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Digital Transformation of Hair Styling Chain

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Abstract

This paper proposes possibilities and methods for using digital electronic technologies for transformation of classical barbershops into modern digital barbershops. Digital electronic technologies are widely used across different sectors of lives including banking, retailing, and education. Application of sensors enables increasing speed, security and efficiency of all operations and services in hair styling industry, bringing the traditional service into a new level and creating new values to both production and consumption ecosystems. It generates many comparative advantages for both the suppliers and users of hair styling services. Several ways to utilize modern digital technologies to effectively transform barbershops into hairstyling ecosystems are proposed and discussed.

Keywords

Digital ecosystems, hair styling industry, sensor data.

1. Introduction

The hair styling industry is one of the service sectors that grew during the 20th century as more customers began paying more attention to their looks, along with greater per capita disposable incomes. Today the salon industry is gaining even more popularity. According to the ANZSCO, the employment rate of hairdressers has grown by 54% from 2000 to 2020 [1]. What's more, based on the information from Australian Industry and Skills Committee, the hairdressing and beauty sub-sectors generated $6.5 billion revenue and created more than 120,000 employment opportunities during 2018 [2]. The Personal Services IRC's 2019 Skills Forecast also indicates that the hairstyling industry is expected to have an even more attractive future [2]. Traditionally, these businesses have competed based on the quality of the tools, products, wigs, functional and decorative ornaments. However, with the emergence of modern digital technologies, salons acquire many more opportunities to improve their services and generate new values through creating superior customer experiences. This is made possible by recognizing the new potential of data that their products and services generate and how such data can be harnessed within new digital ecosystems.

The idea that firms are competing within ecosystems are commonly accepted by managers nowadays [3]. Ecosystems are interdependent networks of entities that connect with one another to create and capture value [4]. Ecosystems become digital when the interdependencies are generated through digital connectivity. Modern technological advancements create new interdependencies as they allow data to be shared across a vast network of data recipients. This creates new opportunities for value creation and also requires

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new approaches to manage business models and compete within the industry. These new trends are heavily impacting the hair styling businesses.

Similar to many other industries, the hair styling industry also needs to prepare itself for changes, because of technological advances and changes in the social environment. As consumers get more and more accustomed to digital services available to them through the devices they commonly use, their expectations for such services grow even higher for hair styling. Traditional hair styling often fails to meet the diverse needs of customers. In other words, there is a need for the traditional hair styling business to digitally transform itself.

Other traditional service industries have begun to undergo digital transformation. For example, traditional banks use different kinds of digital technologies, increasing the efficiency and effectiveness of banking operations and services to benefit users [5]. In the automotive industry, leading trends such as driverless cars, connectivity and car sharing are creating new business models [6]. In the medical industry, sensors are placed in medical devices to optimize results for patients and better guide caregivers based on data [7]. In order to catch up with the great evolution, the hair styling industry also needs to expand and deepen its understanding about its target customer based on the valuable data brought by the technology. It should also learn how to harness digital ecosystems to connect products to customer information and improve service quality through data sharing to external parties [8]. While several studies have highlighted how digital natives, those whose businesses mainly revolve around the usage of digital data, have benefitted from digital ecosystem, and some other studies have investigated how legacy firms can embrace digital ecosystems to obtain the similar prowess as digital natives [9-11]. few studies have illuminated specifically how the hair styling industry can adopt such a mechanism to refine itself.

In a futuristic and disruptive vision, hair styling enterprises will work together with customers and suppliers in new digital ecosystems. To this aim, one of the main challenges they are facing now is to define their transformation roadmap [12]. The purpose of this paper is to analyze how the hair styling industry can capitalize on the digital transformation and seek for new opportunities.

The main point for traditional industries like hair styling to thrive in the digital era is to create new value within their digital ecosystems through data. In order to gather comprehensive and diverse customer data, it is necessary to adapt sensors thoroughly into different appliances used during all hair styling processes. Moreover, this data needs to be harnessed through new digital ecosystems that expand opportunities beyond the traditional hair styling industries.

