

# Complex Project Management Systemic Innovation

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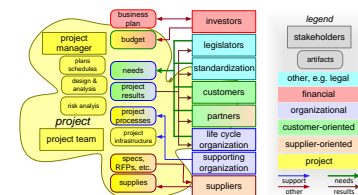
## Abstract

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

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# Project Management Tasks

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Composing the project team

Organizing and facilitating project members

Orchestrating solution design and analysis

Organizing the project infrastructure and processes

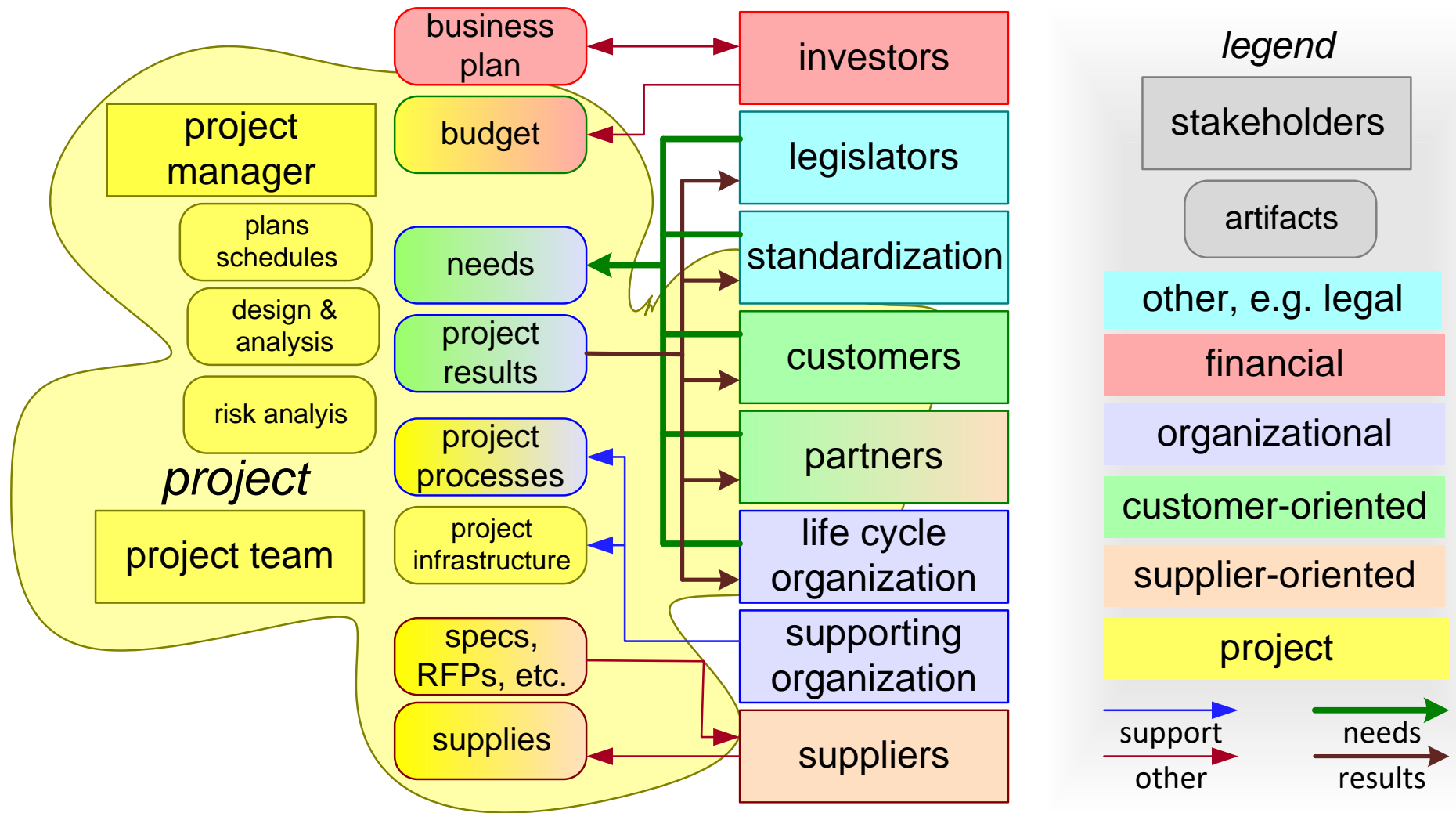
Managing budget and business and project plans

