



USING BUSINESS ECOSYSTEMS MAPPING TO GENERATE NEW COMPETITIVE VALUE PROPOSITIONS

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ABSTRACT

As manufacturing-firm strategies move from product-centric towards those in which a higher degree of service is associated with the product a company's business ecosystem – the collaborative network needed to build value for the customer – often becomes more complex. When considering the collaborative possibilities, firms can find it challenging to identify and compare the potential value created by alternative strategic actions such as radical new partnerships and partnering arrangements. To support capability development, strategic thinking is shifting to include a broader approach to understanding and conceptualizing business ecosystems. The Institute for Manufacturing (IfM) and IfM Education and Consultancy Services Ltd. are applying a novel way to allow managers to visualize and understand their firm's external complexity, which we refer to as business ecosystem value mapping. The technique has been used in strategic workshops with industry partners. This paper includes a case study of one such workshop, focusing on how the industry partner deepened their understanding of value exchange in their business ecosystem. This understanding was critical to the workshop purpose: to decide whether and how to proceed with a tender offering. From an inauspicious starting point – the firm considered itself relatively uncompetitive in relation to the tender – the workshop led to the identification of eight new value creation opportunities from which four propositions were selected to form the basis of an offering. The partner's subsequent tender offering was successful. Following acceptance, the partner cited a number of these propositions as the reasons why the offering was chosen. The paper seeks to illuminate how the two-day workshop process, built on strong preparation to ensure that the right strategic questions were addressed, developed understanding and application of value creation and exchange in offerings based on collaborative ecosystems. We then suggest some implications for further work.

Keywords: business ecosystem, collaborative network, ecosystem mapping, business models, strategy, value exchange, value mapping

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1. INTRODUCTION

Manufacturing firms are diversifying their offerings to their clients by offering services and changes to their products during the lifetime of the product. Two out of three companies in developed countries, and globally one-third of large manufacturing firms are stated to offer a form of services [1]-[4]. Furthermore, researchers state that, on average, one-third of income is generated by product manufacturers through the offering of service [5]. Despite the importance of services within the manufacturing field, many companies struggle to manage the change from a product-centric to a service-centric business [6]-[9]. One aspect of this struggle is bringing value to the customer through a structure whereby multiple companies collaborate. These business structures are often referred to as business ecosystems.

A business ecosystem is defined as a network of organizations and individuals that collaborate and evolve roles and capabilities, as well as synchronizing their investments to build value and increase efficiency (see for example Moore [10] and Williamson and De Meyer [11]).

This paper contributes to the discussion on value creation in ecosystems and acknowledges that there is value exchange between companies when they operate in the same ecosystem. It focuses on a case study where business ecosystem value mapping was used to help a company solve a competitive challenge. The problem concerned putting together a competitive response to a customer tender request for a complex systems engineering change required for a class of naval ships. The challenge was linked to limited ability to understand the complete value exchange between partners in business ecosystems (focusing on the direct and indirect value capture and creation between key stakeholders).

By addressing this demand from practitioners we are answering not only the call of practitioners for a deeper understanding of value, but also academic calls to understand value (see, for example, Lepak et al. [12]).

The research question is: “How did managers create a winning tender for business considering their business ecosystem?” considering a single case study as a methodology [13], [14].

2 ECOSYSTEMS BACKGROUND

Business ecosystems have been investigated in at least three different areas of the literature. These are: (i) electronic platforms in the form of, for example, social networks, sales platforms and games [15], [16]; (ii) ecosystems in a context of technological innovation [17]; (iii) ecosystem as affiliation and structure – a concept recently introduced by Adner [18]. An ecosystem as an affiliation is described as linked members who make a community defined by their belonging to the platform. Ecosystem as a structure starts with a value proposition that has to be delivered by the ecosystem members producing value together; a proposition that a single actor in the ecosystem could not deliver alone [19], [20].

The theoretical grounding for the ecosystem mapping process used in this case study is based on the resource dependence perspective [21]. This theory defines companies’ inability to be sustainable without external dependencies. In the past this has been viewed less within a business-to-business context than within the business; for example, in human resources the dependence on being able to hire suitably qualified and experienced staff. If we extend this, then companies, in order to survive or extend business, can create dependencies on other businesses and make strategic decisions based upon them. Therefore, other businesses can also be viewed as resources. The result is a business ecosystem, in which multiple companies coexist in a strategic interaction.

