

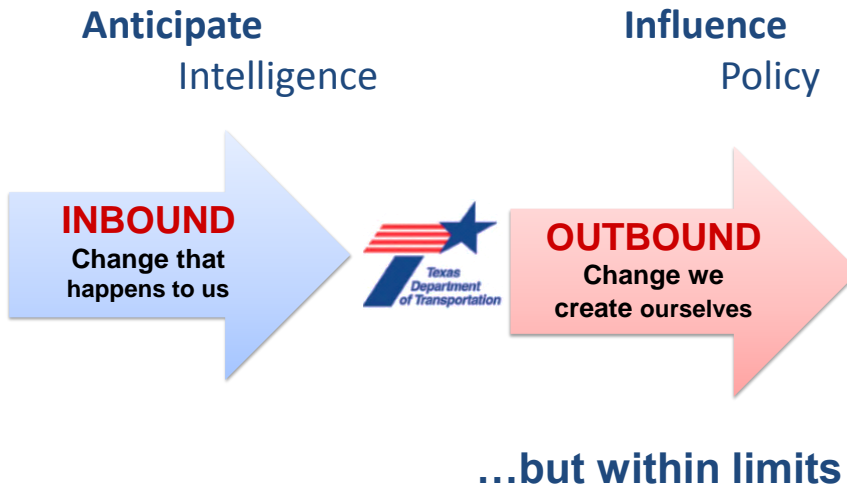


**TRANSPORTATION  
RESEARCH BOARD**  
OF THE NATIONAL ACADEMIES

The Case for Foresight  
Portland OR  
14 Aug 2016

*Dr. Peter Bishop  
Teach the Future  
Houston TX*

## The Future is about Change!



## Scenario Planning by any other name...

- **Planning**
- Outbound change
- Inside out
- “We could ...”
- Scenarios = alternative actions
- **Forecasting**
- Inbound change
- Outside in
- “The world could...”
- Scenarios = alternative conditions



We teach the future as we do the past.

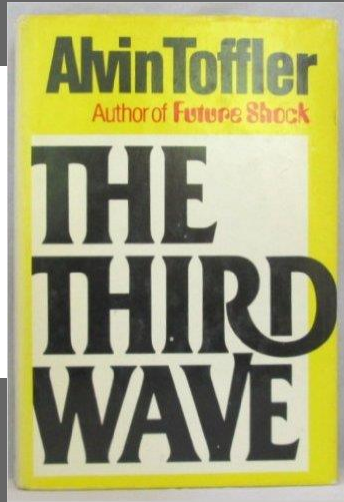
## Key questions

Should DOTs adopt more practices from Strategic Foresight?

- How well do traditional forecasting techniques work in today’s world?
- Is there an alternative? Is Strategic Foresight the alternative?
- What is Strategic Foresight and how does it compare to traditional forecasting?
- Is there a case to be made for using more Foresight practices?
- What difference would it make?



We teach the future as we do the past.

