CHALLENGES OF DIGITAL TRANSFORMATION

A case study of the restaurant industry

Laksilu Weerasinghe, Blandine Nirere
Abstract

Recently digital transformation has become imperative that organizations must embrace to cope with today’s digital world’s new demands. Previous research has been investigating the opportunities provided by digital transformation but still, there is a gap when it comes to digital transformation challenges. This thesis addresses the main challenges faced by restaurants during their digital transformation journey. A qualitative research method with semi-structured interviews has been used to investigate digital transformation challenges in the restaurant industry in the following countries: Sweden, Sri Lanka, Australia, and Korea. Our findings show that restaurants mostly face a lack of resources, culture change, and lack of knowledge. This study has a double contribution. On the one hand, this thesis provides practitioners with the main challenges restaurants face during their digital transformation journey, on the other hand, this study provides literature to fill the gap that exists in digital transformation challenges.

Keywords: Digital transformation, restaurant industry challenges, culture change, lack of knowledge, lack of resources

1. Introduction

In the last few years, digital transformation has become imperative that organizations must embrace to respond to today’s digital world’s new demands (Alhubaishy and Aljuhani, 2021). This is a trend that is being used by almost every industry to increase its competitiveness. Implementing digital transformation involves making changes to at least one of the following three important aspects of the organizational functioning system; the customer experience, the operations processes, and the business model (Westerman, Bonnet, and McAfee, 2014). Reaping the fruits of digital transformation requires organizations to leverage new digital technologies in a way that creates value for them and increases their system performance. The fact that a grasp of new digital technologies leads to organizational changes is enough to justify challenges triggered by digital transformation. Handling digital transformation challenges differs depending on the organizational digital mastery level: Beginners, Conservatives, Fashionistas, and Digital masters (Westerman et al., 2014). Therefore, it is important for an investigating organization to be aware of challenges associated with digital transformation which is a good input for them to know how to handle these challenges to achieve expected outcomes. This thesis addresses the challenges faced by restaurants during their digital transformation journey. The next part of this chapter covers the Background, followed by the research question formulation, and the topic justification. At the end of this chapter, the delimitations of our research are presented.

1.1 Background

The priority of marketplace rivalry has made digital transformation essential to embrace for both big and small organizations in every industry (Scholnick, 2022). Recently, this has
become more serious where the need for cloud-based digital transformation increased and made organizations create a new C-suite position “the chief digital transformation officer”. According to (Scholnick, 2022) digital transformation has evolved into four stages ranging respectively as follows: systems of record (SOR), systems of collaboration, systems of engagement, and systems of productivity and outcomes. Systems of record (SOR) counted on utilizing the internal data to record information smoothly accessed by employees. This record became specialized data for an organization to consult whenever it needs to make decisions in the future. One of the examples of systems of record (SOR) is the electronic health record (EHR). Regarding the system of collaboration, this came as a solution to siloed organizations caused by the systems of record (SOR) introduction. Even if the systems of record (SOR) made data available, it was a difficult task for departments to disseminate information to each other and make everyone get informed. The system of collaboration came as an improvement of systems of record (SOR) which made data more important and increased the speed at which employees share the flow of knowledge. For the system of engagement, this is a stage where organizations that embraced digital transformation recognized the need to use data insights as a starting point to develop digital strategies able to help them move from product-focused status to service-focused outcomes. The final stage of digital transformation evolution is the systems of productivity and outcomes. This is the stage where digitalization is linked to both productivity and outcomes. Once an organization has reached a real unified digitalization, the system for the whole organization can be shaped smoothly, and the affectation of new tools can occur faster than before. From these stages in which digital transformation has evolved, it is advisable for an organization to engage in a digital transformation journey to ensure that they understand what they are expecting to get out of it (Scholnick, 2022).

Recently, digital transformation has been a trend for both researchers and practitioners (Vial, 2019). The availability of new technologies such as artificial intelligence, cloud computing, and data analytics reveals new opportunities that enable value creation and increase the flexibility of an organization’s operational processes. To fit in today’s digital environment, organizations must adopt these new technologies and adapt to related changes. Otherwise, the organization may not survive (Brunetti, Matt, Bonfanti, Longhi, Pedrini, and Orzes, 2020). Adopting digital technologies enables organizations with new capabilities which can increase their system performance. However, obtaining the expected digital transformation benefits requires the organization not only to align information technology (IT)/Business strategy but also to have capabilities. Both digital and leadership capabilities need to work collaboratively to reach a successful digital transformation (Westerman et al., 2014). By adopting digital transformation, organizations may encounter so many challenges that can prevent them from progressing. Most of them may be related to an organizational culture that others may come from lacking the capability to afford new technological equipment or having unskillful employees to lead changes. Therefore, these challenges need to be addressed and identified.

Digital transformation has had a significant impact on the restaurant industry. This can be justified by comparing the restaurant business in both ages: the industrial age and the digital age. Starting from the industrial age, it was hard to estimate the number of customers who could visit the restaurant. Sometimes this made restaurateurs prepare too much/less food
compared to the customers they expected to have, which resulted in food wastage or food insufficiency.

In today’s digital era, restaurants that digitally transformed their working systems can identify the regular clients with their food preferences as well as the days on which they usually visit the restaurant. Although digital transformation increases the system performance of restaurants, some clients still complain and prefer to keep having physical interactions with waiters rather than digital devices (Flink and Beling, 2017). This has become a source of challenges not only on the side of restaurateurs but also on the side of the customers. When we look at customers who were familiar with addressing their food preferences and got advice from waiters and now are dealing with only digital tools, the introduction of digital transformation within the restaurant industry has been so challenging. Therefore, some people prefer using digital tools but are assisted by humans (Flink and Beling, 2017). On the side of restaurateurs, digital transformation may be challenging because it requires acquiring new skills (in a short period of time) to match with the new working digital environment. For these reasons, coping with a digital culture being adopted in the restaurant industry is still worrying (Flink and Beling, 2017). For that reason, restaurateurs must be attentive to the challenges associated with digital transformation. This will be a good input for them to attain a successful digital transformation associated with expected benefits.

1.2 Research question
To identify the gap that exists in the digital transformation field of research, a collection of information related to digital technologies used in the restaurant industry, the opportunities provided by digital transformation as well as the associated challenges were made. Also, an analysis of collected information from several related articles was done by looking at where digital transformation needs more contributions. As we can see in Appendix table 01, articles that talked about digital transformation challenges in a clear and understandable way are still few. This justifies how we identified the gap that exists in digital transformation and our motivation to formulate our research question as follows:

**What are the main challenges restaurants face during their digital transformation journey?**

1.3 Topic justification
The restaurant business is a fast-growing industry, which is trending to adopt digital technologies. Restaurants need technological adaptation to overcome their competitive advantages (Verevka, 2019). Customers visit restaurants not only for food but also for seeking leisure experiences. Restaurants are divergent from one another with the purpose of increasing their customer service experience. Covid-19 measures such as social distancing have pushed business owners to adopt digital technologies to keep surviving (Abed, 2021). Previous research focused on the opportunities provided by digital transformation and few of them have introduced digital transformation challenges see appendix table 01. This justified the motivation behind conducting this research.

1.4 Delimitation
This research considers restaurants in countries from different geographical locations around
the world. Those countries are under different development categories and various levels of technological literacy. For these reasons, restaurants residing in those countries are using different levels of digital technologies. This thesis won’t compare those digital technologies based on their located countries’ development levels and technological literacy levels, but it will observe the challenges faced by the restaurant industry during the digital transformation journey.

2. Related research

2.1 The restaurant industry

The restaurant industry has many competitors including single sandwich shops, cafes, coffee shops, pizzerias, fast food chains as well as super luxuries restaurants that provide a wide range of dishes (Statista, 2018). Restaurants are an important area of the hospitality industry (Alt, 2021). The Restaurant is a public organization that can provide catering services. In addition to that, restaurants have become places of social activity (Tan, 2021).

The restaurant can get involved with two types of processes (Sachs, Allen, Terman, Hayden and Hatcher, 2014). The processes are referred to as Front-Of The-House (FOH) and Back-Of-The-House. Front-Of The-House is the process of customers interaction during their visit in the restaurant. For example, waiting, seating, dining, and activities customers interact with before and after visiting the restaurant. This also involves functions such as website searching, marketing interactions, food delivery, payments, and reviews (Cavusoglu, 2019); (Sommerville, 2007). Back-Of-The-House represents areas where supply chain process, food preparation, cooking, administrative, souring and management processes are performed. (Cavusoglu, 2019); (Sommerville, 2007). Restaurants can be categorized based on their Front-Of The-House (FOH) and Back-Of The-House (BOH) processes. The restaurant industry is divided into several kinds of segments depending on food type, quality of services, atmosphere, and price range (Auty, 1992). The below diagram mentions the overview of the restaurant process.

