

BAM 2023 CONFERENCE

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Data utilization for establishment of luxury goods brands in small and medium-sized companies: Product development process analysis using coffee roast profile data

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Abstract

This article discusses the product development process of luxury goods in small and medium-sized companies, focusing on the coffee industry. It is important how the taste created by a skilled roaster can be reproduced at multiple stores or with multiple employees in branding. While coffee roasting technology has been regarded as craftsmanship because it was difficult to reproduce, it has come to be much easier for roasters equipped with sensors and electric heaters that can precisely control heating have appeared in recent years. However, A method for sharing control methods for roasting machines through the computerisation of technology within organizations has not yet been well established. In order to establish a production system for stable taste sensations using electronic control technology, it is necessary to recognize the differences between skills easily digitized and not and develop ways to share the recognition of the boundary.

Word count

1942(incl. captions of figures)

1930

Background

Coffee is a commodity, mass-supplied in homogenous products by global companies like Nestle, JDE Peats and Keurig Dr Pepper. At the same time, coffee is one of the typical luxury goods. In Japan, many coffee shops have purchased their own coffee beans, roasted them, extracted them, and served them. The business practice of privately-owned coffee shops in Japan providing high-quality coffee beverages in their own way is said to be “Kissa-ten bunka (coffee shop culture)”. The coffee shop culture has fostered many coffee brewing equipment manufacturers in Japan. One of them is Kalita. Kalita's line of coffee brewing equipment, the V60, has been adopted by small luxury coffee shop chains in the United States and Europe, such as Blue Bottle Coffee. One of the reasons why Japanese coffee shop culture has spread to the world is the emergence of specialty coffee.

In the 1970s, as the price of coffee beans continued to decline, the quality of distributed beans continued to decline. The establishment of the Specialty Coffee Association of America in 1982 and the start of the Cup of Excellence Project in 1999 promoted the distribution of high-quality coffee beans, and even outside of Japan, small-scale roasting at privately-owned or small-scale chain stores became popular.

Large coffee suppliers roast green beans in an automated manner in factories. Large-scale cafe chains such as Starbucks and Peet's roast a large amount of coffee beans intensively in large-scale roasting factories and deliver them to stores. In the case of intensive machine-controlled roasting, it is possible to supply a large amount of beans with stable quality. This method is used not only by Nestle, Keurig Dr Pepper, Japan's Ueshima Coffee (UCC), which supplies instant coffee globally, but also by coffee shop chains such as Starbucks and Peet's. (These coffee shop chains sell beans that are roasted in their shop). However, even smaller chains of coffee shops and independent cafes find it difficult to compete on scale.

Therefore, they tend to differentiate themselves by procuring high-quality coffee beans and roasting and extracting according to the characteristics of the beans. The roasting machines used by small coffee shops can roast beans weighing anywhere from several kilograms to 30 kilograms at a time. Until now, the structure of most roasting machines was simple, with a rotating pot heated from below by a gas fire. Roasting is a simple process of just adding heat, but the taste of the finished product can be greatly changed by changing the heat and time slightly. For this reason, each coffee shop and roaster has its own roasting method and the taste created by it, which is an important factor in the branding of the shop and individual. Some models of roasting machines can record temperature changes during roasting as data. There are also roasting machines that can control heating using stored data.

Research Question

It is important how the taste created by a skilled roaster can be reproduced at multiple stores or with multiple employees in branding. Coffee roasting technology has been regarded as a craftsmanship because it was difficult to reproduce, but in recent years, roasters equipped with sensors and electric heaters that can precisely control heating have appeared.

Coffee beans are an agricultural product, and even if they are of the same variety and are produced in the same production area, the quality of each individual lot differs. In addition, the surrounding environment of the roasting machine, such as the temperature, changes daily, and it is necessary for the roaster to ascertain such changes and fine-tune the roasting method.

In this research, through the utilization of sensing data in coffee roasting in small businesses and the process analysis of technology sharing within the organization, we analyze a product development method with the data utilization method. We defined the research question as follows.

