TOWARD A PROCESS THEORY OF IT-ENABLED FRUGAL INNOVATION: THE ROLE OF ORGANIZATIONAL BRICOLAGE IN KOUFU SINGAPORE

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Abstract

As firms seek to innovate, they must undertake a bricoleur’s mindset, one that allows them to make do with the resource constraints they have in order to enact their innovation frugally. This mindset allows for the identification of resources that can be recombined and repurposed in the interest of efficiency and effectiveness. This case study of Koufu, one of Singapore’s largest food and beverage operators, seeks to explore how the underlying processes of frugal innovation can be through enacting organisational bricolage. With its findings, this research-in-progress paper hopes to present an empirically substantive stage-wise model that complements frugal innovation at the organisational level, providing practitioners with a useful source for harnessing the potential of frugal innovation. Being able to do more with less is an invaluable tool that will allow for firms to witness rapid growth, and allowing them to bring their organisational goals to life.

Keywords: Frugal Innovation, Bricolage, Case Study
1 INTRODUCTION

Frugal innovation is recognised as doing more with less (Soni and Krishnan, 2014). It is an emerging stream of literature largely led by practitioners as a response necessary in resource constrained firms (Bhatti and Ventresca, 2012, Tiwari et al., 2014, Womack and Jones, 2010). Firms such as South Africa’s Safaricom/Vodafone (M-PESA) have innovatively developed products and services that meet needs generally ‘good enough’ or at a low cost (Heeks, 2012). Although research has mostly focused on frugal innovation as a response triggered by resource constraints, there are also real world examples of large resource rich firms such as Renault-Nissan who pursue frugal innovation as a strategic choice which have not received the same academic treatment (Radjou et al., 2012). In reframing frugal innovation as a strategic choice, it becomes not only doing more with less but doing better with less (Radjou and Prabhu, 2014). With the impending threat of digital disruption (Deloitte Australia, 2012), firms across industries are spending an all-time high of $647 billion towards innovation activities to remain relevant in the market (Jaruzelski, 2014). Yet, despite the increased awareness of its importance, there is little apparent connection between abundance and success of innovation activities (Jaruzelski, 2014). This suggests that the notion of resources constraining innovation should be revisited as the practice of frugal innovation is potentially relevant for organisations that are operating in either abundance or resource constraints.

Firstly, this lack of “doing better with less” could stem from the lack of theoretical scrutiny as literature has mostly focused on conceptual studies of frugal innovation (Rao, 2013, Soni and Krishnan, 2014). Emerging scholars have called for empirical studies to build upon understanding of frugal innovation and posit strategic relevance at the organisational level (Ahuja and Chan, 2014). Over the years, practitioners have asked to consider a process of bricolage to combine various resources to solve problems or work towards opportunities to innovate within time and resource constraints. (Baker, 2007, Duymedjian and Rüling, 2010, Garud and Karnøe, 2003, Weick, 1993). Furthermore, of the many studies that have been conducted, there are few that captures the relationship between Information Technology (IT) and frugal (Ahuja and Chan, 2014, Watson et al., 2013). It is important to address this gap as Information Systems (IS) can potentially be a powerful enabler of frugal innovation. It is of interest to the IS domain to improve success rates of innovation projects and thus posit practical significance as well for organisations with abundance or constrained resources.

Hence, our paper seeks to address the following research question: “How does IT enable bricolage to achieve frugal innovation?” Addressing this question will provide an in-depth understanding of IT-enabled frugal innovation which may be crucial to improving success rates of innovation projects. Our research will conduct an in-depth case study of how IT can enable frugal innovation. We will examine the transformation of Koufu from a small coffee shop to one of Asia Pacific’s largest multinational food court operators based in Singapore. To address the aforementioned gaps, our study aims to develop and present a stage-wise model that is grounded in the empirical evidence of a real world organisation. For preliminary analysis, we conducted pilot case study interviews with a number of informants across many levels of management from operational to strategic. Our preliminary findings suggest the enablement of frugal innovation through IT has three key steps. We conclude this paper with discussion of our preliminary findings, summary model and future research.