![An overview of the restaurant process taken from (Alt, 2021)](image)

2.1.1 Technology used in the restaurant industry

Digital technologies are used to reach a degree of perfection in terms of psychological, ethical, aesthetic, organizational, technological, and other aspects. Key factors we must consider as
successful development in digital technologies are the ability to respond quickly, and sensitively. Apply those technologies to various parts of life which are making internal and external changes (Serebryakova and Avdeev, 2018). Most of the stationary devices that are used in the restaurant process have a trend to convert to smart devices (Berezina, Ciftci, and Cobanoglu, 2019); (Geron, 2017). The rapid development of digital technologies in the restaurant industry raises the question of how these technologies will improve and enhance customer dining experiences. People in the hospitality industry think digital technologies make revolutionary trends in eating and drinking. Back-Of-The-House (BOH) are areas that are related to purchasing, receiving, storage, food preparation, service, dishwashing area, sanitation, accounting, budgeting, and control (Meyer and Vann, 2013: 152). Back-Of-The-House technologies contain product management systems for purchasing, managing inventories, menu management, controlling labor costs, and kitchen display systems. These mentioned systems and applications are built as software programs that contain up-to-date and accurate data for making management decisions (Walker, 2010: 392). When considering some of the other Back-Of-The-House technologies that are functionalities for accounting, smart kitchen, and restaurant management services. Also, when looking at SMAC (Social, Mobile, Analytics, Cloud) technology is playing an important role in enabling digital services (Alt, 2021).

Front-Of-The-House (FOH) operations are related to customers and the dining area. For example, taking orders, food deliveries, and payments (Walker, 2010). Among the technologies used in the Front-Of-The-House include tabletop technologies, digital display menu, kiosks with self-service technology (SST) as the main technology (Amr, 2019). Front-Of-The-House technological services are social media presences, digital signage devices as well as reward programs (Alt, 2021). The restaurant owners and restaurant staff use mobile devices such as smartphones and tablets to increase their customer experiences. This allows their customers to order food online or on-site ordering, self-service assisted ordering (Alt, 2021).

2.2 Digital transformation

The emergence of new technologies such as the internet, big data, and mobile technologies has been disruptive in almost every industry. Therefore, companies must be aware of this disruption occurring in adjacent industries and react accordingly. To maintain their business relevance according to today’s digital market and ensure their competitiveness, companies must embrace digital transformation otherwise they would go out of business (Andersson, Movin, Mähring, Teigland and Wennberg, 2018). Recently, Digital transformation has been an exciting trend for both strategic IS researchers and practitioners (Vial, 2019). Researchers have defined digital transformation in different ways (Westerman, Calméjane, Bonnet, Ferraris, and McAfee, 2011); (Bekkhus, 2016) defined digital transformation as the use of digital technologies to increase the organization’s performance. Whereas (Piccinini, Hanelt, Gregory and Kolbe, 2015b); (Horlacher, Klarner, and Hess, 2016) ; (Singh and Hess, 2017); (Paavola, Hallikainen, and Elbanna, 2017) defined digital transformation as a way to leverage new digital technologies to enable the investing company with the capability to increase the customer experience, smooth operations or creating new business models. Also (Eymann, Legner, Prenzel, Krcmar, Müller, and Liggesmeyer, 2015); (Nwankpa and Roumani, 2016); (Andriole,
(Clohessy, Acton, and Morgan, 2017) mention the change brought by digital technologies within the organization which results in changing the products, organizational structure, or even automating the system processes. Although the researchers defined digital transformation in different ways, they all have in common “the change of normal ways of working due to the introduction of new digital technologies or the improvement of outdated technologies to enhance the performance of the company”.

2.2.1 A successful digital transformation
To reach a successful digital transformation, (Westerman et al., 2014) advised companies to build both digital and leadership capabilities. As a starting point, they should identify where they are on the matrix that he provided, which will help them know the lacking capabilities and what they can do to build those ones. The provided matrix is composed of four digital mastery levels: the fashionistas, the beginners, the conservatives as well as the digital masters.

![Digital Maturity Matrix](Figure 2: Digital maturity matrix is taken from (Westerman et al., 2014))

Considering the example of Fashionistas companies (those that have developed more digital capabilities rather than leadership capabilities), need to increase their leadership capabilities by strengthening their leaders. They can empower their managers by equipping them with the required skills and capabilities. The manager must have the ability to mobilize employees about the change that is going to occur within the organization due to engagement in the digital transformation journey. To deal with digital transformation-related challenges, (Westerman et al., 2014) provided three concepts to reflect upon, which are described as follows: signaling, earning the right to engage, and setting new behaviors. **Signaling:** This is the starting point of the organization mobilization, where the leaders should communicate the digital transformation information in a clear and sufficient way. They should explain what a digital transformation is and the importance of engaging in it, and what they will need to engage in it. At the end of this step, at least all employees must be aware of the digital transformation information and its importance to the organization as well as to the individual employee. **Earning the right to engage:** This is the next step to reach after spreading the digital transformation information, where the leaders of the organization become role models for other employees. They must develop new behaviors that reflect the new vision and elaborate the implementation plan of the digital transformation vision with responsible employees. Also, they should look for those employees who understand the digital transformation vision more
than others and make them the digital champions who will help them mobilize other employees. Finally, the leaders should visibly show the quick business improvement that will bring digital transformation both internally and externally. Setting new behavior: This concept reflects how the implementation of digital transformation requires employees to change their behaviors in a way that makes them get adapted to a new culture that came from the use of new technologies.

2.2.2 Digital transformation strategy
“Many companies define great digital transformation strategies, but there is a huge difference between having a well-reasoned digital strategy on paper and successfully implementing it. Most digital transformation projects fail due to poor strategy execution” (Correani, Massis, Frattini, Petruzzelli and Natalicchio, 2020, p37)
Digital transformation is not an act of making some small improvements within the company but a journey to engage in, with a well-formulated strategy to reach certain goals. A well-formulated strategy for digital transformation is a strategy where the business strategy is aligned with the IT strategy (Bharadwaj, Savy, and Venkatraman, 2013). Sometimes companies fail to realize their digital transformation, not because they don´t have a good strategy formulation, but because they have a poor execution strategy. Researchers have shown their contribution to helping companies reach their goals. (Correani et al., 2020) suggested four main elements to consider; firstly, the investigating company must engage the customer base. They need to consider the customer behavior data, analyze them, and use the outcome to predict the future. As a result, this will increase their customer experience which will be a good sign for the investigating company to reach a successful digital transformation. Second, they should empower their employees by equipping them with the required skills to help them cope with the new digital world of work, as well as all the changes associated with it. Third, they should improve their system performance by promoting the automation of their business processes across different departments. Lastly, they should start altering their services, products, or business models.

2.2.3 Digital transformation challenges
Embracing digital transformation creates opportunities that make organizations cope with the new demands of today’s digital world (Clubbish and Aljuhani, 2021). This is not only a foundation for organizations to achieve another level of competitiveness but also a source of challenges. Therefore, the leaders of organizations must be aware of the different challenges associated with digital transformation. Researchers have conducted studies on digital transformation challenges in different sectors. In education, (Alhubaishy and Aljuhani, 2021) conducted research to assess the challenges faced by students and instructors during a digital transformation adoption at Saudi universities. The results have shown that students mostly faced a lack of resources, the fear to change as well as learning performance challenges. Whereas the instructors mostly faced a lack of experience as well as a data privacy issue. Also, (Al-Ohali, Alhojailan, Palavitsinis, Najjar, Koutoumanos and AlSuhaibani, 2019) studied the human factor in digital transformation in the education sector and found that the main challenge mostly faced by both students and teachers is the lack of skills to adopt new technologies.
In business (Senior, Swailes and Schwertner, 2017) found that the adoption of digital transformation makes the business owners struggle with data security issues, lack of control as well as lack of integration with current IT systems. At logistics service providers (Cichosz, Wallenburg, and Knemeyer, 2020) identified digital transformation barriers as follows: technology adoption, lack of resources including skilled resources, the complexity of logistics network and underlying processes, resistance to change as well as data protection and security breach. The mining industry (Gao, Hakanen, Töytäri, and Rajala, 2019) found a lack of capability, technological constraints, and goal ambiguity (where the current skills are mismatched with the digital transformation requirements) as well as external constraints as the main challenges associated with digital transformation. In small service businesses (Chen, Lin, Chen, Chao, and Pandia, 2021) found the lack of digital capability, the lack of human resources and technical barriers as well as the lack of funding as the main barriers to digital transformation.