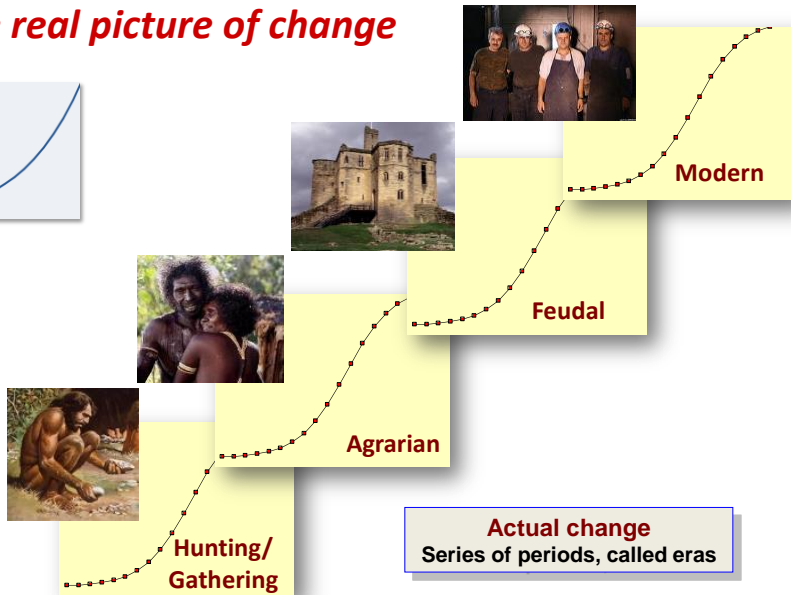


# Eras



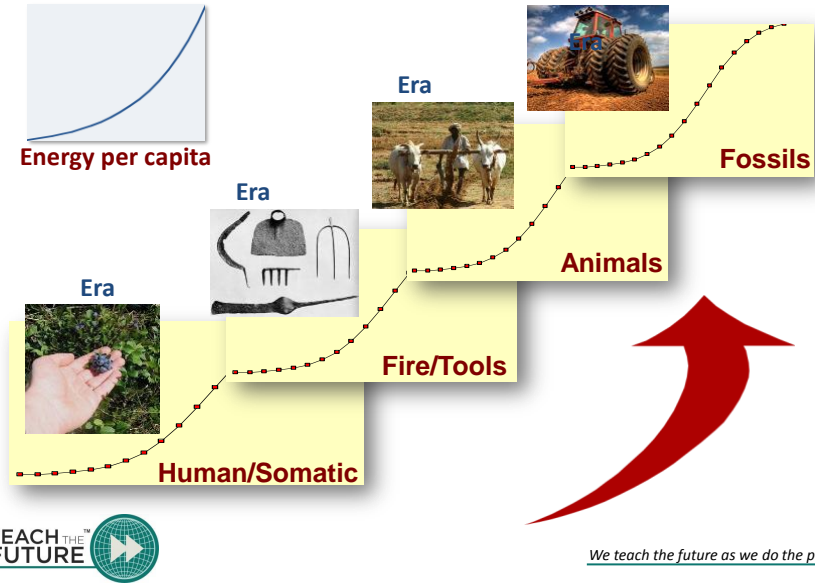
## Eras

*The real picture of change*

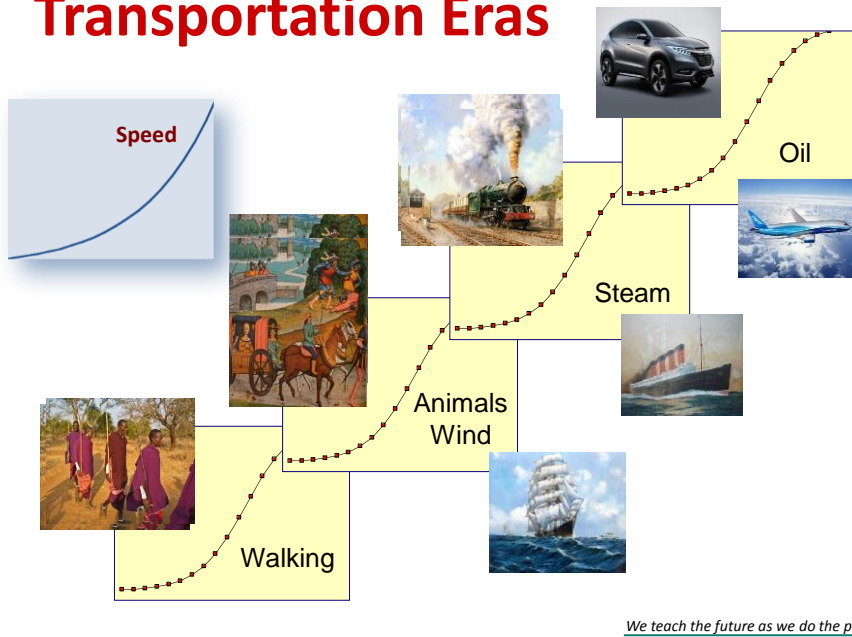


We teach the future as we do the past.

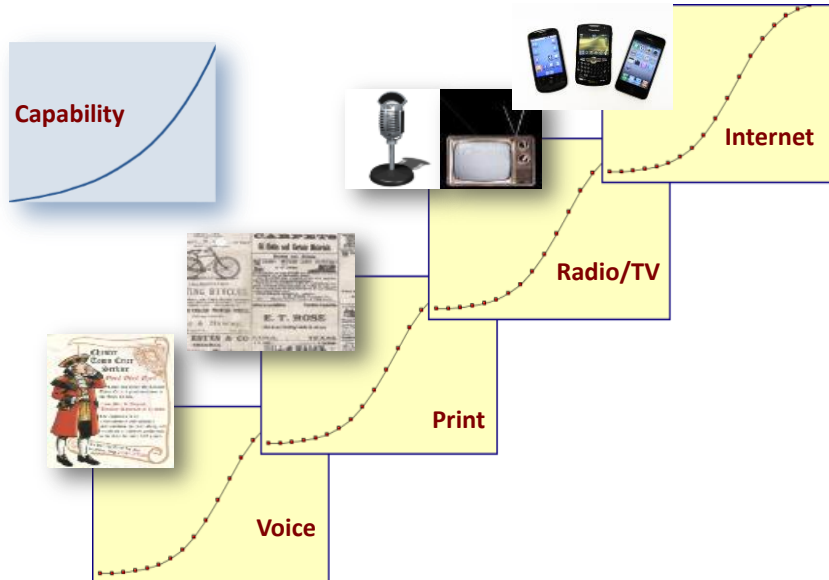
# Energy Eras



# Transportation Eras



## Communication Eras



We teach the future as we do the past.