2 BACKGROUND

2.1 Frugal Innovation

Frugal innovation is an emerging term within the literature and has been consistently referenced in relation to resource constrained firms (Bhatti and Ventresca, 2012, Tiwari et al., 2014, Womack and Jones, 2010). The terms frugal and innovation are used collectively to epitomise the type of innovation
where “a lot is done with not much”. Bhatti (2012) refers to frugal innovation as “innovation that redefines business models, reconfigures value chains and redesigns products to use resources in different ways and create more inclusive markets by serving users with affordability constraints, often in a scalable and sustainable manner”. Where the costs of Research & Development (R&D) capabilities are beyond an organisation’s means, frugal innovation is a new means of innovation especially appealing to the resource constrained. The term frugal innovation refers to both a process and an outcome of business, social and technological innovation (Ahuja and Chan, 2014). In this paper we refer to frugal innovation as the systematic innovation processes that have been adopted in order to develop high-end low-cost technology products for markets (Kumar and Puranam, 2012). Kumar and Puranam (2012) identify six principles that underpin the theory of frugal innovation, including: robustness, portability, de-featuring, leap frog technology, mega-scale production and a service ecosystem. Similarly, Ahuja and Chan (2014) identify six different principles, including: seeking opportunity in adversity, doing more with less, thinking and acting flexibly, including the margin, keeping it simple and following your heart. However, the above terms overlap with other notions of innovation, including creative improvisation or ‘jugaad’ [Hindi-Urdu word for frugal innovation] (Krishnan, 2010).

Although frugal innovation is an explored topic in areas such as engineering and management, there are few papers that exist within the IS domain. A number of reviews on the frugal innovation literature within IS found few or no instances on the topic of frugal innovation prior to 2008. The lack of understanding here has been widely acknowledged among many of the case studies that have emerged since it has arisen in the IS discipline (Ahuja and Chan, 2014, Bhatti, 2012, Watson et al., 2013). Moreover, of the studies currently in frugal innovation, the papers are largely conceptual. Although the conceptual papers provide insights on a theory of frugal innovation as a mindset, process and outcome, and at the different management levels they occur, there are few revelatory studies that were empirically validated (Ahuja and Chan, 2014, Bhatti, 2012, Soni and Krishnan, 2014). Without the justification through empirical analysis, many aspects of frugal innovation remain as purely assumptions. This makes it difficult to build concrete theories in order to further understand the phenomena. To further understand frugal IT innovation at an organisation, Ahuja and Chan (2014) call for empirical studies to follow up existing conceptual papers.

Therefore, there is a significant opportunity in literature to uncover the key mechanisms driving frugal IT innovation at the organisational level. More specifically, how technology innovation can be both an enabler and outcome of frugal innovation. Frugal innovation is centred on the concept of making do with the resources an organisation has at hand, which implies the enactment of bricolage. Due to the lack of research around the mechanisms on Frugal IT innovation, we turn to a bricolage lens. The bricolage lens allows us to systematically identify how frugal IT innovation is the dominant contributor to frugal innovation as a phenomenon. This lens will serve as “a complicated sensing device to register a complicated set of events” (Weick, 2007).

2.2 Organizational Bricolage and Improvisation

First introduced by (Lévi-Strauss, 1966), the concept of bricolage was grounded in anthropology to describe how people relate to their environment and its resources. In considering resourcefulness as the concept of one’s knowledge of their environment, Levi-Strauss proposed a process of bricolage. This process involved using and combining various resources to solve problems or work towards opportunities (Baker, 2007). Instead of first designing solutions and then finding resources that are appropriate, bricoleurs start with what they have ‘at hand’ and work towards a solution (Ferneley and Bell, 2006). While the notion originated from anthropology, bricolage has been adopted by wide range of academic disciplines (see (Baker and Nelson, 2005) for a review) such as social science, to innovation studies, social psychology and entrepreneurship (Baker, 2007, Duymedjian and Rüling, 2010, Garud and Karnøe, 2003, Weick, 1993).
Many case studies have drawn a relationship between bricolage and innovativeness within various firms and their contexts. For example, scholars examined how Special Weapons and Tactics (SWAT) teams use bricolage to innovate within time and resource constraints (Bechky and Okhuysen, 2011). This example infers that bricolage is perhaps also related to the theory of organizational improvisation. Organizational improvisation research posits that firms enact innovation in dealing with time and resource constraints through improvisation (Crossan, 1998). Organisational improvisation (Moorman and Miner, 1998) is a theory which is drawn from a wide range of contexts from music, theatre, sports and firefighting management (Barrett, 1998, Bjurwill, 1993, Crossan, 1998, Weick, 1996). More relevantly, organisations have been examined through the lens of improvisation for enterprise agility in making decisions (Kamoche and Cunha, 2003). Organisational improvisation entails spontaneous, free form activity where planning and execution overlap (Moorman and Miner, 1998). It relates to acting in environments of uncertainty (Brown and Eisenhardt, 1997). And it usually results in actions and decisions that are tailored to the specific context (Baker and Nelson, 2005).