Ensuring and monitoring progress

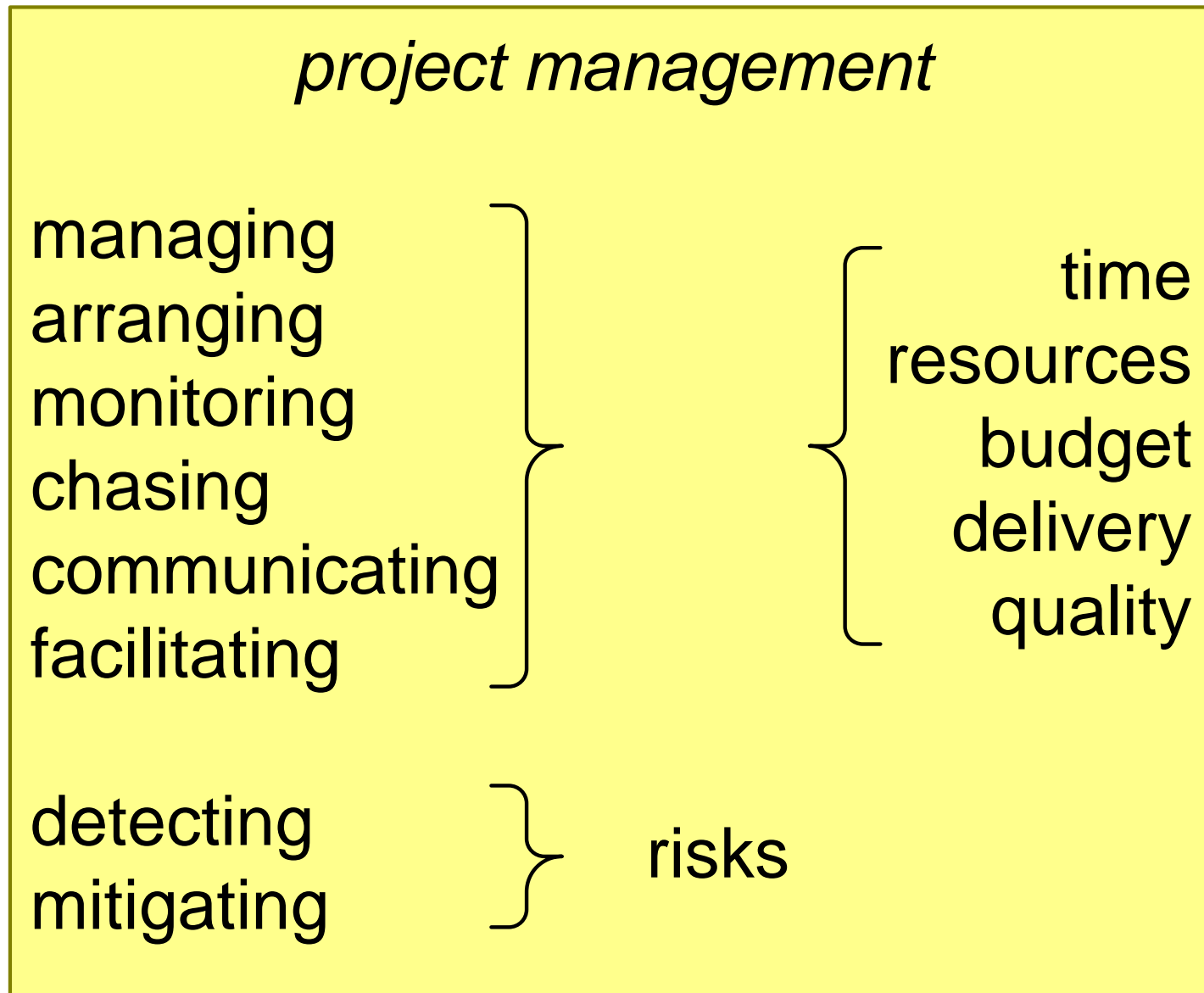
Managing external contacts

Detecting and mitigating risks

