

Digital menu for restaurants in Finland as a SaaS web application: definition, functionality, feasibility.

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<p>For several years, the menu has been strong marketing, communication, and sales tool for restaurants. And, as digitalization transforms the majority of businesses and business instruments, the traditional paper menu in a restaurant is now part of the transition.</p> <p>Yearly online consumption is growing, more industries are shifting into the digital world. The current global pandemic accelerated the growth of e-commerce globally. Binding shifts in the restaurant sector are ahead. In many countries, restaurants started utilizing digital menus that can be accessed via scanned QR code by customers' mobile phones, links, or by downloading the application. This service enables restaurant and bar customers to avoid the usage of a physical paper menu. In addition to that, the digital menu benefits restaurants through valuable data insights, increases sales, enhances operations and provides a platform for innovative features. This topic has become more popular during the pandemic and becomes trendier among restaurants globally.</p> <p>The main purpose of the thesis is to study the role of the digital menu as a SaaS web application in different restaurant segments and discover potential features that can bring added value, to increase sales and enhance the operations. The research presents an end-user perspective, analyzes the interest and possible requirements. Interviews with restaurant owners, directors, managers, will be conducted, in order to identify the interest, the relevance of the service and discover required additional features.</p>	
Keywords SaaS, Digital menu, QR code	

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1 Introduction

Online consumption is increasing year after year, and more sectors are migrating to the online world. The current global pandemic has accelerated the worldwide expansion of e-commerce. In the restaurant industry, there will be significant changes. Digital menu has been on agenda for path few years as digitalization reaching all aspects and fields of our lives. The current global pandemic boosted digitalization processes. Online shopping increased significantly, consumers started to order food delivery via apps and websites. Digital menu became a standard globally and even substitutes traditional paper menus. The topic is conversational as the digital menu is relatively new, the usability and feasibility of the product are unclear.

As the world is shifting towards digitalization, restaurants started to implement digital menus. The most convenient and cost-efficient approach is on-premise implementation of the PDF menu, which is linked to a generated QR code. This method is seemed to be an easy approach; however, it is quite poor from the usability side and limited in functionality. Web app menus are more user-oriented and can include various options of additional features, that can benefit both parties – restaurants, and customers. Nevertheless, the Implementation of an interactive menu is similar to software development, which is a high-priced and resource-consuming process, that not all restaurants can afford and manage to execute. Therefore, this research focuses on the assessment of the digital menu as a cloud computing service, which enables restaurants to utilize the benefits of the web app menu in an affordable and easy way. At the same time, cloud computing provides technical freedom for the vendor, to be able to implement all required and necessary features and data-driven solutions.

The study commissioner is Dose Family Oy. It is my own company that provides marketing consulting services for restaurants, bars, and clubs. Since the company has an existing client base, this thesis will showcase the market feasibility of the project. If the research shows positive results, Dose Family Oy will take further steps in researching and developing a digital menu system as a SaaS solution. And potentially company will upsell the service to the existing client base. This research provides key details about the attitude of the restaurants and their customers toward the interactive digital menu. The thesis will present the situation on the market, opinions of the different restaurant stakeholders, the difference between the traditional menu and digital, different types of menu, and cloud computing technologies, that can add value to the service.

Semi-structured interviews with restaurant owners, managers, directors will be conducted by using a qualitative research approach. In order to gain more in-depth insights on the topic and to understand thoughts and interest in the service. On top of that, questionnaires will be sent to the end-user of the service – restaurant consumers. To establish and get an understanding of the customer's opinion about the service and usability of the QR codes.

1.1 Research Objectives

First of all, the thesis is aimed to study traditional menus, digital menus, and their types. Restaurant segments and cloud computing services. Secondly, to assess the feasibility and market interest toward interactive digital menu service as SaaS solution from both restaurants' and their clients' perspective.

In addition, the thesis includes research about different features and functionality that can be integrated into the digital menu. And the effects on consumer behaviour and restaurant business in general.

RO1: Study digital menu types and functionality.

RO2: Evaluate the feasibility and necessity of the digital menu as a SaaS solution from restaurant owners', directors,' managers' perspectives, and customer perspectives.

RO3: Sum up the results from evaluations and come up with a conclusion. Discover possible features to enhance the service and future perspectives.

1.2 Thesis structure

The thesis is consisting of an introduction, theoretical part, empirical part, and discussion. The introduction part showcases the brief description of the thesis, research objectives, structure, benefits, and delimitations. Theoretical is the second part of the thesis, which includes the definition of the restaurant and segmentation, the definition of traditional, digital menus and their types. The difference between conventional menu and digital is also part of the theoretical part and definition and segmentation of the cloud computing services. Furthermore, the functionality of the digital menu and potential value-added features are explained. In the empirical part research process and data collection are outlined, interview structure questioners and results are presented. In conclusion, the discussion part includes the outcome of the thesis and the functionality of the product that might be potentially beneficial for the entire service.

1.3 Benefits

First of all, I will gain valuable insights about the industry and demand of the service among potential clients and get an overall understanding of the end-users attitude towards the service. Secondly, I'm gaining in-depth knowledge of the digital menu types, technologies, and functionality that can be potentially implemented. If the thesis demonstrates positive results, I will pursue further analysis and development of the project. As an entrepreneur, in the future, I will be starting up different IT projects. The in-depth research and analysis experience will help me evaluate the niche and make the right decisions.

1.4 Delimitation

This thesis evaluates only digital menu as a web application, provided as a SaaS solution. PDF menus, digital boards, and self-service kiosks and tables are not part of the evaluation.

The research aim is to understand the attitude of restaurants and their customers towards the web-app digital menu, identify the benefits, advantages, and disadvantages.

The thesis is not covering financial planning or price modelling, neither digital service design. The feasibility study in this thesis focuses only on the feasibility of the product/service and is examined via semi-structured interviews and online surveys. This thesis is not a business plan.

2 Theoretical framework

Theoretical part of the thesis will provide basic knowledge about the restaurant types and menu types. In addition, the technological aspects are overviewed. Features and functionality are listed and explained in this chapter.

2.1 Restaurant definition and segmentation

The restaurant is a French word that can be translated as “feed, strengthen”. At the moment, this concept exists in many languages of the world, denoting establishments that serve food.

For the first time, this was the name of a Parisian tavern (1765), the owner who invited passers-by to come to him and recuperate. They were offered mainly soups and hot stews. A little later, an institution appeared in which the tables stood separately from each other. Its owner took it a step further by setting a schedule and creating the first semblance of a menu.

The restaurant is a public organization that provides catering services. In addition to that, restaurants have become a place where people also socialize, listen to music, and participate in different occasions, events, and activities. There are various types of restaurants. This thesis highlights five main restaurant segments, and the concept and service type categorize them.

2.2 Restaurant segments

Full-service

A full-service restaurant is a type of restaurant where customer orders food from the table. Food is cooked on-premises and served to the sitting place of the customer by a waiter. Usually, the payment procedures are held after eating as an ending point of the experience at the table. The word "full service" can refer to anything from a family-style experience to an exquisite restaurant, from casual dining to fine dining. (Domenick Celentano, July 2019.)

Casual Dining

A casual dining restaurant offers moderately priced meals in a relaxed environment. Casual dining is a form of dining that is a middle ground between fast food and fine dining. In a friendly environment, a casual restaurant provides a more laid-back and relaxed atmosphere. Restaurants may have buffet service or table service with a waiter, and dishes are moderately priced. (Domenick Celentano, July 2019.)

Fine Dining

Fine dining is defined as a more formal dining experience. It explains as exceptional cuisine and high-priced restaurants, but there are also low-cost options. Food is served more formally by well-trained staff. The restaurant will have an attractive, calmer feel, and the service will be superior. (Domenick Celentano, July 2019.)

Quick Casual

The newest trend in this style of restaurant dining is "Quick Casual." The name derives from the concept's hybrid form, which combines fast-food and casual dining. Quick casual takes elements from both fast food and casual dining. The food range at fast-casual restaurants is more upscale and varied. Quick Casual restaurants usually do not have table service; customers place their orders, pay, and are led to a sitting place where their food is ready and waiting for them to take to a table. In some cases, personnel can deliver food to the customer's table. (Domenick Celentano, July 2019.)

Self-service

Self-service is a type of restaurant where a customer has a minimum interaction with customer service personnel. Customers place the order by using a digital system. It enables the customer to choose the desired meal, modify it, add suggested items to their order and pay for it. Usually, self-service restaurants also include a queuing system that displays the number of orders placed previously to approximate waiting time. The customer needs to pick up the order, and however, in some cases, as in the quick casual segment, staff can deliver the order to the customer. (Domenick Celentano, July 2019.)

Digital menu service would fit the most restaurants: self-service, quick-casual, and maybe even casual dining, since table service is not the priority in such restaurant types. Fine dining restaurants and full-service restaurants are customer service-oriented and ordering with a waiter's help is a significant part of the experience.

2.3 Traditional paper menu

In the design of a restaurant, each element often plays a vital role. Many people believe that the menu is just a list of different dishes offered by the restaurant for the visitors. However, this is not entirely true. Indeed, menu provide information to the client about the assortment of dishes and their cost, but the task of the menu is not limited to this function.

On the one hand, the menu is a kind of agreement between the restaurant and the visitor, since the client orders a particular dish in accordance with the stated information about it.

Usually, the restaurant visitor expects an exact match of the specified ingredients and methods of their preparation. On the other hand, the menu is part of the marketing policy. A beautiful description of the assortment, distinctive features and nuances of the cooking methods, a visual element such as photos, well-chosen colour pellets, and illustrations can be an attractive advertisement or even a sales tool, both for the dish itself and the restaurant as a whole.

- The main functions of the menu:
- Clear definition of the pricing
- Representing the cuisine, dishes, and service standards
- Help for the visitor to make a decision
- Entertain customers and provide aesthetic pleasure
- Generate sales, sell the most profitable products.
- Communication channel

A coherently designed menu has a huge impact on the consumer decision-making process. The menu is a powerful sale tool. Positioning and emphasizing specific products, switching the guest's attention from the price to the quality and description of the product, visual identity, suggestions, special offers can increase sales of the profitable positions. And many various practices could be implemented in traditional menus to boost sales and increase profitability. (Mark Yi-Cheon Yim, 2020.)

