

PAPER #221

COMPETITIVE CAPABILITY-BUILDING FOR INTEGRATED DESIGN SCHEDULING AND MANAGEMENT

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AGENDA

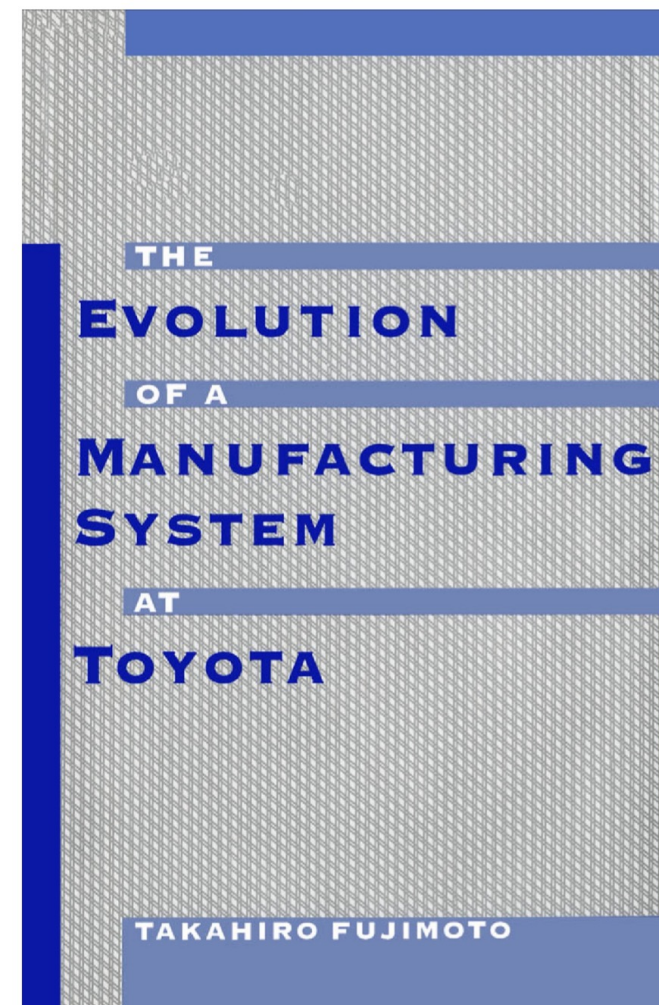
- Theory
- Capability-Building & Findings

THEORY

Takahiro Fujimoto Explains Toyota



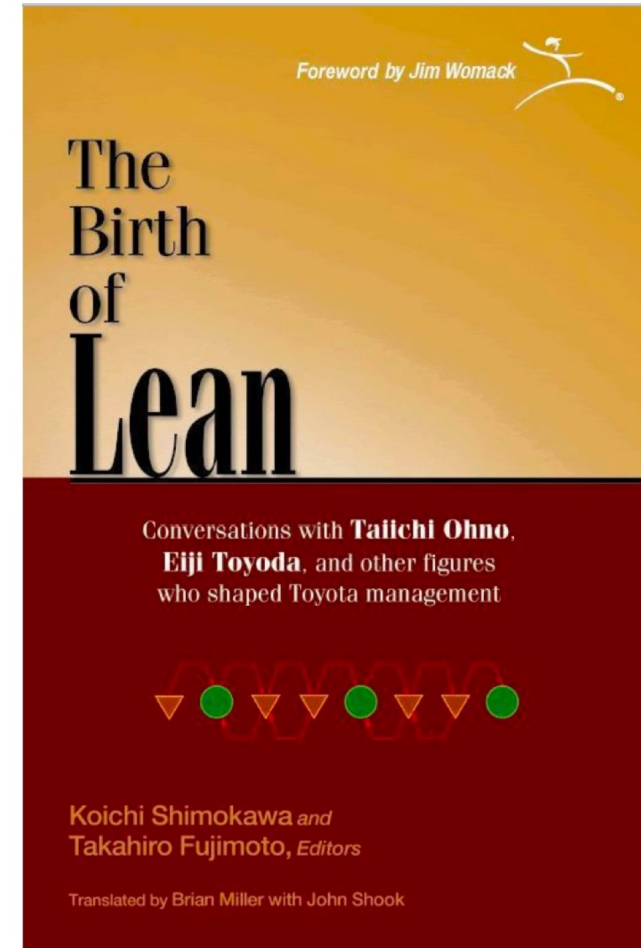
Takahiro Fujimoto is a scholar of Toyota and the Executive Director of the Manufacturing Management Research Center at the University of Tokyo



How Was the Toyota Production System Created?