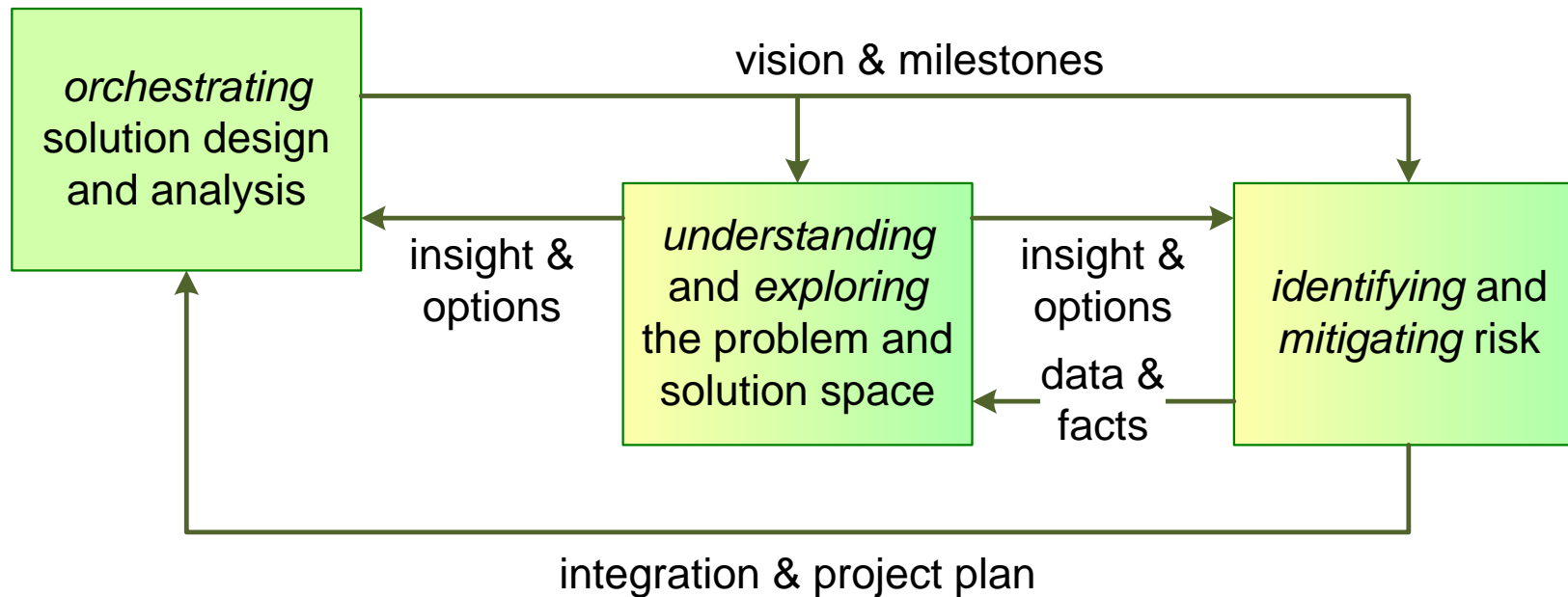
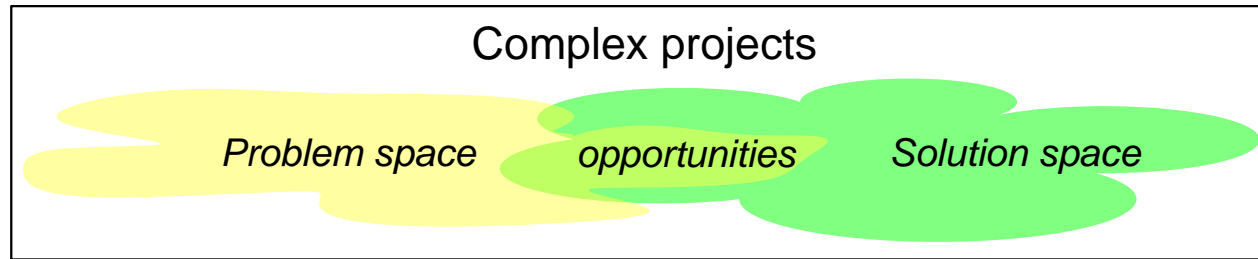
# The Landscape for Project Management in Innovation