Traditional organizations (Shahi and Sinha, 2021) identified challenges they mostly face and described them as follows: the lack of vision, the organizational culture, the lack of skills, lack of sufficient infrastructure, having a limited budget, lack of integration of systems across different functions of the organization and the data security issue. In SMEs (Popescu, Homutescu, and Balanescu, 2018) identified the lack of knowledge as well as the lack of resources as the main challenges they face when they engage in digital transformation. By examining the leadership challenges during a digital transformation journey (Hai, Van, and Thi, 2021) argued that they lack the skills to fit in a new digital environment. For a strategic management system, according to (Maksimenko, Vashko, and Zdrestova-Zakharenkova, 2021) the problems they face while adopting digital transformation such as the lack of digital skills, the absence of digital culture, the lack of integration between systems, and budget limitations, and the implementation complexity.

Investigating digital transformation challenges requires exploring the organizational change concepts, as the former goes in line with the latter. Also, using organizational culture insights can help to clarify the reason why some organizations become resistant to changes. By considering the example of what (Senior and Swailes, 2016) argued concerning organizational change and culture, we found that sometimes the organization’s culture can be supportive or against changes. In case the organization’s culture becomes against changes this can lead to a digital transformation failure. It is always the responsibility of the organization’s leaders to know how to deal with cultural challenges when engaging in a digital transformation journey. (Sambamurthy and Zmud, 2017) outlined the organizational change essence by comparing the speed of changing digital technologies with that of changing people’s minds and behaviors. He found that it is easier for an organization to change digital technologies rather than change people’s minds. He gave an example of what may happen in case the employees don’t want to change their minds in a way that makes them fit in the newly adopted digital environment. They cannot accomplish the given tasks and if those tasks were to be associated with others in the same project, this results in the failure of a project.

Another important aspect to consider when looking at digital transformation challenges is the lack of knowledge. In his book “guiding the digital transformation” (Sambamurthy and Zmud, 2017) defined knowledge as a shared understanding and argued that to reach a
successful digitalization, it must be combined with information. This is what mostly happens to companies from different industries where the organization’s knowledge is kept in individual minds rather than being stored digitally as an organizational resource. The worse situation arises when that individual who holds the company’s knowledge is left and no one else in the company can fulfill his/her responsibility. To make knowledge an organizational asset that can be consulted in the future wherever it is needed, (Sambamurthy and Zmud, 2017) advised that it should be systematized and authenticated by knowledge expertise.

In addition, the lack of resources including skills resources is a common challenge mostly found in almost every organization. As the organizations have the same fight of matching the outdated system with a new digital system to fulfill the demands of digital transformation Hai et al. (2021). Resources may be buying new technological devices to replace outdated ones, affording new software, or acquiring the required skills to fit with a new digital working environment. Regarding the skills resource, (Sambamurthy and Zmud, 2017) clarified the significant role of skills in a digital transformation journey and the impact it has when it lacks. He used an example that shows how an ineffective project manager can prevent organizations from gaining pledged digital investment promises. The project manager may assign tasks to the wrong people, which may result in an uncompleted project in case those tasks were to be associated with those of other people in the same group project. In the same spirit, (Westerman et al., 2014). outlined the impact of the lack of skills within an organization, which can create a gap between employees (those who are habitual with using digital tools with those who are not). It is good to look at intangible assets like skills while planning for a digital transformation investment to minimize the risks of failing to reach expected digital transformation outcomes. To ensure a digital transformation associated with expected benefits, digital transformation challenges must be handled. To handle this, both digital and leadership capabilities are needed (Westerman et al., 2014)

2.3 Digital transformation in the restaurant industry

To meet the competitive advantages and to increase efficiency in restaurants there is a need to automate the processes and increase the implementation of digital solutions (V.Verevka, 2019). The companies like restaurants or hotels completely deal with customer loyalty and their interest to return. Therefore, restaurants and hotels are always aware of innovations through customer experiences (Foroudi, Jin, Gupta, Melewar. And Mohammad, 2016); (Ottenbacher and Gnoth, 2005). These two factors are combined with the advancement of digital transformation and digital innovation (Sebastian, Jeanne, Martin, Kate, Nils, 2017) Digital Technologies used in the restaurant can increase the quality of services as it is stated by (Kim, Nicolau, and Tang, 2021) and (Pinchos, 2021). Pinchos follows a business model strategy as well as customer self-service in the digital transformation path. They take orders via a mobile application, and their model of serving as well as the encouragement of cashless payment, made the organization win the Franchise of the future award in 2016 and continue the innovative process through customer self-service (Pinchos, 2021). Continuously focusing on the innovation of service experiences can lead to an increase in the overall quality and affect the increasing number of customers (Lin, 2013).

Restaurants are like other service-oriented industries, with the trend to adopt digital
technologies for increasing customer value using marketing tools such as social media. They also come up with web pages and phone applications for distance ordering services (Nambisan, 2017). Digitalization can be compared with the metaphoric snowball. Because a snowball is growing bigger but no clear vision down when it’s rolling down the hill. The only thing is motion and broad effect. This is the same to apply digital technologies in restaurants and the food serving industry. Some of the traditional way processes of human interaction are abandoned due to the use of digital technologies in the restaurant industry. Traditional restaurants are apparently slow to achieve digital transformation and innovation. They are having difficulties adapting to digital technologies even if this is the only way they can pass through to gain a competitive advantage and increase their customer experience (Kim et al., 2019). Therefore, by adopting digital solutions in their regular processes and services, restaurants can increase their profits (Hanks et al., 2016)

2.4 Theoretical framework
To build our theoretical framework, we used the theory of the literature that conducted their studies on digital transformation challenges in different sectors and deduced what they have in common such as lack of knowledge, culture change, and the lack of resources. Below is the table that summarizes the challenges of digital transformation in different sectors.

<table>
<thead>
<tr>
<th>Category</th>
<th>Challenges</th>
<th>Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>the lack of resources, the fear to change the learning performance</td>
<td>(Alhubaishy and Aljuhani, 2021) &amp; (Al-Ouali, Alhojailan, Palavitsinis, Najjar, Koutoumanos, and AlSuhaibani, 2019)</td>
</tr>
<tr>
<td>Small service businesses</td>
<td>the lack of digital capability, the lack of human resources the technical barriers the lack of funding.</td>
<td>(Chen et al., 2021)</td>
</tr>
<tr>
<td>Tourism industry Small medium-sized (SMEs)</td>
<td>the lack of knowledge the lack of resources</td>
<td>(Popescu et al., 2018)</td>
</tr>
<tr>
<td><strong>Mining industry</strong></td>
<td>the lack of capability, technological constraints, goal ambiguity, External constraints</td>
<td>(Gao et al., 2019)</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>Leadership</strong></td>
<td>The lack of skills</td>
<td>(Hai et al., 2021)</td>
</tr>
<tr>
<td><strong>Strategic management system</strong></td>
<td>lack of digital skills, absence of digital culture, lack of integration budget and limited implementation complexity.</td>
<td>(Maksimenko et al., 2021)</td>
</tr>
<tr>
<td><strong>Business</strong></td>
<td>data security issues, lack of control, lack of integration</td>
<td>(Schwertner et al., 2017)</td>
</tr>
</tbody>
</table>

### 2.4.1 Culture change

The concept of culture is complex based on its application to organizations, societies, and groups, where all interact with one another (Senior and Swailes, 2016). The thing that differentiates one organization from another is its culture. Culture reveals how the organization’s daily activities are performed. (Senior and Swailes, 2016) define Culture as a predominant influence on organizational life. It involves great and more enduring values, beliefs, and norms within the organization (Tidd and Bessant, 2018). Therefore, a firm that needs to bring about innovation requires changing its culture. During the innovation process, culture serves as a key to the knowledge base with all the necessary information innovators may need while exploring both the internal and external environment of the organization. On one hand, culture can facilitate innovation, by providing the knowledge base about the current situation of the organization and the existing capability. This may be a good input for an organization engaging in a digital transformation journey where they can easily identify the capabilities they have and which ones they lack, as reaching a successful digital transformation both digital and leadership capabilities are needed (Westerman et al., 2014). On the other hand, culture can be a barrier to innovation. This is the case where culture within the organization becomes like “how things are done around here” (Drennan, 1992, p.3). In this situation, the organization seems to be satisfied with its operational and technological systems where it develops different behavior, structure, and cognitive systems to reinforce its current situation.

In the context of digital transformation, the organization can only be successful when its culture supports changes otherwise this leads to a digital transformation failure. This is because organizational change goes hand in hand with organizational culture. According to (Maksimenko et al. 2021); (Cichosz et al. 2020), culture change issues can be presented in
different forms. On one hand, cultural issues can appear as a lack of integration within an engaging organization, on the other hand, they can appear as resistance to change. Therefore, it is advisable for an organization to engage in digital transformation to consider culture in all its aspects to reach a successful digital transformation full of achieving designed goals.