## The Current World Era Instant Information and Communication

- Primary objective = The world at your fingertips
- Lead technology = Digital processes
- Primary means = Computers, Smart phones
- Primary infrastructure = Internet
- Primary funding = Private sector

## The Major Effects

- Orders of magnitude increase in the amount of **information** and the speed of **communication**
- Leading to more and faster **connectivity**
- Leading to more and faster **innovation**
- Leading to an increasing **rate of change**
- Leading to more frequent **disruptions**, greater **uncertainty** and more **surprises**

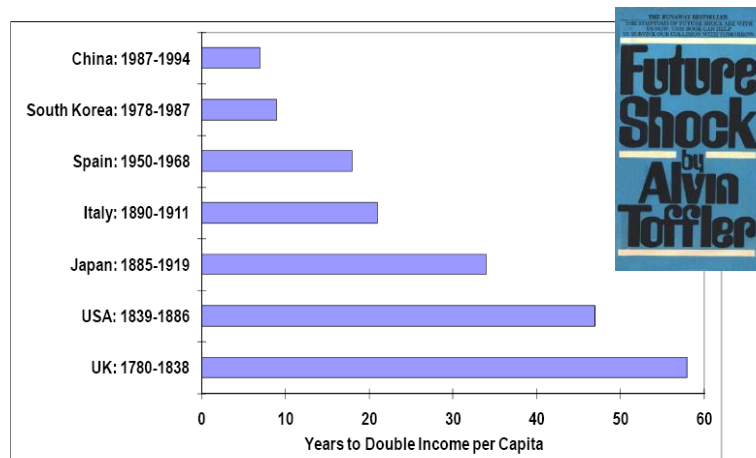
How well do traditional forecasting and planning work in this world?



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## Increasing Rate of Change

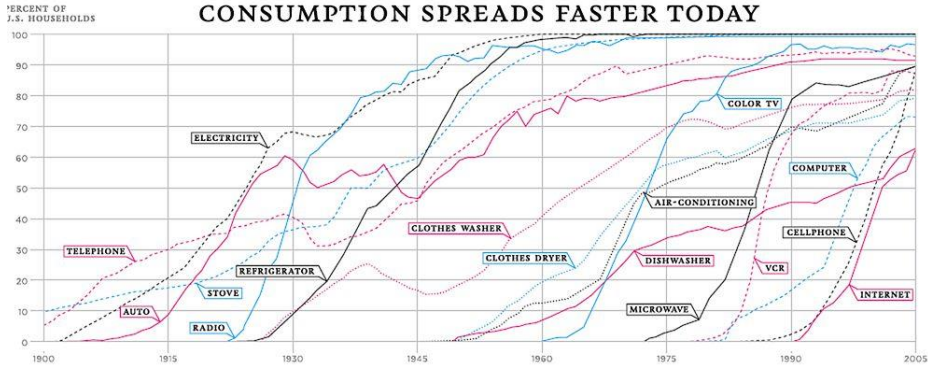
**Development** is faster and faster



Jose Cordeiro, *Thinking about the Unthinkable*, Olomouc University, 2010

*We teach the future as we do the past.*

# Accelerating rate of adoption



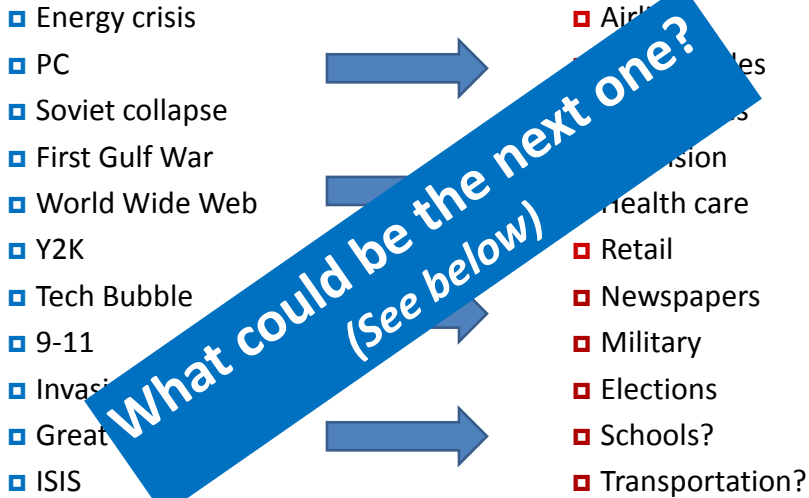
## Time to 50% adoption

- Telephone = 45 yrs
- Internet = 10 yrs



*We teach the future as we do the past.*

# More Frequent Disruptions



*We teach the future as we do the past.*

## The Previous DOT Era The Ribbon Cutting Era

- Lead technology = Petroleum
- Primary means = Automobile
- Primary objective = Build infrastructure
- Primary infrastructure = Roads and bridges, principally the Interstate System
- Primary funding = Gas tax



We teach the future as we do the past.