Business ecosystems evolve in different stages. The starting point is described as a mix of capital, customer interest and talent base, which is the starting point for an ecosystem’s formation. This is followed by expansion, leadership and, finally, self-renewal or death [22], [23]. If the ecosystem is considered a success, there can also be a merger between the companies, which is considered to increase efficiency between the parties involved [23].

Value is created by the company itself or by its partners for the end customer. Therefore, every actor in the ecosystem creates and also captures value. This can take place upstream or downstream the value chain [17]. However, it is important that there is a value increase to the value chain and as little as possible value slippage within the system [12]. All these factors mean that one can look at value in very different ways. One example is a consumer benefit experienced, which is looking at the value creation from the perspective of additional utility the consumer can experience [24].

For the purposes of this paper we are looking at value creation and capture in the context of the resource dependence perspective. Hence, if there is dependency between two organizations, such as an ecosystem, companies must both create and capture value as a result of being dependent on each other, for commercial success to be achieved.

Value will be seen as both direct and indirect. We consider the former as a value provision (pain/gain) following the definition of Osterwalder et al. [25]. We note that services are interchangeable, heterogeneous, inseparable and perishable (Lovelock and Gummesson [26]). This also applies to the value they deliver and the value that companies exchange with one another. The paper uses a framework developed by the Institute for Manufacturing (IfM) to describe the creation and capture of direct and indirect value by companies and exchanged within ecosystems.

This paper is a first effort to understand the impact of business ecosystem understanding. The single case study is not aiming to generalize, but to show the impact of a workshop-based thought development process concerning business ecosystems and the value that is exchanged between the organizational actors. After detailing the case study and defining its impact, we will offer some conclusions and areas of further work.

3 CASE STUDY

The case study considers the provision of upgrade services to complex naval ships, particularly in the context of a specific major tendering contract for a significant modification for commissioned naval platforms.

The opening situation was assessed and could be summarised as follows:

- The customer issuing the invitation to tender is strongly wedded to introducing more competition to the maritime supplier market
- It is vital that the customer perceives significantly improved delivery capability
- The programme can impact on major future bids, so it is vital that the provider bids to win

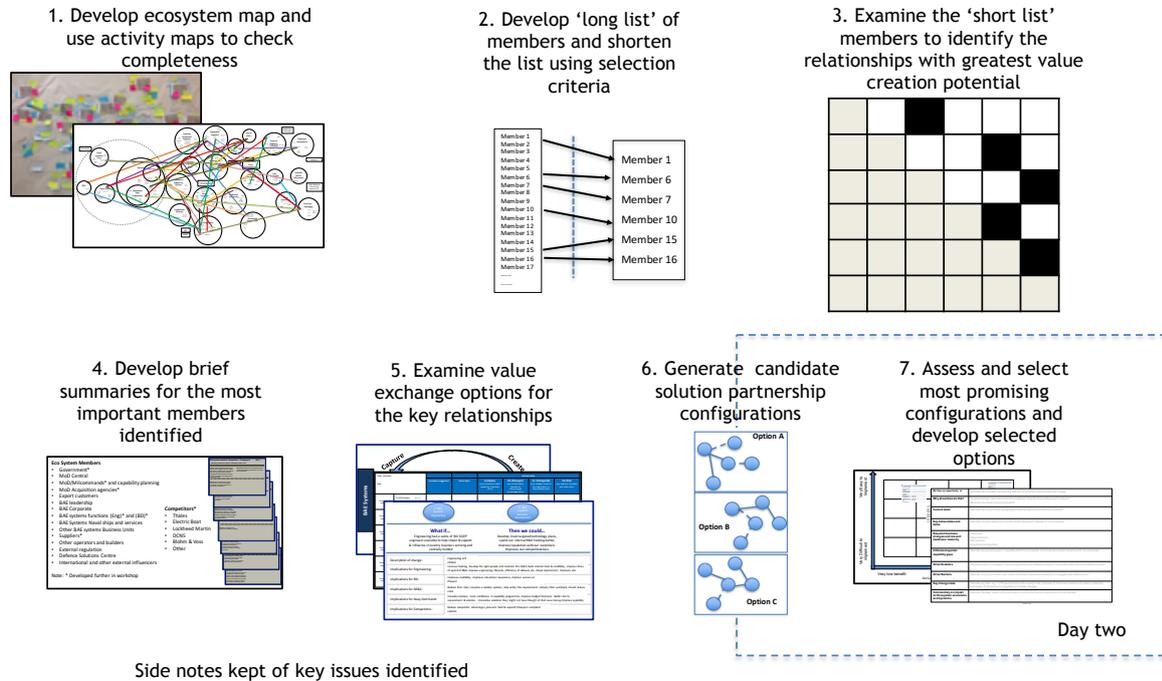
IfM developed an ecosystem mapping programme with the client (provider) to examine alternative possible partnership configurations for the project, and associated competitive value propositions. The critical question considered was to examine how different potential alliance configurations might fit the strategic context of the maritime support environment (including impact on effective decision-making around solution definition).

