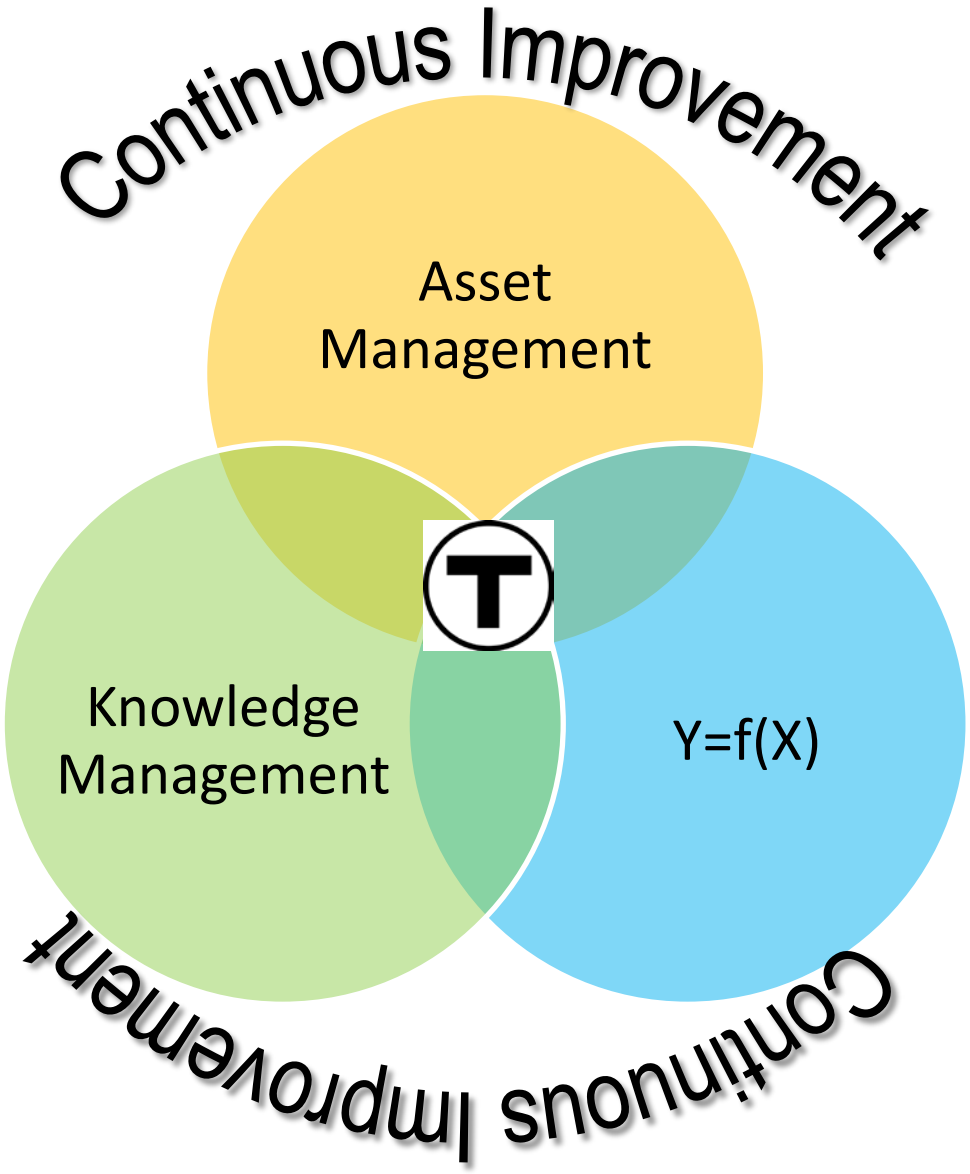
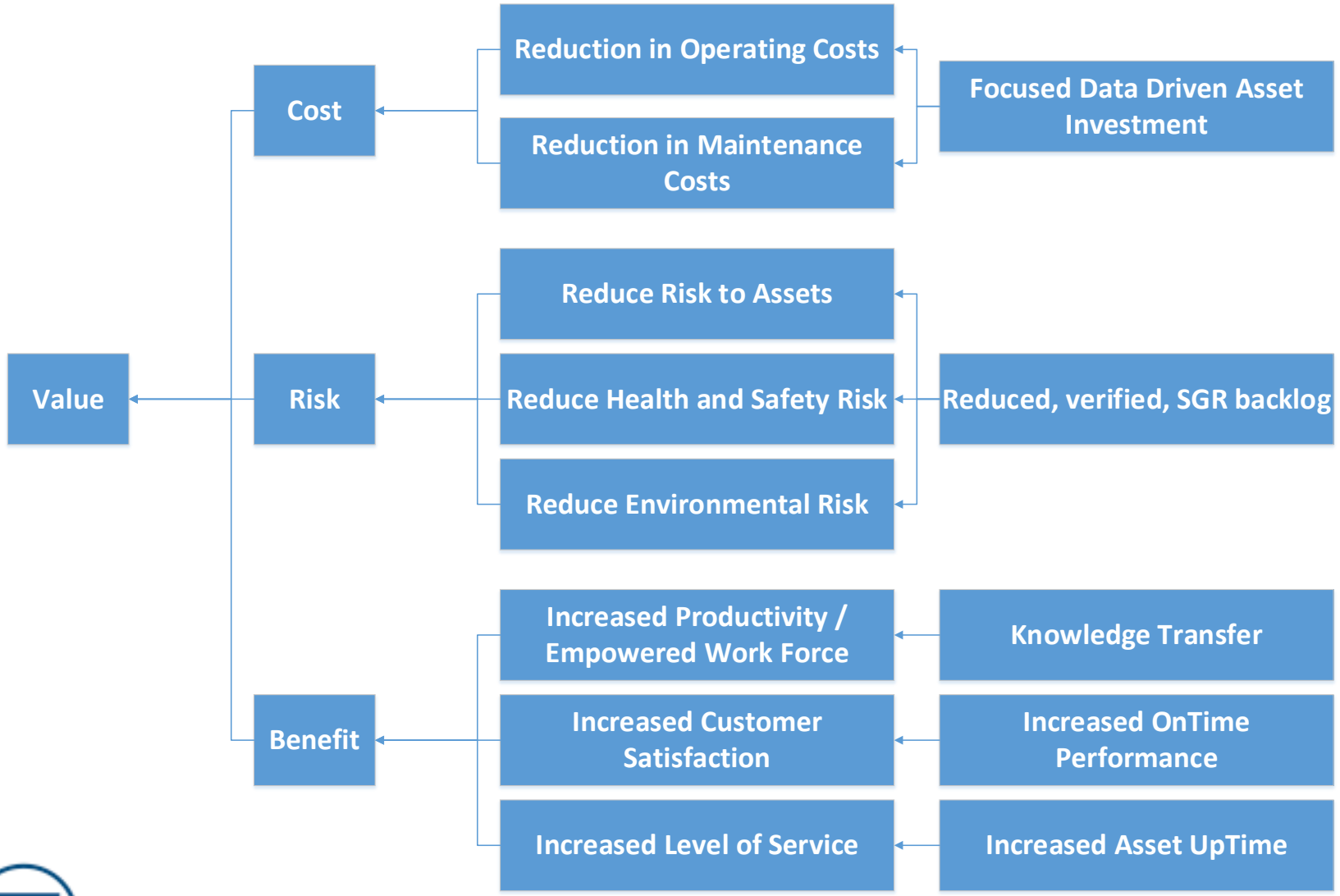
MBTA Advanced Asset Management Program