2.3.1 Types of traditional paper menus

There is a vast amount of different menu categories. Restaurants define the suitable type depending on the restaurant's segment, concept, target audience, serving hours, and cuisine. In this research, a classic approach of menu categorization will be presented, which is based on the frequency of the changes in the menu and offering type.

A la Carte

It is a menu with a wide selection of dishes at an individual price. Customers can combine different meals according to their wishes and pay accordingly. La Carte offers a wide variety of dishes and provides flexibility in the choice. Dishes from à la carte menu are prepared only after the customer places an order, indicating that the customer has to wait sometime before the order is ready.

Breakfast À La Carte	
Breakfast Favorites	
Two Farm Fresh Eggs	\$14.00
Three Egg Omelete	\$18.00
Poached Eggs Florentine	\$18.00
Pancakes	\$15.00
French Toast	\$15.50
Side Orders (Bacon, Ham, or Sausage)	\$9.00
Cold Selection	
Sliced Fruits	\$17.00
Yogurt	\$7.00
Bircher Muesli	\$9.00
Assorted Cereal	\$8.00
Bakers Basket	\$10.50
Toast	\$6.00
Beverages	
Chilled Apple Juice	\$5.00
Fresh Squeezed Orange Juice	\$12.00
Coffee	\$5.00
Espresso Coffee	\$5.00

Figure1, A la Carte menu type (resource from <https://www.menushoppe.com/8-menu-types-you-should-know-about>)

Du Jour Menu

It is a menu, usually with a specific number of servings, that are structured in packages. The customer needs to pay for the whole package and cannot combine dishes from different packages. This menu includes prepared courses that are available at a set time range. Thus, the customer can receive the desired meals without waiting.



Figure 2. Du Jour Menu (resource from <https://www.menushoppe.com/8-menu-types-you-should-know-about>)

Cycle Menu

It is a menu with packages of food offerings that repetitively changes over a period of time. Usually, this type of menu is performed by non-commercial organizations that provide food services to feed the personal daily. Cycle menu can found, for instance, universities, hospitals, schools, office, factory canteen, and restaurants.



LOUNAS VK 30

10,70€

MAANANTAI
SITRUSBROILERIA (G, L)
PERUNAPYRETTÄ, PARSAA & VOI-VIINIKASTIKETTA

TIISTAI
PORK RAMEN (M)
MARINOITU MUNA & PORSAA NISKAA

KESKIVIikko
YRTTIBROILERIA (G, L)
SIPULIRIISIÄ & PAPAIIJA CHUTNEY

TORSTAI
LAMMASPYÖRYKÖITÄ (G, L)
YRTTICOUSCOUS & MINTTUJOGURTIA

PERJANTA
BURRITO
SALSAA & NACHOJA

Figure 3. Broo Pizza&Bar menu

However, some fast-food restaurants implemented the cycle menu as a part of the special offering. A good example is fast-food chain SUBWAY. They have a menu with a new sub with a special price on each day of the week. The menu repeats weekly.

Static menu

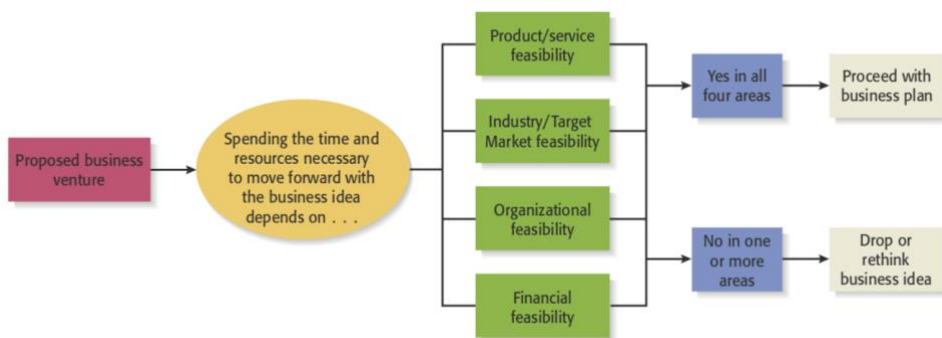
It is a consistent menu that doesn't change often. Usually, quick service restaurants are utilizing. These menus are typically small with limited choice and with a simple categorization structure.



Figure 5. Bangkok 9 static menu

2.4 Feasibility

The method of evaluating whether or not a business idea is viable is known as a feasibility study. It consists of four main components – product/service feasibility, industry/target market feasibility, organizational feasibility, financial feasibility. (Bruce R. Barringer, 2015.)



Entrepreneurship, Global Edition, Pearson Education UK, 2015.

Figure 6. Feasibility study plan (Entrepreneurship, Global Edition, Pearson Education UK, 2015).

In order to maximize the accuracy of the research and fit the objectives, only product/service feasibility is examined in this thesis.

As Bruce R. Barringer defines product/service feasibility analysis as an evaluation of the overall attractiveness of the project. Although there are several factors to remember when starting a new business, none matter if the product or service does not sell.

Product/service feasibility research has two parts: product/service desirability and product/service demand. "One of the most effective techniques for discerning the feasibility of a product or service idea is to get out and talk to prospective users" (Bruce R. Barringer, 2015).

The research studies the attractivity of the project via conducted semi-structured interviews with restaurant's directors, owners, managers to get their perspective toward the service. During the interview, the interviewees presented a concept statement to provide a brief introduction about the service. A concept statement is a one-page document that consists of the description of the product or service, intended target market, market positioning, and company management description. (Bruce R. Barringer, 2015).

The interviews are aimed to identify the disability of the service. The interviews showcase the necessity of the service, advantages and values, the problem that the service is solving, and the implementation schedule. During the concept statement presentation, only a limited version of the concept statement is presented due to the thesis objectives and lack of resources. The only description of the service and intended target market is included.

Product/Service demand is the second part of product/service feasibility. It highlights if there is demand for the service. The most frequently applied method is to send a questionnaire to potential clients. Since the end-user of the service are restaurant customers, the questioner is sent to them.

2.5 Digital menu

The digital menu became an essential tool in the contemporary restaurant business environment, especially among quick service restaurants. They can be seen mainly as a big monitor with interactive graphics, which positively impacts customer's decision-making process. Due to the current pandemic, some countries already have implemented regulations and safety precautions that enforce restaurants to provide a contactless

experience. For certain restaurants, the fastest option is to have a PDF menu that can be obtained with a QR code. It is both quick and inexpensive. On the other hand, PDF menus have little benefit to restaurants and do not improve the eating experience. The web app digital menu that can be accessed by QR code is becoming trendy in many countries. In this thesis, interactive QR code menus will be evaluated. Since building your own web application can be costly and challenging to implement, the service will be assessed as a cloud-based service.

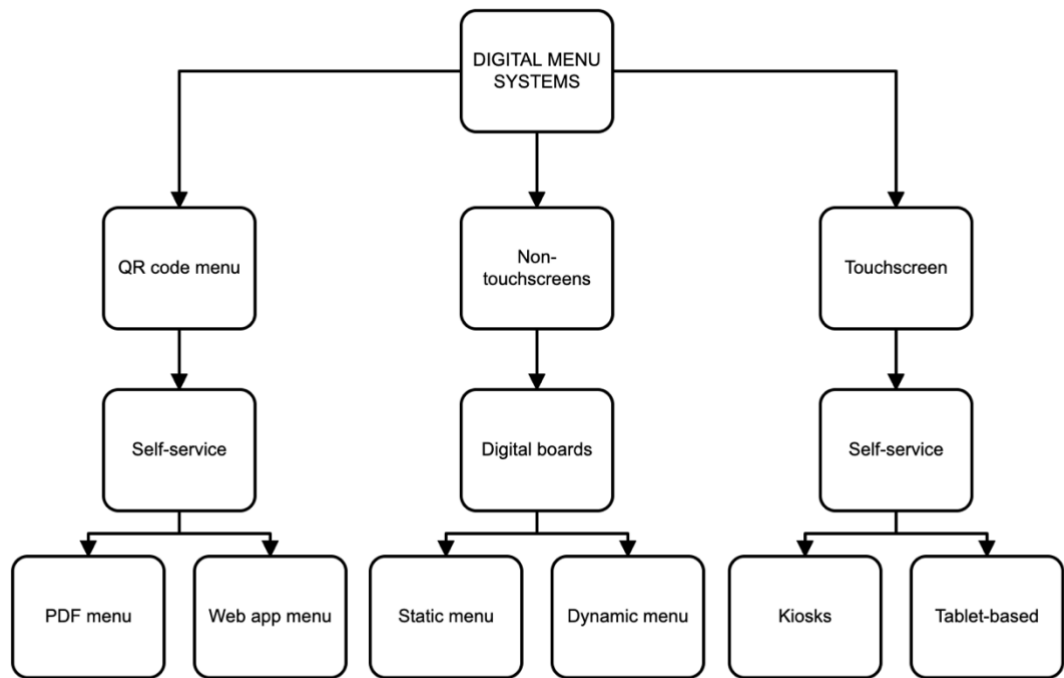


Figure 7. Modified version of Digital menu types (Şahin, 2019).

2.5.1 Definition

A Digital menu presents the business's menus that provide information about food and beverages through an electronic display. As a result of the literature review and field observations, it is seen that businesses use different digital menu types. Commonly used digital menu types can be grouped as follows. (Şahin, 2019 on Evaluation of Digital Menu Types and Their Advantages).

2.5.2 Digital menu types

Non-touchscreen menus

Non-touchscreen digital menu is defined as a digital board that displays visual details about the restaurants' products and involves personal interaction with the customer for the customer to place an order. They are suitable for both indoor and outdoor use. By linking to a private network, LCD, LED, OLED, or plasma screens are used in product marketing. Digital menu boards are commonly used in quick-service restaurants. "Static digital menu boards" and "dynamic digital menu boards" are two types.

Touchscreen menus

People can self-serve using touchscreen integrated menu systems. Customers can use self-service technologies to complete any transaction without the assistance of personnel. Tablets, tabletop touchscreens, smartphone handheld applications, and kiosks are the most popular devices.

