Enterprise Change and Transformation

Enterprise barriers to MBSE adoption
Context and Disclaimers

• Engineer 2X
  – BS Industrial, PhD Systems

• Crossed over to the dark side
  – Teach business at liberal arts university
  – Spend most of my time in Leadership, OB, Philosophy, Social Sciences

• Last time I was personally involved with programming, it was in COBOL and Fortran, in a TSO environment, using punch cards!

Every organization is ALREADY Model based
The image of the world around us, which we carry in our head, is just a model. Nobody in his head imagines all the world, government or country (author addition – enterprise). He has only selected concepts, and relationships between them, and uses those to represent the real system.

(Forrester, 1971)
“Picture this….”

MBSE adoption and enterprise transformation using it is like the Steeple Chase

- Distance race
- With obstacles
- Often wanders off the track
CAUTION
OBSTACLE AHEAD
MODELS
All models are wrong, but some are useful.

George E.P. Boxx

Inputs → System → Outputs

Time
People
Money

Goods And Services
Models

Source: VITECH web site
CAUTION
OBSTACLE AHEAD
CHANGE
Everything changes and nothing stands still. The only constant is change.

To lead others is to help them change their thoughts, beliefs, and actions for the better.

Change is hard because people overestimate the value of what they have and underestimate the value of what they may gain by giving that up.

People don’t resist change. They resist being changed.
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Hand-to-hand combat changing minds/beliefs/assumptions

NOT about technology
Management Agreement Model

Yes X insert large # here = Adoption

No X 1 = Delay or doom

Default setting of most large enterprises is NO!

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RHO Model – Rho \( (p) \) symbol of resistivity or density

R - Ridiculous
H – Heretical
O - Obvious

Hand-to-hand combat changing minds/beliefs/assumptions

NOT about technology
Dynamics of Change

1. Even experienced people will feel awkward – a novice in new order
2. People will focus first on what they must give up and strive to maintain status quo
3. People will grieve – some a lot some a little
4. All organizations have a limit to the amount of change they can tolerate – limit can be expanded through training and culture
5. People will take it personally and feel alone or un-appreciated
6. Most will want more time and/or resources
7. There will be a strong tendency to revert back if the need to change is not constantly evident

Source: The Bradley Group
Six Steps to Change

1. Mobilize commitment through joint diagnosis of problems
2. Develop a shared vision of how to move forward – new mental models, new roles, new rewards
3. Foster consensus for the new vision, build commitment, cohesion and new competencies
4. Replace non-compliers
5. Institutionalize the new way through policies, systems, structures, reports, etc.
6. Monitor compliance and make corrections as needed

Source: Beer, Eisenstat and Spector
CAUTION
OBSTACLE AHEAD

PERSONAL MASTERY
If $x$ is a real number satisfying $\frac{1}{x} < 10$, then it must be true that $x > \frac{1}{10}$.
• Charles Sanders Peirce – The Fixation of Beliefs (1877)
  – Stubbornly revert to our beliefs, even if the are formed in error
  – Only time we will change is when we are uncomfortable with them
  – But, discomfort causes us to revert back to avoid discomfort

• Edward DeBono – Various (60s on)
  – We think at all in order not to have to think further - For the sake of the mind’s economy
  – Only when forced do we really think about our underlying beliefs, biases and assumptions

• Daniel Kahneman - Thinking Fast and Slow (70s on)
  – System 1 (Fast) – Little or no effort and no sense of voluntary control – Snap decisions
  – System 2 (Slow)– Effortful mental activities that shape System 1 snap decision engine, but most not well trained

• James Reason – Human Error (90s)
  – Mind reduces thinking to If/Then engine for efficiency
  – Compares against existing beliefs, patterns/schema and triages
  – We think only when we have to and as briefly as possible

• Malcolm Gladwell– Blink (2005)
  – Experts have reduced complex thought to patterns of response to avoid thinking and improve performance, but these heuristics, while beneficial, can be traps
Alfred Schütz and many others argued that our beliefs are not adequately:

• Coherent, or
• Consistent, or
• Clear, or
• Conscious

“We are incredibly heedless in the formation of our beliefs, but find ourselves filled with an illicit passion for them when anyone proposes to rob us of their companionship”

James Harvey Robinson
American Historian

Hand-to-hand combat changing minds/beliefs/assumptions

NOT about technology
ENGINEERING?

Add SYSTEMS?

LIKE?  
Assumptions

19%  
20%

ASSUME?

