Snakes and Ladders in Servitization

Using a Game to Capture Inhibitors and Enablers of Transformation*

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Overview: Servitization is the process by which manufacturers transition to building revenue streams through services rather than solely through the sale of products. The development of new services offerings entails business model change and organizational transformation; these transformation processes remain poorly understood. To contribute knowledge to bridge this gap, we developed a novel research method that adapts the classic board game Snakes and Ladders to a proposed transformation roadmap. Mapping transformation steps to the game board and assigning inhibitors to snakes and enablers to ladders enabled us to capture data related to the inhibitors and enablers associated with transformation over time. This approach, which embedded data generation in an entertaining game, provides a balance between data generation and engagement with participants and offers an opportunity for industrial stakeholders to share insights.

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Servitization is the process by which manufacturers build revenue streams from services rather than the sale of products (Baines et al. 2017). The journey from product sales to service provision requires transformation of both the business model and the organization itself (Bustinza et al. 2015). That transition, however, is not linear. Rather, it often proceeds in fits and starts, as organizations access innate strengths, build new capabilities, and encounter unanticipated (or unexpectedly difficult) challenges. One participant in a workshop we conducted on servitization noted that a roadmap—like the one we presented at the workshop—suggests a linear process, whereas transformation is more akin to the game Snakes and Ladders, with the organization accelerating transformation as it encountered enabling factors—the ladders on the board—and falling back when it ran into challenges, or inhibitors—the snakes.

Intrigued by this idea, we mapped the transformation roadmap that was the subject of the workshop (see Ziaee Bigdeli and Baines 2017) onto a Snakes and Ladders game board. The outcome of this process was the Service Transformation Game. For researchers, the game offers a method of capturing data related to the inhibitors and enablers associated with longitudinal transformation. For practitioners, the game provides a context that encourages players to compare notes on their experiences and reflect on the barriers to and accelerants of progress toward servitization.

In this paper we discuss the research that has informed the Service Transformation Game, the process of co-creating the game, and its application. First, we provide an overview of current research on service transformation. We argue that there is an opportunity to explore barriers and enablers of longitudinal transformation that has yet to be exploited. We then discuss the design and implementation of our game to both engage manufacturers with servitization and obtain data related to barriers and enablers of transformation. In the discussion of our study we argue that the game enables both researchers and practitioners to generate useful insight into transformation, which can inform the continued refinement of transformation roadmaps. Of note was that, broadly, organizational cultures were most frequently associated with both inhibitors and enablers, internally and across the value chain. Participants shared these insights with one another while playing the game, which was useful for both the research team and the practitioners. We discuss these benefits and

potential limitations of our approach, and opportunities for future work integrating our findings into future roadmaps and designs and applications of the game.

Transformation toward Servitization

Servitization involves the transformation of products into services; in servitizing, manufacturers move from generating revenue exclusively (or nearly so) from products to generating revenue from services built on the products they manufacture. Manufacturers may offer services in three different categories (Baines and Lightfoot 2013):

- Base services (offering replacement or spare parts for previously sold products under warranty or agreement),
- Intermediate services (help desk support, training, maintenance, repair, and overhaul), and
- Advanced services (outcome-based contracts and comprehensive customer support agreements).

Broadly, the argument for taking on this change is that servitization provides opportunities to extend customer relationships from transactional sales to long-term outcome-based contracts, broadening revenue streams and strengthening long-term prospects (Baines and Lightfoot 2013). However, the development of new services offerings entails extensive business model change and organizational transformation (Bustinza et al. 2015); these transformation processes remain poorly understood (Baines et al. 2017; Ziaee Bigdeli et al. 2017).

Since Vandermerwe and Rada (1988) first explored servitization as an emerging trend, research in this area has grown steadily. That research has focused extensively on the difficulties and drivers manufacturers face when seeking to servitize (Oliva and Kallenberg 2003; Rabetino, Kohtamäki, and Gebauer 2017; Roche and Dimache 2013). More recently, however, researchers have started to explore the longitudinal organizational transformation that manufacturers engage in on their journey toward servitization (Baines et al. 2017; Kindström and Kowalkowski 2014). Within this stream of research, servitization is widely portrayed as a planned or intentional organizational transformation (Martinez et al. 2017) that entails changes in the organization's structure, competencies, and culture (Baines et al. 2009; Oliva and Kallenberg 2003) facilitated by different supporting measures and new partnerships and operating models (Pawar, Beltagui, and Riedel 2009). This transformation is affected by both the internal and external environment; internal and external factors may interact so that the two are not independent in their effects. Hence, organizations can be influenced by the external environment, but elements in the internal environment, such as rules and programs that govern organizational development, may mediate this impact (Van de Ven and Poole 2005). Researchers have acknowledged the complexity and number of factors influencing the transition toward servitization and determining its success, but the interrelationship of the various factors in longitudinal transformation processes remains poorly understood (Baines et al. 2017).