QR code menu

It is a digital menu that can be accessed via QR code. The link can lead either to the webpage with a PDF file or a simple webpage. Either can lead to a cloud-based web application with interactive UX/UI design. QR code is a set of black and white squares recognizable by devices with scanning technology. Mostly QR codes store URLs or other types of information. There are two types of QR code menus that are covered in this thesis. PDF menu and web-app menu.

PDF menu is a digital version of the paper menu, without any changes in design and not adopted for utilisation it via digital gadgets.

Web-App menu is a digital menu, which is adapted for tablet or mobile phone utilisation. In addition, various technological solutions can be embedded into the digital menu to enhance usability, provide valuable insights, and increase sales.

DIGITAL MENU TYPE	WEB-APP MENU	PDF MENU	QR CODE	TOUCHSCREEN	NON-TOUCHSCREEN
ACCESS VIA MOBILE DEVICE	x	-	x	-	-
CUSTOMER DOESN'T NEED OWN DEVICE,	-	-	-	x	x

IN ORDER TO ACCESS						
ONLINE PAYMENT SYSTEM	X	-	-	X	-	
DATA ANALYTICS	X	-	-	X	-	
INTERACTIVE UX DESIGN	X	-	-	X	X	
CROSS SELLING	X	-	-	X	X	
INTEGRATION OF ADDITIONAL FUNCTIONALITY	X	-	-	X	-	

Figure 8. Digital menu comparison.

The table showcases web-app digital menu outstands from other digital menu segments. It has the same amount of advantages, comparing to touchscreen menus. However, touchscreen menus require a more initial investment and more resources for maintenance since the restaurant has to provide digital gadgets where menus are presented. Compared to the web-app menu, which is a fully cloud-based SaaS solution, restaurants don't need to offer, and devices to customers, and the digital menu is fully maintained and supported by the service provider.

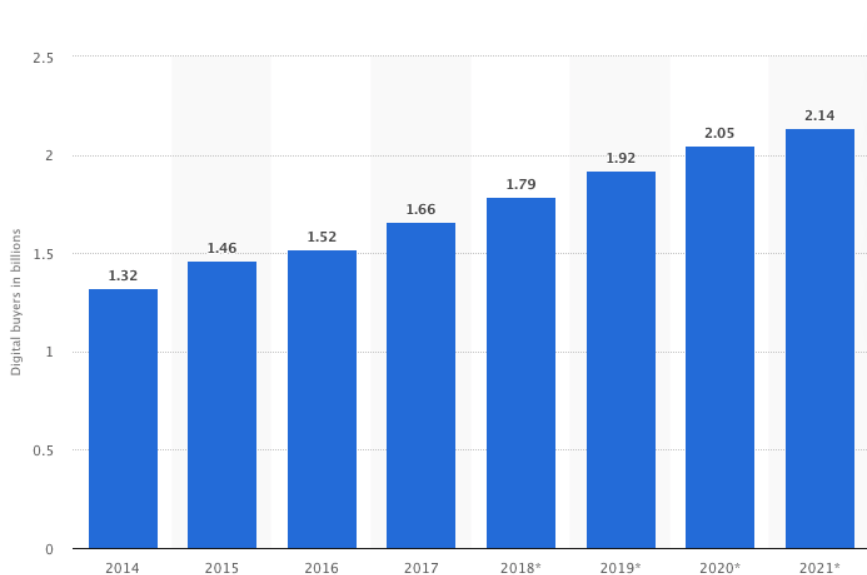
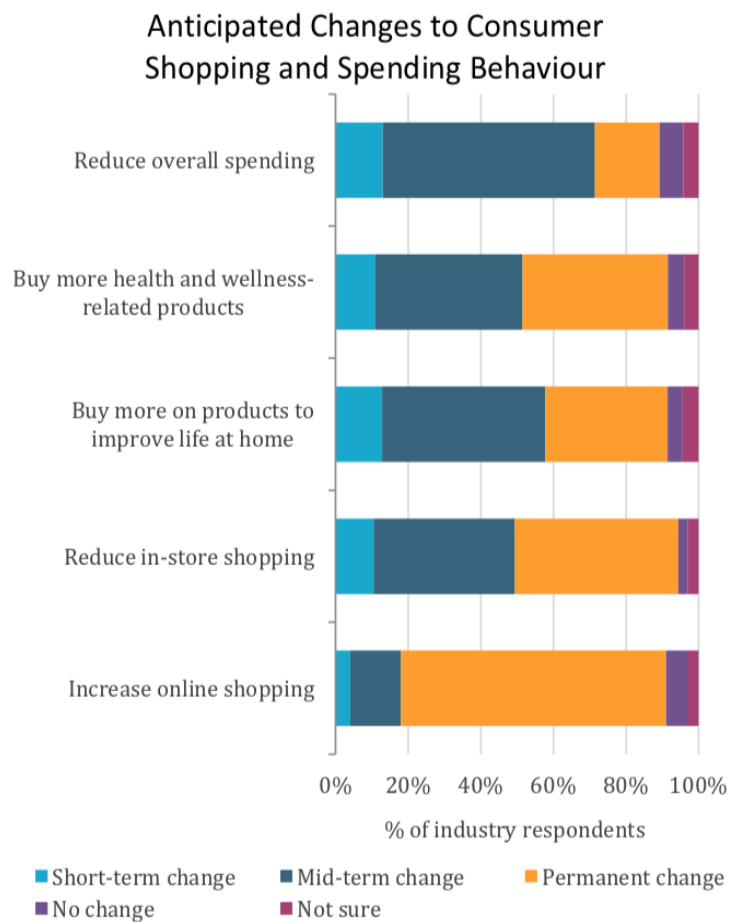


Figure 9. Statista, Number of digital buyers worldwide from 2014 to 2021.

This research focuses on the web-app menu since this type of digital menu can enhance the restaurant industry and provide a digital platform that will be cost-efficient for restaurants and easy to implement. In addition, according to Statista, there is a stable growth of digital buyers worldwide from 2014-20121. As well, permanent shifts are head in the restaurant industry stated by Euromonitor, 2020. Further information will cover potential features that can be integrated. And in the Empirical part of the thesis, the web-app menu as a cloud service is studied and evaluated.



Source: Euromonitor International's Voice of the Industry: COVID-19 Survey, October 2020

Figure 10. Anticipated Changes to Consumer Shopping and spending behaviour (THE NEW NORMAL: PERMANENT SHIFTS EXPECTED IN THE RETAIL AND HOSPITALITY INDUSTRIES November 2020).

2.5.3 Functionality

This chapter highlights additional features that can be integrated into the digital web app menu. Since we are considering the digital menu based as a SaaS solution, it provides the possibility to implement a variety of features. Different functions and features can be integrated into a cloud-based digital menu in order to boost sales and increase customer satisfaction.

Online payment system

Based on the Technology in society article "Electronic payment systems: an analysis and comparison of types," an electronic payment system is a platform that enables a digital transaction between two parties. It includes credit or debit card payments, bank transfers, and online payment providers.

Blog post in Bigcommerce states that in the contemporary online business environment, there are two main online payment methods - Payment Gateways.

Kaleigh Moore (2020) defines Payment Gateways as a merchant service that processes credit card payments for e-commerce sites and traditional brick and mortar stores. The most popular service providers are PayPal, Stripe, and Pay trail, which are some of the leading gateway providers in the Finnish market. In other words, it is a system that allows companies and their clients to verify the acceptance or rejection of transactions.

The online payment system will benefit both restaurants and their clients by providing a better customer experience, automating the billing process, and avoiding human caused mistakes since the customer inputs the order and sees the total price of the order.

Interactive design

"Interaction Design is the creation of a dialogue between a person and a product, system, or service. This dialogue is both physical and emotional in nature and is manifested in the interplay between form, function, and technology as experienced over time" (Jon Kolko, Thoughts on interaction design, 2007).

The findings that were studied in the journal of interactive marketing demonstrated that the interactivity of the digital menus affects customer's attitude towards the digital menu and impacts the consumer decision-making process.

Booking system

Restaurant Booking System is a self-service table reservation system that can be integrated into a digital menu. The system enables a restaurant to configure the booking process, allow people to book a table through the website, and handle restaurant availability and reservations through the restaurant reservation system.

Rating and review

Bettinavon Helversena 2018, stated that product ratings and reviews have a well-known effect on consumers' online decision-making process. User feedback and recommendations have been found in several kinds of research to influence people's purchasing habits and intentions, as well as feelings toward brands.

Moreover, instant feedback from customers enables restaurants to increase the accuracy of the product and service quality, as well as provides valuable insights.

Restaurant Data Analytics

Thor Olavsrud 2021 define data analytics as a discipline that focuses on gathering valuable insights from large amounts of data. It consists of tools and techniques of data analysis and management, including the data collection, organization, and storage of data. Data analytics aims to use mathematical research and software to identify patterns and solve challenges in business.

Data became a standard in the restaurant industry. Different restaurants are utilizing data-driven approaches in order to enhance business operations and maintain competitive advantages. (Michigan State University, 2017.)

Digital menu can be a beneficial data resource that can provide valuable insights. For instance, it can showcase the most and least ordered dishes, highlight the busiest days of the week, rush hours, and customer order history.

"Once you know that people who buy 'A' also like item 'B,' you're getting a lot of insight from the consumer on not only a promotional standpoint but also on a bundling standpoint and that information can help you adjust your menu," Mike Lukianoff, CEO at Fishbowl Marketing Analytics.

Cross-selling

Cross-selling is encouraging the purchase of anything in conjunction with the primary product (Sophia Bernazzani, 2018). For example, if a restaurant client has already

ordered the main dish, the digital menu can send a recommendation to order a dessert, a drink, or any other necessary adding.

AR integration

Julie Carmigniani explains Augmented Reality as described as a real-time direct or indirect view of a physical real world with the addition of virtual visual components. AR is both immersive and 3D-registered, combining both physical and simulated objects.

Fast-casual chain Bareburger is an interesting example of implementing AR in the restaurant business. The restaurant, in collaboration with an IT company, created a Snapchat filter that presented virtual 3D versions of their dishes. The AR provides a possibility to get a 360-degree view of the restaurant product to get a better understanding of how the dish looks like. Feedback from customers was positive, and it helped to make a better decision.