27%  
12%

BELIEFS
Hate engineering
Not good at engineering

BIASES

VALUES
Don’t Care

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CAUTION
OBSTACLE AHEAD

PERSONAL MASTERY - CHANGE AND KNOWLEDGE
The Knowledge Continuum

No Knowledge or Experience

Knowledge but no impact on implementation

Focus on materials

Focus on materials down

Clear mental framework

Confusion

Focus on materials down

Connection of knowledge & practice

Ambiguity

Concepts and relations are extracted

Adapts practice & knowledge to different situations

Stress

Sequence not needed

Application across context w/o supervision

No Supervision

Source: *Educational Leadership*, Sept. 1993
The Change Continuum

Shock or change introduced

Time

Contentment

Denial

Negotiation

Confusion
Ambiguity
Stress

Forays & Exploration

Assimilation

Note: Assimilation does not mean acceptance

Source: *Educational Leadership*, 1993
<table>
<thead>
<tr>
<th>NOVICE</th>
<th>EXPERT</th>
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<tbody>
<tr>
<td>No Knowledge or Experience</td>
<td>Clear mental framework</td>
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<tr>
<td>Knowledge but no impact on implementation</td>
<td>Connection of knowledge &amp; practice</td>
</tr>
<tr>
<td>Focus on materials</td>
<td>Adapts practice &amp; knowledge to different situations</td>
</tr>
<tr>
<td>Reliance on sequence or plan</td>
<td>No Supervision</td>
</tr>
<tr>
<td>Application dependent on feedback, supervision.</td>
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<td>Mechanistic</td>
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Note: Assimilation does not mean acceptance
The Knowledge Continuum

Unconsciously incompetent

Consciously incompetent

Consciously competent

Unconsciously competent

NOVICE EXPERT

Source: *Educational Leadership*, Sept. 1993

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Personal Mastery

Siloed Views - Bounded Rationality

Shared System View – Common Mental Model

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Hermeneutic Circle

Can’t know the whole until you know the parts, but can’t know the parts unless you know the whole.

Note: Comes from Philosophy!!!!

Have to synthesize all parts to understand the whole.

Whole gives context to analyze the parts.
CAUTION
OBSTACLE AHEAD

COMMON MENTAL MODELS
Common Mental Models

Conflicting Mental Models

Common Mental Model

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Is your company/division/department a system?
• 99% answer yes

Have you ever studied systems theory, systems science, systems dynamics, systems thinking, systems engineering?
• 99% answer No
Most large enterprises are remarkably siloed
Bounded rationality is the norm
PHILOSOPHY?

Yes
- Makes my head hurt: 19%
- Hate Philosophy: 27%

No
- Don’t Care: 20%
- 22%
Ludwig von Bertalanffy in conjunction with Ervin Laszlo and proposed the term “Systems Philosophy” as one of three pillars of his General Systems Theory in the 1973 revision of his classic text.
The “Ologies”

• Sociology: The study of the development, structure, and functioning of human society. The sociological aspects of a subject or discipline; a particular sociological system (OED)

• Philosophy: Knowledge, learning, scholarship: a body of knowledge (OED)

Inescapable conclusions
1. The enterprise is a micro-sociologic construct
2. The enterprise forms a system philosophy
Emergence of a System Philosophy

System of Interest

- Harden into distinct system philosophy
- Coalesce into unique system sociology
- Emergent social behaviors

“The way we do things around here”
Weltanschauung

A fundamental concept in German philosophy and epistemology.

Welt => World
Anschauung => View or Outlook

Refers to the framework of ideas and beliefs forming a holistic description through which an individual or group watches, interprets and interacts with the world (or other shared environment)

News flash: An enterprise -- your company -- is a shared, sociological environment!!
“Weltanschauung becomes a real issue when it is very difficult to find consensus around the definition of the process”

Luc Hoebeke
The “Ologies”

- Enterprise is a micro-sociologic construct
- Forms a system philosophy
- Dense web of thoughts, beliefs, images, and language that shape actions
- Emergent character of the system of record
- Cannot be controlled directly or modelled with precision
- Leaders, managers, and systems engineers must learn to sense them
Hand-to-hand combat changing minds/beliefs/assumptions
CONCEPTUAL ENGINEERING!!!

…the most basic beliefs, concepts, and attitudes of an individual or group.

Taking a systems approach is a philosophy!!!!

Taking a systems approach is not common!!!!
CAUTION
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SHARED VISION
Value Proposition

A promise of value to be delivered, communicated, and acknowledged

- Increased market share
- Demonstrable differentiation
- Increased revenues
- Increased margins
- Reduced expenses
- Some combination of above
- Customer dictate
Value Proposition

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- Increased market share
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Does your C-Suite or customer share this vision of MBSE’s value?

Weltanschauung
CAUTION
OBSTACLE AHEAD
SHARED SYSTEMS
It isn’t uncommon for managers at senior levels of large organizations to be so out of touch with customer or production reality that they don’t know just how broken some of their business processes are.

Michael Hammer & James Champy
SLOW AHEAD

SUMMARY
So, the odds that you are……

going to be welcomed with open arms…
and your model is going to be embraced without question..
thanked for you efforts and…..
hailed as a savior..

Are… NIL!!!

Hand-to-hand combat changing minds/beliefs/assumptions

NOT about technology
What should you do?

• Have to have a compelling value proposition to engage C-Suite
• Have to have a champion in the C-Suite
• Jujitsu
• Listen

• Be humble/empathic
• Learn to love the social sciences!
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Questions?