Complex Project Management Systemic Innovation

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Abstract

Systemic innovation requires organizational competences that ensure that resources and time work properly together to achieve results.

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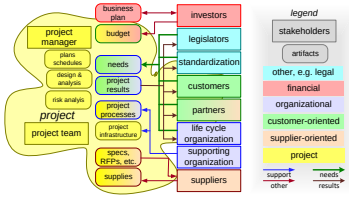
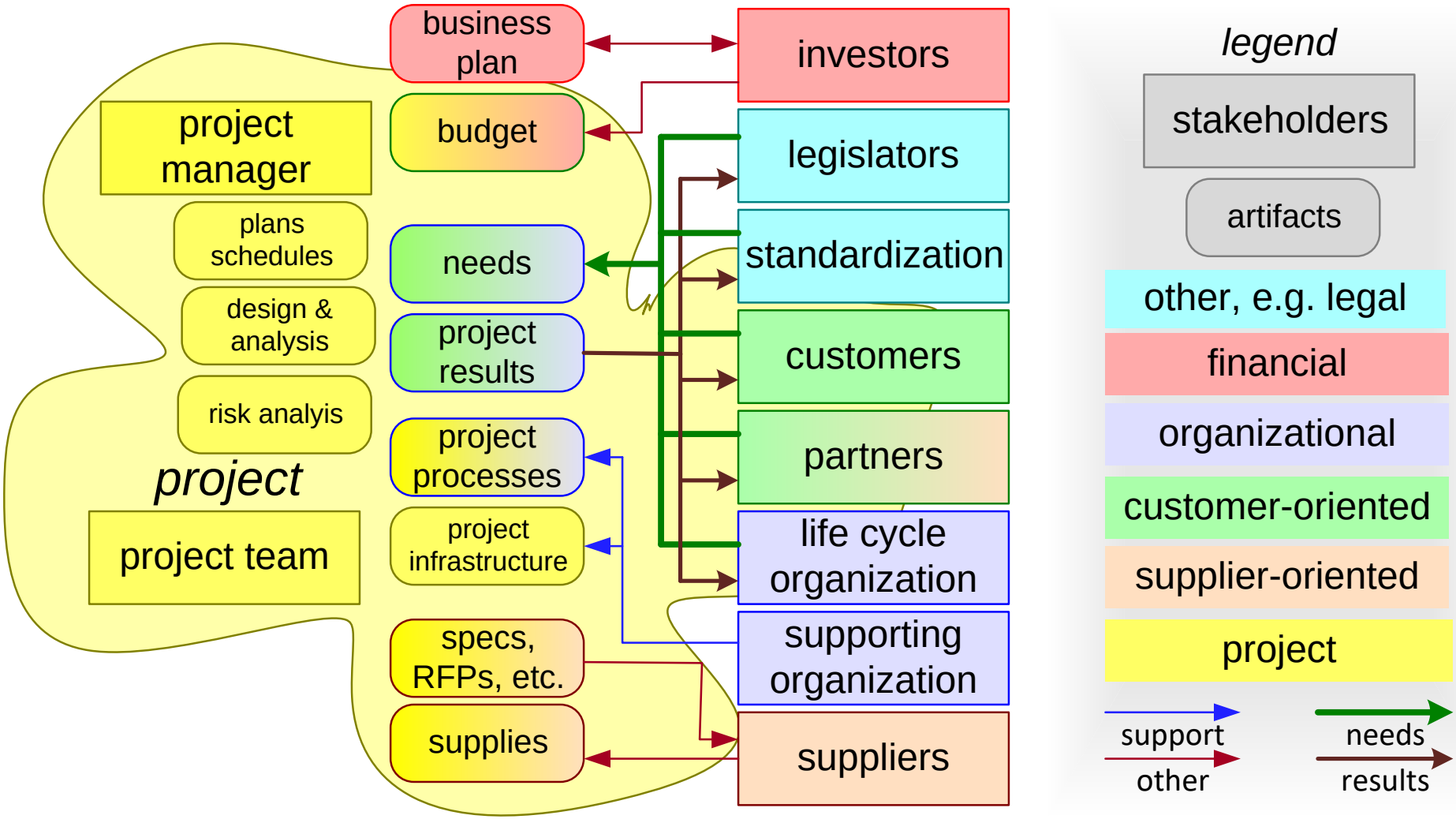