The programme consisted of a planning workshop with key leaders from the bid team to ensure the current situation was well understood and articulated and define the scope and critical question, and selection criteria, followed by a two-day workshop in November 2016 with client bid team members and other key internal stakeholders to examine the ecosystem and develop strategic options for new partnering and value creation opportunities. The key steps in the two-day workshop process were as follows:

- Develop ecosystem map and use 'activity maps' to check completeness
- Develop long list of members and shorten the list using agreed selection criteria
- Examine the short-list members to identify the relationships with greatest value creation potential

- Develop brief summaries for the most important members identified, showing value proposition, dependencies on other ecosystem members, and key risks run
- Examine value exchange options for the key relationships
- Generate candidate solution partnership configurations
- Assess and select most promising configurations and develop selected options

The workshop process is outlined in Figure 1.



Side notes kept of key issues identified

Figure 1: Workshop Process Summary

The key steps in the process are described below.

1) Develop ecosystem map and check completeness

In small groups or individually, delegates brainstorm ecosystem members and post on a collective large wall chart, as shown in the photograph in Figure 2. Similar categories of ecosystem member are clustered and then the key relationships are highlighted with string. Delegates review the chart for completeness based on known activities and processes and then spend time reflecting and capturing immediate observations about gaps, potential opportunities, and insights that emerge.

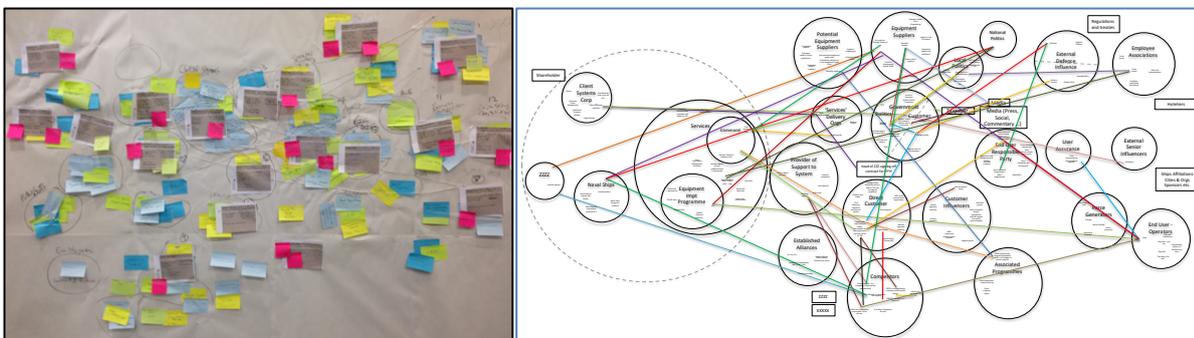


Figure 2: Ecosystem Wall Chart – Raw State and Transcribed Map

2) Develop long list of members and shorten using agreed selection criteria

The ‘critical question’ and associated selection criteria would have been developed in the planning meeting; however at this point, in the light of the ecosystem map (Figure 2), delegates review and finalize the critical question and criteria, in case a further development is required in the light of new information gathered.

Delegates then individually distribute a limited number of votes amongst the ecosystem members based on the agreed criteria. Votes are represented by two kinds of coloured dots. In addition to a rationed (blue-dot) vote for identifying most important ecosystem members delegates may use an unrationed (red-dot) vote to identify important members whom they consider disconnected or inadequately connected.

Whilst the votes are compiled delegates in pairs continue to discuss insights from the work to date (possibly using a 5/5/5 approach where each delegate speaks for five minutes whilst the other listens, then swap places, then talk together for five minutes).