Figure 11. Bareburger; Source: video screenshot

Online Tipping

Online tipping is a function integrated into an online payment system to tip the employees of the restaurant for good services. Due to the limited information resources concerning online tipping, it is challenging to assess the necessity and feasibility of the feature. However, popular online taxi services such as Uber and Yango have included online tipping features. The online tipping function will be evaluated in the empirical part.

2.6 Concept statement

Web app digital menu as a SaaS service is a ready cloud-based solution that enables the customer of a restaurant to access the digital menu through a QR code, link or application. The end-user can see variant options of the restaurant and their menus. The menu includes a comprehensive design with in-depth descriptions and reviews of the dishes. In addition, the digital menu showcases pictures that can help customers to make better decisions. The functionality includes a payment system. Hence the end-user can place an order and input required modifications to the meal. Users can choose to it inside of the restaurant or take away and book a table if it is needed. The customer monitored the status of the production and notified when the order is ready. After the order is completed, the end-user can tip the restaurant and leave a review.

2.7 Benefits of the digital menu

Digital menus provide customers with a variety of features, including eye-catching images, photographs, links, nutritional values, digital content, recipes, comprehensive wine lists, and the ability to check for specific products using the filtering tool, recommendations, data analytics, online payment system, ratings of the dishes, table booking system and it is possible to create more innovative features and test them. (Kasavana, 2011.)

2.8 Cloud computing services

One of the main challenges of providing an efficient digital menu system as a service is the development custom platform for each customer. Development is an expensive procedure, and not all restaurants can afford to pay and spend time and resources on it. Therefore, cloud-based service is an efficient solution. Cloud systems enable restaurants to use a ready-made solution to limit costs and save time and avoid hosting of the system, development, and maintenance. In this chapter, the definition of cloud-based services is presented, and types of cloud-based services are reviewed.

Cloud-based services is an application, software, or IT platform that is stored in a cloud database, which means that the IT system can be accessed remotely, without on-premise installation of the system. It is an alternative solution to operate an application or software. Usually, the vendor hosts the servers on the customer's behalf. The end-user is not involved in the development of the system and on-premise database.

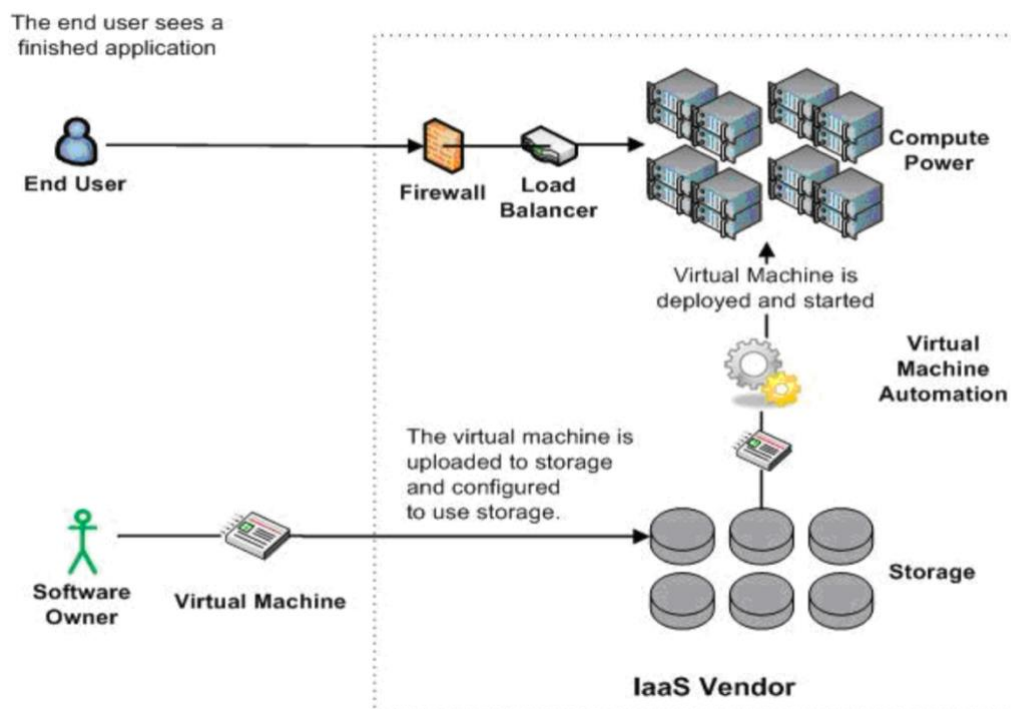
"Cloud-based services integrate globally distributed resources into seamless computing platforms" by Sushil Bhardwaj in International Journal of Engineering and Information Technology in 2010.

"Choosing the right service model is a critical success factor for delivering cloud-based solutions." by Micheal Kavis, Architecting the Cloud: design decisions for cloud computing. It is necessary to have a clear understanding of what cloud service model is and what obligations cloud service providers have in comparison to the responsibilities that cloud service consumers have.

IaaS

Infrastructure as a Service. The National Institute of Standards and Technology (NIST) defines IaaS as: "The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications and possibly limited control of select networking components (e.g., host firewalls)".

It is a cloud-based infrastructure that provides a platform for software development and fulfils all required technical aspects. Instead of building on-premise servers and databases, users can utilize all necessary tools for the company's IT infrastructure.



PaaS

Platform as a Service

This kind of cloud computing, which is provided to the customer in the form of a ready-made software platform, which includes various tools, and enables the user to customize them. PaaS delivers ready-made solutions in order to facilitate the development of the final product.

SaaS

Software as a Service

Probably the most common cloud-based service. It consists of providing the customer for the use of any programs installed in the cloud of the service provider. The user only needs to set up the settings of the application and manage it. All the development, maintenance, infrastructure is handled by the service provider. A prime example of a SaaS service is Google Workspace and the Microsoft Office 365 suite.

2.9 Consumer purchase behaviour

Purchasing behaviour is a compilation of people's emotional, psychological reactions to the selection of a product or service, the location, the distribution channel, purchase, and the use of the product or service. Companies use marketing strategies and techniques to meet customer desires and preferences in order to affect consumer purchasing behaviour. There are a number of factors that influence a client's choice. There are different opinions on the pre-defined process in the decision-making process. In this thesis, five main stages are highlighted, as the majority of researchers are referring to.

- awareness of the problem (need)
- search for information on solving the problem;
- assessment of existing options;
- purchase decision;
- reaction to the purchase.

In order to fit the objectives of the thesis, only the phase of choosing the order from the menu will be evaluated in this research via a quantitative research method. During the questionnaire, end-users will be asked questions about the factors and elements in the menu that influence their purchase decision.

2.10 Pricing model

The digital menu is considered in the thesis as a cloud-based solution (Software as a Service). Therefore, the pricing model is optimized according to the usual pricing models for cloud-based services.

“One of the promises of cloud computing is that the pay-as-you-go model greatly reduces the cost of IT infrastructure” (Kavis, Michael J. *Architecting the Cloud*, 2014). The digital web-based menu billing system is based on the pay-as-you-go model. Restaurants will have a monthly fee for each menu. For instance, if one company manages multiple restaurants, they will have to pay a separate subscription for each menu. The pricing model is examined in the empirical part. During interviews, respondents were asked their opinion towards the system, and the price they are willing to pay was identified

3 Research processes and data collection

The research's goals, objectives, and priorities are discussed in this chapter. This chapter reviews risks and potential problems, research methodology, data collection, reliability and validity, questionnaires and interviews, and the results from them.

3.1 Aim and Objectives

The aim of the research was to study different digital menu types and technologies that assist the digital menus. And evaluate the feasibility of the web-app digital menu as Software as a Service solution. One of the targets is to identify the attitude of the restaurant owners, directors, managers towards the web-app digital menu. Recognise the obstacles and downsides as well as advantages and potential features that can bring additional value to the restaurant.

Furthermore, the perspective of the end-user is also considered. The thesis showcases restaurants' customer opinion on the web-app digital menu, their previous experience, and the influence of the digital menu on purchase decision making.

Last but not least important is the conclusion of the thesis. The objective is to sum up, all the theory part with the results from interviews and questionnaires. Point out key insights and identify features that bring the most value to the customers and restaurants.

3.2 Risks and problems

Since the empirical part consists of the interviews with restaurant owners, directors, and managers, it is difficult to schedule meetings with them, and since the COVID regulation are getting lifted, and restaurants are busy with the opening.

3.3 Research methodology and data collection

Since the goal of the research is to find out the attitudes towards web-app digital menu as SaaS service from both restaurant and customer perspective, I decided to utilize mixed research methodologies, which includes qualitative and quantitative research. The mixed-methods approach allows getting an understanding of more sophisticated research.

Qualitative research is a form of analysis that involves open-ended conversations and is expressed through words. It requires keen observation, systematic note-taking, strategic questioning of targeted subjects. Qualitative study techniques consist of in-depth interviewing, observation, and focus groups. (Joseph Check & Russell K. Schutt, 2012.)

The thesis will include one on one interviews since this method implies an open-ended, semi-structured discussion format with open questions. That enables to understand the restaurant owners', directors', managers' opinions and thoughts on the topic.

The quantitative part will include a questionnaire, which focuses on the restaurant customers. It is essential to review the end-user perspective on the topic to understand the feasibility of the service, technology, and functionality. The quantitative approach suits better for end-user perspective evaluation since it is easier to reach a wider group. More answered questionnaires enable to achieve better results and to increase the accuracy and validity of the collected data.

3.4 Interviews

Interviews were conducted on five different days. Overall there were eight successfully conducted interviews. Each interview took from thirty minutes to one hour. Interviews were conducted with owners or managers of restaurants in different segments, which enables to look at the feasibility of the presented project from different perspectives. The representatives of the restaurant were contacted via phone and messages. I used my personal network and customer base in order to be able to reach restaurant representatives. The organizations were picked according to specific criteria. I tried to interview various restaurants type with different menu structures. The interview was semi-structured, more in a discussion format. My goal was to get interviewees' opinions on the service, requirements, and suggestions. All interviews were recorded and transferred into transcripts later, which were neatly analysed and categorized.

3.5 Questionnaire

An online survey was conducted in order to get an understanding from the end-user perspective. End-users of the service are restaurant customers. Therefore, anyone who visits restaurants is the audience that provides valuable insights for the research. Questioners were sent via Webroot tool. The survey included 12 questions, and three of them were open format. The audience was reached via social media channels and my own network.

