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Digital Queuing in Amusement Parks - Possibilities and Challenges

Master's thesis in Quality and Operations Management

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Abstract

With the advancements in digital technologies, its applications are of great significance in many different industries. The situation is not different in the case of amusement parks all around the world. Most of these parks have already implemented different forms of digital technologies used for queuing. These digital queuing systems help to a great extent in reducing stress among the visitors as they do not have to wait in long lines in order to experience their favorite rides. This thesis explores the possibilities and challenges of implementing such a digital queuing system in Liseberg, one of the largest amusement parks in the Nordic region. Literature is used extensively to understand various dimensions of queuing, implementation, service quality and digital queuing systems. The first objective was to identify the variables that should be taken care of while implementing a new digital technology. The second objective was to provide the management team with measures for effective utilization of pilot testing and for scaling up to full scale implementation. The thesis also provides information on the possible effects and consequences that were analysed during the conduction of the thesis. The thesis was mostly based on literature and a survey which was intended to identify the needs and expectations of customers, which then was compared to the understanding of Liseberg about their customers and their expectations towards certain features. Gaps were identified during the analysis and recommendations are provided based on this. The recommendations mostly include suggestions to identify improvement areas, tackle any upcoming potential risks and to add features that the current system lacks. This will help Liseberg to understand what and where the focus should be on, in order to maximize visitors' satisfaction. It could be concluded from the study that long waiting lines are the main reason for dissatisfaction among visitors and also that digital queuing will be accepted well, provided that the implementation process is well executed by taking the needs and expectations of visitors into account.

Keywords: Service management, Service quality, Servqual model, Implementation, Digital queuing, Innovation.

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Arun Babu Suresh Babu
Ashoka Narayana Shankaranarayanan
Gotheburg, August 2020

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1
Introduction

This chapter shall provide the reader with the background of the thesis, the aim, delimitations, specification of issue under investigation and the structure of the thesis.

1.1 Background

In today's fast-paced, hectic, and pressured life, contemporary society wants their free time to be utilized in the form of quality time (Christensen, 2002). Most of us would want this quality time to include some leisure time as well. It is 24 hours that is available every day, and this time is being completely dependent on every individual on how they should utilize it. Even though most of us are negligent about the management and effective utilization of time, most individuals are aware of the importance of time (Hamid et al., 2016). This time is considered valuable just like money and everyone wants to make maximum use of it (Ledbetter et al., 2013). When people don't get the desired benefits from this leisure time, they get stress and dissatisfaction (Hamid et al., 2016). Most of us go to amusement parks in order to escape from our daily routine. But it is not always possible to make maximum use of our time, mostly due to the perceived inconvenience of standing in queues mainly to get into the main attractions. This situation is almost inescapable always (Ledbetter et al., 2013). It is always physically and mentally draining to be waiting for the turn in front of attractions and this creates an unpleasant experience for guests. Studies in the U.S have shown that from around 320 million visitors in different parks, there is a potential for numerous unpleasant experiences for customers which adversely affects the $13-billion industry (Ledbetter et al., 2013). It is found that when customers are aware of the waiting time, this increases the perception of time remaining and creates discomfort (Katz et al., 1991). However, it is also seen that the perception of waiting duration is increased when customers do not have a baseline for determining how long they should be waiting (Ledbetter et al., 2013). Liseberg, being one of the Nordic regions leading tourist attractions, has around 3.2 million visitors annually and when these visitors have to stand in a queue for a long duration in order to enjoy their favorite attractions, there is dissatisfaction among the visitors. By introducing a digital queuing system, visitors will have an opportunity to know when their turn comes, thus significantly reducing indeterminate waiting time which will improve customer satisfaction. Many of the customers might be turning away from experiencing some of the best attractions just when they see the big queues. With the implementation of the digital queue, visitors can make use of the free time in some other attractions, restaurants, or any other option of their choice rather than waiting in line. It is also a fact that long queues in peak seasons create a lot of tension and stress not just among the customers, but also among the staff and management (Ahmed, 2016).