3 RESEARCH METHODOLOGY

The case research method was adopted for a number of reasons. First, case research is particularly useful for exploratory research which aims at theory building (Eisenhardt, 1989), and little is currently known about the phenomenon of IT-enabled frugal innovation. Second, case research is especially appropriate for answering “how” research questions and examining processes (Orlikowski and Baroudi, 1991, Gephart, 2004). This is perfectly aligned with our research interests, which lie in examining the process of how IT-enabled frugal innovation is achieved.

Based on our research question, we used three case selection criteria for our study. First, the selected organisation must have successfully enacted frugal innovation at the organisational level. Second, the frugal innovation must be enabled through the use of IT. Finally, the means through which frugal innovation is achieved should be sufficiently sophisticated and varied so as to reveal the underlying mechanisms more fully. Based on these criteria, the revelatory case of Koufu was especially appropriate. This is because Koufu has successfully enacted frugal innovation through the use of IT to transform itself from a micro Singaporean enterprise to multi-national food court operator.

Research access was negotiated and granted in January 2015, and interviews were conducted with informants across Koufu’s top management, middle managers, and operational staff. In total, we conducted 20 interviews by July 2015, lasting an average of 45 minutes each (refer to table 1 for profile of informants and their role descriptions). We conducted our interviews through site visits to Koufu headquarters and several foodcourts across the country. Interviewees were chosen through snowball sampling (Biernacki and Waldorf, 1981) as a means of identifying informants, as the researchers were not able to identify the right informants independently (Pan and Tan, 2011). The informants consisted of various business units, including both top level management and operational management. A mirroring technique (Myers and Newman, 2007) was used, in order to focus on the subject’s world and allowing them to use their own language. Questions were positioned to first ask what they do on a day-to-day basis before allowing them to delve into the respective proceedings. The informants were asked to describe their experience of critical activities related to our subject matter. They were encouraged to discuss these from an organisational perspective to further align with our approach. The interviews were recorded and later transcribed.

We used coding to analyse the interview data (Strauss and Corbin, 1990). Based on our literature review, we formulated three key processes that led to the frugal innovation. These themes formed the basis of bricolage and worked as a “sensitising device” (Klein and Myers, 1999), in order to view the phenomenon in a certain way. These processes were iterated upon through the consultation of the literature and empirical data. Once two sources of data successfully substantiated each process, a visual map was created to reflect our interpretation of the data. This process continued until the point of theoretical saturation was reached (Eisenhardt, 1989).
<table>
<thead>
<tr>
<th>No.</th>
<th>Interviewee Title</th>
<th>Role Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Managing Director (2 interviews)</td>
<td>Mission, vision, culture &amp; strategic direction</td>
</tr>
<tr>
<td>2</td>
<td>Chief Operations Officer</td>
<td>Operations, strategic implementation &amp; management</td>
</tr>
<tr>
<td>3</td>
<td>Financial Controller &amp; Strategy Coordinator</td>
<td>Business strategy &amp; financial processes</td>
</tr>
<tr>
<td>4</td>
<td>Learning and Development Manager</td>
<td>Organisational learning and development</td>
</tr>
<tr>
<td>5</td>
<td>Purchasing Manager</td>
<td>Procurement and purchasing management</td>
</tr>
<tr>
<td>6</td>
<td>Hygiene Officer</td>
<td>Quality assurance &amp; Hygiene management</td>
</tr>
<tr>
<td>7</td>
<td>IT Manager</td>
<td>IT Architecture, infrastructure, software and management</td>
</tr>
<tr>
<td>8</td>
<td>Operations Manager</td>
<td>Operations and management of logistics</td>
</tr>
<tr>
<td>9</td>
<td>Brand &amp; Marketing Manager (2 interviews)</td>
<td>Brand development and marketing management</td>
</tr>
<tr>
<td>10</td>
<td>Human Resource Manager</td>
<td>Organisational management of human resources</td>
</tr>
<tr>
<td>11</td>
<td>Business Development Manager</td>
<td>Contractual acquisition, development and management</td>
</tr>
<tr>
<td>12</td>
<td>Changi Area Manager</td>
<td>Operational day-to-day area management</td>
</tr>
<tr>
<td>13</td>
<td>Food and Beverage Manager</td>
<td>Operational day-to-day area management</td>
</tr>
<tr>
<td>14</td>
<td>Food court Managers (5 interviews)</td>
<td>Operational day-to-day area management</td>
</tr>
</tbody>
</table>