Some researchers have proposed models that structure and explain transformation processes by focusing on the stages of transformation that characterize servitization efforts (see, for instance, Martinez et al. 2017; Ziaee Bigdeli and Baines 2017). Ziaee

Bigdeli and Baines (2017) propose a model that aims to illustrate these processes and map the interrelationship of various factors across four stages (Figure 1):

1. **Exploration**—Initial learning about servitization and its implications. The manufacturer is searching for information, learning about the concept and implications of competing through advanced services, and building confidence in the opportunity it presents for the organization.

2. **Engagement**—Evaluation and communication of the business potential of servitization, in order to create readiness for change throughout the organization. The manufacturer is seeking to demonstrate the potential of advanced services to all stakeholders until the transformation is widely accepted and supported within the organization.

3. **Expansion**—Development of specific product-service offerings and implementation of changes in organizational structure to demonstrate value creation from servitization. The manufacturer increases the scale and speed at which advanced services are created and implemented.

4. **Exploitation**—Optimization of innovation and delivery of an advanced services portfolio. The manufacturer continuously seeks to optimize the scope and delivery of the advanced services in its servitization portfolio to ensure that service offerings provide a viable basis for competitive advantage.

---Figure 1 near here---

A number of elements can influence progress through the stages; these fall into four broad categories:

- **Organizational maturity and readiness**—Internal factors that can accelerate or impede transformation.

- **Market pull**—External factors related to the market's readiness for services.

- **Technology push**—The availability and maturity of technologies that enable the provision of services

- **Ecosystem structure and organizational positioning**—The willingness and maturity of partners to support the delivery of services in the value chain.

This model provides a well-developed structure to map the various factors that can impact an organization's transformation. However, the shift from conceptualizing servitization as a discrete strategic decision to seeing it as a longitudinal, multistage transformation challenges the existing research on the barriers and enablers associated with servitization. Researchers lack understanding of the barriers and enablers that can occur across the various stages of transformation, understanding that is needed to provide accurate roadmaps for transformation. For practitioners, this lack of knowledge poses risks to firms embarking on a servitization journey and represents a barrier to adoption in itself. Our study seeks to illuminate the barriers and enablers of servitization across the stages of transformation to benefit both researchers and practitioners.

Gamifying the Transformation Roadmap

Inspired by the workshop participant's observation about the nature of the servitization transformation, we developed a novel research method to validate Ziaee Bigdeli and Baines's (2017) model (the model we were presenting for feedback at the workshop): we mapped our transformation roadmap to the classic board game Snakes and Ladders. Mapping transformation steps to the game board and assigning inhibitors to the snakes and enablers to the ladders provides an engaging and interactive visual framework for discussions about the transformation process. Previous work has shown that games have the potential to engage manufacturers in the co-creation of research and help stakeholders explore the implications of servitization (Andrews, Baines et al. 2017; Andrews, Petridis et al. 2017; Shi et al. 2017). Our research continues this work, describing the application of an adaptation of the game Snakes and Ladders to focus players on the transformation process.

To explore the value of the adapted game for engaging manufacturers in discussions about servitization and the attendant transformation processes, we undertook an exploratory qualitative study, using the game to gain insight into the enablers and inhibitors that shape the servitization journey. Researchers have argued that games and gamification strategies can provide manufacturers with the motivation to engage in consideration of the transformation journey and that engagement with games can generate data that can be used to inform models for service transformation (Andrews, Baines et al. 2017; Andrews, Petridis et al. 2017). For researchers, this process can provide insight into the perceived inhibitors and enablers associated with long-term transformation that can help guide emerging practices. Snakes and Ladders is particularly suitable for this process due to the analogousness between game play and the transformation process.