# Project Management Tasks



# Value of Tools for Complex Project Management



# Planning Methods

<i>planning</i> pacing <sup>1</sup> agile, wall <sup>2</sup> last planner <sup>3</sup> PERT planning <sup>4</sup> planning for integration <sup>5</sup>	<i>decision timing</i> set-based design <sup>6,7</sup> real option theory <sup>8,9</sup> late decision making <sup>10</sup>	<i>long term outlook</i> roadmapping <sup>11,12</sup> foresight <sup>13</sup> gigamaps <sup>14</sup> scenario planning <sup>15</sup>
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<sup>1</sup> <https://www.entrepreneur.com/article/288769>

<sup>2</sup> <http://deepali10dulkars.blogspot.com/2014/07/pm-toolkit-series-release-planning-wall.html>

<sup>3</sup> Combating Uncertainty in the Workflow of Systems Engineering Projects, INCOSE 2013

<sup>4</sup> [https://en.wikipedia.org/wiki/Program\\_evaluation\\_and\\_review\\_technique](https://en.wikipedia.org/wiki/Program_evaluation_and_review_technique)

<sup>5</sup> <https://gaudisite.nl/SystemIntegrationHowToPaper.pdf>

<sup>6</sup> <http://lean-analytics.org/set-based-concurrent-engineering-sbce-why-should-you-be-interested/>

<sup>7</sup> [https://gaudisite.nl/INCOSE2012\\_Hansen\\_Muller\\_SetBasedDesign.pdf](https://gaudisite.nl/INCOSE2012_Hansen_Muller_SetBasedDesign.pdf)

<sup>8</sup> Ivanovic, A. and America, P., 2008, Economics of architectural investments in industrial practice; 2nd International Workshop on Measurement and Economics of Software Product Lines.

<sup>9</sup> Ivanovic, A. and America, P., 2008, Economics of investments in evolvable architecture in industrial practice, ICSM08

<sup>10</sup> <https://electricalfundablog.com/agile-model-methodology/>

<sup>11</sup> <http://www.cambridgeroadmapping.net/>

<sup>12</sup> <https://gaudisite.nl/RoadmappingPaper.pdf>

<sup>13</sup> Miles, I., Saritas, O., and Sokolov, A., 2016. Foresight for Science, Technology and Innovation. Springer

<sup>14</sup> Skjelten, E.B.: Complexity & other beasts a guide to mapping workshops. The Oslo School of Architecture and Design, Oslo (2014).

<sup>15</sup> Wilkinson, A. and Kupers, 2013, R. Living in the Future, Harvard Business Review, May 2013

# Stakeholder Methods

*stakeholder communication*

A3AOs<sup>1,2</sup>  
T-shaped presentation  
physical & virtual demonstrators:  
prototypes, animations, simulations, mockups