Table 1. Profile of Informants

3.1 Case Description

Koufu is one of Singapore’s most established food court operators who believe that a commitment to “Better Food” contributes to the good fortune and wellbeing of people in the community. “Koufu” refers to the Chinese belief that it is one’s good fortune to feast on good food. Its history started with Mr Pang Lim who founded Koufu in 2002 as a neighbourhood coffee shop. Since its establishment, Koufu’s growth can be split into three phases. In the first phase, Koufu deeply grounded themselves in the suburban heartlands, amongst Housing Development Board (HDB) (Teo and Ranganathan, 2003). By overcoming the challenges during the outbreak of SARS in 2003, Koufu swiftly responded to the importance of hygiene in the food and beverage industry, enabling fast market share acquisition. Building upon strength on strength, Koufu progressed through phase two mid-2000s entering commercial spaces in the following years to work towards becoming a food and beverage platform. With the successful acquisition of commercial space at Marina Bay Sands a luxury tourist mall attracting more than 75,000 visitors daily, Koufu started to diversify their portfolio of products and services towards the international customer segments. In the early 2010s, Koufu entered their third phase by expanding overseas opening up outlets in Macau in 2013 with plans to open in Hong Kong as well. They now have over 70 outlets worldwide and are one of the largest food and beverage operators in the Asia-Pacific reporting a turnover of over $100 million (Ye et al., 2009). Despite undergoing immense growth within the short time span, their modern management style and the introduction of IT capabilities innovatively preserves the Singaporean coffee shop traditions, known as the Kopitiam culture.

4 PRELIMINARY FINDINGS

In this section, we examine the development of IT-enabled frugal innovation at Koufu. Furthermore, we identify three interrelated stages of development and organizational bricolage that emerged from the preliminary analysis of the data. Results are summarized in table 2 below. From case evidence collected in Koufu, we construct a suggested preliminary stage-wise model (Goh, 2001) and towards a more complex process model (Newman and Robey, 1992, Montealegre, 2002) of how IT enables frugal innovation (as shown in Figure 1). Figure 1 illustrates that a minimal structure must be first developed in order to allow an organisation identify resources needed for enacting bricolage.
4.1 Developing a Minimal Structure (early 2000s)

We begin our analysis with the Managing Director’s account of the state of the business and IT investment through the early years. Throughout 2003, the outbreak of SARS saw a need to improve hygiene throughout the Food and Beverage industry, especially in food courts in the Housing and Development Board (HDB) public housing (Thong and Chee-Sing Yap, 2000, Teo and Ranganathan, 2003), colloquially referred to as the HDB heartlands (Goh, 2001).