“The creators of lean had no grand plan and no company-wide program to install it. Instead, they were an army of line-manager experimenters trying to solve pressing business problems.”

Jim Womack - co-author of *The Machine that Changed the World* and *Lean Thinking*



Capability, Systems and Competitiveness



A capability is made up of routines for accomplishing necessary tasks



Every capability contributes to a larger system



The capability-building goal is to improve the competitiveness of the system relative to competitors in the marketplace

3-Levels of Capability to Make Things

Production

Effective routines for competitive performance in stable environment with efficient repetitive information transfer of accurate information.

Learning

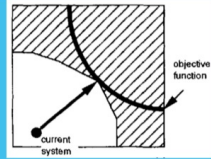
Dynamic capability for changing patterns of routines for improved performance to handle system emergencies or irregular system changes.

Evolutionary Learning

Effective routines for changes or recoveries of competitive performance in a dynamic environment to handle repetitive problem-solving cycles or routine system improvements.

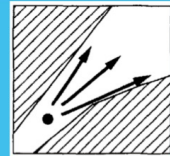
Multi-Path Development of Solutions

Rational Calculation



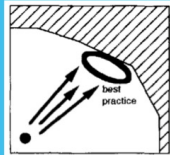
the complete problem-solving cycle of goal-setting and problem recognition, searching for feasible alternatives, evaluating alternatives and selection

Environmental Constraints



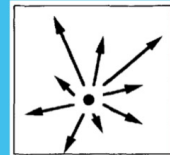
feasible alternatives constrained by external factors

Knowledge Transfer



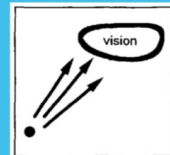
knowledge about implementing solutions shared by others

Random Trials



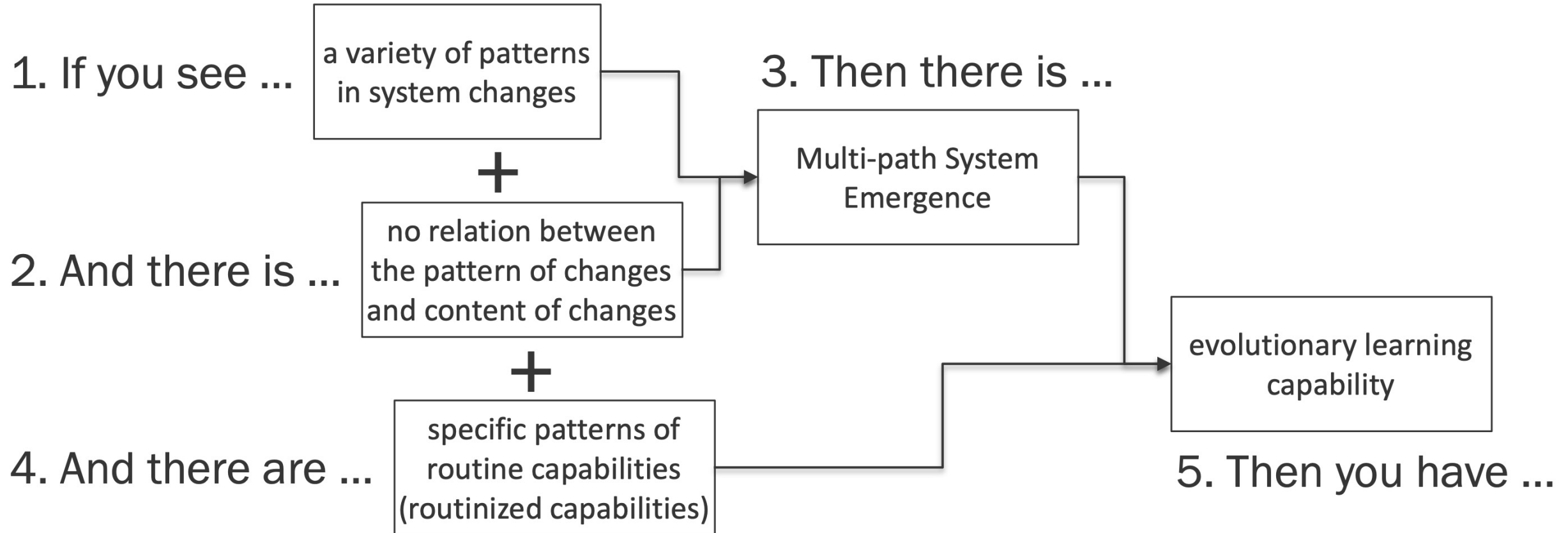
try different solutions advocated leaders