2.4.2 Lack of knowledge
Knowledge is defined as an expanding combination of structured experience, values, contextual information, and expert insights that offer a framework to evaluate and incorporate the latest information and experiences (Davenport and Prusak, 1998). In the organization, knowledge appears in documents, repositories, organizational norms, routines, and practices. Sometimes knowledge is confused with Data and information. According to (Davenport and Prusak, 1998), Data is defined as an organized transaction record whereas information is described as a message. In comparison with these two terms (data, information), knowledge is wider, great, and plentiful. (Alavi and Leidner, 2001) identified organizational knowledge creation as “involving a continual interplay between the tacit and explicit dimensions of knowledge and a growing spiral flow as knowledge moves through the individual, group, and organizational levels” (p.166). However, Storing and extracting organizational knowledge from the organizational memory involves a hesitant process on the organizational capability to learn and make informed decisions (Stein and Zwass, 1995).

According to (Alavi and Leidner, 2001), knowledge can be transferred amidst individuals, between individuals and definite sources, between individuals and groups, amidst groups between groups and organizations. The application of knowledge within an organization is being used for competitive advantage. Therefore, it is the responsibility of the organization to create and store their past knowledge to be retrieved either in the present or in the future whenever it is necessary. This can help to equip them with the required knowledge and skills to fit in today’s digital world (Alhubaishy and Aljuhani, 2021). In the context of digital transformation, the lack of knowledge may lead to digital transformation failure. By consulting the contribution of researchers who tried to conduct their studies in the digital transformation field, the lack of knowledge has been one of the common challenges that organizations mostly face once they adopt digital transformation (Popescu et al. 2018), (Schwertner et al. 2017), (Shahi et al. 2021). This is because employees who have a certain knowledge keep it for their own rather than storing that knowledge and making it an organizational digital asset that can be transferred amongst other employees (Sambamurthy and Zmud, 2017). To handle this, (Sambamurthy and Zmud, 2017) advised Making knowledge an organizational asset that can be consulted in the future wherever it is needed, and this can only be systematized and authenticated by knowledge expertise.

2.4.3 Lack of Resources
The typical requirement of any project is the people to run that project. Having the right people to perform certain tasks is the key to a project’s success. Every project is associated with resources and in case of insufficient resources, this leads to project failure (Rajkumar and Alagarsamy, 2013). It is the size and scope of the project that shape the necessary resources for a given project. (Safeopedia, 2022) defines resources as something utilized to make profits or benefits. An organization engaging in a digital transformation journey must have required
resources including skilled resources to reach success. According to (Cichosz et al., 2020), the lack of resources appears as a barrier to digital transformation. In the same way (Mbuyisa and Leonard, 2017) identified the lack of financial resources as a leading factor to slow down the digitization process. In the digital transformation context, resources may include buying new technological devices to replace outdated ones, affording new software, or acquiring required skills to fit in a new digital working environment. By reviewing the literature of researchers who studied the challenges of digital transformation, the lack of resources was among the common challenges (Alhubaishy and Aljuhani, 2021) & (Al-Ohali et al., 2019), Popescu et al. (2018). Concerning skilled resources, the common issue faced by different organizations (Berezina, K., Ciftci, O., & Cobanoglu, 2019) engaging in digital transformation is to find people able to integrate the digital system with the outdated one (Hai et al., 2021). Therefore, it is essential to look at intangible assets like skills while planning for a digital transformation investment to minimize the risks of failing to reach expected digital transformation outcomes.

2.5 Theoretical Framework

![Theoretical Framework Diagram]

Figure 3 The Theoretical Framework

3. Research Methodology

3.1 Method

One of the key benefits of qualitative research is that it allows researchers to understand the context within which decisions and actions take place (Myers, 2014). This quality encourages us to choose a qualitative research method for this thesis. Qualitative research methods are designed to help researchers to understand people and what they say and do. (Myers, 2014). It encourages researchers to understand the social and cultural contexts within people’s lives.

This research investigates digital transformation challenges in the context of the restaurant industry. Qualitative research is the most suitable method when it comes to the purpose of this research. the characteristics of qualitative research will help us to get a clear
understanding of what kind of challenges the restaurants face once engaged in a digital transformation journey. In this study, we conducted seven interviews with both restaurant owners and restaurant workers. We analyzed those gathered data according to the theoretical framework that we presented in Chapter 2. We used the interview guide which is based on our presented theoretical framework. But meanwhile, we developed some additional questions to convert the interview into a semi-structured format. According to (Saunders et al., 2015), Semi-structured interviews have some predetermined themes, and key questions and allow follow-up questions to be adapted to each interview context.

In Qualitative research, there are many ways to conduct the research. Here we decided to go ahead with a Case study (Saunders et al., 2015) argued that a case can be a person, group, organization, or change process. Because the Case study is based on real-world evidence from the people who are involved (Myers, 2013). Also, when conducting the research, based on the case study as researchers we need solid knowledge about the research area (Myers, 2013). The purpose of our research is to understand the challenges of digital transformation in the context of the restaurant industry. We gathered information from real-world people who work in the restaurant industry. The restaurant industry is also a real-world context. (Myers, 2014) argues that in Case study research, researchers must deal with empirical evidence from real-world people in real organizations. In our theoretical framework chapter 2, we introduced three main categories of challenges faced by digital transformation. We got solid knowledge about our research from the above-mentioned theoretical framework which we introduced in chapter 2. And we gather empirical evidence by using why and how questions (Myers, 2014). According to (Yin, 1994), ‘how’ or ‘why’ research questions are a contemporary phenomenon, and the researchers had no mandate to control the event taking place. By considering the aim of this research and our research questions, we came up with the conclusion that a Case study is most suitable for this research. The aim of this research is to find the challenges of digital transformation in the restaurant industry. We conducted seven interviews and analyzed the findings. These empirical findings are discussed in chapter 4.

3.2 Literature review

In the beginning, we conducted the literature review of existing research in a wider way by looking at articles on google scholar with the digital transformation keyword. This gave us an overview of digital transformation and its impact on different industries. After getting a general overview, the challenging section was to look at the way to move forward. To handle this, we choose to move on to looking at the digital transformation of Small and medium-sized enterprises, as we always have in our mind working in an industry from where it will be easier for us to collect data. After exploring more Small and medium-sized enterprises, we found that it is easier for us to choose one Small and medium-sized enterprise industry, the one we are more comfortable with, and from which it will be easier for us to collect data. We were wondering whether to choose between restaurants and the tourism industry. By conducting in-depth research on the digital transformation of Small and medium-sized enterprises we found that there exist many articles that conducted their studies on the tourism industry rather than those on the restaurants. Therefore, this is a good starting point to identify the gap that exists in the research. Afterward, we chose to put our focus on digital transformation, digitalization,
and digitization of the restaurant industry. To ensure the gap, we were going to fill, we conducted our literature review in a form of a Table (Appendix 1) which has five columns in the heading identified as follows: In the first column, we wanted to collect information related to the identification of the article we were going to explore such as the title, author, the year in which the article has been published. In the second column, we wanted to collect digital transformation ideas in the form of a summary. In the third column, we wanted to collect different technologies used in the restaurant industry, back-of-the-house (BOH) technology and Front of the house (FOH) technology. The fourth Column was for identifying the opportunities provided by digital transformation once it is introduced within an industry and the fifth column was for tracking the challenges associated with digital transformation. These headings helped us a lot to identify the gap as well as find the method mostly used in the previous studies. After filling the table, we found that the researcher who has been interested in conducting their studies in both digital transformation and the restaurant industry talked a lot about the technologies being used as well as the opportunities provided by digital transformation rather than the associated challenges. Therefore, this motivated us to orient our study in this direction. Table (Appendix 1) summarizes the articles we used to identify the gap that exists in the research on digital transformation challenges faced by the restaurant during their digital transformation journey.

### 3.3 Data collection

#### 3.3.1 Interviews

The Semi-structured interviews have pre-designed themes, and several types of main questions and it also allows you to ask follow-up questions which are necessary for each interview context. Semi-structured interviews are considered to allow flexibility and adaptability based on new ideas and their relevance to the research (Saunders et al., 2015). In our research, we conducted seven interviews. These interviews are with restaurant owners and restaurant workers. The restaurants we chose for this research are in different parts of the world. Because of that reason, researchers were not able to participate in the interviews physically. All interviews are handled digitally via Zoom Technology. Most of the interviews are conducted in the English language and Two interviews were conducted in the Sinhala language. We used an interview guide based on our theoretical framework, but, if necessary, we asked several follow-up questions. The main advantage of the semi-structured interview is that interviewees can express their ideas freely. They can express their own ideas without concerns about whether they are relevant or not (Myers, 2014). As researchers, we were comfortable with semi-structured interviews when it comes to data gathering. Conducting the interviews in a semi-structured manner allows us to obtain time-consuming. The semi-structured interview method helps us to understand the subject and provides detailed data. The semi-structured interviews are aimed at gaining insights into the interviewee’s own experiences. The below table mentioned a detailed summary of the respondents and the interview length.