“So within this 4 months after the SARS outbreak, I did everything quickly (e.g. testing, electronic painting etc.) with the 3 shops on hand... I wanted the stores to deliver a common message which is what we now know as Better Food, Better People and Better Life.” [Managing Director]

Our interviews with the Managing Director reveal that most Koufu businesses and operations were conducted on very little but maintained very high standards, such that food and beverages processing and production often occurs in-house with highly experienced workers. For instance, the current hygiene officer, one of the more senior employees and in charge of quality assurance and hygiene management had worked for the health boards in Singapore for many years. The changing character of the foodcourt environment after 2003, and to gain trust of the HDB heartlands (Goh, 2001) was the nascent strategy. To achieve this, the Managing Director did not just trust in-house senior employees but encouraged the willingness and the ability of its employees to do more with less. The Managing Director reveals the close ties between social learning and formal training in technology (see table 2).

Interviews with the financial controller reveal that at this time, IT use was constrained to a transactional accounting system for financial reporting. As the number of foodcourts increased and with growing operations, it faced the challenge of allocating appropriate manpower and resources for managing the autonomous HDB heartland foodcourt operations and symmetries required for overall operational efficiency. Developing a minimal structure allows employees elect to combine existing IT knowledge with others, use social knowledge to cover shortfalls in existing IT knowledge and substitute IT knowledge that could be related or unrelated, and (or) form a preference for other users’
knowledge. This lead to socialisation influences that facilitated system uses and (or) foodcourt transitions and practices which resonates well with locals dining in foodcourts in the HDB heartlands.

4.2 Identify and Developing Resources at Hand

Following the adoption of a minimal Structure, and following Koufu’s successes in the HDB heartlands, the Koufu identity was increasingly in demand in commercial spaces in Singapore. This prompted the identifying and development of polymorphic IT resources alongside developing new second order capabilities (Winter, 2003) from first-order competencies at Koufu. We define polymorphic IT resources as ones that take multiple forms, often outside their original intention. The acquisition of polymorphic resources occurs as a result of the adaptation of minimal structure. For example, Koufu uses mobile phones and apps as a key polymorphic IT resource. Koufu’s development of second order capabilities are embodied by their new learning and development manager role, who has developed to a reference user of technology (Majchrzak and Markus, 2012) in the firm.

“My role in this company is very unique... I am in charge of handling both the training and long term development of the staff as a team. How this role came about was I started with Koufu many years ago as a foodcourt manager, and I left later to spend some time running a foodcourt before returning to Koufu in this new role from what I have experienced all this time. The company has helped me a lot in developing this new role and I am looking very much to use technology in this role, for example I am using Cahoot and a number of other software.” [Learning and Development manager]

The above is evidence that within Koufu, polymorphic resources are complemented by second-order capabilities which help develop first order dynamic capabilities (Winter, 2003). They are sometimes also referred to as meta or regenerative dynamic capabilities (Ambrosini et al., 2009). The learning and development manager occurs at a higher level including the reconfiguration of first order capabilities and the deinstitutionalizing of first-order routines. Regarding the role of IT as a polymorphic resource, social media as one that is both convenient and free, reinforces the cultivating of willingness emanating from the minimal structure. The brand and marketing manager comments on the unintended uses (Watson et al., 1988) of social media platforms.

“there are events where I will have to respond to my colleagues via Whatsapp if they message me via that platform... I can share videos, pictures and unlimited messages for free.” [Brand and Marketing Manager]

4.3 Enacting Bricolage

Due to its rapidly growing business lines and demand in late 2000s, particularly in commercial spaces in Singapore, Koufu is currently investing into a biography of package software including Microsoft Navision to streamline its operations. Following the identification of the resources at hand, it is imperative for the firm to enact organizational bricolage to support its growth, both locally and overseas. This, according to the IT manager and the Chief Operations Officer involves the careful recombining and repurposing of said resources. Using a social media platform as the archetype example, the recombining of resources occurs when it is used to inform data entries in the accounting systems. On the other hand, WhatsApp was repurposed outside its original intention in Koufu for knowledge management, message dissemination and as an accounting reporting tool.

In our district, we collect the sales data from our hawkers (street food vendor), then send to our purchasing officer to take stock and inform purchases...the information from our (whatsapp) group needs to be collated [Foodcourt Manager, Changi District]

Currently, Koufu is investing into a number of programs and IT-enabled initiatives that develops a platform for hawkers and would-be young hawkers in Singapore. This is amid rising costs of business and increasing competition amongst its tenants the hawkers, and the capability to sustain healthy
hawker numbers in all foodcourts. To address this, the Manager Director and COO identifies the building of a first ever food and beverage social enterprise.