This article elaborates the concept of digital ecosystems, analyzes the effect on the traditional hair styling industry made by digital transformation, and develops the business ideas for the hair styling industry to improve its performance under the new environment. Our analysis is based on the framework that is constituted by the production and consumption ecosystem as well as digital envelopes and product-in-use information. As the digital ecosystems is defined as a combination of production and consumption ecosystems powered by digital envelopes and product-in-use information, the brand will expand on their conceptual meanings before presenting the opportunities that digital ecosystems bring to the hair styling industry [3].

2. Background

2.1. Production and Consumption Ecosystem

Simply put, the production ecosystem consists of interdependencies that lie within a firm's value chain, such as finding the supplier of raw material, producing, selling, and delivering a product to customers. In contrast, the consumption ecosystem is composed of interdependencies generated after the product is sold or the service is offered and consumed [3]. Consider a traditional product such as a lock. A lock’s production ecosystem would entail

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its independencies across manufacturing, research and development, supplier, distributor and retailer, while its consumption ecosystem would include interdependencies that take place after a lock is sold to its customers and while customers are enjoying the benefits of the lock. With the rise of modern digital technologies, a digital lock with sensor implant is able to strengthen the effectiveness of its internal value chain and improve the efficiency of its external value delivery network. For example, compared to a little amount of data that a traditional lock can generate, a digital smart lock can bring about and assess a myriad of data such as people's biological information as fingerprints, visions outside the house, daily routine and schedule of the host, information regarding the weather, temperature and humidity outside and inside the house. In the past, a lock functioned only as a guardian who protected the host from the potential danger and invasion. However, nowadays, a digital lock can be readily considered as a complex combination of guardian, housekeeper, and secretary due to the breadth and depth of a set of activities it can help with. In fact, such data benefits not only the customers but also the producer of the lock. Data regarding the security level of a specific area and historical information gathered about the general income level of the households in that area will be matched to accurately identify the necessity of different types of lock, which can be realized through inputs in the research and development department, thus revolutionizing the traditional production and selling process. Moreover, such data is able to enhance customers' experiences through various dimensions: (1) enabling the host to remotely control the door; (2) notifying other digital devices in the house to adjust the house settings according to people's preferences ahead of their arrivals; (3) reminding people of the emergencies and security issues happened around the area. In a similar way, digital transformation for a legacy firm would require both reconfiguration of its production ecosystem and augmentation of its consumption ecosystem based on sensor data; however, traditional reengineering efforts to make changes in production ecosystems are notoriously time-consuming, expensive, and risky [13]. Thus, there is every reason to believe that a legacy firm needs to prioritize and expand on its consumption ecosystem to acquire more opportunities for growth.

2.2. Sensors and Data

In order to generate values within digital ecosystems, it becomes necessary for a firm to generate a new kind of data captured by sensors. The core idea of winning the game of digital transformation is about utilizing evolved technology and taking advantages of the convenience it creates to push products closer to target customers. Technology also helps understand new demands and offer new services that can create new values not only to the company but also to the whole industry [14,15]. By implementing sensors into each individual product or throughout the process of using products, personal data like customer habits or preference can be collected precisely, which is called product-in-use information. For example, GE implements digital sensors to its machine connected to a designed platform which is able to conduct sophisticated analysis and advance the product development [16].