*Table 2 - Overview of respondents and restaurants*
16

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Role</th>
<th>Location</th>
<th>Description</th>
<th>Interview Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assistant Chef</td>
<td>Jonkoping, Sweden</td>
<td>Buffets Restaurant</td>
<td>22 min</td>
</tr>
<tr>
<td>2</td>
<td>Owner</td>
<td>Melbourn, Australia</td>
<td>Fast food Restaurant</td>
<td>30 min</td>
</tr>
<tr>
<td>3</td>
<td>Owner</td>
<td>Colombo, Sri Lanka</td>
<td>Sri Lankan foods</td>
<td>25 min</td>
</tr>
<tr>
<td>4</td>
<td>Owner</td>
<td>Colombo, Sri Lanka</td>
<td>Fast food Restaurant</td>
<td>35 min</td>
</tr>
<tr>
<td>5</td>
<td>Owner</td>
<td>Umea, Sweden</td>
<td>Fast food chain</td>
<td>45 min</td>
</tr>
<tr>
<td>6</td>
<td>Assistant Manager</td>
<td>Umea, Sweden</td>
<td>Fast food chain</td>
<td>20 min</td>
</tr>
<tr>
<td>7</td>
<td>Kitchen Staff</td>
<td>Seoul, Korea.</td>
<td>Korean Foods</td>
<td>20 min</td>
</tr>
</tbody>
</table>

### 3.3.2 Interview Guide
The interview guide used is based on the theoretical framework introduced in chapter 2 of this thesis. According to the above-mentioned theoretical framework we built 33 interview questions. The interview guide was divided into seven subparts. First, three-part covered questions with the background of the interviewee and the restaurant, Digital technologies used in the restaurant, and how digital transformation affected the restaurant. The last question categories are cultural changes, Lack of resources, Lack of Knowledge, and overall challenges restaurants face because of digital transformation see (Appendix 2). To come up with good data collection, this interview guide played an important part in this thesis. These underpinning questions are made by predicting the answers that interviewees give. Researchers followed the semi-structured interview method with several follow-up questions. But when it came to the interview guide, we followed, it gave huge encouragement to come up with correct data.

### 3.3.3 Selection
The interviewees were selected based on their position in the restaurant. Because we need to gather data from top to bottom hierarchical and functional level persons from the restaurant industry. Each level deals with the digital transformation in the restaurant in a different way. We assumed experiences or challenges of digital transformation faced by managers and owners are different from the other minor staff employees. This allowed us to conduct interviews with owners/managers as well as other staff members. Because owners and managers are involved in introducing the digital transformation to restaurants. But most of the time employees are performing the operational processes of these digital technologies. One researcher has
personal contact with these restaurants. And we searched restaurants' web pages and social media pages and got ideas about restaurants' suitability for this research. All interviewees are contacted via email and phone to perform this thesis formal way. The researchers explained the background and purpose of the research when they contacted the restaurants. We mainly focused on getting in contact with restaurants in different parts of the world. We contacted restaurants which are in Sri Lanka, Australia, Sweden, and Korea. Because of the geographical differences between selected restaurants, we were not able to represent ourselves physically at each location. The interviews were conducted digitally. Researchers' Interviews are conducted using ZOOM technology. At the beginning of the interview, we asked permission from the interviewees to record the whole interview. And we gave them a brief introduction to digital transformation and semi-structured interviews. The interview Contains 33 structured questions. Because of the semi-structured method, researchers were able to ask follow-up questions. Also, participants were able to express their ideas and experiences freely.

3.4 Data Analysis
According to (Myers, 2014), researchers use qualitative research to acknowledge the social and cultural contexts in people's lives. This helps them analyze the context in which actions and human decisions are made. It is this context that clarifies how people act the way they do, and this can only be recognized by giving a voice to people (Myers, 2014). To identify the data analysis approach relevant to our work, we considered the one that supports the gathered data and came up with a top-down approach which is the best way to move forward when you want to analyze your data with the help of literature review concepts (Myers, 2014). (Myers, 2014) explained qualitative data analysis needs to achieve two goals. The first one is that researchers need to find values in the dataset to convert them into a manageable way. The second one is to transform and interpret data to find the meaning in the data set. Good qualitative research always requires the best data analysis method. Thematic analysis is the method that can capture the patterns and themes in the Qualitative data set (Myers, 2014). The qualitative data set always seems messy. By using Thematic analysis researchers are allowed to convert those messy data into meaningful themes (Myers, 2014). This flexible nature of Thematic analysis encourages us as researchers to choose thematic analysis as the data analysis method in this thesis. Thematic analysis has high transparent quality (Myers, 2014). This transparent quality of thematic analysis allows for categorizing similarities and differences among qualitative data sets (Myers, 2014). According to (Braun and Clarke, 2006) and (Braun et al., 2019) Thematic analysis has six steps to analyze a qualitative data set. We follow all these six steps to come up with our qualitative data analysis. (Appendix 3).

Table 3 - Thematic Analysis inspired by (Gioia, 2012)

<table>
<thead>
<tr>
<th>1st Order concept</th>
<th>2nd Order concept</th>
<th>Aggregate dimension or Theme</th>
</tr>
</thead>
</table>

17
“When it comes to employees, old employees are not very satisfied with systems. Because they want to see people in restaurants physically. And they need face-to-face feedback about the food.”

<table>
<thead>
<tr>
<th>Culture challenge</th>
<th>Culture change</th>
</tr>
</thead>
</table>

We conducted seven interviews with different hierarchical and functional levels in the restaurant industry. We had four interviews with restaurant owners, a manager, and two members of the kitchen staff. And we used Otter.ai_transcribing software for transcribing the answers that we got from our interviewees. We transcribed each interview one by one. After analyzing similarities and patterns between the statements of respondents, we came up with several amounts of coding. According to Table1 in Appendix 3, We categorized each statement under the coding we identified. This coding allowed us to identify the themes of our findings. Our theoretical framework contains three components as challenges of digital transformation. By analyzing these coding, we concluded our findings into three main themes which we introduced in our theoretical framework. Lack of resources, Lack of Knowledge, and Culture change are the themes that we analyzed by using the interviewee’s statements. As illustrated in Table 2. in Appendix 3 We gave color codes for each theme and categorized the interviewees’ statements under each theme.

3.5 Ethical Principles

According to (Myers, 2014), it is crucial to think about ethics while conducting a study that involves real people. To help researchers protect themselves as well as the research participants, he provided some key ethical thoughts to reflect upon before starting doing research. These are the considerations commanded by the national law. By applying these ethics, a researcher is given an opportunity to explain the research design to other people. For that reason, qualitative researchers should treasure the seriousness of ethics as well as the associated procedures. In this context, qualitative researchers should know their responsibility of considering the interest of the research participants rather than their sponsors or funders. In this thesis, the ethical principles as provided by (Myers, 2014) has been followed such as the golden rule, interviews, and fieldwork. To apply the golden rule, the participants have been treated as if they are interviewers. In the beginning, the participants have been contacted via email, explaining to them both the purpose of the research and the reason for choosing them to be the interviewees. After getting their feedback, the interview time has been scheduled. During the interview, the participants have reminded of the purpose of the research, and the average time it would take and asked them permission to take the records. Also, the participants have been informed that their ideas will be combined with those of others, and the outcomes will be published, but both identities and those of their restaurants will be kept confidential. In addition, it was assured to write their shared information in code form for them to feel more comfortable while expressing themselves for no one else knows what they have shared. That was done to obtain the participant’s informed consent considered to be an important ethical principle when conducting qualitative research (Myers, 2014). Sometimes studies may have exceptions to consider ethical principles like informed consent such as those that studied criminal activities but, in Theis’s study, it was a different case as the informed
consent from all the participants has been obtained.

4. Empirical Findings
In this chapter, the outcomes of the collected data in relation to the built framework have been presented. This is a framework made up of three elements which are the lack of knowledge, the lack of resources, and culture change. The data was collected from countries in different geographical locations around the world. To ensure the clarity of the findings the analysis the collected data has been made for each restaurant independently.

4.1 Respondent 01
This was the chef assistant of the buffet menu restaurant which is in Jonkoping Sweden. The restaurant uses digital technologies like Digital menus and POS (point-of-sale system) systems. According to him this restaurant is not fully digitally transformed yet.