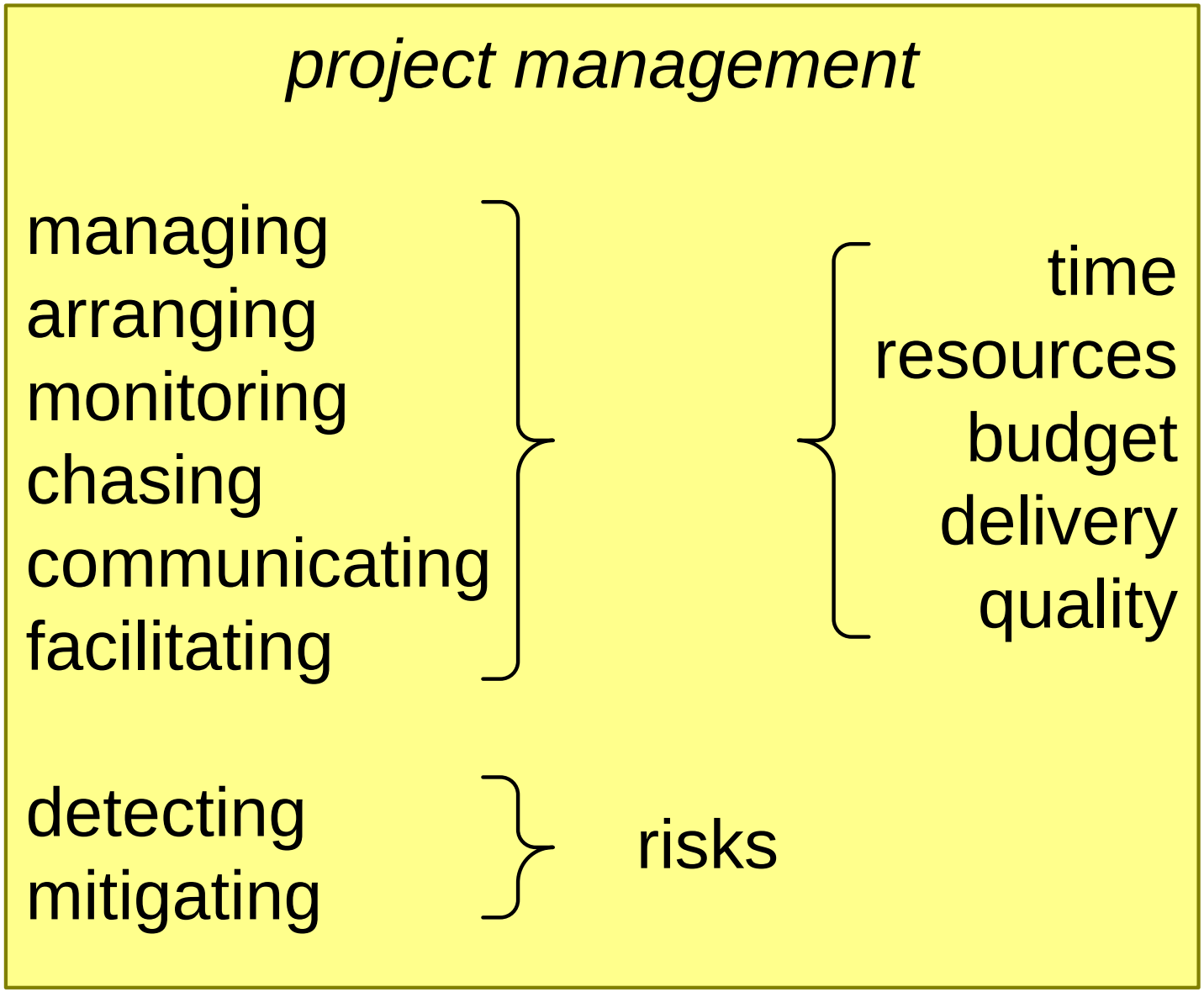
Project Management Tasks

- Composing the project team
- Organizing and facilitating project members
- Orchestrating solution design and analysis
- Organizing the project infrastructure and processes
- Managing budget and business and project plans
- Ensuring and monitoring progress
- Managing external contacts
- Detecting and mitigating risks

The Landscape for Project Management in Innovation



Project Management Tasks



Planning Methods

planning	*decision timing*	*long term outlook*
pacing[1]	set-based design[6,7]	roadmapping[11,12]
agile, wall[2]	real option theory[8,9]	foresight[13]
last planner[3]	late decision making[10]	gigamaps[14]
PERT planning[4]		scenario planning[15]
planning for integration[5]		