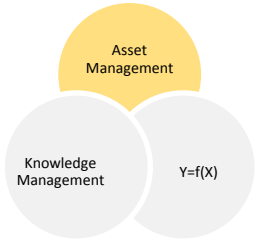
By Satyen Patel, MBA, CEng, MIET,
Director of Asset Management

Core Elements of the Program



Maximizing the Value of our Assets





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Elements of Infrastructure AM and Linkages within the Design/ Build World

Continuous Improvement

MBTA INFRASTRUCTURE ASSET MANAGEMENT PROGRAM MODEL

Total Asset LifeCycle Management							
Design and Construction					Engineering and Maintenance		
Concept	Feasibility	Design	Build	Commission	Maintain	Overhaul	Dispose/Replace
Suitably Qualified and Experienced Personnel							
Stage 4 - 6					*Stage 1 - 3*		
No Requirement (The Right Thing to Do)					MAP - 21 Requirement		
Project Management Systems, Building Information Modeling (BIM), Product LifeCycle Management (PLM), Geographical Information System (GIS), Enterprise Asset Management System (EAM), Enterprise Resource Planning (ERP)							
Stds for example: PAS 1192 Series Inc. COBie					Stds. for example: ISO 55000 Series, PAS 1192, ISO 14224		
Corporate Goals, Department Scorecards, Metrics (KPI) and Data, LSS, SPC, ROI, "blue vs. green dollars", OEE etc.							
National / International Best Practices							

Continuous Improvement

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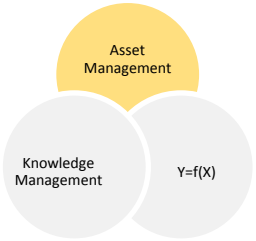
Director of Asset Management, MBTA



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Core Service Delivery Impacts

Continuous Improvement

MBTA INFRASTRUCTURE ASSET MANAGEMENT PROGRAM MODEL

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Continuous Improvement

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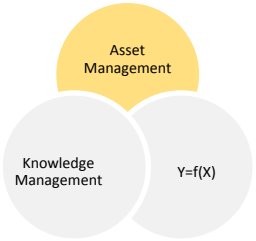
Operations Management - Maximize asset performance and equipment reliability

Maintenance Management - Physical assets, the right maintenance the right way

Supply Chain Management - Lowest bidder not always the best choice!
- Ensuring correct spare parts are in the right place at the right time will enhance operational performance and reduce operating capital requirements

- So now you have data what do you do with it?
- Where do you start?
- How do you use it strategically?