Snakes and Ladders is traditionally played on a board that is divided into square units on a grid. Each player is assigned a token; the goal is to be the first to advance the assigned token from the bottom left to the top right corner of the grid. Players advance by rolling a die and moving their token the number of squares rolled. Along the way, players may encounter snakes or ladders. If a token lands on a square at the tip of a snake's tongue, it must slide down the snake—and back down the grid—to the square at the end of its tail. Conversely, if a token lands on a square that touches the bottom of a ladder, it progresses up the grid to the square at the top of the ladder, skipping the intervening rows of the grid. The snakes and ladders add an element of unpredictability to the game, making it more fun and engaging for players. By adapting Snakes and Ladders to explore the inhibitors and enablers of the servitization transformation, we aimed to generate engaging experiences and catalyze conversation related to servitization.

Adapting Ziaee Bigdeli and Baines's (2017) model to Snakes and Ladders required subdividing each stage. The research team made the subdivisions by synthesizing the description of the transformation roadmap with the mechanics of the Snakes and Ladders board to distribute the various stages across the board evenly; the result was 49 transformation steps spread across the grid of the game board, which was color coded by transition stage (Figure 2). Milestone steps were also created, marking movement from one stage to the next. In game sessions, players were asked to reflect briefly on the steps as they progressed up the board and then to consider inhibitors when they landed on snakes and enablers when they hit ladders.

---Figure 2 near here---

The size and positioning of the snakes and ladders were subject to some debate among the academic and industrial stakeholders involved in the project. Potentially, barriers and enablers could be associated with all of the steps, which would not make for a very interesting game. Various iterations of the board were produced, with snakes and ladders positioned to represent likely enablers and inhibitors and the different steps that would be bridged by those snakes and ladders. The final iteration illustrates a consensus that inhibitors tend to be associated with steps just before milestones and snakes are more likely to be encountered than ladders as longitudinal transformation progresses (Figure 3).

---Figure 3 near here---

Our next step was to validate the game's usefulness in both catalyzing thinking about the transformation process and generating data related to the attendant inhibitors and enablers—in other words, the ability of the game to provide both insight for researchers and a practical toolkit for manufacturers engaging with servitization. To accomplish this, we designed a study in which these data were captured by groups of participants playing the game and reflecting upon the steps as they encountered them.

The Study

We envisioned the Snakes and Ladders approach as analogous to the traditional Delphi technique, which is designed to capture and consolidate real-world expertise on a complex matter and to generate reflection on both past experiences and future events (Donohoe and Needham 2009). In the conventional Delphi method, researchers (1) create a panel of anonymous experts on an issue of concern, (2) collect opinions from that panel via a series of questionnaires, and (3) share feedback from analysis of responses with participants (Bardecki 1984; Woudenberg 1991). The panel size can vary considerably; we found literature on Delphi studies arguing for participant numbers ranging from 7 or more (Dalkey and Helmer 1963), to between 10 and 50 (Turoff 1970), to up to 80 members (Rowe and Wright 1999). Communication is iterative in Delphi processes and controlled by the researchers (Meijering, Kampen, and Tobi 2013). Feedback is provided to panelists between iterations; researchers present qualitative feedback in an organized manner, allowing panel members to provide further input (Rowe, Wright, and Bolger 1991).

In the game model, players are equivalent to the expert panel in a Delphi study, and each turn and the attendant reflection provide the data normally collected via questionnaires. In a Snakes and Ladders session, players who land on a snake or ladder are encouraged to reflect and consider the nature of the inhibitor or enabler represented by the snake or ladder. They are asked one of two questions: In the case of a snake, What could go wrong here, and how would you deal with it? or, in the case of a ladder, What might help you here, and how would you enable this? To an extent, therefore, communication is controlled by the design of the game. A researcher acts as facilitator in the game and records the responses given by players in abbreviated form on sticky notes, which are labeled according to the number of the snake or ladder the player is reflecting upon. This approach is in some ways more efficient than a traditional Delphi study, because the design of the game automatically

clusters responses around the inhibitors and enablers at each of the stages of transformation.

