# Open European Network for ENTerprise InnOVation in High Value Manufacturing (ENTOV-HVM)

## Case Study 2: "Implementing the Digital System"

Facilitator: Dr. Oliver Schwabe, Principal Web Weaver, Open European Network for ENTerprise InnOVation in High Value Manufacturing (ENTOV-HVM), oliver.schwabe@innovation-web.eu.   Tel.: ++ 49 (0) 170 9053671

Website: www.innovation-web.eu
Blog: https://open-european-innovation-network.blogspot.com/
Facebook: https://www.facebook.com/groups/2014779865300180/
LinkedIn Group: https://www.linkedin.com/groups/8779542/
LinkedIn Company Page: https://www.linkedin.com/company/entov
Researchgate: https://www.researchgate.net/project/Open-European-Network-for-Enterprise-Innovation-in-High-Value-Manufacturing-ENTOV-HVM
Sourceforge: https://sourceforge.net/projects/entov-hvm/
Twitter: @owschwabe (#innovationweb)

# Case Study 2: "Implementing the Digital System" – The Challenge

**Challenge**

Jessy works for a medium sized aerospace OEM and is responsible for the digital manufacturing systems of internal facility manufacturing various components in an 18 shift pattern with 1,000 shopfloor and 400 office staff. 435 machines are operated to produce 800 unique parts and the facility makes an annual turnover of €300M. As part of their digital transformation efforts and in preparing for a new product the facility has gained significant funding to deploy a new manufacturing execution system and key systems integrated with this (i.e. quality and DNC code distribution / management) including the needed shop floor / facility infrastructure and data migrations. The systems must be implemented within the next 9 months and the board of the company has signaled that there will be no additional budget.

The project is part of a larger programme refreshing the digital manufacturing estate of 24 facilities distributed globally. 10 facilities in other countries have already been transformed and there is a central team at the mother company providing guidance and governance. Experienced resources are limited and the projects typically need to assign significant portions of the work to a variety of sub-sub-contractors who will then also assume service and support of the implemented systems. Experience has also shown that significant resources from the business community are needed in order to transfer business processes into the new digital systems landscape.

Jessy has asked you to advise her of what she needs to consider in order to implement the "innovation web" approach for mastering the challenge described. After a discussion with a colleague of Jessy at another facility you have prepared the map of a similar previous challenge that was resolved at another facility.

**Context**

Assume the following context:

1. A central stage gate process is available for implementing the planned digital transformation.
2. Jessy is PMI qualified and has not delivered a project like this before.
3. The mother company is in the US. Jessy´s company is in France.
4. Jessy´s company has recently gone through a transformation process which resulted in a 15% reduction in shop floor and office staff. A significant number of employees went into early retirement.
5. Approximately 50% of the machines will be needed to support the new products.
6. Each machine performs operations on an average of 23 different parts.
7. The below image illustrates how the various relevant project management approaches overlap.