## The Current DOT Era Managed Decline\*

- Lead technology = *Digital processes*
- Primary means = *Computers, smart phones*
- Primary (transportation) objective = Preserve and maintain assets
- Primary infrastructure = Existing highway systems
- Primary funding = Gas tax

\* Title from a former TxDOT Commissioner

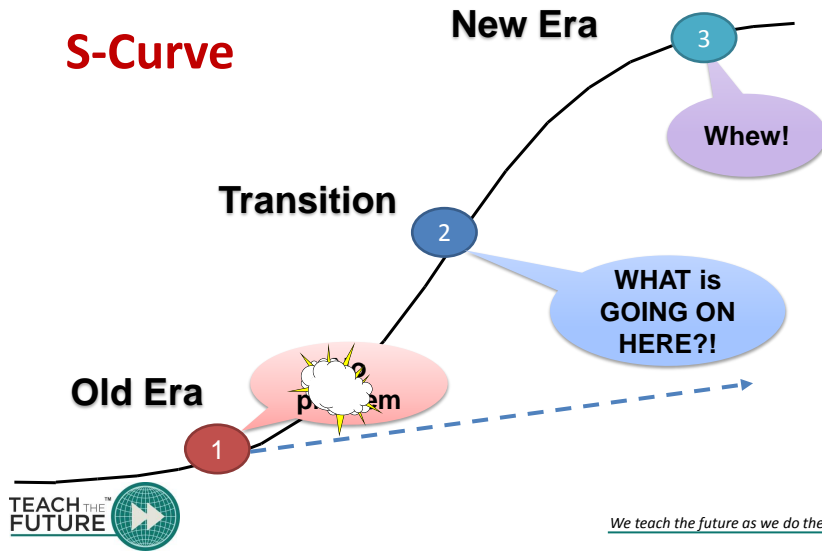
How well are we doing?



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# Transition



**Dealing with the Future**

# The Current Mental Model

## *Systems are complicated, but...*

---

Rational, intelligible

Direct causal relations

Direct feedback

Explanation and prediction

Possibility of control

Like mechanical systems



We teach the future as we do the past.

## Useful Metaphors for the Future

- Is the future more like a river or a **forest**?
- Is change predictable or is it **surprising**?
- Are we in control or is the **world**?
- Is building and maintaining transportation systems more like building a house or **growing a garden**?
- Can we “plan and act” or do we “**sense and respond**”?

**How well does the existing mental model describe the world today?**



We teach the future as we do the past.

## Models of Organization



Machine → Hierarchy



Internet → Network



Organism Ecology → Agents



We teach the future as we do the past.

## A New Look at Systems

### Wolfram's Four Systems Classes

**Class I**      Constant      **Ocean bottom**



**Class II**      Periodic      **Tidal pool**



**Class III**      Chaotic      **Crashing surf**



**Class IV**      Complex      **Coral reef**



We teach the future as we do the past.

## Two Mental Models

### *Complicated*

Macro behavior, variables  
 Rational, intelligible  
 Direct causal relations  
 Direct feedback  
 Explanation and prediction  
 Possibility of control  
 Like mechanical systems

### *Complex*

Micro behavior, agents  
 Unintelligible, unpredictable  
 No direct causality  
 Reciprocal feedback  
 Explanation but not prediction  
 Surprising, creative, innovative  
 Like living ecologies



*We teach the future as we do the past.*

## Learning about Forecasting



*We teach the future as we do the past.*

## Predictable Future

The future as a **river** or a **road** or even a **roller coaster**, following one path and leading to a specific point



We teach the future as we do the past.

## Contingent Future

The future as a **game of chance**, completely unknowable and unpredictable.



We teach the future as we do the past.

## Chosen Future

The future as  
 a **plan** or a  
**blueprint**, the  
 result of our  
 own efforts



*We teach the future as we do the past.*

## The Actual Future

Which one is correct? Why not use all three?

### – The Expected Future

- Where we are headed
- The future if everything continues as it has
- The result of conditions and trends (momentum)

### – The Alternative Futures

- What might happen instead
- The set of plausible futures if something less likely or unexpected happens
- The result of events and issues (contingencies)

### – The Preferred Future(s)

- What we want to happen
- Either the expected or any of the alternative futures that is preferable
- The result of our vision, goals, plans and actions (agency)