We followed panelist qualification criteria for servitization-related Delphi studies established by Baines and Shi (2015) to identify potential players. This meant involving experts who (1) are associated with a servitizing organization, (2) had been personally involved in facilitating the servitization transformation at that organization, and (3) had knowledge of organizational structures and functions. Additionally, we sought to include representatives from organizations across the range of servitization maturity stages (from exploration to exploitation) to ensure that there were senior experts who could discuss both past experiences and future scenarios. Our study was conducted over two workshops held several weeks apart; the two workshops engaged a total of 24 representatives from different functional areas in 17 organizations that were actively pursuing servitization in a total of six games. As players indicated that they valued the chance to compare notes on their experiences, researchers matched players so that each game included a set of players from similar contexts.

The data related to perceived barriers and enablers were collected from players as part of the game process, with reflections captured by researchers on sticky notes. Snakes and Ladders is a game of chance, and therefore its length is indeterminate and the number of players progressing to the latter stages of the game (and of the transformation journey it represents) is variable. When facilitating game sessions, the researchers suggested that the games continue until a certain number of players reached the end, depending upon how each game was progressing.

In each session, we allowed one hour for game play and one hour for group reflection. During the reflection period, the responses recorded on sticky notes were presented back to participants for discussion. The notes were then placed on a wall and positioned according to the enablers or barriers they corresponded with. Through iterations of discussions, the notes were then consolidated and coded according to themes and by the stages of transformation. This process also allowed participants to share their reflections with the wider group and elaborate on the issues they deemed most significant to their transformation. Furthermore, the group reflection provided an opportunity for researchers to obtain feedback on the game itself and whether participants found it to be an enjoyable, engaging, and informative experience.

Findings

All participants found playing the game to be an enjoyable experience. Some members of the research team were concerned that the simplicity of Snakes and Ladders and its role as primarily a childhood game would lead some practitioners to dismiss the approach as not credible. This proved not to be the case. Indeed, after playing the game, one participant admitted to initially being skeptical but ultimately found the game to be insightful. In part, we believe, this evolution was motivated by the way the use of snakes and ladders aligned the game mechanic of surprise and chance with the research process, while the positioning of snakes and ladders encouraged practitioners to reflect upon the relevance of the stages of transformation—and the barriers to and enablers of that transformation—in their specific contexts.

Interestingly, in use, the game provided a channel through which participants reflected on the value of the research data being obtained as well as on their own experiences. In this respect, some participants noted that the use of a game imposes some limitations. While every effort was made to reflect the input of different stakeholders in the positioning of the snakes and ladders, for instance, it is impossible to accommodate all the different inhibitors and enablers that a company may face, or where and when those inhibitors and enablers will arise, in the game. The mechanics of the game also mean that players encounter inhibitors and enablers by chance; some snakes or ladders could be encountered several times and others not at all. In some instances, this mechanism encouraged players to generate multiple responses to questions and envisage various scenarios related to their specific contexts. While this exercise can be valuable to both researchers and practitioners, it also means that the data generated may not be consistent for each use of the game.

Nevertheless, the process of playing the game in small groups then discussing transformation with the wider group provided both practitioners and researchers with the opportunity to consider a range of responses. Accumulating and coding these responses by transformation stage encouraged both researchers and practitioners to reflect upon the transformation process as a whole. Though the transformation steps themselves were not challenged, the point was raised that organizations of different sizes would transform at various rates and would therefore not necessarily experience the same number of steps. However, participants did agree that the transformation steps used in the game were defined at a sufficient level of abstraction to make them applicable to a range of contexts. Through playing the game and discussing the experience with other players, participants were able to reflect upon the barriers and enablers associated with each transformation stage in their specific contexts and consider how their experiences compared with those of other players. The results of this process illuminated a number of enablers and barriers at each stage of transformation, from exploration through exploitation.

Exploration

In the exploration stage, enablers and barriers were predominantly associated with organizational culture, whether the relevant culture was the servitizing firm's or the customer's. Enablers were associated with acceptance of servitization in the wider market, which in turn increased the chances of internal stakeholder buy-in. Similarly, a lack of acceptance in the market was associated with difficulties in obtaining buy-in from various stakeholders, which inhibited the generation of momentum required to leave the exploration stage. General enablers and inhibitors associated with organizational culture and maturity included leadership, management, power, and politics. The capability for transformation was discussed in relation to the day-to-day activities of organizations and how organizational tendencies can broadly inhibit the pursuit of innovation. However, it was acknowledged that "where there's a will, there's a way," and appropriate incentives should be sufficient to push organizations through any perceived lack of capability. Interestingly, technology was discussed very little, other than as a potential method of positioning new service offerings to entice customers.