Entrepreneurial Vision

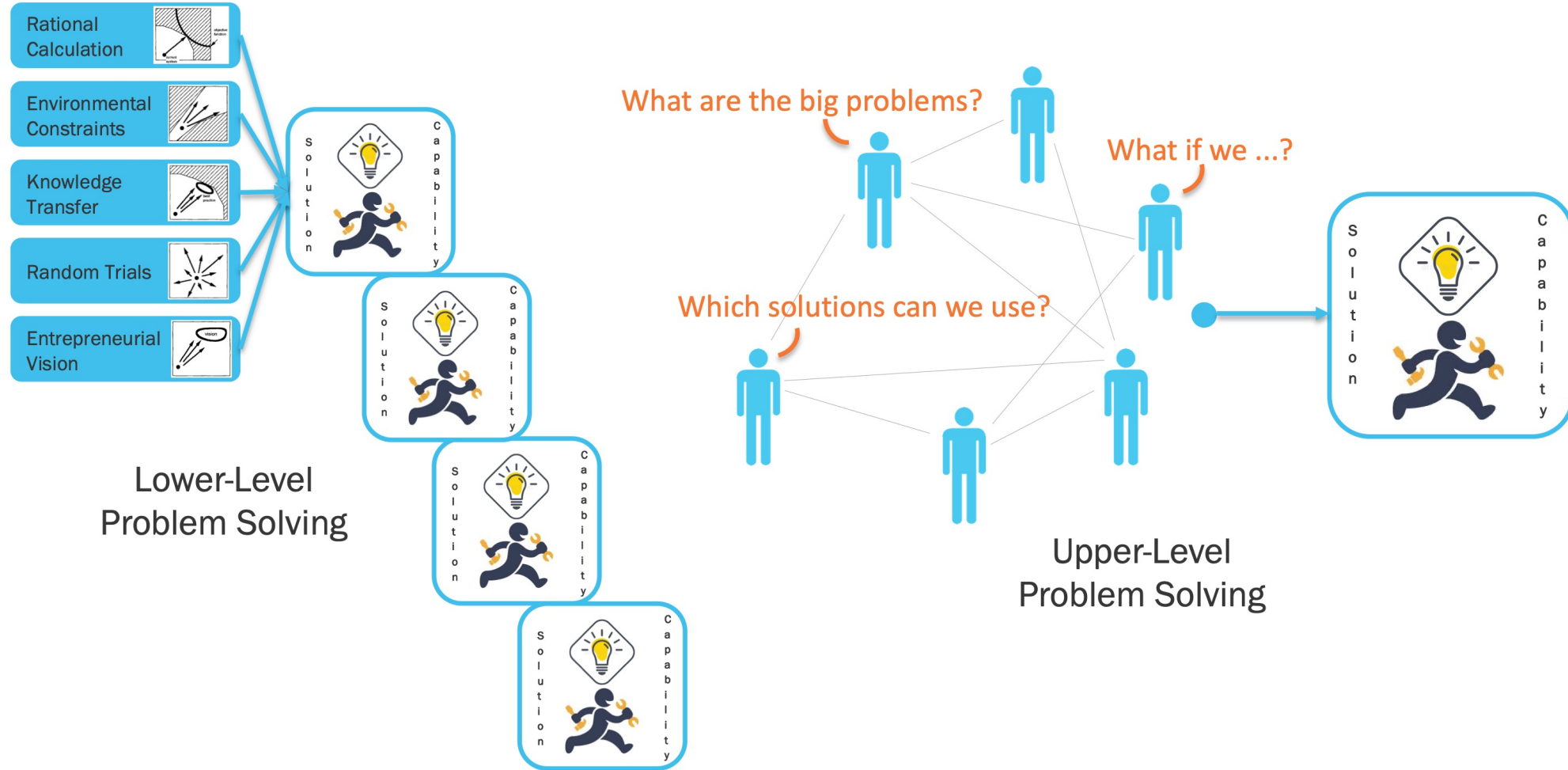


apply solutions advocated by leaders

Operational Definitions of Multi-Path System Emergence and Evolutionary Learning Capability



