Project No. NCHRP 20-93

DEVELOPMENT OF A GUIDE FOR TRANSPORTATION TECHNOLOGY TRANSFER

LITERATURE REVIEW REPORT

(Part of Task 1)

Prepared for
National Cooperative Highway Research Program (NCHRP)
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Development of a Guide for Transportation Technology Transfer

Task 1: Literature Review

Submitted to:
Transportation Research Board
of the National Academies

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NCHRP 20-93: National Cooperative Highway Research Program

Literature Review

I. Introduction

A literature search on factors related to technology transfer and innovation implementation was conducted. The literature search encompassed topics such as:

- Technology transfer, transportation technology transfer, technology transition, technology insertion (Department of Defense [DOD] term), research to practice or translating research into practice (R-into-P or TRIP– medical clinical community), implementation research (behavioral health); and more from private and public sectors
- Technology commercialization (various aspects encompassing technology transfer)
- Communication and trust in technology transfer
- Climate and culture for change and innovation
- Technology diffusion, deployment, dissemination
- Human barriers to innovation implementation
- Innovation and change leadership, organizational change
- Learning new habits and unlearning old habits

The search focused specifically on how transportation agencies, other public agencies, and private industry apply innovation to practice, including introducing an innovation resulting from a research project or new regulation (pushing out of information) or pulling technology into the operational sector. Technology transfer efforts in other organizations such as the Federal Laboratories, other Federal Agencies including Departments of Energy, Defense, Interior, Agriculture, etc., were reviewed, as well as those in the private sector documented in the literature. The ultimate goal is to use this information as a foundation for changing the transportation technology transfer state-of-the-*art* to state-of-the-*practice* via the development of a Transportation Technology Transfer Guide.

Published and unpublished studies in domestic and international books and journals were sought from such literature domains as technology transfer, innovation and technology management, organizational psychology and social sciences, medicine, training and education, engineering, and information technology. The literature review included transportation resources such as the Transportation Research International Documentation (TRID) database, ProQuest® and EBSCOHost® services and others. Note that the TRID database incorporates

TRB's TRIS database, the TRB Research-in-Progress database, the International Transport Research Documentation database, and the Australian Road Research Board library.

This report is organized into four sections:

I. Introduction;
II. Synopsis of Findings: What the Literature Says about Technology Transfer;
III. Listing of References, Abstracts, and Relevant Topics of Articles and Reports Cited
IV. Suggested Readings on Technology Transfer

Section II provides summaries of findings for topics and subtopics. Most studies relate to more than one topic or subtopic, and are therefore counted as relevant to multiple subtopics. Likewise, summaries of findings have some duplication across topics because studies are multiply classified. For each topic listed in Section II, the count of relevant citations is shown, along with the associated citation numbers. A complete listing of citations, including references and abstracts for each article and study, is included in Section III. Section IV includes a selection of the citations in Section III that transportation practitioners may find particularly helpful to gain further knowledge and understanding of technology transfer.

The research settings in the 228 studies cited in this report represent a range of institutional types. The numbers of studies by organizational setting are as follows (the numbers sum to more than 228 because some studies included multiple settings):

Organizational Settings for Studies Cited (Number of Studies):

A. Transportation – Federal (41)
B. Transportation – State (53)
C. Transportation – Other (private sector and international) (23)
D. Other Public Sector (47)
E. Private Industry (93)
F. University (25)

II. Synopsis of Findings: What the Literature Says about Technology Transfer

Definition of *Technology Transfer*

One of the challenges of the literature review was the wide array of ways in which the term *technology transfer* is used. This is particularly true since the term is not only used in conjunction with transportation, but references were found in other domains such as the military, medicine and health care, high-tech industry, agriculture, and social services. Even within these groupings, there are differences in what *technology transfer* constitutes. There are, however, commonalities. At its most fundamental level, all authors seem to accept that *technology transfer involves a process through which knowledge, practices, products, processes, or techniques move or migrate from one institution to another.* Where the differences occur is in the purpose or outcome of that transfer, who is involved in that process, and other elements unique to an industry or community. Since these differences impact the perspective and views of the authors cited in this review, it is worth looking at some of them more closely.

Purpose

Some uses of the term *technology transfer* apply it in the context of a process intended or expected to achieve a particular outcome. In the case of the Federal Laboratory Consortium (FLC), the term has historically been used to describe the process through which technologies developed for one purpose (e.g., Teflon for the space program), were transferred for applications in other areas (e.g., commercial application of Teflon in household products). The purpose of these transfers is multifaceted: produce further public good from federal research investment; achieve a higher rate of return from these discoveries; find new research applications for these products. Essentially, the focus on technology transfer in this regard is *finding new uses* for an innovative technology or practice.

Alternatively, in the highway community, the term *technology transfer* has usually been associated with *increasing the use* of a particular innovation to address a particular problem. The process under this definition is driven much more with the effective demonstration and dissemination of information, and less on finding new applications for it. The purposes associated with such transfers often speak in terms of allowing highway users to enjoy the benefits of these innovations faster. The speed and breadth of dissemination and application are often used as measures to evaluate these processes.

In organizational studies, *technology transfer* is often associated with the sharing of knowledge for the purpose of improving organizational effectiveness and efficiency. The techniques and strategies applied for these purposes focus less on specific outcomes (e.g., transfer of a particularly successful practice), and more on the growth of the organizations' overall capacity as a result of collaboration. Likewise, the emphasis on "technology" seems less than the sharing of ideas and the synergy it brings.

While all of these viewpoints bring unique perspectives and observations, it was found that those that were most relevant to this research study were those that focused on broadly disseminating ideas and innovation to expand their use.

Roles

Similarly, the definitions of *technology transfer* differ in the way in which they describe the roles various parties must play in the process. The exchange, which is the focus of the process, typically involves at least two players, variously referred to as *researcher-user*, *supplier-buyer*, *producer-receptor*, *laboratory-industry*, and the like, to designate the exchange from a source to a recipient. Again, depending on the perspective of the author, such an exchange may look much more like a "sale" (i.e., a commercial transaction), than a "knowledge exchange" (i.e., collegial sharing). This is one of the reasons why some of the *technology transfer* literature seemed less relevant to the highway scenario.

In much of the literature, the researcher or the unit responsible for research plays a key role in not only generating new knowledge, but also in early stakeholder involvement in defining what the ultimate user or implementer needs. This may include engagement not only during the research process, but even their involvement in defining the original research problem statement. Under this definition, the technology transfer process begins even before the innovation is manifested, and continues all the way through deployment.

Other authors do not focus as much on research, but instead discuss processes that are needed to move new technologies, innovations, or practices, regardless of their source (e.g., applying a practice developed in another country). In these cases, the technology transfer process focuses much more on the dissemination and implementation of knowledge, versus shaping those products while they are being developed. In such cases, the role of the "technology transfer coordinator/agent" may shape the definition of the process.

In reviewing the literature, there were examples from both of these scenarios that would be relevant to this research study, inferring that in some cases technology transfer may initially be shaped by researchers, while in others, that opportunity may not exist.

One commonality in the literature was the role of management in the technology transfer process. Virtually all definitions and studies point to the important role that leaders play in setting a *culture of innovation* in an organization. This points to the assumption that technology transfer, by definition, is not a process that is simply applied to move ideas, but it is a process embedded within an organization that modifies its entire openness to change.

Summary

In summary, the term *technology transfer* does not have a single definition in the literature. Wahab, Rose, and Osman (2012) compiled some of the extant definitions which are reproduced here as Table 1. These definitions, shown in the chronological order of their publication, document the diversity of

Table 1. Various Definitions of Technology Transfer

Scholars	Viewpoints
Rogers (1962)	A process by which an organization adopts an innovation made by another organization.
Hall & Johnson (1970)	A technology system in terms of whether it is embodied in people (person-embodied), things (product-embodied) or processes (process-embodied).
UNCTAD (1973)	The act of transferring the needed technical knowledge that has been designed and managed.
Gigch (1978)	The transfer of 'inventive activities' to secondary users.
Jeannet & Liander (1978)	Technology transfer consists of any element or combination of research, development and engineering transferred across national borders.
Sherman (1981)	The application of technology to a new use or user.
Derakhsahani (1983)	An acquisition, development and utilization, of technological knowledge by a country other than in which this knowledge originated.
Kanyak (1985)	The transmission of know-how to suit local conditions, with effective absorption and diffusion both within and from one country to another.
Rodrigues (1985)	An application of new technology to a new use or user.
Tepstra & David (1985)	A cultural system concerned with the relationships between human and their environment.
Shiowattana (1987)	A learning process wherein technological knowledge is continually accumulated into human resources that are engaged in production activities; a successful technology transfer will eventually lead to a deeper and wider accumulation of knowledge.
Derakhshani (1987)	A country's acquisition, development and use of technical knowledge.
Das (1987)	Technology transfer can be the production of new product (product or embodied technology transfer) and more efficient production of existing products (process or disembodied technology transfer).
Hoffman & Girvan (1990)	Technology transfer needs to be perceived in terms of achieving three core objectives: the introduction of new techniques by means of investment of new plants; the improvement of existing techniques and the generation of new knowledge.
Williams & Gibson (1990)	The process of transferring the knowledge and concepts from developed to less-technically developed countries.
Hayden (1992)	The kind of knowledge that can be used as inputs, such as patents rights, scientific principles and R&D, but which must be able to be used to make products.

Table 1. Various Definitions of Technology Transfer (continued)

Scholars	Viewpoints
Zhoa & Reisman, (1992)	The *economists* tend to define technology on the basis of the properties of generic knowledge, focusing particularly on variables that relate to production and design. The *sociologists* tend to link technology transfer to innovation and to view technology, including social technology as a design for instrumental action that reduces the uncertainty of cause-effect relationships involved in achieving a desired outcome. The *anthropologists* tend to view technology transfer broadly within the context of cultural change and the ways in which technology affects change. The *business* disciplines tend to focus on stages of technology transfer, particularly relating design and production stages, as well as sales, to transfer. *Management* researchers are more likely than others to focus on intra-sector transfer and the relation technology transfer to strategy. The recent researchers have focused on alliances pertain to the development and transfer of technology.
Roessner (1993)	The movement of know-how, technical knowledge, or technology from one organizational setting to another.
Levin (1993)	A socio-technical process implying the transfer of cultural skills accompanying the movement of machinery, equipment and tools. Transfer of technology is both the physical movement of artifacts and also, at the same time, transfer of the embedded cultural skills.
Gibson & Roger (1994)	The application of information where the process usually involves moving a technological innovation from an R&D organization to a receptor organization.
Autio & Laamanen (1995)	An intentional, goal oriented interaction between two or more social entities, during which the pool of technological knowledge remains stable or increases through the transfer of one or more components of technology.
Farhang (1996)	Transfer of technologies in cases of manufacturing processes requires not only the transfer of technological knowledge in the form of process sheets, blueprints, products, and materials specification, but also the transfer of know-how of high-calibre engineering and technical personnel.
Phillips (2002)	The process by which ideas and concepts that move from the laboratory to the market place.
Mascus (2003)	Any process by which one party gains access to another's technical information and successfully learn and absorbs it into the production function.

Source: Sazali and Raduan, as quoted in Wahab, Rose, and Osman (2012)

conceptualizations of the term. This diversity undoubtedly reflects the variety of disciplines represented by the researchers. Although the definitions span some 33 years and reveal commonalities as well as diversity, it is difficult to detect any apparent progression or convergence in thinking about the concept.

In keeping with the various definitions of technology transfer offered by the literature, the studies that were examined may appear to lack consistency of thought, or in some cases, point to very different conclusions. As stated by Rye and Kimberly, "We have no widely accepted theory of innovation

adoption in organizations, and this along with other empirical problems frustrates our efforts to make sense of the empirical results" (Rye and Kimberly, 2007, p. 254). These authors cited Rogers and others in observing that one of the most consistent themes in this literature is the inconsistency of findings. To address this dilemma, they called for a number of enhancements and refinements, including clear definitions of terms such as *innovation*, *newness*, and *adoption*, stronger research designs and measures of key variables that are theoretically grounded, greater attention by researchers to typologies of innovations, and thoughtful consideration of the scope of theoretical models.

In light of the challenges posed by the technology transfer and related literatures, an effort was made in creating this summary to use those citations that appeared most relevant and consistent with those used in the transportation industry, drawing judiciously on valuable studies in other areas. These differences in definition do suggest there are multiple ways to look at this issue. As noted, some definitions emphasize commercialization, while other focus more on knowledge sharing and innovation implementation. To give appropriate attention to each of these, this literature summary provides synopses of findings reflecting these main themes (Technology Transfer, Knowledge Sharing, Innovation Implementation, and Commercialization) and subtopics. The synopses include syntheses of concepts as well as findings from abstracts. For each topic and subtopic listed in this section, the count of relevant citations is shown, along with the associated citation numbers. A complete listing of citations, including references and abstracts for each article and study, is included in Section III. Most studies relate to more than one topic or subtopic, and are therefore counted as relevant to multiple subtopics and a number of the same findings are discussed in multiple synopses.

I. Technology Transfer

Citation Count: 151
Citations: 1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 15, 16, 17, 18, 19, 22, 25, 31, 32, 34, 36, 38, 39, 40, 41, 42, 43, 45, 46, 47, 50, 51, 52, 53, 54, 55, 57, 58, 59, 61, 62, 66, 67, 68, 70, 73, 74, 75, 77, 78, 80, 81, 82, 83, 84, 86, 87, 91, 93, 96, 98, 99, 100, 101, 102, 103, 104, 105, 107, 109, 110, 112, 113, 115, 117, 118, 120, 124, 125, 126, 128, 132, 133, 137, 138, 139, 140, 141, 142, 143, 144, 146, 151, 152, 153, 154, 155, 157, 158, 159, 161, 162, 163, 166, 167, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 199, 200, 202, 203, 204, 206, 207, 209, 210, 211, 212, 213, 215, 216, 218, 219, 220, 221, 222, 226, 227

Numerous authors have offered prescriptions for successfully transferring technology and implementing innovations, perhaps the best-known of these being Everett M. Rogers (*Diffusion of Innovations*, 2003 and earlier editions). Five such prescriptive lists are summarized in this section, along with selected research on factors impacting technology transfer and innovation. From this research general principles of success can be inferred, such as the importance of an organizational culture that is primed for change, thorough education of all parties concerning the details and potential benefits of an innovation and their roles in its implementation, management support particularly concerning availability of resources, boundary spanning change agents, innovation champions, and timely communications among all stakeholders. Examples for the transportation industry are summarized. However, prescriptions for successful transfer are limited in applicability by barriers and limitations, which tend to be situation- or domain-specific. Common barriers and resource limitations are described together with some suggested remedies.

A. Successes

Citation Count: 109

Citations: 3, 5, 6, 7, 8, 9, 14, 15, 16, 17, 18, 19, 21, 22, 24, 27, 31, 32, 39, 40, 42, 45, 47, 51, 52, 54, 57, 58, 59, 62, 66, 68, 70, 72, 73, 75, 77, 78, 80, 83, 84, 86, 91, 93, 96, 99, 100, 102, 103, 104, 107, 110, 112, 113, 114, 115, 118, 119, 120, 124, 125, 128, 133, 139, 140, 141, 142, 143, 151, 152, 154, 162, 163, 164, 169, 170, 171, 172, 174, 175, 176, 177, 181, 182, 183, 184, 185, 186, 189, 190, 191, 197, 199, 200, 204, 206, 207, 210, 211, 212, 213, 215, 216, 219, 220, 221, 222, 226, 227

Success Factors in Technology Transfer and Innovation Implementation

The Literature in Brief

- There are known success factors that facilitate successful technology transfer which can be applied in a broad context; in addition there are specific strategies that relate to discrete contexts in which technology transfer is accomplished.
- Initial considerations for technology transfer are the perception of the innovation, its worthiness or usefulness for benefit, and the organizational ability to accomplish the technology transfer either through pulling in the innovation or pushing it out to others, or both.
- Individuals and organizations must interact in the process of technology transfer; communication, collaboration, and partnerships are essential foundations of the activity of technology transfer.

Rogers (2002) proposed five strategies for facilitating technology transfer: (1) creating boundary-spanning units; (2) transplanting personnel; (3) forming network relationships linking R&D organizations and receptor organizations; (4) encouraging the formation of high-tech spin-offs; and (5) organizing consensus development conferences to create practice guidelines. Once transferred from one organization to another, the task remains to implement the new technology so that its benefits are fully realized.

Factors that affect technology transfer and commercialization at federal laboratories include mission, management, agency leadership, organization and coordination of technology transfer and commercialization activities, resources, and more. Strategies believed to increase the speed and extent of dissemination of technology transfer: (1) collaborate with universities; (2) increase laboratory director involvement in technology transfer activities; (3) strengthen or complement the skill set of the Office of Research and Technology Applications staff; (4) enhance education and incentives for researchers to engage in technology transfer; (5) use standardized agreements to streamline industry interactions; (6) increase visibility and access to federal laboratories by increasing outreach and use of partnership intermediaries; (7) increase availability of resources through leveraging economic development and commercialization programs and partnership intermediaries (Shipp et al., 2011).

Critical success factors in technology transfer from federal laboratories to private industry include a "transfer culture" in both the government laboratory and private organization, shared personnel of the federal and private organizations throughout the transfer project life cycle, the private organization's ability and intent to adequately fund the transfer project, and the private organization's completion of a business plan for the commercialization of the transferred technology prior to transfer initiation. Additional factors include: (1) the developer establishes a dedicated technology transfer unit within its organization; (2) the transfer agent is located close to the developing organization; (3) the developing organization targets advertising to relevant industries; (4) the acquiring organization facilitates informal transfer processes; (5) the acquiring organization funds the transfer project adequately; (6) the acquiring organization has a business plan for commercializing the technology; and (7) both the developing and the acquiring organizations share personnel over the life of the transfer project (Franza and Grant, 2006).

The innovation process can be described in discrete stages: idea generation and mobilization, screening and advocacy, experimentation, commercialization, and diffusion and implementation. Organizational characteristics for successful diffusion and implementation include: (1) the whole organization is targeted; (2) existing initiatives are incorporated; (3) realistic objectives are established; (4) knowledge broker role is acknowledged; (5) dialogue is emphasized with all stakeholders; (6) older, duplicative processes are eliminated; (7) unlearning is understood and prepared for; (8) storytelling and metaphor are used to inspire and convey the need for and type of change; (9) values and culture are emphasized; (10) social networks are utilized; (11) customer segmentation is established; (12) technology is used to communicate; (13) failures are evaluated and considered for further stages or processes (Desouza et al., 2009).

Implementation principles in a state transportation department include: (1) top management support; (2) dedicated resources; (3) effective communications; (4) implementation teams with the requisite skills, credibility, and enthusiasm; (5) broad involvement of the field; and (6) a supportive culture of innovation (Bonini et al., 2011).

Intellectual property rights such as patents protect new inventions from imitation and competition. Patents provide incentives for invention, sacrificing short-term market efficiency for long-term economic gains. The structure of the licensing agreement affects technology transfer outcomes for technologies patented and licensed by the Agricultural Research Service (ARS) of the U.S. Department of Agriculture. As commercial partners gain experience with the technology and learn more about the market, mutually advantageous revisions to license terms can maintain the incentives through which private companies distribute the benefits of public research.

A meta-analysis of factors influencing successful information technology (IT) adoption found organizational readiness to be the most significant attribute. We note, however, that this relationship was based on only 2 of the 31 studies included in the analysis, a sample too small to support reliable conclusions. The authors reported a moderately significant relationship between IT adoption and information system (IS) department size. They characterized IS infrastructure, top

management support, IT expertise, resources, and organizational size as only weakly related to IT adoption. Again, our interpretation of the results presented by these authors is somewhat different. We regard the magnitude of the average correlations between IT adoption and top management support, IT expertise, and IS infrastructure as moderately strong (average correlations of .29, .27, and .28, respectively). (This study, although noteworthy as a rare instance of a meta-analysis of research on technology adoption, is perhaps a case in point regarding inconsistencies in thought and interpretation that one encounters repeatedly in reviewing the technology transfer literature.)

A review of studies of IT adoption reported that the best predictors of IT *adoption by individuals* include perceived usefulness, top management support, computer experience, behavioral intention, and user support. The best predictors of IT *adoption by organizations* were top management support, external pressure, professionalism of the IS unit, and external information sources. At the level of independent variables, top management support stands as the main linkage between individual and organizational IT adoption. Firm-internal traits are particularly important influencers of adoption of high-tech innovations (Vowles, Thirkell, and Sinha, 2011).

Earliest adopters appear to be innovation-focused: the perceived benefits of the innovation, the strength of the producer network, the influence of a champion, the ability to sense and respond to new technology, and the depth of technology knowledge are significant influencers of early adoption. A review of multiple programs in Hewlett-Packard revealed top enablers of innovation: highly skilled people; a helping culture; management support; using checkpoints to provide focus; and interdisciplinary people working together. However, barriers are different across programs; consequently, managers should regularly interview teams to determine which barriers need to be addressed.

Technical communicators need to do more than just advocate for new technologies, they need to become negotiators of technology, finding common ground among stakeholders and facilitating understanding. Learning before doing is an important strategy in entrepreneurial firms facing resource constraints. The alternative, pure reliance on “on the job learning” impedes efficiencies and delays the absorption of knowledge for effective collaboration, integration, and gains.

Promoting Technology Transfer in Transportation

The Literature in Brief

- Support and structure for lead states model for disseminating and deploying innovation has been successful in a number of uses, e.g., SHRP, AASHTO TIG; similar processes can be applicable to technology transfer efforts.
- Research and/or technology programs having technology transfer, implementation, and deployment as a central and identified objective have worked well in transportation applications.
- Transportation professionals derive particular benefit in technology transfer activities that include peer interactions, e.g., demonstrations, showcases, domestic scans, and other face-to-face opportunities.

To improve the constructability and reduce the maintenance of the nation's highways and bridges, in 1987 Congress initiated the five-year Strategic Highway Research Program (SHRP). The American Association of State Highway and Transportation Officials (AASHTO), in cooperation with the Federal Highway Administration (FHWA), created a Task Force for SHRP implementation. The Task Force's approach for technology transfer was through the use of teams consisting of the states that took the lead on various products. Subsequently, the executive committee of the Technology Implementation Group (TIG) of AASHTO developed a guidebook to facilitate the work of lead states teams. This guidebook provides clear descriptions of roles and responsibilities of all involved in lead states team activities as well as example lead states team documents and templates for creating new documents.

Objectives of the Highways for LIFE program include involving stakeholders, enhancing technology deployment, moving emerging private sector innovations into the marketplace, employing demonstration projects, developing a new business model, and evaluating success (Bergeron, 2010). These innovations can help highway agencies complete construction faster, at lower cost, and more safely with less impact on the driving public.

The Technology Partnerships Program is part of Highways for LIFE, an FHWA initiative to accelerate innovation in the highway industry (Zirlin, 2009). It provides grants to fund the critical final steps in developing technologies with potential to improve project or work zone safety, accelerate construction, reduce construction-related congestion, or improve quality. Established in 2007, the program promotes partnerships to test and demonstrate those technologies in real-world settings.

The U.S. Domestic Scan program gives transportation agency professionals the opportunity to gain firsthand knowledge of best practices and policies and successful technologies that other states have implemented (Casey, 2009). The project aimed to make observations and note trends among

the scans; discover successes of and obstacles to the technology transfer and implementation efforts; and make recommendations for future scans to promote more effective implementation. Major findings: (1) scans were valuable to participants, to participants' own agencies, and to the nation; (2) the scans met timely needs; (3) states implemented technologies learned on the scan tour; (4) scans had an impact on federal policy and practices; (5) the success of implementation efforts depended in part on each individual scan and the nature of the scan topic; (6) the scan revealed barriers to implementing new technologies and practices; (7) participants were supportive of the domestic scan process; (8) host states also benefited from the scans; (9) a significant benefit of the scans included participants' learning from the lessons of others; (10) technology transfer efforts were conducted broadly and with significant success; (11) scans had reaching effects well beyond participants.

The Federal Highway Administration (FHWA) has played a key role in the high performance concrete (HPC) technology transfer from research and development to routine practice for bridge and pavement design and construction. Success has been largely due to a long-term continuing partnership between FHWA, State Departments of Transportation, AASHTO, local agencies, industry and academia.

Small and rural transportation agencies are responsible for building or maintaining nearly 3 million miles of roadways and more than 29,000 bridges in the U.S. (Sullivan, 2003). Ensuring that these local agencies have access to the knowledge and tools they need to do their jobs effectively depends on getting information about proven, new technologies and processes from the research centers into the hands of the transportation professionals who can implement them in the field. The Rural Technical Assistance Program (RTAP) was introduced in the early 1980s by the Federal Highway Administration to facilitate information exchange in support of local road and bridge agencies. The name has since changed to the Local Technical Assistance Program (LTAP) and Tribal Technical Assistance Program (TTAP). LTAP's Product Demonstration Showcase Program was unveiled in 1995 with the goal of reducing the timeline for moving new technologies from state-of-the-art status to state-of-the-practice at the local level.

A conceptual framework for a toolbox that contains methods, processes, and techniques to facilitate and enhance technology transfer activities in the transportation community included two components: (1) Implementation Tool to prepare implementation action plans, marketing plans, and executive briefing presentations and reports and other communication materials; (2) scheduling and tracking tool for activity timelines, elements of the processes being performed, critical accomplishments, resources needed or expended, and capability to assess the effectiveness of the tools and outcomes achieved.

Most respondents to Orcutt's and AlKadri's (2009, citation 114) survey of transportation professionals concerning common barriers and enablers of innovation considered themselves to be innovation champions (63%). Virtually all respondents rated innovation as important. The highest-rated enabler of innovation was "product matched user need." Specific suggestions to improve

innovation were establishing clear direction and procedures, securing executive sponsorship, empowering people to innovate, and finding champions for innovation at all levels.

With concurrent engineering, the design, consultation, and definition of the methods of highway construction are carried out simultaneously rather than sequentially (Penfentenyo, Fadeuilhe, and Ray, 2006). Project alignment is worked out while integrating, progressively, the elements coming from these three sources. This requires a common information system where each actor has access to the updated project. This process generates more upstream work for the project team, since it results in adapting the project uninterrupted as new constraints appear, but this investment proves to be advantageous because the effort spent during the earlier phases of the work prevents significant downstream delay and reduces overall cost. Such concurrent processes enable effective technology transfer and facilitate adoption of innovation as solutions are developed during the course of the construction.

Dynamic and collaborative interactions between technology provider and receiver greatly facilitate knowledge transfer in transportation. An effective transfer infrastructure uses seamless communication among all parties involved, and requires top management commitment, human and financial resources, and an organizational culture that embraces change and works to dissolve resistance to new technology introduction.

B. Barriers

Citation Count: 78

Citations: 3, 5, 6, 8, 9, 14, 15, 16, 18, 19, 21, 22, 32, 37, 39, 40, 42, 47, 51, 52, 57, 59, 62, 68, 70, 72, 73, 77, 83, 86, 87, 91, 93, 99, 101, 102, 104, 109, 112, 114, 115, 117, 120, 125, 128, 132, 139, 140, 143, 151, 154, 162, 163, 164, 167, 169, 173, 174, 175, 176, 178, 181, 182, 184, 187, 190, 191, 197, 199, 204, 211, 213, 214, 216, 220, 221, 226, 227

The Literature in Brief

- Barriers to technology innovation, and thus for technology transfer, have a basis in the newness of the market as well as the newness of and unfamiliarity with the technology. Differences between a technology failure and risk averse, resistance to change behaviors often are not easily identified.
- Multi-layered projects, inter-jurisdictional responsibilities, and many players, as in transportation practice, are frequently the source of difficult hurdles to successful technology transfer. With such complexities trust is difficult to build and should be built in the early stages of an effort.
- A lack of systems and infrastructure for marketing and distribution – technology transfer essentials – is a barrier to the speed of use of new technologies.

Barriers to technology innovation tend to be situation specific; consequently, managers should regularly communicate with team members to determine which barriers need to be addressed. Barriers can be predicted on the basis of technology and market newness. Products with technologies that are new to the company face capability issues while products with new markets may experience market planning issues. "People-issues" are often blamed for technology implementation failures, particularly participation and management. Remedies include structuring more accurate and realistic implementation timelines, and developing checks, balances, and incentives that align the interests of stakeholders toward implementation.

Many information technology projects fail in the early stages due to problems in requirements definition. Establishing trust among parties is critical to collaborative work, particularly in the early stages of projects. Trust can depend on the pace of knowledge sharing among participants, so it is important to encourage openness from the outset. Other major knowledge sharing barriers that should be anticipated include: the codification process (definition of terms), inadequate information technology, lack of initiative and strategy by the workers, and lack of time and resources.

In Orcutt's and AlKadri's (2009, citation 114) survey of transportation professionals, the worst-rated innovation roadblock was "resistance to change." Respondents provided specific suggestions to improve innovation by establishing clear direction and procedures, securing executive sponsorship, empowering people to innovate, and finding champions for innovation at all levels.

Resistance to change has received considerable attention from organizational researchers, who have studied it both as an individual disposition and as a group-level aspect of an organization's culture. For many, change is threatening, unsettling, and stressful, whereas the known is comfortable and reassuring. Organizational cynicism is a tendency to find fault with the management of one's workplace, to criticize the change and improvement efforts of others while doubting their motives, and to be prematurely disappointed in the future. As a learned disposition, cynicism arises from direct experience with frustration and through group socialization – co-workers share expectations that change and improvement efforts will prove futile. Cynicism implies behavior in the form of resistance to change, as a way to avoid the anticipated disappointment when a new initiative inevitably fails (in the view of a cynic). The challenge is to develop change management strategies that are both effective and acceptable to those who ultimately make them succeed or fail.

Roadblocks faced by Caltrans in three showcase innovations included: (1) transportation projects are complex, multifaceted, inter-jurisdictional with many players having different interests; (2) multiple layers of decision making sometimes lacking logic; (3) public sector procurement driven by competitive multiple low-bid processes often infringes on intellectual property rights; (4) public agencies resist change; and (5) risk aversive executives hesitate to implement new innovations. To mitigate roadblocks, a systems engineering process is advocated that ensures the inclusion of customers throughout all phases so that the final product meets their needs. It is important to interconnect researchers, developers, operators, decision makers, and innovation champions by improving communications at all levels and stages (Orcutt and AlKadri, 2009 - citation 115).

A fundamental obstacle to successful dissemination and implementation of evidence-based public health programs is the absence of systems and infrastructure for marketing and distribution: customer research and segmentation, packaging, promotion, transfer, distribution, inventory management, sales, communication, training, technical assistance, customer service, product service, coordination, and evaluation and data analysis (Kreuter and Bernhardt, 2009). Effective dissemination systems are important and without a marketing infrastructure, application of proven solutions will continue to occur slowly and rarely.

C. Resource Limitations

Citation Count: 52

Citations: 3, 5, 16, 19, 22, 32, 39, 40, 42, 47, 50, 51, 52, 57, 62, 65, 70, 73, 77, 79, 83, 91, 93, 102, 114, 115, 120, 125, 128, 139, 143, 154, 162, 163, 169, 172, 175, 176, 180, 181, 182, 184, 191, 199, 204, 211, 213, 216, 220, 221, 226, 227

The Literature in Brief

- Successful technology transfer is a complex undertaking, requiring competent and effective management, strategy, timing, and marketing.
- Institutions of higher education have an important place in technology transfer but may not yet possess the knowledge, skills, and ethos necessary for effectively engaging the entrepreneurial culture.
- An aging transportation infrastructure combined with public demand for better, faster, and safer roadway betterment projects requires a coordinated, strategic approach to the application of new technologies.

The expertise necessary to understand and apply all facets of technology transfer pull and push activities, including technical, procurement, institutional, marketing, resource management, training and legal issues, is immense. It is difficult for recent hires or professionals new to technology transfer to grasp the fundamentals and be “up and running” in a short period of time (Nakanishi, Elrahman, and Horn, 2007). Improving technology transfer involves a steep learning curve. It has taken decades for organizations to learn how to operate successful transfer programs. Successful commercialization requires significantly more than a good idea or new technology. Developing a successful product requires, among other things, effective management, strategy, timing, and marketing. Coordinating among many organizations, some with widely varying missions, is a significant challenge. Technology transfer processes that work for one industry or institution may not be applicable to another.

Educational institutions that emphasize the entrepreneurial dimension of technology transfer must address skill deficiencies in technology transfer offices, reward systems that are inconsistent with enhanced entrepreneurial activity, and the lack of training for faculty members, post-docs, and

graduate students in starting new ventures or interacting with entrepreneurs. Universities also are required to confront issues related to ethics and social responsibility, as they more aggressively pursue technology commercialization (Phan and Siegel, 2006).

An aging transportation system faces increasing traffic demand. Large construction projects to improve outdated roads and bridges compound traffic problems during extensive construction periods. Today's motorists demand high-quality roads, but they want them put in place as quickly as possible; they will not settle for a "business as usual" approach. Key to the success is a team of experts working together in a coordinated, strategic approach to ensure that the project is completed better, faster, and safer.

II. Knowledge Sharing

Citation Count: 125
Citations: 1, 2, 3, 4, 5, 6, 12, 13, 14, 15, 16, 22, 23, 24, 25, 26, 28, 29, 32, 33, 34, 35, 38, 39, 40, 41, 42, 44, 45, 47, 48, 49, 54, 55, 56, 58, 59, 60, 61, 63, 64, 67, 68, 71, 73, 76, 77, 78, 79, 83, 84, 85, 88, 89, 93, 99, 100, 102, 104, 105, 109, 110, 112, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 130, 131, 132, 137, 138, 139, 140, 141, 143, 148, 149, 153, 155, 156, 162, 164, 166, 168, 173, 174, 175, 177, 179, 180, 181, 184, 185, 186, 190, 191, 192, 195, 196, 198, 199, 201, 205, 206, 209, 210, 211, 213, 216, 217, 220, 222, 223, 224, 225, 228

The field of knowledge management recognizes that much of the work of an organization is accomplished through the tacit (or procedural) knowledge of its members -- understanding how to get things done. Tacit knowledge is complementary to explicit (or declarative) knowledge -- comprehension of relevant facts and operational details. Explicit knowledge can usually be taught or transferred from one person to another verbally or in writing (via instructions, training manuals, textbooks, etc.), but tacit knowledge is more difficult to articulate. Tacit knowledge is learned by doing, by working with and observing others with guided practice, and/or through trial and error. Examples of tacit knowledge in action are driving a car and playing a guitar; these activities can be taught through instruction and demonstration, but ultimately they must be learned through practice and experience.

To ensure that organization members acquire the knowledge and skills needed to fulfill the organization's mission, knowledge management strategies are used. These are often either "push" strategies, whereby members are asked to codify what they know about work processes into shared repositories such as databases and manuals, or "pull" strategies, whereby members are apprenticed to local experts in order to learn needed skills and insights. Strategy components of knowledge management can include rewards for knowledge sharing and mentoring, after action reviews, cross-project assignments, expert directories, knowledge fairs, collaborative technologies, and many others. Leaders facilitate knowledge sharing by promoting a climate of trust and open communication. Team network density (the number and intensity of network members' interactions) and learning culture facilitate knowledge transfer across levels in an organization.

A. Knowledge Management

Citation Count: 81

Citations: 1, 3, 5, 6, 14, 23, 28, 29, 30, 33, 34, 39, 40, 44, 45, 48, 49, 50, 55, 58, 60, 61, 63, 64, 65, 67, 68, 73, 76, 77, 78, 83, 84, 89, 95, 101, 102, 105, 110, 116, 118, 119, 121, 123, 124, 125, 127, 131, 132, 137, 138, 139, 140, 141, 148, 153, 155, 156, 166, 168, 173, 177, 178, 180, 181, 184, 186, 191, 195, 196, 199, 201, 205, 206, 210, 211, 213, 216, 220, 222, 225

The Literature in Brief

- Knowledge is a strategic resource that must be carefully managed, including the “push” and “pull” of information. This includes the “unlearning” of old information and the retention of existing knowledge when personnel change.
- Research and development is becoming more collaborative, expanding the role of technology transfer agents.
- A significant barrier to effective collaboration is failing to establish trust among participants.
- Successful large-scale research implementation programs include the collaboration between FHWA and AASHTO for the Strategic Highway Research Program (SHRP) implementation, and FHWA’s Local Technical Assistance Program (LTAP)/Tribal Technical Assistance Program (TTAP), among others.

Managers and project leaders may see the value of tacit knowledge, but have different perceptions of the goals of successful knowledge transfer and lack effective processes to manage it. To effectively manage a technology transfer process, the need to "unlearn" old practices must be recognized -- new knowledge may not be fully exploited until old habits are recognized and modified or replaced. One knowledge management challenge facing many organizations today is knowledge retention arising from loss of members due to downsizing for economic reasons and retirements of the baby boomer generation.

Knowledge sharing within communities of practice in health care organizations is facilitated by motivation to learn, trust among members, and group leadership. Among younger aerospace engineers, knowledge transfer from older generations requires visible and participative management involvement to create a knowledge-sharing culture based on open and honest communication, respectful and trusting relationships, effective mentoring, co-location of team members, and a technology infrastructure. Even in the financial sector that relies heavily on technology and on quantitative approaches to decision making, the "people" dimension predominates in determining the quality of risk management knowledge sharing, especially organizational capacity for work coordination.

With aging workforces, knowledge retention is an increasing challenge in many organizations. As baby boomers retire, it is important that they share their knowledge with younger cohorts.

Millennials (or Gen-Ys, as they are also called) are a generation in which knowledge is acquired, shared, and created as an extension of the primacy of relationships and networks and embedded in the connections that information technology provides. Knowledge retention strategies should acknowledge cross-generational differences in preferences for modes of knowledge sharing, networking, and communication.

The importance of the need for knowledge management and its effective transfer is critical in our increasingly knowledge-based economy. Knowledge is a strategic resource and a competitive advantage to be carefully managed and leveraged through alliances and networks. A useful tool in evaluating potential alliances is an alliance scorecard, focusing on factors such as clarifying the key metrics of asset management, articulating the value discipline for the partners, identifying the contributions of each participant to enterprise equity, and setting the stage for mechanisms to enhance knowledge management, especially those related to the resolution of potential conflicts – all of which can facilitate the transfer of essential knowledge.

The trend toward open innovation, whereby companies form R&D partnerships and alliances with universities and other companies, including highly specialized small research companies, is changing the traditional profile of R&D in companies and expanding the role of technology transfer agents as "integrators of knowledge and expertise." In knowledge management in R&D alliances, it is important to distinguish the entrepreneurial processes of gaining technological experience and also of leveraging the accumulated experience through implementation. Accumulating experience strengthens the positive effects of the implementation experience, thus enhancing alliance performance. Furthermore in R&D partnerships and alliances, trust is essential to knowledge sharing in the exploration phase of buyer-supplier R&D projects, whereas both trust and contractual mechanisms are important in the development phase.

Examples and Illustrations:

- To improve the constructability and reduce the maintenance of the nation's highways and bridges, in 1987 Congress initiated the five-year Strategic Highway Research Program (SHRP). The American Association of State Highway and Transportation Officials (AASHTO), in cooperation with the Federal Highway Administration (FHWA), created a Task Force for SHRP implementation. The Task Force's approach for technology transfer was through the use of teams consisting of the states that took the lead on various products. Subsequently, the executive committee of the Technology Implementation Group (TIG) of AASHTO developed a guidebook to facilitate the work of lead states teams. This guidebook provides clear descriptions of roles and responsibilities of all involved in lead states team activities as well as example lead states team documents and templates for creating new documents.

- The Rural Technical Assistance Program (now Local Technical Assistance Program/Tribal Technical Assistance Program (LTAP/TTAP) was introduced in the early 1980s by the Federal Highway Administration to facilitate information exchange in support of local road and bridge agencies. LTAP's Product Demonstration Showcase Program was unveiled in 1995

with the goal of reducing the timeline for moving new technologies from state-of-the-art status to state-of-the-practice at the local level.

- An intense 2 1/2 day multi-partner Winter Maintenance Technical Peer Exchange involving state and local governments sponsored by the Commonwealth of Pennsylvania was geared toward improving winter maintenance training, technical assistance, and knowledge resources; the identification of technology development needs; and the improvement of critical methodologies and networks (e.g., Technology Transfer/LTAP). This technical exchange explored winter maintenance technology addressing operations, materials, equipment, planning, and communications with respect to safety, the environment, and traffic mobility.

- Similar to the Winter Maintenance Peer Exchange, the Pennsylvania LTAP Center hosted two FHWA sponsored Technology Transfer Specialist Technical Peer Exchanges: one for Highway Maintenance Technology and the second for Highway Safety Technology. These exchanges brought LTAP/TTAP transportation technology transfer specialists from across the country together to explore information and best practices of road/street maintenance and safety training, technical assistance, knowledge resources, technical developments, and improvement of critical technology transfer methodologies and networks. Focus was placed on dissemination of information to the local level; several lessons learned and recommendations were generated to enhance technology transfer in these arenas.

- In new product transitions at Intel, functional teams across the organization had access to specific information (for example, about macroeconomic conditions in Asia or the availability of a particular part) that had significant bearing on the relative demand and supply of old and new products. However, the lack of a formal mechanism to aggregate and utilize such diverse information frequently caused misalignment. A new process defined a specific market objective, assessed product drivers and risks, explored possible risks arising from interactions between products, and developed a transition playbook, including prevention and contingency strategies with which to manage and mitigate transition risks (Erhun, Concalves, and Hopman, 2007).