Engagement

Numerous factors were associated with both success and failure during the engagement stage, which pivoted around the deliveries of pilots and business cases.

Success was associated with the adequate preparation and evaluation of pilots, which served to convince internal stakeholders of the organization's capability to deliver profitable services, and customers of the organization's capability to generate value through services. The value of pilots was related to validating servitization as a strategy. If adequately evaluated, pilots can generate evidence that inform business cases, which in turn help to secure internal buy-in. Participants acknowledged that extensive preparation and comprehension of the complexities of the service offering were essential for progressing past this stage. They also said that technology could be an important factor to assess at this point, as the technology required to provide a particular offering could be too expensive or immature to enable delivery of a service at a profit.

Expansion

Success in the expansion stage was tied directly to success in the engagement stage. All participants said that a successful pilot would help generate market interest and that a strong team would deliver a good launch. However, at a broad level, the need to ensure that various activities were sustained to a certain standard was seen as the biggest challenge in this stage. Potential inhibitors related to this need included poorly performing pilots, internal competition for resources, inadequate selection or exploitation of promotional channels, inappropriate skillsets, and a need for internal organizational restructuring. On the other hand, successful pilots could lead to resource allocation that accelerates momentum in the transformation process.

Exploitation

General issues related to organizational culture resurfaced in the exploitation stage. Here, the organization is dedicated to providing services rather than products. This new direction should build upon the success of previous experiences; however, some dramatic instances were reported where key internal stakeholders were replaced with influential individuals or groups that had not bought into the concept. Participants also noted that loss of interest from key customers could be devastating at this point, which could occur if the marketing was inconsistent with the offering or the value created. Monitoring all internal and external stakeholders carefully was recognized as being a key challenge at this point, as shifts in skills and mindsets would be crucial for the success of the organization.

Discussion

Though exploratory and in some ways experimental in nature, this study has demonstrated the potential for games to both engage manufacturers with service transformation and generate data related to that transformation. Regardless of their level of experience as players, all participants were able to conceive of inhibitors and enablers during game play. This simple finding suggests the usefulness of the game both to generate data and to catalyze thinking and discussion in organizations embarking on transformation.

Participants with similar backgrounds were grouped together for game play, allowing us to compare responses. Those with limited experience of the latter stages of servitization reflected on potential inhibitors and enablers they might experience in their contexts, while those with more experience of the latter stages of transformation shared "war stories," talking about the challenges they had encountered. Significantly, the themes that emerged were similar across all groups, although they appeared at

different levels of abstraction. Players who had direct experience of specific inhibitors, for instance, were able to give examples of customers or internal champions that withdrew their support at crucial points; those who didn't have this experience still envisioned the devastating impact of key stakeholders backing out in latter stages even though they didn't have specific examples.

The study did identify some particular categories of enablers and inhibitors. Of particular note was the significance of culture in the process. Organizational culture was more often associated with both enablers and inhibitors than any other aspect. Culture relates to both the mindsets of key stakeholders and the general operations of an organization, which were considered to be fundamental to transformation. This observation applied both internally and externally, as the mindsets and operations of customers and partners in the value chain would need to be consistent with an organization's service offerings.

Interestingly, technology was rarely discussed as either an enabler or an inhibitor. The value of digital technologies in facilitating the provision of services was generally assumed. Participants acknowledged that these technologies would need to be carefully managed to ensure they had the maturity required to enable the delivery of value at a profit. For those in organizations that had not yet approached the latter stages of transformation, this was an important consideration.

Broadly, the activity validated the proposed transformation roadmap (Ziaee Bigdeli and Baines 2017) while highlighting some areas that would benefit from further exploration, particularly with regard to internal and external organizational cultures. Such insights could inform future modifications to the game, which would in turn inform adjustments to the transformation roadmap. It is acknowledged that, in its current form, the game would not be suitable for this further exploration.

The game does have further value as a tool for teaching manufacturers about service transformation, engaging manufacturers with advanced services, and generating data. As research develops in service transformation, which could be informed by the game itself, it is anticipated that this balance between learning, engagement, and data generation will improve.