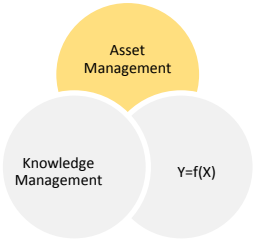


Management by Risk

ISO 31000

- **Context –** Why are you managing risk? Internal / external context?
- **Identify –** Find, recognize, & describe risk – what?, when?, where?, why?, how?
- **Analysis –** Nature of risk and magnitude – consequence vs likelihood
- **Evaluation –** Is the risk acceptable?
- **Treat –** Mitigation, prevention, transfer, acceptance?

- **PESTEL analysis can help identify risks that are not so obvious**
  - Many contexts of risk e.g. Safety, Operations, Financial, Environmental etc.



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Risk

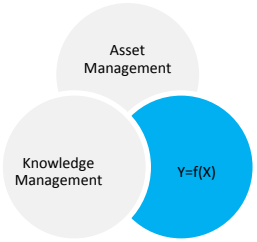
	Consequence				
	Major	Moderate	Minor	Insignificant
Likelihood		6	10	15
		9	14	19
		13	18	22
	12	17		24
	16	20		25

Score		Risk Accep		
1 to 3	xtreme	Intolerable		Board
4 to 9	High	Unacceptable	Stop proce	or Management
10 to 19	Medium	Acceptable with continuous review	Continue proce and/o	Directors
20 to 25	Low	Acceptable with periodic review	Continue p review n	th peri onth intervals	visors

Do you Invest in your Infrastructure based on Risk?