- Decision support systems help organizations evaluate and choose among alternatives, for example, transit agencies choosing the most appropriate project delivery method considering the traditional design–bid–build, construction manager-at-risk, design–build, and design–build–operate–maintain delivery methods.

- Transportation libraries play a crucial role in providing information that supports transportation policy, regulations, research, operations, and technology transfer. LTAP/TTAP has a wide variety of resources from training manuals to professional development programs, including: training materials and videos; tips from the field; best practices;

downloadable files; and web-based resources.

- Enterprise architecture (EA) has been embraced by governments as an instrument to advance their e-government efforts, create coherence, and improve interoperability. EA is aimed at closing the gap between high-level policies of organizations and low-level implementations of information systems. In addition to technical components, to be effective EA must incorporate relational capabilities, clear responsibilities, and sound governance mechanisms.

B. Trust and Communication

Citation Count: 54

Citations: 3, 5, 13, 14, 16, 25, 29, 33, 38, 40, 42, 44, 47, 48, 58, 59, 60, 61, 69, 71, 73, 77, 79, 92, 102, 114, 115, 117, 125, 126, 127, 128, 130, 132, 135, 137, 138, 139, 140, 148, 149, 150, 156, 169, 173, 190, 195, 196, 198, 199, 210, 211, 224, 228

The Literature in Brief

- Open communication and knowledge sharing foster trust and enable a functional team environment.
- Barriers to effective communication include technical terminology and differences in knowledge and skill levels.
- Competitive, commercial cultures can lead to knowledge hoarding, limiting knowledge sharing.
- Common ground among participants must be actively sought.

Knowledge sharing is fundamental to technology transfer and innovation implementation. Knowledge can be shared between team members, managers and employees, business partners, buyers and suppliers, transfer agents and clients/adopters, internal and external stakeholders, and others. Leaders can facilitate knowledge sharing by promoting a climate of trust and open communication; and this may be especially important early in the technology transfer process when defining project requirements. Open communication fosters trust and sets the stage for effective working relationships among stakeholders, especially in a team environment.

A leader can anticipate barriers to communication such as technical terminology and varying knowledge and skill levels among stakeholders, and address them through mentoring and knowledge management processes. Competitive cultures of many organizations promote knowledge hoarding and inhibit communications, particularly in R&D organizations oriented toward commercialization. A leader's appreciation and affirmation of individual contributions promote trust, trust promotes knowledge acquisition, and knowledge acquisition influences team

performance. Technical communicators should go beyond advocacy to become negotiators, actively seeking common ground among stakeholders and facilitating understanding.

C. Networks and Teams

Citation Count: 45

Citations: 2, 3, 9, 10, 13, 14, 22, 33, 35, 40, 42, 44, 49, 50, 59, 64, 68, 73, 77, 85, 88, 100, 102, 104, 110, 112, 122, 123, 125, 128, 130, 137, 138, 140, 150, 152, 153, 156, 174, 192, 196, 210, 211, 217, 223

The Literature in Brief

- Positive team outcomes are the result of a strong team identity, the exercise of cooperative behaviors, and the encouragement of individual risk-taking.
- The adoption and use of new technologies may occur through intentional efforts such as implementation teams or communities of practice.
- The adoption and use of new technologies may occur through social phenomena such as social contagion, geographic propinquity, and the celebrity of prior users.

Team climate is an important determinant of members' willingness to share information. Team leaders who employ a transformational and charismatic style facilitate more cooperative interactions in teams. Teams with a strong team identity combined with the exercise of cooperative behaviors are more innovative. Fostering an autonomous and experimental climate (i.e., encouraging individual risk taking by team members) encourages a team's knowledge integration capability, which in turn enhances team outcomes. As noted above, team network density (the number and intensity of network members' interactions) and learning culture facilitate knowledge transfer across levels in an organization.

Implementation of innovations can be facilitated by "implementation teams" formed to design and lead the implementation of an organization-wide change strategy. Knowledge intensive organizations often rely on knowledge sharing networks, sometimes called communities of practice. Knowledge sharing within communities of practice is facilitated by motivation to learn, trust among members, and group leadership.

Strategic innovation is facilitated by combinative capabilities of networks (systematization, coordination, and socialization of knowledge). User bandwagons (relating to the number of the specific technology users in the organization) may be a way for firms to hasten the adoption and use of new technologies by spreading from one group to another. Social contagion, the transmission of information through direct contact and observation, influences adoption of new technologies through the influence of prior adopters. Geographic proximity and "celebrity" of prior adopters influence adoption by others.

D. Unlearning Old Habits

Citation Count: 11

Citations: 28, 29, 30, 40, 77, 102, 117, 125, 140, 186, 187

The Literature in Brief

- Learning new technologies can be difficult for individuals and organizations for which past practices are well-learned and habitual.
- The full exploitation of new knowledge may not occur until the practices of the past are modified or replaced.
- Recognizing the practices of the past that must be modified or replaced with new occurs best in an innovative culture.

Technology transfer and innovation implementation typically require knowledge sharing and learning. Adoption of new technologies and practices usually mean that past technologies and practices must be revised, replaced, abandoned, and/or augmented. Particularly when past practices were well-learned and habitual, assimilating new knowledge and practice can be challenging to individuals who must transition from the old to the new. Resistance can be especially strong to external sources of knowledge or technology ("not invented here"), and this resistance can translate into intentional failure to exploit ("not sold here"). Resistance to change and fixation on "tried and true" practices can become part of an organization's culture.

To effectively manage a technology transfer process, the need to "unlearn" old practices must be recognized -- new knowledge may not be fully exploited until old habits are recognized and modified or replaced. Leaders should work to establish an innovative culture, and managers should support employees in the learning process with training, skills development, and communications that are informative, targeted, and frequent.

III. Innovation Implementation

Citation Count: 94
Citations: 2, 3, 4, 8, 10, 17, 18, 19, 21, 26, 27, 34, 36, 37, 38, 39, 42, 43, 44, 47, 48, 52, 57, 58, 59, 62, 65, 66, 67, 70, 72, 73, 76, 78, 81, 82, 84, 85, 88, 89, 90, 94, 95, 97, 98, 103, 104, 107, 108, 109, 111, 112, 113, 120, 128, 129, 131, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 146, 147, 150, 152, 155, 157, 162, 163, 164, 165, 166, 171, 174, 182, 184, 188, 189, 196, 201, 203, 209, 213, 215, 218, 219, 225, 227

Once an innovation is transferred from one organization to another, the task remains to implement the new technology so that its benefits are fully realized. Successful innovation implementation requires top management support, careful planning, and commitment of resources. A marketing approach can reveal the differing roles and perspectives among stakeholders and product users, and help to shape the messages and implementation strategy. Outcome measures document and reinforce successful implementation, promoting organizational learning. Entrepreneurship education is becoming a more important component of business school curricula, to prepare managers for technology transfer and innovation implementation.

The literature in this area is, again, mixed. However, from these readings and based on the study team's knowledge of this and related topics, it does appear that certain themes emerge including the value of leadership involvement, a supportive organizational culture, and business processes that facilitate implementation. We explore these themes before presenting synopses of findings from studies of innovation implementation.

Leaderships' Role in Innovation

The literature consistently points to the important role an organization's management plays in the success of the innovation process. Although this role may be applied relative to specific implementation activities (e.g., championing a new product), more often this role is associated with setting the overall "culture of innovation" in the organization. Organizations that lack this culture appear to face more internal barriers to implementation activities.

More specifically, successful innovation implementation requires top management support, careful planning, and commitment of resources. The research literature consistently identifies a set of characteristics important to implementation that are common across multiple industries. These include: (1) management direction and support; (2) human, financial, and technical resources; (3) a knowledge sharing culture open to innovation and change; (4) a willing innovation champion; (5) knowledgeable employees who understand the benefits of a specific innovation; (6) regular communications among all parties involved; (7) implementation teams with the requisite skills, credibility, and enthusiasm; and (8) timely criteria for evaluating progress and success. Ultimately, these factors also establish a culture that is not "risk-adverse" and is willing to try new ideas, understanding that they may not all be winners.

Conversely, management and leadership can also create, even unintentionally, barriers to innovation. As an example, if employees perceive that the organization culture does not encourage risk-taking or

change, they may avoid bringing innovative ideas forward. Leadership is also crucial in organizations with highly competitive cultures, as competition fosters knowledge hoarding and inhibits communication and innovation.

Establishing a "Culture of Innovation"

As noted, organizations that have a culture that supports, promotes, and rewards innovation appear to have a much stronger foundation to build successful implementation activities. There is no single definition of *organizational culture* in either the research literature or the business press, but authors speak to the shared values, attitudes, beliefs, processes, and relationships that exist within an organization, and how those impact the overall functioning of the organization. Although management may have an intuitive sense of this culture in their organization, employee surveys, focus groups or other participatory tools have typically been used to develop a more objective picture. Of the factors that impact an organization's culture, management and their actions are often cited as having a major effect.

The literature is less specific regarding the factors that might lead to changes in an organization that would generate a more innovative-friendly culture. A clear message from management supporting innovation is important, but it is also important that leaderships' actions are viewed as consistent with that message. Budgeting, personnel recognition and advancements, and staffing are examples of such actions. Even if leadership is successful in establishing an innovative-friendly culture, equally important is how that is institutionalized so when there is a change in leadership, those cultural attributes do not disappear.

Organizational and Business Process Changes

Once again, the literature points to characteristics of organizations that can foster successful implementation. It is worth noting that although a specific implementation initiative may lead to an organizational change (e.g., creation of a new product team), most of the references are to things that are done in the organization to support all implementation and innovation processes. As noted, this is one of the tools that management has to put a "culture of innovation" in place.

Since technology transfer typically involves two or more elements of an organization (e.g., researcher and manufacturer, supplier and marketing), it is important to reduce the natural friction that may exist between these units. Rogers and other have proposed technology transfer and implementation strategies that promote smooth working relationships. An organization's business processes can also facilitate or impede innovation processes. Everything from the organization's processes for changing standards, modifying IT systems, as well as procurement practices (note later discussion on commercialization), can significantly affect the speed and ease with which innovations can be successfully implemented. Unfortunately, inflexibility of these business processes is often cited as an impediment to implementation, inferring that a more systemic evaluation of those barriers may be warranted.

A. Leadership, Culture, and Change

Citation Count: 82

Citations: 2, 3, 8, 12, 18, 29, 30, 36, 38, 39, 44, 47, 48, 52, 56, 58, 59, 61, 66, 67, 69, 72, 73, 78, 84, 85, 88, 90, 94, 95, 96, 97, 101, 103, 104, 107, 108, 111, 112, 114, 115, 119, 120, 122, 127, 128, 129, 132, 133, 134, 135, 136, 138, 140, 146, 147, 150, 153, 155, 163, 164, 165, 166, 167, 169, 171, 174, 178, 183, 184, 186, 187, 188, 189, 194, 196, 197, 198, 213, 214, 219, 227

The Literature in Brief

- Innovations can be successfully transferred and implemented given upper management support, strategic planning, necessary resources, and acceptance within the receiving organization.
- Barriers to effective implementation include rejection of the innovation as a viable and/or better solution, inability to adapt, and unwillingness to change.
- Outcome measures document progress and success, and promote organizational learning.

Implementation of an innovation by an organization implies changes to current practices and ways of doing business. Depending on the innovation, of course, change can be minimal, for example when a new version of a software program replaces a previous version. In this case, the organization's IT staff must ensure compatibility of the new software with other existing software and hardware, and users must adapt to any changes in functionality and learn new features; however, in most organizations such adaptations are probably more or less routine. Other changes, even those emerging from the same innovation, can generate far reaching ramifications throughout the organization and beyond. As an example, when a new paving technology such as warm mix asphalt is adopted as an alternative to traditional hot mix asphalt by a transportation department, multiple changes are required. Adoption of warm mix asphalt can have far reaching impacts to the organization, requiring revisions to a transportation department's paving policies and specifications, changes in application methods and practices, training workers, just to mention a few. Those charged with implementing innovations need to have a clear view and understanding of these organizational implications, and the time and effort that will be required to make them. Underestimating these can be a tremendous source of frustration and misunderstanding.

Technology transfer typically involves two or more organizations (researcher and user, producer and adopter, provider and receptor, supplier and buyer), or two or more parts of a single organization. It is important to note here as well as in the discussion on success factors for technology transfer, that Rogers (2002) proposed five strategies for facilitating technology transfer: (1) creating boundary-spanning units; (2) transplanting personnel; (3) forming network relationships linking R&D organizations and receptor organizations; (4) encouraging the formation of high-tech spin-offs; and (5) organizing consensus development conferences to create practice guidelines. Once transferred from one organization to another, the task remains to implement the new technology so that its benefits are fully realized.

Barriers to implementation tend to be organization- or innovation-specific, and should be anticipated and avoided or dealt with by local managers. Leadership is crucial in organizations with highly competitive cultures, as competition fosters knowledge hoarding and inhibits communication and innovation. Charismatic leadership and trust in top management, on the other hand, promote knowledge acquisition, knowledge sharing, innovation, participation in decision making, team identity and commitment, and implementation.

B. Marketing/Market Potential

Citation Count: 23

Citations: 3, 10, 17, 18, 31, 38, 48, 57, 78, 81, 85, 104, 106, 107, 109, 111, 116, 138, 146, 164, 193, 196, 227

The Literature in Brief

- Tools are available that can help implementers identify potential markets for new technologies, even those that may have not been considered earlier in the implementation process.
- Marketing research can be applied early in the commercialization process to better evaluate the size and dispersion of markets, their volatility, and ways that market can best be reached.
- There are examples within the highway community of how marketing principles have been applied to not only implement individual technologies and practices, but in the case of the ITS program, an entire family of products.

When there is a technical knowledge gap between seller and buyer, effective project marketing can help bridge this gap. Knowledge management is a pertinent tool for project marketing as it helps to understand the roles and applicability of different knowledge types. With a more efficient approach to searching for market opportunities, the impact of technology commercialization on innovation and wealth creation could be far greater. In many cases, market opportunities and possible product extensions are simply unknown to those in charge of commercialization. A solution is to involve user communities in the search for market opportunities, a process referred to as technological competence leveraging. This has the potential to identify markets previously unknown to the technology holder.

Trade shows for innovative products are important venues at which markets coalesce (Aspers and Darr, 2011). The identification and ordering of market actors, the institutionalization of a distinct business culture and the social networks developed among market actors and across the subsidiary markets provide the basic social infrastructure for emerging industries. The actor-network theory (ANT) includes users in studies of innovation and diffusion through focus groups. It treats both innovation and diffusion as processes of translation within networks. By studying how users embed products in work practices, it guides further product development.

Radical innovation is risky because of uncertain markets, but having an assessment tool to help manage the transition from R&D to business-unit product development can enhance the probabilities of commercial success. Elements of readiness assessment are: technology readiness, product/system development readiness, manufacturing (hardware) and software readiness, partners' readiness, clarity of competitive advantage, market entry strategy, market development readiness, and sales force readiness.

A fundamental obstacle to successful dissemination and implementation of evidence-based public health programs is the absence of systems and infrastructure for marketing and distribution: customer research and segmentation, packaging, promotion, transfer, distribution, inventory management, sales, communication, training, technical assistance, customer service, product service, coordination, and evaluation and data analysis (Kreuter and Bernhardt, 2009). Effective dissemination systems are important and without a marketing infrastructure application of proven solutions will continue to occur slowly and rarely.

Examples and Illustrations

- The Technology Partnerships Program is part of Highways for LIFE, an FHWA initiative to accelerate innovation in the highway industry (Zirlin, 2009). It provides grants to fund the critical final steps in developing technologies with potential to improve project or work zone safety, accelerate construction, reduce construction-related congestion, or improve quality. Established in 2007, the program promotes partnerships to test and demonstrate those technologies in real-world settings.

- The U.S. Department of Defense (DOD) and the U.S. Department of Transportation (DOT) are both supporting the development of intelligent vehicles (e.g., using robotics and other computer-based sensing and control technologies) to reduce human casualties on the battlefield in the first instance and to reduce human casualties on the nation's highways in the second. An intelligent vehicle technology transfer workshop was held to: solicit ideas and approaches for establishing a technology transfer program; determine the level of interest in such a program and the key issues; and plan for a subsequent, more inclusive workshop which will address the critical requirements and challenges of a technology transfer process (Finkelstein, 2005). The benefit of mutual technology transfer, between the military and commercial sectors, is exemplified by computer technology - expensive military computer technology became faster, better, cheaper - and ubiquitous - after commercialization. Commercialization of intelligent vehicle technologies, likewise, is expected to offer enormous potential benefits for the military and civil sectors in the 21st century.

C. Entrepreneurship Education

Citation Count: 16

Citations: 18, 20, 34, 38, 57, 58, 78, 84, 85, 98, 113, 118, 120, 136, 137, 213

The Literature in Brief

- There are higher educational courses and programs which focus on entrepreneurship and evolving technology.
- Employers should adjust their job requirements and tasks to take advantage of this newer topic of education.
- Traditional business schools need to change their approach to teaching from case-studies to involving students in real technology transfer activities in an actual company.

Traditionally, graduate education programs in business management and strategy (e.g., MBA programs) have not emphasized entrepreneurship. That has been changing in recent years, driven by macro-economic developments such as rapidly evolving information technologies, globalization, open-sourcing, out-sourcing, etc. Some institutions of higher education now offer entrepreneurship education opportunities that seek to prepare students with knowledge, skills, and experiences needed to act in an enterprising manner, to understand and adapt to new technologies and work practices and to work either as an external or internal transfer and change agent. Program content focuses on topics such as: entrepreneurial thought, action, and leadership; design thinking; and team building. These programs adopt a more interdisciplinary approach to the curriculum than a traditional business school education, with less of a case-study orientation in favor of experiential, mentored, entrepreneurial "boot camps" that involve students in technology transfer activities in companies. Businesses that hire employees and managers with entrepreneurial skills may need to adjust leadership training and reward practices to take advantage of their skills.

D. Outcomes Management

Citation Count: 13

Citations: 18, 26, 38, 44, 63, 89, 90, 111, 131, 139, 155, 201, 225

The Literature in Brief

- Properly designed outcome management systems enable learning from successes and barriers, and help prepare for future implementation.
- Simply collecting data is not the answer. Effectively using the data is the difficult task.

In assessing the effectiveness of innovation implementation, outcome measures are essential. They must directly relate to the process, product, service, and/or system that the innovation was intended to improve. Feedback about outcomes can be used to monitor implementation progress and adjust

strategy as needed. By documenting the benefits of innovations and their successful implementation, outcome measures help the organization learn the value of new practices and how to implement them. When there are many stakeholders with differing perspectives, defining objectives in terms of anticipated outcomes facilitates evaluation of alternatives.

An outcomes management system helps an organization achieve accountability and facilitates use of empirically based interventions. An outcomes management system measures outcomes associated with services, facilitates implementation of evidence-based practices, informs decision making, enables better and more efficient management, and provides aggregated information used to improve services.

IV. Commercialization

Citation Count: 63
Citations: 1, 6, 10, 11, 14, 15, 18, 19, 20, 22, 25, 31, 34, 35, 36, 41, 46, 48, 54, 57, 58, 62, 70, 74, 81, 85, 86, 87, 92, 93, 102, 106, 110, 111, 118, 123, 124, 129, 137, 144, 145, 146, 151, 154, 157, 158, 159, 160, 161, 175, 192, 194, 196, 207, 208, 209, 210, 211, 212, 215, 221, 226, 227

Universities and businesses benefit when innovations arising from university research are transferred to industry and successfully commercialized. Strategies used by universities to promote technology transfer and commercialization include technology licensing offices, entrepreneurial education for students and faculty, and reward systems that recognize entrepreneurial activities. Commercialization promotes competition, within the scientific community and between organizations. Copyrights, patents, and contractual agreements protect intellectual property rights and facilitate knowledge sharing.

A. University to Industry

Citation Count: 19
Citations: 20, 25, 34, 58, 75, 86, 87, 92, 98, 106, 110, 113, 129, 137, 145, 154, 186, 192, 226

The Literature in Brief

- Although universities can be substantial sources of innovations, output is often maximized when the commercialization process is expressly formalized within the institution.
- Involving users themselves in the market search process is a unique solution to circumvent several of the challenges associated with the technology transfer process in university-to-industry situations.
- Although universities are increasing the quantity and quality of training in entrepreneurship, many programs currently lack the capacity to provide the full range of skills necessary for the transfer process.

Research universities are a significant source of inventions and innovations. The likelihood of commercialization of inventions of a research university was found to be positively influenced by two factors, scope and pioneering nature, and to have an inverted U-shaped relationship with the age of the invention. Commercialization outcomes (revenue and start-up creation) are enhanced when technology licensing offices (TLOs) employ diverse licensing strategies, TLOs enjoy greater autonomy, universities share revenues with scientists' departments, and universities compensate TLO officers well (Markman, Gianiodis, and Phan, 2009).

A formal guidebook for technology transfer such as that developed by the Massachusetts Institute of Technology (MIT) provides a broad overview of the technology transfer process and services available for researchers. The guidebook answers frequently asked questions from the research community about the formal licensing of technology to third parties. In many cases, market opportunities and possible product extensions are simply unknown to those in charge of commercialization. This may be especially true in university-to-industry commercialization. In an MIT case study of a technology start-up, the involvement of user communities to identify technology marketing opportunities substantially increased the potential number of marketing opportunities as well as increased the diversity of application of the technology, creating new markets.

Institutions that emphasize the entrepreneurial dimension of technology transfer must address skill deficiencies in technology transfer offices, reward systems that are inconsistent with enhanced entrepreneurial activity and the lack of training for faculty members, post-docs, and graduate students in starting new ventures or interacting with entrepreneurs (Phan and Siegel, 2006). Some institutions of higher education now offer entrepreneurship education opportunities that seek to prepare students with knowledge, skills, and experiences needed to act in an enterprising manner, to understand and adapt to new technologies and work practices and to work either as an external or internal transfer and change agent. Preparing students for careers in developing new business innovations and ventures is challenging, and no shared set of "best practices" exists. Carnegie Mellon University has developed an interdisciplinary curriculum with program content that focuses on topics such as: entrepreneurial thought, action, and leadership; design thinking; and team building.

B. Technology Development

Citation Count: 29
Citations: 1, 10, 11, 18, 35, 36, 41, 46, 57, 62, 70, 81, 85, 86, 93, 96, 118, 124, 144, 151, 157, 158, 159, 160, 175, 196, 208, 212, 215

The Literature in Brief

- Because technology development serves as a necessary precondition for technology transfer, factors that facilitate development are critical precursors to successful transfer and include a range of influences (e.g., culture, resources).

- Although it is the critical end goal, technology transfer fundamentally represents a later stage in a *series* of processes, with early activities being comprised of idea generation, early-stage idea refinement, and basic research.

- Despite their seemingly sequential relationship, successful technology development and technology transfer are maximized when both are conducted in on-going, simultaneous fashion – with lessons learned from each being used to improve all phases of design.

Technology development precedes technology transfer. Successful transfer depends on the interplay of many factors, including technological, social, organizational, legal, financial, educational, cultural, and temporal factors. Although generalizations are difficult, some noteworthy points, findings, and approaches concerning the path from technology development to technology transfer are:

- Critical success factors in technology transfer from federal laboratories to private industry include a "transfer culture" in both the government laboratory and private organization, shared personnel of the federal and private organizations throughout the transfer project life cycle, the private organization's ability and intent to adequately fund the transfer project, and the private organization's completion of a business plan for the commercialization of the transferred technology prior to transfer initiation. Additional factors include: (1) the developer establishes a dedicated technology transfer unit within its organization; (2) the transfer agent is located close to the developing organization; (3) the developing organization targets advertising to relevant industries; (4) the acquiring organization facilitates informal transfer processes; (5) the acquiring organization funds the transfer project adequately; (6) the acquiring organization has a business plan for commercializing the technology; and (7) both the developing and the acquiring organizations share personnel over the life of the transfer project (Franza and Grant, 2006).

- NASA developed technology readiness levels (TRLs) -- a nine-level structure of the evolution of an idea from a thought to the full deployment of a product in the marketplace: (1) basic

research; (2) applied research; (3) critical function or proof of concept established; (4) lab testing/validation of alpha prototype component/process; (5) laboratory testing of integrated/semi-integrated system; (6) prototype system verified; (7) integrated pilot system demonstrated; (8) system incorporated in commercial design; (9) system proven and ready for full commercial deployment (Banke, 2010).

- A structured technology readiness method includes a development process that improves the stability of the technology until its performance meets predetermined criteria and an assessment component that measures the degree of technology readiness and the risk involved in proceeding to development (Clausing and Holmes, 2010). Technology readiness assures that new products will integrate smoothly with downstream design and manufacturing processes and perform as expected in the user's environment.

- With concurrent engineering, the design, consultation, and definition of the methods of highway construction are carried out simultaneously rather than sequentially (Penfentenyo, Fadeuilhe, and Ray, 2006). Project alignment is worked out while integrating, progressively, the elements coming from these three sources. This requires a common information system where each actor has access to the updated project. This process generates more upstream work for the project team, since it results in adapting the project uninterrupted as new constraints appear, but this investment proves to be advantageous because the effort spent during the earlier phases of the work prevents significant downstream delay and reduces overall cost. Such concurrent processes enable effective technology transfer and facilitate adoption of innovation as solutions are developed during the course of the construction.

- The Federal Highway Administration (FHWA) has played a key role in the high performance concrete (HPC) technology transfer from research and development to routine practice for bridge and pavement design and construction. Success has been largely due to a long-term continuing partnership between FHWA, State Departments of Transportation, AASHTO, local agencies, industry and academia.

- The structure of the licensing agreement affects technology transfer outcomes for technologies patented and licensed by the Agricultural Research Service (ARS) of the U.S. Department of Agriculture. As commercial partners gain experience with the technology and learn more about the market, mutually advantageous revisions to license terms can maintain the incentives through which private companies distribute the benefits of public research.

- Trade shows for innovative products are important venues at which markets coalesce (Aspers and Darr, 2011). The identification and ordering of market actors, the institutionalization of a distinct business culture and the social networks developed among market actors and across the subsidiary markets provide the basic social infrastructure for emerging industries.

C. Competition and Secrecy

Citation Count: 8

Citations: 1, 15, 86, 92, 148, 158, 159, 160

The Literature in Brief

- Competition can be a benefit to processes such as innovation and technology transfer, driven by the various entities attempting to develop new and better products ahead of their competitors.

- Despite the positive benefits of competition, there are potential downsides: secrecy and the fundamental lack of knowledge sharing.

- To combat the challenges characterizing secrecy, entities should seek out non-competitive partners (e.g., suppliers) who gain from knowledge sharing and benefit from increased innovation and knowledge transfer between both parties.

Copyright and patent laws protect the intellectual property rights of inventors, enabling them to profit from the commercialization of their ideas. Commercialization promotes competition, however, and competitive cultures tend to promote secrecy while inhibiting knowledge sharing and creativity.

Increasing secrecy in the scientific community seems to result from a combination of increasing commercial linkages and increased pressures from scientific competition. Scientists' competition for priority spurs effort, but it also produces negative effects that recent trends toward commercialization of academic science seem to be exacerbating (Hong and Walsh, 2009). An intellectual property rights policy acts as an incentive for collaboration and transfer of technology from the defense to the civilian sector; the lack of such a policy strongly inhibits spin-offs.

Trust is essential to knowledge sharing in the exploration phase of buyer-supplier R&D projects, whereas both trust and contractual mechanisms are important in the development phase. Contractual mechanisms are paramount in the finalization phase, although trust also plays a role. The structure of the licensing agreement affects technology transfer outcomes for technologies patented and licensed by the Agricultural Research Service (ARS) of the U.S. Department of Agriculture. As commercial partners gain experience with the technology and learn more about the market, mutually advantageous revisions to license terms can maintain the incentives through which private companies distribute the benefits of public research.

V. Organizational Setting

Many of the research studies included in this review were conducted in one or more organizational settings. A potentially useful sort of the citations is by the settings addressed by or included in them, presented below. The main findings of most of these citations are summarized in the sections above, and are not repeated here.

A. Transportation - Federal

Citation Count: 41

Citations: 7, 16, 17, 18, 23, 37, 38, 39, 43, 47, 52, 55, 57, 65, 70, 77, 83, 99, 104, 105, 120, 131, 138, 141, 143, 144, 157, 159, 160, 161, 163, 174, 181, 203, 204, 208, 210, 211, 218, 221, 228

B. Transportation - State

Citation Count: 53

Citations: 3, 4, 16, 17, 18, 21, 23, 26, 27, 37, 38, 40, 43, 47, 52, 67, 68, 72, 76, 77, 82, 83, 84, 89, 91, 93, 99, 104, 114, 115, 120, 124, 125, 131, 138, 139, 141, 143, 159, 160, 162, 166, 177, 181, 191, 193, 203, 204, 210, 215, 216, 222, 228

C. Transportation - Other (private sector and international)

Citation Count: 23

Citations: 8, 16, 17, 18, 40, 46, 47, 52, 68, 77, 79, 91, 93, 104, 118, 120, 124, 125, 143, 179, 191, 201, 203

D. Other Public Sector

Citation Count: 47

Citations: 1, 2, 5, 6, 14, 32, 36, 41, 44, 51, 53, 54, 57, 58, 59, 62, 81, 86, 88, 89, 93, 101, 102, 109, 113, 114, 115, 128, 130, 141, 158, 159, 160, 175, 176, 189, 199, 201, 202, 204, 206, 207, 209, 212, 213, 221, 225

E. Private Industry

Citation Count: 93

Citations: 1, 6, 8, 9, 10, 11, 13, 14, 19, 22, 24, 28, 29, 30, 31, 33, 35, 41, 42, 44, 48, 49, 54, 56, 57, 58, 59, 60, 61, 62, 63, 64, 66, 70, 71, 85, 86, 93, 102, 107, 109, 111, 113, 115, 116, 117, 118, 119, 122, 123, 124, 126, 130, 131, 132, 135, 136, 137, 140, 144, 146, 148, 149, 150, 151, 152, 153, 156, 158, 160, 164, 168, 169, 172, 173, 175, 183, 190, 194, 196, 199, 205, 206, 207, 208, 211, 212, 213, 219, 221, 223, 224, 226

F. University

Citation Count: 25

Citations: 6, 14, 19, 20, 32, 44, 54, 57, 58, 59, 62, 86, 87, 102, 113, 130, 137, 144, 154, 185, 186, 207, 211, 221, 226

III. Listing of References, Abstracts, and Relevant Topics of Articles and Reports Cited

1. Technology Transfer Commercialization Act of 2000

106th Congress

Public Law 106-404, November 1, 2000, http://www.glin.gov/view.action?glinID=73020

The Technology Transfer Commercialization Act of 2000 (Public Law 106-404, 114 Stat. 1742-1750) amends the Stevenson-Wydler Technology Innovation Act of 1980 (Stevenson-Wydler Act) to revise requirements regarding enumerated authority under a cooperative research and development (R&D) agreement to permit government laboratories to grant licenses to federally owned inventions for which a patent application was filed before the signing of the agreement. It rewrites federal restrictions on the licensing of federally owned inventions. It requires such licenses to include provisions: (1) retaining a nontransferable, irrevocable, paid-up license for the federal agency to practice the invention or have the invention practiced throughout the world by or on behalf of the U.S. Government; (2) requiring periodic reporting on use of the invention by the licensee only to the extent necessary to enable the federal agency to determine whether the licensee is complying with license terms; and (3) empowering the federal agency to terminate the license if the licensee has been found by a competent authority to have violated the federal antitrust laws in connection with its performance under the license agreement; and more. (Summary, Law Library of Congress)

Associated Categories: Commercialization, Competition and Secrecy, Knowledge Management, Knowledge Sharing, Other Public Sector, Private Industry, Technology Development, Technology Transfer

2. Leadership, innovation climate, and attitudes toward evidence-based practice during a statewide implementation.

Aarons, Gregory A.; Sommerfeld, David H.

Journal of the American Academy of Child & Adolescent Psychiatry, Vol 51(4), Apr 2012, 423-431.

Objective: Leadership is important in practice change, yet there are few studies addressing this issue in mental health and social services. This study examined the differential roles of transformational (i.e., charismatic) leadership and leader–member exchange (i.e., the relationship between a supervisor and their direct service providers) on team innovation climate (i.e., openness to new innovations) and provider attitudes toward adopting evidence-based practice (EBP) during a statewide evidence-based practice implementation (EBPI) of an intervention to reduce child neglect. Method: Participants were 140 case-managers in 30 teams providing home-based services to families in a statewide child-welfare system. Teams were assigned by region to EBPI or services as usual (SAU) conditions. Multiple group path analysis was used to examine associations of transformational leadership and leader–member exchange with innovation climate and attitudes toward adoption and use of EBP. Results: Transformational leadership predicted higher innovation climate during implementation, whereas leader–member exchange predicted higher innovation climate during SAU. Innovation climate was, in turn, associated with more positive attitudes toward EBP for the EBPI group. Conclusions: Strategies designed to enhance supervisor transformational leadership have the potential to facilitate implementation efforts by promoting a strong climate for EBPI and positive provider attitudes toward adoption and use of EBP. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Networks and Teams, Other Public Sector, Technology Transfer

3. A Guidebook for Lead State Teams of the AASHTO Technology Implementation Group

AASHTO Technology Implementation Group

AASHTO Technology Implementation Group
http://tig.transportation.org/Documents/GLST-1.pdf

The executive committee of the Technology Implementation Group (TIG) of the American Association of State Highway and Transportation Officials (AASHTO) developed this guidebook to facilitate the work of their lead states teams. The TIG executive committee is acutely aware that lead states team chairs and members are quite busy in their full-time agency capacities. To assist these volunteers, this guidebook provides clear descriptions of roles and responsibilities of all involved in lead states team activities as well as example lead states team documents and templates for creating new documents. Information and assistance is included for all lead states team activities, beginning with the selection of team members through the team closeout process.

Associated Categories: Barriers, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Resource Limitations, Marketing/Market Potential, Networks and Teams, Successes, Technology Transfer, Transportation - State, Trust and Communication

4. A Guidebook for the Executive Committee of the AASHTO Technology Implementation Group

AASHTO Technology Implementation Group

AASHTO Technology Implementation Group,
http://utca.eng.ua.edu/research/projects/?id=04112

AASHTO TIG. A technical service initiative established by the AASHTO Board of Directors and the Standing Committee on Highways (SCOH) to identify and expand the use of new, high payoff, ready-to-use technologies. Primary components of this initiative are the TIG executive committee and the lead states teams appointed by the TIG executive committee. This guidebook documents the operating procedures of the executive committee of the Technology Implementation Group (TIG) of the American Association of State Highway and Transportation Officials (AASHTO). It has been prepared to facilitate consistency in TIG executive committee practice as well as orientation of new executive committee members and AASHTO staff.

Associated Categories: Innovation Implementation, Knowledge Sharing, Technology Transfer, Transportation - State

5. Technology Transfer Systems in the United States and Germany: Lessons and Perspectives

Abramson, H.N., J. Encarnacao, P.P. Reid, and U. Schmoch, editors

National Academies Press,
http://www.nap.edu/catalog.php?record_id=5271

The consensus study, prepared by a binational panel of German and American experts, documents the significance of effective technology transfer to industrial competitiveness in a global economy. The study's findings make clear that it is no longer appropriate to view technology transfer as a simple one-way transfer—from research performer to technology user—of processed knowledge and finished concepts. Rather, technology transfer should be understood as a mutual, multidirectional exchange—comprising many different forms and mechanisms—within and between nonindustrial research institutions and industry. This comparison of the origins, framing conditions, instruments, and recent development of the German and American technology transfer systems reveals strengths and weaknesses in both countries. It also offers a starting point from which each nation can pursue new paths toward strengthening economic and technological performance, as well as

cultivate more intensive, mutually advantageous international collaboration in technology transfer.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Other Public Sector, Successes, Technology Transfer, Trust and Communication

6. Technology Transfer in ARS (Agricultural Research Service) Policy and Procedures

Agricultural Research Service	September 11, 2000, http://www.afm.ars.usda.gov/ppweb/PDF/141-02.pdf

This manual sets forth ARS policies, procedures and responsibilities for TT, and includes guidelines for inventors: (1) reporting inventions, (2) patents, (3) Plant Variety Protection Certificates (PVPC), (4) licensing, (5) distribution of license income (including awards to inventors), (6) CRADAs, and (7) other agreements used in TT. The manual is straightforward clearly written description of how the ARS addresses intellectual property.

Associated Categories: Barriers, Commercialization, Knowledge Management, Knowledge Sharing, Other Public Sector, Private Industry, Successes, Technology Transfer, University

7. A Plain Language Overview: The ARS Agricultural Technology Innovation Partnership Program

Agricultural Research Service, Office of Technology Transfer	January 9, 2010; http://www.edacademy.org/wp-content/uploads/2010/11/Plain%20Language%20Overview%20of%20Agricultural%20Technology%20Innovation%20Partnership%20_ATIP_%20Program%20of%20ARS%20ver01%2009.pdf

The document is an overview of concept, strategy, and status of the Agricultural Technology Innovation Partnership Program; it provides an overview of the program, lists member organizations, provides examples of activities, and describes traits of prospective partners.

Associated Categories: Successes, Technology Transfer, Transportation - Federal

8. Technology Transfer: Moving R&D to Operations

Albersheim, S. R.	Proceedings, 2nd International Conference on Volcanic Ash and Aviation Safety, Nov 2004, Session 5, pp. 1-5, http://www.ofcm.gov/ICVAAS/Proceedings2004/pdf/14-session5.pdf

This paper discusses the U.S. Federal Aviation Administration's (FAA's) adoption of a new management system for the delivery of air traffic control system technology. This management system is performance-based. It allows senior management to make sure that modernization efforts are accountable and that these efforts are also keeping track of the costs that are related to the service goals. The paper uses the Aviation Weather Technology Transfer (AWTT) process, which was established in 1999, to illustrate the performance based management system. The paper describes the AWTT governing board and its functions, and also discusses the AWTT process.

Associated Categories: Barriers, Innovation Implementation, Leadership, Culture, and Change, Private Industry, Successes, Technology Transfer, Transportation - Other

9. Social contagion and information technology diffusion: The adoption of electronic medical records in U.S. hospitals.

Angst, Corey M.; Agarwal, Ritu; Sambamurthy, V.; Kelley, Ken

Management Science, Vol 56(8), Aug 2010, 1219-1241.

We use a social contagion lens to study the dynamic, temporal process of the diffusion of electronic medical records in the population of U.S. hospitals. Social contagion acknowledges the mutual influence among organizations within an institutional field and implicates information transmission through direct contact and observation as the mechanisms underlying influence transfer. We propose hypotheses predicting a hospital's likelihood of adopting electronic medical records as a function of its susceptibility to the influence of prior adopters, the infectiousness or potency of influence exerted by adopting hospitals, and its social and spatial proximity to prior adopters. Results obtained by fitting a heterogeneous diffusion model to data from a sample drawn from an annual survey, spanning 1975 to 2005, of almost 4, 000 U.S. hospitals suggest that diffusion can be accelerated if specific attention is given to increasing social contagion effects. In particular, with respect to susceptibility to influence, greater hospital size and age are positively related to the likelihood of adoption for nonadopters, whereas younger hospitals are associated with greater infectiousness for adopters. A hospital's "celebrity" status also contributes to its infectiousness. We further find strong effects for social proximity and significant regional effects for spatial proximity and hospital size, suggesting that geographical covariates should be included in diffusion studies. Results also reinforce the importance of theorizing about and including interactions in examinations of social contagion.

Associated Categories: Barriers, Networks and Teams, Private Industry, Successes, Technology Transfer

10. Trade shows and the creation of market and industry.

Aspers, Patrik; Darr, Asaf

The Sociological Review, Vol 59(4), Nov 2011, 758-778.

This study addresses the question of the constitution of markets in advanced societies. Specifically, the article studies the role of the traveling trade show in creating the real time computing market, which is part of the US electronics sector, during the mid-1990's. Real time computing products assist the transfer, storage and processing of digital signals in real time and support many of the internet applications we use today. By applying ethnographic methods, we explore the general question of how economic actors cope with uncertainty in the phase of market-making and at the cutting edge of technology. The paper makes two contributions to the existing literature. First, it shows that the attempt to organize a trade show in real time computing was triggered by the uncertainty experienced by sellers regarding the identity of prospective buyers and about the exact use to which they would put the emergent technology which is offered for sale. Secondly, we trace the history of an emergent market. We claim that trade shows for innovative products are important venues at which markets coalesce. The identification and ordering of market actors, the institutionalization of a distinct business culture and the social networks developed among market actors and across the subsidiary markets provided the basic social infrastructure for what later became known as the real time computing industry.