4.1.1 Culture change
By asking about the challenges, they face while using the POS (point-of-sale system) system adopted in their buffet restaurant when they engaged in digital transformation, the Chef of this restaurant confirmed the culture change challenge by saying: “But I am always struggling with the system language. Because it uses Swedish, and my Swedish knowledge is not at a very satisfactory level. The System has no options to change the language”. Again, by asking if the employees get training about digital technologies that they use in the restaurant at the beginning, the culture challenge was confirmed by the same respondent within the same restaurant. He says: “I struggled to get familiar with the system from the beginning because of the language barriers. but it is a user-friendly system”

4.1.2 Lack of resources
In addition to the culture change digital transformation challenge, both the lack of resources and knowledge have been found in what the respondent replied when asked to tell the interviewers the main digital transformation challenges, they face within their restaurant. Because they are dealing with external partners for system maintenance. He confirmed this by saying: “One day the system went down, and as employees, we couldn’t mark our attendance and customers struggled to make orders. We took orders manually and waited for the maintenance team for more than 2 hours.”

4.2 Respondent 02
Owner of the restaurant which is in Melbourne Australia. According to the owner, his restaurant is only 75% digitally transformed. They must achieve the other 25% as much as possible. They are using Australia’s famous food delivery applications and their restaurant is highly using digital marketing tools.

4.2.1 Culture change
We confirmed the culture change challenge in this restaurant from what the owner of this restaurant replied when asked if each employee who works in the restaurant is satisfied with digital transformation or digital technologies used in the restaurant. He confirmed this by
saying: “When it comes to employees, old employees are not very satisfied with systems. Because they want to see people in restaurants physically and need face-to-face feedback about the food.”

4.2.2 Lack of resources
From what the owner of the restaurant said when asked the kind of challenges they faced because of the lack of resources, it confirms the lack of resources. He proved that in the following statements: “Sometimes when it becomes a rush, we cannot accept all the orders. so, some orders are waiting in the queue. so sometimes customers are complaining about it”. “All are handled via the internet, so sometimes network connection problems are occurring.” The owner’s statement, he mentioned that his restaurant always uses external partners for system maintenance and digital marketing. When we questioned him about the challenges, he is still facing because of the digital transformation he explained them as below. “I hired external expert for Digital marketing and system maintenance. Using digital technologies is expensive but I feel it is an investment.” “System goes down in rush times like Saturday and Friday. But it will be fixed within a few hours.”

4.2.3 Lack of Knowledge
The owner replied as follows when asked about challenges currently facing in using digital transformation: “Old employees are unable to work with the system, they place wrong orders. because they do not have enough knowledge about DT.”

4.3 Respondent 03
The restaurant is located at One Galle face shopping mall in Colombo, Sri Lanka. According to the owner, this restaurant is fully digitally transformed. They use a Placing system; they give notifications to customers via a digital buzzer system and, they use a POS (point-of-sale system) system. They also collaborate with external food delivery partners like Uber and Pickme.lk by using digital applications.

4.3.1 Culture change
In this restaurant, the culture change challenge has been validated from the answer got when the owner is asked about the restaurant if the employees are satisfied with the digital technologies used in their restaurant. He replied: “A major challenge is the user-friendliness of the systems.”

4.3.2 Lack of resources
The owner is questioned about if he is collaborating with any external parties regarding these digital technologies and he responded as follows: “All the systems collaborate with external parties. When we outsource, we don’t need additional manpower?” By asking about the kind of challenges the restaurant is facing because of digital transformation, the answer we got confirmed the lack of resources within this restaurant. The owner answered in the following statement: “Of course, things happen sometimes with batteries with the placing system running down. batteries are down around six months. we must replace them. Sometimes very busy days like Saturday placing system gets stuck and it doesn’t work. Buzzers are beyond
the radius area; the buzzers don't get the system.”
“Also, in POS systems, Microsoft got stuck and system errors happened.”

4.4 Respondent 04
She is still passing the middle of the digital transformation journey. Her restaurant was recently started and is in Colombo, Sri Lanka. But according to her statement, they use digital systems like POS (point-of-sale system) and many clouds base tools.

4.4.1 Culture change
By asking the owner of this restaurant if the culture of their restaurant is supportive or not to digital transformation, the answer confirmed the culture change challenge. She replied by saying:
“We mostly have resistance when there is a newcomer because most of the employees working with us, People who are new to the industry. So basically, there is a little bit of resistance when they get started on the POS system, just a, there's a learning curve for them”.

4.4.2 Lack of resources
By asking the same respondent about the necessary resources their restaurant need when it comes to digital transformation, she confirmed the lack of resources by saying: “Finances are crucial. Now when it comes, one major challenge for us to do that is finance, uh, because it can be quite costly for us”

4.4.3 Lack of Knowledge
By asking the same person, what employees think about digital transformation in their restaurant, and if they are happy about that or not, the answer confirmed the lack of knowledge challenge. She replied by saying: “don't train your new employees properly, sometimes if you, Customers, expect the employee to know what is doing and to be very efficient with the system that they're working on. But if employees also know about the system very less, that is, not yet fully trained in the system.”

4.5 Respondent 05
The owner of the two restaurants which are in Umea Sweden. One restaurant owned by him is a fast-food chain. He said that the fast-food chain is fully digitally transformed, and the other restaurant is still in the middle stages of digital transformation. The fast-food chain use applications to get orders, an employee management system, and a POS (point-of-sale system) system.

4.5.1 Culture change
By asking the owner of this restaurant if digital transformation or digital technologies made any change in their restaurant culture, what he replied validated the culture change challenge. He replied by saying: “We still want to give service, but when they have everything in the application employees fall back to the application., employees rely too much on that when they have time for more service. Staff fully relies on the application. the staff doesn't make sales contact with customers.”
4.5.2 Lack of resources
When the same person is asked about the kind of challenges they face when it comes to digital transformation, he confirmed the lack of resources as time. He spends more time updating and maintaining systems used in his restaurants. “Keep it updated, but with new information about big things, it’s like, if you change it to the computer, it will change everywhere. Right? I must work with the system. With the system. So, it’s more complicated to control and update the system. It wants more time”.

4.6 Respondent 06
The assistant manager of the restaurant. He works at the fast-food chain owned by Respondent 05, which is in Umea Sweden. His restaurant uses applications for getting orders, the POS (Point -Of -Sale) system, and an Employee Management system. According to the assistant manager, this restaurant is a fully digitally transformed one.

4.6.1 Lack of resources
By asking the manager of this restaurant the kind of challenges they face because of digital transformation, the lack of resources challenge was confirmed when we got the following answer: he replied: “Customers are unable to connect to the network, this is a problem sometimes. Connecting with Wi-Fi is a problem when it comes to rush days like Friday”

4.7 Respondent 07
Respondent 7 is working at the kitchen staff of a restaurant which is in Seoul, Korea. This restaurant uses digital tools like digital menus, an online booking system, and a digital buzzer system that notifies waiters about the customer's needs. This restaurant is special for authentic Korean foods.

4.7.1 Lack of resources
By asking her about the customer complaints because of the technology, she replied with the following answer. This answer is confirming the lack of resources as a digital transformation challenge.
“because of this busy hour, orders are overlapped, or some orders must wait in a long queue. In such a situation customers complain to us because they want to go back to their work within an hour.”

4.7.2 Culture change
When asked the respondent about the training she got to use the system which is used in the restaurant she is currently working. She replied to this question with the answer that can prove that culture change is a challenge in restaurants when it comes to digital transformations. “I spent more than two months getting good knowledge with the digital technologies which are used in this restaurant. I struggled with the language of the digital system.

5. Discussion of Result
In this chapter, the challenges according to the findings from the interviews elaborated in chapter 4 have been discussed. the findings were discussed according to the theoretical
framework. Table 4 mentions how the findings from the interviews are compared directly to the discussed theoretical framework. The findings are categorized under three concepts of the theoretical framework. The table illustrates how the interviewee's statements are going through digital transformation challenges such as lack of resources, lack of knowledge, and culture change.

*Table 4 - Findings from the interviews are compared directly with the theoretical framework*

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Lack Of Resources</th>
<th>Lack of Knowledge</th>
<th>Culture Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1 Employee (chef)</td>
<td>“One day the system went down, and as employees, we weren’t able (...)” Quote 3</td>
<td></td>
<td>“I struggled to get familiar with the system from the beginning because of the language(...)” Quote 2</td>
</tr>
<tr>
<td>Respondent 2 Owner</td>
<td>“Sometimes when it becomes a rush, we cannot accept all the orders(...)” Quote 2 “network connection problems are occurring(...)” Quote 3 “System down in rush times(...)” Quote 4</td>
<td>Old employees are unable to work with the system(...)” Quote 5</td>
<td>“Old employees are not very satisfied with systems(...)” Quote 1</td>
</tr>
<tr>
<td>Respondent 3 Owner</td>
<td>“the system gets stuck and it(...)” Quote 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respondent 4 owner</td>
<td>“Finances are crucial. Now when it comes(...)” Quote 2</td>
<td>“don’t train your new employees properly(...)” Quote 3</td>
<td>“ just a, there is a learning curve for them (...)” Quote 1</td>
</tr>
<tr>
<td>Respondent 5 Owner</td>
<td>“Keep it updated, I still see it all the time (...)” Quote 2</td>
<td></td>
<td>Staff fully relies on the application. the staff don’t make sales contact with customers(...)” Quote 1</td>
</tr>
</tbody>
</table>
5.1 Culture change

By considering the outcomes of the study as it is summarized in the table 3, it is realized that the culture change challenge is a common issue found in almost all the investigated restaurants. According to (Senior and Swailes, 2016) culture reveals how the organization’s daily activities are performed. If someone was familiar to work with an organization whose systems are designed using a familiar language like English this will be a big challenge for the same person to shift to a system that uses a different language than he never learned before. This is connected to what people struggled with when they are engaged in a digital transformation journey and required them to use a system designed in a different language.