Limited CAPEX & OPEX = Risk Based Management of Assets

Courtesy: W



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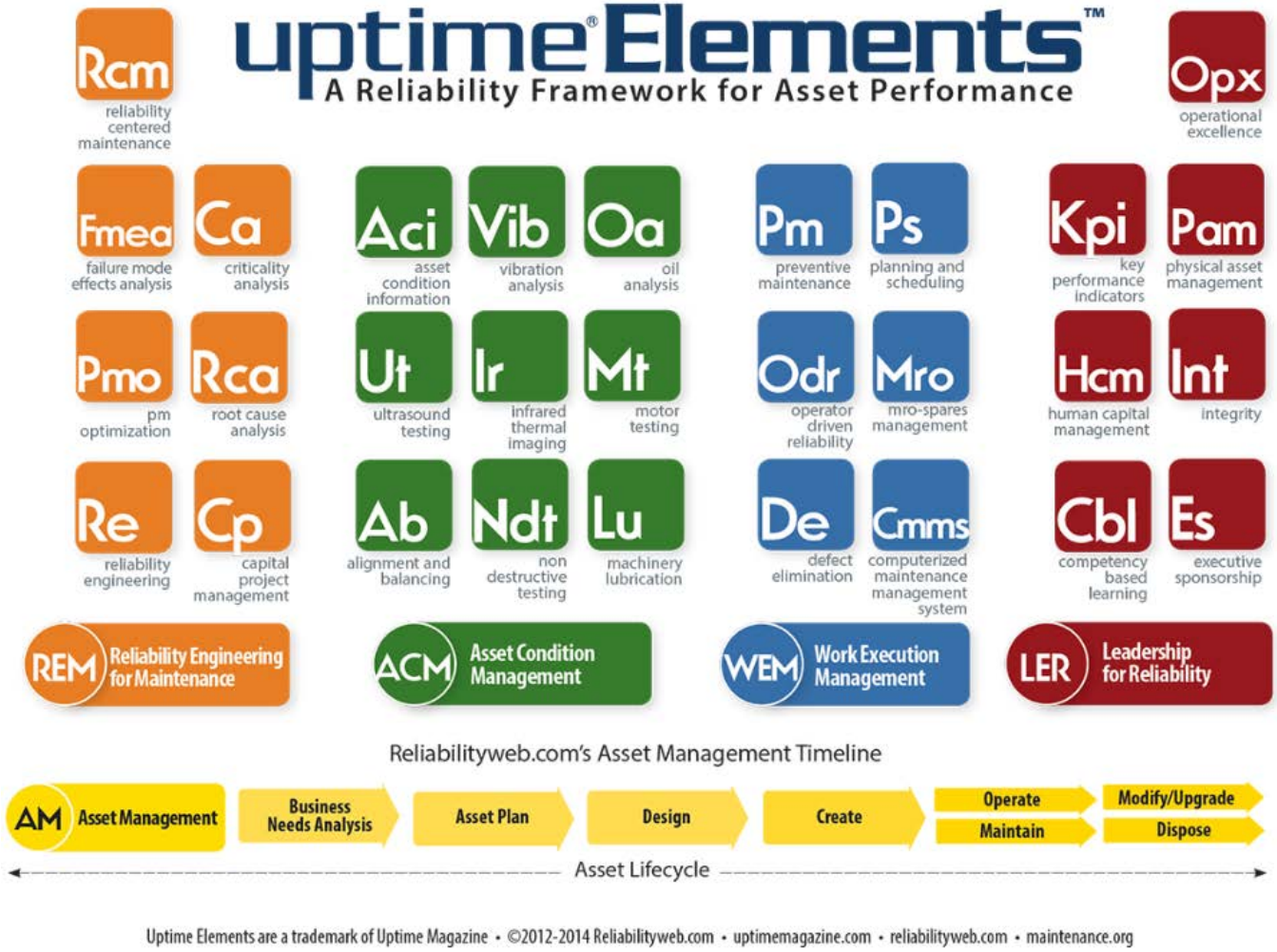
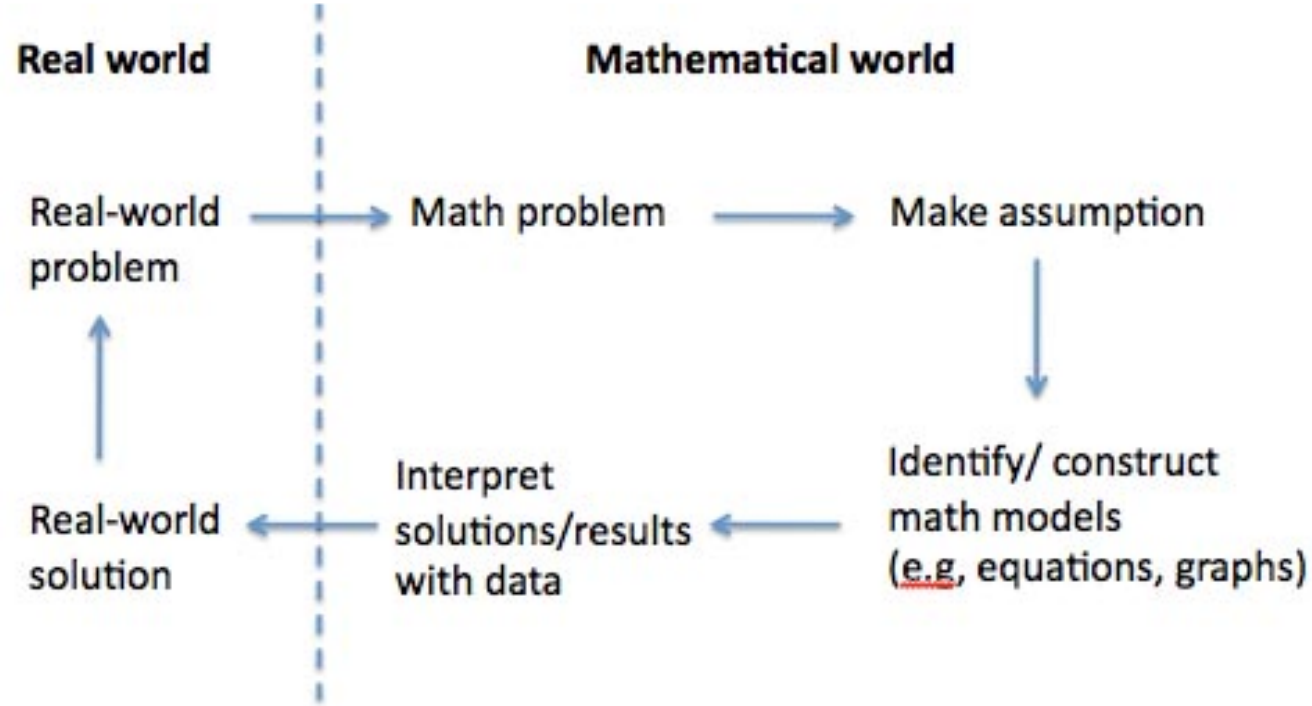
Reliability Centered Engineering