“We are aligning the government strategy with business strategy...what we do is that we still setting up a social enterprise to manage the development of our tenants and hawkers. So we are actually trying to make it so that new food courts as social enterprise...you can use this as a platform to develop new hawkers I think hawker centres are a good place to start.” [Chief Operations Officer]

<table>
<thead>
<tr>
<th>Temporal Phases</th>
<th>Empirical Constructs</th>
<th>Representative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Developing a Minimal Structure</td>
<td>Acquiring Ability</td>
<td>“Actually this is my weakest aspect...I will need to strengthen on this weaker [technological] aspect.” (Managing Director)</td>
</tr>
<tr>
<td></td>
<td>Cultivating Willingness</td>
<td>Though we are hawkers [who don’t have much]... we can still be leading a comfy and ‘better life’” (Managing Director)</td>
</tr>
<tr>
<td>2 Identifying Resources at Hand</td>
<td>Identifying Polymorphic IT Resources</td>
<td>“[We identified that] Whatsapp is the most convenient platform for communication, and the best part of it all, is that it is free... Personal use and for work too [continues to describe the many different uses of Whatsapp]” (Brand and Marketing Manager)</td>
</tr>
<tr>
<td></td>
<td>Identifying Second Order Capabilities</td>
<td>“My role in this company is very unique... I am in charge of handling the long term development of the staff as a team.” (Learning and Development)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“We are using this one [organizational development] to teach them to change their mindset” (Purchasing Manager)</td>
</tr>
<tr>
<td>3 Enacting Bricolage</td>
<td>Recombining</td>
<td>“We use WhatsApp in conjunction with the accounting team in order to use it also as a reporting tool” (Financial Controller)</td>
</tr>
<tr>
<td></td>
<td>Repurposing</td>
<td>“[We use] WhatsApp group chat. We have 11 area managers, so each Area Manager will have their own group chat, [WhatsApp] is also used for learning and development, and for stakeholders.” (Learning and Development)</td>
</tr>
</tbody>
</table>

Table 2. Summary of Data Analysis and Preliminary Findings

5 DISCUSSION AND FUTURE WORK

Future work focuses on theoretical development of the notions presented in the study and summary model. We have developed a new model for IT-enabled frugal innovation in a food and beverage industry context. In conducting an in-depth study into Koufu’s transformation from a small coffee shop to one of Asia Pacific’s largest multinational food court operators based in Singapore, we identified three key steps. Our preliminary model prescribes developing a minimal structure, identifying resources at hand and enacting bricolage as key processes towards IT-enabled frugal innovation. It is important to note that this is a pilot case and ongoing analysis will involve more interviews throughout early 2016 and further ensure the generalisability of the findings. Future work will seek to contribute to existing literature largely led in engineering and entrepreneurship domains which focus on frugal innovation as a response to resource constraints (Bhatti and Ventresca, 2012, Tiwari et al., 2014, Womack and Jones, 2010). Our analysis hints that resource rich firms such as Koufu can strategically choose to engage in frugal innovation using three steps to do ‘better with less’. In addition to this, we posit that frugal innovation is a domain of significance and relevance to IS studies, including this being one of the earliest contributions to the relationship between IT and frugal innovation (Ahuja and Chan, 2014). The novelty of the case transforming the firm from SME to MNC provides a significant framework for examination of the transformative nature of the phenomenon. Currently our model does not yet consider the influence of improvisational capabilities of actors within the firm (Moorman and Miner, 1998). To increase the robustness of the model, our future work will also aim to improve and extend the enactment of bricolage with organisational improvisation within a frugal innovation context. We believe that this acts as a springboard for future understanding, especially for practitioners looking to achieve the frugal innovation outcome. The next steps are crucial as they will determine the significance of IT’s role in strategically enabling frugal innovation.
6 ACKNOWLEDGEMENTS

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7 REFERENCES