Conclusion

As research into the transformation process toward advanced services develops, both academics and practitioners will become increasingly confident in producing and applying roadmaps for longitudinal service transformation. We have developed an activity that teaches participants about Ziaee Bigdeli's and Baines's (2017) transformation roadmap while generating data that informs its continuing development. This was done by aligning the theory of transformation processes in servitization with co-creation processes of games and gamification. Our game takes players through the hypothetical transformation process in a way they have reported they find engaging and enjoyable. By mapping potential inhibitors and enablers to snakes and ladders, the process of generating knowledge of transformation is aligned with the mechanics of a classic game.

The game has been used as a research tool, but it has also been successfully employed as an engagement tool at various conferences, roundtables and events with large,

small, and medium-sized enterprises. The game will be refined in future work related to the transformation roadmap and positioning of enablers and inhibitors, and further dissemination may occur through digitization of the game. Following this exploratory study, there is potential to generate further qualitative and quantitative data related to the forms of inhibitors and enablers participants report, and the game's effectiveness as a method of engaging stakeholders with servitization. As the game continues to be used, it will inform its own design through the generation of these data, which will in turn be used to validate theoretical transformation processes for the benefit of academics and practitioners exploring advanced services.

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Figures

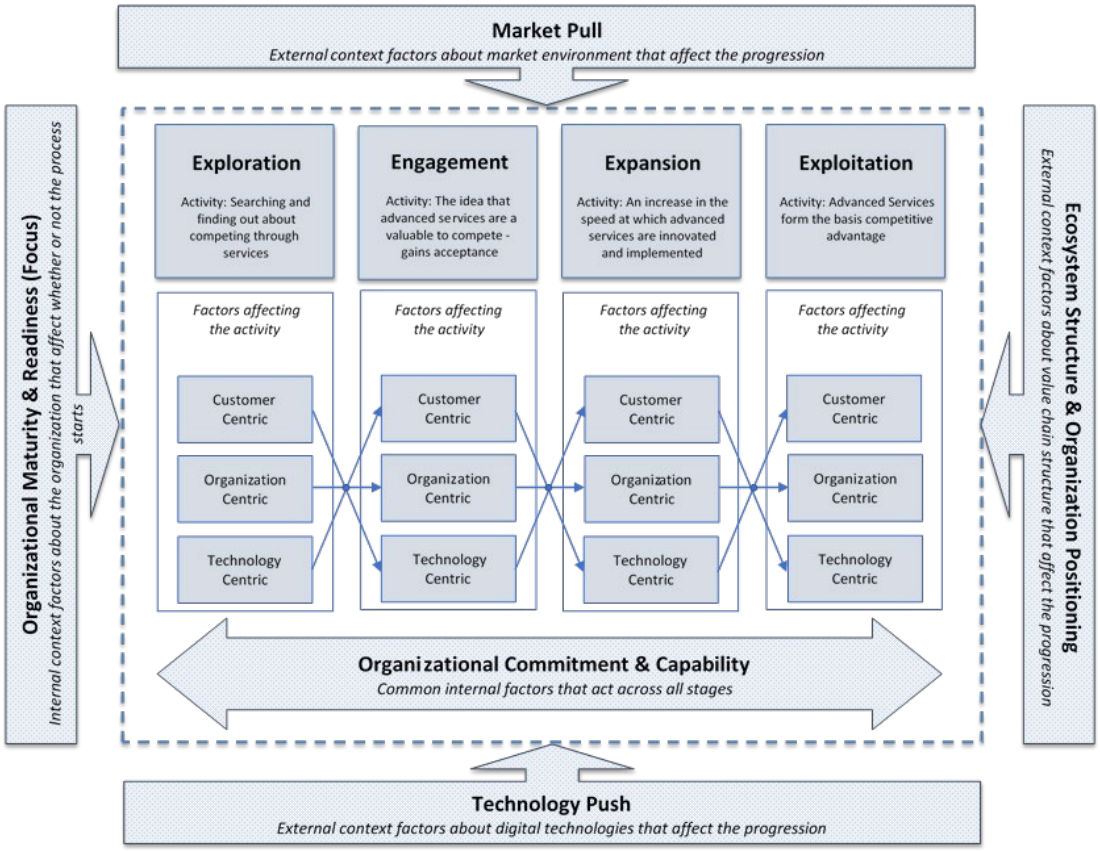

Figure 1.—Model for organizational transformation toward servitization (adapted from Ziaee Bigdeli and Baines 2017)

Figure 2.—The transformation model mapped to the Snakes and Ladders board

Figure 3.—Positioning of inhibitors and enablers as Snakes and Ladders