Associated Categories: Commercialization, Innovation Implementation, Marketing/Market Potential, Networks and Teams, Private Industry, Technology Development

11. Constructing nanobusiness: The role of technology framing in the emergence of a commercial domain.

Aten, Kathryn Jeanette

Dissertation Abstracts International Section A: Humanities and Social Sciences, Vol 70(11-A), 2010, 4350.

s International Section A: Humanities and Social Sciences, Vol 70(11-A), 2010, 4350. Abstract Entrepreneurs seeking to commercialize science-based technologies face considerable challenges including uncertain environments, policy makers and investors' ignorance, and public opposition and ethical concerns. Most research exploring the emergence of technologies assumes the existence of accepted uses or products, despite the fact that efforts to commercialize science-based technologies often begin before specific applications exist. We have little empirical evidence of how individuals and organizations influence the earliest development of technologies. To address this gap, I conduct a real-time, seven-year, qualitative study of the nanotechnology venture investing community. The study draws on extensive archival data, participant observation of a complete series of annual nanotechnology investing conferences, and case studies of the three venture capital (VC) firms specializing in nanotechnology through the period of the study. The cases are based on semi-structured and website archives. I document the emergence of competing nanotechnology frames in the period prior to the identification of product applications. I identify three sequential activities of nanotechnology business proponents: constructing a socio-semiotic space, positioning as experts within the space, and translating scientific, opposition and futuristic discourse for a target audience. I introduce the concept of a socio-semiotic space and develop a model reflecting the three activities to explain the process through which technology proponents project a business frame to support the commercialization of science-based technologies. This dissertation contributes to our knowledge of technology evolution by focusing on the understudied period of early emergence and the sociopolitical process of technology framing. I contribute to our knowledge of how science discoveries become the basis for fields of commercial activity. The findings of this dissertation provide knowledge that can assist business people and policy makers seeking to develop science-based technologies and the fields that emerge around them. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Private Industry, Technology Development

12. Adapting leadership theory and practice for the networked, millennial generation.

Balda, Janis Bragan; Mora, Fernando

Journal of Leadership Studies, Vol 5(3), 2011, 13-24.

Current research offers a complex perspective on the main characteristics of Millennials (or Gen-Ys, as they are also called) as a generation in which knowledge is acquired, shared, and created as an extension of the primacy of relationships and networks and embedded in the connections that information technology provides. Aspects of the servant-leadership model provide a context from which to examine the construction of workplace practice (action) and purpose (meaning) among members of the Millennial generation. However, theories developed in previous generations are not automatically applicable and require critical examination and adaptation if they are to offer an understanding of means for motivating and influencing Millennials toward more broadly defined goals and aspirations in multigenerational workplaces. After a review of recent literature, we conclude that future organizational paradigms will have to develop a multigenerational collaborative culture. With this in mind, we discuss how service leadership contributes to these new networked and collaborative organizations to help Millennials flourish and prepare them for leadership positions as well. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Leadership, Culture, and Change

13. IT knowledge integration capability and team performance: The role of team climate.

Basaglia, Stefano; Caporarello, Leonardo; Magni, Massimo; Pennarola, Ferdinando

International Journal of Information Management, Vol 30(6), Dec 2010, 542-551.

Previous research considering a normative perspective for fostering knowledge integration at the team level of analysis underscores that teams are often reluctant to share important knowledge among their members. In the attempt to provide a wider perspective on team knowledge integration, we take a different perspective, basing our arguments on team climate theoretical framework. Specifically, we argue that an autonomy and experimental climate (i.e. shared perception that the team supports autonomous action and experimentation and risk taking) can favor the team's ability to integrate members' knowledge. Indeed, focusing on members' willingness to contribute to team well-being, team autonomy and experimental climate may enhance the team's capability to integrate knowledge enabled by the IT infrastructure (IT knowledge integration capability). We tested our research model on a sample of 410 members and leaders of 69 organizational work teams. Results show the critical role played by team climate in favoring IT knowledge integration capability, which in turn affects team outcomes. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Networks and Teams, Private Industry, Trust and Communication

14. Technology Transfer and Technology Transfer Intermediaries

Bauer, S.M., and J.L. Flagg

Assistive Technology Outcomes and Benefits, Vol.6, No.1., Summer 2010, pp.129-150

A standard and comprehensive model is needed to evaluate and compare technology transfer systems and the stakeholders within these systems. The principle systems considered include federal laboratories, U.S. universities, the rehabilitation engineering research centers (RERCs), and large small business innovation research programs. An earlier model accounts for technology transfer activities, events, stakeholders, and resource providers (Lane, 1999). This model is augmented to account for dynamic aspects of technology transfer (transfer efficiency, transfer latency) and scale (micro-, macro-). The critical role of technology transfer intermediaries is emphasized. Examples pertaining to the assistive technology industry are used to illustrate important concepts and issues. The technology transfer model with extensions is applied to the four technology transfer systems. Major studies pertaining to the technology transfer performance of: large small business innovation research programs, the federal laboratory system, the U.S. Department of Education RERCs, and U.S. universities are reviewed. Study outcomes are examined in terms of a uniform and comprehensive technology transfer model. Conclusions are drawn regarding the evaluation of program performance. The need for a uniform and comprehensive technology transfer model is demonstrated by showing inconsistencies within and between research study outcomes for major technology transfer systems. Barriers that prevent the full and optimal use of these programs by the assistive technology industry are discussed. The authors conclude that technology transfer from the public to private sector is a major and critical economic driver. Large federal programs, which are generally established through legislation, facilitate and structure the technology transfer efforts of federally funded entities. Effective program oversight and good public policy requires systematic program evaluation in reference to a standard and complete technology transfer model. Identifying and promoting best practices for technology transfer intermediaries requires that the technology transfer model encompass both the macro (systems) and micro (stakeholders within systems) scale.

Associated Categories: Barriers, Commercialization, Knowledge Management, Knowledge Sharing, Networks and Teams, Other Public Sector, Private Industry, Successes, Technology Transfer, Trust and Communication, University

15. Defense Innovation, Technology Transfers, and Public Policy

Bellais, R., and R. Guichard

Defense and Peace Economics, Vol. 17(3), June 2006, pp. 273–286

This article discusses the challenges faced by governments in promoting technology transfer from defense to the civilian sector. Our central hypothesis is that while patents do not play a central role in the defense industry, the lack of an intellectual property rights (IPR) culture strongly inhibits spin-offs. We conclude with four suggestions to lead to the creation of a market for defense technologies. This paper discusses 1)understanding of the basic requirements of a dual-use policy, especially with regard to spin-off strategies; 2)successful technology transfer appears to be a more difficult, labor-intensive process than expected, requiring both substantial technological modifications and additional developments and an adequate legal framework. Because an active collaborative partnership is required, resting on a strong commitment from both parties, an IPR policy clearly appears as an incentive for collaboration and transfer.

Associated Categories: Barriers, Commercialization, Competition and Secrecy, Knowledge Sharing, Successes, Technology Transfer

16. Outreach Technology Transfer: Communications for Accelerating Adoption of Innovation

Benouar, A. (contact)

Research in Progress, California Department of Transportation

Outreach Technology Transfer: Communications for Accelerating Adoption of Innovation is intended to accelerate deployment and widespread adoption of the innovations and research results from Caltrans sponsored research by agencies statewide through communications, training and technical assistance.

Associated Categories: Barriers, Knowledge Sharing, Resource Limitations, Successes, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State, Trust and Communication

17. A Conduit for New Technology

Bergeron, K.

Public Roads, Vol. 66, Issue 3, March 2003, pp. 15-19, http://www.fhwa.dot.gov/publications/publicroads/03mar/04.cfm

Each year, millions of dollars are spent on highway-related research. However, once an innovation has emerged from that research, it is difficult to determine how much it will cost to inform the transportation community about the new development. This article provides an overview of videoconferencing, one possible solution to this problem which has shown great promise. Sections are devoted to the predecessors of videoconferencing, federal use of videoconferencing, and experience within the highway industry with this form of information sharing.

Associated Categories: Innovation Implementation, Marketing/Market Potential, Successes, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State

18. Highways for Life

Bergeron, K. A

Public Roads, Vol. 73, Issue 4, January 2010, pp. 2-9, http://www.fhwa.dot.gov/publications/publicroads/10janfeb/01.cfm

Under a program established by the U.S. Congress in 2005, the Federal Highway Administration (FHWA) is boosting awareness of and standard use of innovations that can produce better, longer lasting roadways and bridges. These innovations can help highway agencies complete construction faster, at lower cost, and more safely with less impact on the driving public. A comprehensive technology transfer effort, the Highways for LIFE program is using proven marketing approaches and dedicated teams to deploy innovations more effectively and is helping private industry move prototypes of promising innovations into the marketplace where they can benefit the traveling public. LIFE is an acronym for Long-lasting, Innovative, Fast construction, Efficient and safe--all characteristics of the ideal highway or bridge construction project. The program also is providing incentives to encourage highway agencies to use customer-focused performance goals to improve construction of highways and bridges. This article describes objectives of the Highways for LIFE program, which include involving stakeholders, enhancing technology deployment, moving emerging private sector innovations into the marketplace, employing demonstration projects, developing a new business model, and evaluating success. Examples are given that reflect how the Highways for LIFE program has targeted each of these objectives. In its five years of existence, the program has provided knowledge, incentives and tools the highway community can use to obtain more value for every transportation dollar invested

Associated Categories: Barriers, Commercialization, Entrepreneurship Education, Innovation Implementation, Leadership, Culture, and Change, Marketing/Market Potential, Outcomes Management, Successes, Technology Development, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State

19. The new science and engineering management: cooperative research centers as government policies, industry strategies, and organizations

Boardman C., and D. Gray

Journal of Technology Transfer, 2010, Vol. 35, pp.445–459

Cooperative research centers (CRCs) are key mechanisms for national and subnational governments and private industry for achieving social and economic outcomes with science and technology. Despite growing policy and scholarly interest in the management and productivity of CRCs, their complex and variegated nature has led to limited and inconsistent understanding of CRCs. In this introduction to this Special Issue of The Journal of Technology Transfer, we discuss the impetuses for and embodiment of CRCs as government policies, industry strategies, and organizations and thus address a number of unexplored aspects of CRCs that are important to decision making for both policy and management. Of note, we discuss the lack of definitional clarity regarding CRCs and introduce criteria for distinguishing CRCs from other organizations. We conclude by introducing the article contributions, which are international in scope and address CRCs from multiple theoretical perspectives and levels of analysis, and by discussing areas for future research.

Associated Categories: Barriers, Commercialization, Innovation Implementation, Resource Limitations, Private Industry, Successes, Technology Transfer, University

20. Innovation in an academic setting: Designing and leading a business through market-focused, interdisciplinary teams.

Boni, Arthur A.; Weingart, Laurie R.; Evenson, Shelley

Academy of Management Learning & Education, Vol 8(3), Sep 2009, 407-417.

The focus on entrepreneurship in business schools has never been stronger; however, preparing students for a career in developing new business innovations and ventures is challenging, and no shared set of "best practices" exist. Our purpose here is to describe efforts at developing a curriculum for entrepreneurship and to consider the role of academic in business commercialization. Central to our efforts is the development of an innovative capstone course in the MBA program at Carnegie Mellon University, offered jointly by faculty in the Tepper School of Business and the School of Design. The interdisciplinary course blends three perspectives needed for the effective commercialization of innovation: entrepreneurial thought, action, and leadership: design thinking; and team building. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Entrepreneurship Education, University, University to Industry

21. How to Build a System to Implement Research and Innovation: Lessons Learned in Pennsylvania

Bonini, Michael R; Fields, Bonnie J; Vance, Robert J; Renz, Michael S; Harder, Barbara T; Treisbach, Mary W; Bankert Jr, Larry I

Transportation Research Record: Journal of the Transportation Research Board, 2011, Issue 2211, pp. 1-9

This paper describes the principles used to build an effective research and innovation implementation system at the Pennsylvania Department of Transportation (DOT). These principles include top management support, dedicated resources, effective communications, an implementation team with the requisite skills and credibility, broad involvement of the field, and a supportive culture of innovation. Examples illustrate how these principles work in practice. More than 80 innovations were implemented in the implementation system's first 5 years. At least the same number of innovations were reviewed for implementation potential and either rejected or postponed until further review; this outcome highlights the importance of careful screening of implementation candidates. The implementation system began with early successes. These successes, together with documentation of the links between system products and the Pennsylvania DOT's strategic objectives, provided the leverage to secure necessary resources to expand the system's scope and impact. Significant challenges and hurdles are described. As the Pennsylvania DOT continues to learn to use the implementation system, the agency continues to adapt to its own changing needs and priorities. Adaptability and responsiveness are keys to the system's future success.

Associated Categories: Barriers, Innovation Implementation, Successes, Transportation - State

22. How 26 companies manage their central research

Bosomworth, C.E., and B.H. Sage

Research Technology Management, Vol. 38, No. 3, May-June 1995

The central research efforts of large corporations vary widely in their organization, objective and their strategic approach to their research investment. Despite these variations, there is a positive correlation between investment in central research and long-term corporate sales growth. There are many other differences among research organizations, such as where the line between research and product development is drawn, and the choice of project strategy. Yet, despite these differences, common basics for research are evident. A good library,

access to peers in other companies, recognition for what the company values, and the use of teams for technology transfer seem to be common to all companies. One of the most important findings: a formal technology transfer process shortens transfer time.

Associated Categories: Barriers, Commercialization, Knowledge Sharing, Resource Limitations, Networks and Teams, Private Industry, Successes, Technology Transfer

23. Masters of Information

Boteler, Jennifer

FHWA-HRT-11-004, Public Roads Magazine, May/June 2011, Vol. 74, No. 6

This article discusses the crucial role that transportation libraries play in providing information that supports transportation policy, regulations, research, operations, and technology transfer. Transportation libraries provide reference and research support. Librarians frequently do background literature reviews for customers. At the Federal Highway Administration Research Library, librarians communicate with highway researchers in order to understand the nature of the specialized information being requested. Library staff search relevant databases and provide citation lists with abstracts. They add value to the search process by evaluating raw search results, removing irrelevant and out-of-scope citations, and revising searches as needed to find the most relevant material. If a researcher then wants the full text, staff will obtain it from the library's own collections or through interlibrary borrowing and document delivery vendors. Libraries also create databases and finding tools. Examples include: the Transportation Libraries Catalog, a shared resource of publications held in government, university, and transportation libraries across the United States; the Transportation Research Thesaurus, a controlled vocabulary of transportation-related terms; and the National Transportation Library (NTL) Integrated Search function. The NTL also coordinates the National Transportation Knowledge Network (NTKN). The NTKN, which is comprised of three regional networks, collaborates to improve information access, exchange, use, and preservation for employees, partners, and stakeholders and the broader transportation community. Additional resources currently are being developed, such as a Knowledge Management System that will offer a Web-searchable database of U.S. Department of Transportation's research, development, and technology projects. Another collaborative effort will combine the records of the International Transport Research Documentation (ITRD) database of the Joint Transport Research Centre of the Organisation for Economic Co-operation and Development and the International Transport Forum with records from the Transportation Research Board's Transportation Research Information Services (TRIS) database to create a newly integrated database called TRID. TRID will be the world's largest database covering current projects and published transportation research.

Associated Categories: Knowledge Management, Knowledge Sharing, Transportation - Federal, Transportation - State

24. A qualitative exploration of entrepreneurial knowledge transfers.

Burns, Alan T.; Acar, William; Datta, Pratim

Journal of Knowledge Management, Vol 15(2), 2011, 270-298.

Purpose: This research seeks to explore the transfer and sharing of knowledge in entrepreneurial product development (EPD). Design/methodology/approach: The effects of organizational complexity and of the temporal locus of learning on knowledge sharing are closely examined through a qualitative case study of four projects in a mid-size manufacturing firm. Findings: Distinguishing between the prior and resulting shared knowledge, this paper uses case studies to establish the importance of learning-before-doing over learning-by-doing under conditions of entrepreneurial resource constraints. Research limitations/implications: This paper revisits and extends the Hoopes and Postrel knowledge integration framework to include the mediating effects of organizational complexity and timing of learning on EPD performance in technology-based firms. Practical implications: In order to better capture the impact of knowledge sharing on EPD, the paper also develops a method for measuring knowledge transfer directly in terms of three knowledge dimensions: depth, scope, and

action. Originality/value: The paper revisits and advances the conversation on knowledge sharing to highlight the importance of learning before doing in (entrepreneurial) firms facing resource constraints, where pure reliance on "on the job learning" may impede efficiencies and delay the absorption of knowledge for effective collaboration, integration and gains. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Private Industry, Successes

25. Learning how to be participatory: An emergent research agenda.

Caister, Karen; Green, Maryann; Worth, Steven

Action Research, Vol 10(1), Mar 2012, 22-39.

The central theme for this article arises from conversation on how agricultural scientists can move from technology transfer to complementing development. Researchers may be willing to embrace developmental concerns while lacking enabling skills and perspectives. Agricultural researchers often choose agendas based on cost, efficiency and appropriate controlled input use. This is problematic for small-scale commercial agriculture in traditionally managed rural situations because it does not include the issues of authority, power and complexity found in situated contexts. This article describes researcher learning arising from participatory farmer–researcher activity that determined a mutually beneficial research agenda. The participatory nature of the research was determined by how relationships were developed and managed. Researchers came to understand that attitude, environment and relevant issues, not specific tools, achieved participation. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Knowledge Sharing, Technology Transfer, Trust and Communication, University to Industry

26. Prototype Software for an Environmental Information Management and Decision Support System

Cambridge Systematics, Parsons Brinckerhoff, Venner Consulting, Inc.

Transportation Research Boards, National Cooperative Highway Research Program, Research Results Digest, Issue 317, March 2007, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_317.pdf

This digest summarizes the results of NCHRP Project 25-23(2), "Software for an Environmental Information Management and Decision Support System, " a multiyear research effort to design, test, and demonstrate a prototype software program for an environmental information management system (EIMS) that state departments of transportation and others could use to support their environmental decision making throughout the transportation system management process, from long-range planning through project development, construction, operations, and maintenance. The EIMS is intended to serve as one component of an agency's broader environmental management system.

Associated Categories: Innovation Implementation, Knowledge Sharing, Outcomes Management, Transportation - State

27. Accelerating the Rate of Innovation Among State DOTs—Tracing Domestic Scan Impacts

Casey, Patrick C

NCHRP 20-68B, Sept 2009

The U.S. Domestic Scan program gives transportation agency professionals the opportunity to gain firsthand knowledge of best practices and policies and successful technologies that other states have implemented.

Through NCHRP project 20-68, two domestic scan tours were conducted as a pilot effort in 2006. Based on their initial success, several additional scans were initiated, including eight launched in 2007 and 2008. Among those, six were completed by the end of 2009. To measure how well the U.S. Domestic Scan program is meeting its stated goals, a parallel effort (funded through NCHRP project 20-68B(02), and the subject of this report) was undertaken to document the technology transfer and implementation activities resulting from each tour. This project sought to measure the first- and second-hand impacts of the first six scan tours in the U.S. Domestic Scan program. The project aimed to make observations and note trends among the scans; discover successes of and obstacles to the technology transfer and implementation efforts; and make recommendations for future scans to promote more effective implementation. For each scan, information was gathered by online surveys, webinars, and telephone interviews. For each scan, the information collected through these channels appears as a separate chapter of this report. Each chapter includes a summary overview and analysis followed by documentation of the surveys, webinar and interview results. The final chapter of this report describes ongoing efforts related to the U.S. Domestic Scan program website, http://domesticscan.org, which was developed as part of NCHRP project 20-68B.

Associated Categories: Innovation Implementation, Successes, Transportation - State

28. Balancing exploration and exploitation of knowledge through an unlearning context: An empirical investigation in SMEs.

Cegarra-Navarro, Juan Gabriel; Sánchez-Vidal, M. Eugenia; Cegarra-Leiva, David

Management Decision, Vol 49(7), 2011, 1099-1119.

Purpose: SMEs may be trapped in a suboptimal stable equilibrium, as many overloaded managers are cutting back on their resources and may be over-investing in the development of exploration and exploitation processes rather than investing in mechanisms to facilitate an unlearning context. This paper proposes an unlearning context to manage an appropriate balance between exploratory processes and exploitative processes. Design/methodology/approach: This paper examines the relationship between and significance of two key factors of organisational learning (the exploration and exploitation of knowledge) within an unlearning context, and their effects on the improvement of the performance of SMEs. These relationships are examined through an empirical investigation of 229 SMEs in the Spanish metal sector. Findings: The results indicate that the effects of exploration and exploitation of knowledge on organizational performance are mediated through an unlearning context. Originality/value: The findings provide interesting insights into the drivers of organizational performance for SMEs using an unlearning context. SMEs need to provide for and support changes of perspective, of individual habits and in the framework for consolidating emergent understandings. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Private Industry, Unlearning Old Habits

29. Managing environmental knowledge through unlearning in Spanish hospitality companies.

Cegarra-Navarro, Juan-Gabriel; Eldridge, Stephen; Martinez-Martinez, Aurora

Journal of Environmental Psychology, Vol 30(2), Jun 2010, 249-257.

The Spanish hospitality industry is facing environmental challenges which require organizations and individuals to learn new skills and practices and create new environmental knowledge. Understanding the nature and role of prior knowledge for sustainable development is a necessary step towards understanding if new environmental practices will be adopted successfully. This research focuses on unlearning and its impact on environmental knowledge by carrying out an empirical investigation of the unlearning context in 127 Spanish hospitality companies. The findings indicate that a process for consolidating emergent understandings would appear to be an

intermediary step between the forgetting of old knowledge and the application of new environmental knowledge. Consequently, it is important that managers provide an appropriate unlearning context to support the openness of individuals to new ideas and environmental awareness. Otherwise, individuals may be fearful of or confused by the prospect of unlearning old habits and routines. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Private Industry, Trust and Communication, Unlearning Old Habits

30. An application of the hospital-in-the-home unlearning context.

Cegarra-Navarro, Juan-Gabriel; Wensley, Anthony K. P.; Sánchez-Polo, Maria-Teresa

Social Work in Health Care, Vol 49(10), Nov 2010, 895-918.

Many researchers who have investigated health care organizations have indicated that health care professionals are replete with outdated knowledge, and some researchers go even further to argue that without the presence of a context that facilitates unlearning (forgetting) practitioners may lose the ability to recognize relevant changes with respect to knowledge pertaining to all aspects of the health care sector and they may decide to rely on potentially out-of-date knowledge and inappropriate ways of interpreting data with attendant loss of decision quality and attendant risks. This article presents an analysis and develops a model of the factors that influence unlearning which is focused on the health care industry and is comprised of three constituent components: (1) a framework characterizing the lens through which individuals view situations; (2) a framework for characterizing how individual habits change; and (3) a framework for characterizing the manner in which emergent understandings are consolidated into existing knowledge and knowledge structures. The model was developed and analyzed using qualitative data from the Hospital-in-the-Home Unit of a Spanish Regional Hospital. From a practical perspective the article provides for the identification of factors that influence the nature and effectiveness of the unlearning context in Hospital-in-the-Home-Units in regional hospitals. This not only valuably adds to the knowledge of the way these units function but also may enable actions to be taken to improve the learning processes associated with such units, resulting in an improvement in the quality of knowledge used in day-to-day decision making. It is to be assumed that, as a result of improving the quality of knowledge used in decision making, the quality of decisions will be improved. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Leadership, Culture, and Change, Private Industry, Unlearning Old Habits

31. Influences of technological attributes and environmental factors on technology commercialization.

Chen, Chih-Jou; Chang, Chia-Chin; Hung, Shiu-Wan

Journal of Business Ethics, Vol 104(4), Dec 2011, 525-535.

As part of a new focus on sustainability, this study examines the effects of technological attributes, market potential, and environmental factors on the commercialization of technologies. A survey was conducted on two of Taiwan's promising sustainable high-tech industries—solar photovoltaic (PV) and light emitting diodes (LEDs). We found that if the technologies possess the specific attributes of innovativeness, genericness, simplicity, and compatibility, as required by the potential adopters, the level of market potential will be more favorable and technology commercialization (TC) probability will be higher. In addition, the results of regression analysis indicate that environmental requirements play moderating roles in affecting the relationships between market potential and TC probability. The empirical findings highlight the role of market potential as a mediator between technological attributes and the likelihood of commercialization. Furthermore, environmental factors moderate the influence of market potential on TC. The results of this study can provide firms' operations with insights into

resource allocation, sustainable development, and competitive advantages in an intensely competitive environment. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Marketing/Market Potential, Private Industry, Successes, Technology Transfer

32. Technology Transfer Issues and a New Technology Transfer Model

Choi, H.J.

Journal of Technology Studies, Vol. 35, Issue 1, Fall 2009, pp. 49-57

The article focuses on the proposal of a new integrated model of technology transfer that includes the components for enhancing the technology transfer in Seoul, Korea. Technology transfer can be successful by integrating the three main aspects of technology which are cultural, organizational, and technical. However, the invisible aspects of technology like knowledge, skills, and organization are more vital than the physical aspect. Moreover, the willingness of the recipient and donor is necessary to be able to assimilate, adopt and generate the new technology.

Associated Categories: Barriers, Knowledge Sharing, Resource Limitations, Other Public Sector, Successes, Technology Transfer, University

33. Communities of practice: An alternative learning model for knowledge creation.

Choi, Mina

British Journal of Educational Technology, Vol 37(1), Jan 2006, 143-146.

Unlike information that can be easily acquired and owned, knowledge is difficult to make and share easily with others. Therefore, the transfer of knowledge, is not just an exchange, to simply give and take similar to friendship, but a strong trust should be formed. Communities of practice (CoP) is the most suitable learning method not only for the achievements of tacit knowledge based on participation and practice in real world contexts, but also for implicit knowledge, which is passed easily through represented and systematic forms by practice at a group level, not at a personal level. Practice includes a framework, ideas, tools, information, style, language, story or documents, and the like. To explore factors facilitating CoP activity, I conducted a survey of employees participating in the PRO Team at Samsung Electronics Corp. in Korea. There were 297 subjects in 81 teams that completed the survey. The survey showed that the prominent facilitating factors were learning motivation and desire for learning, creation of work-related knowledge and sharing of expertise in CoP participation, relationship between theme and outcome of CoP and performance, trust among members, and the leadership trait of the team leader. Judging from results, it is important that members recognize how shared knowledge by CoP activity improves performance. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Networks and Teams, Private Industry, Trust and Communication

34. New trends in technology management education: A view from Europe.

Clarysse, Bart; Mosey, Simon; Lambrecht, Inge

Academy of Management Learning & Education, Vol 8(3), Sep 2009, 427-443.

In the nineties, postgraduate technology management education was mainly concentrated upon structuring the product development cycle and positioning technology strategy within the overall strategy of the company. Today it encompasses a much wider range of capabilities to address contemporary challenges such as globalization, open innovation, and the need for corporate renewal and venturing. To gain insight into the implications of this change, we conducted a number of exploratory interviews with leaders from both the demand and supply sides in

Europe based in higher education institutes, the corporate sector, and public institutes. Our interviews highlight a dynamic field moving from traditional MBA-focused programs toward more entrepreneurial "boot camps, " from a case study-oriented teaching style toward a mentoring approach, and from an emphasis upon general business toward working across disciplines yet being sensitive to underlying technologies. We found important implications for technology management education with respect to its location within universities and identified opportunities for business schools to provide technology entrepreneurship and commercialization skills. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Entrepreneurship Education, Innovation Implementation, Knowledge Management, Knowledge Sharing, Technology Transfer, University to Industry

35. Technology Readiness

Clausing, D. and M. Holmes	Research Technology Management, July 6, 2010, July-August 2010, pp. 52-59, http://www.iriweb.org/CMDownload.aspx?ContentKey=d37dfe26-a9eb-4386-ba26-be0f0bd08ffb&ContentItemKey=3cfe23bd-da45-4488-8b6f-b355b42f573a

Finance and technology meet at the crossroads of technology readiness. A disciplined method for assessing technology readiness assures that new products will integrate smoothly with downstream design and manufacturing processes and perform as expected in the user's environment. In the absence of a technology readiness assessment, unstable performance will disrupt later stages in the development process or, worse yet, appear once the product is in the hands of the customer. A structured technology readiness method like the one described here includes a development process that improves the stability of the technology until its performance meets predetermined criteria and an assessment component that measures the degree of technology readiness and the risk involved in proceeding to development. Such a technology readiness method can transform a technology stream into a reliable stream of profit.

Associated Categories: Commercialization, Knowledge Sharing, Networks and Teams, Private Industry, Technology Development

36. Accelerating Technology Transition: Bridging the Valley of Death for Materials and Processes in Defense Systems

Committee on Accelerating Technology Transition, National Research Council	2004, http://www.nap.edu/catalog.php?record_id=11108

Accelerating the transition of new technologies into systems and products will be crucial to the Department of Defense's development of a lighter, more flexible fighting force. Current long transition times-ten years or more is now typical-are attributed to the complexity of the process. To help meet these challenges, the Department of Defense asked the National Research Council to examine lessons learned from rapid technology applications by integrated design and manufacturing groups. This report presents the results of that study, which was based on a workshop held to explore these successful cases. Three key areas emerged: creating a culture for innovation and rapid technology transition; methodologies and approaches; and enabling tools and databases.

Associated Categories: Commercialization, Innovation Implementation, Leadership, Culture, and Change, Other Public Sector, Technology Development, Technology Transfer

37. Implementing Research Results: Highlighting State and National Practices

CTC & Associates, LLC. California Department of Transportation

Caltrans 2099 (UC Berkeley Transportation Library), March 8, 2011

This Preliminary Investigation compiles practices and citations that address the issue of implementing the results of transportation research. Topics addressed include adopting successful implementation practices, overcoming hurdles to implementation, structuring a research program to support implementation, developing the staff responsible for implementation, and fostering a culture of innovation. Recurring themes include encouraging management support, staffing for implementation, considering implementation throughout the research process, communicating research results, ongoing monitoring of implementation, and encouraging innovation.

Associated Categories: Barriers, Innovation Implementation, Transportation - Federal, Transportation - State

38. Seven Keys to Building a Robust Research Program, NCHRP Synthesis 280

Deen, T.B, and B.T. Harder

Transportation Research Board, National Cooperative Highway Research Programs, 1999, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_280.pdf

Robust research programs are those most often held up as the models others desire to emulate; they flourish and thrive, are vital and enduring, contribute to the achievement of organizational goals and, overall, add value to the parent organization. These programs must be effective, that is, they must produce a quantity of high-quality, well-targeted products capable of application to the real problems of their parent units. However, it is not enough that they do good technical work. To achieve a robust status, they must also be perceived as doing good work. Some research programs remain robust over long periods, whereas others struggle for respect and support. Managers concerned about building robust research programs should seek ways to achieve these ends. This report focuses on those key attributes that contribute to the achievement of robustness. The seven keys to building and maintaining a robust program are as follows: • Found it on Trust • Market Boldly • Embrace Policy Research • Root It in Economics • Make Deals Unabashedly • Insist on Accountability • Empower the Staff All robust research programs may not necessarily employ all seven keys, and the emphasis placed on each key will vary depending on circumstance. However, this study suggests that more is better in the sense that all seven lead to the enhancement of trust, which is the most important factor, or to an improved output, which is essential. Research programs desiring to enhance their potential for robustness should seek ways to employ these keys in their programs.

Associated Categories: Entrepreneurship Education, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Marketing/Market Potential, Outcomes Management, Technology Transfer, Transportation - Federal, Transportation - State, Trust and Communication

39. An example of technology transfer in road sector from the point of view of a developing country. The case of Cuba

Degado, F.C

Proceedings of the 22nd PIARC World Road Congress, 19-25 Oct 2003, Durban, South Africa, 2004

Technology transfer plays a very important role in the international cooperation relations among two or more countries, since it may be regarded as one of their main objectives. Every technology transfer implies at least two parties involved: a donor and a receiver. In the present communication the work carried out by the Transport Works Technology Transfer Center, appertaining to the Design Enterprise for the Transport Works of the Ministry of Construction of Cuba is exposed, based on its experience for more than ten years. Likewise the general terms on which the transfer is made, its selection criteria, the policy to be followed concerning its requirements, the conditions required for its success, the subject to be transferred, its adaptability to the real conditions and procedures to be used, employing the new communication and information technologies, are taken into account, but from the point of view of a developing country

Associated Categories: Barriers, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Resource Limitations, Successes, Technology Transfer, Transportation - Federal

40. Florida LTAP Safety Circuit Rider Program

Degner, J.D., and N.M. Baker

University of Florida, FDOT Project BD545-52, UF52349, September 2009

Annually, over 60 percent of the 40, 000 plus roadway fatalities in America occur on low volume, local roads. Federal Highway Administration (FHWA) funded a Safety Circuit Rider (SCR) program in 2005 as a pilot to be administered through the national Local Technical Assistance Program (LTAP), which consists of 57 centers jointly funded by FHWA and the respective state departments of transportation serving each of the 50 states, Puerto Rico, and seven tribal governments. FHWA awarded the pilot program to four states, and Florida was one of the four states. The SCR program offers a simple, low cost, and easy-to-implement solution to lower fatality numbers in Florida using federal and state program safety objectives as guidelines to address traffic safety issues and provide potential solutions within targeted Florida counties. Targeted areas received training, technical assistance, and improvement suggestions tailored to match city and county public works department problems and resources that lead to implementing low-cost safety improvements. Florida SCR program managers chose qualified individuals as safety circuit riders who reviewed 110 sites in 15 Florida counties and offered a total of 483 suggestions. Florida county and city officials reacted positively to the reviews, implemented 94 suggestions, and included others in city-county work plans. Due to time and budget constraints, the safety circuit riders were unable to review a significant number of sites after officials implemented the suggestions to further analyze crash data and compare implementation impact. Appendix A of this report consists of a comprehensive spreadsheet of the data collected for each county with references to any available before/after photographs. Appendix B contains before/after photographs. In addition to site reviews, safety circuit riders and Florida program managers trained 684 Florida city/county personnel in 34 sessions of seven different workshops, developed general sign maintenance guidelines and a Highway Safety Resource CD, leveraged SCR program funding to purchase additional equipment used during site reviews, and participated in an effort funded by FHWA that produced a best practices guide for the national SCR program.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Networks and Teams, Successes, Technology Transfer, Transportation - Other, Transportation - State, Trust and Communication, Unlearning Old Habits

41. Technology Readiness Assessment Deskbook (2009) and TRA Guide (2011)

Department of Defense

July 2009, May 2011, Department of Defense (Guide) https://acc.dau.mil/adl/en-US/154268/file/59527/TRA%20Guide%20OSD%20May%202011.pdf

A Technology Readiness Assessment (TRA) is a formal, systematic, metrics-based process and accompanying report that assesses the maturity of critical hardware and software technologies to be used in systems. It is conducted by an Independent Review Team (IRT) of subject matter experts (SMEs). The Technology Readiness Assessment (TRA) Deskbook, provides guidance for conducting TRAs. The body of this document is a concise description of suggested best practices, responsibilities, roles, and procedures for meeting the TRA requirements.

Associated Categories: Commercialization, Knowledge Sharing, Other Public Sector, Private Industry, Technology Development, Technology Transfer

42. Crafting organizational innovation processes

Desouza, K., C. Dombrowski, Y. Awazu, P. Baloh, S.Papagari, S. Jha, and J. Kim

Innovation: Management, Policy & Practice, Vol. 11, No. 1, April 2009, pp. 6-33.

Innovation is a crucial component of business strategy, but the process of innovation may seem difficult to manage. To plan organizational initiatives around innovation or to bolster innovation requires a firm grasp of the innovation process. Few organizations have transparently defined such a process. Based on the findings of an exploratory study of over 30 US and European companies that have robust innovation processes, this paper breaks down the innovation process into discrete stages: idea generation and mobilization, screening and advocacy, experimentation, commercialization, and diffusion and implementation. For each stage, context, outputs and critical ingredients are discussed. There are several common tensions and concerns at each stage, which are enumerated; industry examples are also given. Finally, strategies for and indicators of organizational success around innovation are discussed for each stage. Successful organizations will use an outlined innovation process to create a common framework for discussion and initiatives around the innovation process, and to establish metrics and goals for each stage of the innovation process. The authors describe the difference between robust and brittle organizations in the innovation process. The following list identifies robust organizations' characteristics for diffusion and implementation:

- The whole organization is targeted
- Existing initiatives are incorporated
- Realistic objectives are established
- Knowledge broker role is acknowledged
- Dialogue is emphasized with all stakeholders
- Older, duplicative processes are eliminated
- Unlearning is understood and prepared for
- Storytelling and metaphor is used to inspire and convey the need for and type of change
- Values and culture are emphasized
- Social networks are utilized
- Customer segmentation is established
- Technology is used to communicate
- Failures are evaluated and considered for further stages or processes

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Resource Limitations, Networks and Teams, Private Industry, Successes, Technology Transfer, Trust and Communication

43. Requirements for Successful Technology Transfer in the Highway Industry

Diewald, W J

Sage Publications, Public Works Management Policy, July 2001, Vol. 6, No. 1, pp. 59-69

Technology transfer describes the movement of technological and technology-related organization expertise among partners. In the highway industry, technology transfer includes identifying new technologies from

numerous sources; selecting and prioritizing technologies to be promoted to state and local highway agencies, contractors, and others; determining, developing, and applying effective technology transfer methods; and continually modifying the technology transfer process in accordance with feedback on which technologies and which methods of technology transfer have been successful. Recent budgetary and organizational changes at the Federal Highway Administration (FHWA) have resulted in the need for the agency to improve its technology transfer program and accelerate innovation in the highway industry. Past studies of public works infrastructures point to the need to exploit opportunities that recent technological developments - in materials, electronics, information systems, and telecommunications - offer to help meet current and future demand for all categories of infrastructure facilities. Expenditures on U.S. highways amount to about $100 billion per year, so innovation that improves performance and/or reduces cost is an important goal. This article describes innovation and technology transfer in the highway industry, describes the important role FHWA plays in highway industry innovation, and suggests how FHWA can accelerate innovation by focusing on requirements associated with the implementation of innovation by state and local highway agencies.

Associated Categories: Innovation Implementation, Technology Transfer, Transportation - Federal, Transportation - State

44. Implementation Matters: A Review of Research on the Influence of Implementation on Program Outcomes and the Factors Affecting Implementation

Durlak, J.A., and E.P. DuPre — American Journal of Community Psychology, Vol 41, 2008, pp. 327-350

The first purpose of this review was to assess the impact of implementation on program outcomes, and the second purpose was to identify factors affecting the implementation process. Results from over quantitative 500 studies offered strong empirical support to the conclusion that the level of implementation affects the outcomes obtained in promotion and prevention programs. Findings from 81 additional reports indicate there are at least 23 contextual factors that influence implementation. The implementation process is affected by variables related to communities, providers and innovations, and aspects of the prevention delivery system (i.e., organizational functioning) and the prevention support system (i.e., training and technical assistance).

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Networks and Teams, Other Public Sector, Outcomes Management, Private Industry, Trust and Communication, University

45. Procedural instructions, principles, and examples: How to structure instructions for procedural tasks to enhance performance, learning, and transfer.

Eiriksdottir, Elsa; Catrambone, Richard — Human Factors, Vol 53(6), Dec 2011, 749-770.

Objective: The goal of this article is to investigate how instructions can be constructed to enhance performance and learning of procedural tasks. Background: Important determinants of the effectiveness of instructions are type of instructions (procedural information, principles, and examples) and pedagogical goal (initial performance, learning, and transfer). Method: Procedural instructions describe how to complete tasks in a stepwise manner, principles describe rules governing the tasks, and examples demonstrate how instances of the task are carried out. The authors review the research literature associated with each type of instruction to identify factors determining effectiveness for different pedagogical goals. Results: The results suggest a trade-off between usability and learnability. Specific instructions help initial performance, whereas more general instructions, requiring problem solving, help learning and transfer. Learning from instructions takes cognitive effort, and research suggests that learners typically opt for low effort. However, it is possible to meet both goals of good initial performance and learning with methods such as fading and by combining different types of instructions. Conclusion: How instructions are constructed influences their effectiveness for the goals of good initial

performance, learning, and transfer, and it is therefore important for researchers and practitioners alike to define the pedagogical goal of instructions. Application: If the goal is good initial performance, then instructions should highly resemble the task at hand (e.g., in the form of detailed procedural instructions and examples), but if the goal is good learning and transfer, then instructions should be more abstract, inducing learners to expend the necessary cognitive effort for learning. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Successes, Technology Transfer

46. Empowering public transportation organizations in developing countries through the transfer of appropriate technologies

Elrahman, O A; SELIM, A A; X GODARD; I FATONZOUN

IRRD E116672 (TRL), Urban Mobility for All, 2002, pp. 553-558

Technology Transfer (T2) is the systematic application of research results. T2 remains to this day an untapped resource in both developed and developing countries. For the latter particularly, the institutionalization of technology transfer is still in the stage of infancy. In spite of formidable hurdles, it is destined to yield bountiful harvest. The rewards that T2 institutionalization promises are unlimited. Generally, it will allow developing countries to do "more with less". It is a tool that public transport organizations can utilize to devise solutions to urban mobility problems, while leveraging scarce resources. It provides a window to the latest innovations and best practices. It grants an opportunity to these organizations to sift, adapt, modify, and transfer only technologies that are appropriate to the local needs. This paper examines technology transfer practices in the transportation field. It discusses the benefits and challenges and outlines a framework of operating a successful T2 organization in a developing country. The paper provides practical tools to practitioners that can be used to establish goals, formulate T2 programs, and prioritize T2 prospects according to organizational goals. T2 implementation remains an art rather than a science. The objective of this paper is to guide the user to the implementation of T2 programs. For the covering abstract see ITRD E116619.

Associated Categories: Commercialization, Technology Development, Technology Transfer, Transportation - Other

47. Effective Transfer of Research Results: Human Element for Successful Transfer

Elrahman, O.A.