3) Examine short-list members to identify relationships with greatest value creation potential

Delegates consider the bilateral connections and potential connections of the short-list members and distribute a further limited number of votes amongst the intersections on the chart as shown in Figure 3. Limited dot voting identifies both the current (blue) and the potentially most important (red) links.

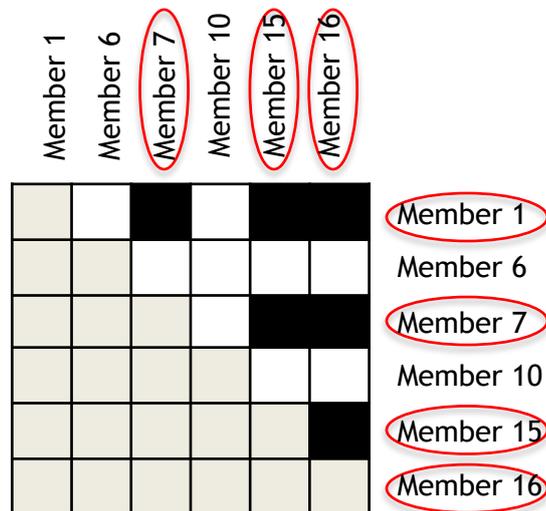


Figure 3: Voting on Short-list Ecosystem Members

The resulting ‘heat map’ is reviewed by delegates to confirm:

- Individual ecosystem members to be described in more detail in the next stage
- The pairs of relationships to investigate later in the process

In the same review session delegates in pairs continue to discuss insights from work to date (possibly using the 5/5/5 approach described above).

4) Develop summaries for the most important members, showing value proposition, dependencies and risks

The key ecosystem members are reviewed by delegates working in small teams using a simple template to briefly summarize value delivered and risk faced by the respective member. An example of this is shown in Figure 4. These summaries are shared and posted on the ecosystem map for future reference.

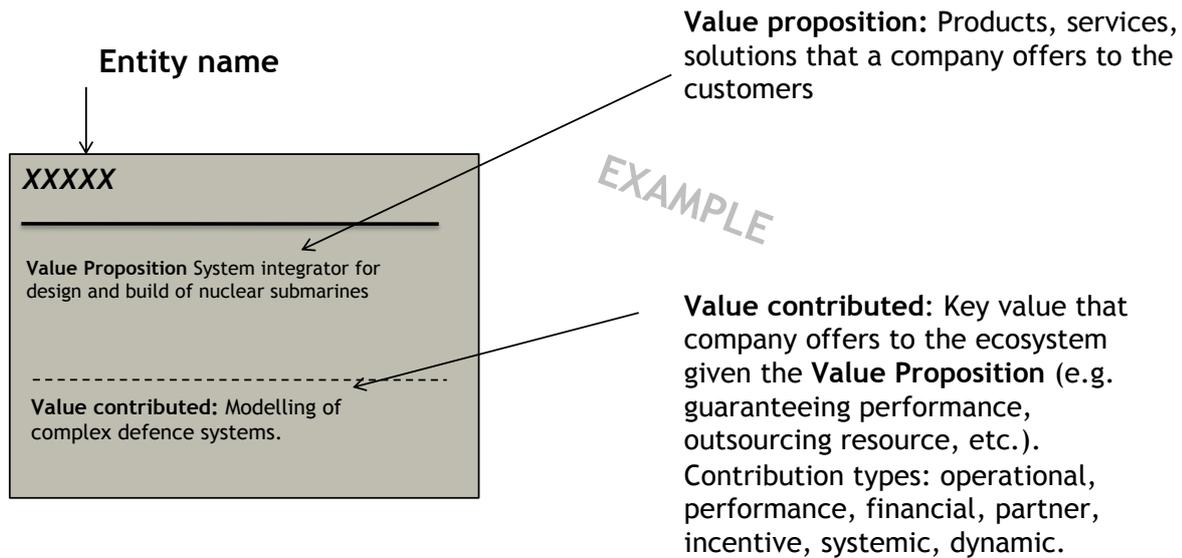
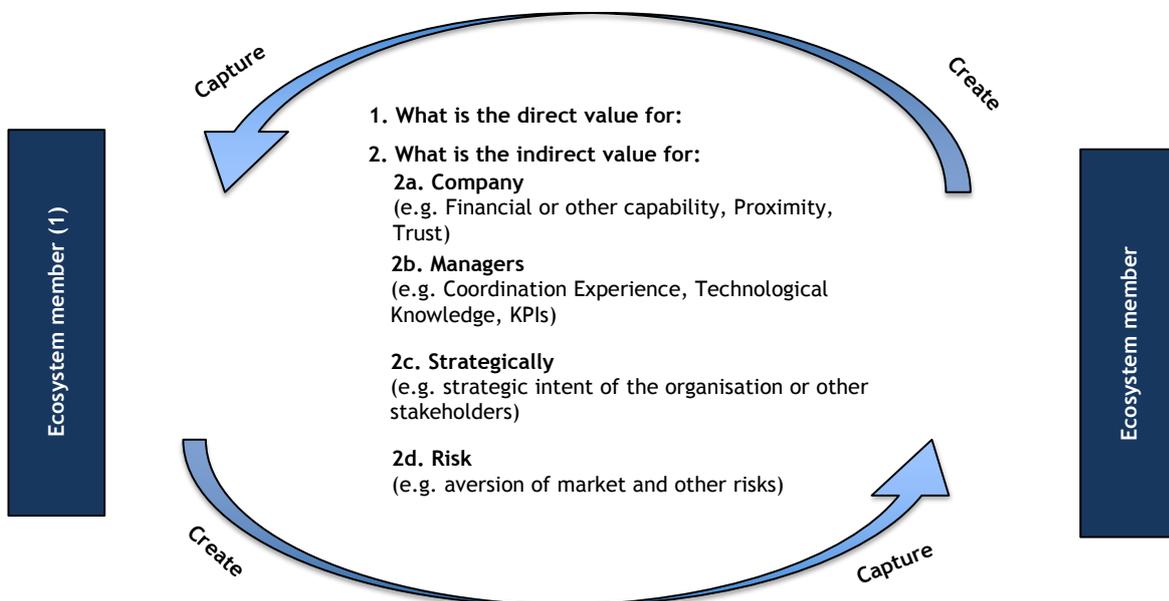