In order to ensure the accuracy and power of data collected, a firm needs a comprehensive plan to adopt sensors. As for a hair styling chain, sensors will be implanted into every hair appliance that might be used on customers, including hair dryers, curling irons and hair clippers. These digital sensors extend digitization and enhance the connectivity between every process, machine and service operation. In the traditional hair salon, basic data such as the requirement for the hair, the frequency of going to the salon can only be collected manually during the whole experience, resulting in a vague profiling of customers' socio-economic statuses. However, with the sensor implanted, once the customer steps into any one of the chain stores, many facets of data can be collected automatically. Some examples of this kind of data are quality of hair, personal preferences for hair style, purposes for getting hair treatments, health condition based on skin and hair quality. With the understanding and agreement on the existence of sensors

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from customers in advance, all data will be transferred into the software platform managed by a certain department of this company, which will effectively benefit customers themselves by creating direct values for services provided after a complex series of analyzing and processing. All data captured by sensors will be organized as separate digital envelopes, which are essential digital representations of physical entities and use. By recognizing and thoroughly understanding the digital envelope, strategic benefit will be appreciated beyond just an amalgam of sensors and sense-making of product-in-use information through operating systems [3].

Such data can be harnessed in the salon's digital ecosystems for the creation of new services. Digital ecosystem is essentially a network of data recipients that can amplify the value of data. This value can be magnified within the salon's value chain such as the production and selling process, and these ecosystems resulted are called production ecosystems. At the same time, the value can also be amplified by entities that are external to the salons' value chains, which will soon be described later. Each of these approaches is described below (see Fig. 1).

3. New Value In Hairstyling Chain

3.1. New Value to Production Ecosystem

Sharing data within a firm's production ecosystem would create several kinds of values that would eventually bring tremendous benefits to customers and the firm itself. The whole value chain could be reconfigured digitally to improve the firm's performance and capability to meet customers' varied needs, resulting in superior product value and complementary value.

3.1.1. Product Value

Despite that styling salon's business relies heavily on the services offered to customers, the haircare-related products that the salon manufacturers and sells, such as shampoo, mousse and dye still provide the salon with a certain amount of income in addition to the service fee charged to customers. Thanks to digital transformation, the salon now can implant voice sensors that are able to record the conversation between customers and stylists somewhere inside the salon with the mutual agreement in advance, and such data would be transmitted to a central software for further processing in order to analyze customers' willingness to purchase the product and satisfaction about a particular product used. Detailed examinations will be conducted based on the tone, diction and structure of the speech that customers articulate during casual conversations. The central software will then generate a list of information that categorizes all comments into two sections as praises and complaints from customers, and a general recommendation about the product would be made and changes to refine the product could be implemented. On a weekly basis, the software would also rank the product and make suggestions to the marketing director about the most and the least popular product for the week, so that the marketing director and other senior executives can make decisions on readjusting the marketing strategies for specific products. In the past, such process could take senior managers a few months as it would require a tremendous effort to gather information regarding customers' attitudes toward the product, but now this process can be done on a weekly basis continuously due to the digital connectivity between interdependencies of the value chain.

3.1.2. Complementary Value

Normally, customers will be offered a great number of hair services once they step into the hair salon, including hair styling or hair treatment. However, in the traditional hair salons, the hair appliances and treatment products are usually from other brands in the market with unchangeable function, like hair conditioner designed only for oily hair scalp or a hair dryer designed by Dyson. Though by carefully picking up the cooperated hair appliances brands, most

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customer demands can be met, hair salon can provide even more thoughtful and diverse services with sensors implanted.

During the service, no matter the hair cutting or dying, sensors in our appliances will collect the personal data about customers' hair conditions as the scalp type or hardness, then transfer the data to the backstage dataset. Such type of data gathered in this process is classified as basic data. Subsequently, customers can contribute more detailed data regarding their demographic or geographic information into the dataset themselves via the community platform, and such data will be classified as advanced data. By combining basic data and advanced data, hair salons can conduct further analysis on every individual customer. This analysis offers a comprehensive report on the potential factors affecting or might affect customer's hair conditions or even skin conditions in the future. For example, the diet consumed, the frequency of exercise and the quality of air can have unbelievable impact on customer's hair or body condition.