Transportation Research Record: Journal of the Transportation Research Vol. 1848, 2003, pp.118-124

New technology is used in transportation to preserve competitiveness and maintain operational efficiency and effectiveness. Technology transfer is the medium for introducing a new technology into an organization: the missing link between research and operations and the bridge between theoretical knowledge and its practical application. Whether the product of an agency's own research or the research of others, technology will not be successfully transferred through the mere delivery of reports. That is but one step in the transfer process, yet it is often mistakenly considered to signal completion of the process. Experience has proved that relying solely on report delivery to transfer research products is bound to yield unsuccessful transfer. That passive mode of communication, with the human element almost absent, has proved futile. The effective transfer of technology entails the dedication and commitment of specialists, time, and funds, along with report delivery. An organizational climate conducive to successful technology institutionalization in public transportation agencies was examined with emphasis on the often-overlooked human element. This focus acknowledges that an active interaction between technology provider and receiver greatly facilitates a successful transfer. Components were developed of an effective framework for technology transfer consisting of two fundamental elements: a solid foundation and an effective transfer infrastructure. A solid foundation is established when (a) top management

commits the organization to transfer efforts, (b) human and financial resources are committed to such efforts, and (c) the organizational culture embraces change and works to dissolve resistance to new technology introduction. An effective transfer infrastructure uses seamless communication among all parties involved, to avert problems before they arise and strengthen performance at each step.

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Resource Limitations, Successes, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State, Trust and Communication

48. The Art of Managing New Product Transitions

Erhun, F., P. Conçalves, and J. Hopman

MIT Sloan Management Review, Vol. 48, No.3, Spring 2007, pp. 73-80

Our research is based on a three-year study between 2001 and 2004 at Intel Corp. on the risks and drivers affecting product transitions. We conducted about 40 semi-structured interviews with managers in supply chain management, demand forecasting, sales, marketing and product development. After studying multiple historical and current product transitions at Intel, we learned that smooth transitions are difficult to achieve. The complexity of demand and supply dynamics causes tremendous uncertainty before a product launch that is not fully resolved until several quarters after it. We observed that functional teams across the organization had access to specific information (for example, about macroeconomic conditions in Asia or the availability of a particular part) that had significant bearing on the relative demand and supply of old and new products. However, the lack of a formal mechanism to aggregate and utilize such diverse information frequently caused misalignment. We saw the need for a new process to overcome this obstacle. The process we designed begins with defining a specific market objective. Subsequent steps involve identifying and measuring a set of factors across departments for each product (old and new) to assess product drivers and risks; exploring possible risks arising from interactions between products using the transition grid; and developing a transition playbook, including prevention and contingency strategies with which to manage and mitigate transition risks.

Associated Categories: Commercialization, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Marketing/Market Potential, Private Industry, Trust and Communication

49. The impact of accumulating and reactivating technological experience on R&D alliance performance.

Ernst, Holger; Lichtenthaler, Ulrich; Vogt, Carsten

Journal of Management Studies, Vol 48(6), Sep 2011, 1194-1216.

Drawing on organizational learning theory, we distinguish the entrepreneurial processes of experience accumulation (i.e. gaining technological experience), and experience reactivation (i.e. leveraging the accumulated experience), as two essential stages of knowledge retention. While controlling for alliance experience, we further use new data of 196 biopharmaceutical R&D alliances to examine the effects of the technology recipient's accumulation and reactivation of technological experience on R&D alliance success. The patent-based experience measures at the level of specific technology fields provide strong support for distinguishing experience accumulation and reactivation, which positively interact in interorganizational learning. Experience reactivation strengthens the positive effects of experience accumulation on alliance performance, and it contributes to avoiding organizational inertia in intertemporal knowledge transfer. In particular, our newly developed technology-specific measures help to explain inconsistent findings of earlier studies, which often relied on firm-level R&D expenditures to capture the level of prior technological knowledge and absorptive capacity. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Networks and Teams, Private Industry

50. Technology for Creativity and Innovation: Tools, Techniques and Applications

Fairchild, J., Cassidy, S., Cushenbery, L., & Hunter, S. T.

The impact of technology on process-models of creativity. In A. Mesquita (Ed.), Technology for creativity and innovation: Tools, techniques and applications (pp. 26-51). March 2011. Hershey, PA: IGI Global Books.

In our fast-paced world, it is necessary for organizations to continually innovate in order to stay competitive. At the same time, technology is continually advancing, and tools to facilitate work are frequently changing. This forces organizations to stay abreast of current technologies, and also puts pressure on employees to utilize the technologies available to them in order to devise innovative solutions that further the organization's goals. To date, there has been little research on how such technologies may best be used to facilitate such creative performance. The present chapter addresses this gap by integrating a model of the creative process from the psychology literature with technology literature from engineering and information technology. This chapter examines how specific technologies may influence performance at each stage of the creative process, and provides specific recommendations for how technology may be used to facilitate the development of creative solutions. There are numerous ways by which technology can influence each stage of the creative process, both in terms of benefits if implemented properly, or hindrances if done poorly. Any organization seeking to remain competitive should be aware of such elements, and be prepared to implement new technologies as appropriate. The technologies discussed in this chapter are also only some of many that may influence the creative process. Furthermore, as technology continues to advance, new developments will inevitably arise that will have further potential to impact the creative process. It will no doubt be vital for organizations to stay up to date with such developments, in order to maintain a competitive edge. However, as asserted by Mumford & Hunter (2005), having more resources (such as novel technologies) is indeed helpful for innovation, but there is a limit to how much assistance resources can provide. The time necessary to learn new technology and the vast possibilities in design that technology allows may lead to a loss of focus that may hamper success in creative endeavors. Therefore, organizations must maintain sight of their goals with respect to innovation, and only adopt and implement new systems when they will have clear benefits, without impairing employee's creative performance in other ways. Such understanding requires conceptualizing creativity as a detailed process, and not simply an input-output relationship. If creativity were only considered in terms of outcomes, it is impossible to gain insight into how technology can impact creative performance; it becomes just another input, filtered through a 'black box.' In order to identify what technologies may be useful, when, and in what ways, it is vital to consider the cognitive and behavioral mechanisms operating throughout the design process. The eight-stage creative process model discussed in this chapter provides an excellent framework for studying the mechanisms by which various technologies can impact creative performance, which can be useful for both academic study and planning for practical implementation. It is important to note that such a model is not technology-specific. Rather, it provides a broad framework within which technology may interact with user characteristics, behaviors, cognitions, and attitudes. In this way, the designers themselves, and their interactions with one another, still drive the creative process. Again, creative design is a social process (Warr & O'Neill, 2005), and any effective attempt to study it must necessarily consider it as such. In essence, when considering the influence of technology on the creation of new products and systems, it is merely a tool of human innovation; no matter how technology develops, it is people who will always be the driving force of the creative process.

Associated Categories: Knowledge Management, Resource Limitations, Networks and Teams, Technology Transfer

51. The Adoption of Agricultural Innovations: A Review

Feder, G., & Umali, D. L.

Technological Forecasting and Social Change, Vol 43, Issues 3-4, May-June 1993, pp. 215-239

This paper reviews the theoretical and empirical literature on the adoption of agricultural innovations during the last decade and the impact of policy interventions promoting technology adoption. The analysis of the final stage of the Green Revolution technology diffusion cycle reveals that the agroclimatic environment is the most significant determinant of locational differences in adoption rates. The linkage between micro-adoption and the aggregate diffusion process needs to be more firmly established to achieve a clearer understanding of diffusion patterns. Several studies showed that the impact of policy interventions to promote technology adoption depends on the type of technology, market structure, and the nature and duration of the policy intervention

Associated Categories: Barriers, Resource Limitations, Other Public Sector, Successes, Technology Transfer

52. Accelerated Construction Technology Transfer (ACTT)

Federal Highway Administration

Priority, Market-Ready Technologies and Innovations, 2006, http://www.fhwa.dot.gov/resourcecenter/teams/construction/cpm_1ac.pdf

An aging system faces increasing traffic demand. Highway construction has intensified in recent years to address two challenges. First, much of the Nation's aging highway infrastructure was built during the 1950s and 1960s and needs to be rehabilitated or replaced. Second, although highway capacity remained virtually unchanged during the past several decades, traffic demand increased tremendously, causing high levels of congestion. Large construction projects to improve outdated roads and bridges compound traffic problems during extensive construction periods. Today's motorists demand high-quality roads, but they want them put in place as quickly as possible; they will not settle for a "business as usual" approach. Key to the success is a team of experts working together in a coordinated, strategic approach to ensure that the project is completed better, faster, and safer.

Associated Categories: Barriers, Innovation Implementation, Leadership, Culture, and Change, Resource Limitations, Successes, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State

53. Technology Transfer Desk Reference: A Comprehensive Guide to Technology Transfer

Federal Laboratory Consortium

April 2011, http://www.federallabs.org/pdf/T2_Desk_Reference.pdf

The FLC Technology Transfer Desk Reference presents a comprehensive introduction to the federal technology transfer process and the technology transfer initiatives, procedures, and mechanisms that are used to implement technology transfer. The primary goal of the Desk Reference is to help technology transfer practitioners become effective facilitators of technology transfer by explaining what technology transfer is and why it is necessary, relating the processes and mechanisms that make it happen, and describing issues and procedures useful in identifying and transferring technologies from the government sector to the private sector. To this end, the Desk Reference provides a thorough overview of the basic elements of technology transfer. It also provides the background, concepts, and practical knowledge required to assist FLC Laboratory Representatives, laboratory

technology transfer personnel (including Office of Research and Technology Applications [ORTA] personnel) and other technology transfer practitioners—whether in government or industry—to facilitate the transfer of federally funded technologies from the laboratory to the marketplace. Includes Appendices: (A) Highlights of Technology Transfer Legislation and Relevant Executive Orders and (B) Major Legislative Themes in Federal Technology Transfer

Associated Categories: Other Public Sector, Technology Transfer

54. Federal Laboratories & State and Local Governments Partners for Technology Transfer Success

Federal Laboratory Consortium for Technology Transfer	2008, http://www.federallabs.org/pdf/2008_State_and_Local_Govt.pdf

This brochure highlights some of the successful technology transfer collaborations between state and local governments and federal laboratories. Such collaborations demonstrate the accomplishments that are possible when state and local government organizations take advantage of the opportunities available through technology transfer partnerships with federal laboratories. Included are descriptions of: - NREL Co-founds Colorado Collaboratory to Spur Renewable Energy Industry Growth - Sandia Licenses Improved Flash-Bang Technology - Berkeley Creates Energy-Saving Roofs in Any Color - Homeland Security & South Jersey Transportation Authority Sign Unique Cooperative Agreement - NASA Goddard Seeds Entrepreneurship Through Technology Assessment Program - Washington Department of Natural Resources Protects Forest Resources While Generating Funds for Schools, County Services - Maryland and Army Team Up to Assist Small Businesses in Biotech - Riverside Forest Fire Laboratory and Space Instruments, Inc., Aid Fire Suppression Efforts in California - Idaho National Laboratory Teams with Idaho TechConnect to Encourage Entrepreneurism - Argonne Constructs Cutting-Edge Computational Facilities

Associated Categories: Commercialization, Knowledge Sharing, Other Public Sector, Private Industry, Successes, Technology Transfer, University

55. Transportation Toolkit for Federal Lands Managers, Decision Support System

Federal Lands	Federal Lands Toolkit Decision Support System, Online, Accessed June 28, 2012, http://www.cflhd.gov/ttoolkit/flt/Decision%20Support%20System/DecisionSupportStart.htm

Decision Support System: By answering the following questions, this software will help you determine what transportation-related issues your Federal land is experiencing, as well as the potential solutions to these challenges. This process will lead you to potential solutions (presented as “Fact Sheets”) for each transportation challenge you have indicated by your answers. The Fact Sheets are categorized in four areas: Infrastructure (the built environment), Intelligent Transportation Systems (“ITS” or electronic solutions), Policy (the management of assets and systems), and Transit (alternative transportation modes).

Associated Categories: Knowledge Management, Knowledge Sharing, Technology Transfer, Transportation – Federal

56. An empirical study of the role of information technology in effective knowledge transfer in the shipping industry

Fei, Jiangang

IAME 2010 Conference Proceedings, 7-9 July 2010, Lisbon EJ (2010)

High human mobility in the shipping industry is one of the main reasons causing severe shortage of skilled and qualified personnel in the shipping industry. This paper looks into the issue from a new perspective where high mobility in the shipping industry is seen as a vehicle of knowledge flows that can be used for knowledge transfer. This paper suggests that advanced information and communication technologies, supported by a dedicated knowledge sharing culture, and strong leadership are essential factors in facilitating knowledge transfer in the context of shipping. The proposed effective knowledge transfer (EKT) model was confirmed by an empirical study in which 275 questionnaires were sent and 166 valid answers were received. The results reveal that (a) there is a positive relationship between perceived effectiveness of information technology (IT) related factors and the current and preferred means of communication between on- and off-shore managements; and (b) there is a high degree of consensus about the role of IT in EKT among participants of different business sectors, fleet sizes and onboard experience. An important implication of this study is that shipping organisations can apply appropriate IT to facilitate EKT to reduce knowledge wastage caused by outflows of personnel.

Associated Categories: Knowledge Sharing, Leadership, Culture, and Change, Private Industry

57. Intelligent Vehicle Technology Transfer between DOD and DOT

Finkelstein, R.

Robotic Technology Inc., US DOT ITSJPO, Aug 2005

The purpose of this final report is to summarize the results of the intelligent vehicle technology transfer workshop, the associated survey of attendees, and the recommendations for a subsequent conference. The purpose of the workshop was to obtain guidance concerning the establishment of an ongoing process for transferring intelligent vehicle technology between the Department of Defense (DOD) and the Department of Transportation (DOT) and their associated stakeholders. The DOD and the DOT are both supporting the development of what are known as intelligent vehicles. The DOD intends to deploy a variety of autonomous intelligent vehicles (robots) to reduce human casualties on the battlefield and increase the global combat efficiency and effectiveness of the U.S. military against conventional and unconventional forces. The DOT supports intelligent vehicle technology to reduce human casualties on the nation's highways and increase the efficiency and effectiveness of the U.S. transportation system. The military's rapid progress in intelligent vehicle technology can directly benefit the commercial development of intelligent cars, trucks, and buses, reducing time and expense for the automotive industry. Conversely, technology transferred from the commercial sector to DOD, and its industry contractors, will reduce the cost and increase the availability of commercial-off-the-shelf (COTS) intelligent vehicle systems and components for military services. The benefit of mutual technology transfer, between the military and commercial sectors, is exemplified by computer technology - expensive military computer technology became faster, better, cheaper - and ubiquitous - after commercialization. A formal process for sharing - and leveraging - intelligent vehicle technology between DOD (and its stakeholders) and DOT (and its stakeholders) will facilitate the advent of intelligent vehicles, a quickly emerging technology, which offers enormous potential benefits for the military and civil sectors alike in the 21st century. The objective of the workshop was to: solicit ideas and approaches for establishing a technology transfer program; determine the level of interest in such a program and the key issues; and plan for a subsequent, more inclusive workshop which will address the critical requirements and challenges of a technology transfer process.

Associated Categories: Barriers, Commercialization, Entrepreneurship Education, Innovation Implementation, Resource Limitations, Marketing/Market Potential, Other Public Sector,

Private Industry, Successes, Technology Development, Technology Transfer, Transportation - Federal, University

58. Entrepreneurship in Residence Program

FITT--Fostering Interregional Exchange in ICT Technology Transfer	http://www.fitt-for-innovation.eu/fileadmin/_fitt/Update_Toolbox/Act3/act3_doc_entrepreneurship_in_residence_program.pdf

Why is it that researchers rarely find their way to the technology transfer office, and what can be done about it? Or how can researchers be motivated to communicate the details of their invention and involve technology transfers early in the process? There are two potential reasons that researchers stay in their labs when they've come up with a brilliant idea instead of going to a technology transfer officer. The first is that they are simply not aware of the transfer opportunities, or do not realise that their invention is of commercial interest. TTOs can try and overcome this by promoting awareness of the technology transfer processes. The second reason is that researchers might lack motivation to engage with technology transfer offices. However, TTOs can motivate researchers to become more entrepreneurially minded by ensuring that academic inventors will receive support throughout the start-up process. Since a strong management team is a key element of successful start-up companies, knowing you will be part of one can be a strong motivator. At Imperial Innovations (UK), complementary teams are put together depending on the needs and stage of the company. One initiative used to provide strong management teams and to enhance technology transfer opportunities is the Entrepreneurs-In-Residence' programme.

Associated Categories: Commercialization, Entrepreneurship Education, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Other Public Sector, Private Industry, Successes, Technology Transfer, Trust and Communication, University, University to Industry

59. Implementation Research: A Synthesis of the Literature

Fixsen, D, S. Naoom, K. Blase, R. Friedman, and F. Wallace,	University of South Florida, National Implementation Research Network, 2005

Our intent is to describe the current state of the science of implementation, and identify what it will take to transmit innovative programs and practices to mental health, social services, juvenile justice, education, early childhood education, employment services, and substance abuse prevention and treatment. The content is distilled from a far-reaching review of existing implementation literature that looks beyond the world of human services to organize and synthesize critical lessons from agriculture, business, engineering, medicine, manufacturing, and marketing. As you will find, authors from around the globe share the rigors of attempting to implement practices and programs and agree that the challenges and complexities of implementation far outweigh the efforts of developing the practices and programs themselves. In a fundamental sense, implementation appears most successful when: • carefully selected practitioners receive coordinated training, coaching, and frequent performance assessments; • organizations provide the infrastructure necessary for timely training, skillful supervision and coaching, and regular process and outcome evaluations; • communities and consumers are fully involved in the selection and evaluation of programs and practices; and • state and federal funding avenues, policies, and regulations create a hospitable environment for implementation and program operations. It also appears that relevant implementation factors and processes are common across domains (e.g., mental health, juvenile justice, education, child welfare).

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Leadership,

Culture, and Change, Networks and Teams, Other Public Sector, Private Industry, Successes, Technology Transfer, Trust and Communication, University

60. Trust as a moderator of the relationship between mentoring and knowledge transfer.

Fleig-Palmer, Michelle M.; Schoorman, F. David

Journal of Leadership & Organizational Studies, Vol 18(3), Aug 2011, 334-343.

To be effective, organizations must facilitate knowledge transfer between employees. Mentoring has long been viewed as a vehicle for effective knowledge transfer. The authors break new ground in examining the role of trust as a moderator of the relationship between mentoring and knowledge transfer. Results of a study conducted among employees of a hospital who indicated they had mentors show main effects for both mentoring and trust as well as a significant interaction effect. Implications of these findings for knowledge transfer are discussed. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Private Industry, Trust and Communication

61. Tacit knowledge transfer and the knowledge disconnect.

Foos, Ted; Schum, Gary; Rothenberg, Sandra

Journal of Knowledge Management, Vol 10(1), 2006, 6-18.

Purpose: The purpose of this paper is to look at some of the factors that influence the transfer of tacit knowledge between two product development partners. Design/methodology/approach: Research involved the collection of both qualitative and quantitative data. The qualitative data was based on 13 interviews with various individuals, representing three companies, charged with integrating external technology. The quantitative portion of the data was collected through an online survey. The survey was executed by soliciting responses from managers of 39 discreet projects involving various types of external technology integration, representing five different companies. Findings: The paper provides evidence that trust, early involvement, and due diligence influence the extent of meeting technology transfer expectations and tacit knowledge transfer expectations. It also finds that the subject of tacit knowledge transfer, content and process, is poorly understood. While managers and project leaders saw the value of tacit knowledge, there were different perceptions of the goals successful knowledge transfer and a lack of processes to manage its process. While project managers may feel that they have tacit knowledge transfer in hand, they have not managed to transfer the knowledge needed for long-term product management. Research limitations/implications: There are a number of limitations affecting the scope of these findings. For one, our survey respondents were all project or product managers. Future research should include a broader base of participants, both horizontally and vertically. Second, interviews and surveys were confined to a total of five US companies in three industries. Future research would benefit from a larger sample size, as well as greater sample diversity in terms of firm size, industry, and cultural context. Lastly, the measure of tacit knowledge transfer needs additional validation. Practical implications: The paper offers several recommendations to help managers begin to think of tacit knowledge as an independent entity and manage it accordingly. Originality/value: This paper offers empirical support for some of the factors that influence the extent of meeting technology and tacit knowledge transfer expectations. Moreover, it offers a unique model that highlights how different levels of an organizational hierarchy are governed by significantly different goals and expectations with regard to tacit knowledge transfer. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Private Industry, Technology Transfer, Trust and Communication

62. Improving Federal To Private Sector Technology Transfer

Franza, R.M. and K.P. Grant

Research Technology Management, Vol. 49, No. 3, May-June 2006

Technology transfer has become an increasingly important mission of federal laboratories in the United States, with results that benefit the government, private companies, and the U.S. economy. However, the performance of this mission over the past decade has been a mix of successes and failures. Research performed to improve this performance by identifying the characteristics of successful public to private sector technology transfers identified several critical success factors. These include a "transfer culture" in both the government laboratory and private organization, shared personnel of the federal and private organizations throughout the transfer project life cycle, the private organization's ability and intent to adequately fund the transfer project, and the private organization's completion of a business plan for the commercialization of the transferred technology prior to transfer initiation. A study identifies seven critical factors with the greatest impact on whether a transfer attempt succeeds or fails. * The developer establishes a dedicated technology transfer unit within its organization. * The transfer agent is located close to the developing organization. * The developing organization targets advertising to relevant industries. * The acquiring organization facilitates informal transfer processes. * The acquiring organization funds the transfer project adequately. * The acquiring organization has a business plan for commercializing the technology. * Both the developing and the acquiring organizations share personnel over the life of the transfer project.

Associated Categories: Barriers, Commercialization, Innovation Implementation, Resource Limitations, Other Public Sector, Private Industry, Successes, Technology Development, Technology Transfer, University

63. Measuring knowledge management/knowledge sharing (KM/KS) efficiency and effectiveness in enterprise networks.

Ganguly, Anirban; Mostashari, Ali; Mamouri, Mo

International Journal of Knowledge Management, Vol 7(4), 2011, 37-54.

Knowledge Management (KM) is critical in ensuring process efficiency, outcome effectiveness and improved organizational memory for the modern day business enterprises. Knowledge Sharing (KS) is fast becoming a rapidly growing area of interest in the domain of knowledge management. The purpose of this paper is to enlist a set of generalized metrics that can be used to evaluate the efficiency and the effectiveness of knowledge sharing in an enterprise network. The metrics proposed in this research are those that can be readily measured by various types of enterprise knowledge sharing systems, and link usage information to organizational outputs The paper uses an illustrative case example of how an enterprise might make use of the metrics in measuring the efficiency and effectiveness of its knowledge sharing system. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Outcomes Management, Private Industry

64. Absorptive capacity, learning processes and combinative capabilities as determinants of strategic innovation.

Gebauer, Heiko; Worch, Hagen; Truffer, Bernhard

European Management Journal, Vol 30(1), Feb 2012, 57-73.

The current paper focuses on absorptive capacity in the context of strategic innovation. Strategic innovation aims at a re-conceptualisation of business models, the creation of uncontested market spaces, and leaps in customer value. By using the learning-process perspective of absorptive capacity (exploratory, assimilative, transformative, and exploitative learning processes), we suggest that transformative learning processes in particular, play a key role in strategic innovation. In addition, a follower strategy and participative role in the knowledge network, instead of a first-mover strategy and a dominant role in the knowledge network, do indeed promote strategic innovation. Companies should not only manage the accumulation of external knowledge, but also adapt their combinative capabilities (systematisation, coordination, and socialisation of knowledge) in order to succeed with strategic innovation. The findings yield a set of research propositions for further academic and managerial consideration. Two longitudinal case studies of European electricity providers form the empirical background. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Networks and Teams, Private Industry

65. Transportation System Preservation Research, Development, and Implementation Roadmap

Gee, King W.

FHWA, January 2008, http://www.fp2.org/wp-content/uploads/2010/05/Roadmap_Report_Complete.pdf

There are significant gaps in the understanding of pavement and bridge preservation and it will require a comprehensive and broadly supported program of research, development and technology transfer to fill those gaps. The Federal Highway Administration (FHWA) has partnered with the American Association of State Highway Transportation Officials (AASHTO) and the preservation industry to sponsor a study to determine what the most critical knowledge gaps in pavement and bridge preservation are and what research is necessary to fill those gaps. This Transportation System Preservation (TSP) Research, Development, and Implementation Roadmap is the output of that partnership effort. Working together with preservation practitioners from State, Provincial, and local transportation agencies, industry, academia, and FHWA, the effort has resulted in developing a broad array of pavement and bridge preservation research needs statements. The number of needs statements and the estimated cost to complete all of them are: Pavement Preservation - 40 Needs Statements - $28.275M; and Bridge Preservation - 25 Needs Statements - $12.770M. The statement titles are summarized on pages 9-13 of this report, and the pavement and bridge preservation statements are enclosed in their entirety in Appendix A. All of the statements were evaluated and ranked to present a sense of timing and priority for their funding and pursuit. The total estimated cost of all these projects is substantial, but so is the ultimate value of providing agencies with the knowledge and tools they will provide. Although it does not represent a commitment of FHWA funds for the research projects, the Roadmap will serve as a valuable guide. It presents relationships between technical and program needs and offers recommendations to help decision makers within FHWA, AASHTO, and the Transportation Research Board (TRB) to allocate resources to conduct the research addressing these short-term and long-term needs.

Associated Categories: Innovation Implementation, Knowledge Management, Resource Limitations, Transportation - Federal

66. The Role of Context and Structure in Radical and Incremental Logistics Innovation Adoption

Germain, R.

Journal of Business Research, Vol. 35, Issue 2, February 1996, pp. 117-127

An analysis of manufacturers was undertaken to examine the adoption of logistics process innovation. A typology

of innovation was created on innovation cost and radicalness. The results reveal that size and environmental uncertainty directly predict expensive, radical but not low-cost, incremental innovation. Specialization predicts both. Decentralization of logistics process innovation adoption decision-making predicts low-cost, incremental innovation but not expensive, radical innovation, whereas decentralization of manufacturing operations does not predict logistics process innovation. Finally, although integration does not predict low-cost, incremental innovation, it inversely predicts high-cost, radical innovation

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Private Industry, Successes, Technology Transfer

67. Winter Maintenance Technical Peer Exchange: A Final Report

Gesford, A.L, and J.A. Anderson

Pennsylvania State University, Harrisburg, FHWA-PA-2005-009-2304P, July 2007

The Commonwealth of Pennsylvania, working closely with FHWA, took the lead in hosting the first Winter Maintenance Technical Peer Exchange. Pennsylvania, with one of the largest winter maintenance organizations involving state and local governments, has identified winter operations as a key to an effective, efficient and safe transportation system, enhancing the mobility and economic stability of the Commonwealth and the nation. The purpose of this multi-partner exchange was to improve the dissemination and use of winter technology for state and local governments and to help guide key transportation committees, organizations and associations addressing winter maintenance issues that affect transportation mobility, productivity, safety and the environment - four items directly related to FHWA's National Strategic Goals. The Winter Maintenance Technical Peer Exchange was an intense 2 1/2 day exchange with Technical Experts from across the country representing LTAP/T2 Centers, State DOTs and FHWA. The exchange was geared toward improving winter maintenance training, technical assistance, and knowledge resources; the identification of technology development needs; and the improvement of critical methodologies and networks (e.g., T2/LTAP). This technical exchange explored winter maintenance technology addressing operations, materials, equipment, planning, and communications with respect to safety, the environment, and traffic mobility. The Exchange took place in Harrisburg, Pennsylvania from March 21 to March 23, 2005.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Technology Transfer, Transportation - State

68. T2 Specialist Technical Peer Exchanges: The Process and the Experience

Gesford, Alan; Hood, Mark; Anderson, John

FHWA

The Pennsylvania LTAP, working closely with FHWA, hosted the first two T2 Specialist Technical Peer Exchanges. The first one was for Highway Maintenance Technology and the second one was for Highway Safety Technology. This report summarizes the process and experiences of these Technical Peer Exchanges along with actual participant observations. Lessons learned and recommendations for future exchanges are also included. Note that one of the purposes of providing information on the process is to help other centers in hosting any future exchanges. Note that a peer exchange for LTAP technical personnel or Specialists (T2 Specialists) is specifically geared toward the exploration of road and street maintenance and safety training, technical assistance, knowledge resources, new technical developments, and the improvement of critical T2 methodologies and networks. T2 Specialists are an LTAP Center’s instructors/trainers and technical assistance providers whose primary responsibilities include technology transfer to governments’ road maintenance and transportation personnel. These Specialists have to be technically savvy with a background of experiences and have to continually strive to keep current with not only new technology to transfer but with new and better ways to accomplish this transfer. In other words, T2 Specialists have unique needs as they transfer technology to local governments. Information must be ferreted from many sources and then massaged and recombined into practical

and communicable bytes. One of the better ways to meet this responsibility is networking with peers. This peer exchange summarized the benefits of such en exchange and was consistent with the National LTAP Strategic Plan.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Networks and Teams, Successes, Technology Transfer, Transportation - Other, Transportation – State

69. Characteristics of leadership effectiveness: Implementing change and driving innovation in organizations.

Gilley, Ann; Dixon, Pamela; Gilley, Jerry W.

Human Resource Development Quarterly, Vol 19(2), 2008, 153-169.

Research indicates that numerous variables impact a leader's effectiveness. In this study, the authors explore leadership effectiveness in driving change and innovation, along with the precursory skills necessary to do so. The findings confirm previously identified low rates of organizational success with change and point to skill deficiencies as a cause. Specifically, the abilities to communicate appropriately and motivate others significantly influence a leader's ability to effectively implement change and drive innovation. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Leadership, Culture, and Change, Trust and Communication

70. Technology Transfer into Intelligent Transport Systems

Goeghegan, A., P. Howarth, and E. Orme

Transport Research Laboratory, Smart Moving Conference Proceedings, 2007

ITS enjoys a symbiotic relationship with many industries. In this paper technology transfer into ITS is described in relation to communications systems (infrastructure, in-vehicle, roadside and vehicle-to-vehicle systems), ultra wide band radar, decision support systems and machine vision systems. The importance of policy in supporting intelligent transport systems ITS is rapidly becoming a mature discipline for communicating with drivers, managing traffic, distributing data and observing traffic. This maturity requires the adoption of techniques to ensure introduction of ITS solutions alongside a developed policy for their use, and all the institutional issues addressed. In the past ITS implementations have often been driven purely by the technical ability to develop a solution. These ITS solutions have contributed to the developing discipline but have not always been suitable for widespread implementation. In the development of a policy for the distribution of CCTV images a rigorous methodology was followed to derive the issues and the video information highway (VIH) was the technical solution created to address them. The result was an open system that assisted the policy, complied with legislative requirements and addressed the institutional issues

Associated Categories: Barriers, Commercialization, Innovation Implementation, Resource Limitations, Private Industry, Successes, Technology Development, Technology Transfer, Transportation - Federal

71. Teleworker knowledge sharing and the role of altered relational and technological interactions.

Golden, Timothy D.; Raghuram, Sumita

Journal of Organizational Behavior, Vol 31(8), Nov 2010, 1061-1085.

Given the growing importance and complexities of telework and the challenges associated with knowledge sharing, in this study we investigate teleworkers and their propensity to share knowledge. We do so by investigating if the relational qualities of teleworkers in the form of trust, interpersonal bond, and commitment,

act to impact teleworker knowledge sharing. We also investigate how telework's altered spatial and technical interactions shape knowledge sharing, by testing the contingent role of technology support, face-to-face interactions, and electronic tool use. Results using matched data from 226 teleworkers support the role of teleworker trust, interpersonal bond, and commitment in predicting knowledge sharing. Moreover, the impact of trust on knowledge sharing is found to be moderated by technology support, face-to-face interactions, and use of electronic tools, whereas the impact of commitment is contingent upon the use of electronic tools. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Private Industry, Trust and Communication

72. Implementing the Pennsylvania Department of Transportation's Winter Services Strategic Plan

Goodhart, Charles C; Fields, Bonnie J; Vance, Robert J; Renz, Michael S; Treisbach, Mary W; Harder, Barbara T

Transportation Research E-Circular, Issue E-C162, April 2012, pp 315-330

This paper describes events associated with a major winter storm that convinced the Pennsylvania Department of Transportation (DOT) of the need to create and implement a strategic plan to improve its winter service operations. A leadership team directed the work of expert task groups who wrote a plan that addresses major deficiencies revealed by the storm. The plan's five objectives, 17 strategies, and 63 action items emphasize fundamentals including staffing, equipment, materials application, situational awareness, contingency planning, environmental stewardship, and performance management. With the aid of Pennsylvania DOT's implementation system staff and consultants, deployment followed the system's principles of effective implementation. These principles include top management support, dedicated resources, effective communications, implementation teams with the requisite skills, credibility, enthusiasm, broad involvement of the field, and a supportive culture of innovation. Work began to accomplish quick-kill action items even before the plan was completed and continues with a goal of full deployment by late 2013. Implementation challenges and lessons learned are described. Notable successes in fighting recent storms attest to the value of a coordinated and consistent approach.

Associated Categories: Barriers, Innovation Implementation, Leadership, Culture, and Change, Successes, Transportation - State

73. Innovations in Technology Transfer

Grabowski, W

World Road Association - PIARC, XXIInd World Congress, 2003

The paper covers its own experience concerning modern technologies transfer in the area of road construction and road transport. Highway Engineering Division of Poznan University of Technology realizes international collaboration with European Union Universities (France, Belgium, Greece, Germany) and also Australia, in order to exchange road technologies between Universities and Road Companies, Consulting Companies and Road Laboratories. The main purpose of our activities is modernization of education and training system of technical staff and Road and Road Transport Development. The greatest current results have been achieved through collaboration with French and German companies, which work in Poland in the field of Road and Transportation. French Central Road Administration which effectively supports our work needs to be distinguished. The paper includes appreciation of our 4-year activity in this area

Associated Categories: Barriers, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Resource Limitations, Networks and Teams, Successes, Technology Transfer, Trust and Communication

74. Technology Transfer for Entrepreneurs: A Guide to Commercializing Federal Laboratory Innovations

Gross, C.M, and J.P. Allen — Praeger Publishers, Westport, CT, Dec 30, 2003

This book is described as a primer for accessing federal laboratory innovations and financing the acquisition of new technologies with corporate equity, as well as understanding the expertise of specific government laboratories. Authors Cross (founder and CEO of UTEK Corp.) and Allen (president of the National Technology Transfer Center at Wheeling Jesuit University) describe how the private sector can engage these labs as long-term strategic as well as development partners for the cost-effective improvement of new technologies. They also explain how to benefit from knowledge of the current technology-transfer landscape in order to maximize this special private-public partnership. A directory of 48 major federal laboratories is included with a synopsis of their expertise and contact information, along with copies of the technology-transfer legislation that has made technology transfer possible. The 11 chapters cover: * Growth and Inspiration of the Federal Laboratories. * Property Rights and Their Imperative. * How to Use Federal Laboratories. * View from the Bridge: Advice from Inside. * Effectively Managing Intellectual Property. * Overview of Federal Laboratories and Capabilities. * A New Model for Transferring Government Laboratory-Developed Technologies to the Private Sector. * Building Successful Alliances with Federal Laboratories: Cooperative Research and Development Agreements (CRADAs). * Introduction to Intellectual Capital. * Measuring Intellectual Capital: Bibliometrics. * "There is Plenty of Room at the Bottom": U.S. Government Laboratory Research and the Nanotechnology Revolution. Five appendices (106 pages) provide: overview of significant technology transfer legislation, Bayh-Dole Act, Stevenson-Wyler Technology Innovation Act of 1980, Cooperative Research and Development Agreements (CRADAs) at National Labs, sample CRADA agreement.

Associated Categories: Commercialization, Technology Transfer

75. A new paradigm: Authorizing a rhetorical ground in technology transfer.

Gulbrandsen, Karen — Technical Communication Quarterly, Vol 21(2), Apr 2012, 87-104.

This work was based on a case study of a university institute designed to bring university and industry leaders together to promote research and economic development. The article examines how key terms in technology transfer not only justified the institute but also constituted a ground for negotiating interests. Framed by Burke's and Bourdieu's theories of motive and space, the analysis examines the question of who or what authorizes the grounds for success in technology transfer. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Successes, Technology Transfer, University to Industry

76. The Value of Handheld Computers in Construction

Haas, C.T., R.L. Tucker, K.S. Saidi, and N.A. Balli — University of Texas at Austin, http://www.ce.utexas.edu/org/ccis/a_ccis_report_25.pdf

Handheld computers (HHC) have the potential to solve some of these problems by providing field workers with accurate, reliable and timely information at the location where it is needed. In addition, HHC's could enable workers to transmit up-to-date project information back to management directly from the construction site, when coupled with the implementation of CCIS's Tier II strategy. Thus, HHC's can increase the amount of direct work on a project indirectly by directly decreasing the time spent on support work (such as accessing drawings and sending RFI's) and by reducing idle time. Applying a HHC evaluation method (developed as part of this

research) hypothetically to 6 construction field activities (punchlisting, materials tracking, MSDS access, drawing access, RFI's, and quantity surveying) showed that HHC's could potentially save time and improve accuracy at the task and activity levels of a construction project. However, barriers related to the HHC's technological limitations and to the nature of the construction industry must be overcome in order to reap the full benefits of HHC's.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Transportation - State

77. Transportation Technology Transfer: Successes, Challenges, and Needs, NCHRP Synthesis 355

Harder, B.T. and R. Benke

Transportation Research Board, National Cooperative Highway Research Program, 2005, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_355.pdf

This synthesis presents information on the use of technology transfer practices in the highway transportation community. It is intended to assist transportation agencies and other transportation research organizations in expediting innovation to practice, thereby increasing safety, enhancing performance, and reducing costs. The report documents successful practices, discusses challenges encountered, and identifies the needs of those responsible for sponsoring, facilitating, and conducting technology transfer activities and processes. It incorporates practices within state departments of transportation and other programs such as Local and Tribal Assistance programs' Technology Transfer Centers and the Resource Center and divisions offices of FHWA. Areas of interest include organizational structures, political and legal aspects affecting technology transfer, resources (financial, personnel, technology, facilities, and equipment), strategies and tools, and performance evaluation. Comparisons with practices from the private sector are included. This synthesis included three primary sources of information: surveys, a literature review, and interviews.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Networks and Teams, Successes, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State, Trust and Communication, Unlearning Old Habits

78. Renewal of FHWA's HPC Technology Delivery Team

Halkyard, T.D.

HPC Bridge Views, Issue 19, Jan/Feb 2002, http://www.cement.org/pdf_files/hpc-19janfeb02.pdf

This paper describes how the Federal Highway Administration's High Performance Concrete (HPC) Technology Delivery Team (TDT), through funding in the Intermodal Surface Transportation Efficiency Act (ISTEA), produced positive results in helping state departments of transportation (DOTs) implement HPC in their highway bridges. The TDT, created in 1997, helped 13 states build HPC bridges and host or participate in technology transfer activities such as showcases and workshops. Working with the AASHTO Lead States Team for HPC Implementation, the TDT influenced many additional state DOTs to try HPC in their highway bridges.

Associated Categories: Entrepreneurship Education, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Marketing/Market Potential, Successes, Technology Transfer

79. Testing Information to Improve Communication with Communities and Decision Makers

Hall, Kadijah; Lewis, Carol Abel National Technical Information Service, Sep 2011

This work focuses on important concepts in making information available to decision makers and the public, specifically focused on the Transportation Industry. The emphasis is on the PowerPoint presentation and enhancing the message through this medium. Critical elements include adhering to the assigned time limit, incorporating animation, font size, including images, techniques, and preparation. While much information is available on-line about presentations, audiences at too many transportation meetings view substandard presentations, which likely negatively affect understanding and decision-making. Blending available information, focus group feedback and observations yield a foundation for transportation planners in improving presentations to constituents.

Associated Categories: Knowledge Sharing, Resource Limitations, Transportation - Other, Trust and Communication

80. A Meta-analysis of Relationships between Organizational Characteristics and IT Innovation Adoption in Organizations

Hameed, M. A., Counsell, S., & Swift, S. Information & Management, 24 May 2012

Adoption of IT in organizations is influenced by a wide range of factors in technology, organization, environment, and individuals. Researchers have identified several factors that either facilitate or hinder innovation adoption. Studies have produced inconsistent and contradictory outcomes. We performed a meta-analysis of ten organizational factors to determine their relative impact and strength. We aggregated their findings to determine the magnitude and direction of the relationship between organizational factors and IT innovation adoption. We found organizational readiness to be the most significant attribute and also found a moderately significant relationship between IT adoption and IS department size. Our study found weak significance of IS infrastructure, top management support, IT expertise, resources, and organizational size on IT adoption of technology while formalization, centralization, and product champion were found to be insignificant attributes. We also examined stage of innovation, type of innovation, type of organization, and size of organization as moderator conditions affecting the relationship between the organizational variables and IT adoption.

Associated Categories: Successes, Technology Transfer

81. Decision Support Model in Technology Transfer for Technology Receiver

Hamzei, A. International Journal of Natural and Engineering Sciences, 5 (2), May 1, 2011, pp.43-48

In any Technology Transfer, after knowing the technology, it is very important for the receiver of the technology to decide for policies and the appropriate provider of the technology. Using statistical methods and multi-criteria decision making models, this paper presents a “decision support system” for determining the policies and the appropriate provider of the technology. Furthermore, using the multi-criteria decision-making models, the appropriate provider of the technology was identified. The case study is jet UAV (Unmanned Air Vehicle). In general success of the T-T project can be attributed to the following factors: the technology being strategic, getting high quality technology, training employee service after selling by the provider, produce of documentation, software and design, product and testing science, providing hardware and special equipment by the provider, using experienced and expert employee by the receiver, having necessary credits for the project, the method of transferring jet UAV technology, commitment to contribute during & after the T-T course by the provider, and support spare parts and subsystems by the provider of the technology, forever using multi-criteria decision-making models and expert choice software, a model was developed for identifying the criteria and

determining the priority of the providers of the technology. This model was assessed in the complex industry of jet UAV production, an industry which is subject to radical changes, and the results were presented in this document.