*We teach the future as we do the past.*

## Mechanisms of Change

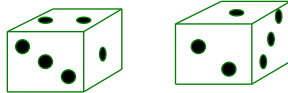
**Momentum**



**Choice**



**Disruption**



*We teach the future as we do the past.*

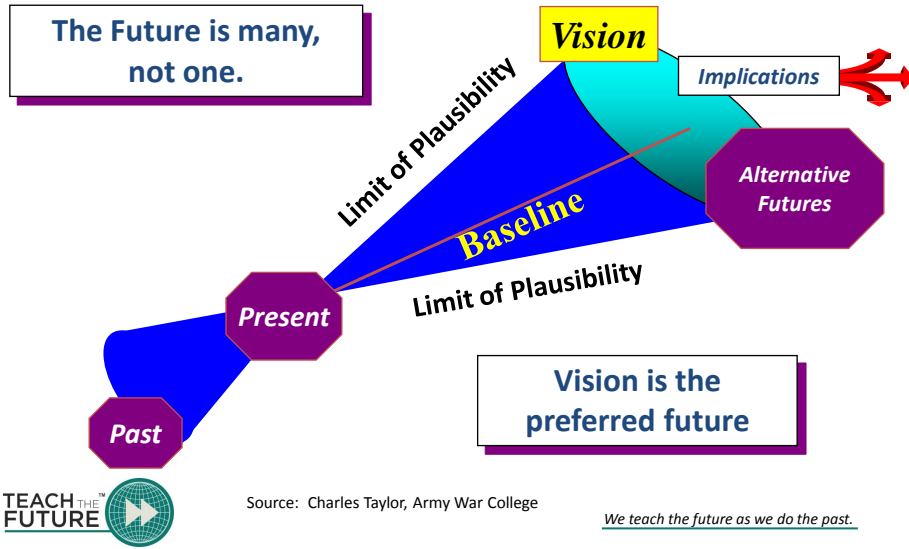
## Three Futures

<b>Futures</b>	<b>Forces</b>	<b>Thinking</b>	<b>Techniques</b>
<b>Expected</b> (baseline)	Constants Trends	Definite Scientific	Historical analogy Extrapolation
<b>Plausible</b> (alternative)	Discontinuities Surprises	Speculative Imaginative	Scenarios Simulation
<b>Preferable</b> (visionary)	Choices Images	Aspirational Empowered	Visioning Planning



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# The Cone of Plausibility



**Where to begin?**





## Is Strategic Foresight the Approach?

Strategic foresight is the ability to create and sustain a **variety of high quality forward views** and to apply the emerging insights in organizationally useful ways –

- to **detect** adverse conditions, **guide** policy, **shape** strategy
- to **explore** new markets, products and services

A process that broadens the boundaries of perception --

- By **assessing the implications** of present actions, decisions
- By **detecting and avoiding** problems before they occur
- By **considering the implications** of plausible future events and conditions
- By **envisioning** aspects of desired futures



Richard Slaughter,

[http://www.forschungsnetzwerk.at/downloadpub/LivreblancAgentielle-Strategic\\_foreight\\_EN.pdf](http://www.forschungsnetzwerk.at/downloadpub/LivreblancAgentielle-Strategic_foreight_EN.pdf)

*We teach the future as we do the past.*

## Forecasting

### *Traditional*

### *Foresight*

Short-term horizon (immediate)	Long-term horizon
Single domain (specialization)	Many domains
Few factors (reductionism)	Many factors
Focus on continuity (models)	Focus on discontinuity
Hide uncertainty (assumptions)	Reveal uncertainty
Single forecast (predictions)	Alternative forecasts
Quantitative techniques (math, computers)	Quantitative and qualitative techniques



*We teach the future as we do the past.*

## Step 1 – Challenge Assumptions

Assumptions resolve uncertainty...

...but resolving uncertainty

may not be the right thing to do.

So resolve as much uncertainty as you can, but no more.



Katrina



Rita



*We teach the future as we do the past.*

## Sources of Uncertainty

- Insufficient or incorrect **information** ?
- Insufficient or incorrect **understanding** ?

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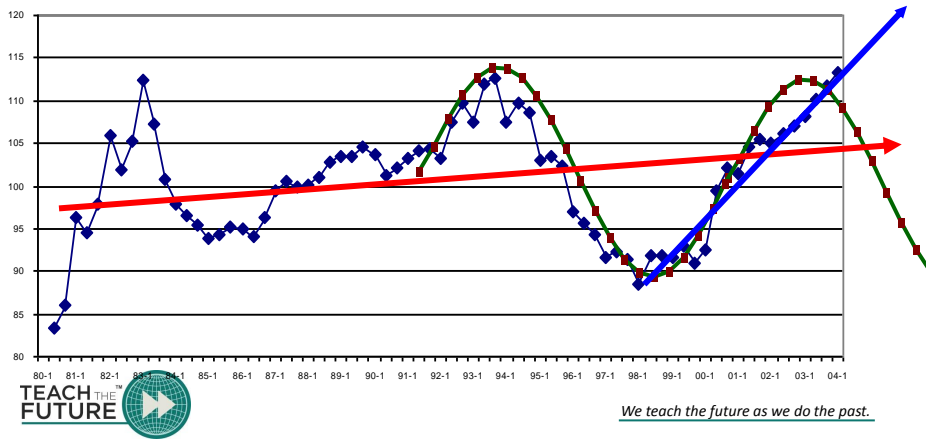
- Inherently unpredictable systems (**chaos**) ?
- Inherently **critical** systems ?
- Inherently **complex**, creative, emergent, self-organizing systems ?
- Human **choice** ?