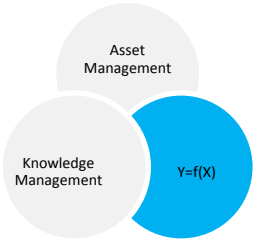
- Framework of elements to have a high-level of performance.
- Enables empowerment and engagement across the business to become asset centric and support the Organizational objectives.
- Supports Asset Management



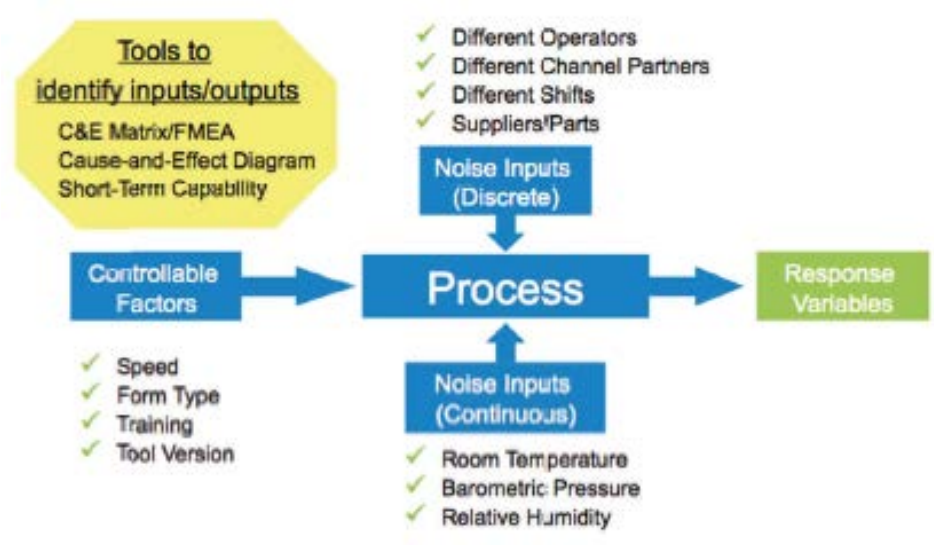
Model the Asset

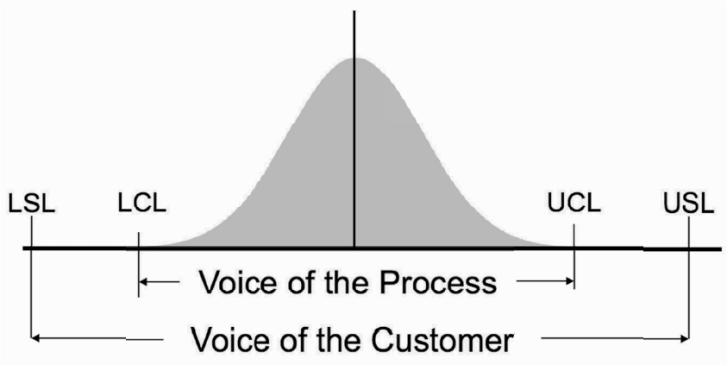


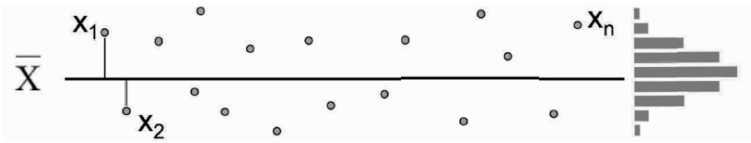
Mathematical Modelling of Assets and their conditions



Define Operational Indicators – Not just OEM!



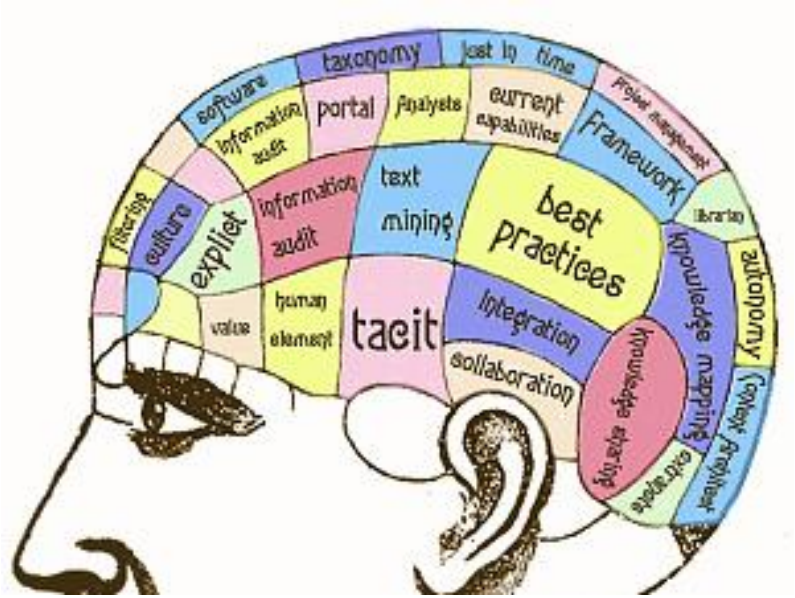




Define and Understand Variables & Collect Data as well as the process you are looking at