Associated Categories: Commercialization, Innovation Implementation, Marketing/Market Potential, Other Public Sector, Technology Development, Technology Transfer

82. Implementation Activities for the Wisconsin Highway Research Program

Hanz, Andrew; Bahia, Hussain

National Technical Information Service, WHRP, 10-08, Mar 2010

The Wisconsin Highway Research Program (WHRP) Steering Committee commissioned an implementation pilot program in 2006 to facilitate the incorporation of research results into the programs, standards, and processes of the Wisconsin Department of Transportation (WisDOT). The program had two main objectives, the first of which was to provide additional funding for each WHRP Technical Oversight Committee (TOC) that allowed researchers to work with WisDOT in providing technology transfer presentations and developing draft specification language or design/construction guidance based on the results of the initial research project. The second objective was to identify processes and committees responsible for initiating changes that integrated research results into the standard practice. To support these implementation activities, the WHRP Steering Committee approved $60, 000 in funding, with the intent to distribute evenly amongst the four TOCs to promote implementation of completed research projects that showed promising results.

Associated Categories: Innovation Implementation, Technology Transfer, Transportation - State

83. Technology Transfer Toolbox Scoping Study

Harder, B. T., B. T. Harder, Inc.

July 2004, http://www.dot.ca.gov/newtech/deployment_support/docs/toolbox_final_report_1-05.pdf

This scoping study was accomplished for the Federal Highway Administration Office of Professional Development and Office of Research Development and Technology and the TRB Committee on Technology Transfer. It lays out a conceptual framework for a toolbox that contains methods, processes, and techniques to facilitate and enhance technology transfer activities in the transportation community. The objective of the study was to describe the types of tools that would be beneficial to increasing technology transfer success and the means for funding the development of the toolbox. T2 Toolbox Components: 1) Implementation Tool encompassing a group of applications necessary for effective implementation of research results or technology transfer. The various modules of this tool will enable the T2 Toolbox user to prepare implementation action plans, marketing plans, and executive briefing presentations and reports and other communication materials; and 2) scheduling and tracking tool would include technology transfer activity timelines, elements of the processes being performed, critical accomplishments, resources needed or expended, and summary capabilities to present an overview of activities and their status. Built into the two primary tools would be the capability to assess the effectiveness of the tools as they foster implementation and technology transfer and the ability to identify whether or not (and if not, why) outcomes are achieved. While the study outlined an approach, the Toolbox was not developed.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Successes, Technology Transfer, Transportation - Federal, Transportation - State

84. Technology Transfer Programs for Concrete QC/QA Certification of Contractors and SCDOT Personnel

Harries, K.A., M.F. Petrou, and M.H. Chaudry

University of South Carolina, Federal Highway Administration Report No. ST02-10, FHWA-SC-02-02, February 2002

The Department of Civil and Environmental Engineering of the University of South Carolina (USC) undertook to develop a comprehensive certification program for portland cement concrete contractors and South Carolina Department of Transportation (SCDOT) technical personnel. This program is aimed at providing certification for SCDOT technicians and inspectors and contractors' personnel pursuant to the adopted SCDOT specification "Structural Concrete Quality Assurance." American Concrete Institute (ACI) certification programs were adopted as the basis for SCDOT certification. Additional supplemental material, relevant to SCDOT practice was appended to the existing ACI certification program. This supplemental material is referred to as Module D. A detailed description of Module D and an overview of ACI certification are provided in this report. A pilot offering of the SCDOT certification program was offered June 19-21, 2001. Considerable feedback was solicited from the pilot program offering and appropriate changes are being made to the content and presentation. Currently, two offerings of Module D are scheduled and USC is prepared to host ACI certification as required. It is believed that the experience of the pilot offering will be representative of future offerings in terms of operation, content and participant performance. It is further believed that the program described in this report satisfies the requirements set out in the SCDOT specification "Structural Concrete Quality Assurance."

Associated Categories: Entrepreneurship Education, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Successes, Technology Transfer, Transportation - State

85. Implementing innovation: designers, users and actor-networks

Harty, C.

Technology Analysis & Strategic Management, Vol. 22, No. 3, April 2010, pp 297-315

The role of users is an often-overlooked aspect of studies of innovation and diffusion. Using an actor-network theory (ANT) approach, four case studies examine the processes of implementing a piece of CAD (computer aided design) software, BSLink (developed by a small UK software firm specialising in designing products specifically for construction firms), in different organisations and describe the tailoring done by users to embed the software into working practices. This not only results in different practices of use at different locations, but also transforms BSLink itself into a proliferation of BSLinks-in-use. A focus group for BSLink users further reveals the gaps between different users' expectations and ways of using the software, and between different BSLinks-in-use. It also demonstrates the contradictory demands this places on its further development. The ANT-informed approach used treats both innovation and diffusion as processes of translation within networks. It also emphasises the political nature of innovation and implementation, and the efforts of various actors to delegate manoeuvres for increased influence onto technological artifacts.

Associated Categories: Commercialization, Entrepreneurship Education, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Marketing/Market Potential, Networks and Teams, Private Industry, Technology Development

86. Government Patenting and Technology Transfer

Heisey, P.W., J.L. King, K.D. Rubenstein, and R. Shoemaker

USDA Economic Research Service, Economic Report #15, February 2006, http://www.ers.usda.gov/media/471043/err15_1_.pdf

Intellectual property rights such as patents protect new inventions from imitation and competition. Patents' major objective is to provide incentives for invention, sacrificing short-term market efficiency for long-term economic gains. Although patents are primarily granted to private firms, policy changes over the last 25 years have resulted in greater use of patenting by the public sector. This study examines government patenting behavior by analyzing case studies of patenting and licensing by the Agricultural Research Service (ARS) of the U.S. Department of Agriculture. ARS uses patenting and licensing as a means of technology transfer in cases in which a technology requires additional development by a private sector partner to yield a marketable product. Licensing revenue is not a major motivation for ARS patenting. More widespread use of patenting and licensing by ARS has not reduced the use of traditional instruments of technology transfer such as scientific publication. Once the decision has been made to patent and license a technology, the structure of the licensing agreement affects technology transfer outcomes. As commercial partners gain experience with the technology and learn more about the market, mutually advantageous revisions to license terms can maintain the incentives through which private companies distribute the benefits of public research.

Associated Categories: Barriers, Commercialization, Competition and Secrecy, Other Public Sector, Private Industry, Successes, Technology Development, Technology Transfer, University, University to Industry

87. AAC technology transfer: An AAC-RERC report.

Higginbotham, D. Jeffery; Beukelman, David; Blackstone, Sarah; Bryen, Diane; Caves, Kevin; Deruyter, Frank; Jakobs, Thomas; Light, Janice; McNaughton, David; Moulton, Bryan; Shane, Howard; Williams, Michael B.

AAC: Augmentative and Alternative Communication, Vol 25(1), Mar 2009, 68-76.

Transferring innovative technologies from the university to the manufacturing sector can often be an elusive and problematic process. The Rehabilitation and Engineering Research Center on Communication Enhancement (AAC-RERC) has worked with the manufacturing community for the last 10 years. The purpose of this article is to discuss barriers to technology transfer, to outline some technology transfer strategies, and to illustrate these strategies with AAC-RERC related activities. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Commercialization, Technology Transfer, University, University to Industry

88. Implementation teams: A new lever for organizational change.

Higgins, Monica C.; Weiner, Jennie; Young, Lissa

Journal of Organizational Behavior, Vol 33(3), Apr 2012, 366-388.

This paper introduces a team form called an " implementation team"—a team charged with designing and leading the implementation of an organization-wide change strategy—and investigates this team type in a context ripe

for change, U.S. public school systems. Unlike prior teams research that has focused on teams as diagnostic collectives or strategic decision-making bodies, this study forwards the notion that teams can be used to implement organizational change. In this study, we examined how positional and tenure diversity and work context relate to team member learning, a critical factor in sustaining organizational change. Results from 25 school district instructional improvement strategy teams over two years challenge some basic assumptions regarding what constitutes a "real team." We find that some taken-for-granted aspects of teams, such as team member stability, may not be central or even appropriate when considering "real teams" in this change context; rather than stability of team membership, the stability of members' roles may matter most. We conclude by suggesting that scholars further investigate this team form and reframe, reconsider, and renew their conceptualizations of "real teams, " especially for teams engaged in implementing organizational change. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Networks and Teams, Other Public Sector

89. A Decision Support System for Integrating Corrective Maintenance, Preventive Maintenance and Condition-Based Maintenance

Hoa, Q., Y.Xue, W. Shen, B. Jones, and J. Zhu

Construction Research Congress 2010. Innovation for Reshaping Construction Practice, pp 470-479

This paper presents a framework of decision support systems for facilities maintenance management (FMM) with the objective of integrating facilities maintenance management, real-time project management, condition monitoring systems and building information models. Multi-faceted views of maintainable assets are designed to meet the requirements of any potential functional extensions or systems integration. Basic processes for asset management, Corrective Maintenance (CM), Preventive Maintenance (PM), and Condition-based Maintenance (CBM) are implemented in a Web-based FMM prototype system. The generic aspects of the system lay in the fact that: (1) all sources of maintenance work, ranging from manually entered CM orders and system generated PM orders to individual maintenance projects, are normalized and manipulated as projects and tasks; (2) the allocation of various kinds of resources, including equipment, materials, trades, contractors, and tools, is optimized using the proposed algorithms.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Other Public Sector, Outcomes Management, Transportation - State

90. Outcomes management: Incorporating and sustaining processes critical to using outcome data to guide practice improvement.

Hodges, Kay; Wotring, James R.

The Journal of Behavioral Health Services & Research, Vol 39(2), Apr 2012, 130-143.

An outcomes management system (OMS) greatly facilitates an organization or state achieving requirements regarding accountability and use of empirically based interventions. A case example of the authors' experience with a successful and enduring OMS is presented, followed by a review of the literature and a proposed model delineating the key components and benefits of an OMS. Building capacity to measure performance requires embedding utilization of youth-specific, clinically meaningful outcome data into the organization's processes and structures. An OMS measures outcomes associated with services, facilitates implementation of evidence-based practices, informs case decision making, enables better and more efficient clinical management, and provides aggregated information used to improve services. A case-specific supervisory model based on instantaneously available information, including progress to date, helps maximize consumer outcomes. Continuous quality improvement activities, which are databased and goal-oriented, become a positive change management tool. This paper describes organizational processes that facilitate the development of a highly functional OMS. (PsycINFO

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Outcomes Management

91. NCHRP Synthesis of Highway Practice 150: Technology Transfer in Selected Highway Agencies

Hodgkins, E. A.

National Cooperative Highway Research Program, Transportation Research Board, National Research Council, December 1989

National Cooperative Highway Research Program synthesis of current practice report: Information is presented on how information about new technology is disseminated and how the use of new technology is actively promoted. Technology transfer is an integral part of the research and engineering functions. This report of the Transportation Research Board describes the technology transfer process as it is carried out in state highway departments and Rural Technology Assistance Program technology transfer centers. It critically discusses various mechanisms that are used to share information (e.g., research reports, short courses, videotapes, etc.) with interested users. Methods for accelerating the process by which new technology information can be shared and used are also considered.

Associated Categories: Barriers, Resource Limitations, Successes, Technology Transfer, Transportation - Other, Transportation - State

92. For money or glory? Commercialization, competition, and secrecy in the entrepreneurial university.

Hong, Wei; Walsh, John P.

The Sociological Quarterly, Vol 50(1), 2009, 145-171.

Scholars have grown concerned that the commercialization of academic science is increasing secrecy at the expense of cooperation and information sharing. Using data from comparable surveys of academic scientists in three fields (experimental biology, mathematics, and physics), we test whether scientists have become more competitive and more secretive over the last 30 years. We also use the recent survey to test a multivariate model of the effects of scientific competition and commercialization (patenting, industry funding, and industry collaboration) on scientific secrecy. We find that secrecy has increased, and has increased particularly for experimental biologists. Only 13 percent of experimental biologists in 1998 felt safe discussing their ongoing research with all others doing similar work. Our multivariate analysis shows that this secrecy is most related to concerns about being anticipated (scientific competition). We find that patenting is associated with increased secrecy among mathematicians and physicists, but not for experimental biologists. We find that industry funding is associated with more secrecy, while industry collaboration is associated with less secrecy, across fields. Our results suggest that the recent concern over increasing scientific secrecy has merit. However, this increased secrecy seems to result from a combination of increasing commercial linkages and increased pressures from scientific competition. Our research highlights the central role that scientists' competition for priority plays in the system of science and that, while such competition spurs effort, it also produces negative effects that recent trends toward commercialization of academic science seem to be exacerbating. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Competition and Secrecy, Trust and Communication, University to Industry

93. Technology Transfer: Long Used to Rejuvenate Roads in the Southwest, Asphalt Rubber Is Gaining Fans Across North America

Hooker, K. A. — Public Works, Vol. 139, Issue 7., June 2006, http://www.pwmag.com/industry-news.asp?sectionID=760&articleID=717637

This article describes the current state of asphalt rubber as it is used in asphalt rubber friction courses, with a closer look at the Arizona DOT's 20-year experience with the material and the changing technologies used to mix it. One main advantage is that just one inch is needed when applied over Portland cement concrete pavement and just one-half inch over existing asphalt. It costs about $2.15 per sq. yd., compared to the $1.55 per sq. yd. that conventional mixes cost. However, because it can be applied at such a shallow thickness, basic road geometry, drainage patterns and curbs and gutters can remain unaltered, which substantially reduces costs. Barriers to its wider adoption are a combination of technical and legalistic complications. Efforts by the Federal Highway Administration in the mid-1970s to promote its use were hampered by the fact that the new procedure wasn't fully tested and caused problems when used with conventional asphalt binders. In the early 1990s, while Arizona was expanding its use of rubber asphalt, federal legislation to include a strong mandate encouraging its use ran into political opposition based on previous difficulties with the material. Gradually, though, its advantages are becoming better known, and states are starting to incorporate it into the paving practices.

Associated Categories: Barriers, Commercialization, Knowledge Sharing, Resource Limitations, Other Public Sector, Private Industry, Successes, Technology Development, Technology Transfer, Transportation - Other, Transportation - State

94. Leading for innovation: Direct and indirect influences.

Hunter, S. T., & Cushenbery, L. — Advances in Developing Human Resources, August 2011, Vol. 13, No. 3, pp. 248-265

Despite growing interest in developing and producing creative products, much remains unknown about how to best facilitate the innovative process. Through a review and integration of creativity, innovation, and leadership literatures, we propose that leaders are one of the primary driving forces in increasing innovative output. To help clarify how leaders achieve this influence, we offer a model of leading for innovation where creativity and innovation are depicted as series of interrelated processes that span multiple levels of analysis (individual, team, and organization). The proposed framework illustrates the direct and indirect ways direct leaders enhance innovation with the resulting discussion helping to highlight the range of behaviors and activities that leaders might engage in to help encourage creative productivity. The implications of our model for HRD scholars, professionals, and other stakeholders, such as executive level leaders, retailers, investors, and consumers, are also discussed.

Associated Categories: Innovation Implementation, Leadership, Culture, and Change

95. Planning for Innovation: A Process Oriented Perspective

Hunter, S. T., Cassidy, S. E., & Ligon, G. S. — Handbook of Organizational Creativity, 2012

Although successfully planning for innovation is a complex, challenging, and resource intensive activity, we contend that the process of plan development is a necessary for developing and sustaining a competitive advantage through innovation. Integrating planning process models and key innovation activities, a model for innovation planning is presented. The proposed framework emphasizes the development of at least four sub-plans necessary for innovation. Key planning processes are considered for each sub-plan and general planning requirements are discussed. Potential new directions for future research are considered and broader conclusions for innovation management are explored.

Associated Categories: Innovation Implementation, Knowledge Management, Leadership, Culture, and Change

96. Leadership, Innovation, and Technology: The Evolution of the Creative Process

Hunter, S. T., Cushenbery, L., Ginther, N., & Fairchild, J.

Leadership, innovation, and technology: The evolution of the creative process. In S. Hemlin, C.M. Allwood, & M. Mumford (Eds.), Creativity and Leadership in Science, Technology and Innovation. New York: Routledge. 2011

In this chapter we explore how current and emerging forms of technology are impacting the creative process and how leaders might play a role in shaping technology use and application. Using Mumford and colleagues eight-stage creative process model as a framework, the results of this chapter reveal five primary themes. First, in the relatively short term it seems that technology's primary role is in speeding up activities comprising the creative process. Second, although most forms of technology supplement current innovation activities there are signs that some unique forms of technology may be fundamentally altering some creative processes. Third, several emergent technologies such as crowdsourcing are beginning to integrate the general public into the design process which has a number of implications for how organizations pursue a strategy for innovation in the future. Fourth, as processes speed up and lines between consumer and designer are blurred we must ask ourselves if current creativity and innovation models will be as applicable to tomorrows design community as they are today. Finally, we conclude with a discussion on the role of leadership in shaping technology adoption and suggest that leaders serve as significant drivers of appropriate technology use in creative endeavors.

Associated Categories: Leadership, Culture, and Change, Successes, Technology Development, Technology Transfer

97. Paradoxes of Leading Innovative Endeavors: Summary, Solutions, and Future Directions

Hunter, S. T., Thoroughgood, C. N., Myer, A., & Ligon, G. S.

Psychology of Aesthetics, Creativity, and the Arts, Vol 5(1), Feb 2011, pp. 54-56

Leading innovative pursuits requires a unique set of leadership behaviors - behaviors that are frequently at odds with traditional forms of management and organizational functioning. We have identified 14 of these tensions, or paradoxes, associated with leading innovative endeavors categorizing them into four clusters: internal/localized, team-level, organization-level, and situational. In addition, we consider some industry-derived solutions to these paradoxes, revealing how some highly innovative organizations have been able to successfully manage these tensions. Supplementing these solutions, we offer suggestions on how organizations might approach those remaining paradoxes, concluding with a discussion on necessary future research endeavors. Finally, we argue that the pursuit of innovation requires a unique leadership approach - one that may not be currently captured by traditional views of leadership.

Associated Categories: Innovation Implementation, Leadership, Culture, and Change

98. Entrepreneurship education: A mechanism for engaging and exchanging with the small business sector.

Hynes, Briga; Richardson, Ita

Education & Training, Vol 49(8-9), 2007, 732-744.

Purpose: The focus of this paper is to highlight the synergies and mutual benefits associated with a range of entrepreneurship education initiatives for a combination of internal and external stakeholders.
Design/methodology/approach: The paper provides a description of four entrepreneurship education initiatives in

operation at the University of Limerick, Ireland. Detail on the objectives of the initiatives, the content, delivery, assessment and benefits of these initiatives is provided. Findings: Entrepreneurship and enterprising activity are widely regarded as instrumental for economic growth, for balanced regional development and for the creation of jobs. Educational institutions need to ensure that graduates are capable of acting in an enterprising manner in the workplace either as an entrepreneur or as an intrapreneur in paid employment. This double objective can materialise through the provision of entrepreneurship education, within either a business or a technical course. Additionally, these same programmes can also be an effective mechanism for the provision of targeted training programmes for skills enhancement in the owner/manager and the creation and facilitation of linkages and working relationships with the small business community. Involvement in technology transfer and industry-based research activities also provides benefits to the small firm. Practical implications: The paper presents challenges for educators and educational institutions on how they perceive and address the needs of their stakeholders by extending the traditional paradigm of what constitutes the role of an educational institution. The need to engage with external stakeholders in programme design and delivery requires commitment by educational institutions and requires educators to change their knowledge and teaching perspective. The findings have implications on how entrepreneurship education initiatives are designed, delivered and assessed to meet the needs of different stakeholders. Originality/value: This paper and its conclusions add to the debate on the importance of linking educational institutions and industry, especially the small firm sector, by suggesting a number of methods of collaboration which mutually benefit a number of stakeholders. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Entrepreneurship Education, Innovation Implementation, Technology Transfer, University to Industry

99. Transportation in the New Millennium: Technology Transfer TRB Committee on Technology Transfer

Irwin, L. H.

2000, http://onlinepubs.trb.org/onlinepubs/millennium/00114.pdf

The article is a statement of current practice prepared by the TRB Committee on Technology Transfer for inclusion in the TRB's compendium of millennium reports. The article discusses then current definitions of technology transfer, provides information on how technology transfer is practiced, lessons learned, barriers and opportunities, and future challenges.

Associated Categories: Barriers, Knowledge Sharing, Successes, Technology Transfer, Transportation - Federal, Transportation - State

100. Improving practice–research connections through technology transfer networks.

Isett, Kimberley R.; Phillips, Susan D.

The Journal of Behavioral Health Services & Research, Vol 37(1), Jan 2010, 111-123.

This paper presents a first look at network and survey data collected to ascertain the salience and value-added of technology transfer networks in reducing the science-to-service gap in behavioral healthcare services. The National Child Traumatic Stress Network served as the case setting upon which administrative and survey data were analyzed. Results show a rich set of formal relationships within the National Child Traumatic Stress Network and suggest participants found these relationships and this medium useful in altering their day-to-day practices and increasing their professional knowledge. The implications of these findings are that technology transfer networks are useful mechanisms worthy of investment of scarce resources. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Networks and Teams, Successes, Technology Transfer

101. Sociopolitical aspects of interoperability and enterprise architecture in e-government.

Janssen, Marijn

Social Science Computer Review, Vol 30(1), Feb 2012, 24-36.

Enterprise architecture (EA) has been embraced by governments as an instrument to advance their e-government efforts, create coherence, and improve interoperability. EA is often viewed as a codified understanding covering elements ranging from organization till infrastructure. It is aimed at closing the gap between high-level policies of organizations and low-level implementations of information systems. Important elements of EA are a framework, tools, principles, patterns, basic facilities, and shared services. EA is influenced by the social interdependencies and interactions among stakeholders in which it is embedded. The survey among public organizations shows that current EAs are primarily product oriented, whereas sociopolitical aspects are often neglected. Architecture implementation also involves learning effects and requires effective communication among participants. The author argue that the architecture concept should be reconceptualized and can only be effective if they incorporate relational capabilities, clear responsibilities, and sound governance mechanisms. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Knowledge Management, Leadership, Culture, and Change, Other Public Sector, Technology Transfer

102. Assessment of Technology Transfer and Diffusion Models in Latvia

Jarohnovich, N. and V. Avotiņš

Journal of Business Management, 2009, Issue 2, pp. 31-41

The paper approaches local technology transfer policy, analyses available in market technology transfer models, describes efficiency of modes and identifies critical factors for efficient technology transfer system in Latvia. Special attention is paid to intangible technology transfer. Traditional approach assesses technology transfer as a knowledge transfer between research laboratories and industry and is influenced by four main components: (a) level of collectivisation or / and globalisation; (b) availability of new facts (knowledge); (c) personnel skills and abilities to adapt, use, improve and innovate and (d) availability of advanced machines and equipment. The wider definition assumes that —technology transfer is an active interaction between two or more social entities, during which the sum of technological knowledge remains stable or increases through the transfer of one or more components of technology. By definition, "Technology transfer addresses the assessment, adoption and implementation of technology." Innovation diffusion theory provides a conceptual background that has frequently been used in the study of technology transfer. Rogers' innovation model (1986) defined diffusion as "the process by which an innovation is communicated through certain channels over time, among the members of a social system" (Fagan). Technological diffusion reflects increasing role of communication over social systems (communities) where in human-centred business ecosystem we may distinguish consolidation of collective intelligence as a result of integration of technological innovation and social learning in product life cycle. Technology can be transferred through a range of channels and applying range of forms of interactions between the sources of technology and their environment locally and globally. For Latvia, a much broader focus is needed, with a stress on technology creation, including both R&D and design and engineering skills, technology acquisition, and technology use. Government should come out with a clear policy statement regarding the ownership of intellectual property motivating PROs and researchers. For development of Latvian national system of technology transfer is needed key strategy, valid for a broad range of different technologies. Main goals of such strategy is to find solutions for (1) improvement of the efficiency of existing technology transfer mechanisms (2) motivation and adoptability in enterprises towards innovation, (3) increasing industry awareness for technological needs and accessibility of research institutions and their products. The last target is (4) to enhance the quality of

technology transfer. Recognizing the profession of technology transfer brokers and managers and introducing technology transfer-training schemes and study program could solve this problem.

Associated Categories: Barriers, Commercialization, Knowledge Management, Knowledge Sharing, Resource Limitations, Networks and Teams, Other Public Sector, Private Industry, Successes, Technology Transfer, Trust and Communication, University, Unlearning Old Habits

103. A review of the predictors, linkages, and biases in IT innovation adoption research

Jeyaraj, A., Rottman, J. W., & Lacity, M. C. Journal of Information Technology, 2006, 21(1), 1–23

We present a review and analysis of the rich body of research on the adoption and diffusion of IT-based innovations by individuals and organizations. Our review analyzes 48 empirical studies on individual and 51 studies on organizational IT adoption published between 1992 and 2003. In total, the sample contains 135 independent variables, eight dependent variables, and 505 relationships between independent and dependent variables. Furthermore, our sample includes both quantitative and qualitative studies. We were able to include qualitative studies because of a unique coding scheme, which can easily be replicated in other reviews. We use this sample to assess predictors, linkages, and biases in individual and organizational IT adoption research. The best predictors of individual IT adoption include Perceived Usefulness, Top Management Support, Computer Experience, Behavioral Intention, and User Support. The best predictors of IT adoption by organizations were Top Management Support, External Pressure, Professionalism of the IS Unit, and External Information Sources. At the level of independent variables, Top Management Support stands as the main linkage between individual and organizational IT adoption. But at an aggregate level, two collections of independent variables were good predictors of both individual and organizational IT adoption. These were innovation characteristics and organizational characteristics. Thus, we can consistently say that generic characteristics of the innovation and characteristics of the organization are strong predictors of IT adoption by both individuals and organizations.

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Successes, Technology Transfer

104. NPDES Stormwater Phase II Technology Transfer

Johnson, P., R. Pitt, S. Jones, and C. Bochis University Transportation Center for Alabama, April 12, 2006, http://utca.eng.ua.edu/research/projects/?id=04112

This project developed a National Pollution Discharge Elimination System (NPDES) Phase II Stormwater Compliance and Best Management Practices manual and four short courses tailoring the transportation industry needs in the area of Phase II training, outreach and permit requirements. The audience included environmental engineers, civil engineers and designers, project scientists and project engineers, state regulators, biologists, architects, and related transportation stakeholders such as developers whose activities directly impact Department of Transportation (DOT) Phase II permit. The database of the potential participants for the course was provided by the technology transfer foundations University Transportation Center for Alabama (UTCA) Project 03217, UTCA Technology Transfer Program. The course was advertised through the "Signal" newsletter and other sources.

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Marketing/Market Potential, Networks and Teams, Successes, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State

105. Transportation Toolkit for Federal Land Managers: Phase II. Executive Summary

Kack, D.

Montana State University, January 2010, http://www.westerntransportationinstitute.org/documents/reports/4W1307_Exec_Summary.pdf

Beginning in 2003, the Federal Highway Administration's Central Federal Lands Highway Division sponsored the first phase of this project. The objective was to develop an interactive decision support system software "toolkit, " which would help Federal land managers to analyze and resolve transportation challenges in their respective units. The Toolkit was created to be a "clearinghouse" of information providing a decision support system, challenges-solution matrix, and fact sheets, along with up-to-date contact information. The toolkit was originally conceived as an interactive CD-ROM. Over the course of the project, it evolved into a web-based toolkit. The original version of the toolkit was completed in 2006, and launched on the Central Federal Lands Highway Division website in January 2007. At the end of 2006, the Central Federal Lands Highway Division agreed to partner with the Western Transportation Institute, Montana State University, for a second phase of this project. The overall goal was to identify and implement potential upgrades and expansions to the Toolkit. This executive summary discusses project activities to accomplish this goal and the current status of the Toolkit.

Associated Categories: Knowledge Management, Knowledge Sharing, Technology Transfer, Transportation - Federal

106. A user community-based approach to leveraging technological competences: An exploratory case study of a technology start-up from MIT.

Keinz, Peter; Prügl, Reinhard

Creativity and Innovation Management, Vol 19(3), Sep 2010, 269-289.

Many studies highlight the impact of technology commercialization on innovation and wealth creation. However, this impact could be far greater, especially as many technologies developed with high costs and effort remain vastly underutilized. One important reason for this problem can be found at the front end of the technological competence leveraging process: searching for market opportunities for a technology is a formidable challenge. In many cases, alternative fields of application (or even a single viable market opportunity) for a given technology are simply unknown to the entity in charge of commercialization. Based on an extensive literature review, we identify two major shortcomings at the front end of the technological competence leveraging process which contribute to the underutilization problem: (1) the local search behaviour of the commercializing entity and (2) the use of solution-based instead of problem-based search specifications. On the basis of these insights, we discuss the potential role of user communities in the search for (additional) market opportunities for a given technology, a process usually referred to as technological competence leveraging. We then empirically explore a user community-based approach in an illustrative case study with a start-up from MIT. Our findings show that when users were included in the search process, the number of potential markets in which the technology could be applied was five times higher, and more far-distant application areas as well as application areas previously unknown to the technology holder were reached. In addition, we discover design principles for a user community-based search process, providing practitioners with a hands-on guideline for employing a user community-based approach to technological competence leveraging. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Marketing/Market Potential, University to Industry

107. Corporate Culture, Environmental Adaptation, and Innovation Adoption: A Qualitative/Quantitative Approach

Kitchell, S.

Journal of the Academy of Marketing Science, Summer 1995, Vol. 23, No. 3, pp. 195-205

Deshpandd and Webster have identified the linkage between corporate culture and innovation adoption as an important industrial marketing topic. In the present study, this relationship is examined by both qualitative and quantitative research methods. The linear regression model, which depicts the corporate culture of adaptive companies attempting to survive in a competitive international environment, demonstrates that corporate culture is predictive of technology adoption. Qualitative data collected through in-depth interviews supplement quantitative results. The divergent cultures and survival modes for innovative and noninnovative companies are presented. Theoretical and methodological implications for marketing research are discussed, and management implications for industrial marketers are presented. Benefits of juxtaposing qualitative~quantitative methods are illustrated.

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Marketing/Market Potential, Private Industry, Successes, Technology Transfer

108. The Challenge of Innovation Implementation.

Klein, Katherine J.; Sorra, Joann Speer

The Academy of Management Review, Vol 21(4), Oct 1996, 1055-1080

Presents an integrative model of the determinants of the effectiveness of organizational implementation. Implementation is the process of gaining targeted organizational members' appropriate and committed use of an innovation. This model suggests that implementation effectiveness (i.e., the consistency and quality of targeted organizational members' use of an innovation) is a function of (1) the strength of an organization's climate for the implementation of that innovation and (2) the fit of that innovation to targeted users' values. The model specifies a range of implementation outcomes (including resistance, avoidance, compliance, and commitment); highlights the equifinality of an organization's climate for implementation; describes within- and between-organizational differences in innovation-values fit; and suggests new topics and strategies for implementation research. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Leadership, Culture, and Change

109. Reframing the Dissemination Challenge: A Marketing and Distribution Perspective

Kreuter, M.W., and J. M. Bernhardt

American Journal of Public Health, Vol. 99, No. 12, December 2009, pp. 2124-2127

A fundamental obstacle to successful dissemination and implementation of evidence-based public health programs is the near-total absence of systems and infrastructure for marketing and distribution. We describe the functions of a marketing and distribution system: customer research and segmentation, packaging, promotion, transfer, distribution, inventory management, sales, communication, training, technical assistance, customer service, product service, coordination, and evaluation and data analysis. Then we critically evaluate the 4 dominant strategies now used to promote dissemination and implementation, (1) increasing scientists' dissemination efforts, (2) assembling inventories of effective programs, (3) building partnerships for dissemination, and (4) increasing demand for evidence-based approaches among practitioners. All of these strategies make important contributions, but even if they were highly coordinated—and they are not—there would remain significant gaps to fill. An examination of these strategies from a marketing and distribution perspective underscores the need for dissemination systems and we explain how each would be enhanced by marketing and distribution systems. Finally, we make 6 recommendations for building the needed system

infrastructure and discuss the responsibility within the public health community for implementation of these recommendations. (1) promote programs strategically, (2) build distribution capacity, (3) develop a proactive, systematic process for identifying and obtaining proven programs that meet a priori standards of evidence-based effectiveness, (4) transform research-tested interventions into programs and products that are easy to adapt and use, (5) build a comprehensive system of user support, and (6) establish evaluation measures and processes. Without serious investment in such infrastructure, application of proven solutions in public health practice will continue to occur slowly and rarely.

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Marketing/Market Potential, Other Public Sector, Private Industry, Technology Transfer

110. Willingness-to-engage in technology transfer in industry–university collaborations.

Lai, Wen-Hsiang

Journal of Business Research, Vol 64(11), Nov 2011, 1218-1223.

Formal collaboration between universities and industries is a recent phenomenon. Currently the role of an industry–university collaboration (IUC) is to close the gap between industry and academia. This study aims to analyze the willingness to engage in technology transfer (TT) in IUCs from the three vantage points of the technology transferor (university), the technology transferee (industry), and the TT intermediary institute. This study mainly observes the pairwise relationships between influencing variables and sub-variables and willingness to participate in TT in an IUC. From the vantage point of universities, this study shows that the “transferor's incentive” and “capability of transferor” variables positively influence willingness to participate in TT in an IUC. From the vantage point of industry, the results indicate that “capability of transferee” and “incentive for establishing technological resources” have major influences on willingness to participate in TT in an IUC. From the vantage point of TT intermediary institutes, the results show that “intermediary's fundamental resources” and “intermediary's transferring process” have a positive impact on willingness to participate in TT in an IUC.

Associated Categories: Commercialization, Knowledge Management, Knowledge Sharing, Networks and Teams, Successes, Technology Transfer, University to Industry

111. The mediating role of new product development in the link between market orientation and organizational performance.

Langerak, Fred; Hultink, Erik Jan; Robben, Henry S. J.

Journal of Strategic Marketing, Vol 15(4), Sep 2007, 281-305.

The proficiency in new product development activities may be the key to the conversion of a market-oriented culture into superior organizational performance through better new product performance. To examine this conjecture our study tests hypotheses on the mediating effects of the proficiency in new product development activities and new product performance on the relationship between market orientation and organizational performance. The results from a sample of 126 manufacturing firms present evidence for the mediating roles of the proficiency in commercialization activities and new product performance. These mediating roles are consistent for three moderator variables: technological turbulence, market turbulence and innovation strategy. Together our findings provide a better understanding of how a market-oriented culture leads to superior organizational performance.

Associated Categories: Commercialization, Innovation Implementation, Leadership, Culture, and Change, Marketing/Market Potential, Outcomes Management, Private Industry

112. Closing the technology adoption–use divide: The role of contiguous user bandwagon.

Lanzolla, Gianvito; Suarez, Fernando F.

Journal of Management, Vol 38(3), May 2012, 836-859.

A firm may readily subscribe to a new technology but then fail to use it. This article advances existing technology diffusion theory by bringing in a new construct that can explain the likelihood of technology use after adoption. The authors define contiguous user bandwagon and show how this information diffusion mechanism can help in explaining the time to technology use. They test their hypotheses using data on the adoption and use of e-procurement technology (N = 3, 158) in the early phase of its diffusion. The authors find support for the hypothesis that contiguous user bandwagon is a strong antecedent of time to technology use. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Networks and Teams, Successes, Technology Transfer

113. Berkeley Lab Gets Its Own Entrepreneur in Residence

Lawrence Berkeley National Laboratory

http://newscenter.lbl.gov/feature-stories/2010/07/26/berkeley-lab-gets-its-own-entrepreneur-in-residence/

The Department of Energy's Office of Energy Efficiency and Renewable Energy started the Entrepreneur in Residence program in 2008 to accelerate the deployment and commercialization of advanced clean energy technologies from the national laboratories. In the first year, three venture capital firms were paired with three national labs. The following year, five more firms were each paired with a national lab, including Berkeley Lab. The EIR at Berkeley, Matheson, has found a high level of entrepreneurial enthusiasm at Berkeley Lab. He and his colleagues have met with close to 100 scientists so far, and now are focusing on how to move forward with a small number of them. He has also held office hours and a couple informal lunch sessions, which is hoped to be the start of a more formal education program. The Berkeley lab management: "We'd like to do something to educate our scientific staff on the entrepreneurial world that is a little more structured, more data rich—what's expected, key elements of success..to make it that much easier to move their technologies out to the private sector if and when they decide to do so."

Associated Categories: Entrepreneurship Education, Innovation Implementation, Other Public Sector, Private Industry, Successes, Technology Transfer, University, University to Industry

114. Barriers and Enablers of Innovation: A Pilot Survey of Transportation Professionals

Lawrence H. Orcutt, Mohamed Y. AlKadri, Ph.D., PE

A TRB manuscript submitted for peer review and for the 2009 Compendium of Papers

In this research, a small sample of 109 transportation professionals was surveyed to document their experiences with a set of common barriers and enablers of innovation. About 76%, of the participants were transportation practitioners and researchers from California. The remaining 24% were DoT research executives from other states. Of the California participants, 84% were employees at the California Department of Transportation (Caltrans). The sample was fairly evenly distributed among professional ranks with 39% rank and file, 15% supervisors, 23% middle managers, and 23% executives. The survey asked the participants whether they considered revolutionary (disruptive) or evolutionary (sustaining) innovation is more critical; how to rate common roadblocks and enablers to innovation; which of the areas of safety, performance, cost-effectiveness, quality, and environment innovation is most important; and finally what steps they suggest to improve the process of innovation. Research findings are described and documented in this paper. Findings indicate that respondents are highly in favor of innovation. About 63% respondents considered themselves champions of innovation. An

impressive 99% of respondents rated innovation as “important” or “very important.” Preference for revolutionary vs. evolutionary innovations varied with 73% of academic respondents stating focus should be on revolutionary innovation and only 27% of nonacademic respondents indicating so. The worst-rated innovation roadblock was “resistance to change.” The highest-rated enabler of innovation was “product matched user need.” Respondents provided specific suggestions to improve innovation by establishing clear direction and procedures, securing executive sponsorship, empowering people to innovate, and finding champions for innovation at all levels.

Associated Categories: Barriers, Leadership, Culture, and Change, Resource Limitations, Other Public Sector, Successes, Transportation - State, Trust and Communication

115. Overcoming Roadblocks Facing the Implementation of Innovations: Three Case Studies at Caltrans

Lawrence H. Orcutt, Mohamed Y. AlKadri, Ph.D., PE

Transportation Research Record, No 2109, Research and Education 2009, page 65

This paper examines Caltrans experience in three recent showcase innovations developed at Caltrans Division of Research and Innovation. Although these innovations promised significant return on investment, deployment faced significant challenges, which motivated the undertaking of this research. For each case, professionals were interviewed to analyze roadblocks encountered. Lessons learned and mitigation measures that were successful in each case are presented. The first case is Sensys™, a compact, low cost wireless traffic sensing system that can replace less reliable, more expensive inductive loops. The second is CA4PRS, a software that simulates highway construction, predicting traffic delays associated with simulation scenarios, to optimize construction quality, costs and traffic impacts. The third, Balsi Beam, is a mobile frame designed to protect highway workers. Findings show that deployment faced roadblocks because: 1) transportation projects are complex, multifaceted, inter-jurisdictional with many players having different interests; 2) multiple layers of decision making sometimes lacking logic; 3) public sector procurement driven by competitive multiple low-bid processes often infringes on intellectual property rights; 4) public agencies resist change, and 5) risk aversive executives hesitate to implement new innovations. To mitigate roadblocks, this paper advocates allowing a systems engineering process that ensures the inclusion of customers throughout all phases and ensures that the final product meets their needs and satisfies their requirements. Findings underline the need to interconnect researchers, developers, operators, and decision makers by improving communications at all levels and stages. Findings emphasize utilizing innovation champions. Findings showed the need for timely establishment of criteria for evaluating new innovations.

Associated Categories: Barriers, Leadership, Culture, and Change, Resource Limitations, Other Public Sector, Private Industry, Successes, Technology Transfer, Transportation - State, Trust and Communication

116. Applying knowledge management to project marketing in a demanding technology transfer project: Convincing the industrial customer over the knowledge gap.

Lehtimäki, Tuula; Simula, Henri; Salo, Jari

Industrial Marketing Management, Vol 38(2), Feb 2009, 228-236.

Literature in project and knowledge management has examined knowledge management in projects, but the utilization of knowledge management in project marketing is still largely unexplored. This study examines the links between knowledge management and project marketing activities in a project where the seller wants to convince the potential buyer about a demanding investment project. An in-depth case study illustrates this in a situation hampered by a technical knowledge gap between the parties. The buyer is committed when they can trust the seller's capability to successfully accomplish the project. The seller must criticize and communicate its core and project specific knowledge of technologies and customer needs through project marketing. A framework and

implications on knowledge management and project marketing activities in different project phases is presented. It is proposed that knowledge management is a pertinent tool for project marketing as it helps to understand the roles of different knowledge types. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Marketing/Market Potential, Private Industry

117. Not-sold-here: How attitudes influence external knowledge exploitation.

Lichtenthaler, Ulrich; Ernst, Holger; Hoegl, Martin

Organization Science, Vol 21(5), Sep-Oct 2010, 1054-1071.