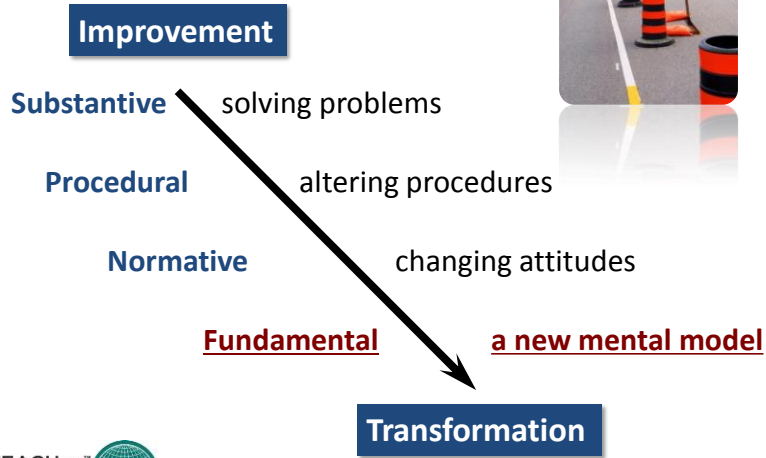
*We teach the future as we do the past.*

## Assumptions in Trend Extrapolation

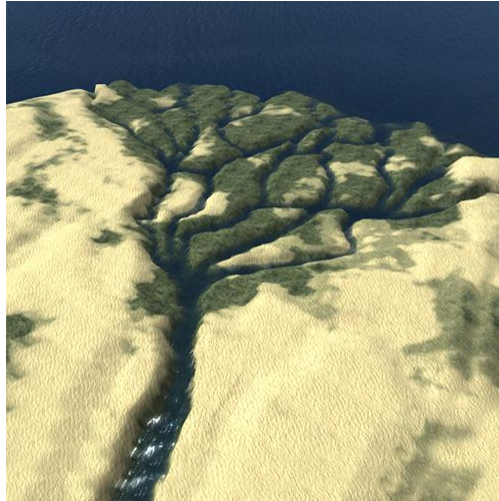
Business School Enrollment, UH-Clear Lake  
*Deseasonalized*



## Types of Change



## Step 2 – Think Contingently



River  
Or  
Delta?



*We teach the future as we do the past.*

### THE LANGUAGE OF PREDICTABILITY

#### PLAUSIBILITY

Indicative

Subjunctive

~~Will~~  
~~Must~~  
~~Should~~

~~May~~  
Doubt is an unpleasant state, but certainty is a ridiculous one.  
-- Voltaire, from Richards Heuer, The Psychology of Intelligence Analysis

**Could**



*Past*

*Present*

*Future*



*We teach the future as we do the past.*

## What If?

### *Who would have thought?*

- 1979 – Collapse of the oil market (Shell Oil)
- 1984 – Collapse of the Soviet Union (Shell Oil)
- 1990 – 2010 – Cell, then flip, then smart phones  
(Motorola?, Nokia?, Apple)
- Oil price -- \$17 (1998), then \$150 (2008), then \$28 (2016)
- 2000 – Al Gore loses Florida (Nader, the Supreme Court)
- 2001 – Terrorists flying aircraft into buildings
- 2006 – Collapse of the housing market (*The Big Short*)
- 2016 – Trump wins the Republican nomination



<b>Were these likely?</b>	<b>No.</b>
<b>Did they affect the future?</b>	<b>Definitely.</b>

*We teach the future as we do the past.*

## What If?

### *Who would think?*

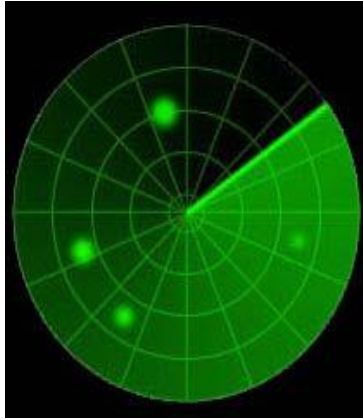
- Demographic – Closing the Southern border
- Technological – Virulent attack on the Internet
- Economic – Protective barriers to trade
- Environmental – Abrupt climate change
- Political – Trump victory
- Cultural – New tech safety standards

<b>Are these likely?</b>	<b>No.</b>
<b>But would they affect your future?</b>	<b>Definitely.</b>
<b>Should we think about them before hand?</b>	<b>Absolutely.</b>



*We teach the future as we do the past.*

## Step 3 – Look for the Signs of Change

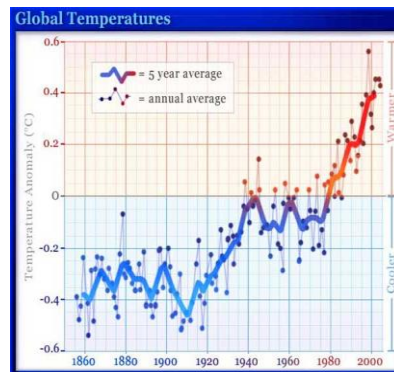


*We teach the future as we do the past.*

## Strong Signal

An **empirical fact** that is bound to change the future to some extent:

- Demographic
- Technological
- Economic
- Environmental
- Political
- Cultural



Source: Schlumberger,  
[http://www.seed.slb.com/en/scictr/watch/climate\\_change/change.htm](http://www.seed.slb.com/en/scictr/watch/climate_change/change.htm)



*We teach the future as we do the past.*

## Weak Signal

An **Event** or

A new piece of **Information**

That **could** change the future.