# Case Study 2: "Implementing the Digital System" – Previous Success Story
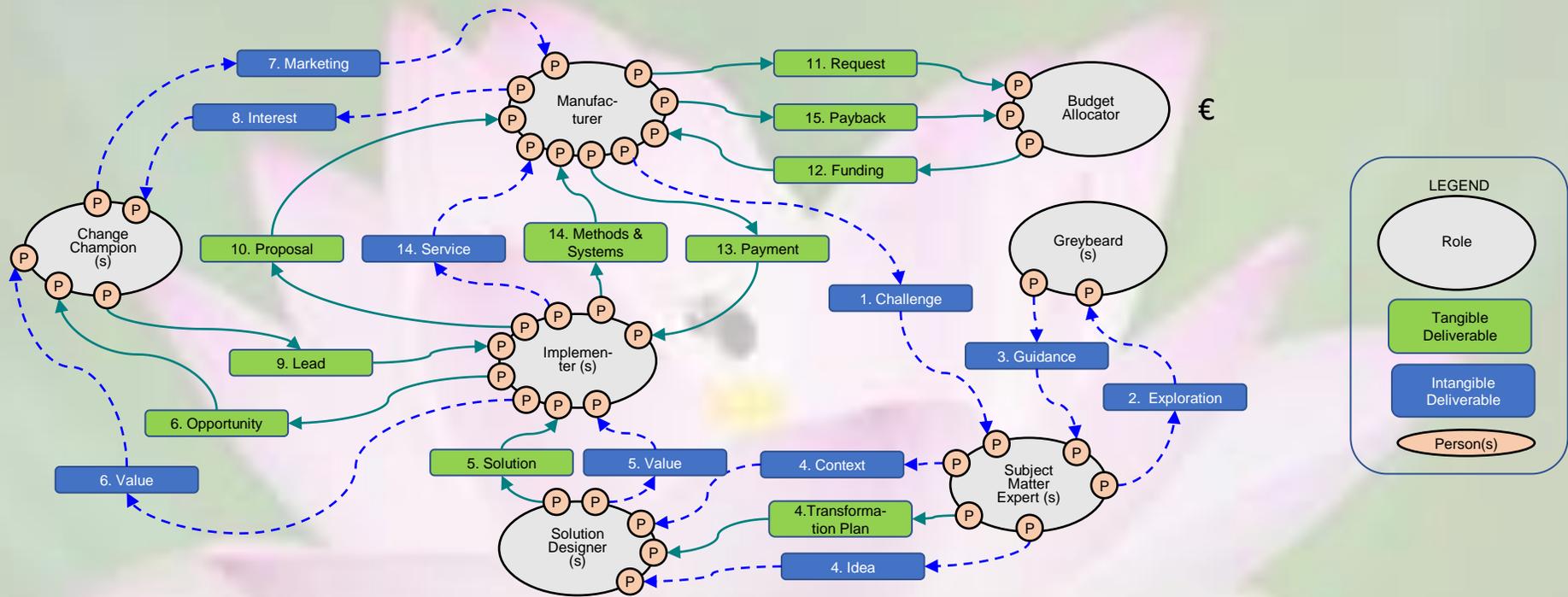


In a previous year another facility located in the UK was faced by a similar challenge and was able to implement the digital systems within 6 months. This facility is significantly smaller and located in the US. The above map is a high level description of the innovation web which enabled that successful change. The map closely follows the narrative for the generic diffusion of innovation (see https://open-european-innovation-network.blogspot.com/2020/01/the-narrative-for-generic-diffusion-of.html) with the primary differences being: (a) in step 4 the "prototype" is actually a transformation plan (b) the role of "user" is now the role of "manufacturer" (c) the role of "researcher" is now the role of "subject matter expert (e) the role of "thought leader" is now the role of "greybeard" (f) the role of "innovator" is now the role of "solution designer" (g) the role of "marketeer" is now the role of "change champion" and (h) the role of "funder" is now the role of "budget allocator.

# Case Study 2: "Implementing the Digital System" – Guidance

**Challenge**

Jessy has asked you to advise her of what she needs to consider in order to implement the "innovation web" approach for mastering the challenge described. After a discussion with a colleague of Jessy at another facility you have prepared the map of a similar previous challenge that was resolved at another facility.

**Expectation**

Jessy works for a medium sized aerospace OEM and is responsible for the digital manufacturing systems of internal facility manufacturing various components and needs specific actionable interventions in order to implement the transformation within 9 months. She expects the previous innovation web success story to be used as the basis for these recommendations.

You should make no more than five (5) recommendations which represent changes to the previous success story and can be visualized in the map.

**Potential Types of Recommendations**

1. Discover the local innovation web story
2. Accelerate the innovation web story
3. Implement game changers in the innovation web story
4. Reduce the uncertainty of actions
5. Design changes to align with the innovation web

**Presentation**

You will have 45 minutes to prepare in groups of 2-4 and then 3 minutes to present your recommendation. Your presentation will be graded by peer teams and the highest scoring team wins.

**Dimensions of Exploration – The Example Success Story**

Innovation webs are primarily described by 13 interdependent indicators. Focusing on these and creating a high level dependency model can be helpful when searching for ways to improve performance.

1. Resilience (Quantitative) - The ability to return to an archetype after an incident.
2. Reciprocity (Quantitative) - The extent of "return" transactions between roles.
3. Agility (Quantitative) - The ability to adapt to changing external conditions.
4. Structural Integrity (Quantitative) - The number of alternate paths for value creation.
5. Structural Dependency (Quantitative) - The intensity / density of exchanges.
6. Complexity (Quantitative) - The number of relationships between roles.
7. Emergence (Quantitative) - The probability of unexpected self-organization.
8. Maturity (Quantitative) - The average length of relationships of participants.
9. Perceived Value (Qualitative) - The benefits participants attribute to deliverables.
10. Value Creation (Qualitative) - The intellectual and financial capital created by roles.
11. Value Consumption (Qualitative) - The intellectual / financial capital consumed by roles.
12. Cost Benefit (Qualitative) - The delta between value creation and consumption.
13. Sequence (Qualitative)- The speed of transfer for deliverables.