Figure 4: Example Summary: Ecosystem Member Value Proposition and Risk

5) Examine value exchange options for the key relationships

Delegates review how value is or might be created and captured in relationships between ecosystem members. In many cases value is both direct and indirect. Direct value is concerned with physical artefacts or information exchanged for money, whereas indirect value is concerned with intangibles, as outlined in Figure 5.



Urmutzer, Martinez, Neely (2016); "The Ecosystem Value Framework: Supporting Managers to Understand Value Exchange between Core Businesses in Service Ecosystems"; Production and Operations Management Society Conference 2016, in proceedings

Figure 5: Ecosystem Value Framework Showing Examples of Indirect Value

Small groups in sequence examine pairs of relationships between each key member of the ecosystem and complete the 'value exchange template' shown in Figure 6 to identify mutual creation and capture of value. As they complete the template they identify possible

innovations that may generate new or enhanced value through the relationship and list these also on the template.

Team members: Date:		Direct value	Indirect value Company (e.g. Financial or other capability, Proximity, Trust), Managers (e.g. Coordination Experience, Technological Knowledge, KPIs) Strategically (e.g. strategic intent of the organisation or other stakeholders) Risk (e.g. aversion of market and other risks)	Innovation and improvement ideas
Ecosystem member P	To A →			
	← From A			
Ecosystem member Q	To B →			
	← From B			
Ecosystem member R	To C →			
	← From C			
Ecosystem member S	To D →			
	← From D			
Ecosystem member	To E →			
	← From E			
Ecosystem member	To F →			
	← From F			

Figure 6: Value Exchange Template

The template considers the mutual creation and capture of both direct value (physical artefacts or information exchanged for money) and indirect value (intangible exchanges such as strategic impact, trust and risk), as described above.

6) Generate candidate new partnership arrangements

Pairs discuss insights from work on value exchange (using the 5/5/5 approach) and develop workable new ecosystem relationships. They draw a simple ‘thumbnail’ model on a flip chart and give it a title, noting any key issues identified. These are presented back in plenary, ideally after an extended break – the process is best conducted the following day to give delegates time to reflect on their innovative ideas overnight. Example configuration ‘thumbnails’ are shown in Figure 7.