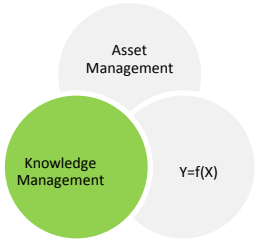
Knowledge Management

- Define and follow a consistent condition assessment criteria and track
- Use of predictive analytical systems becomes more attractive.



- BUT be careful, you may be measuring the wrong things!

- SANITY CHECK! – don't forget people and compare with how you work now!



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Knowledge Management

Asset Centric Decision making

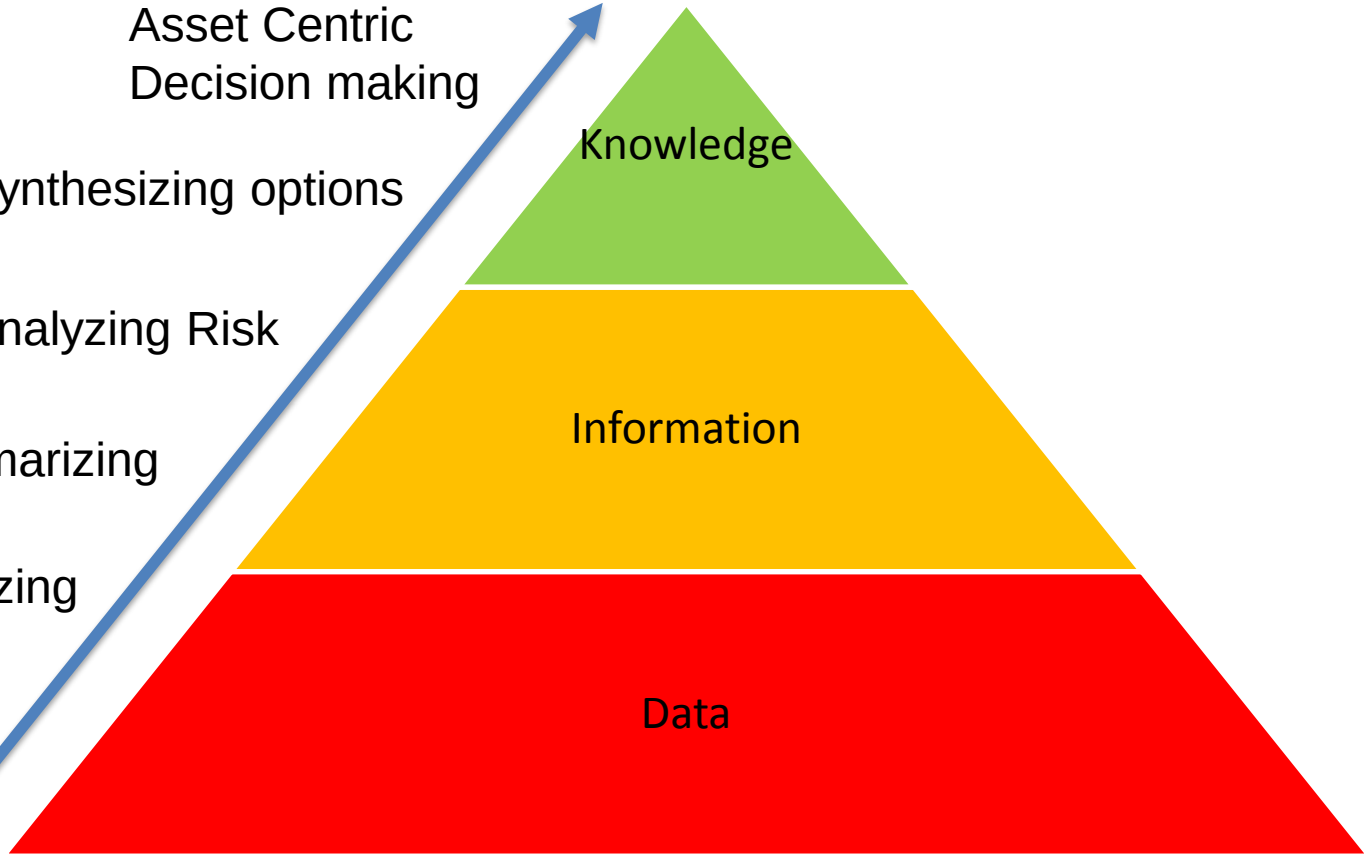
Synthesizing options

Analyzing Risk

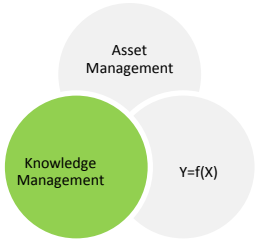
Summarizing

Organizing

Collecting



Condition based monitoring becomes apart of maintenance strategy and feeds into business strategy and operational performance goals