Dual-Layer Problem Solving



CAPABILITY-BUILDING & FINDINGS

Project 3

Biomedical Sciences Partnership Building University of Arizona



Schedule Compression



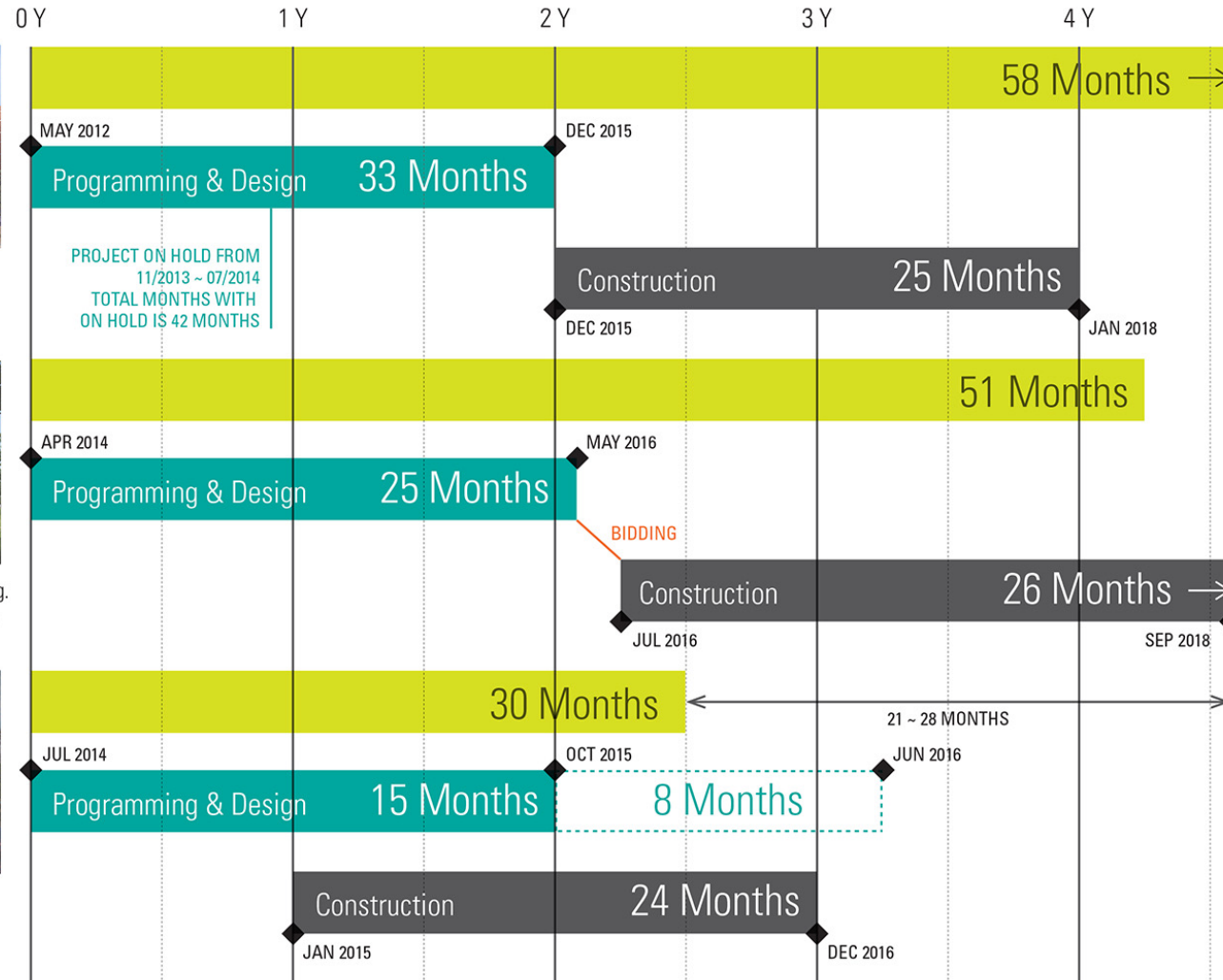
Bioscience Research Laboratories
 University of Arizona



Biological & Physical Sciences Bldg.
 University of California, San Diego



Biomedical Scie. Partnership Bldg.
 University of Arizona



Responding to the Need - IDSM Capability Routines

1. Continuous advocacy and engagement by leaders
2. Team understanding and commitment to the process
3. Tasks defined by design team
4. Durations applied to tasks by design team
5. Logic applied to tasks by the design team
6. Milestones or constraints (Defined Information Requirements) identified and applied to tasks by GC and trade contractors
7. Iterative loops identified, analyzed and broken-down if necessary
8. Schedule aligned with milestone / constraints
9. Continuous process improvement PDCA cycle to identify, root-cause and remove constraints

CONCLUSIONS

Entrepreneurial
Vision (EV) is
important

- Toyota created a new position, the Chief Engineer
- A person with visibility across so much of this work **could promote evolutionary learning and the intentional development of new capabilities during the design of construction projects.**

The **Project Management Team (PMT)** this small team of leaders would include people who individually or in aggregate can assume the responsibilities **function as the Chief Engineer?**

THANK YOU!

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