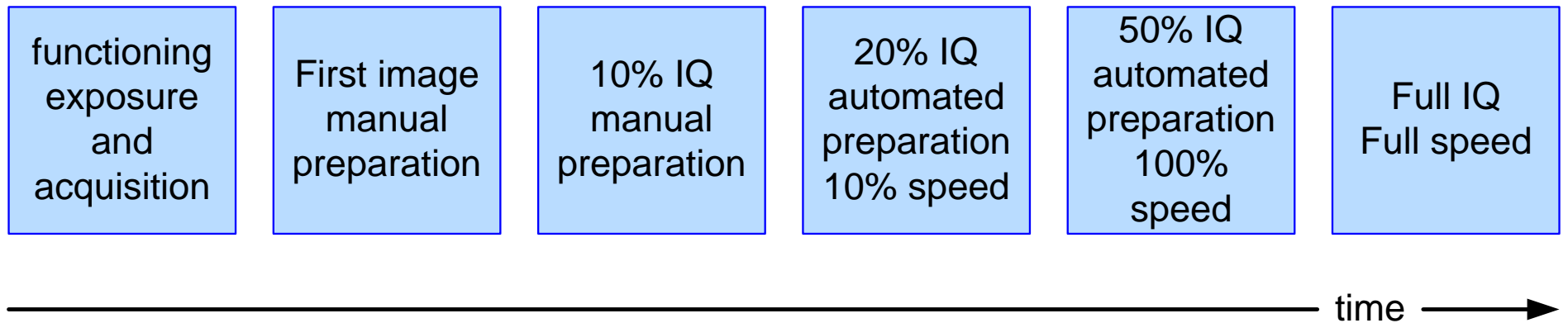
*understanding and exploring problem and solution space*

conceptual modeling<sup>3,4</sup>  
illustrative ConOps<sup>5,6,7</sup>  
Ideation, Creativity techniques<sup>8,9,10,11</sup>  
storytelling, scenarios<sup>12</sup>  
virtual prototyping<sup>13</sup>  
value network analysis

business model analysis  
Business Model Canvas<sup>14</sup>  
low-tech tools:  
flip over sheets, sticky notes, markers  
high-tech tools:  
modeling, simulation, animation, virtual reality

- <sup>1</sup> Borches D, 2010 A3 architecture overviews: a tool for effective communication in product evolution.
- <sup>2</sup> <https://gaudisite.nl/BorchesCookbookA3architectureOverview.pdf>
- <sup>3</sup> Muller, G. Challenges in Teaching Conceptual Modeling for Systems Architecting, ER 2015
- <sup>4</sup> Muller, G. Teaching conceptual modeling at multiple system levels using multiple views, CIRP 2014
- <sup>5</sup> [https://gaudisite.nl/INCOSE2016\\_Solli\\_Muller\\_VisualConOps.pdf](https://gaudisite.nl/INCOSE2016_Solli_Muller_VisualConOps.pdf)
- <sup>6</sup> [https://gaudisite.nl/INCOSE2015\\_MullerEtAl\\_SubseaOverviewA3.pdf](https://gaudisite.nl/INCOSE2015_MullerEtAl_SubseaOverviewA3.pdf)
- <sup>7</sup> ISO/IEC 2011. Systems and software engineering - Life cycle processes - Requirements engineering.
- <sup>8</sup> <https://www.ideou.com/pages/ideation-method-mash-up>
- <sup>9</sup> Skjelten, E.B.: Complexity & other beasts a guide to mapping workshops. The Oslo School of Architecture and Design, Oslo (2014).
- <sup>10</sup> Young, J.W. 2016: A Technique for Producing Ideas, Stellar Editions.
- <sup>11</sup> 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>
- <sup>12</sup> Muller, G., 2011, Systems Architecting; a Business Perspective, CRC Press
- <sup>13</sup> [http://www.esi.nl/innovation-support/documents/symposium-2016/2-PT\\_Virtual-Prototyping-Interventional-X-Ray-Systems.pdf](http://www.esi.nl/innovation-support/documents/symposium-2016/2-PT_Virtual-Prototyping-Interventional-X-Ray-Systems.pdf)
- <sup>14</sup> Osterwalder, A. et al., 2004, The business model ontology: A proposition in a design science approach.