Employee attitudes with regard to the usefulness of external knowledge may influence a firm's extent of interorganizational knowledge transactions. Prior research has focused on "not-invented-here (NIH)" tendencies, which refer to negative attitudes in organizations toward the acquisition of knowledge from external sources. In this research, we develop the concept of "not-sold-here (NSH)" tendencies, which result from protective attitudes in firms toward the external exploitation of knowledge, for example, technology licensing. We show conceptually how NSH tendencies develop and how they can influence the extent of outward knowledge transfer. We test five hypotheses regarding antecedents and consequences of NSH tendencies with data from 152 firms spanning multiple industries. The empirical findings show that NSH tendencies exist in organizations and that they constitute a major barrier to the implementation of external knowledge commercialization strategies. The concept of NSH therefore helps explain the varying degrees of activity in external knowledge exploitation, and it contributes to understanding particular microfoundations of dynamic capabilities. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Knowledge Sharing, Private Industry, Technology Transfer, Trust and Communication, Unlearning Old Habits

118. Technology Transfer Concrete Consortium

Lim, D. (contact)

Research in Progress, Pooled Fund Study, Iowa State University

Increasingly, state departments of transportation (DOTs) are challenged to design and build longer life concrete pavements that result in a higher level of user satisfaction for the public. One of the strategies for achieving longer life pavements is to use innovative materials and construction optimization technologies and practices. In order to foster new technologies and practices, experts from state DOTs, Federal Highway Administration (FHWA), academia and industry must collaborate to identify and examine new concrete pavement research initiatives. The purpose of this pooled fund project is to identify, support, facilitate and fund concrete research and technology transfer initiatives. The Iowa DOT will serve as the lead state for the execution of the pooled fund project described in this proposal. The Iowa DOT, through the National Concrete Pavement Technology Center (CP Tech Center) at Iowa State University, will handle all administrative duties associated with the project. The CP Tech Center will also serve as the lead research institution for the project.

Associated Categories: Commercialization, Entrepreneurship Education, Knowledge Management, Knowledge Sharing, Private Industry, Successes, Technology Development, Technology Transfer, Transportation - Other

119. Antecedents of the stage-based knowledge management evolution.

Lin, Hsiu-Fen

Journal of Knowledge Management, Vol 15(1), 2011, 136-155.

Purpose: To enhance one's understanding of the evolution of knowledge management, this study seeks to develop a research model to examine the impact of individual (knowledge self-efficacy, openness in communication, reciprocal benefits), organizational (top management support, organizational rewards, and sharing culture), and information technology contexts (knowledge management system infrastructure and knowledge management system quality) on the knowledge management evolution along three stages (knowledge management initiation, implementation, and institutionalization). Design/methodology/approach: Survey data from 241 managers (in charge of knowledge management practices in their companies) in large Taiwanese firms were collected and used to test the research model using the structural equation modeling (SEM) approach. Findings: The results reveal that the attributes for individual-organizational-technological contexts have different impacts on three stages of knowledge management evolution. In particular, knowledge self-efficacy, top management support, and knowledge management system quality have positive effects on all three knowledge management evolution stages. Research limitations/implications: Future research should include structured interviews and case studies of managers dealing with ongoing or recently completed knowledge management planning projects to help understand the practical usefulness of the research model. Practical implications: Creating an organizational climate characterized by top management support and knowledge-sharing culture is likely to assist both management and employees in socializing and interacting with one another, thus driving knowledge management effectiveness. Managers should strive to enable employees to propose ideas for new opportunities and foster a positive social interaction culture for implementing knowledge management initiatives. Originality/value: Theoretically, this study aims to provide a research model that is capable of understanding the antecedents of the stage-based knowledge management evolution. From a managerial perspective, the findings of this study provide valuable guidelines to policy-makers and practitioners in implementing knowledge management and accelerating knowledge management evolution. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Private Industry, Successes

120. Incorporating Technology Transfer into ITS Professional Capacity Building

Lister, M., and S. Sloan

17th ITS World Congress, Busan, 2010: Proceedings

The Intelligent Transportation Systems (ITS) Joint Program Office (JPO) is moving to incorporate elements of the technology transfer process into the mission of the ITS Professional Capacity Building (PCB) Program with the intention of accelerating the transformation of ITS research and prototypes into market available technologies that are readily adopted by agencies. Through the years, adoption of ITS technologies has steadily increased and the market for technologies has grown. The ITS Deployment Statistics Database tracks the growth in systems in 108 of the largest metropolitan areas in the Nation; the report, Intelligent Transportation Systems: A Summary of Progress and Results, describes the impact of these installed and operational systems. As evidenced by both of these sources, adoption of ITS technologies still faces challenges at the decision making level and with the workforce. ITS is not yet mainstreamed as part of the project planning processes; however, once incorporated, the ITS deployment process (following a systems engineering regimen) is fraught with institutional complexities. The process of transitioning technologies and knowledge (including specifications, test procedures, and lessons learned from pilot deployments) from the research process and into commercialization and use has faced its own challenges. Additionally, well-established organizations are typically successful based on their ability to produce results and thus tend toward proven products and techniques as opposed to adopting innovation.

Associated Categories: Barriers, Entrepreneurship Education, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Resource Limitations, Successes,

Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State

121. Knowledge sharing in dynamic virtual enterprises: A socio-technological perspective.

Liu, Pingfeng; Raahemi, Bijan; Benyoucef, Morad

Knowledge-Based Systems, Vol 24(3), Apr 2011, 427-443.

The success of a virtual enterprise depends largely on the effective collaboration of its members in orchestrating their knowledge, skills, core competences and resources, in order to enhance competitive capabilities and respond better to business opportunities. In this paper we address the challenges of knowledge sharing in dynamic virtual enterprises. We take a socio-technological approach by proposing a human-centered knowledge sharing solution and architecture. Specifically, we propose a knowledge resource space model to represent heterogeneous knowledge resources, both explicit and implicit. We then introduce a knowledge sharing community model and adopt an agent based solution to perform the functions of knowledge sharing among members of a dynamic virtual enterprise. Our solution incorporates the concepts of agent society and semantic ontology. Knowledge sharing in dynamic virtual enterprises is performed with three types of ties: knowledge agent to knowledge agent, knowledge agent to knowledge item, and knowledge item to knowledge item. We measure agent-to-agent ties by preference correlation using the contribution degree of one agent to another and the preference similarity degree between two agents. We define a semantic view to show agent-to-item ties and use semantic links in the knowledge resource space model to reflect item-to-item ties. We also elaborate the co-evolution mechanism of collective intelligence across enterprises throughout the lifecycle of a dynamic virtual enterprise. A case study is presented to validate our approach. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing

122. Examining the antecedents of knowledge sharing in facilitating team innovativeness from a multilevel perspective.

Liu, Yuwen; Phillips, James S.

International Journal of Information Management, Vol 31(1), Feb 2011, 44-52.

This paper examines how transformational leadership (TFL) climate influences employees' team identity and their intentions to share knowledge and how team knowledge sharing intention subsequently influences team innovativeness. Data was collected from 301 employees comprising 52 R&D teams. Hypotheses were tested with both hierarchical linear modeling (HLM) and regression analyses. Results indicated that TFL climate was related to employees' intention to share knowledge through team identity. At the group level, results supported the relationships between team knowledge sharing intention and team innovativeness. The results also indicated that team knowledge sharing intention mediated the relationship between TFL climate and team innovativeness. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Leadership, Culture, and Change, Networks and Teams, Private Industry

123. Designing a strategy formulation process for new, technology-based firms: A knowledge-based approach.

Livieratos, Antonios

Electronic Journal of Knowledge Management, Vol 7(2), Jun 2009, 245-254.

In the knowledge-based economy the nature of what is strategic has been modified along with the importance of knowledge and its management. One of the most important implications of these changes is the expansion of

resources and products that are globally tradable, highlighting the importance of knowledge as the key economic resource of lasting competitive advantage. As a consequence of this shift in the economy, an increasing number of industries are moving from the closed innovation model to the open innovation model that created porous boundaries between the innovative company and its surrounding environment, changing the inter- and intra-organizational modes of coordination. In an environment where knowledge is the key economic resource and the open innovation model is applied in more and more industries, we are experiencing the increasing importance of the New Technology-Based Firm (NTBF). NTBFs face a number of difficulties mainly associated with a lack of resources and entrepreneurial skills and in order overcome the difficulties NTBFs strive towards flexibility while accelerating the development and commercialization processes by creating and/or entering business networks. By adopting a knowledge-based view for NTBFs and consequently placing knowledge in the centre of a systemic innovation model, knowledge networks constitute an asset for NTBFs. As this new form of cooperation takes multiple and often unpredictable forms it is thus essential to develop strategy formulation tools and processes that can help NTBFs to face their challenges. Until now little attention has been given to the development of strategy tools and processes tailored for the requirements of NTBFs. The present paper presents a concept to cope with NTBFs' by developing a generic process for strategy formulation. In this respect, an action research project was initiated. The proposed concept was initially designed, although not exclusively, for a Greek NTBF, Astrofos Ltd. The author, who is coordinator of the incubator where Astrofos is sited, is acting as a strategy consultant for the firm and has taken part in all its major decisions since summer 2007. In order to build the strategy formulation process, this paper proposes a mapping technique that attempts to depict a NTBF's tangible and intangible transactions as well as the strength of ties between the focal NTBF and its partners and the complexity of the knowledge. In developing the mapping technique, we have used a combination of the concept of weak ties, derived from social network analysis, with the notion of complex knowledge, as this combination was initially proposed by Hansen (1999). Additionally, a set of questions is proposed that have to be answered in order to pass from knowledge identification to knowledge transfer, from a strategic point of view. In this regard, the presented methodology constitutes an effort, on the one hand, to study the emergent patterns in what is considered to be a chaotic or disordered system and, on the other, to stimulate the creation of new patterns in the system that would be consistent with the NTBF's strategy. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Knowledge Management, Knowledge Sharing, Networks and Teams, Private Industry

124. Mobile Geophysical Technology: A Subsurface Scoping Tool for Reducing Unforeseen Roadblocks in Project Delivery

Lopez, J.

NCHRP IDEA 20-30/IDEA 107; http://www.trb.org/studies/idea/finalreports/highway/NCHRP107_Final_Report.pdf.

Argus Technologies has developed the EM3 to perform mobile, noninvasive underground surveys. Depending on the terrain, nearly 50 lane-miles can be surveyed per day. Argus' EM3 technology is an adaptation of conventional hand-held electromagnetic (EM) instrumentation. The IDEA project is a specialized application tailored to non-invasive preliminary surveys for highway construction. The EM3 provides fundamental information regarding the consistency or variability of subsurface materials, the presence or absence of buried objects, and lateral trends in soils and rock. This information is important because unknown subsurface factors such as relict or current transportation infrastructure, underground storage tanks or utilities, and unpredicted changes in soils or geologic strata complicate excavation work and trigger highway construction delays

Associated Categories: Commercialization, Knowledge Management, Knowledge Sharing, Private Industry, Successes, Technology Development, Technology Transfer, Transportation - Other, Transportation - State

125. National LTAP/TTAP Resources

LTAP/TTAP various http://www.ltap.org/resources/

LTAP/TTAP has a wide variety of resources from training manuals to professional development programs. These resources come from LTAP/TTAP staff, FHWA and other organizations in the transportation industry. The LTAP/TTAP database alone contains over 2, 000 items on a variety of topics, including: •training materials and videos; •tips from the field; •best practices; •downloadable files; and •web-based resources.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Networks and Teams, Successes, Technology Transfer, Transportation - Other, Transportation - State, Trust and Communication, Unlearning Old Habits

126. Dynamics between the trust transfer process and intention to use mobile payment services: A cross-environment perspective.

Lu, Yaobin; Yang, Shuiqing; Chau, Patrick Y. K.; Cao, Yuzhi Information & Management, Vol 48(8), Dec 2011, 393-403.

Many Internet-based services have already been ported to the mobile-based environment, embracing the new services is therefore critical to deriving revenue for services providers. Based on a valence framework and trust transfer theory, we developed a trust-based customer decision-making model of the non-independent, third-party mobile payment services context. We empirically investigated whether a customer's established trust in Internet payment services is likely to influence his or her initial trust in mobile payment services. We also examined how these trust beliefs might interact with both positive and negative valence factors and affect a customer's adoption of mobile payment services. Our SEM analysis indicated that trust indeed had a substantial impact on the cross-environment relationship and, further, that trust in combination with the positive and negative valence determinants directly and indirectly influenced behavioral intention. In addition, the magnitudes of these effects on workers and students were significantly different from each other. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Private Industry, Technology Transfer, Trust and Communication

127. Knowledge sharing and trust in collaborative requirements analysis.

Luna-Reyes, Luis F.; Black, Laura J.; Cresswell, Anthony M.; Pardo, Theresa A. System Dynamics Review, Vol 24(3), 2008, 265-297.

Many information technology projects fail due to problems in requirements definition. Possible leverage points in improving requirements analysis lie in collaborative processes crossing functional and organizational boundaries, in which stakeholders learn about the problem and together identify possible solution requirements. Establishing trust among parties is critical to collaborative work, particularly in the early stages of information systems projects. However, there are few guidelines on how to establish trust among project participants. This paper draws on empirical work from the Center for Technology in Government facilitating interagency groups and system dynamics to generate a simple model of the role of knowledge sharing in building trust during the requirements analysis phase of a complex information systems project. Analysis of the model suggests that trust can depend on the pace of knowledge sharing among participants. More broadly, this examination offers a closer look at some of the "soft" variable dynamics that play critical roles in project progress. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Trust and Communication

128. Overview of Africa and Sustainable Practice Status Of T2 Centres and Participation in Piarc

Lyatuu, W.A.

Proceedings of the 22nd PIARC World Road Congress, 2004

This paper discusses the overview of the Africa's road transport and links it to the Technology Transfer Centre project under PIARC. The paper further discusses the effectiveness of the centre with respect to the future and as springboards for other African T2 Centres. The status of the Tanzania Technology Transfer Centre and its participation in PIARC will be discussed and reported. The most profound contribution to the establishment of the Malawi and Zimbabwe T2 centres will be highlighted. Achievements made so far will be explained and recommendations on how to improve further the use of the centre. The linkages with other Centres will be emphasized and recommended. Finally the paper will highlight the need for other African countries to be encouraged to be active on technology transfer issues through establishment of Technology Transfer Centres.

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Resource Limitations, Networks and Teams, Other Public Sector, Successes, Technology Transfer, Trust and Communication

129. Supply-side innovation and technology commercialization.

Markman, Gideon D.; Gianiodis, Peter T.; Phan, Phillip H.

Journal of Management Studies, Vol 46(4), Jun 2009, 625-649.

The majority of research and practice tends to conceptualize innovation as a vertically coupled, intra-organizational process. We expand this perspective by conceptualizing innovation as a vertically decoupled, inter-organizational process and by studying the role of research universities as suppliers of discoveries to this market for innovation. We combined logic from agency and real options theories to explain why the outcomes of technology commercialization are a function of licensing strategies, the autonomy of technology licensing offices (TLOs), and the incentives bestowed on scientists, research departments, and TLO officers. We rely on data from licensing surveys, interviews with 128 TLO directors, and—for convergent validity—from web-based searches of the TLOs of American universities and the US Patent and Trademark Office. Results suggest that commercialization outcomes (in this case, revenue and start-up creation) are enhanced when TLOs employ diverse licensing strategies, TLOs enjoy greater autonomy, universities share revenues with scientists' departments, and universities compensate TLOs officers well. Results also show that late entrants—typically underperforming universities—inflate royalty shares to scientists as a means to rectify their commercialization record. We conclude with a discussion of this study's contribution to the literature on innovation and technology commercialization. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Innovation Implementation, Leadership, Culture, and Change, University to Industry

130. Enterprise 2.0: New Collaborative Tools for Your Organization

McAfee, A. P.

Harvard Business School Press, 1st Edition, November 16, 2009

"Web 2.0" is the portion of the Internet that's interactively produced by many people; it includes Wikipedia, Facebook, Twitter, Delicious, and prediction markets. In just a few years, Web 2.0 communities have demonstrated astonishing levels of innovation, knowledge accumulation, collaboration, and collective intelligence. Now, leading organizations are bringing the Web's novel tools and philosophies inside, creating Enterprise 2.0. In this book, Andrew McAfee shows how they're doing this, and why it's benefiting them.

Enterprise 2.0 makes clear that the new technologies are good for much more than just socializing-when properly applied, they help businesses solve pressing problems, capture dispersed and fast-changing knowledge, highlight and leverage expertise, generate and refine ideas, and harness the wisdom of crowds.

Associated Categories: Knowledge Sharing, Networks and Teams, Other Public Sector, Private Industry, Trust and Communication, University

131. Decision Support System to Evaluate and Compare Concession Options

McCowan, A.K, and S. Mohamed

Journal of Construction Engineering and Management, Vol. 133, No. 2, 2007

With the increased popularity of concession projects over the last three decades, there is a need for a decision support system (DSS) capable of evaluating and comparing several concession project investment (CPI) options in an effective and efficient manner. Hence, a novel DSS has been developed that takes into consideration both financial and nonfinancial aspects of the investment option, as well as the uncertainties commonly encountered during the feasibility stage of a project. The DSS is fully implemented as a standalone computer software package, ECCO (evaluate and compare concession options), in order to be of practical use. This paper outlines and validates ECCO's design and structure through the demonstration of its capabilities in the evaluation and comparison of three real-life CPI case studies.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Outcomes Management, Private Industry, Transportation - Federal, Transportation - State

132. Optimal knowledge transfer methods: A Generation X perspective.

McNichols, Debby

Journal of Knowledge Management, Vol 14(1), 2010, 24-37.

Purpose: This research study seeks so explore the thoughts and perspectives of Generation X aerospace engineers regarding strategies, processes, and methods to enhance the transfer of knowledge from Baby Boomers to Generation X aerospace engineers. Design/methodology/approach: The qualitative Delphi research method is a formalized process designed to extract opinions from a panel of experts in an anonymous and iterative manner. The strength of the technique lies in its ability to gather a diverse range of opinions in an anonymous fashion without the bias of a single individual dominating the discussion. Findings: Data collected from the Generation X participants helped to answer the study research questions. According to the 24 Generation X study panelists, optimal knowledge transfer requires visible and participative management involvement. Management support is the core of a knowledge-sharing culture that fosters open and honest communication, respectful and trusting relationships, effective mentoring relationships, dynamic team environments, co-location of team members, and a technology infrastructure. Synthesis of the data results from all survey rounds assisted in the creation of a knowledge transfer model. Research limitations/implications: The first limitation is the sample size. Another limitation was the predominantly male demographic within the aerospace community. The study did not involve any attempt to examine different perspectives based on race, gender, or geographic location. The scope of the research questions asked and the research methodology employed to extract thoughts, feelings, and perspectives from the Delphi panelists limited the study. Originality/value: The study is unique because it offers the perspective of a population critical to the survival of organizational knowledge within the aerospace community, the Generation X engineers. The contributions of the study may provide leaders with knowledge transfer methods, strategies, and processes to mitigate knowledge transfer barriers, create an optimal knowledge transfer domain, and facilitate intergenerational knowledge transfer. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Leadership,

Culture, and Change, Private Industry, Technology Transfer, Trust and Communication

133. Organizational assimilation of innovations: A multilevel contextual analysis

Meyer, A. D., & Goes, J. B.

Academy of Management Journal, 1988, Vol. 31, No. 4, 897-923

This study examined the assimilation of innovations into organizations, a process unfolding in a series of decisions to evaluate, adopt, and implement new technologies. Assimilation was conceptualized as a nine step process end measured by tracking 300 potential adoptions through organizations during a six-year period. We advance a model suggesting that organizational assimilation of technological innovations is determined by three classes of antecedents: contextual attributes, innovation attributes, and attributes arising from the interaction of contexts and innovations

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Successes, Technology Transfer

134. Diffusion Methodology: time to innovate?

Meyer, G.

Journal of Health Communication, Vol 9, 2004, pp.59-69

Over the past 60 years, thousands of diffusion studies have been conducted in numerous disciplines of study including sociology, education, communication, marketing, and public health. With few exceptions, these studies have been driven by a methodological approach that has become institutionalized in diffusion research. This approach is characterized by the collection of quantitative data about one innovation gathered from adopters at a single point in time after widespread diffusion has occurred. This dominant approach is examined here in terms of both its strengths and weaknesses and with regard to its contribution to the collective base of understanding the diffusion of innovations. Alternative methodological approaches are proposed and reviewed with consideration for the means by which they may expand the knowledge base.

Associated Categories: Innovation Implementation, Leadership, Culture, and Change

135. Affective commitment to change and innovation implementation behavior: The role of charismatic leadership and employees' trust in top management.

Michaelis, Björn; Stegmaier, Ralf; Sonntag, Karlheinz

Journal of Change Management, Vol 9(4), Dec 2009, 399-417.

This questionnaire-based study investigated the relationship between two aspects of leadership (charismatic leadership and trust in top management) and followers' innovation implementation behavior. Findings from 194 employees working in R&D teams of a multinational automotive company indicated that charismatic leadership and trust in top management were both positively related to innovation implementation behavior, controlling for followers' individual differences, management level, and department affiliation. The findings demonstrate that both relationships were mediated by followers' affective commitment to change. Results implicate the need to more closely bond the concepts of affective commitment to change and innovation implementation behavior and consider their connection in future investigations. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Private Industry, Trust and Communication

136. Shedding light on followers' innovation implementation behavior: The role of transformational leadership, commitment to change, and climate for initiative.

Michaelis, Björn; Stegmaier, Ralf; Sonntag, Karlheinz

Journal of Managerial Psychology, Vol 25(4), 2010, 408-429.

Purpose: The purpose of this paper is to provide a deeper understanding of how transformational leadership relates to followers' innovation implementation behavior, the psychological mechanisms of this relationship, and the role of individual perceptions of climate for initiative. Design/methodology/approach: Perceptual data were collected from 198 employees in lower and middle management positions of a multinational automotive corporation. Relationships were tested using hierarchical regression analysis. Findings: Results demonstrate that transformational leadership was strongly related to followers' innovation implementation behavior and that the nature of this relationship was moderated by followers' levels of perceived climate for initiative. Additionally, commitment to change fully mediated the relationship between transformational leadership and followers' innovation implementation behavior. Research limitations/implications: The paper is based on a cross-sectional design. A causal interpretation requires studies with experimental or longitudinal designs. Practical implications: Companies should invest in transformational leadership training and in the selection of supervisors with this leadership style before initiating the implementation of innovations. Enhancing contextual factors, such as a perceived climate for initiative, should be promoted by integrating them into organizations' reward systems. Originality/value: The paper is one of the first to investigate the relationship between transformational leadership and followers' innovation implementation behavior. It specifies the organizational contexts under which transformational leadership is most likely related to innovation implementation behavior, and those in which such a relationship is unlikely to occur. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Entrepreneurship Education, Innovation Implementation, Leadership, Culture, and Change, Private Industry

137. An Inventor's Guide to Technology Transfer at the Massachusetts Institute of Technology

MIT Technology Licensing Office

May 20, 2005, http://web.mit.edu/tlo/www/downloads/pdf/inventors_guide.pdf

The Inventor's Guide to Tech Transfer outlines the essential elements of technology transfer at the Massachusetts Institute of Technology. This guide is organized to answer the most common questions we typically field from our research community and is designed to provide a broad overview of the technology transfer process and services available for researchers. Technology transfer is the movement of knowledge and discoveries to the general public. It can occur through publications, educated students entering the workforce, exchanges at conferences, and relationships with industry. For the purposes of this guide, however, technology transfer refers to the formal licensing of technology to third parties, under the guidance of professionals employed by universities, research foundations and businesses, in departments focused on these activities

Associated Categories: Commercialization, Entrepreneurship Education, Innovation Implementation, Knowledge Management, Knowledge Sharing, Networks and Teams, Private Industry, Technology Transfer, Trust and Communication, University, University to Industry

138. AASHTO Lead State Implementation

Moore, J.A.

HPC Bridge Views, Issue 2, March/April 1999

This paper describes how, in 1987, Congress initiated the five-year Strategic Highway Research Program (SHRP) to

investigate various products to improve the constructability and reduce the maintenance of the nation's highways and bridges. High Performance Concrete (HPC) or “engineered concrete” is one of the products from the SHRP program. To implement these products, Congress authorized additional funding over the following six years. The American Association of State Highway and Transportation Officials (AASHTO), in cooperation with the Federal Highway Administration (FHWA), created a Task Force for SHRP implementation. The Task Force's approach for technology transfer was through the use of teams consisting of the states that took the lead on various products; hence, the AASHTO Lead State Team for HPC Implementation was formed.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Marketing/Market Potential, Networks and Teams, Technology Transfer, Transportation - Federal, Transportation - State, Trust and Communication

139. Technology Transfer Support 2011-2012

Morrison, V. (contact) | Research in Progress, Florida Department of Transportation

The project involves the development and dissemination of technology transfer media in the form of editorial reviews of final reports, summaries of final reports and the production and distribution of Research Showcase magazine to meet the goal of increasing dispersion of research results, increasing potential for the application of research results, and improving accountability.

Associated Categories: Barriers, Innovation Implementation, Knowledge Management, Knowledge Sharing, Resource Limitations, Outcomes Management, Successes, Technology Transfer, Transportation - State, Trust and Communication

140. Utilisation of strategic communication to create willingness to change work practices among primary care staff: A long-term follow up study.

Morténius, Helena; Fridlund, Bengt; Marklund, Bertil; Palm, Lars; Baigi, Amir | Primary Health Care Research and Development, Vol 13(2), Apr 2012, 130-141.

Aim: To evaluate the long-term utilisation of strategic communication as a factor of importance when changing work practices among primary care staff. Background: In many health care organisations, there is a gap between theory and practice. This gap hinders the provision of optimal evidence-based practice and, in the long term, is unfavourable for patient care. One way of overcoming this barrier is systematically structured communication between the scientific theoretical platform and clinical practice. Methods: This longitudinal evaluative study was conducted among a primary care staff cohort. Strategic communication was considered to be the intervention platform and included a network of ambassadors who acted as a component of the implementation. Measurements occurred 7 and 12 years after formation of the cohort. A questionnaire was used to obtain information from participants. In total, 846 employees (70%) agreed to take part in the study. After 12 years, the 352 individuals (60%) who had remained in the organisation were identified and followed up. Descriptive statistics and multivariate analysis were used to analyse the data. Findings: Continuous information contributed to significant improvements over time with respect to new ideas and the intention to change work practices. There was a statistically significant synergistic effect on the new way of thinking, that is, willingness to change work practices. During the final two years, the network of ambassadors had created a distinctive image for itself in the sense that primary care staff members were aware of it and its activities. This awareness was associated with a positive change with regard to new ways of thinking. More years of practice was inversely associated with willingness to change work practices. Strategic communication may lead to a scientific platform that promotes high-quality patient care by means of new methods and research findings. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Networks and Teams, Private Industry, Successes, Technology Transfer, Trust and Communication, Unlearning Old Habits

141. Technological Innovations in Transportation for People with Disabilities, Workshop Summary Report

Morton, T., and M. Yousuf	Federal Highway Administration, http://www.fhwa.dot.gov/advancedresearch/pubs/11041/11041.pdf

In addition to expert presentations, the 1-day workshop included small breakout group discussions on four topics, all offering a foundation to be developed into something that empowers people with disabilities: Intelligent Transportation Systems (ITS), wireless technologies, and mobile computing; robotics, artificial intelligence, and object detection; navigation, wayfinding, orientation, and guidance; and universal design and accessible transportation. Some of the issues related to ITS, wireless technologies, and mobile computing were identified as a hierarchical series of basic travel needs to be met, from the ability to receive information on a mobile device to sharing real-time transit information over a network. The proliferation of smart phones points to many future applications for such devices, although affordability and overall cost to access this technology need to be kept in mind.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Other Public Sector, Successes, Technology Transfer, Transportation - Federal, Transportation - State

142. Innovation in Organizations: A Multi-level Perspective on Creativity.

Mumford, M. D., & Hunter, S. T.	Research in Multilevel Issues, Volume 4, pp. 9-73, 2005

Recognizing the impact of innovation on organizational performance, scholars from a number of disciplines have sought to identify the conditions that make innovation possible. Although these studies have served to identify a number of key variables, the relationship between these variables and innovation is complex. In this chapter, we argue that the apparent complexity of these relationships may be attributed to cross-level differences in the requirements for innovation and the existence of complex interactions among the phenomena operating at a given level of analysis. The implications of this multi-level perspective for understanding how innovation occurs in organizational settings are discussed.

Associated Categories: Innovation Implementation, Successes, Technology Transfer

143. Transportation Technology Transfer Training and Education Needs

Nakanishi, Y.J., O.A. Elrahman, and R. Horn	Transportation Research Forum, 48th Annual Forum, March 15-17, 2007, http://www.trforum.org/forum/downloads/2007_1C_TechTrans_paper.pdf

This paper describes how technology transfer is defined as the activity leading to the adoption of a new-to-the-user product or procedure by any user or group of users. Technology transfer is a means of directly affecting the rate and nature of innovation and improvements to the transportation system. Whether there is a new device to apply or a more effective manner of performing a task, technology transfer is an essential part of that innovation.

The expertise necessary to understand and apply all facets of technology transfer pull and push activities including technical, procurement, institutional, marketing, resource management, training and legal issues is immense. It is difficult for recent hires or professionals new to technology transfer to grasp the fundamentals and be "up and running" in a short period of time. While the need for trained technology transfer professionals has been expressed in prior research on this topic in specific components of the industry, the authors conducted relevant research and undertook a survey to determine the nature and extent of the need and to gather information useful for the establishment of a Transportation Technology Transfer Certificate Program.

Associated Categories: Barriers, Knowledge Sharing, Resource Limitations, Successes, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State

144. NASA Technology Readiness Levels Demystified

National Aeronautics and Space Administration, Jim Banke

Aug 20, 2010, http://www.nasa.gov/topics/aeronautics/features/trl_demystified.html

NASA developed technology readiness levels -- a structure that represents the evolution of an idea from a thought, to the full deployment of a product in the marketplace. TRLs are a useful, commonly understood method for explaining to collaborators and stakeholders just how mature a particular technology is: TRL 1 Basic Research: Initial scientific research has been conducted. Principles are qualitatively postulated and observed. Focus is on new discovery rather than applications. TRL 2 Applied Research: Initial practical applications are identified. Potential of material or process to solve a problem, satisfy a need, or find application is confirmed. TRL 3 Critical Function or Proof of Concept Established: Applied research advances and early stage development begins. Studies and laboratory measurements validate analytical predictions of separate elements of the technology. TRL 4 Lab Testing/Validation of Alpha Prototype Component/Process: Design, development and lab testing of components/processes. Results provide evidence that performance targets may be attainable based on projected or modeled systems. TRL 5 Laboratory Testing of Integrated/Semi-Integrated System: System Component and/or process validation is achieved in a relevant environment. TRL 6 Prototype System Verified: System/process prototype demonstration in an operational environment (beta prototype system level). TRL 7 Integrated Pilot System Demonstrated: System/process prototype demonstration in an operational environment (integrated pilot system level). TRL 8 System Incorporated in Commercial Design: Actual system/process completed and qualified through test and demonstration (pre-commercial demonstration). TRL 9 System Proven and Ready for Full Commercial Deployment: Actual system proven through successful operations in operating environment, and ready for full commercial deployment.

Associated Categories: Commercialization, Private Industry, Technology Development, Technology Transfer, Transportation - Federal, University

145. Determinants of invention commercialization: An empirical examination of academically sourced inventions.

Nerkar, Atul; Shane, Scott

Strategic Management Journal, Vol 28(11), Nov 2007, 1155-1166.

We examine the attributes of technological inventions that influence their commercialization. Using a unique dataset of the Massachusetts Institute of Technology (MIT)-licensed patents, we show that the likelihood of invention commercialization, which we measure by the achievement of first sale, is positively associated with two characteristics of licensed technological inventions--scope and pioneering nature--and has an inverted U-shaped relationship with the age of the invention. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, University to Industry

146. Assessing Transition Readiness for Radical Innovation

O'Connor Gina Colarelli, Hendricks Richard, Rice Mark P

Research Technology Management Magazine, Industrial Research Institute, Volume 45, Number 6, 1 November 2002, pp. 50-56(7)

Radical innovation is fraught with risk due to the high levels of uncertainty in creating new technologies and new markets. Add to this the challenge of managing in the context of the large corporate enterprise, replete with its bureaucratic processes and necessary focus on continuous improvement, and it is obvious why successful commercialization of radical innovations through large established companies does not happen more regularly. Having an assessment tool to help manage the transition from R&D project team to business-unit product development team can greatly enhance the probabilities of commercial success. Elements of the readiness assessment tool are: Technology readiness, product/system development readiness, manufacturing (hardware) and software readiness, partners readiness, clarity of competitive advantage, market entry strategy, market development readiness, sales force readiness, assessing the R&D team's readiness to transition, assessing the receiving unit's commitment to the project, human resources issues: R&D project team and receiving unit, informal support systems, and alignment of expectations,

Associated Categories: Commercialization, Innovation Implementation, Leadership, Culture, and Change, Marketing/Market Potential, Private Industry, Technology Transfer

147. The influence of leadership on innovation processes and activities.

Oke, Adegoke; Munshi, Natasha; Walumbwa, Fred O.

Organizational Dynamics, Vol 38(1), Jan-Mar 2009, 64-72.

Innovation can be seen as representing a change in the status quo and has been defined as involving the discovery of new things and the commercialization of such discoveries. To be innovative, it is not sufficient to be creative and come up with new possibilities and ideas, implementation is a key aspect of the innovation process. In this paper, we investigate two different leadership styles focusing on transformational-transactional leadership theory and the underlying linkages between these leadership styles and different innovation processes and activities. Our goal is to demonstrate that different leadership styles may foster distinct innovative processes such as the creative and the implementation processes as well as distinct innovation activities, such as exploitation and exploration. The importance of leadership to organizational performance cannot be over-emphasized. Leadership plays a vital role in fostering innovation outcomes in organizations. This paper has implications for the leadership of innovation efforts at different levels within an organization. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Leadership, Culture, and Change

148. The dynamics of relational and contractual governance mechanisms in knowledge sharing of collaborative R&D projects.

Olander, Heidi; Hurmelinna-Laukkanen, Pia; Blomqvist, Kirsimarja; Ritala, Paavo

Knowledge and Process Management, Vol 17(4), Oct-Dec 2010, 188-204.

The purpose of this paper is to explore the dynamics of relational and contractual governance mechanisms in vertical buyer-supplier R&D projects requiring both knowledge sharing and protection. Prior literature has recognised the mutual impact of relational and contractual governance on knowledge sharing, but treats the linkages in a rather static way. This research introduces a more explicit process perspective, and combines four concepts: trust, relational norms, contracts and intellectual property rights (IPRs). The paper concentrates on the roles and interplay of both types of mechanisms in the different project phases. We collected qualitative interview data from four buyer-supplier R&D collaboration projects, each pair serving as a unit of analysis. Our

findings indicate that both contractual and relational governance mechanisms play a role in buyer-supplier R&D collaboration but their relative importance varies according to the collaboration phase. Whereas in the exploration phase trust may even substitute contractual governance, both mechanisms support each other in the development phase. Contractual mechanisms are emphasised in the finalisation phase, although relational mechanisms also play a role. The lesson for management understanding is that both types of mechanisms should be considered simultaneously throughout the collaboration process. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Competition and Secrecy, Knowledge Management, Knowledge Sharing, Private Industry, Trust and Communication

149. The role of IT human capability in the knowledge transfer process in IT outsourcing context.

Park, Joo Yeon; Im, Kun Shin; Kim, Joon S. Information & Management, Vol 48(1), Jan 2011, 53-61.

Our research attempted to identify the behavioral process of knowledge transfer by examining the effects of IT human capability, human character, trust, and cooperative learning on it in an IT outsourcing situation. By analysing data collected from vendor and client matched-pair samples of 87 IT outsourcing projects, we found that both the client's and the vendor's character influenced trust, trust affects on cooperative learning, and the cooperative learning influence on knowledge transfer. More importantly, it we found that the client's IT human capability had a direct impact on cooperative learning and knowledge transfer. This indicated that client's IT human capability was a crucial factor in effective knowledge transfer during IT outsourcing. It also implied that client firms should identify and retain some IT personnel who can apply vendors' competencies in IT practice and respond effectively to any technological challenges. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Private Industry, Trust and Communication

150. Charismatic leadership, change and innovation in an R&D organization.

Paulsen, Neil; Maldonado, Diana; Callan, Victor J.; Ayoko, Oluremi Journal of Organizational Change Management, Vol 22(5), 2009, 511-523.

Purpose: The purpose of this paper is to investigate the effects of the charismatic dimension of transformational leadership on team processes and innovative outcomes in research and development (R&D) teams. Design/methodology/approach: Data are collected by surveying 34 teams that totaled 178 participants. Surveys measured charismatic leadership style, team identity, cooperative strategies and team innovation. Findings: Results reveal the importance of managers assuming a charismatic style of leadership to encourage innovation. Charismatic leaders promote team innovation by supporting a sense of team identity and commitment, and encourage team members to cooperate through the expression of ideas and participation in decisions. Research limitations/implications: The study is conducted in a single R&D organization and future research should explore the influence of these factors in other settings. The measures of team innovation are based on the perceptions of the team members, and future research needs to include a wider variety of data sources over time. Practical implications: Successful team leaders who employ a more charismatic style facilitate more cooperative interactions in teams. Teams with a strong team identity combined with the exercise of cooperative behaviors are more innovative. Originality/value: The preliminary model tested enhances the understanding of the importance of the leaders in influencing team processes and innovation. Leaders who are more transformational in style influence followers by affecting their sense of identity. This sense of identity influences how well teams adopt and follow more cooperative strategies to resolve issues and to make decisions. In turn, the model shows how these factors influence team innovation. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Networks

and Teams, Private Industry, Trust and Communication

151. Concurrent engineering: Large time savings through Concurrent Engineering applied to transport infrastructure design and Works: lessons from theory and practice

Penfentenyo, A, J. Fadeuilhe, and M. Ray — Proceedings of the Transport Research Arena Europe 2006

Concurrent Engineering is used for years in space, aviation, car manufacturing sectors; the heavy time constrains for transport infrastructure design and construction justified a technology transfer. This has been done both by a detailed benchmarking exercise on the methodology and has also been successfully implemented on a large project. The recourse to concurrent engineering allowed the Engineering and Design Department ALISEE (BOUYGUES / SCETAUROUTE) to carry out in only 19 months the phase of design and development of the motorway A28 Rouen / Alencon (120 km; West of France), that is about half a traditional time. With concurrent engineering, the design, the consultation and the definition of the methods of construction are carried out simultaneously and not in a sequential way. The definite alignment of the motorway is worked out gradually while integrating, progressively, all the elements coming from these three sources. Part of the challenge lies in a permanent integration of the modifications, which requires the most extreme rigour. That also supposes the installation of a common information system where each actor has access to the updated project. This system generates an extra work for the whole of the project team, since it results in adapting the project uninterrupted as new constraints appear. But this investment proves to be very profitable because of the time saved

Associated Categories: Barriers, Commercialization, Private Industry, Successes, Technology Development, Technology Transfer

152. The Diffusion of Technological Innovation in the Commercial Banking Industry

Pennings, J. M., & Harianto, F. — Strategic Management Journal, Vol. 13, No. 1, (Jan., 1992), pp. 29-46

This paper examines the propensity of organizations to adopt technological innovations. Technological innovations evolve from the stock of skills which organizations have accumulated over time. Linkages with extramural sources of technology are presumed to be important as well. Hypotheses are tested on a sample of commercial banks. Findings show that prior experience in information technology, in tandem with a variety of interfirm linkages, will affect the banks' decision to adopt this innovation.

Associated Categories: Innovation Implementation, Networks and Teams, Private Industry, Successes, Technology Transfer

153. Open innovation and new issues in R&D organization and personnel management.

Petroni, Giorgio; Venturini, Karen; Verbano, Chiara — The International Journal of Human Resource Management, Vol 23(1), Jan 2012, 147-173.

The steady growth of R&D costs and the increasingly widespread dissemination of information and communication technology over the past decade have resulted in the affirmation of the paradigm of open innovation, which consists in the continual expansion of access to sources of technological innovation outside the firm itself. Industrial companies are, in fact, turning more frequently to collaboration with university departments and other public and private research centers, and there is a notable increase in agreements regarding technological cooperation and the exchange of know-how between companies. In addition, recourse to highly specialized small research companies is on the rise. This is common, for example in the pharmaceutical sector and, more generally, in the area of biotechnological research. Furthermore, we are witnessing the development

of the new role of innovation broker. These factors alter the traditional profile of company R&D structures, within which the role of researchers and technologists often changes. In particular, matrix and network organizational models are on the increase, and the professional figures of 'integrators of knowledge and expertise' (T-men) are assuming major importance at the expense of traditional scientists. As a consequence, the model for training and managing scientific personnel tends to change. This model, as it moves away from the prevailing pattern adopted by firms in Anglophone countries, is continually drawing closer, even from a cultural standpoint, to the R&D management approach found in the Japanese and German companies. The aim of this article is to investigate how the adoption of open innovation has changed the organizational structures of R&D and altered the methods used in managing its personnel. The results of the study are based on the analysis of four case studies of Italian multinational firms operating in the pharmaceutical, food, specialty chemical, and aerospace industries. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Networks and Teams, Private Industry, Technology Transfer

154. The Effectiveness of University Technology Transfer

Phan, P.H., and D. S. Siegel

Foundations and Trends in Entrepreneurship, Vol. 2, No. 2, 2006, pp. 77-144

In recent years, there have been numerous studies of the effectiveness of university technology transfer. Such technology transfer mechanisms include licensing agreements between the university and private firms, science parks, incubators, and university-based startups. We review and synthesize these papers and present some pointed recommendations on how to enhance effectiveness. Implementation of these recommendations will depend on the mechanisms that universities choose to stress, based on their technology transfer "strategy." For example, institutions that emphasize the entrepreneurial dimension of technology transfer must address skill deficiencies in technology transfer offices, reward systems that are inconsistent with enhanced entrepreneurial activity and the lack of training for faculty members, post-docs, and graduate students in starting new ventures or interacting with entrepreneurs. Universities will also have to confront a set of issues related to ethics and social responsibility, as they more aggressively pursue technology commercialization.