When enough volumes of data are collected, it will help provide basis for new product creation. For example, with air quality worsening in certain cities, there might be a large number of customers who suffer from similar hair condition issues due to the environment. If this is supported by the analysis based on the dataset, it means that there will be potential markets for the salon to create a hair treatment product only for customers living in the big cities with critical pollution issues. Furthermore, the salon can combine this feature with all other personal condition, such as the hair being too fluffy or too hard, and come up with an inclusive collection of different hair shampoo designed according to customers' data. Through digging out more potential factors that influence the hair condition, hair salons can bring new creations to the hair treatment products with greater variability and effectiveness.

Additionally, based on customers' hair conditions, the hair styles preferred by the public and the environment customers live in, a myriad of hair appliances can be introduced and recommended for customers to keep their favorite hair styles for a longer period of time. It has been a common issue that once customers leave the salon, the perfect hairstyle seems can be kept for only one day or even less. By understanding more about the problems customers encounter to keep the new hair style for as long as possible, it will be possible for hair salon to invent new hair appliances that specifically target this issue through researches and inputs in R&D, which can potentially shape the whole hair styling industry.

3.2. New Value to Consumption Ecosystem

Similar to production ecosystems, the consumption ecosystems help companies to strengthen the value of product-in-use information through a network or a collection of third-party consumers of that information who can connect it with other complementary information. In the case of hairdressing, consumption ecosystems create values that are not available in traditional barber shops, such as online community value and industry expansion value.

3.2.1. Online Community Value

The barbershop can build an online community for stylists and customers to connect with each other much more easily. Firstly, the online community will record each customer's personal information such as haircut records, location, age, and scalp type. The personal information will be essential to help salon provide customized services for its customers. For example, sensor data from each customer can help the barbershop analyze when customers want to have their particular type of hair services. Moreover, people of different ages in different regions usually have distinct hairstyle preferences. The salon can analyze the in-use information in the database to offer the most favorable hair styling and services to different groups of customers. For instance, teenagers may prefer dying their hair while elders may prefer having hair care services.

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While having a haircut, the sensor data from the hair clipper can collect the scalp and hair quality information. The information can be shared within the online community, so that the server can offer the shampoo, hair services and recommend hair styles that suit the most for different individual customers when they come to the salon again.

More importantly, in the online community, the customers can choose and rate their favorite hair stylist, which deepens the relationship and bond between customers and stylists. Last but not least, customers can share their individual unique experiences at the barbershop with others through the online community or network, so that the company can gradually improve its service level and increase its competitiveness by referring to customers' experiences to provide them with the most optimal experiences possible.

3.2.2. Industry Expansion Value

In the traditional hairdressing industry, salons often only collect personal information of users. Based on the personal work experience of the hairdresser and the limited current information that they have obtained, they recommend the hairstyles that they consider suitable for users. This approach is obviously not efficient enough for the era of digital transformation. In the context of digital transformation, the hair salon envisions expanding industry data to create more values for users through information exchange in the consumption ecosystem.

The data stored in the consumption system combines public preference with industry data, so that the hair style choices provided are created according to both personal needs of customers and public aesthetics. The value of the database increases user satisfaction. With the supplement of public preference data, users can acquire clearer guidance on professional hairstyles applicable in different scenarios with high-quality services. This option transmits not only the information in use but also the industry data to the consumption ecosystem. An outstanding consumption ecosystem can accurately predict the user's preferences while expanding the user's field of vision to help them discover what they may be interested in. Users will obtain the most suitable hairstyle after comprehensive considerations of various factors. Through data filtering, salon can find the hairstyle data set that is the most similar to the target user's interests, and generate the most suitable product recommendation to the target user according to a certain algorithm.