1 https://www.entrepreneur.com/article/288769
2 http://deepali10dulkars.blogspot.com/2014/07/pm-toolkit-series-release-planning-wall.html
3 Combating Uncertainty in the Workflow of Systems Engineering Projects, INCOSE 2013
4 https://en.wikipedia.org/wiki/Program_evaluation_and_review_technique
5 https://gaudisite.nl/SystemIntegrationHowToPaper.pdf
6 http://lean-analytics.org/set-based-concurrent-engineering-sbce-why-should-you-be-interested/
7 https://gaudisite.nl/INCOSE2012_Hansen_Muller_SetBasedDesign.pdf
8 Ivanovic, A. and America, P., 2008, Economics of architectural investments in industrial practice; 2nd International Workshop on Measurement and Economics of Software Product Lines.
9 Ivanovic, A. and America, P., 2008, Economics of investments in evolvable architecture in industrial practice, ICSM08
10 https://electricalfundablog.com/agile-model-methodology/
11 http://www.cambridgeroadmapping.net/
12 https://gaudisite.nl/RoadmappingPaper.pdf
13 Miles, I., Saritas, O., and Sokolov, A., 2016. Foresight for Science, Technology and Innovation. Springer
14 Skjelten, E.B.: Complexity & other beasts a guide to mapping workshops. The Oslo School of Architecture and Design, Oslo (2014).
15 Wilkinson, A. and Kupers, 2013, R. Living in the Future, Harvard Business Review, May 2013

Stakeholder Methods

stakeholder communication

A3AOs[1,2]

T-shaped presentation

physical & virtual demonstrators:

- prototypes, animations, simulations, mockups

understanding and exploring problem and solution space

conceptual modeling[3,4]

illustrative ConOps[5,6,7]

Ideation, Creativity techniques[8, 9, 10, 11]

storytelling, scenarios[12]

virtual prototyping[13]

value network analysis

business model analysis

Business Model Canvas[14]

low-tech tools:

- flip over sheets, sticky notes, markers

high-tech tools:

- modeling, simulation, animation, virtual reality

1 Borches D, 2010 A3 architecture overviews: a tool for effective communication in product evolution.

2 https://gaudisite.nl/BorchesCookbookA3architectureOverview.pdf

3 Muller, G. Challenges in Teaching Conceptual Modeling for Systems Architecting, ER 2015

4 Muller, G. Teaching conceptual modeling at multiple system levels using multiple views, CIRP 2014

5 https://gaudisite.nl/INCOSE2016_Solli_Muller_VisualConOps.pdf

6 https://gaudisite.nl/INCOSE2015_MullerEtAl_SubseaOverviewA3.pdf

7 ISO/IEC 2011. Systems and software engineering - Life cycle processes - Requirements engineering.

8 https://www.ideou.com/pages/ideation-method-mash-up

9 Skjelten, E.B.: Complexity & other beasts a guide to mapping workshops. The Oslo School of Architecture and Design, Oslo (2014).

10 Young, J.W. 2016: A Technique for Producing Ideas, Stellar Editions.

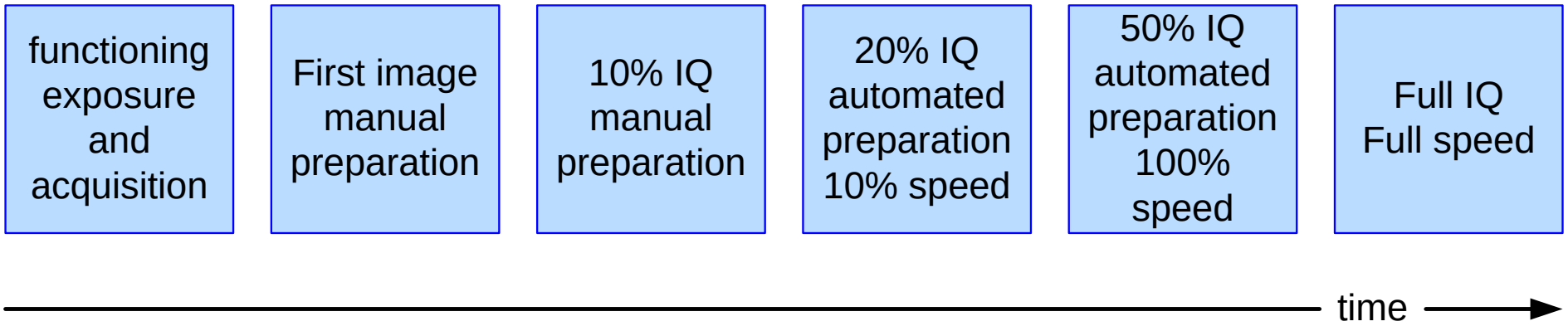
11 Bhattacharya, Hemerling & Waltermann, 2010, Competing for Advantage; How to Succeed in the new Global Reality. Boston Consulting Group https://www.bcg.com/documents/file37656.pdf