RQ: How is information-communication technology used to develop an organization that can provide a stable supply of luxury goods?

As mentioned above, while it has come to be possible to control the roasting process using electronic data, it is still difficult to roast a small amount of coffee beans to make them have a stable taste adopting individual differences and changes in the surrounding environment. However, with the advent of roasting machines that can be electronically controlled, it has become possible to share techniques based on control by data, not just learning techniques through imitation as in the past, as pure craftsmanship. We would like to clarify how the digitization of technology and control technology using data can transform the skill sharing and product development process within the organization.

Previous Researchs

In Japan, two approaches have been considered to share and transfer coffee roasting technology. The first is a mass production and consumption approach, where major beverage manufacturers have standardized everything from purchasing coffee beans to roasting and brewing to produce a consistent taste. On the other hand, the second approach involves sharing and transferring the roasting technique from specialists to their apprentices through an apprenticeship or similar system, critical in the Japanese coffee shop culture to produce and reproduce the unique taste of the store.

Recently, manufacturers and stores that employ the second approach have begun to use roasting technology with sensing technology and publish various data. However, despite the publication of such data, it is challenging to reproduce the taste of each manufacturer or store, indicating the interrelated parts of roasting technology that can and cannot be converted into data.

Orr's (1996) study of Xerox copier repair technicians highlighted the process by which they construct social reality through language. The narratives of these technicians were used to share their knowledge and constituted their semantic world or social reality, more than the manuals and training prepared by the company. Similarly, in coffee bean roasting, there are two types of technologies, explicitly stated technology due to advances in sensing technology and the technology possessed by technicians that is not explicitly stated. The latter technology and the narratives associated with its transfer are crucial.

These ideas do not exclude the existence of data and manuals about knowledge and technology. Narratives about knowledge include formalized ones, such as data and manuals on knowledge, and are interdependent with people producing and reproducing narratives based on data and manuals, while simultaneously revising data and manuals based on the narratives and practices that have been shared.

Our idea is similar to the SECI model (Nonaka & Takeuchi, 1995) but fundamentally different in that it always separates tacit and explicit knowledge and assumes the creation of knowledge by transforming each. In contrast, Tsoukas (2005) points out that the understanding of tacit knowledge, including the SECI model, is incorrect. In this study, coffee roasting techniques move back and forth between the data and manuals that roasters try to leave behind, the narratives they tell, and their practices from a narrative perspective.

Therefore, the aim of this study is to clarify how roasters perceive their roasting techniques and what kind of narratives they currently use to try to transfer their techniques. It is challenging for roasters to share their narratives about their techniques, but it is important to understand what kind of narratives make it difficult to share and transfer their techniques.

Research Design

This research has been conducted through case analysis of small cafes (chains) and coffee shops that roast their own coffee by themselves. We have conducted interviews with the shops below.

Maruyama Coffee is a coffee shop chain established in Karuizawa, Nagano, Japan. The founder, Kentaro Maruyama launched a small coffee shop in Karuizawa, then began to import coffee beans with visiting production areas world wide. He had also served as a judge for the Cup of Excellence.

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Product development process analysis using coffee roast profile data

Maruyama Coffee currently has a roasting factory in Komoro, Nagano, and operates multiple shops and cafes in Nagano and Tokyo. The roasting factory has two Smart Roasters manufactured by Loring in the United States that can be electronically controlled. At Maruyama Coffee, there are people in charge of roasting other than Maruyama, the president. So far, we have interviewed President Maruyama and the head roaster, asking them about their perception of roasting technology and their thoughts on electronic control.

Another analysis is Benizakura Coffee in Sapporo, Hokkaido. This roastery was founded in 2021 at a campsite in a private park owned by a real estate company. While the core business of Maruyama Coffee is a coffee business and run by roasting craftsmen, Benizakura Coffee is a mere department of park management companies and led by originally a web designer. Therefore, the company tries to adopt information technology for coffee roasting, and has the belief that anyone can operate the roasting machine in the same way and supply the same quality coffee beans. We have interviewed with the manager of the division, and we are analyzing the narratives in lectures on roasting technology for us.