3.6 Reliability and Validity

Reliability refers to the tendency toward accuracy seen in repeated observations of the same phenomena. The higher the consistency of the measuring process, the more reliable the results of repetitive tests are. Likewise, decreased consistency, less reliable the results are. However, in order to achieve accurate empirical research results, the indicator must also be valid. The validity of the results is essential. Validity identifies the relationship and relevance between concept and indicator. (Edward G. Carmines & Richard A. Zeller, 1979)

In the theory part, all materials that were collected are valid and trustworthy. The research topic is quite new, and not many valid recourses available. I steered clear of fringe online sources and focused on reputable ones. I managed to find academic articles concerning the research objectives.

The empirical part is consisting of two types of data collection. Mixed research methodologies were utilized qualitative and quantitative. In addition, feasibility study methodologies were partly used. The objective of the thesis is to identify the feasibility of the web-based digital menu and the attitude of the restaurant stakeholders and end users of the service. Ten restaurant owners were interviewed, and 98 end users responded to the online survey to understand from both perspectives.

To sum up, according to the definition stated by Edward G. Carmines and Richard A. Zeller, all resources used for the research are valid, and the empirical part was done by implementing reliable methodologies.

3.7 Research results

This chapter includes the outcome of the empirical studies, gathered from interviews of restaurant representatives and online questionnaires that were sent to restaurant customers. The chapter is divided into three parts: Results from the online survey, from interviews, and conclusion, where the key findings and observations are discussed briefly.

3.7.1 Questionnaire

Results from the online survey are reviewed and analysed in this subchapter.

The first three questions were aimed to gather basic information from the respondents. The first question was asking the gender. The second question was concerning age

groups, four different options were offered to answer: 15-24, 25-44, 45-64, 65+. And an open format question about the occupation. This information is used to have accurate analytics and observation. Background information of the respondents helps to measure the collected data and conduct comparison and analysis.

Gender groups

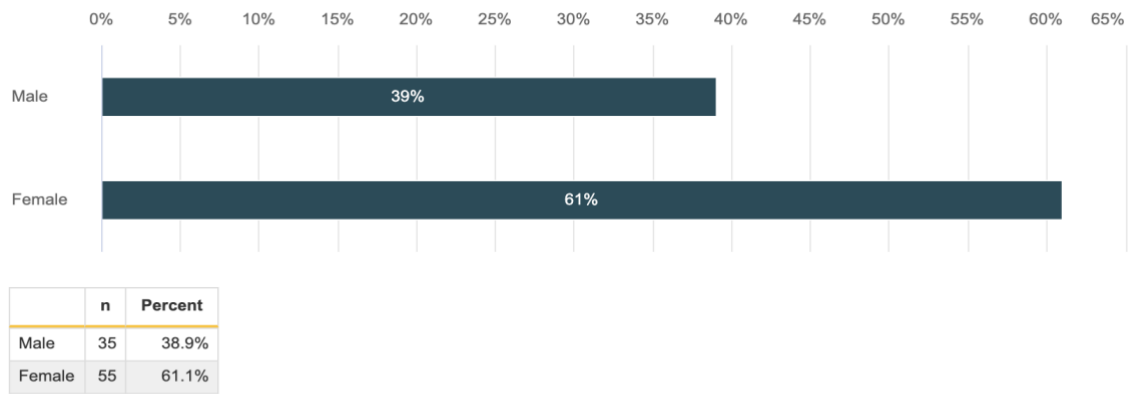


Figure 13.

Age

The bar chart demonstrates that 65 respondents out of 90 were female, and 45 respondents were male, according to the results.

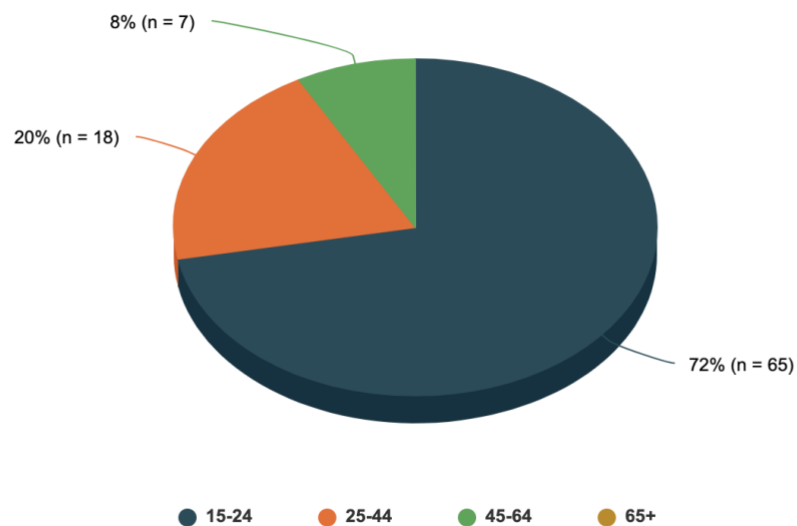


Figure 14.

As the pie chart showcases, the majority of the respondents are in the age group between 15 and 24, which is 72 percent of the total number of rep. The second-largest age group is

between 25 and 44. The chart presents 20% of the total 90 respondents. And 8 percent of respondents are in the 45-64 age group. There are zero responses in the 65+ age group.

Your Occupation

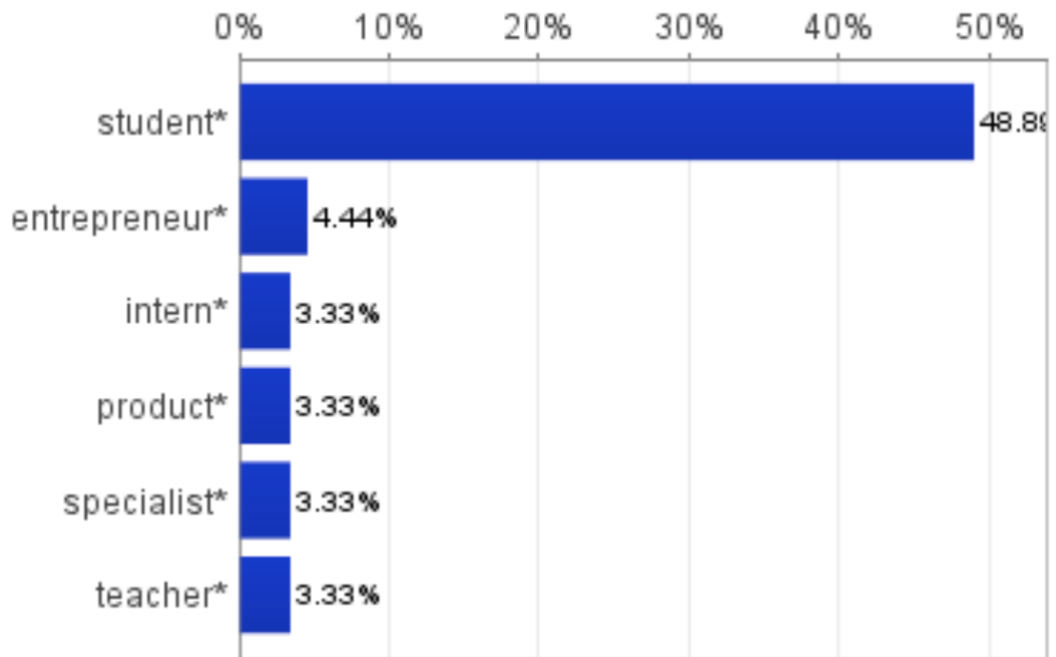


Figure 15.

The bar chart demonstrates that 48.89 percent of applicants were students. The amount of other occupations is significantly lower. The graph illustrates 4.44 percent of entrepreneurs and the rest of the professions are divided equally between interns, product managers, specialists, and teachers with 3.33 percent.

How often do you go to a restaurant?

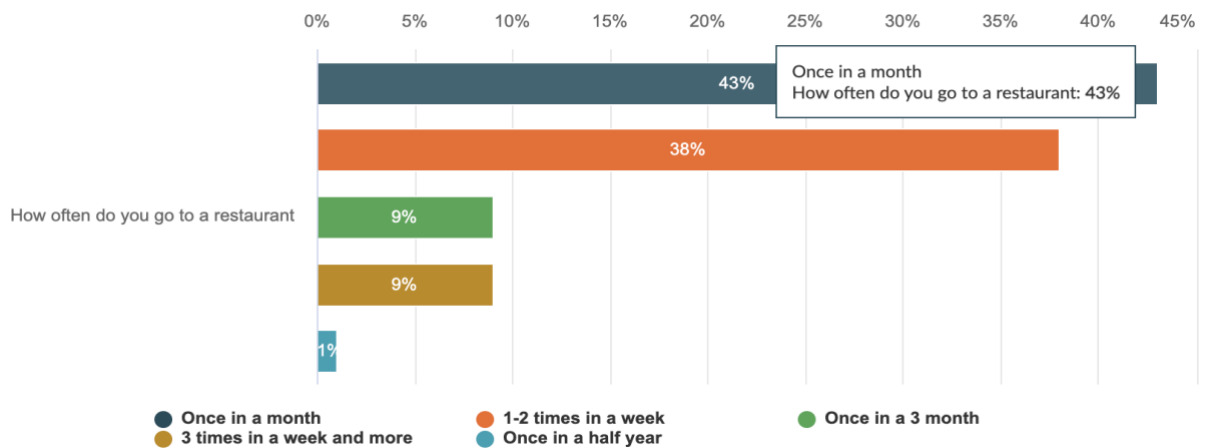


Figure 16.

As the bar chart illustrates the frequency of visiting restaurants. The majority of the respondents visit restaurants once in a month. However, 38 percent of the people visit restaurants once or twice in a week. 3 times in a week and more answers have 9 percent from the total responds, same as once in 3 months. And only 1 percent visits restaurants once in a half year.

Are you familiar with QR code usage?