12 Muller, G., 2011, Systems ArchitectIng; a Business Perspective, CRC Press

13 http://www.esi.nl/innovation-support/documents/symposium-2016/2-PT_Virtual-Prototyping-Interventional-X-Ray-Systems.pdf

14 Osterwalder, A. et al., 2004, The business model ontology: A proposition in a design science approach.

Example of Pacing Milestones

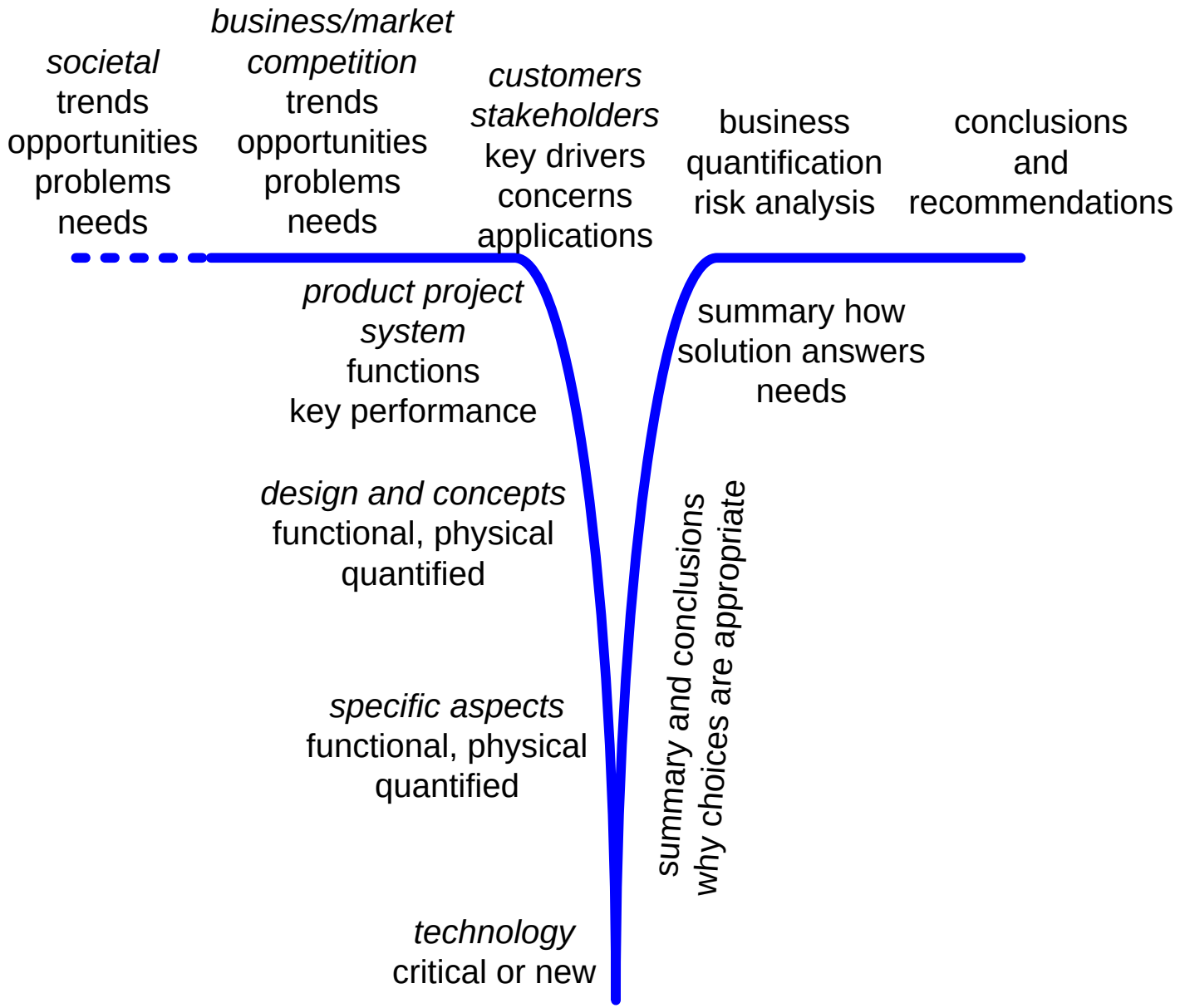


pacing:

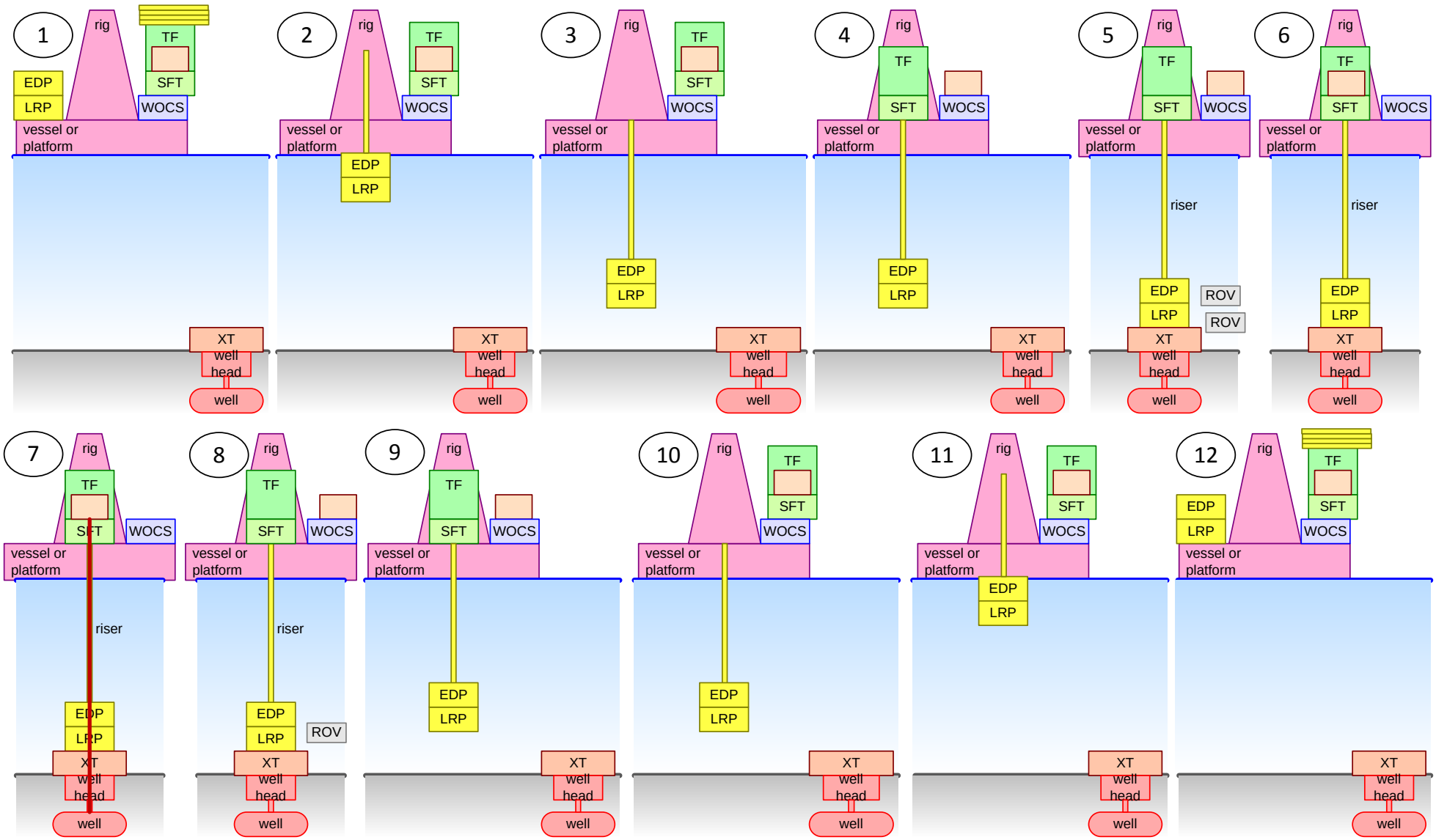
maximum 6 month between milestones

depending on technology and domain

T-shaped Presentation



Example of an Illustrative ConOps



Example A3AO from Offshore Energy

Workover operation; architecture overview

This A3 based on the work of SEMA participants: Martin Moberg[a], Tormod Strand[a], Vazgen Karlsen[f], and Damien Wee[f], and the master project paper by Dag Jostein Klever[f]. [a]Aker Solutions, [f]FMC Technologies