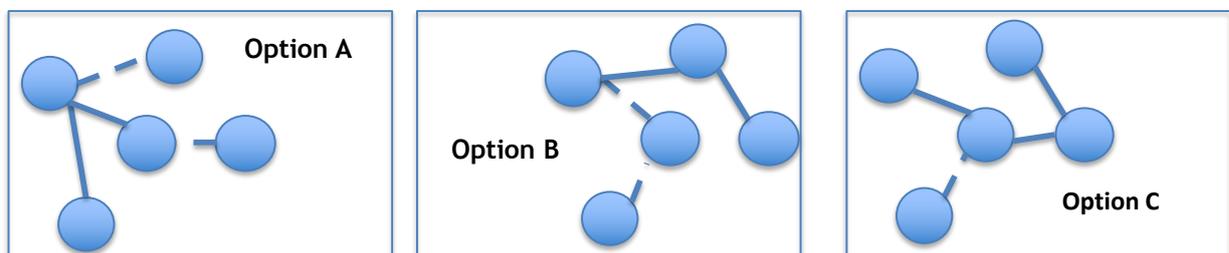


Figure 7: Example Thumbnails of Partnership Configurations

Plenary review examines the options, clarifies understanding of the intent and groups similar ones together to create a series of candidate options.

7) Assess arrangements and develop selected options

Small groups are each allocated one or two options (depending on the number generated) for review using the template shown in Figure 8.

Opportunity and feasibility criteria are agreed in advance and may be relatively simple, depending on the context and business requirement.

Point	Comment
Value proposition description	
Potential customers	
Why should we do this?	
Implications for wider strategy	
Key ecosystem members' and their contribution	
Implications for the company	
Benefit score/range and comment	Score/Range:
	Comment:
Implementation score/range	Score/range
	Comment:
Key enablers	
Other comment:	

Picture of option

Lead to develop the proposition:

Figure 8: Template for Assessment of Partnership Option

Results are shared in plenary by posting the templates on a large 'opportunity and feasibility' wall chart as shown in Figure 9. Delegates vote on the options to down select a short list for further development as shown by the coloured dots on the figure.

Discussion (which may include grouping of options) is used to confirm selected options.