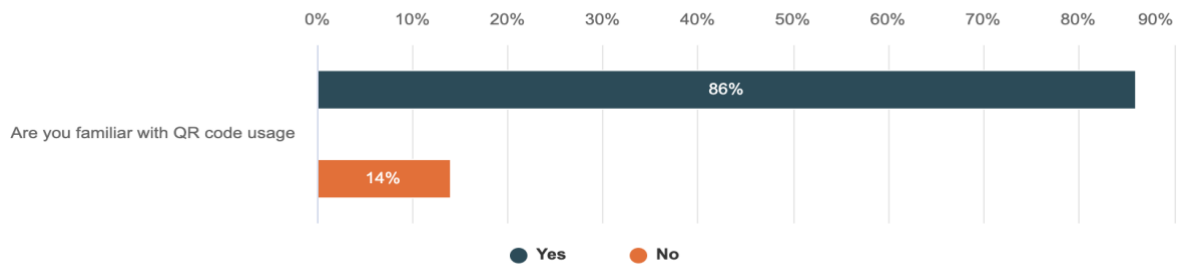


Figure 17.

The graph showcases the familiarity of the respondents with QR code usage. As the bar chart states, 86 percent are familiar with QR code usage, and only 14 percent are not familiar. This result was analysed also by age groups. The majority of all age groups are familiar with the QR code concept. This fact highlights that QR code is a technology that people in different groups ages or familiar enough to use the QR code.

Have you ever used a digital menu?

6. Have you ever used a digital menu? (Wolt and Foodra have digital menus)

Number of respondents: 90

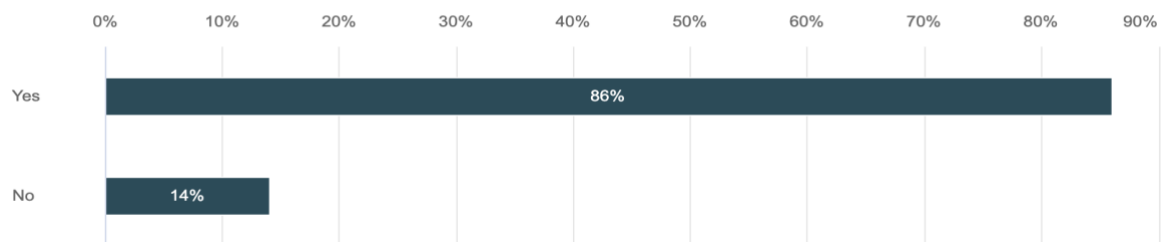


Figure 18.

The bar chart presents the utilisation experience. It demonstrates that 86 percent of questioned potential end-users have already experienced the digital menu. And only 14 percent have never used any digital menu. In addition, the bulk of people from all age groups have used digital menus.

Which menu you would prefer to use in a restaurant?

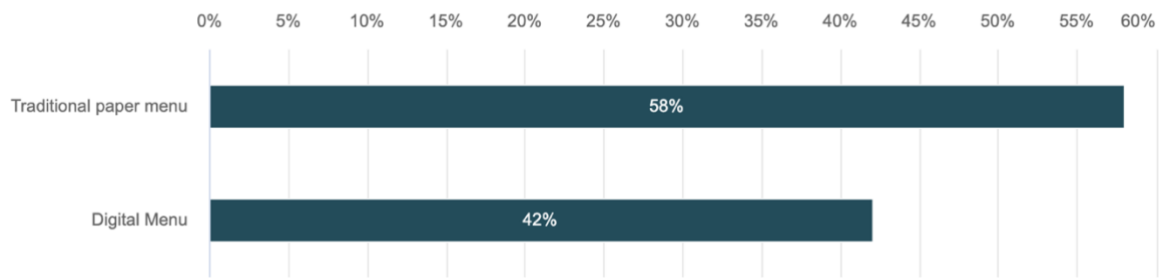


Figure 19.

The bar chart demonstrates the proportion of the end-user menu preferences. Traditional paper with a slightly difference became the most preferred type of menu with 58 percentage and digital menu with 42 percentage. However, the proportion changes, if age groups are considered separately. For instance, the young group age between 15-24, the traditional paper menu is in more demand. The percentage of traditional paper menu preference is slightly increased by four percent. In comparison to the age group between 25-44. Fifty percent of the respondents from that age group prefer a digital menu, and 50 percent prefer a traditional menu. And with 45-64 age group, traditional menu preference with 58 percent exceeds digital menu with 42 percent.

Please fill in the boxes with features you would like to have in digital menu.

The end users were asked to choose features that potentially that would like to use in digital menu system.

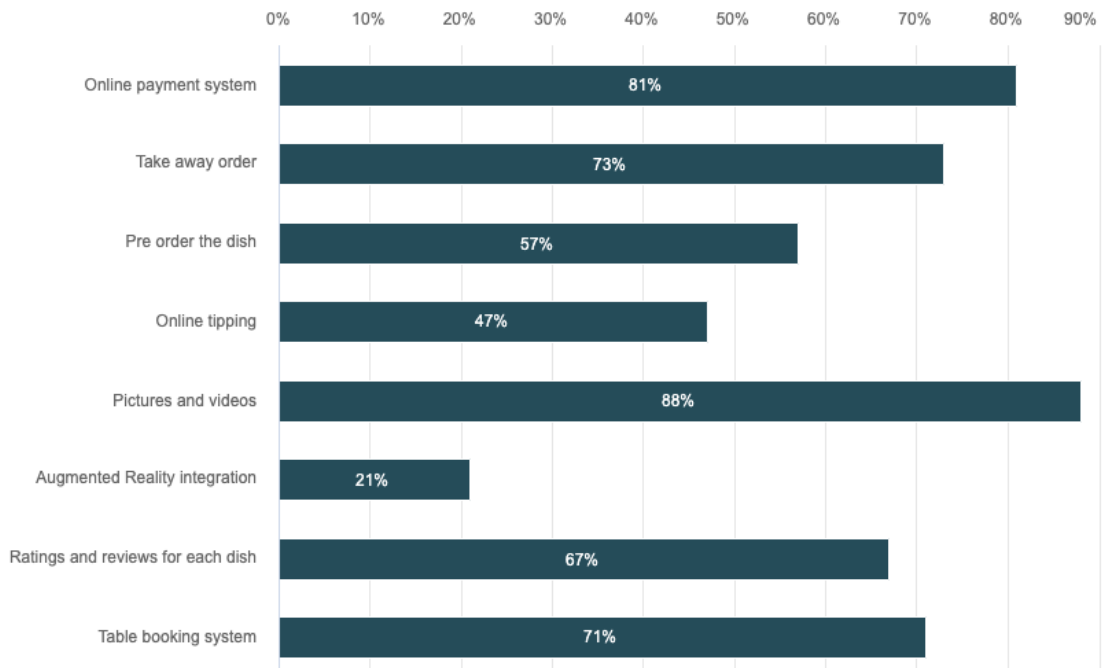


Figure 20.

This figure showcases the most and least exciting functions. The picture and video of the dishes integrated into the digital menu are the most desired (88%). Online payment system (81%), Take away order (73%), Table booking system (71%), and rating and reviews for each dish (67%), all these features are in high demand. In comparison, augmented reality integration (21%), Online tipping (47%), and pre-order dish (57%) functions are least interesting for the end-users.

Would you prefer to download the app or to have it on browser?

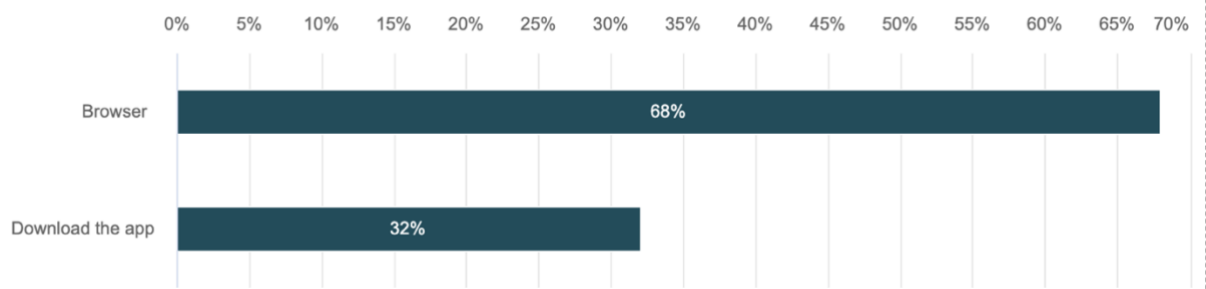


Figure 21

The chart above describes end users favoured way to access the digital menu. The majority answered that accessing the digital menu via browser is more convenient (68%), and only 32 percent preferred to access the menu via downloading an app. Besides, all age group results are approximately the same; over 65 percent finds browser access more convenient.

What would be the main reason to use a digital menu?

This question is an open format. The most valuable answers are presented only and categorized in 3 sections. Due to the fact, that some of the answers contained uncertainty, not all answers are considered as reliable and valid.

Hygiene and pandemic related answers:

- Currently hygiene, but any other than that, I guess it must be oriented with the restaurant theme
- Avoid talking to people
- Hygiene purposes
- Overall convenience + less communication with me personnel
- safer in terms of germs
- Covid19 precautions
- Its hygienic and easier in general.
- Covid
- It is safer in COVID-19 terms
- Its more practice and better for COVID

- paper menus get really dirty when a lot of people touch them

The influence of paper menu on virus spread hasn't been scientifically proved yet, therefore the reliability and validity of the answers, regarding this issue, are not trustworthy. Nevertheless, the responds demonstrate the concern of the consumers.

Functional and operational enhancement:

- look like
- Faster
- possibility of pre-order
- Pictures
- Visibility
- Accessibility
- Ordering becomes easy for a customer as you can decide quickly with confidence. Visual information helps a lot.
- Save time
- ease of use
- When you want to do things quick
- It is more safe and fast way to order my food. I can also check more detailed descriptions of dishes and filter foods that I am allergic to.
- Save the time and money
- Convenience. Especially with this weird time, people would be hesitant to touch anything that was touched by other people. Having a digital menu will eliminate that, though I prefer physical menus kind of like a part of an experience
- It's useful because you can always read it while you are eating another dish, in the case you are still hungry and want to order something else. Usually, when restaurants give your paper Menu, they take it back when you order the first dish
- The main reason would be its effortlessness.
- Smart and easy

Comments from respondents listed above raise valuable topics. Digital menu can enable positive user experience for people with disability. In addition, responds that were referred to the convenience and ease of use are the most common answers, which was one of the main highlights that is raised in this question. In addition, features like visual integration, online payment system, language selection, rating and reviews system, in-depth description of the dishes were emphasized, which indicates positive attitude towards the digital menu functionality from end user perspective and potential demand. Besides, it was mentioned that digital menu can affect customers restaurant choosing decision, since they want to be able to check the menu of the restaurant, before arriving.