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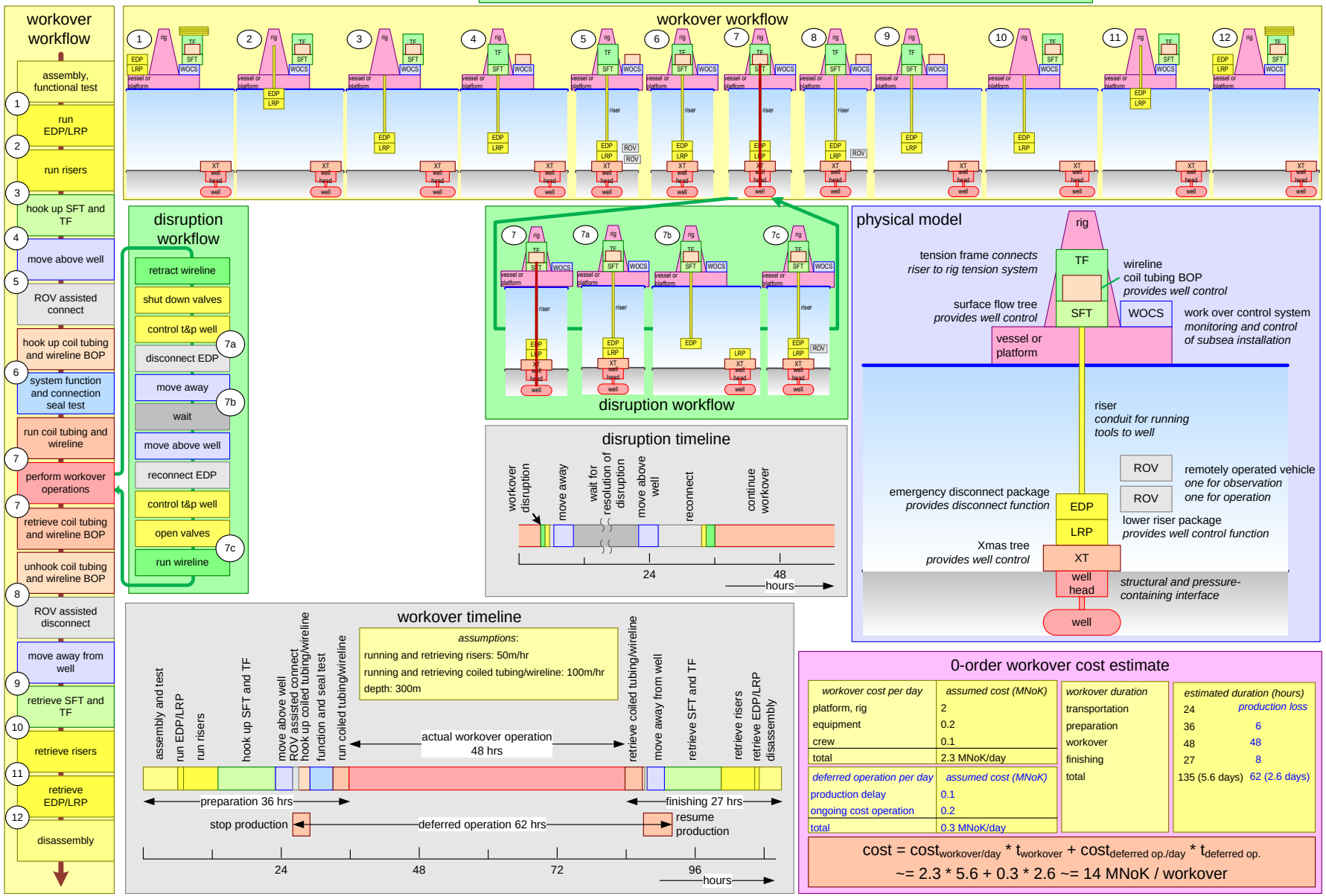

Stepwise Approachto Planning for Integration

Understand Solution Design and Context

Parts inside solution and in context, their interactions, emergence of Key Performance Parameters

Identify Risks

gaps in knowledge of problem and solution space, uncertainties, and ambiguity

Determine an Integration Sequence to get Key Performance Parameters functioning ASAP

using a pacing process (regular visible results)

Merge Constraints from Test Configurations, Suppliers, Partners, Resources, etc.

with a mindset to fail early

From Integration Sequence to Project Master Plan