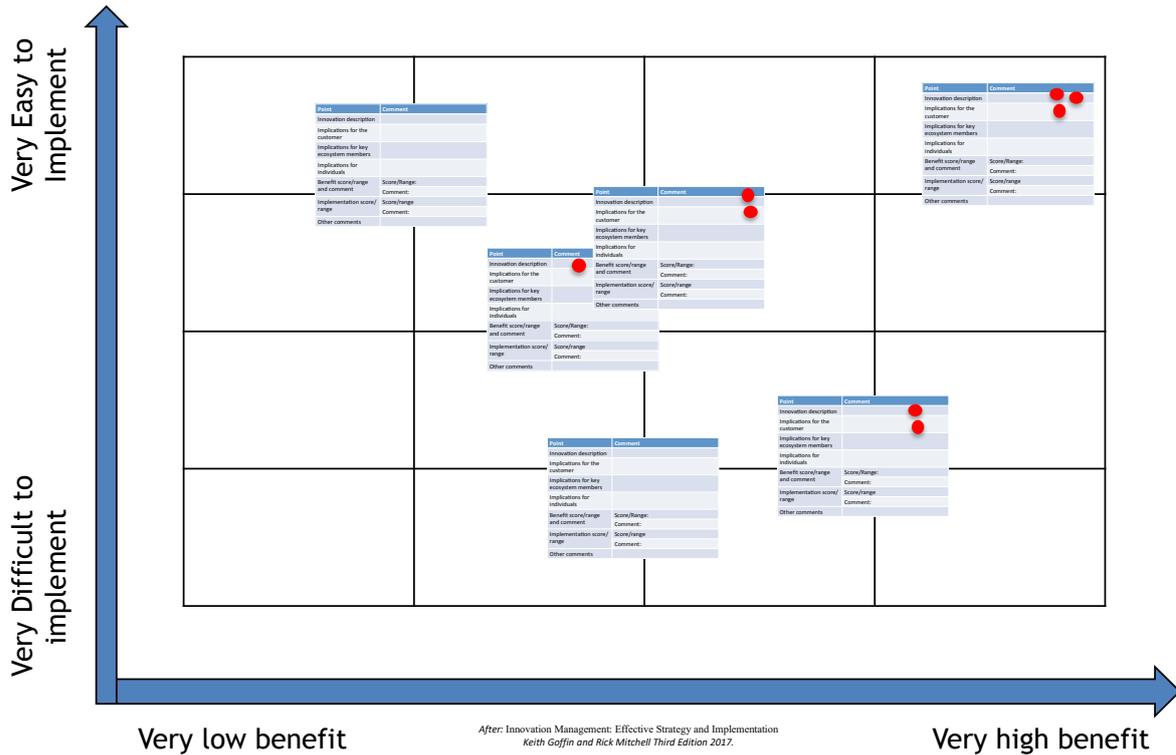


Figure 9: Opportunity and Feasibility Wall Chart

Small groups develop one option each using templates as shown in Figure 10. Note that the light-coloured text on the right-hand side of the table is a guide for delegates in completing the template, rather than indicative responses. (The layout and topics of the template are agreed during the workshop planning stage.)

Final results are presented to plenary for review and finalization.

We have an opportunity to:	<i>Describe the option and the key features of the current set up that would change</i>
Why should we do this?	<i>To what strategic objectives does this contribute? How does it benefit the end customer? What are the interim and end benefits?</i>
Current state	<i>Describe the current state highlighting the deficiencies and problems encountered</i>
Key deliverables and dates	<i>Describe any key milestones and associated dates which appear on your roadmap</i>
Critical ecosystem capability gaps	<i>Describe key present gaps in capability within the ecosystem and its members which would need to be addressed.</i>
Other Enablers	<i>Describe policies, strategies or other programmes and initiatives in place or anticipated which would facilitate the result</i>
Other Barriers	<i>Describe any factors which may, unless addressed impede the initiatives and suggest appropriate action.</i>
Key change risks	<i>Describe key risks e.g.: 1) Those inherent in the novelty of the proposal; 2) This due to reliance on parties outside the enterprise; 3) Those due to integration of multiple changes</i>
Commentary on impact on Ecosystem economics and dynamics	<i>Describe the likely impact of the innovation on the economics and dynamics of the ecosystem</i>
Key actions to deliver	<i>Describe the key actions needed to deliver technical, organisational, behavioral and commercial changes required</i>
Key issues for ecosystem exploitation	<i>Describe any key issues to consider relating to best exploitation of the ecosystem</i>

Figure 10: Option Development Template

In this instance, the workshop outputs were subsequently written up in a confidential report which was taken forward by the industry partner on to their bidding process.

4 DISCUSSION AND FINDINGS

The workshop identified eight possible new or transformed partnering opportunities, which were mapped onto a simple benefit/implementation chart. These opportunities are given cryptic code names to protect anonymity and competitive information (Figure 11).

Delegates voted using agreed criteria to support the down selection and the results are shown also on Figure 11.

The industry partner decided to examine a hybrid of the four priority options emerging and do an analysis on possible impact of any changes that might arise during the evolution of their customer’s requirements. The four options were:

- *Piggy back*: Use existing contracts delivered under brands other than the client’s that are recognized as successful
- *RIP*: Integrate own and client internal customer roles and offer a proposition that extends throughout the life of the asset
- *Tie up commercial yards*: Offer lower costs through partnership with shipyard outside traditional naval sector
- *Happy family*: Collaborate with key ecosystem members to create a competitive alliance