Figure 1: Roaster at Benizakura Coffee

Analysis/Discussion

The current analysis for two organizations is as follows. Maruyama Coffee has introduced ROARING SMART ROASTER, an electronically controlled roasting machine, and has published roasting profile data in books. President Maruyama stated that if it is possible to incorporate all the beans and the surrounding environment as data, it is possible to automate the roasting process. He recognizes that the appropriate roasting method has been established for each bean, and that the role of the person (human) is only to correct the beans to be baked at that time and how to bake it according to the surrounding environment. On the other hand, he said that when his apprentice roasts, the taste is more unstable due to the unconscious influence of personal characteristics. In order to become proficient, roasters must be able to consciously and actively manipulate taste. To do this, they must be able to explain the intent of each manipulation and be able to reflect on it.

Meanwhile, the manager of Benizakura Coffee says that while he learned roasting techniques from a number of roasters when they launched the coffee business, the business model he is aiming for is that of Starbucks Coffee, where the espresso machine runs automatically and provides a steady supply of beverages. Due to the constraints of cost, Benizakura Coffee introduced a used Japanese roasting machine equipped only with an analog thermometer and a gas pressure meter. The data was manually input and accumulated in Excel, and a roasting method was established. The manager argues that anyone can consistently roast beans to a certain taste by using sensing technology. At the same time, he says that standing in front of a roasting machine and watching the flames coming out of the burners instills an artisanal spirit in everyone.

In organizations founded and operated from two very different backgrounds, managers commonly recognise that information technology can stabilize roasting quality and standardize work, and also that corrections by the roaster's individual senses is still important and requires a certain degree of mastery. In other words, roasting technology can be divided into two areas: the core area that can be formalized, and the area that exhibits individuality due to fluctuations that require processing by craftsmanship that cannot be digitized. In addition, the boundary between these two fields continues to change due to technological evolution, and it is thought that there will be differences in the skillfulness of responding to changes as an organization.

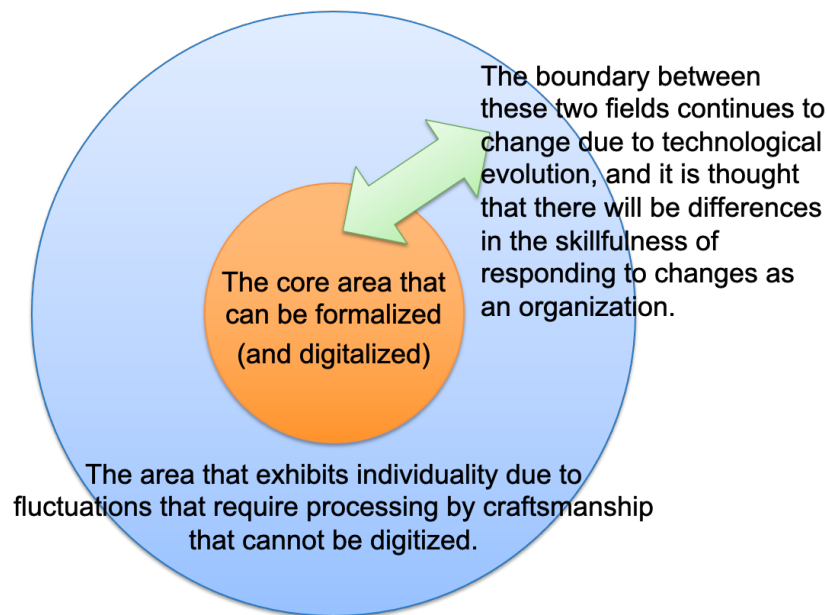


Figure 2: Architecture of Roasting Skill

Future Work

The study has only just begun fieldwork, with interviews conducted with two managers and one subordinate in two organizations. In the future, we would like to conduct a survey of coffee shops with several roasters and collect and analyze discourses in technology sharing to improve the accuracy of the analysis.

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