Associated Categories: Barriers, Commercialization, Resource Limitations, Successes, Technology Transfer, University, University to Industry

155. Organizational Management Improvement Through Planned Decision Support Tools in Technology Based Organizations

Pierson, K.L

Thesis submitted for Doctor of Management Candidate, University of Maryland, Oct 2010

Changes that were traditionally handled through manual decision making processes have proven to be unreliable and ineffective. New alternatives for change management must be adapted by businesses and organizations to ensure they remain effective and efficient in pursuing their organizational objectives. Relationships among change management, the effects of bounded rationality, an organization's ability to analyze change from a systems perspective and how a Decision Support System could support the change environment are considered in order to understand the far reaching impacts of organizational change. Organizational decision making, decision making processes and how they currently support the business environment are investigated. Identification of decisional bottlenecks and their impact on organizational efficiency are analyzed in order to mitigate their effects through improved decision making processes. The benefits Decision Support Systems have provided by improving organizational change management and decision making processes are investigated as a part of this research. Best practices on the use of decision support systems to improve change management are recommended. Key Case Studies associated with decision support management are used to provide qualitative examples on the

current state of change management in technology based organizations. The intent of this research is to determine through a systems perspective how to improve change and decision making processes through a correctly applied decision support system or other decision support processes that will also account for the effects of bounded rationality.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Outcomes Management, Technology Transfer

156. The connection between trust and knowledge management: What are its implications for team performance.

Politis, John D.

Journal of Knowledge Management, Vol 7(5), 2003, 55-66.

The latest buzzwords in organizational change and development literature are "knowledge management" and "knowledge transfer", which proponents claim are successful ways of improving and enhancing employees' performance. Moreover, trust and the ability of employees to work in an autonomous manner are often cited as being essential for the effectiveness of self-managed teams. Little however, is known on the effect of interpersonal trust on knowledge management (acquisition) of team members, and the consequences for team performance. A survey of 49 self-managing teams was carried out to investigate the relationship between the dimensions of interpersonal trust, knowledge acquisition, and team performance. Overall, findings support that most interpersonal trust dimensions are positively related to the variables of knowledge acquisition. The results also showed that the effects of interpersonal trust on team performance to a large extent are mediated by the intervening variables of knowledge acquisition. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Networks and Teams, Private Industry, Trust and Communication

157. Accelerating Technology Transfer and Commercialization of Federal Research in Support of High-Growth Businesses

Presidential Memorandum

White House, http://www.whitehouse.gov/the-press-office/2011/10/28/presidential-memorandum-accelerating-technology-transfer-and-commerciali

Policy. Innovation fuels economic growth, the creation of new industries, companies, jobs, products and services, and the global competitiveness of U.S. industries. One driver of successful innovation is technology transfer, in which the private sector adapts Federal research for use in the marketplace. One of the goals of my Administration's "Startup America" initiative, which supports high growth entrepreneurship, is to foster innovation by increasing the rate of technology transfer and the economic and societal impact from Federal research and development (R&D) investments. This will be accomplished by committing each executive department and agency (agency) that conducts R&D to improve the results from its technology transfer and commercialization activities. The aim is to increase the successful outcomes of these activities significantly over the next 5 years, while simultaneously achieving excellence in our basic and mission focused research activities. I direct actions be taken to establish goals and measure performance, streamline administrative processes, and facilitate local and regional partnerships in order to accelerate technology transfer and support private sector commercialization.

Associated Categories: Commercialization, Innovation Implementation, Technology Development, Technology Transfer, Transportation - Federal

158. National Technology Transfer and Advancement Act of 1995

Public Law 104–113, 104th Congress	March 7, 1996, http://www.gpo.gov/fdsys/pkg/PLAW-104publ113/pdf/PLAW-104publ113.pdf

National Technology Transfer and Advancement Act of 1995 To amend the Stevenson-Wydler Technology Innovation Act of 1980 with respect to inventions made under cooperative research and development agreements, and for other purposes. The commercialization of technology and industrial innovation in the United States will be enhanced if companies, in return for reasonable compensation to the Federal Government, can more easily obtain exclusive licenses to inventions which develop as a result of cooperative research with scientists employed by Federal laboratories.

Associated Categories: Commercialization, Competition and Secrecy, Other Public Sector, Private Industry, Technology Development, Technology Transfer

159. Stevenson-Wydler Technology Innovation Act of 1980

Public Law 96-480, 96th Congress	94 Stat. 2311, 15 U.S.C. 3701, Oct 21, 1980, http://www.csrees.usda.gov/about/offices/legis/techtran.html

Among a variety of stipulations, the Act required federal laboratories to facilitate the transfer of federally owned and originated technology to state and local governments and to the private sector.

Associated Categories: Commercialization, Competition and Secrecy, Other Public Sector, Technology Development, Technology Transfer, Transportation - Federal, Transportation - State

160. Bayh-Dole University and Small Business Patent Act (1980)

Public Law 96-517, 96th Congress	Dec 12, 1980, http://history.nih.gov/research/downloads/PL96-517.pdf

Permitted government grantees and contractors to retain title to federally funded inventions and encouraged universities to license inventions to industry. The Act is designed to foster interactions between academia and the business community.

Associated Categories: Commercialization, Competition and Secrecy, Other Public Sector, Private Industry, Technology Development, Transportation - Federal, Transportation - State

161. Federal Technology Transfer Act of 1986

Public Law 99-502, 99th Congress	October 20, 1986, http://history.nih.gov/research/downloads/PL99-502.pdf

To amend the Stevenson-Wydler Technology Innovation Act of 1980 to promote technology transfer by authorizing Government-operated laboratories to enter into cooperative research agreements and by establishing a Federal Laboratory Consortium for Technology Transfer within the National Bureau of Standards, and for other purposes.

Associated Categories: Commercialization, Technology Transfer, Transportation - Federal

162. Dissemination Plan: Environmental Strategies for Highway Construction

Quimpo, R. G. and R.D. Neufeld

Pennsylvania Department of Transportation, October 15, 2007, ftp://ftp.dot.state.pa.us/public/pdf/BPR_PDF_FILES/Documents/Research/Complete%20Projects/Education%20and%20Training/Technology%20Transfer%20and%20Implementation%20Activities%20for%20District%202-0%20Research%20Projects.pdf

As a result of two projects sponsored by the Pennsylvania Department of Transportation (PennDOT) and in collaboration with several consultants, the University of Pittsburgh has identified techniques and procedures for assessing and mitigating the environmental impacts of highway construction. These findings need to be disseminated among design professionals and implementing agencies. The objective is for these techniques to eventually be adopted and used as guidelines in the design and monitoring of construction projects. This report discusses proposed strategies for this technology transfer and outlines the initial steps that have been taken to carry them out.

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Resource Limitations, Successes, Technology Transfer, Transportation - State

163. Managing Technology Transfer: A Strategy for the Federal Highway Administration, TRB Special Study 256

Research and Technology Coordinating Committee, the Transportation Research Board

Special Report 256, 1999, http://onlinepubs.trb.org/onlinepubs/sr/sr256.pdf

This report was prepared by the Research and Technology Coordinating Committee (RTCC), a special committee convened by the Transportation Research Board (TRB) of the National Research Council and funded by the Federal Highway Administration (FHWA). This report addresses how FHWA selects research products for technology transfer and transfers those products to the highway industry, in particular the state and local agencies that own, operate, and maintain the nation's highways. The recommendations in this report are aimed at the establishment of a specific strategy for FHWA's technology transfer activities. The proposed strategy addresses programmatic issues related to identifying, selecting, and prioritizing technologies for transfer; making resource allocations; and measuring program success. The recommendations also address what the committee sees as a management gap created by FHWA's recent reorganization, which the committee believes could have an impact on the overall effectiveness of agencywide technology transfer efforts.

Associated Categories: Barriers, Innovation Implementation, Leadership, Culture, and Change, Resource Limitations, Successes, Technology Transfer, Transportation - Federal

164. Accelerating Innovation at Hewlett-Packard

Rivas, R. and David H. Gobeli

Research-Technology Management, Industrial Research Institute, Vol 48, Num 1, January-February 2005, pp. 32-39(8)

Accelerating the rate of innovation is a top priority for technology managers; understanding and managing common innovation enablers and barriers saves time and money. A review of multiple programs in Hewlett-Packard revealed that the top enablers of innovation are highly skilled people, a helping culture, management

support, using checkpoints to provide focus, and interdisciplinary people working together. However, barriers are different across programs; consequently, managers should regularly interview teams to determine which barriers need to be addressed. And, barriers can be predicted on the basis of technology and market newness. For example, products with technologies that are new to the company face capability issues while products with new markets may experience market planning issues.

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Marketing/Market Potential, Private Industry, Successes

165. Age and technology innovation in the workplace: Does work context matter?

Rizzuto, Tracey E.

Computers in Human Behavior, Vol 27(5), Sep 2011, 1612-1620.

Two workplace trends will become increasingly important in years to come: reliance on information technology (IT) and workforce aging. This study explores the influence of workplace context on employee reactions to the implementation of a new IT initiative to better understand innovation enhancers and inhibitors. Employees from multiple workplace departments completed a questionnaire that assessed their reactions to the implementation. Age-based differences and contextual influences were estimated to predict satisfaction with the implementation process. Hierarchical linear models indicate that younger workers reported less satisfaction than older workers—an effect that was more pronounced in relatively young departments. These findings challenge ageist notions and emphasize the role of context on attitudes formation. Multi-institutional and multilevel field-setting data are rare making this a unique research contribution. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Leadership, Culture, and Change

166. Marching in-step: Facilitating technological transitions through climate consensus.

Rizzuto, Tracey E.; Mohammed, Susan; Vance, Robert J.

Computers in Human Behavior, Vol 27(1), Jan 2011, 185-194.

This study explored the benefits of strong and positive climate attitudes throughout the implementation of new workplace information technology (IT). Unit-level climate attitudes, perceived work stress, and training completion were measured in a field-setting over a 6-year period. Trends and moderating influences of climate consensus were estimated from data collected from several sources (employees, managers, supervisors, and technical coordinators) using multiple methods (archival records, interviews, and surveys). As expected, climate consensus weakened over time, and interacted with climate for innovation to predict training completion with varying effects that depended upon implementation period and training type (Internet versus general technology). More training completion occurred when climate consensus was strong prior to implementation and weak during and after implementation indicating that the merits of strong and positive climate attitudes may be specific to early implementation stages. Less attitudinal agreement may be more beneficial to units once implementation is underway. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Technology Transfer, Transportation - State

167. A multidisciplinary meta-analysis of human barriers to technology implementation.

Rizzuto, Tracey E.; Reeves, Jennifer

Consulting Psychology Journal: Practice and Research, Vol 59(3), Sep 2007, 226-240.

Although "people-issues" are often blamed for technology implementation failures (Klein, 2001), research on the human behaviors and attitudes that challenge workplace innovation is scattered across multiple disciplines and

lacks integrated theory. The Person- Implementation Framework proposed here describes person-related problem sources, symptoms, and solutions associated with information technology (IT) implementation failure, and is used to analyze scholarly literature (N = 81) from four academic disciplines spanning two decades (1984-2004). Findings reveal dominant and underrepresented person-related implementation factors over time. Linkage analyses are used to identify symptoms and solutions associated with two of the frequently researched implementation problem sources: participation and management. Finally, despite psychology's centrality to understanding person-related IT implementation barriers, less than 10% of the research on this topic appears in the psychology literature. Suggestions are provided for how academic researchers and consulting psychologists can contribute to this important and timely issue. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Leadership, Culture, and Change, Technology Transfer

168. People, technology, processes and risk knowledge sharing.

Rodriguez, Eduardo; Edwards, John

Electronic Journal of Knowledge Management, Vol 8(1), Jan 2010, 139-150.

The present global economic crisis creates doubts about the good use of accumulated experience and knowledge in managing risk in financial services. Typically, risk management practice does not use knowledge management (KM) to improve and to develop new answers to the threats. A key reason is that it is not clear how to break down the “organizational silos” view of risk management (RM) that is commonly taken. As a result, there has been relatively little work on finding the relationships between RM and KM. We have been doing research for the last couple of years on the identification of relationships between these two disciplines. At ECKM 2007 we presented a general review of the literature(s) and some hypotheses for starting research on KM and its relationship to the perceived value of enterprise risk management. This article presents findings based on our preliminary analyses, concentrating on those factors affecting the perceived quality of risk knowledge sharing. These come from a questionnaire survey of RM employees in organisations in the financial services sector, which yielded 121 responses. We have included five explanatory variables for the perceived quality of risk knowledge sharing. These comprised two variables relating to people (organizational capacity for work coordination and perceived quality of communication among groups), one relating to process (perceived quality of risk control) and two related to technology (web channel functionality and RM information system functionality). Our findings so far are that four of these five variables have a significant positive association with the perceived quality of risk knowledge sharing: contrary to expectations, web channel functionality did not have a significant association. Indeed, in some of our exploratory regression studies its coefficient (although not significant) was negative. In stepwise regression, the variable organizational capacity for work coordination accounted for by far the largest part of the variation in the dependent variable perceived quality of risk knowledge sharing. The “people” variables thus appear to have the greatest influence on the perceived quality of risk knowledge sharing, even in a sector that relies heavily on technology and on quantitative approaches to decision making. We have also found similar results with the dependent variable perceived value of Enterprise Risk Management (ERM) implementation. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Private Industry

169. The Nature of Technology Transfer

Rogers, E. M.

Science Communication, March 2002, Vol 23, No. 3, pp. 323-341, http://scx.sagepub.com/content/23/3/323

Technology transfer, defined as the application of information into use, is often a difficult and frustrating process. This essay explores the concept of technology transfer and suggests strategies for its facilitation. The technology transfer process involves two-way communication between an R&D organization and a receptor organization. It is a difficult kind of heterophilous communication process, one that requires skilled personnel, resources, and the

organization of boundary-spanning institutions or networks. The similarities and differences between technology transfer and the diffusion of innovations involve such concepts as heterophily, champions, gatekeepers, and boundary spanners. Five strategies for facilitating technology transfer were discussed: (1) creating boundary-spanning units, (2) transplanting personnel, (3) forming network relationships linking R&D organizations and receptor organizations, (4) encouraging the formation of high-tech spin-offs, and (5) organizing consensus development conferences to create practice guidelines. Given the tremendous investment in R&D, it is surprising that more research attention has not been given to investigating technology transfer. The scholarly study of this process is underfunded, dissipated among a wide variety of disciplines, and lacks a widely accepted theoretical conceptualization and an effective methodological approach to illuminate the nature of the technology transfer process. Until these limitations are overcome, the results of scientific research will not be effectively communicated to appropriate users.

Associated Categories: Barriers, Leadership, Culture, and Change, Resource Limitations, Private Industry, Successes, Technology Transfer, Trust and Communication

170. Diffusion of innovations (5th ed.).

Rogers, Everett M. New York, NY: Free Press, 2003

In this renowned book, Everett M. Rogers explains how new ideas spread via communication channels over time. Such innovations are initially perceived as uncertain and even risky. To overcome this uncertainty, most people seek out others like themselves who have already adopted the new idea. Thus the diffusion process consists of a few individuals who first adopt an innovation, then spread the word among their circle of acquaintances--a process which typically takes months or years. But there are exceptions: use of the Internet in the 1990s, for example, may have spread more rapidly than any other innovation in the history of humankind. Furthermore, the Internet is changing the very nature of diffusion by decreasing the importance of physical distance between people. The fifth edition addresses the spread of the Internet, and how it has transformed the way human beings communicate and adopt new ideas. (Amazon.com)

Associated Categories: Successes, Technology Transfer

171. Organizational Innovation Adoption: A Multi-Level Framework of Determinants and Opportunities for Future Research

Rudd T. Frambach and Niels Schillewaert Journal of Business Research, Vol. 55, Issue 2, Feb 2002, pp. 163-176

Organizational innovation adoption has received increasing attention in the marketing and management literature over the past two decades. Insight in adoption processes, its inhibitors and stimulators helps suppliers of innovations to market their new products more effectively. The objective of this paper is to discuss main findings on organizational adoption and integrate them within a framework. The framework that we propose addresses the adoption decision at two levels, i.e. the organizational level and the level of the individual adopter within an organization. Thus, we aim to contribute to an integration of two streams of research on innovation adoption or technology acceptance that have emerged in the marketing and management literature. Based on our discussion, we tentatively identify several issues in innovation adoption research that we feel need attention in future research.

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Successes, Technology Transfer

172. The adoption of innovations by provider organizations in health care.

Rye, Colleen Beecken; Kimberly, John R.

Medical Care Research and Review, Vol 64(3), Jun 2007, 235-278.

Innovations in health care account for some of the most dramatic improvements in population health outcomes in the developed world as well as for a nontrivial proportion of growth in expenditures. Provider organizations are the adopters of many of these innovations, and understanding the factors that inhibit or facilitate their diffusion to and possible disengagement from these organizations is important in addressing cost, quality, and access issues. Given the importance of these issues, the purpose of this article is to (1) create a comprehensive census of studies examining the adoption of and disengagement from innovations in health care provider organizations; (2) organize these studies into an inductively derived classification scheme; (3) assess the studies' strengths and weaknesses; and (4) reflect on the implications of our review for future research. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Resource Limitations, Private Industry, Successes, Technology Transfer

173. Knowledge sharing barriers in complex research and development projects: An exploratory study on the perceptions of project managers.

Santos, Vitor Ricardo; Soares, António Lucas; Carvalho, João Álvaro

Knowledge and Process Management, Vol 19(1), Jan-Mar 2012, 27-38.

Numerous projects are considered complex because of the number of stakeholders, the diversity of skills, and the uncertainty involved, requiring accurate information retrieval and management of the social interactions between different participants leading to efficient knowledge sharing. This paper reports the findings of an empirical study on knowledge sharing barriers and research and development (R&D) activities that occur in the context of complex project management. The study presents issues, difficulties, and practices acknowledged by project managers related to knowledge sharing and R&D (focused on activities that involve cooperation and collaboration). Particularly, we point out the following major knowledge sharing barriers: codification process, inadequate information technology, lack of initiative and strategy by the workers, and lack of time and resources. We also explained the following practices and issues regarding the collaborative R&D activities: information exchange and retrieval, communication barriers, interdependence of knowledge and skills, and different technical terminologies. We intend to contribute to the understanding of the work carried out in the context of complex projects to improve the management practices and the information technology platforms to support them. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Private Industry, Technology Transfer, Trust and Communication

174. Accomplishing NextGen Research to Implementation, Establishing NASA FAA Research Transition Teams

Scardina, John

Next Generation Air Transportation System, Joint Planning and Development Office, Oct 22, 2007

The presentation describes the goal of the Next-Gen implementation activities: to identify, conduct, and effectively transition the R&D accomplished to the implementing agency. The technology transfer strategy involves forming technology transition teams organized according to the near, mid, and far-term research goals; to formalize collaboration through a Technology Transfer Coordinating Committee co-chaired by the technical leads of both organizations (NASA and FAA); and to enable close working relationship between the transition teams and the coordinating committee. The presentation describes start-up activities and roles of each of the partners. The strategy ensures interaction of the transition teams with FAA and NASA during the planning and

conduct of the research.

Associated Categories: Barriers, Innovation Implementation, Knowledge Sharing, Leadership, Culture, and Change, Networks and Teams, Successes, Technology Transfer, Transportation – Federal

175. Tools for Innovative Partnering: Technology Transfer Techniques, Special Report #10

Schmid, L.C.	Federal Laboratory Consortium for Technology Transfer, Special Report #10, May 2000, http://www.federallabs.org/store/innovative/

This report highlights effective partnering tools and techniques used in successful innovative initiatives and partnering arrangements in the Mid-Continent Region of the FLC and includes recommendations for replication by other regions. The partnering involves federal laboratories and private and public sector organizations.

Associated Categories: Barriers, Commercialization, Knowledge Sharing, Resource Limitations, Other Public Sector, Private Industry, Successes, Technology Development, Technology Transfer

176. Technology Transfer and Commercialization Landscape of the Federal Laboratories

Shipp, S., M. Hughes, S. Howieson, G. Walejko, N. Gupta, S. Jones, A. Brenner, D. Holmes, E. Shyu	Institute for Defense Analysis, Science and Technology Policy Institute, IDA Paper NS P-4728, June 2011, https://www.ida.org/upload/stpi/pdfs/p-4728nsfinal508compliantfedlabttcreport.pdf

This landscape study describes the technology transfer and commercialization activities, barriers, and current measures of success at federal laboratories. It is the first systematic study of technology transfer at federal laboratories published since the early 2000s. The study discusses factors that affect technology transfer and commercialization such as mission, management, agency leadership, organization and coordination of T2 and commercialization activities, resources, and more. Findings include innovative strategies used that are believed to increase the speed and extent of dissemination of technology transfer • Collaborate with universities. • Increase laboratory director involvement in technology transfer activities. • Strengthen or complement the skill set of the Office of Research and Technology Applications staff. • Enhance education and incentives for Researchers to engage in technology transfer. • Use standardized agreements to streamline industry interactions. • Increase visibility and access to federal laboratories by increasing outreach and use of partnership intermediaries. • Increase availability of resources through leveraging economic development and commercialization programs and partnership intermediaries.

Associated Categories: Barriers, Resource Limitations, Other Public Sector, Successes, Technology Transfer

177. Integrated Field and Office Tools for Bridge Management

Siddiqui, M., E. Juni, T.M. Adams, and J. Dzienkowski	Wisconsin DOT, Project 0092-03-10, “Integrated Field and Office Tools for Bridge Management, " http://minds.wisconsin.edu/handle/1793/6887

Tablet PCs for Quick, Easy Entry of Bridge Inspection Data -- The Wisconsin Department of Transportation has

adopted a new system for bringing together bridge inventory, inspection, maintenance and maintenance cost data. The new system renders WisDOT's existing field data collection tools and procedures obsolete. Researchers found the Tablet PC to be a viable, time-saving tool for collecting bridge inspection data in the field. With some effort, inspectors were successful in learning to use the handwriting recognition technology and were enthusiastic about the Tablet PC's benefits. Existing handwriting technology was found to be superior to speech recognition technology. Combined with a new electronic version of the Inspector's Pocket Manual that is hyperlinked to the inspection form, the technology promises to facilitate greater detail, accuracy and consistency in reports. Economic analysis showed that Tablet PCs would pay for themselves through time savings in 10 to 16 months, or 120 to 200 bridge inspections.

Associated Categories: Knowledge Management, Knowledge Sharing, Successes, Technology Transfer, Transportation - State

178. Organizational readiness for stage-based dynamics of innovation implementation.

Simpson, D. Dwayne

Research on Social Work Practice, Vol 19(5), Sep 2009, 541-551.

Implementing innovations in social and health-related service programs is a dynamic stage-based process. This article discusses training, adoption, implementation, and practice as sequential elements of a conceptual framework for effective preparation and implementation of evidence-based innovations. However, systems need to be prepared for change in terms of organizational readiness and functioning as well as their service delivery infrastructure. Emphasis is given to practical methods for advancing innovation implementation through collection and applications of better information about staff perceptions of need, organizational climate and resources, leadership commitments to change, and barriers likely to be faced. Measurement tools for these constructs, along with evidence of their applications in field studies, are presented. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Knowledge Management, Leadership, Culture, and Change, Technology Transfer

179. Transferring Transport Research Results into University Education - Report on the Results of a User Survey, a Workshop in Rome, and a Roadmap for Future Improvements

Site, Paolo Delle

Transportation Research Knowledge Center, Nov 29, 2007, http://www.transport-research.info/Upload/Documents/200802/20080221_090303_08171_Transferring_transport_research_results.pdf

A workshop on education and training related to transportation and research took place on September 28, 2007 in Rome, Italy. The transfer between research and education was especially targeted. A project called, Promotion Of Results In Transport Research And Learning (PORTAL), was discussed and lessons learned from the project were described. Transportation related issues which emerged included public transit planning and operation; safety and accident reduction; environment, energy and transportation; urban traffic management; modeling and data analysis; pricing; urban freight transportation; mobility management; and transportation planning, land use and implementation, and policy formulation.

Associated Categories: Knowledge Sharing, Technology Transfer, Transportation - Other

180. Do downsizing decisions affect organisational knowledge and performance?

Sitlington, Helen; Marshall, Verena Management Decision, Vol 49(1), 2011, 116-129.

Purpose: This study seeks to examine the impact of downsizing and restructuring decisions and processes on perceptions of organizational knowledge and effectiveness after downsizing and restructuring events in "successful" and "unsuccessful" organizations. Design/methodology/approach: The study proposes a conceptual framework hypothesizing that the impact of decisions and processes on levels of organizational knowledge are key determinants of effectiveness in post-downsizing and restructuring organizations. Data were collected using a survey instrument developed through review of literature along with focus group findings. Survey data are factor-analyzed to identify stable constructs for testing hypotheses using regression analysis. Findings: The findings indicate that the significance of the variables tested is found in those organizations considered by employees to be unsuccessful after downsizing and restructuring, rather than in their successful counterparts. Practical implications: The findings indicate that organizations undertaking downsizing or restructuring need to consider the organizational culture and climate with regard to knowledge retention and the potential impact of these initiatives to ensure that employee experiences are constructive. Support strategies such as counseling and training are important, as are job redesign, time for employee handover and documentation of procedures, if knowledge retention is to be maximized. Originality/value: Although knowledge retention within organizations is generally accepted as desirable, little previous research has considered the impact of downsizing decisions or processes on knowledge retention. Additionally, data collected for this research were drawn from multiple respondents within a large number of organizations, providing breadth and depth of data for analysis. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Resource Limitations, Technology Transfer

181. Technology Transfer of Transportation Research Products and Ideas for Caltrans and the FHWA Division Office

Skeen, S. (contact) Research in Progress, California Department of Transportation

The National Cooperative Highway Research Program's NCHRP Synthesis 355 defines technology transfer as "activities leading to the adoption of a new-to-the-user product or procedure by any user or group of users" (NCHRP 355 (2005), pg 7). The report goes on to say that technology transfer is now recognized as important to achieving agency goals. This has also led to the practice of not just having a researcher push the technology on users, but to have users seek out new technologies to help them solve problems and improve existing processes (NCHRP 355 (2005), pg. 11). The Federal Highway Administration (FHWA) has a rich history of promoting technology transfer in the transportation industry; with specific focus on state departments of transportation. This is evident in the several programs and processes that have been developed; which include the transportation pooled fund program, the local technical assistance programs, and their internal technology transfer program. This focus on technology transfer performance measures has been incorporated into the Joint Stewardship and Oversight Agreement between FHWA and the California Department of Transportation (Caltrans). This project will strengthen the technology transfer effort in California. The focus of this project is to provide a mechanism to rapidly fund small tasks that will promote or aide in the implementation of developed technologies that will enhance the transportation industry. Each of these tasks will be qualitatively analyzed, in order to capture the benefits realized from this project.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Successes, Technology Transfer, Transportation - Federal, Transportation - State

182. Technology in Planning and Participatory Processes: Identifying New Synergies Through Real World Application

Slotterback, Carissa Schively; Hourdos, John

National Technical Information Service, CTS 09-09, February 2009, http://www.cts.umn.edu/Publications/ResearchReports/pdfdownload.pl?id=1440

This report provides a discussion of findings from a study of application of planning support systems (PSS) to typical participatory processes. For the purposes of this study, we are inclusive in our definition of planning support systems, addressing all types of technology that might be used in the preparation, execution, and analysis of participatory processes and outcomes. The overall intent of the study is to develop an understanding of how to tailor technologies to the unique aspects of various types of participation efforts used in planning practice. The report outlines some important background information related to the use of various types of technologies in participatory processes, including the challenges and opportunities associated with their use. The report also highlights and categorizes a range of current technologies that can be used to supplement or enhance planning and participatory processes. In addition, the report summarizes the findings of a series of five focus groups conducted with planners, engineers, and other practitioners related to the participation process and the application of technology. Finally, the report concludes with a discussion of the findings of survey or practitioners related to their perceptions of constraints and opportunities related to the implementation of technology in planning and participatory processes in their organizations.

Associated Categories: Barriers, Innovation Implementation, Resource Limitations, Successes

183. Beyond the technology adoption: Technology readiness effects on post-adoption behavior.

Son, Minhee; Han, Kyesook

Journal of Business Research, Vol 64(11), Nov 2011, 1178-1182.

Technology readiness (TR) refers to people's propensity to embrace and use new technologies. Nowadays, the proliferation of technology-based products and services brings consumers not only benefits but also frustration over ineffective use of products and services. A key factor, therefore, in the diffusion and success of these products and services is how well-prepared consumers are for new technologies. Although some studies examine the relationships between TR and technology adoption, the long-term survival and substantial success of firms rely on the continued use of such technology rather than first use. This study focuses on post-adoption behavior and investigates how TR affects the continued use intention of new technology. Specifically, the study classifies usage behavior into the usage rate of basic functions, the usage rate of innovative functions, and the variety of use of innovative functions. The article then, examines how each dimension (optimism, innovativeness, discomfort and insecurity) of TR influences consumer usage patterns, and how usage patterns affect repurchase intention through consumer satisfaction. The empirical results from IPTV users in Korea show that each dimension of TR has a significantly different influence on usage patterns. The findings show that usage patterns, particularly the use of innovative functions, have a significantly positive impact on consumer satisfaction and repurchase intention. Finally, the article suggests several managerial implications and directions for further studies. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Leadership, Culture, and Change, Private Industry, Successes, Technology Transfer

184. Improve Tech Transfer With This Alliance Scorecard

Spivey, W.A., J.M. Munson, W.T. Flannery, and F Tsai

Research Technology Management, Vol. 52, No. 1, January-February 2009, pp.10-18

To improve the chances of effective technology transfer, a strategic alliance must mirror respective objectives; a partnership is most effective when enterprises carefully match the type of technology to be transferred to the type of relationship between the technology supplier and recipient. The purpose of this paper is to introduce technology managers to a tool -- an alliance scorecard -- to help them incorporate all these voices into their thinking about strategic alliances. The insights derive from two sets of managers: one set works at a US OEM involved in producing a new generation of audio-visual displays, and the other works at a Taiwanese supplier. An alliance scorecard is useful in clarifying the key metrics of Asset Management, articulating the Value Discipline for the partners, identifying the contributions of each participant to Enterprise Equity, and setting the stage for mechanisms to enhance Knowledge Management, especially those related to the resolution of potential conflicts.

Associated Categories: Barriers, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Resource Limitations, Successes, Technology Transfer

185. Transportation Research Board Student Technology Transfer

Spring, G.

University of Missouri, Research and Special Programs Administration, UTC ETT62, Dec 2002, http://transportation.mst.edu/media/research/transportation/documents/ett062-cr.pdf

The goals of the University of Missouri-Rolla ITE Student Chapter are to promote the advancement of traffic and transportation engineering through close association with the profession and the Institute, and to acquaint students with transportation and traffic engineering topics through continuing education.

Associated Categories: Knowledge Sharing, Successes, Technology Transfer, University

186. Training substance abuse treatment organizations to adopt evidence-based practices: The Addiction Technology Transfer Center of New England Science to Service Laboratory.

Squires, Daniel D.; Gumbley, Stephen J.; Storti, Susan A.

Journal of Substance Abuse Treatment, Vol 34(3), Apr 2008, 293-301.

Underutilization of evidence-based treatments for substance abuse represents a longstanding problem for the field and the public health of our nation. Those who would most benefit from research advances (community treatment agencies and the clients they serve) have historically been the least likely to be exposed to innovative evidence-based methods for substance abuse treatment. To help address this gap, the Addiction Technology Transfer Center of New England (ATTC-NE), located at Brown University, has adapted and implemented an organizational change strategy intended to equip substance abuse treatment organizations and their employees with the skills needed to adopt evidence-based treatment practices. Since 2003, the ATTC-NE has worked with 54 community-based substance abuse treatment agencies from across New England using this model, which is called Science to Service Laboratory (SSL). Twenty-eight of 54 agencies completed all of the SSL components, and 26 of these 28 completer agencies (96%) successfully adopted and implemented contingency management as a result. Survey data comparing completer and dropout agencies' satisfaction with the quality, organization, and utility of the SSL indicate that both groups rated the SSL favorably. However, differences emerged with respect to organizational characteristics between completer and dropout agencies. Specifically, dropout agencies were more likely to report turnover in staff positions vital to training effort. Future directions for the model are discussed.

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Associated Categories: Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Successes, Technology Transfer, University, University to Industry, Unlearning Old Habits

187. Overcoming organizational fixation: Creating and sustaining an innovation culture.

Stempfle, Joachim

The Journal of Creative Behavior, Vol 45(2), 2011, 116-129.

Fixation on established paradigms and practices can severely limit the capability of organizations to change, thereby jeopardizing the ability of organizations to keep up with changes in their environment and new technological developments. Overcoming organizational fixation is therefore a requirement for any organization that strives to achieve sustained success. Based on a discussion of individual, social and organizational causes of organizational fixation, a framework for overcoming organizational fixation and establishing an innovation culture is presented. Elaborating on the important role of leaders in creating an innovation culture, competencies and behaviors of innovation leaders are discussed, and a comprehensive leadership development strategy is outlined. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Leadership, Culture, and Change, Technology Transfer, Unlearning Old Habits

188. Managing the innovative process: The dynamic role of leaders.

Stenmark, Cheryl K.; Shipman, Amanda S.; Mumford, Michael D.

Psychology of Aesthetics, Creativity, and the Arts, Vol 5(1), Feb 2011, 67-80.

Innovation has become increasingly important to the survival of organizations. Leaders must manage the process in a series of planning stages. These stages are qualitatively different and thus, have implications for what the leader must think about and do. The relevant leader cognition and social behaviors are discussed, as they must change throughout the process of planning for innovation. In order for leaders to effectively and efficiently manage innovation, they must be able to recognize and adapt to the varying requirements. Existing discrepancies in the literature may be resolved when considered within the context of these stages. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Technology Transfer

189. Federally Funded Innovation Inducement Prizes

Stine, D. D.

Congressional Research Service, June 29, 2009, http://www.fas.org/sgp/crs/misc/R40677.pdf

This analysis focuses on federally-funded “innovation inducement prizes, ” which are sponsored by federal organizations and designed to encourage scientists and engineers to pursue scientific and technical societal goals not yet reached. The objectives of such prizes are generally to identify new or unorthodox ideas or approaches to particular challenges; demonstrate the feasibility or potential of particular technologies; promote development and diffusion of specific technologies; address intractable or neglected societal challenges; and educate the public about the excitement and usefulness of research and innovation. They differ from “recognition prizes” such as the National Medal of Science, National Medal of Technology, and the Nobel prizes, which reward past S&T accomplishments. The scientific and technological goals for federally-funded innovation inducement prizes include the full spectrum of research, development, testing, demonstration, and deployment. They are an

alternative to more traditional ways of achieving societal objectives with S&T such as grants, contracts, fees, patents, and human or physical infrastructure investments that some think are too costly, risk-averse, and bureaucratic. Prizes differ in their intentions, objectives, sources of funding, competition mechanisms, reward structure, and other variables. The prizes themselves may take the form of recognition and publicity, cash, marketing monopolies, or other means.

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Other Public Sector, Successes, Technology Transfer

190. The Need for Technical Communicators as Facilitators of Negotiation in Controversial Technology Transfer Cases.

Sullivan, Dale L., Hayhoe, George F. (Ed); Grady, Helen M. (Ed)

Baywood's technical communications series., 2009, (pp. 177-183). Amityville, NY, US: Baywood Publishing Co, vi, 269 pp.

We take it for granted that technological innovation is a good thing, and that it will be adopted if we make it easy to understand and use. However, not all scientific and technical innovation is widely accepted as beneficial. In such cases, the task of the technical communicator needs to be more than that of an advocate for adoption who translates complex knowledge into simple language. If technical communication is going to set itself apart from public relations and marketing, its practitioners need to seek ways of becoming negotiators of technology, facilitating understanding, and creating opportunities for new interpretations and common ground to emerge. In this chapter, I explore the need for negotiators who help set conditions for the interpretation of controversial technology. I will get at this issue by telling the story of Monsanto's attempt to release transgenic wheat in the upper Midwest of the United States. It is my belief that we in technical communication should study cases of this kind to learn more about potential roles for technical communicators. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Knowledge Sharing, Private Industry, Successes, Technology Transfer, Trust and Communication

191. Technology Goes Local

Sullivan, J.L.

Public Roads, Vol. 66, March 2003, No. 5., pp.10-14, http://www.fhwa.dot.gov/publications/publicroads/03mar/03.cfm

Small and rural transportation agencies are responsible for building or maintaining nearly 3 million miles of roadways and more than 29, 000 bridges in the U.S. Ensuring that these local agencies have access to the knowledge and tools they need to do their jobs effectively depends on getting information about proven, new technologies and processes from the research centers into the hands of the transportation professionals who can implement them in the field. This article provides an overview of the Local Technical Assistance Program (LTAP), introduced in the 1980s by the Federal Highway Administration to facilitate information exchange in support of local road and bridge agencies. The focus is on LTAP's Product Demonstration Showcase Program, unveiled in 1995 with the goal of reducing the timeline for moving new technologies from state-of-the-art status to state-of-the-practice at the local level.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Successes, Technology Transfer, Transportation - Other, Transportation - State

192. How Necessary are Intermediary Organizations in the Commercialization of Research?

Suvinen, N., Konttinen, J. and Nieminen, M.

European Planning Studies, Vol. 18, No. 9, September 2010

As universities around the world are under pressure to produce commercial outputs of their research results, it is surprising how a few studies have been conducted about intermediary organizations and their role in this matter. The intermediaries' basic roles to diminish market and system failures in innovation processes are targeted to respond to the challenges that may emerge in innovation processes, in general, especially in the commercialization of academic research. In this article, we analyse the roles of, and needs for, different kinds of intermediary organizations in two Finnish technology agglomerations from the perspective of the commercialization of new knowledge.

Associated Categories: Commercialization, Knowledge Sharing, Networks and Teams, Technology Transfer, University to Industry

193. Development and Implementation of the Division of Research and Technology Web Page

Szary, P; Wible, J; Zeller, M; Maher, A

National Technical Information Service, FHWA-NJ-2002-024, Oct 2002

The New Jersey Department of Transportation (NJDOT) Research Division increased their output of technology transfer with the creation of an interactive web page. The web page provides technology transfer through information distribution of current as well as previous research to those who browse through the site. Current news and updates are available on the "what's new page." A photographic outline of the Research Division hierarchy, mission, strategic plan, and core values are available. Online distribution of resources for research associates provides a valuable tool for the university and research communities. Web page education of the NJDOT Research Division employees was included with the project. This allowed Research Division employees the ability to modify the graphics and other essential elements to the presentation of the website. The final placement of the website was to be located at the NJDOT site. This allows Research Division employees to update and change sections of the site to provide up-to-date information to research professionals and others who would be using the website resources.

Associated Categories: Marketing/Market Potential, Technology Transfer, Transportation - State

194. Individual choice or institutional practice: Which guides the technology transfer decision-making process?

Tello, Steven; Latham, Scott; Kijewski, Valerie

Management Decision, Vol 48(8), 2010, 1261-1281.

Purpose: This paper aims to examine the degree to which individual technology transfer officers' heuristics and biases, as well as peer technology transfer institutions' practices, influence the technology commercialization decision-making process. Design/methodology/approach: A qualitative method was used to gather data from technology transfer officers (TTO) regarding how they make commercialization decisions. Responses were examined in the context of rational choice theory and institutional theory in an attempt to discern whether common decision-making practices are shared among officers from different institutions. Findings: The subjects shared relatively few common organizational and professional decision-making practices. The sample was relatively evenly divided by TTO with an individual heuristic bias and those with a rational approach to decision making. Individual heuristics influenced all subjects to varying degrees. Research limitations/implications: The TTO

plays a central role in the technology commercialization process yet the paper found little evidence that professional practice and standards were integrated into decision-making processes. Further research examining why this is the case, and examining if there is a relationship to outcome success, is warranted. Practical implications: Managers need to better understand and monitor how decisions are made within individual offices. Technology transfer directors should conduct a process audit to determine the extent decision-making processes are internally or externally defined, and then implement best practice where appropriate. Originality/value: Very few studies examine how TTO make commercialization decisions, and fewer examine this phenomenon in the context of both a rational choice and institutional theory framework. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Commercialization, Leadership, Culture, and Change, Private Industry, Technology Transfer

195. An exploratory examination of knowledge-sharing behaviors: Solicited and voluntary.

Teng, James T. C.; Song, Seokwoo

Journal of Knowledge Management, Vol 15(1), 2011, 104-117.