Sustainability and environmental concerns:

- Save paper and decrease waste
- Environmental awareness reasons
- Save papers and other materials
- More ecological
- Saves paper

- sustainability, reducing paper waste
- Ecology
- eco-friendly
- Ecological reason, less paper, less plastic usage
- Avoid paper usage

This category demonstrates that digital menu also solves environmental issue, by providing restaurant customers sustainable menu option.

What additional functions you would like to have?

- Recommendations & Wine pairing
- I would want to see a brief recipe of the meal if it's not a secret.
- Communication with restaurants
- information on the composition of the dish and calorie content
- Ability to choose the composition of products
- Change the dish (exclude some ingredients or change them)
- Order tracking. Real-time tracking on delivery, and real-time preparation on dine-in
- Well maybe this is too broad but an app that has all the menus from different restaurants that you wouldn't have to have 10 different apps for all different restaurants, and if it would be worldwide or Europewide would be a big plus
- I am able to make an order without calling a waiter and see its status. I am able to see status of my order and waiting time. I am able to filter foods by vegan/allergic and other preferences. I can leave feedback to the staff.
- voice order
- pre-ordering dishes and accurate pictures of the food
- Serving sizes. An option to have the meal split into n number of plates. Or if a meal is too big, I can have the option to get half of a portion only to reduce food waste. Pay now or pay later option. Request the waiter/waitress/bartender for a follow up order. Live updates on when my food will be ready
- Maybe reviews for each dish, from other clients
- voice order
- pre-ordering dishes and accurate pictures of the food
- Serving sizes. An option to have the meal split into n number of plates. Or if a meal is too big, I can have the option to get half of a portion only to reduce food waste. Pay now or pay later option. Request the waiter/waitress/bartender for a follow up order. Live updates on when my food will be ready
- Maybe reviews for each dish, from other clients

Order process monitoring function is highlighted by the respondents, as well functions like voice order, pre order, meal size selectin, dish reviews were mentioned. One of the respondents, mentioned, that different restaurant should be under one system, to increase the usability and necessity of the application.

Reasons why you don't want to use digital menu?

- Small phone screen makes it more difficult to read (comparing to the paper version)
- If there is bad/no internet connection - there will be difficulties in loading menu

- Takes more time (loading, downloading an app) that browse through the paper menu at the counter. Nowadays people are used to do everything fast. No one wants to waste time!
- I want to use my phone not so much when I go out
- Perhaps, if my battery low.
- No internet connection
- When I am in a restaurant, I want to hold it in my hands and see clearly. I don't want to have to go to the restaurant's webpage on my own mobile device to read the menu.
- We use our phone for almost everything today and people constantly watch their phones instead to talk to each other etc. If I am in a restaurant, I like to enjoy the whole experience and my company and wouldn't like to check the phone for the menu. Because people also tend to do other things than just ordering when they take the phone out.
- The classic atmosphere
- Paper is just more familiar
- I would like to see full sized menu instead of watching the screen of my phone
-

Most of the concerns refer to possible accessibility issues since customers might have problems with the phone, such as a low battery, broken phone, and no internet connection. And the usability of the menu is questionable in comparison to the traditional paper menu. Besides, some customers want to fully experience the restaurant and minimize phone usage since the phone is already taking a lot of attention and time during the day. They want to enjoy the atmosphere of the restaurant, not being on the phone to make an order.

To sum up, there are two sides to the coin. Some end users see potential in the digital menu and perspective features that can enhance their customer experience and, at the same time, solve operational issues. However, customers want to appreciate the offline experience and limit phone usage while they are out. Issues about usability and ease of use are raised and questioned. For certain groups, the traditional paper menu seems to be a much user-friendly option.

The results from the survey also demonstrate that the majority of the respondents are interested in digital menu usage and the value that it can offer. Digital menu with the right functional selection and coherent implementation can influence the decision-making process and, in general, enhance customer experience by allowing to facilitate the ordering and payment process via visual integration and interactive UX design, reducing paper and other material consumption, elevating customer experience for people with disabilities and enabling to monitor the product preparation phases. In conclusion, according to the results from the survey, there is a demand for digital menus and interest, but it cannot fully substitute traditional menu since there is still a large group of people that is willing to stick with traditional paper menus for multiple reasons.

3.7.2 Interviews

Semi-structured open format interviews were conducted during five days with five different restaurant owners in order to gain a depth understanding of the required functionality, feasibility of the service, and attitude of the potential customer of the service towards the web-based digital menu as a SaaS solution. Companies were chosen cautiously, restaurants from different segments with diverse menu types and service models were interviewed to study the demand and requirements of the restaurants with different requirements and needs. It enables to see the advantages and disadvantages of the service in different restaurant segments. Offline meetings were scheduled with each interviewee separately, and each session took from one to two hours on average. The interviews were very productive and informative. Restaurant owners were interested in the service and provided valuable opinions and suggestions.

Background information about the interviewees

Interviewee	Position	Restaurant type	Menu type	Existing digital platform
Broo pizza&Bar	Branding/Marketing Director	Quick casual	Cycle menu Static menu	Restalution Instagram Facebook
Roasberg	CEO	Self service	Du Jour Menu Cycle menu	Netvisor Tyovuorovelho Instagram Facebook
Kafe Koma	CEO	Quick casual	A la carte	Viwa wallet Restolution Instagram Facebook
Limone	CEO	Quick casual	Static menu	Table online Insgtagram Facebook
Pjazza	COO	Full-service	A la carte	Table online Wolt Foodra Instagram

				Facebook
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Figure 22. Interviewees' background

The main goal of this interview is to get an understanding of the restaurants' attitude towards the web-based digital menu service as a SaaS solution. The results from the interview describe the value that a digital menu can bring to the business, desired additional features, and downsides.

One of the questions that was included in the interview was about the existing digital services that are used by the organisation. All of the questioned restaurant owners were aware of the necessity of the digital system and the value that it can bring. All of the restaurants have already been using digital systems for payment platforms, order records and reports, marketing tools, delivery and take away orders, online table reservation platform, and shift planning system. All of the digital services are ready solutions and mostly are cloud-based.

List of digital systems:

- Wolt
- Foodra
- Facebook
- Instagram
- Table online
- Restalution
- Netvisor
- Tyovuorovelho

The study found out that a digital menu will not benefit all restaurant segments. Fine dining and full-service restaurants, where the customer service and communication between the customer and waiter is a crucial part of the experience, the digital menu is an unnecessary add-on. The digital menu doesn't fit the concept of fine dining and full-service restaurants. Therefore, it doesn't provide significant value. In addition, the Du jour menu cannot be implemented as a digital menu, as the concept of the menu that changes daily brings up a variety of complications.

Meantime, self-service and quick casual restaurant representatives mentioned that digital menu could provide them vast benefits in terms of time efficiency and operational enhancements. Restaurant owners believe that a digital menu with an online payment system, modern interactive design, and cross-selling features can not only reduce waiting time for the customer but also increase sales by recommending additional products to

purchase and analysing reports and all the necessary data that can provide insights for the management.

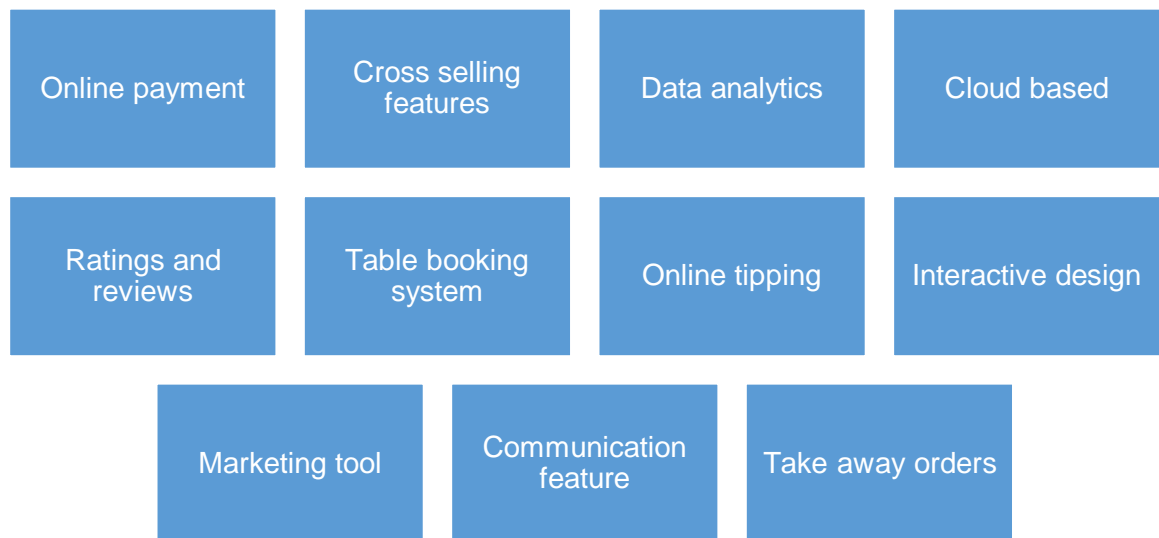


Figure 23. Functionality.

The interviewee emphasized that digital as a platform for all restaurants would make it feasible and valuable for restaurants. The end-user does not need to access each restaurant menu separately, but they can see all the restaurants from the web app. The service should also be a marketing tool for restaurants that will enable them to reach new customers. This function was mentioned by all the interviewees and was strongly highlighted. This function should be one of the key elements and selling points for restaurants.

Pay as you go model got overall positive feedback from the interviewees. Some of the restaurant owners stated that with commission-based pricing model is more valuable since the price is directly affected by the delivered results. Another restaurant suggested restaurant capacity-based pricing. The monthly fee would not only depend on the amount of required menu, but also on the registered sitting places inside of the restaurant.

Downsides:

The restaurants mostly provided positive feedback and admitted the visible potential in web-based digital menu service. However, there were several concerns that might affect the service usability and feasibility in a negative way.