# Case Study 2: "Implementing the Digital System" — Support & Additional Challenge
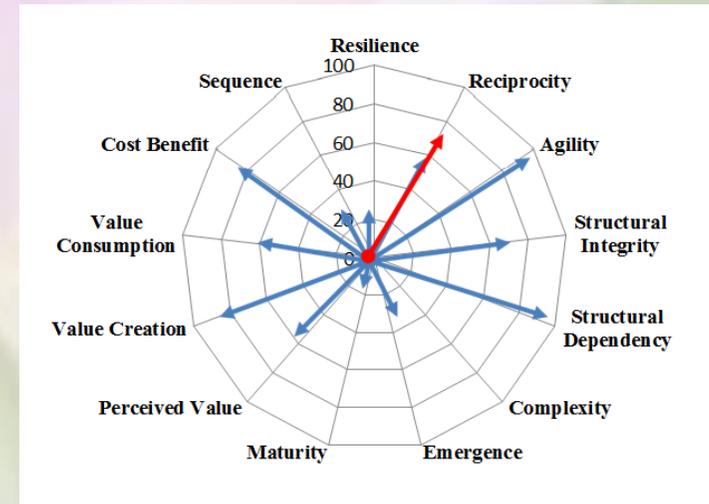
## Support

1. **ENTOV-HVM Sourceforge Project** (https://sourceforge.net/projects/entov-hvm/ ) – The download section contains extensive toolsets for exploring and serving innovation webs from a more generic value networks perspective.
2. **ENTOV-HVM Blogsite** (https://open-european-innovation-network.blogspot.com/) – The blog contains extensive posts describing innovation systems, in particular (a) The Living Systems Molecule https://open-european-innovation-network.blogspot.com/2019/12/the-living-systems-molecule.html (b) The Narrative for Generic Diffusion of Innovation https://open-european-innovation-network.blogspot.com/2020/01/the-narrative-for-generic-diffusion-of.html (c) Research Web https://open-european-innovation-network.blogspot.com/2019/06/exploring-first-innovation-web-research.html (d) Socialization Web https://open-european-innovation-network.blogspot.com/2019/06/exploring-second-innovation-web.html (e) Market Validation Web https://open-european-innovation-network.blogspot.com/2019/06/exploring-third-innovation-web-market.html (f) Commercialization Web (g) https://open-european-innovation-network.blogspot.com/2019/06/exploring-fourth-innovation-web.html (g) ADI-HVM One Page Overview – the Living Innovation System and the DNA of the Idea https://open-european-innovation-network.blogspot.com/2019/11/adi-hvm-one-page-overview-living.html
3. **ENTOV-HVM Website** (https://www.innovation-web.eu) – The literature and download sections contain extensive additional resources and guidance.
4. **ENTOV-HVM LinkedIn Group** (https://www.linkedin.com/groups/8779542/) – This group of highly passionate web weavers may be helpful in giving subject matter guidance to your explorations.

## Additional Challenge

Innovation webs are best described through a series of performance indicators as discussed in the COST proposal (available in the downloads section of https://www.innovation-web.eu). The below image is a radial polar force field representation of these indicators (for detailed explanation see Schwabe, O. (2018) A Geometrical Framework for Forecasting Cost Uncertainty in Innovative High Value Manufacturing. PhD Thesis. Cranfield University. Available at: https://dspace.lib.cranfield.ac.uk/bitstream/handle/1826/13616/Schwabe_O_2018-%20FINAL%20CORRECTED.pdf?sequence=1&isAllowed=y .

Additional Challenge: Determine the indicator values for the example and recommended innovation webs in this case study and discuss their interdependence using co-variate and / or geometrical analysis. Which indicator or combination of these suggests „tipping points" for disruptive acceleration of value creation?

# Case Study 2: "Implementing the Digital System" – The Actual Solution



Co-Creation / Co-Learning Community Created

Enthusiastic (in-) formal leaders

Payback ignored

Focus on highly experienced advisors (from tier 1 IT partners)

Resources "scavenged" where-ever possible

Scope focused on high value critical parts only (Pareto Principle)

Intangible value creation emphasized

Cognitive Threshold: 5-7 roles / 6-8 strong participants / 30-40 exchanges

Successful orchestrators know the importance of maintaining strong political ties throughout their ecosystems as a method for achieving success.

7. Marketing
8. Interest
10. Proposal
14. Service
14. Methods & Systems
13. Payment
9. Lead
6. Opportunity
6. Value
5. Solution
5. Value
4. Context
4.Transformation Plan
4. Idea
1. Challenge
3. Guidance
2. Exploration
11. Request
15. Payback
12. Funding

Manufacturer
Change Champion (s)
Implementer (s)
Solution Designer (s)
Subject Matter Expert (s)
Greybeard (s)
Budget Allocator

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