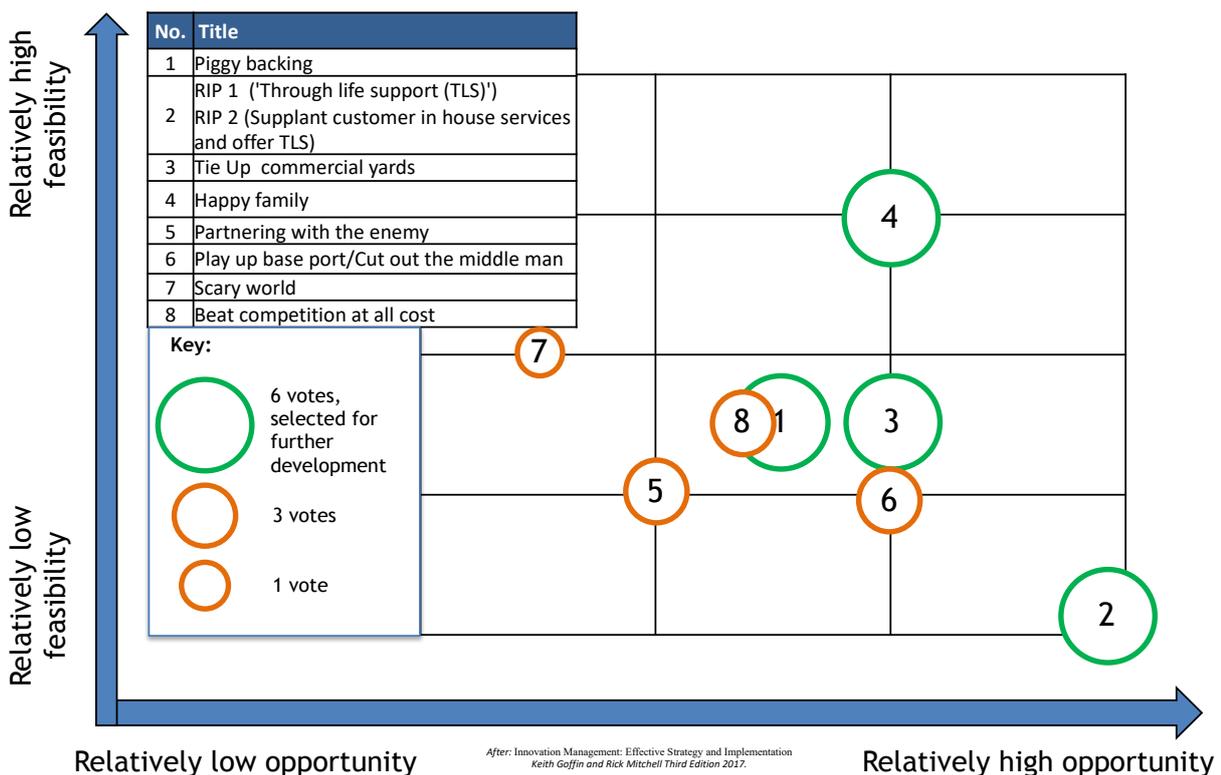


Figure 11: Opportunity Prioritization Tool

The client bid team leader commented on the value of the process:

“We covered a lot of ground with the tools and techniques, and we got a richness of insights quicker than if we had just utilized our tried and tested in-house processes.”

The options put forward subsequently formed part of the successful bid, which was announced in early 2018.

“Before we started the process we feared that we were not competitive to win this tender and this would increase risk to future potential contracts. We won the bid thanks in strong part to the themes identified using the workshop, which had a significant impact on our strategic approach by evidencing the best value proposition required to deliver the solution.”

The workshop process encourages delegates to immerse themselves in the detail of value creation and capture, both within existing relationships, and potential new relationships. Experience has shown that this immersion leads to a ‘eureka’ effect amongst delegates, in that previously tacit, hidden or unspoken insights are crystallized as new opportunities are brainstormed. This important element of the process is best facilitated by an overnight dwell time, hence the value of the two-day process. The psychological mechanisms whereby this occurs could be the subject of further study, as they are intuitive rather than analytical, and typically move engineering-oriented delegates out of their personal comfort zone.

5 CONCLUSION, FURTHER WORK, MANAGERIAL IMPLICATIONS

The application of business ecosystem value mapping offers a rapid method of identifying and examining strategic partnering options in the delivery of complex services. This and other case studies suggest that considerable competitive advantage can be drawn from the insights so generated.

Providers developing new, digital offerings throughout the manufacturing supply chain may consider exploiting the methodology to identify new partnering opportunities and other relationships, particularly where knowledge of the market is limited and/or threats may exist from new entrants and/or combinations of third parties.

The research application here has been to the delivery of complex systems engineering upgrade and modification. Potential application areas are much wider and are being extended. For example, in New Zealand a series of workshops has been held through Export New Zealand to support manufacturing companies in transforming their value proposition into services provision based on enhanced data exploitation, and in the UK the approach is being deployed to help shape and prioritize future research agendas, for example in the establishment of data science capability.

The work described here features research into the nature of value creation and capture in the ecosystem context and particularly in business-to-business relationships. Further research is being conducted by IfM to expand the ability of the techniques to focus also on capability development.

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