In addition to the values created within the industry itself, traditional salons can be extended to other industries to provide customers with a diverse digital experience. For example, by expanding into the health industry, on the premise of ensuring no privacy violations, contacting and collecting information provided by third-party health agencies, the salon will be able to expand its business scope to create values from new sources of opportunity. The salon will guide its products in use from the information in the digital envelope to initiate, measure and coordinate the new consumption ecosystem. In this way, it can enhance the integration of customer data with other supplementary information by exchanging product-in-use information in its consumption ecosystem.

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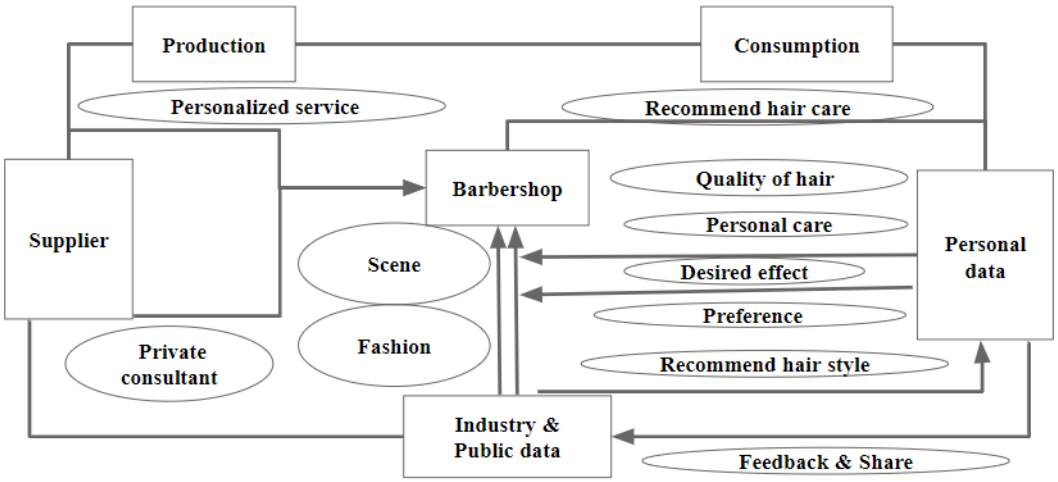

Figure 1. Data value of production and consumption ecosystems

4. CONCLUSION

Digital technology is reshaping the current structures and rebuilding new environments for businesses. It requires companies to raise attention on both production and consumption ecosystem. For those traditional industries who are still struggling to survive the evolution or hoping to find a new way out, digital transformation is becoming an inevitable trend. Managers should be able to thoroughly understand the digital ecosystem, and propose a new corporate strategy based on novel digital technologies in order to create new values for the firm. For a service industry like the hair styling chain, the focus should lie in the improvements of service quality and the generation of new values based on both production and consumption ecosystems.

With the rise of software, it is possible now for the hair styling chain to implant sensors into every process of its service, including the hair styling and hair treatment. A dataset built by customers' information enables stylists to have a better idea on the preference and demands of certain customers. Based on this, new products like hair appliances can be customized or invented to improve the out-of-store service, which can generally bring new values to the original production ecosystem.

At the same time, company can manage an online community based on this dataset including both stylists and customers to acquire advanced customer data. By creating connections with different other industries like fashion, cosmetics and health industries, the hair styling chain can gain new business opportunities, bringing new values to consumption ecosystem as a result.

Value creation both within and outside the original value chain has already become the core of competence in the digital world, and traditional industries like hair styling chain are in urgent needs of adapting new technologies into the antiquated service mode. This paper, meanwhile, serves as a beacon of light and provides the basic guidelines for traditional industries including hair styling chain to enable such value creation. By emphasizing various approaches legacy businesses can take to advance both production and consumption ecosystems based on sensor data, this paper further points out one of many possible ways that legacy businesses can reinvent themselves to maintain their fits with the evolving era and reacquire the dominance in the industries. Notably, despite of the efforts already made to investigate and decode digital transformation, more researches should be done in the future to address issues related to the sustainability and profitability of such transformation.

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