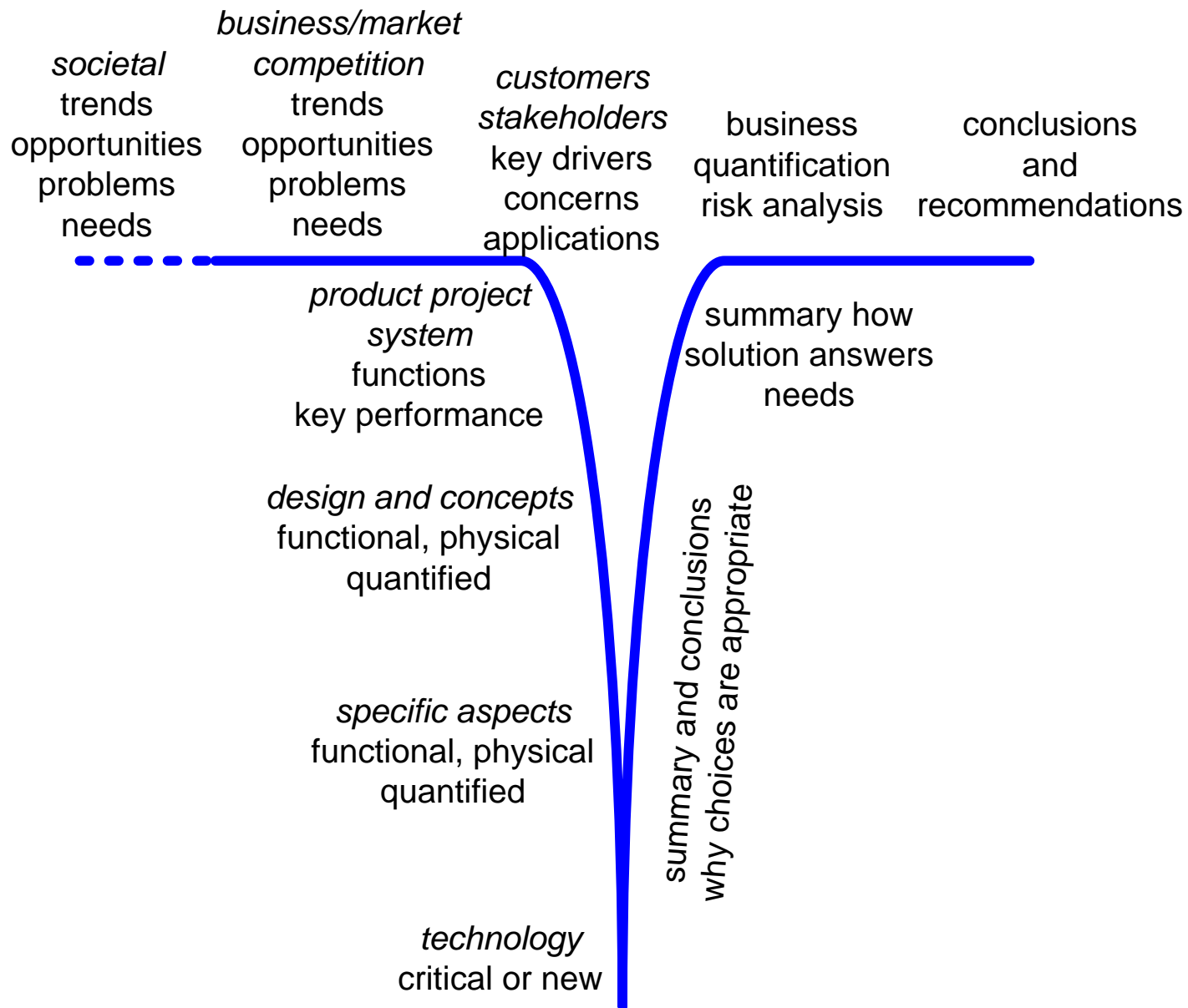
# Example of Pacing Milestones



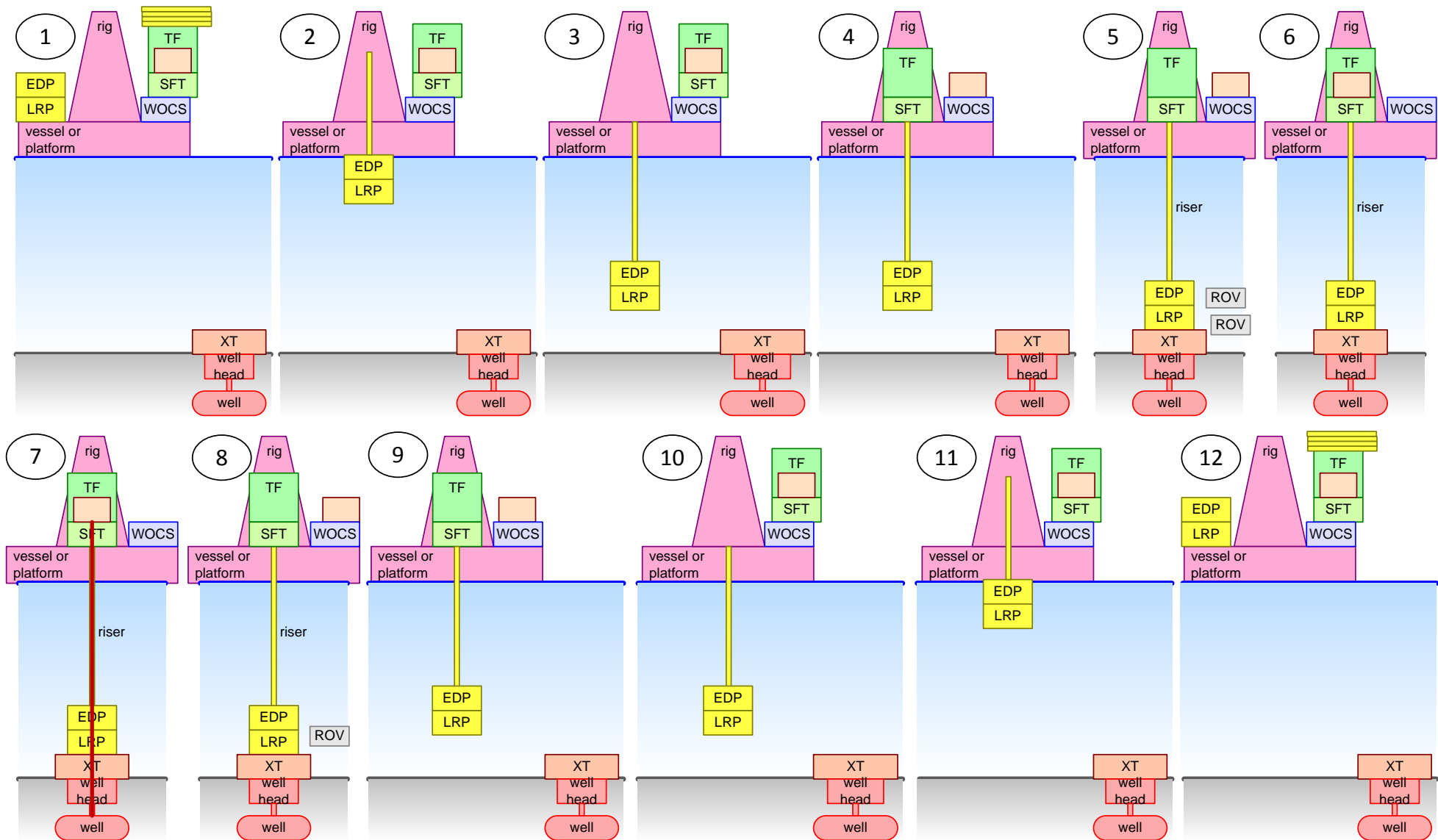
spacing:  
maximum 6 month between milestones  
depending on technology and domain