Pricing was one of them. Since the restaurant business has a lot of costs already, the pricing model should be reasonable.

Some restaurant segments and menu types do not fit the concept of the digital menu due to technical issues. In some restaurants, customer service and communication with the waiter is core and cannot be replaced with the digital menu.

In addition, the service has to include marketing and promotion for the restaurant. The digital menu service should develop a client base in order to help restaurants to reach new clients. Without this customer traffic, the service won't have enough value to offer.

4 Discussion

This chapter describes the key finding from the research. Results from quantitative and qualitative researches are combined and discussed. The outcomes from the thesis are evaluated and concluded. Further suggestions for the development of the project are presented as well as the feasibility of the service is reviewed.

4.1 Key findings

The results that I have collected from the online surveys and based on the theoretical research, it is clear that Digital Menu is raising the topic and has potential growth. However, implementation, selection of the right problem to solve, and usability are fundamental factors for the successful service execution.

First of all, the majority of the online survey respondents are familiar with QR code usage, and they have already used digital menus. Surprisingly, age groups didn't impact the outcomes from the topics mentioned above, which means that the majority of all age groups are familiar with QR code usage and have tried to use digital menu concepts. However, as an online survey demonstrates, that the majority of end-users still prefer the traditional paper menu, respondents concerns that their phone devices might not always be available, low battery, and lack of internet connection might ruin the experience. In addition, some of the end-users want to minimize the usage of mobile devices while they are out. People want to appreciate their time outside of the digital world. Besides, it was mentioned that people want to keep a traditional paper menu to maintain the restaurant atmosphere and avoid interaction with digital devices.

On average, all age groups prefer to access the digital menu via QR code, not by downloading the app. However, in open questions, some of the respondents mentioned that if the app includes several restaurants, and it becomes a platform to find a restaurant, downloading an application on a mobile device is also can be considered as a way to access the service.

Visual integration, online payment, language selection, rating, and review system, an in-depth description of the dishes were also highlighted, indicating a positive attitude towards the web-based menu functionality from the end user's viewpoint and future demand. Besides, it was mentioned that a digital menu could affect customers' restaurant purchase decisions since they want to be able to check the menu of the restaurant before arriving. Digital menu also can be a useful tool for people with disabilities. However, more in-depth research is required in order to examine and evaluate the functionality that can be implemented.

From the restaurant perspective, it became clear that not all segments benefit from a web-based digital menu since, in full-service and fine dining restaurants, the customer service and atmosphere are the key factors in the overall experience. However, in other restaurants, a web-based digital menu has big potential to enhance operational services and increase sales in perspective. Restaurants types like self-service and quick causal, where the foodservice itself overweighs in value the communication with the personnel and offline customer service, will potentially benefit from the functionality of the digital menu service.

All restaurants are already utilizing various types of digital systems, and all of them are ready solutions, which demonstrates the strength of cloud-based technologies. It also confirms the fact that in-house development of a digital system is not feasible for the restaurant market due to required resources and lack of time.

Both restaurants and end users mentioned that the concerns regarding the global pandemic might affect utilization of the digital menus in a positive direction. But this fact might be invalid since the situation with COVID-19 is shifting on a daily basis, and there is no scientific article concerning the spread of the virus via paper menus.

The table attached below represents the advantages and disadvantages of the web-based digital menu as a SaaS solution. The information was collected from the conducted interviews with restaurant owners and from the online survey that was sent to potential end-users.

Advantages	Disadvantages
Digital menu increases and automates payment procedures, which is crucial factor in sales.	Phone accessibility. End users' phone can be out of battery, issues with internet connection and etc. Which can cause unpleasant order experience.
Visual elements and interactive UX design have a positive impact on customer purchase behaviour.	Concept of digital menu doesn't fit all restaurant segments. Full-service and fine dining restaurants don't see benefit from the service.
Ratings and reviews enable restaurants to get instant feedback about the service and quality of the product. At the same time, it allows customers to make a better choice.	Not attractive service for restaurants without a client base. Restaurants expecting from the service to get new customer traffic.

Preorder and take away orders. Customers can check the menu and place an order, before arriving to the restaurant	End users want to appreciate the time outside and limit phone usage, while being in a restaurant.
Multiple language selection.	
Data analytics. Restaurants can analyse all the data from the digital menu.	
Functions for people with disabilities.	
Ready solution. Restaurants do not need to spend time and resources on development and maintenance.	
Cross selling functions. The digital menu can provide recommendations for customer, which will benefit both sides; restaurant and customer.	
Marketing tool. The service can provide new customers for restaurant.	
Communication channel between customer and restaurant.	
Custom function integration. The service enables to upgrade and system and come up with custom additional solutions.	

Figure 24. Pros and cons.

4.2 Suggestions for further actions

The research gives an in-depth understanding that it is an excellent time to start developing a digital menu service for restaurants in Finland. First of all, online consumption is growing steadily, and the global pandemic only accelerated the growth. Secondly, the empirical part of the research showcased that there are restaurant segments interested in such a service and see the value that it can bring to their business. Besides, the online survey demonstrated interest from the end-user perspective.

The following steps would be developing a prototype and conducting the usability tests in order to meet end-user requirements accurately and at the same time fulfil restaurant needs. Besides, marketing and branding should be an essential part of web-app product development. Both for restaurants and end-users, it is crucial to develop the service as a marketing platform for multiple restaurants to provide restaurants with a client base and end users with different options to consider.

After establishing the functionality and final version of the prototype, the pricing strategy should be studied and examined more neatly.

4.3 Conclusion

The conclusion of the research objectives is discussed in this subchapter.

Traditional menus, digital web-based menus, and their variations are all investigated in this thesis. Restaurant segments and cloud computing service types are studied and overviewed. The feasibility of web-based digital menu and potential functionality have been evaluated the perspectives of both restaurants and their customers are analysed.

Research objectives:

RO1: Study digital menu types and functionality.

RO2: Evaluate the feasibility and necessity of the digital menu as a SaaS solution in restaurant owners', directors', managers' perspectives, and customer perspectives.

RO3: Sum up the results from evaluations and come up with a conclusion. Discover possible features to enhance the service and future perspectives.

The first research objective was achieved in the theory part, where the in-depth explanation of the traditional paper menu and digital menu type were studied. Along with that, possible functions were well described and examined in the empirical part by interviewing restaurants and sending online surveys to potential end-users.

The second research objective concerns the feasibility and necessity of the web-based digital menu service as a SaaS solution. The definition of feasibility is stated in the theory part. Due to the limited time and recourses, a feasibility study was partly conducted. The study focused on the feasibility of the product or service only to increase the accuracy of the results.

The most efficient way to implement a service/product feasibility study is to conduct semi-structured interviews with potential users or to send an online survey to them. In this case, there are two essential stakeholders: restaurants and restaurant customers. A semi-structured interview was conducted with restaurant representatives to get their perspectives on the web-based digital menu. In general, the feedback from them was positive. The restaurant owners highlighted that the coherent feature selection and promotion of the digital menu service among restaurant consumers would potentially lead

to an essential tool for self-service and quick casual restaurant segments in Finland. However, the concept of the digital menu doesn't fully fit restaurant concepts, where customer service plays a significant role in the overall experience.

From the end-user perspective, the results are ambiguous. The majority of the respondents are interested in the service and admit the potential value that a web-based digital menu can provide to them. Nevertheless, almost half of the replicants still prefer to use the traditional paper menu due to usability reasons. In my opinion, usability tests should be conducted to prevent any kind of usability issues. And it also might take some time for people to get used to new service.

The third research objective is the sum up of both interview and online survey results. According to the discussions and online survey outcomes, the web-based digital menu service as a SaaS solution has potential, and both sides are interested in use. Except for the functions listed before in the theoretical part, I would like to emphasize that additional features for people with disabilities would be a sustainable a wise decision to implement. Besides, both parties mentioned that the digital menu has to provide the possibility to access it via web browser, but the application would work as well if the system provides a platform for multiple restaurants. A concept where each restaurant doesn't need to have a separate application. On the contrary, the service would provide a platform for all restaurants, which will enable end-user to look for new restaurants.

However, particular research doesn't guarantee the success of the project since a lot of other factors that were not considered in this thesis have a significant impact on implementation. Financial, market, and organization feasibility should be strongly considered and researched, as these factors are crucial indicators of the feasibility of the product or service.

The thesis was a challenging journey and the most memorable part of the whole study experience in Haaga-Helia. The results from the thesis encouraged me to continue further research. My future steps are forming an organizational structure inside Dose family Oy to continue further development of the project. During the research, I faced with a variety of the complication.

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Appendices

Appendix 1. Interview

1. What is your position and responsibilities	2. What type of restaurant(s) do you work in / own
3. What type of digital systems are you utilising in restaurant?	4. What are the main reason why you utilise digital systems
5. Disadvantages of the service	6. Do you use digital systems as a ready solution? Or did restaurant develop it?
7. What type of menu do you have in <u>restaurant</u> ?	8. Do you see this service as something that would benefit the restaurant?

Appendix 2. Online survey

Digital Menu

 Mandatory fields are marked with an asterisk (*) and must be filled in to complete the form.

1. Gender *

- Male
- Female

2. Age *

- 15-24
- 25-44
- 45-64
- 65+

3. Occupation *

4. How often do you go to a restaurant *

- Once in a half year
- Once in a 3 month
- Once in a month
- 1-2 times in a week

3 times in a week and more

5. Are you familiar with QR code usage *

Yes

No

6. Have you ever used a digital menu? (Wolt and Foodra have digital menus)

*

Yes

No

7. Which menu you would prefer to use in a restaurant? *

Traditional paper menu

Digital Menu

8. Please fill in the boxes with features you would like to have in digital menu. *

Online payment system

Take away order

Pre order the dish

Online tipping

Pictures and videos

Augmented Reality integration

Ratings and reviews for each dish

Table booking system

9. Would you prefer to download the app or to have it on browser? *

- Browser
- Download the app

10. What would be the main reason to use digital menu? *

11. What additional functions you would like to have? *

12. Reasons why you don't want to use digital menu? *

9. Would you prefer to download the app or to have it on browser? *

- Browser
- Download the app

10. What would be the main reason to use digital menu? *

11. What additional functions you would like to have? *

12. Reasons why you don't want to use digital menu? *