Purpose: Knowledge sharing has been a central concern in knowledge management (KM) practice and research. However, knowledge sharing has remained largely a simplistic concept. This study aims to differentiate between solicited knowledge sharing and voluntary knowledge sharing and also to attempt to examine the role of both types of knowledge sharing in relation to task, culture, technology and knowledge management processes at the work unit level. Design/methodology/approach: The survey method was used. The questionnaire was issued to MBA students enrolled in a major southern university's cohort-based program for working professionals, and a total of 149 usable responses were collected. Findings: It was found that task routineness and open communication facilitate only solicited sharing behaviors, while perception of solidarity is significantly related to voluntary sharing behaviors. In addition, knowledge tools and tacit-oriented knowledge management processes were found to play a significant role in both voluntary and solicited knowledge sharing. Research limitations/implications: Exploratory analysis points to differentiated influence of these environmental conditions on the two knowledge sharing types, suggesting further implications for research and practice. With the realization that voluntary sharing is a more proactive form of knowledge sharing, knowledge management practitioners may find it beneficial to monitor different forms of knowledge sharing. Originality/value: While knowledge sharing has been the focus of intensive research in recent years, the concept itself has remained surprisingly simplistic among researchers. This study differentiates between two forms of knowledge sharing: solicited knowledge sharing and voluntary knowledge sharing. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Trust and Communication

196. INTEL'S Open Collaborative Model of Industry-University Research

Tennenhouse, D.

Research Technology Management, Vol. 47 Issue 4, Jul/Aug 2004, p19-26,

Intel's exploratory research program is a coordinated effort involving four key components: university research grants, open and collaborative research labs located adjacent to major universities, corporate venturing, and proprietary strategic research projects. The company's exploratory research model fosters collaboration and allows for projects to be carried out concurrently in different venues so as to enhance results and accelerate technology transfer. In developing the model, Intel drew on observations of existing industrial research labs in the information technology sector and borrowed lessons from the Defense Advanced Research Projects Agency about how to effectively manage complex research efforts.

Associated Categories: Commercialization, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Marketing/Market Potential, Networks and Teams, Private Industry, Technology Development, Trust and Communication

197. Generalization of employee involvement training to the job setting: Individual and situational effects.

Tesluk, Paul E.; Farr, James L.; Mathieu, John E.; Vance, Robert J.

Personnel Psychology, Vol 48(3), 1995, 607-632.

Examined if variables at individual, unit, and suborganization levels influence the extent to which knowledge and skills learned in employee involvement (EI) training are generalized beyond specific EI activities. A multiple-cross-level design using data gathered from 252 employees and supervisors drawn from 88 units across 11 suborganizations provided support for both individual and situational effects. Results demonstrate that characteristics at individual, unit, and suborganization levels significantly predicted the extent EI knowledge, skills, and attitudes were generalized to the core job activities. Trainees were more likely to use EI the more EI activities they participated in, the greater the commitment to the organization, and the less cynical they were about the likelihood of positive organizational change. More generalization of EI training was found to occur in units and suborganizations with less participative climates. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Barriers, Leadership, Culture, and Change, Successes

198. Appreciative inquiry and knowledge management: A social constructionist perspective.

Thatchenkery, Tojo Joseph; Chowdhry, Dilpreet

Northampton, MA, US: Edward Elgar Publishing. (2007). x 163 pp.

The authors of this book advance the Appreciative Sharing of Knowledge (ASK), a unique approach by which organizations create a culture that facilitates the sharing of information. Using social constructionist approaches, historical data, and case studies, the authors demonstrate that appreciation -- or affirmation -- is the key ingredient for people to trust each other and overcome their inhibitions and concerns about sharing what they know. The hyper-competitive culture of many organizations has created a knowledge-hoarding climate that many firms struggle to change. The ASK process can reinvent, in a sustainable manner, how we think about organizing knowledge. By linking practices, artifacts, technologies and managerial skills, the ASK model offers a management framework for a wide range of enterprises. One of the basic tenets put forth is that if knowledge is shared appreciatively, managing knowledge will no longer be an issue. The authors expand on the concept of appreciation and illustrate how systems can be created to institutionalize knowledge sharing. In addition, they give examples of organizations that have planted the seeds for the exchange to happen. Academics and practitioners in the fields of knowledge management and organizational behavior and development will find this innovative study of great value. The findings will also be of great practical use for managers and executives in a variety of firms. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Leadership, Culture, and Change, Trust and Communication

199. The missing piece: improving seismic design and construction practices

Thiel, C. C., editor, Rojahn, C. Project Manager

Applied Technology Council, ATC-57, 2003, http://www.nehrp.gov/pdf/atc57.pdf

In 2001, the Applied Technology Council (ATC) commenced a broadly based effort to define a problem-focused

knowledge development, synthesis and transfer program to improve seismic design and construction practices. Input was sought from seismic design and construction industry leaders, and a Workshop was convened in the summer of 2002 to develop the program. The report provides a framework for creating a knowledge bridge and allows the nation to more fully realize its NEHRP (National Earthquake Hazards Reduction Program) investment in practical terms—safer buildings. Industry participants recommended that NEHRP agencies develop a much expanded, problem-focused knowledge development, synthesis and transfer program that will: 1. Develop standards and guidelines that incorporate the best knowledge available in a practical way. 2. Facilitate the development of new mitigation technologies. 3. Improve the productivity of the engineering and construction industries. Included in this report are:

- A definition of what needs to be done;
- Background information on the impetus for THE MISSING PIECE: IMPROVING SEISMIC DESIGN AND CONSTRUCTION PRACTICES program, on how technology transfer works, and a history of the decline in engineering and construction productivity in the United States; and
- THE MISSING PIECE program plan

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Other Public Sector, Private Industry, Successes, Technology Transfer, Trust and Communication

200. Innovation Characteristics and Innovation Adoption-Implementation: A meta-analysis of findings

Tornatzky, L. G. & Klein, K.

IEEE Transactions on Engineering Management, Vol. EM-29, No. 1, February 1982

A review and meta-analysis was performed of seventy five articles concerned with innovation characteristics and their relationship to innovation adoption and implementation. One part of the analysis consisted of constructing a methodological profile of the existing studies, and contrasting this with a hypothetical optimal approach. A second part of the study employed meta-analytic statistical findings to assess the generality and consistency of existing empirical findings. Three innovation characteristics (compatibility, relative advantage, and complexity) had the most consistent significant relationships to innovation adoption. Suggestions for future research in the area were made.

Associated Categories: Successes, Technology Transfer

201. Decision Support System for Selection of Project Delivery Method in Transit

Touran, A., K.R. Molenaar, D.D. Gransberg, and K. Ghavamifar

Transportation Research Record, Journal of the Transportation Research Board, 2009, No. 2111, pp. 148-157

A decision support system was developed to help transit agencies evaluate and choose the most appropriate project delivery method for their capital projects. The system considers the traditional design–bid–build, construction manager-at-risk, design–build, and design–build–operate–maintain delivery methods. A set of 24 pertinent issues that can affect the choice of project delivery method are identified and described. The described decision support system consists of two distinct tiers. The first tier is a qualitative assessment in which the decision maker evaluates the effectiveness of each delivery method for dealing with the relevant pertinent issues. This tier will help agencies determine if there is a dominant or obvious choice of project delivery method. If at the end of this stage a clear choice is not evident, the user will move to the second tier, where a weighted matrix is used to score competing alternatives. The system will also provide a structure for documenting the project delivery decision in the form of a project delivery decision report. A validation process for the system is described, and a brief example is provided to show the application of the decision support system.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Other Public Sector, Outcomes Management, Transportation – Other

202. No Boundaries Roadway Maintenance Practices (Accelerating Maintenance Innovation Implementation and Technology Transfer Across State Boundaries)

Transportation Pooled Fund Project, Missouri DOT lead, with CA , GA , IA , MS , OH , PA , WA participating	Transportation Pooled Fund Program website, http://www.pooledfund.org/details/study/468

Research-in-Progress: Through this pooled fund project, the Missouri Department of Transportation plans to work with other State Departments of Transportation (DOTs) to establish a program in order to facilitate the implementation of promising innovations and technologies. This project will provide a forum for State DOTs to share their maintenance innovations with each other, support technology transfer activities and develop marketing and deployment plans for the implementation of selected innovations. Resources will be provided for implementing the innovations that includes travel, training and other technology transfer activities. It is anticipated that this consortium would become the national forum for state involvement in the technical exchange needed for collaboration and new initiatives, and be a forum for advancing the application and benefit of research technologies. State participation in this process will be through the pooled fund. The Federal Highway Administration (FHWA), industry, and others will be invited to participate in the project discussions and activities. Workshops could be provided for the states participating in the pooled fund project. This project will help DOTs to save time and money by not investing in the same research that has already been performed by other State DOTs; hence rather than having each DOT identify and implement research separately, DOTs can work collectively through this pooled fund project. The Missouri DOT will serve as the lead state for the execution of the pooled fund project described in this proposal. The Missouri DOT will handle all administrative duties associated with the project.

Associated Categories: Other Public Sector, Technology Transfer

203. Optimizing the Dissemination and Implementation of Research Results: A Summary of Workshop and Midyear Meeting Activities

Transportation Research Board Committees on Conduct of Research and Technology Transfer	TRB E-Circular 70, Number E-C070, November 2004, http://onlinepubs.trb.org/onlinepubs/circulars/ec070.pdf

This circular is the result of a joint initiative by the Transportation Research Board (TRB) Committee on the Conduct of Research and TRB Committee on Technology Transfer to investigate the issues and challenges associated with optimizing the dissemination and implementation of research results. It documents the problem exploration process and the potential priority actions from these efforts. The process was initiated with a workshop on May 5, 2003 that brought together over 60 transportation professionals from federal, state, city, and county agencies, the private sector, and research and educational academia to address the process of research dissemination and implementation. Then, the two sponsoring TRB committees met jointly for a midyear meeting on September 10-11, 2003 for a follow-up discussion to expand on issues and to develop priority actions for the committees. The following were among the priority actions mentioned most often by workshop participants and committee members: (1) Conduct a study to document best practices for research implementation, including a benchmarking effort; (2) Develop a guide to support implementation activities, including a contract verbiage, implementation plans, reporting mechanisms, and training tools; (3) Develop a framework and strategies for engaging end-users in all steps of the research process; and (4) Encourage the use of incentives for promoting implementation activity and promote the use of state planning and research funds to

support these activities. Another suggested action was to promote the recognition and use of the National Transportation Library (NTL) as a key resource for research dissemination and implementation.

Associated Categories: Innovation Implementation, Technology Transfer, Transportation - Federal, Transportation - Other, Transportation - State

204. Transpiration Technology Transfer: A Primer on the State of the Practice Transportation Research Circular 488

TRB Committee on Technology Transfer, Lynne Irwin, Chair

May 1998, http://onlinepubs.trb.org/onlinepubs/circulars/circ488/circ488_add.pdf

This Transportation Research Circular is a primer on technology transfer (T2) within the transportation enterprise. It was developed for the Committee on Technology Transfer of the Transportation Research Board. It is intended for use by state and local transportation agency personnel and T2 providers to understand the totality of the T2 process. This initial work is proposed as the forerunner of a more comprehensive T2 manual. Technology transfer is an integral part of the research and engineering functions. This report of the Transportation Research Board describes the technology transfer process as it is carried out by various technology transfer agencies, particularly in the United States. The circular is organized in the following sections: (1) What Is Technology Transfer?; (2) Technology Transfer in Practice; (3) Technology Transfer Practitioners; (4) User Needs and Prioritizing Resources; (5) Tools and Methods; (6) Barriers and Opportunities; (7) Evaluating Technology Transfer; (8) Technology Transfer Processes and Practices; and (9) The T2 Challenge for the Future. The appendix contains a list of the principal T2 organizations and contacts mentioned in the report.

Associated Categories: Barriers, Resource Limitations, Other Public Sector, Successes, Technology Transfer, Transportation - Federal, Transportation - State

205. Knowledge absorptive capacity and innovation performance in KIBS.

Tseng, Chun-Yao; Pai, Da Chang; Hung, Chi-Hsia

Journal of Knowledge Management, Vol 15(6), 2011, 971-983.

Purpose: The purpose of this paper is to discuss whether the three knowledge sources, knowledge input, knowledge spillover and knowledge absorptive capacity, really increase the innovation performance of firms in the Taiwan IC design industry, one of the most important knowledge-intensive business services (KIBS) industries in Taiwan. Design/methodology/approach: Based on the knowledge-based theory, this study uses pooled regression analysis and tests with fixed effect model to analyze the influence of three knowledge sources on innovation performance in the KIBS sector. Findings: The results demonstrate that: knowledge input is positively related to innovation performance; knowledge spillover effect is partial positively to innovation performance; and knowledge absorptive capacity is positively related to innovation performance. Originality/value: The paper advances the concept of absorptive capacity by defining it as the interactions between knowledge input and knowledge spillover and refines the measurement of absorptive capacity as the multiplication of knowledge input and knowledge spillover effects. Moreover, knowledge spillover effects and knowledge absorptive capacity are both divided into four kinds which help us distinguish clearly different sources of knowledge spillover and absorptive capacity. In addition to that, this study also contributes to the empirical evidence to innovation activities by using firm-level micro data. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Management, Knowledge Sharing, Private Industry

206. Decision Support & Technology Transfer

U.S. Department of Agriculture, Forest Service

http://www.fs.fed.us/research/climate-change/technology.php

The Forest Service is developing appropriate climate change adaptation and mitigation management plans. Much of the science required for this effort is produced Forest Service researchers. The Forest Service created a website that provides decision support tools for technology transfer. Specific products resulting from Forest Service research and funding include a variety of relevant areas such as: Tools to estimate carbon, to show potential species migration, to help determine appropriate seed sources for current and future climates, to assist National Forest planners incorporate climate change in forest plans, live and web-based training for national, regional, and local audiences, and a Climate Change Resource Center

Associated Categories: Knowledge Management, Knowledge Sharing, Other Public Sector, Private Industry, Successes, Technology Transfer

207. DOE's New Tech Transfer Policy

U.S. Department of Energy

Innovation, Volume 9 Number 3; http://www.innovation-america.org/doe%E2%80%99s-new-tech-transfer-policy

Guiding Principles for Technology Transfer at DOE Facilities The department's technology transfer activities, and its review of associated policies and procedures, shall be guided by the following principles: • COMMITMENT • EMPOWERMENT • FAIRNESS • FACILITATION • VISIBILITY, • LEVERAGE • IMPACT • PREDICTABILITY and • COOPERATION. Responsibilities: developing the department's technology transfer framework; establishing goals, strategies and performance measurement criteria that provide accountability for technology transfer results; taking responsibility for promoting partnership relationships among DOE facilities and reducing impediments to initiatives with non-federal partners; evaluating technology transfer efforts; implementing a technology transfer program consistent with their contract and in coordination with their funding programs; promoting implementation of technology transfer in a manner that supports small business needs and the formation of new companies; facilitating commercialization of technologies arising from their programs.

Associated Categories: Commercialization, Other Public Sector, Private Industry, Successes, Technology Transfer, University

208. Partnership Intermediary Agreement Template US Navy

U.S. Department of the Navy, Office of Naval Research

U.S. Department of the Navy, Office of Naval Research

The template is a model document for establishing a partnership intermediary agreement between the U.S. Navy and a selected partnership intermediary organization and includes intermediary agreement activates such as licensing of inventions, technology marketing programs and showcases, and more.

Associated Categories: Commercialization, Private Industry, Technology Development, Transportation - Federal

209. Department of the Navy, Technology Transfer Program, Online Training Course for Offices of Research and Technology Applications

U.S. Department of the Navy, Offices of Research and Technology Applications	http://www.onrglobal.navy.mil/orta_training/index.htm

This online training course from DON includes -General overview and review of the Office of Research and Technology Applications -Technology Transfer -Cooperative Research and Development Agreements (CRADA) Overview, Collaborators, Types of CRADA, Implementing a CRADA, Negotiating a CRADA, Administering a CRADA -Intellectual Property -Partnership Mechanisms

Associated Categories: Commercialization, Innovation Implementation, Knowledge Sharing, Other Public Sector, Technology Transfer

210. ITS Technology Transfer Portal

U.S. DOT Research and Innovative Technology Administration	http://www.its.dot.gov/tech_transfer.htm

The ITS Technology Transfer Portal is a repository of resources to assist in decision making for ITS applications. It includes training-professional capacity building programs, technical assistance, knowledge databases, communities of practice, a source of "What is in use today" and deployment evaluations.

Associated Categories: Commercialization, Knowledge Management, Knowledge Sharing, Networks and Teams, Successes, Technology Transfer, Transportation - Federal, Transportation - State, Trust and Communication

211. Key Findings and Recommendations for Technology Transfer at the ITS JPO

U.S. DOT, Research and Innovative Technology Administration	http://ntl.bts.gov/lib/42000/42100/42107/FHWA-JPO-11-085__Key_Findings___Recommendations_for_Tech_Transfer_at_ITS_JPO__PDF_508.pdf

This report provides key findings and recommendations for technology transfer at the Intelligent Transportation Systems Joint Program Office (ITS JPO) based upon an assessment of best practices in technology transfer in other industries, such as national labs, Federal Agencies, universities and industry. For this project, the assessment of best practices in other industries was comprised of the following components; a literature review to identify best practices; web surveys of technology transfer professionals in other industries and at University Transportation Centers to get the current perspective on technology transfer best practices; and site/telephone interviews to generate 7 case studies of the best practices of selected organizations in other industries. There are five (5) primary mechanisms for transferring technology that are common across all industries. These best practice approaches have been developed by organizations to help facilitate the transfer of technology to or from their respective sector: Licensing, Cooperative R&D, Technical Assistance, Information Exchange, and Public Sector Technology Transfer. Topics discussed for lessons learned are: Technology Transfer Process, Policy, Management and Operations, Intellectual Property, Licensing, Cooperative R&D Partnerships, Technical Assistance, Information Exchange, Metrics, Public Sector, and Trends. Recommendations for the JPO are: Form an ITS JPO Partners Program, Expand Collaborative R&D Partnerships in the Public and Private Sectors, Establish Research Park Hubs for Transportation Innovation, Develop a Transportation Commercialization Portal, Expand Small Business Mentoring and Support, and Enhance IP Identification and Valuing/Creating Market Opportunities.

Associated Categories: Barriers, Commercialization, Knowledge Management, Knowledge

Sharing, Resource Limitations, Networks and Teams, Private Industry, Successes, Technology Transfer, Transportation - Federal, Trust and Communication, University

212. Partnership Intermediary Agreements (PIAs) and Technology Transfer, Agricultural Research Service

USDA Agricultural Research Service	Brochure, April 2008, http://www.ars.usda.gov/SP2UserFiles/Place/36200000/OTT-S2.pdf

Partnership Intermediary Agreements allow federal research agencies to enter into an agreement with a non-profit organization(partnership intermediary) to assist the federal agency with its technology transfer efforts. The partnership intermediary's services complement those of the federal laboratory and increase the likelihood of success in conducting cooperative or joint activities between the federal agency and a partnering organization (businesses, universities, or other federal agencies). The partnering organization offers many benefits to ARS researchers, including: • identifying potential research partners and licensees, • increasing access to a variety of businesses, • providing industry perspective on ARS technologies, • increasing the likelihood of impact from research outcomes, • identifying potential funding sources for research scientists, and • expanding customer and stakeholder interactions with the private sector and other federal agencies

Associated Categories: Commercialization, Other Public Sector, Private Industry, Successes, Technology Development, Technology Transfer

213. Technology Transfer of Intelligent Transport Systems: China and the Netherlands

van Zuylen, H. J., and Y.S. Chen	Transportation Research Record: Journal of the Transportation Research Board, Vol 1848, 2003

China is a developing country with a great need for an expansion of its transport system. Its policy aim is, among others, stimulating the role of the car in its transport system. That creates problems similar to those found in nearly all other countries in the world: congestion and inefficiency of the road transport system, especially in and around cities. To deal with those problems and to speed up the process of solving them, the Chinese cities cooperate with experts from other countries. Intelligent transport systems (ITS) are seen as a key to solving urban congestion problems. A cooperation agreement has been signed between the Chinese government, certain Chinese cities, and the Netherlands Ministry of Transport that aims to exchange experts, execute shared research and development, and provide training. The shared research shows that many of the traffic problems in Chinese cities differ very little from problems found in European cities: many of the problems concern particularly the interfaces between high-capacity urban freeways and the urban road network. The technology transfer was executed partly by providing training to Chinese experts. The training program is based on two principles: training for impact and training the trainers. The impact concerns participants applying what was learned from training to their daily practice, and their improved ability to work on solving traffic problems. Course participants are stimulated to become trainers themselves. The first results of the Chinese-Netherlands ITS training center are very promising.

Associated Categories: Barriers, Entrepreneurship Education, Innovation Implementation, Knowledge Management, Knowledge Sharing, Leadership, Culture, and Change, Resource Limitations, Other Public Sector, Private Industry, Successes, Technology Transfer

214. Organizational Cynicism

Vance, Robert

Vance, R. (2007). Organizational cynicism. In S. G. Rogelberg (Ed.), Encyclopedia of industrial and organizational psychology (Vol. II). Thousand Oaks, CA: Sage Publications.

Organizational cynicism is a tendency to find fault with the management of one's workplace and to criticize the efforts of others who strive for excellence, while doubting their motives. A cynic can be said to be prematurely disappointed in the future. Various approaches to the study of cynicism contribute essential insights into its role in the psychology of the individual and as a dimension of social processes at work: (1) there is a dispositional aspect to cynicism -- some people are generally more pessimistic than others, and when they encounter frustration and duplicity they more readily become cynical than optimists; (2) cynicism requires specific targets -- everyone is capable of becoming cynical about something; (3) cynicism serves a purpose -- it is a psychological defense against disappointment and frustration, so that cynics are not as disappointed as non-cynics when promised benefits fail to appear, indeed they are righteously reassured to know that their doubts were well-founded; (4) cynicism is learned through direct experience and through group socialization (e.g., senior co-workers alert a newcomer to management guile and duplicity) -- with experience comes wisdom and, for many, cynicism; (5) cynicism implies behavior, or perhaps lack of behavior (i.e., resistance to change) -- if one expects any and all improvement initiatives to fail, why bother to get involved?

Associated Categories: Barriers, Leadership, Culture, and Change

215. Implementation of High-Performance Concrete Bridge Technology in the USA

Vanikar, S.N., and L.N. Triandafilou

Seventh International Symposium on the Utilization of High Strength/High-Performance Concrete, Special Publication, Vol 228, pp. 1-12, June 1, 2005

The utilization of high performance concrete (HPC) has increased substantially in the last decade. HPC can provide enhanced mechanical and durability properties and at the same time allow efficient placement and finishing. HPC has been utilized for cost-effective construction of bridges, buildings and pavements in most countries. The Federal Highway Administration (FHWA) has played a key role in the HPC technology transfer from research and development to routine practice for bridge and pavement design and construction. FHWA's HPC implementation for highway bridges in the USA has been a success story. The success has been largely due to a long-term continuing partnership between FHWA, State Departments of Transportation, American Association of State Highway and Transportation Officials (AASHTO), local agencies, industry and academia. This paper provides an historic perspective on the HPC implementation activities since the Strategic Highway Research Program (SHRP) in late 1980's and the subsequent programs and activities. Forty-four State Departments of Transportation have utilized HPC. HPC implementation has contributed significantly to improvements in highway infrastructure. Implementation of the long-term strategic plan developed by the industry will further contribute toward meeting the goals which include reduced congestion and improved safety, trained workforce, reduced life cycle costs and improved quality as well as reliability

Associated Categories: Commercialization, Innovation Implementation, Successes, Technology Development, Technology Transfer, Transportation – State

216. Pavement Preservation Technology Transfer Among Southeast States

Varndoe, S. (contact)

Research in Progress, Transportation Pooled Fund Project, NCDOT lead state

The research is designed to: 1) Assist states in developing sound pavement investment programs to gain infrastructure and operational efficiencies and also satisfy the new reporting requirements of GASB 34; 2) Develop a partnership in the southeastern region to share experiences with pavement preservation treatments. Information exchange would include treatment design, construction practices, performance measures, specifications, as well as research needs; 3) Present an annual workshop meeting to highlight common successes and problems, identify research needs, assemble best practices, and allow for a general transfer of knowledge. A regional exchange of thinking and expertise would solve common issues among the states much more effectively. The success of the partnership depends on its ability to create a forum where states may meet as a group.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Successes, Technology Transfer, Transportation - State

217. A typology of knowledge sharing networks in practice.

Verburg, Robert M.; Andriessen, Erik J. H.

Knowledge and Process Management, Vol 18(1), Feb 2011, 34-44.

Knowledge intensive organizations often rely on knowledge sharing networks. Such networks, often called 'communities of practice' are found in many organizations but their forms and functions appear to be quite diverse. In this article we determine and discuss a number of basic types of knowledge networks. A literature analysis and a study of 38 networks in large organizations yielded two dimensions of networks, institutionalization and proximity. On the basis of these dimensions four basic types of knowledge networks were discerned: strategic networks, informal networks, question and answer networks, and on-line strategic networks. The recognition of this variety of knowledge networks highlights the different ways in which knowledge sharing and creating can be organized and shows that these different forms of organizing require different technological and organizational support. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Networks and Teams

218. A Guide to Transportation Technology and Innovation, 2004

Volpe National Transportation Systems Center

Volpe National Transportation Systems Center, January 2004

This guidebook was produced by members of the U.S. Department of Transportation (DOT) Technology Innovation Committee and is intended as an overview of innovation and technology transfer activities in the Department. The guide presents a quick reference to innovation, research, and technology activities at the DOT as well as points of contact and is designed to help the user pursue development of more formal technology and innovation sharing partnerships.

Associated Categories: Innovation Implementation, Technology Transfer, Transportation – Federal

219. Different determinants at different times: B2B adoption of a radical innovation.

Vowles, Nicole; Thirkell, Peter; Sinha, Ashish

Journal of Business Research, Vol 64(11), Nov 2011, 1162-1168.

This research aims to empirically determine which factors best explain business to business adoption of a radical, high-tech innovation early in the diffusion process. Early lifecycle data collection provides insights about the differences in determinants of adoption at different times in the product diffusion process. The results indicate that differences do exist between the determinants of early adoption, intent to adopt later, and unawareness of the innovation. The influencers of earliest adopters appear to be innovation-focused: the perceived benefits of

the innovation as well as the strength of the producer network positively relate to early adoption; early adopters also tend to perceive the technology in the innovation as less different than previous technology than do those who intend to adopt later. The influence of a champion within the adopting firm, the ability of the firm to sense and respond to new technology, and the depth of technology knowledge within the adopting firm are significant influencers across multiple stages of diffusion, showing that firm-internal traits are particularly important influencers of adoption. Laggard firms are missing the critical firm traits that lead to information gathering and understanding of innovations. In addition to contributing to adoption research theory and methodology, this research has implications for innovation-marketing and innovation-adopting firms. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Innovation Implementation, Leadership, Culture, and Change, Private Industry, Successes, Technology Transfer

220. Defining the Concepts of Technology and Technology Transfer: A Literature Analysis

Wahab, S.A., R.C. Rose, and S.I.W. Osman

International Business Research, Vol. 5, Issue 1, January 1, 2012, pp.61-71

The primary objective of this paper is to contribute to the existing literature by comprehensively reviewing the development, definitions and concepts of technology and technology transfer based on a literature review conducted on these wide research areas. This review covers various definitions and dimensions of both technology and technology transfer from the early technology concept i.e. from the development of Solow's (1957) growth model up to Maskus's (2003) definition and concept of technology and technology transfer. While the term 'technology' itself is difficult to interpret, observe or evaluate, as argued by many scholars, this review attempts to provide in-depth discussion and enhance understanding on these concepts from various perspectives, research background and disciplines. This review could shed some dynamic ideas for future researchers to further identify, conceptualize and understand the underlying theories and perspectives which strongly influence the previous, current and future concept of technology transfer. The article presents a list of definitions of technology transfer from 1968-2003.

Associated Categories: Barriers, Knowledge Management, Knowledge Sharing, Resource Limitations, Successes, Technology Transfer

221. Conference Proceedings, Technology Transfer of Federally Funded R&D: Perspectives from a Forum

Wang, M.S., Pfleeger, D.M. Adamson, G. Bloom, W. Butz, D. Fossum, M. Gross, C. Kelley, T. Kelly, A. Kofner, and H. Rippen

RAND, 2003, http://www.rand.org/content/dam/rand/pubs/conf_proceedings/2006/CF187.pdf

In order to identify important issues and best practices, a Technology Transfer Forum was held at RAND's Washington, D.C., office on December 12, 2002, to raise as many issues and perspectives as possible on the topic of technology transfer. This forum included a roundtable discussion featuring the participation of technology transfer experts representing research universities, federal laboratories, the U.S. government, and various industries. A significant portion of the agenda was devoted to an open forum session at which attendees could make public comments. An open discussion period also provided an opportunity for additional comments. Many individuals who were unable to attend the forum could submit comments from an on-line questionnaire-and-comments form. Several themes emerged from discussions at the forum and subsequent questionnaire submissions. The discussion that follows represents RAND's summary of the main issues and perceptions that emerged at the forum. Note that these are perceptions only and not necessarily fact, although the opinions expressed here may help to suggest where further research may be most valuable. Technology Transfer: Adjusting to the Policy Environment • Participants generally agreed that improving technology transfer involves a steep

learning curve. It has taken decades for organizations to learn how to operate successful transfer programs. • In part because of the length of this learning curve, many forum panelists and attendees expressed the belief that technology transfer legislation should not be altered. • There is a broad perception that the U.S. R&D landscape has changed in the past two decades. For instance, the relative share of R&D funded by government is believed to have shifted, altering the balance of basic versus applied research, and a short-term focus versus a long-term focus. General Views of Technology Transfer • Panelists and attendees noted that technology transfer should be viewed broadly. A framework including federal investment, legislation, and commercialization seemed useful. • Many forum attendees discussed technology transfer within a global context. U.S. competitiveness and an increasingly global economy spurred these comments. Industry partnerships with foreign research institutions was also a recurring point of discussion. • Successful commercialization requires significantly more than a good idea or new technology. Developing a successful product requires, among other things, effective management, strategy, timing, and marketing. Coordinating among many organizations, some with widely varying missions, is a significant challenge. Implementation of Technology Transfer • Many attendees urged that recommendations to improve technology transfer, particularly of implementation issues, be tailored to specific circumstances. The processes that work for one industry or institution may not be applicable to another. • Employees at the federal laboratories feel less incentive than their counterparts in universities or in industry to contribute to technology transfer. Lack of consulting time, royalties, and equity in startups were among the issues raised. • The implementation of technology transfer is not uniform: Technology licensing offices operate in diverse ways and do not apply Bayh-Dole uniformly. • The increase in interdisciplinary and jointly sponsored research sometimes creates confusion when ownership of intellectual property is not clear. • Resources early in the technology transfer process are sought by all parties. Lack of these early resources hinders technology and market development, and hinders patent and licensing processes. This document contains an extensive bibliography on Federal/Private sector technology transfer, including over 700 citations.

Associated Categories: Barriers, Commercialization, Resource Limitations, Other Public Sector, Private Industry, Successes, Technology Transfer, Transportation - Federal, University

222. Hand-held Thermographic Inspection Technologies

Washer, G. — Research project TPF-5(152) http://engineers.missouri.edu/washerg/2011/08/23/htit/

Thermal (infrared) imaging is used to detect and image subsurface damage (delaminations) in concrete. The technology works by imaging temperature variations on the surface of the concrete that result from subsurface damage such as delaminations. Images showing damage are observed in real-time by the inspector, so that on-site assessment can be conducted. A significant advantage of the technology is that it is rapid, non-contact and can be utilized from a distance, such that arms-length bridge access and traffic control are not required. As a result, the technology can be used to rapidly scan large areas of a bridge to identify areas of damage. Additionally, the technology is commercially available in field-hardened configurations suitable for use in the bridge maintenance and inspection environments, and training to use the technology is minimal.

Associated Categories: Knowledge Management, Knowledge Sharing, Successes, Technology Transfer, Transportation - State

223. Social capital and knowledge transfer: A multi-level analysis.

Wei, Jun; Zheng, Wei; Zhang, Mian — Human Relations, Vol 64(11), Nov 2011, 1401-1423.

This study explores how individual level and team level social capital characteristics manifest their joint influence on knowledge transfer, considering team social capital as a moderator between individual social capital and knowledge transfer. Situated in a post-training context, a survey of 390 individuals from 30 teams in a Chinese bank was conducted. Our results revealed that team social capital interacted with individual social capital in

influencing knowledge transfer. At the individual level, distance and structural equivalence between the knowledge seeker and the knowledge source influenced how much knowledge was transferred between them. Furthermore, team network density mitigated the negative effect of distance on knowledge transfer, and team learning culture reduced the positive effect of structural equivalence on knowledge transfer. Theoretical implications based on the findings are drawn. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Networks and Teams, Private Industry

224. Determinants of success in IS offshoring projects: Results from an empirical study of German companies.

Westner, Markus; Strahringer, Susanne

Information & Management, Vol 47(5-6), Aug 2010, 291-299.

High labor cost in western countries allows cost savings by companies engaging in IS offshoring. However, studies worldwide indicate that a large number of companies that engaged in IS offshoring are not satisfied with the outcome. Our study examined the determinants of IS offshore project success: We developed a model and empirically tested it with data collected from 304 experts who reported on projects offshored from Germany to a wide range of near and distant countries. The model posited a direct effect of offshoring expertise and trustin offshore service provider (OSP) on success, as well as an indirect effect mediated by project suitability, knowledge transfer, and liaison quality. An analysis using partial least squares (PLSs) provided significant support for almost all these relationships. However, it showed that offshoring expertise played a minor role in explaining success and the mediating constructs. Trust in OSP had a small direct effect on success and a medium to large effect on the mediating constructs. Project suitability, knowledge transfer, and liaison quality all had small direct effects on success. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Associated Categories: Knowledge Sharing, Private Industry, Trust and Communication

225. Decision Support for Airport Strategic Planning

Wijnen, R.A., W.E. Walker, J.H. Kwakkel

Transportation Planning and Technology, Feb 2008, Vol. 31, Issue 1, pp. 11-34

Master planning is currently the dominant approach to airport strategic planning. However, history shows that this approach can often result in costly mistakes. Because there are many stakeholders with conflicting objectives, deep uncertainty about the future, and many potential strategies, planners often narrow their scope by using a single forecast for the future, leaving out alternative strategies, and excluding stakeholders, resulting in a master plan that quickly becomes obsolete and may be opposed by some stakeholders. What is needed is a flexible, integrated approach that enables collaboration among stakeholders. Such an approach can be facilitated using a decision support system (DSS) that provides a way for decision makers and stakeholders to evaluate alternatives quickly and easily with respect to their outcomes of interest. The authors present the conceptual design for a DSS called HARMOS, showing how it meets the high-level requirements for airport strategic planning while addressing the problems associated with master planning.

Associated Categories: Innovation Implementation, Knowledge Management, Knowledge Sharing, Other Public Sector, Outcomes Management

226. The role of technology transfer offices in building the South African biotechnology sector: an assessment of policies, practices, and impact

Wolson, R. A.

Journal of Technology Transfer, No. 32, 2007, pp. 343-365

While South Africa appears to have many of the building blocks in place to support a vibrant biotechnology sector, the potential which exists has not yet been realised. Several policies and programmes have therefore been introduced by government in recent years in order to address some of the barriers. The poor flow of technologies from research laboratories to industry has been identified as an area of particular concern, with the role of institutional technology transfer offices (TTOs) as facilitators of improved technology transfer being highlighted. This paper describes the status quo of biotechnology in South Africa, discusses relevant policy developments and against this background, examines the status of TTOs, the constraints which are faced and how these might be overcome.

Associated Categories: Barriers, Commercialization, Resource Limitations, Private Industry, Successes, Technology Transfer, University, University to Industry

227. Bringing Innovations to Market

Zirlin, J.	Public Roads, Vol. 72, Issue 4, January 2009, pp. 22-27, http://www.fhwa.dot.gov/publications/publicroads/09janfeb/04.cfm

This article describes a Federal Highway Administration (FHWA) program that is helping highway industry innovations make the leap from promising prototypes to market-ready products. The Technology Partnerships Program provides grants to fund the critical final steps in developing technologies with potential to improve project or work zone safety, accelerate construction, reduce construction-related congestion, or improve quality. The program, established in 2007, also promotes partnerships to test and demonstrate those technologies in real-world settings. The grants enable companies to adapt nonhighway-related innovations to highway use or refine existing equipment, materials, or processes that are not common practice in the transportation industry. The Technology Partnerships Program is part of Highways for LIFE, an FHWA initiative to accelerate innovation in the highway industry. So far, FHWA has awarded Technology Partnerships grants of $200, 000 to $500, 000 to five companies to refine and evaluate prototype technologies. The projects include an all-weather pavement marking system for work zones, an intelligent asphalt compaction analyzer, an aggregate imaging system, an automated pavement marker placement system, and an asphalt binder cracking device. FHWA plans to announce the recipients of a second round of Technology Partnerships grants in spring 2009.

Associated Categories: Barriers, Commercialization, Innovation Implementation, Leadership, Culture, and Change, Resource Limitations, Marketing/Market Potential, Successes, Technology Transfer

228. Communicating the Value of Transportation Research, NCHRP Report 610

Zmud, J.P., J.L. Paasche, M. Zmud, T.J. Lomax, J. Schofer, J. Meyer	National Cooperative Highway Research Program, 2009, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_610.pdf

Among the resources developed under the National Cooperative Highway Research Program's (NCHRP) Project 20-78, "Communicating the Value of Research, " this guidebook advises transportation researchers, planners, managers, and others how to overcome communication challenges. The information in this guidebook shows how incorporating a basic communication strategy into the research process can make that process easier, and that by following the practical advice, one can increase the likelihood of research accomplishing the desired goal. The guide offers a blueprint for integrating communication throughout the research process and introduces new ways of thinking about it; stresses the importance of adopting a principle of continual communications throughout the research process. This means integrating communication at the beginning of the research planning and involving

others in each step. Incorporating communication produces important assets that complement the research results: building public trust, strengthening credibility, and inspiring positive action.

Associated Categories: Knowledge Sharing, Transportation - Federal, Transportation - State, Trust and Communication

IV. Suggested Readings on Technology Transfer

13. IT knowledge integration capability and team performance: The role of team climate.

Basaglia, Stefano; Caporarello, Leonardo; Magni, Massimo; Pennarola, Ferdinando	International Journal of Information Management, Vol 30(6), Dec 2010, 542-551.

21. How to Build a System to Implement Research and Innovation: Lessons Learned in Pennsylvania

Bonini, Michael R; Fields, Bonnie J; Vance, Robert J; Renz, Michael S; Harder, Barbara T; Treisbach, Mary W; Bankert Jr, Larry I	Transportation Research Record: Journal of the Transportation Research Board, 2011, Issue 2211, pp. 1-9

30. An application of the hospital-in-the-home unlearning context.

Cegarra-Navarro, Juan-Gabriel; Wensley, Anthony K. P.; Sánchez-Polo, Maria-Teresa	Social Work in Health Care, Vol 49(10), Nov 2010, 895-918.

33. Communities of practice: An alternative learning model for knowledge creation.

Choi, Mina	British Journal of Educational Technology, Vol 37(1), Jan 2006, 143-146.

38. Seven Keys to Building a Robust Research Program, NCHRP Synthesis 280

Deen, T.B. and B.T. Harder	Transportation Research Board, National Cooperative Highway Research Programs, 1999, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_280.pdf

42. Crafting organizational innovation processes

Desouza, K., C. Dombrowski, Y. Awazu, P. Baloh, S.Papagari, S. Jha, and J. Kim	Innovation: Management, Policy & Practice, Vol. 11, No. 1, April 2009, pp. 6-33.

47. Crafting organizational innovation processes

Elrahman, O.A.	Effective Transfer of Research Results: Human Element for Successful Transfer, Transportation Research Record: Journal of the Transportation Research Vol. 1848, 2003, pp.118-124.

53. Technology Transfer Desk Reference: A Comprehensive Guide to Technology Transfer

Federal Laboratory Consortium	April 2011, http://www.federallabs.org/pdf/T2_Desk_Reference.pdf

59. Implementation Research: A Synthesis of the Literature

Fixsen, D, S. Naoom, K. Blase, R. Friedman, and F. Wallace,	University of South Florida, National Implementation Research Network, 2005

77. Transportation Technology Transfer: Successes, Challenges, and Needs, NCHRP Synthesis 355

Harder, B.T. and R. Benke	Transportation Research Board, National Cooperative Highway Research Program, 2005, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_355.pdf

88. Implementation teams: A new lever for organizational change.

Higgins, Monica C.; Weiner, Jennie; Young, Lissa	Journal of Organizational Behavior, Vol 33(3), Apr 2012, 366-388.

90. Outcomes management: Incorporating and sustaining processes critical to using outcome data to guide practice improvement.

Hodges, Kay; Wotring, James R.	The Journal of Behavioral Health Services & Research, Vol 39(2), Apr 2012, 130-143.

92. For money or glory? Commercialization, competition, and secrecy in the entrepreneurial university.

Hong, Wei; Walsh, John P.	The Sociological Quarterly, Vol 50(1), 2009, 145-171.

108. The Challenge of Innovation Implementation.

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