Also, according to (Senior and Swailes, 2016) culture can be presented in two forms. On one hand, culture can support changes within the organization by providing the knowledge base about the current situation as well as the existing capability. This is a good input for an organization engaging in a digital transformation journey for an easy capabilities identification as reaching a successful digital transformation both digital and leadership capabilities are needed (Westerman et al., 2014). On the other hand, culture can be a barrier to changes. In this case, it becomes like “how things are done around here” (Drennan, 1992, p.3). In this situation, the organization seems to be satisfied with the current situation and develops a spirit of fighting against innovation. This is connected to what mostly happens to old employees who don’t want to adapt to changes made within their organizations due to their mentality of being satisfied with the current situation and pretending to always have an unchangeable system. When it comes to innovation, old employees with this mentality, always pretend to use the old system even if the updated system makes their work easy. It can be seen see how big the culture change issue is when it comes to digital transformation especially when the organizational culture is against changes. This may have a great probability to lead the organization to digital transformation failure. Therefore, the leaders of the digital transformation project need to consider culture as an important aspect to reach a successful digital transformation.

5.2 Lack of Knowledge

When considering the findings in table 4, two respondents mentioned the lack of knowledge as a crucial issue in their organization. In that case, one respondent mentioned employees who are not well trained and created a problematic environment for the customers. Knowledge is defined as an expanding combination of structured experience, values, contextual information,
and expert insights that offer a framework to evaluate and incorporate new information and experiences (Davenport and Prusak, 1998). According to (Alhubaishy and Aljuhani, 2021) Knowledge can be used for competitive advantages within the organization. Therefore, one of the responsibilities of the organization is to create and store their past knowledge for the present or future whenever necessary. According to the respondent 04 statement, the problem is created because restaurants don’t have a proper method of transferring the knowledge to new employees. According to (Alavi and Leidner, 2001), knowledge can be transferred among individuals, between individuals and definite sources, and between individuals and groups. Regarding the lack of knowledge, the experience respondent 02 differs from the one of respondent 04. According to the former experiences, old-aged employees struggle with digital transformation because of their lack of knowledge. Lack of knowledge is one of the common challenges facing digital transformations (Popescu et al., 2018), (Schwertner et al., 2017), (Shahi et al., 2021). It is from that statement; knowledge is one of the important factors in every organization. But when it becomes a lack of knowledge, it will be a challenge that is faced in the organization.

5.3 Lack of resources
When it comes to the lack of resources, the findings show that every respondent who shared their ideas during the interview experienced a lack of resources. In digital transformation, resources can be considered as buying new technological devices to replace outdated ones, affording new software, or acquiring the required skills to fit in a new digital working environment. (Alhubaishy and Aljuhani, 2021) & (Al-Ouali et al. 2019), (Popescu et al. 2018). In this research, considerable resources mentioned by the interviewees are finance, time, hardware, software, and networking. (Alhubaishy and Aljuhani, 2021) & (Al-Ouali et al. 2019), and (Popescu et al. 2018), mentioned finance as the main resource which can slow down the Digital transformation journey. According to, Respondent 04, finance became crucial, and the cost of hardware is high. Concerning skills as resources, the common issue faced by different organizations engaging in digital transformation is finding people able to integrate the digital system with the outdated one (Hai et al., 2021). Most of the restaurants that participated in this thesis mentioned system maintenance and system updating as their challenge. They mentioned they use external partners for system maintenance and updating. We can argue that these problems are occurring because restaurants do not have enough skillful human resources to maintain and update system tasks. The lack of resources was among the common challenges in digital transformation (Alhubaishy and Aljuhani, 2021) & (Al-Ouali et al. 2019), (Popescu et al. 2018). Here we argue that the restaurant industry is also facing barriers in its digital transformation process because of a lack of resources.

6. Conclusion and Recommendation
This thesis is about identifying digital transformation challenges faced by restaurants during their digital transformation journey. To answer our research question “What are the main challenges restaurants face during their digital transformation journey?”, the data were collected in the restaurants from different geographical locations in the following countries:
Sri Lanka, Sweden, Australia, and Korea. The interviewees were the owners and employees of the restaurants. A qualitative research method with semi-structured interviews was used to get ideas about what employees and/or owners of the restaurant's experiences with digital transformation. Also, a theoretical framework based on digital transformation challenges literature review has been conducted for the successfullness of this study. It helped in the design of the interview research questions, analysis of the gathered data as well as discuss the findings. The analysis of the findings confirmed the three concepts that made up to the theoretical framework as the main digital transformation challenges faced by the restaurant industry which are ranked from the highest to the lowest as follows: the lack of resources, culture change, and the lack of knowledge (see Appendix 04). These challenges can be found in different restaurants regardless of their geographical locations as well as their different technologies. In addition, there is an unpredicted finding which is that the owners and the employees of the restaurant don’t face the same challenges. On one hand, the restaurant owners mostly face financial related challenges such as the capability to upgrade their system, on the other hand, the employees mostly face adaptability-related challenges.

6.1 Our contribution
This thesis will contribute knowledge to restaurant owners who are willing to introduce digital transformation to their restaurants as well as those who want to improve their current digital requirements. They can identify what kind of barriers they must face when it comes to digital transformation, and they can analyze the solutions before they invest in digital transformations. Future researchers who are willing to research digital transformation and associated challenges can also use this research. They can improve this thesis by investigating digital transformation challenges in another industry or they should compare digital transformation challenges in different industries. They can improve this thesis by making a comparison of these different countries' Information technology literacy levels and technological levels. Finally, anyone who is curious about digital transformation and the challenges of digital transformation at the industry level can use this research.

References


Frey, B., and Osborne, M., (2013). THE FUTURE OF EMPLOYMENT: HOW SUSCEPTIBLE ARE JOBS TO COMPUTERISATION? Oxford Martin Programme on Technology and Employment,


Lendrèn, E. (2021). Towards increasing the quality of service at traditional restaurants: -by the design of a digital artifact.

Myers, M.D., 2014. Qualitative research in business and management.


Ng, C. W. (2010). Improved back-of-the-house processes with RFID enabled it to model for the hospitality industry in Singapore.


Tan, T.,(2021). Digital menu for restaurants in Finland as a SaaS web application: definition, functionality, feasibility.