We teach the future as we do the past.

## Weak Signals? *Historical examples*

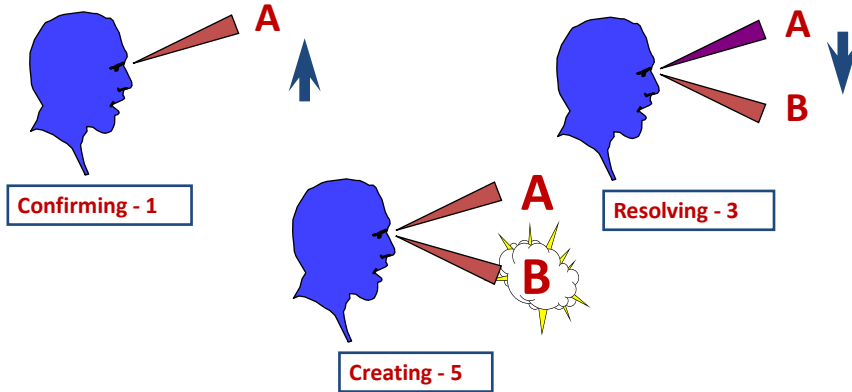
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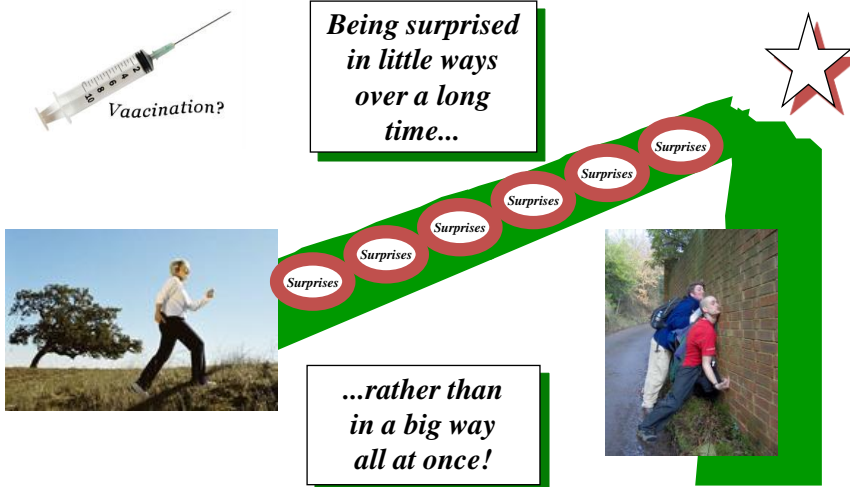
# Scanning Hits

*Changing our image of the future*



*We teach the future as we do the past.*

# Two ways to health and safety



*We teach the future as we do the past.*



## Weak Signals? Today

- Demographic – Closing the Southern border
- Technological – Virulent attack on the Internet
- Economic – Protective barriers to trade
- Environmental – Abrupt climate change
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*We teach the future as we do the past.*

## Step 4 – Promote Continuous Change



Not **whether**  
to change...