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Some Standards to help – Asset Management, Reliability, and Condition Monitoring

ISO 55000, 1, 2 – Asset Manageme… IS… …ant Analysis

ISO 31000, 31010 –

ISO 50001 – Ene…

ISO 90001 – Q… …ations

ISO 14001 – E… …y

SAE IA 1… …Monitoring Maintena…

ISO 1422… Data for Eq…

PAS 1192 … Modelling (…

ISO 13372 – … Diagnostics of Maci…

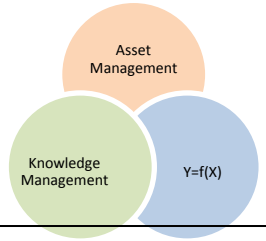
ISO 17359 – Condition M… … Diagnostics of Machines

Don’t reinvent the wheel, Perfect it!

The Future of Asset Knowledge Management

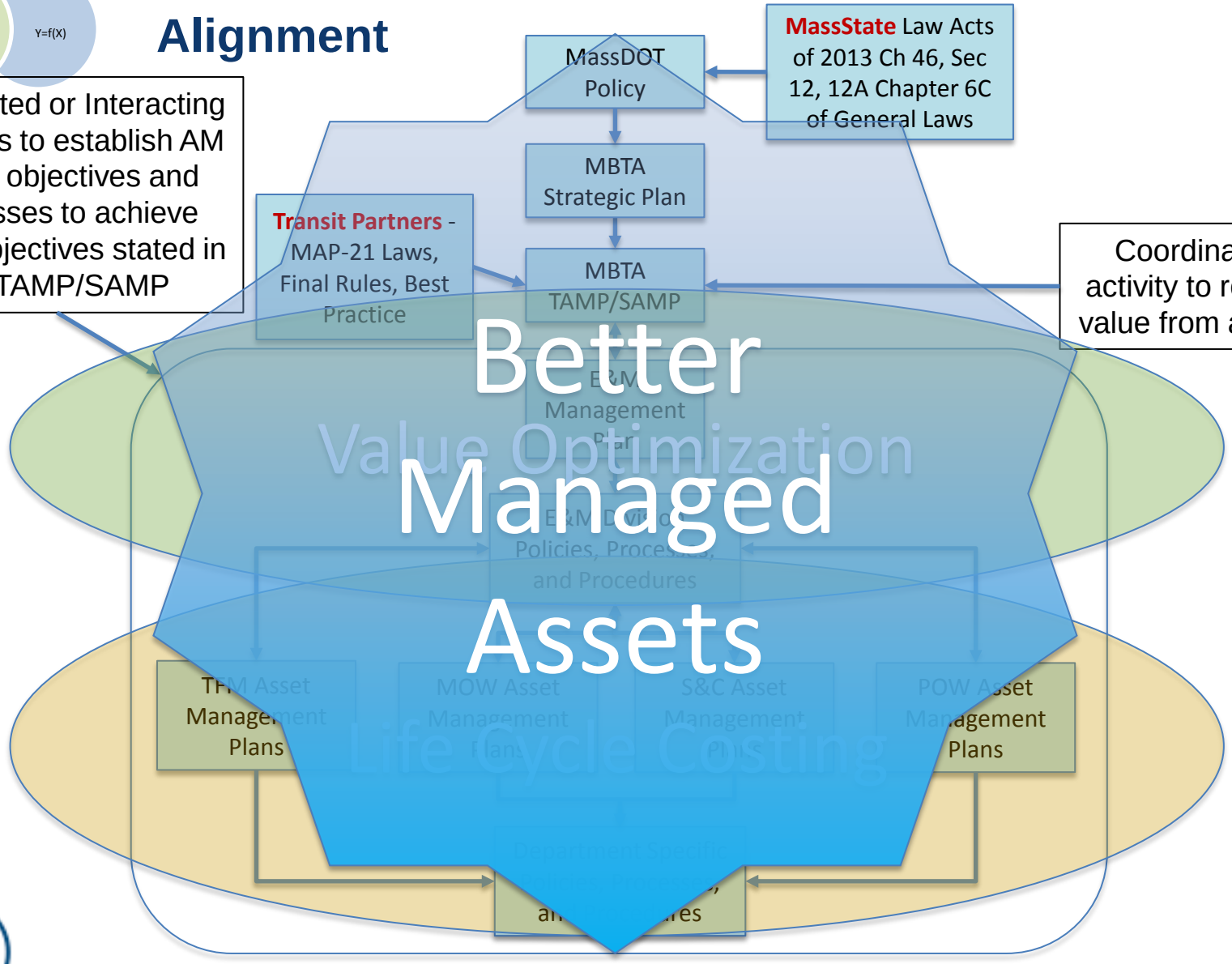
Imagine….