**Appendix 1**

*Table 5 – Literature review*

<table>
<thead>
<tr>
<th>Title of article, Author and year</th>
<th>Paper Summary</th>
<th>Technology identified in this paper</th>
<th>Digital transformation opportunity in this paper</th>
<th>Digital transformation challenges in this paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitalization of Restaurant Business as a Factor of Competitiveness Increase By Pyanikova et Al, 2020</td>
<td>Digitalization allows identifying and comparing the potential benefits of its implementation in the restaurant business Digitalization allows to attract more customers and create permanent customers</td>
<td>No-cash payment, Electronic booking system electronic menu interactive table. Touch-based self-service</td>
<td>improve service and reduce costs To make the life of restaurant more comfortable and simple, less time-consuming Attracting customers And make regular customer base. Make competitive advantages</td>
<td></td>
</tr>
<tr>
<td>Digitalization or flexibilization? The changing role of technology in the political economy of Japan</td>
<td>Process through which digitalization has occurred, how and why it has been adopted, what outcomes it has generated, and how it has changed</td>
<td>AI &amp; ML Digital booking Robotic Technology</td>
<td></td>
<td>Problem of disliking among employees Pressure to adapt to new technologies</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>describe</th>
<th>Impact of Digitalization</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food for thought - A study on the digitalization of restaurant interactions (Flink and Beling, 2017)</td>
<td>Digitalization transform services and affect the value-creation process</td>
<td>Positive effect on digitalization to value creation and service providing in restaurants.</td>
<td>Negative effect of digitalization for both value creation and service providing.</td>
<td></td>
</tr>
<tr>
<td>The Digital Transformation of Tourism SMEs in the European Union: Challenges, Opportunities, and Support Popescu et Al</td>
<td></td>
<td></td>
<td>Internal Challenges Lack necessary technical tools Lack of knowledge lack of time-limited human resources ability to learn useful digital processes External Challenges Geography lack of understanding</td>
<td></td>
</tr>
<tr>
<td>Development of Industry 4.0 in the Hotel and Restaurant Business</td>
<td>Industry 4.0 Digital transformation of hotel and restaurant business</td>
<td>.Toast Go. A gadget with Internet access is designed for working with restaurant software</td>
<td>creation of the new business models</td>
<td>Robots created inefficiency and persistent problems in the Workplace.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Digital transformation in the restaurant industry current development and implications by Rainer, 2021</td>
<td>DT impacts product, processes and business models</td>
<td>Point of sale devices Online ordering systems E-commerce platform New pick-up and delivery process</td>
<td>customer touch points Customer individualization FoH and BoH services automation Integration of digital systems digital services support many functions in a restaurant’s FoH and BoH areas</td>
<td>creating new values for customer Increase management efficiency reduce costs</td>
</tr>
<tr>
<td>Multi-channel message passing service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Towards increasing the quality of service at traditional restaurants - by design of a digital artefacts by Lenderen, 2021</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The use of digital artifacts to increase the quality of service of traditional restaurants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To fill the gap between what customer expect regarding the quality of service and how they perceive that service during the visit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examination of customers’ Attitudes about Tabletop technology in full-service restaurant By Alex et Al, 2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The additional of customer-facing technology in full service restaurants, Toptable devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase of customer participation in the service process</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offer to customer more control over the dining experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Smart System for Restaurants Using Wireless Technology By Kunal et Al, 2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>An automated touch based digital smart system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital food ordering Instant e-billing Fast parking service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>An exploratory study of digital technology applications used in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital revolution is changing the way people and business work together</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOH technologies such as Kitchen Display Systems,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High prices of technological solution Lack of knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Summary</td>
<td>Technologies</td>
<td>Benefits</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>restaurants and cafes in Ankara</td>
<td>By Amri, Misagh Haji, 2019</td>
<td>Smart Oil Management System, Customer Relationship Management (CRM) Systems</td>
<td>FOH technologies such as Self-service technology, digital display menu, tabletop technology, self-service kiosk</td>
<td></td>
</tr>
<tr>
<td>A study on customer perception of technology innovation in restaurants</td>
<td>by Priority Pte. Ltd, B Surapuri, 2018</td>
<td>Identifies factors perceived by customers towards the changing technology in the restaurants.</td>
<td>Kiosk ordering solution, Mobile ordering solution, Table top digital ordering menu solution, Pagers, Virtual waiter</td>
<td></td>
</tr>
<tr>
<td>The use of information technology by restaurants in Joglosemar, the mainstay city of Indonesian culinary</td>
<td>by A. Asrihapsari &amp;</td>
<td>Examination of IT adaptation in restaurants owned by micro, small and medium enterprises (MSMEs) at Joglosemar</td>
<td>IT contact Online transportation partner, No-cash cashier payment, IT cashier, WIFI</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enhance productivity, Maximize profits</td>
<td></td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D.Setiawan, 2020</td>
<td>Large orders-outside restaurant</td>
<td>Ensure good quality of service Customer satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integration of touch Technology in Restaurants using Android by Sushmita et Al, 2014</td>
<td>The integration of touch Technology in restaurants using Android</td>
<td>QORDER Personal digital assistant Touch and order restaurant system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Touch based Digital Ordering system on android using GSM and Bluetooth for Restaurants by Bhaskar, 2011</td>
<td>This paper proposes an automated food-ordering process as a replacement to existing pen and paper method to take orders from customer</td>
<td>Personal Digital Assistant Kiosk based system Computer based food ordering Touch-based digital ordering systems using Android, bluetooth and GSM Removes manual process of food ordering Make the menu editing process dynamic Increase productivity and revenue.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digitalization and Work Organization in New Urban Food Delivery Systems Klumpp et Al 2018</td>
<td>Thesis is aimed to study traditional menus, digital menus, and their</td>
<td>Digital menu types</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The most important hospitality competencies in</td>
<td></td>
<td>expensive procedure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A short introduction on digital transformation (this is the use of digital technologies to transform your restaurant business. For example, you can transform your restaurant business by using different technologies such as digital menus, digital payments, digital reservations, QR codes to help your clients make their orders, etc)

Appendix 2 Interview Questions

Background of the Restaurant

1. What is your educational background?
2. What is your role at this restaurant?
3. How big is this restaurant (how many employees)? What kind of restaurant is it? (chain or
4. For how long have you worked at this restaurant?

Digital Technologies use in Restaurant

5. What is your experience when it comes to using digital technologies in your work?
6. Do you use any digital technologies in this restaurant? If yes, which ones do you use?
7. Why did you choose to introduce digital technologies in your restaurant?
8. For how long have you used digital technologies in your restaurant?
9. Does the use of digital technologies make any change to you and your role in this restaurant? If yes, which one?
10. Does the use of digital technologies make any change to this restaurant? If yes, which one?
11. How has the application of digital technologies affected your work? In what ways? Can you give us some examples?
12. How has the application of digital technologies affected your business?

Digital transformation In Restaurant
13. What does digital transformation mean to this restaurant?
14. Do you consider yourself to have digitally transformed? Where are you in the process of digital transformation?
15. Do you think that digital transformation has increased the quality of service to this restaurant?
16. What do you think about restaurants that are not digitally transformed?

Cultural Challenges
17. What do your employees think about digital transformation in your restaurant? Are they happy about that? If not, why?
18. Did you ever get complaints from customers about your digital transformation?
19. How would you describe your organizational culture?
20. Has your organizational culture affected digital transformation at this restaurant? If yes in what way? If not go to question 21
21. Is your culture supportive of digital transformation or not? Please give some examples?

Lack Of Knowledge

22. How easy was it for every employee to adapt to digital transformation? If not, why?
23. Do you find that you have enough knowledge to digitally transform? (relevant for the management team)
24. Did your employees get training to use the new system? If not, why? If yes, which category of employees?
25. Do you collaborate with external partners or expertise to compensate for the knowledge that you lack? If yes, why?

Lack of Resources
26. Which resources are necessary for your organization to digitally transform? Which of these resources do you have, and which ones are lacking?
27. How do you deal with the resources that you lack?
28. Do you collaborate with external partners or expertise to compensate (deal )for the resources that you lack? If yes, why?

Challenges
29. What are the main challenges you faced when you introduced digital transformation in your restaurant? How did you deal with them?
30. What about the current situation in terms of digital transformation? Are you still facing some challenges? If yes, what are those challenges?

31. Do you have someone in your restaurant who can tell us more about digital transformation in your restaurant? If yes, what is his/her role in this restaurant?

32. Do you have any additional information that you would like to share with us

**Appendix 3 Thematic Analysis**

1. Role at this restaurant
2. A number of employees
3. Type of Restaurant
4. Time working at restaurant
5. Digital technologies
6. Changes made by
7. Experiences about
8. Affect to work
9. DT in restaurant
10. DT process
11. Quality of services
12. Restaurants not using DT
13. Employees adapt to capability
14. Employees training
16. Resources need to DT
17. Lack of resources
18. External partners
19. Challenges of DT
20. Current situation DT
21. Culture challenge

Here we concluded Lack of resources is the most common challenge faced by the restaurant industry. And most of our respondents were dealing with the Culture change as a challenge. Culture change can conclude as the second most common challenge. Only two of our respondents contributed their statements about Lack of knowledge (figure 4).

*Table 6 - Code Identifikations*

<table>
<thead>
<tr>
<th>Statement</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>We use Digital technologies, in AUS there are five famous apps that use for taking orders and food deliveries. Example Delivery, Menu log, Uber app, Easy. Apart from that apps, I always use digital marketing tools. Like, google marketing and Fb Marketing. I hired external</td>
<td>5. Digital technologies 18. External partners</td>
</tr>
</tbody>
</table>
expertise for Digital marketing and system maintenance. Using digital technologies is expensive but I feel it is an investment.

16. Resources need to DT

Table 7- Identifying themes

<table>
<thead>
<tr>
<th></th>
<th>Lack of Resources</th>
<th>Lack of Knowledge</th>
<th>Culture change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td>Sometimes when it becomes a rush, we cannot accept all the orders. So, some orders are waiting in the queue. (...)</td>
<td>Old employees are unable to work with the system, they place wrong orders because they do not have enough knowledge about DT.</td>
<td>Old employees are not very satisfied with systems. Because they want to see people in restaurants physically(...)</td>
</tr>
</tbody>
</table>

Appendix 4- Overall conclusion

**Digital Transformation Challenges in Restaurant Industry**

- **Lack of Resources**
- **Lack of Knowledge**
- **Culture Change**

Number of Respondance