# T-shaped Presentation



# Example of an Illustrative ConOps

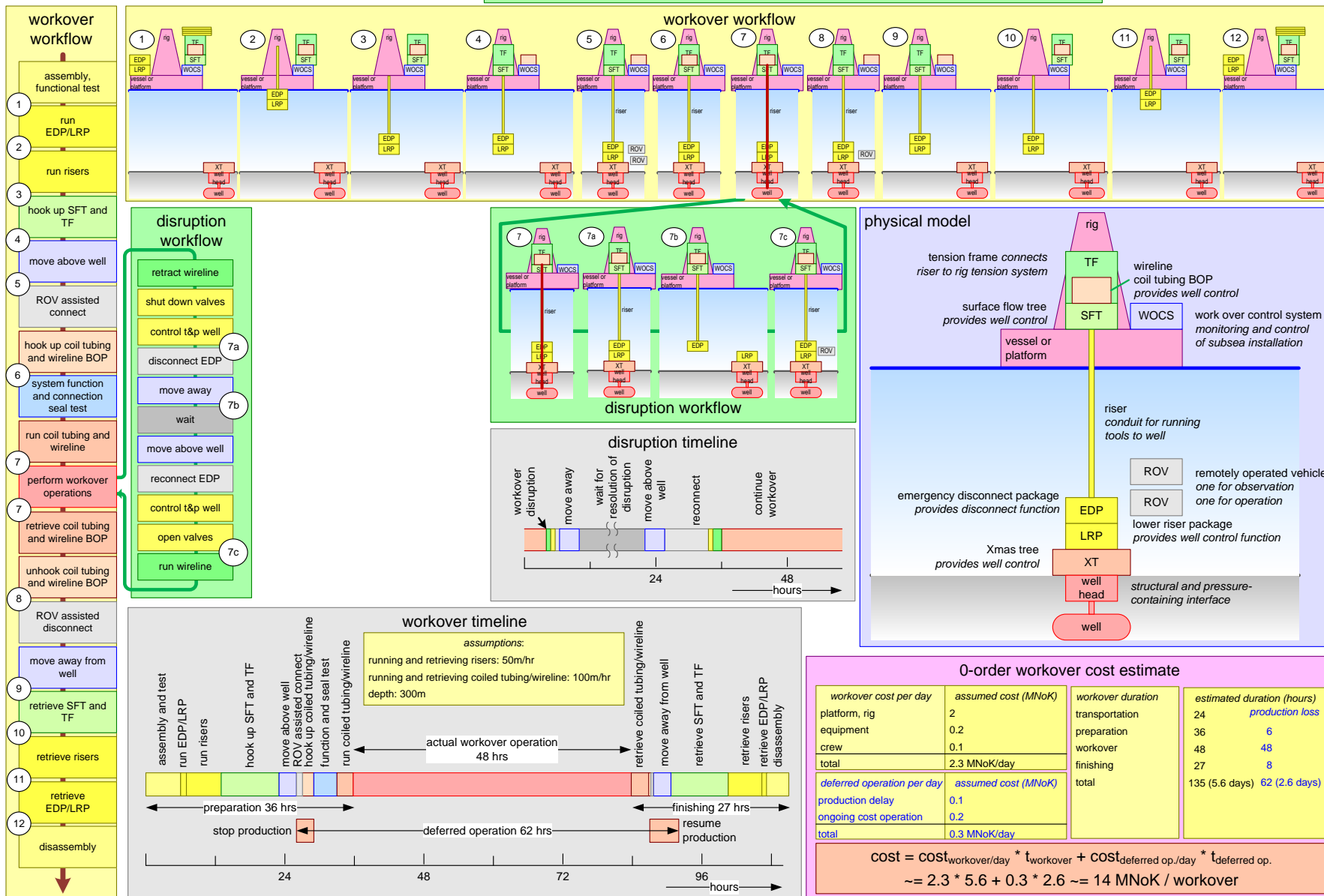


# Example A3AO from Offshore Energy

Workover operation; architecture overview

This A3 based on the work of SEMA participants: Martin Moberg<sup>3</sup>, Tormod Strand<sup>2</sup>, Vazgen Karlsen<sup>1</sup>, and Damien Wee<sup>1</sup>, and the master project paper by Dag Jostein Klever<sup>1</sup>. <sup>3</sup>Aker Solutions, <sup>1</sup>FMC Technologies

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# Stepwise Approach to 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