- Augmented Reality Based Maintenance with Virtual Reality for Maintenance

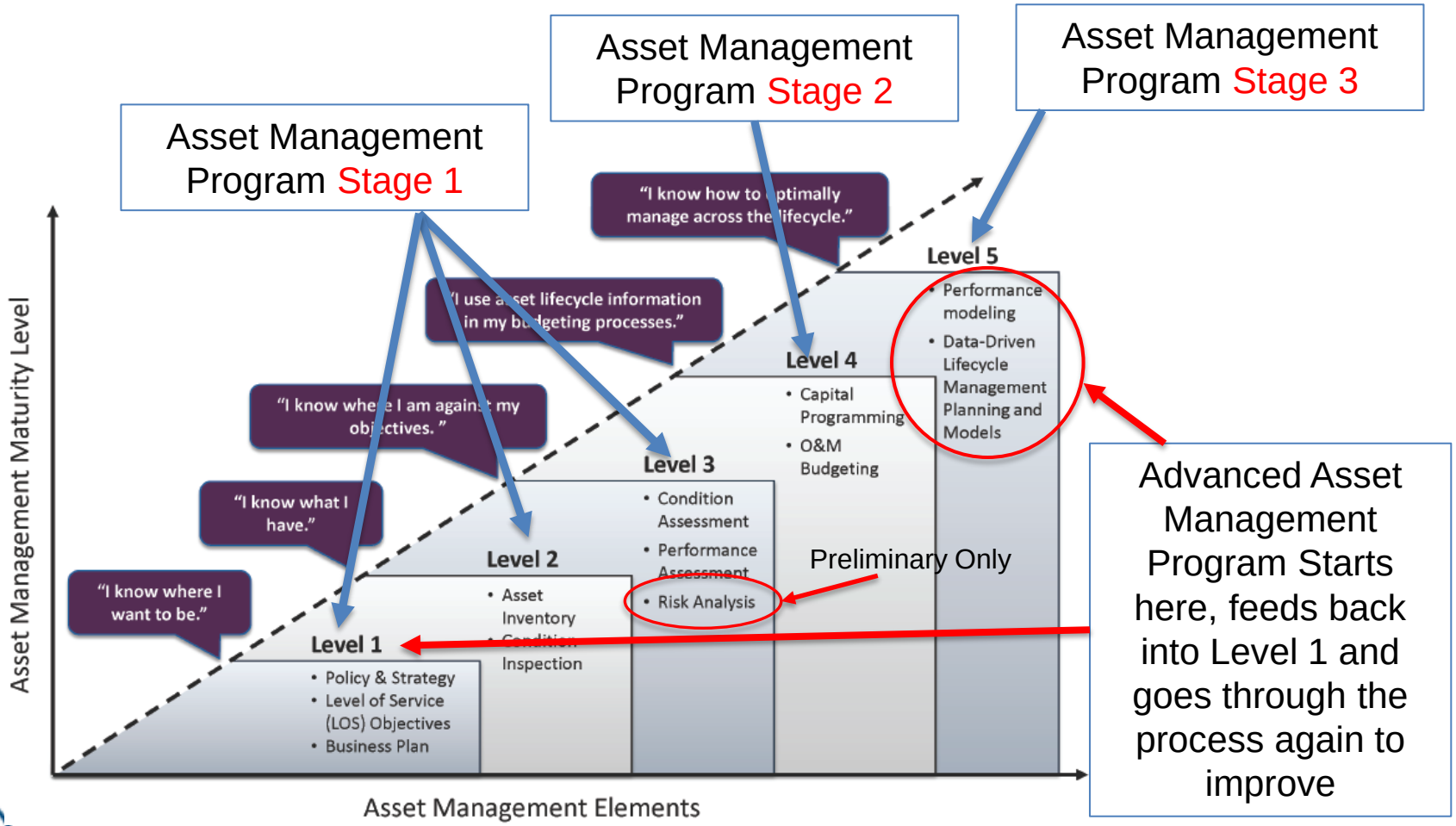


Alignment

Interrelated or Interacting elements to establish AM policy, objectives and processes to achieve those objectives stated in the TAMP/SAMP



Summary – Journey towards Advanced Asset Management



Thank you
Any Questions?

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