...but rather

**what** (scope, how much)

**when** (timing, how fast)

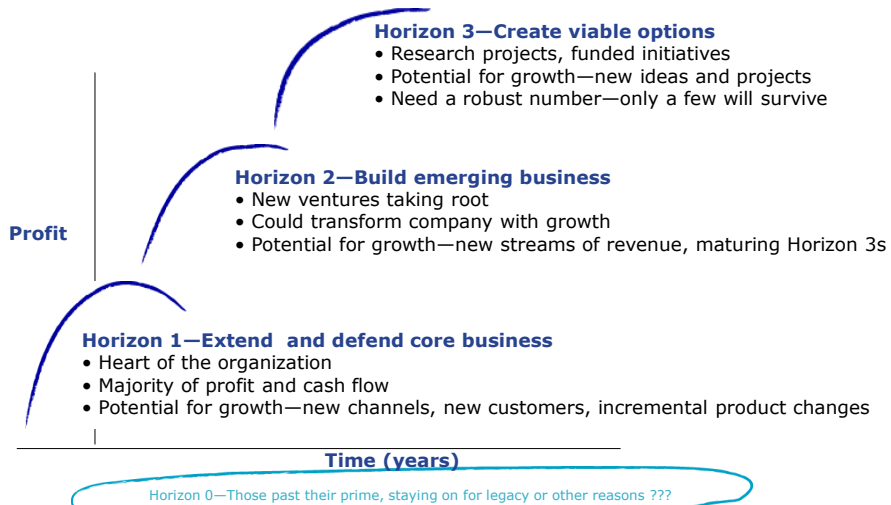


**Everyone has a Strategic Goal**



*We teach the future as we do the past.*

## Portfolio Management

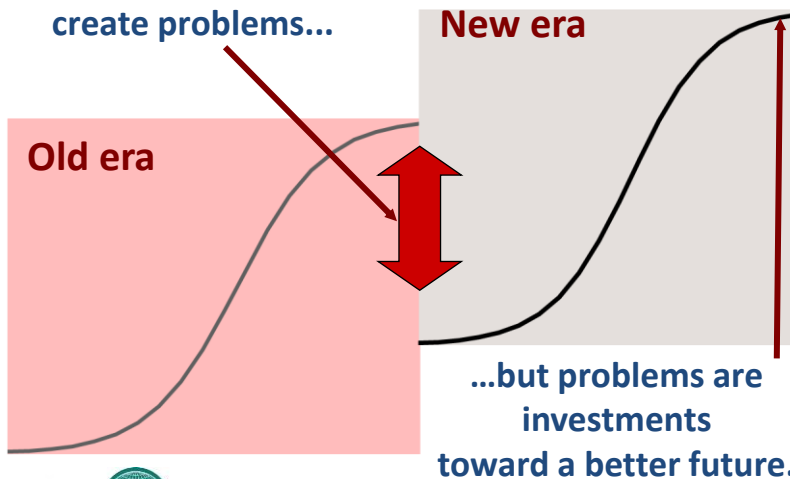


Source : *The Alchemy of Growth* by Mehrdad Baghai, Stephen Coley and David White, 1999

We teach the future as we do the past.

## The Gap

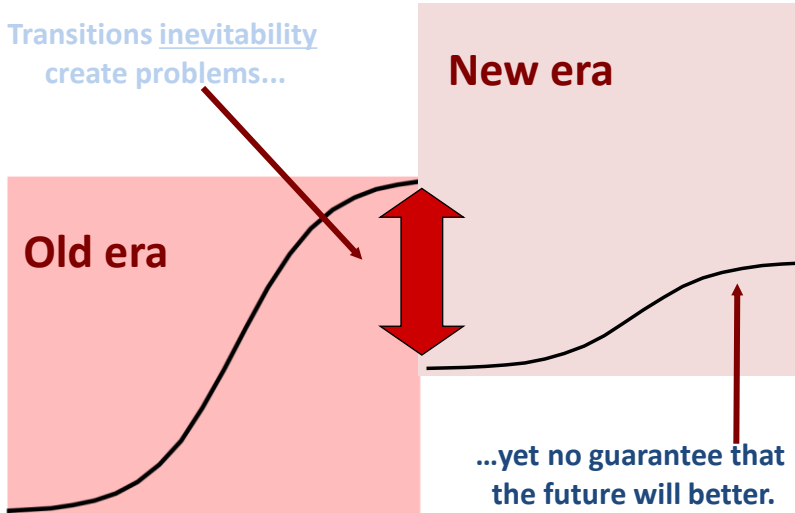
Transitions inevitably create problems...



We teach the future as we do the past.

# Failure

Transitions inevitably  
create problems...



*We teach the future as we do the past.*



## So What?

# Managing the Future



**Learning faster is  
the only sustainable,  
competitive advantage  
in an environment of  
rapid innovation and change.**

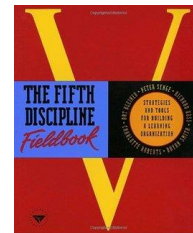


Arie de Geus  
former Director  
Strategic Planning Unit  
Royal Dutch Shell Group

*We teach the future as we do the past.*

## Learning Organizations...

- ...are not **“Knowing”** Organizations.
- They don't have all the answers.
- They don't always use precedents.
- They ask a lot of questions.
- They are open to new ideas.
- They try lots of things.
- They fail a lot in small ways.
- But they improve and get better over time.



Richard Karash, <http://world.std.com/~lo/WhyLO.html>



*We teach the future as we do the past.*

## Learning Organizations...

- Promote independent thought
- Increase the ability to manage change
- Improve quality
- Develop a committed work force
- Give people hope that things can get better
- Stretch perceived limits
- Are in touch with a fundamental part of our humanity: the need to learn, to improve our environment, and to be active actors, not passive recipients



Richard Karash, <http://world.std.com/~lo/WhyLO.html>

*We teach the future as we do the past.*

## Begin Today!

- ⊘ ...because that's the way we do it.
- ⊘ That's impossible; that can't happen.
- ⊘ I don't think that will happen.



*We teach the future as we do the past.*

## Final Question

If you find any of this valuable for yourself  
Or your organization,  
shouldn't we be teaching this to young people  
before they pick up the old habits?



[www.teachthefuture.org](http://www.teachthefuture.org)

## For more information...

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houstonfutures.org



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