1.2 Aim

This thesis focuses on analyzing the challenges and possibilities of implementing a digital queuing system in amusement parks. The effects and consequences of implementing a digital queuing system and its impact on visitors and the management will be taken into account. This includes identification of the opportunities and also the challenges that could hinder the effective implementation of the new technology, and thus providing methods to mitigate those risks, helping the company to start working with the digital queuing system successfully. A big part of the aim is to identify methods to make visitors adopt the new technology, which is the digital queuing system.
Apart from the challenge of getting prospective visitors interested in the new system, other challenges also need to be taken into consideration. Thus a systems approach will be used by taking several perspectives into account, such as economic, logistical, customer behavioral, and technological. Based on what the research is about, a system can be identified as a combination of different elements that give a view of the total reality. All of these elements can be related to each other and can have relationships with other elements outside the whole picture of the research as well (Veeke et al., 2008).

RQ 1: What should be taken care of while implementing a new digital technology in amusement parks and how can this process of new technology implementation be made smooth?

RQ 2: How to efficiently utilize pilot testing for full-scale implementation of the digital queuing system in amusement parks?

RQ 3 : What effects and consequences of digital queuing can be seen in amusement parks?

1.3 Delimitations

This thesis focuses on analyzing the challenges and possibilities of implementing the digital queuing system in amusement parks, focusing on Liseberg. Thus a multi-objective or systems approach will be used considering several factors into account, such as economic, logistical, customer behavioral, and technological. No technical support will be provided in this thesis, but improvements are suggested in the existing systems. Also, since the digital queuing system might affect the allocation of resources and employees, this will be taken into consideration.

1.4 Specification of the issue under investigation

Liseberg, being one of the Nordic regions leading tourist attractions, has around 3.2 million guests annually, and this generates sales of approximately SEK 1.4 billion. An amusement park with such a high number of visitors should develop measures to

manage the flow of people in and around different attractions. It is always stressful to manage the big queues for these attractions. It is stressful not just for the management, but also for the visitors who get disappointed with the long waiting lines. The main reason for these long waiting lines could be the lack of information for visitors on how long they should wait, or the uncertainties in queue lengths. To sort out this issue, Liseberg is implementing a digital queuing system in selected 15 rides. This requires an analysis of the possibilities and challenges of implementing digital queues in amusement parks. With the new system, there is a need to consider several factors that affect the success of this new system and also how it would affect customer satisfaction. This includes methods used to educate visitors about the new system, the distribution and number of people waiting for their turn, the number of employees supporting the visitors, and technical and operational aspects of the ride. Thus a multi-objective approach is required to analyze the situations and thus provide valuable suggestions for further improvements.

1.5 Structure of the Thesis

The thesis comprises a total of eight chapters, where chapter one gives the reader the background of the thesis, the aim, delimitations of the thesis and the specific issue under investigation. The related theory is presented in chapter two, comprising service quality, the Servqual model, queuing theory, digital queuing, implementation, and pilot testing. The case of Liseberg is presented in chapter three where light is thrown upon the current scenario and stating the reason for the change towards digital queuing. In chapter four, the authors present the research design and methodology. The findings from the study are presented in chapter five and the discussions and analysis is presented in chapter six. Chapter seven is focusing on the conclusion part of the study. The bibliography used for literature study is presented in chapter eight.

2

Theory

The objective of this chapter is to instigate the reader to the relevant literature used in the thesis. This section is the foundation on which the thesis is built upon. This chapter introduces concepts of service quality, customer satisfaction, SERVQUAL model, queuing, implementation, and ends with digital queuing in different contexts and ongoing research on digital queuing.

2.1 Service Quality

2.1.1 Services and its Quality

Quality has been defined and expressed in different ways. Crosby (1979) defines it as "conformance to requirements" which is narrow, and hence the focus is on fulfilling those requirements. Juran (1951), defines it more customer-oriented: "quality should be aimed at the needs of the customer, present and future". It has been not easy to define and measure service quality as it is intangible, and the customers rather experience it (Parasuraman, Zeithaml & Berry, 1985).
Firstly, to define service quality, we must understand the characteristics of a service. Services are intangible, heterogeneous, and inseparable. Intangible here means that the services can only be experienced, and therefore these services cannot be measured or stored. Hence it makes it very difficult for the organization to deliver such experiences. Services are heterogeneous as the experience may vary from person to person and from producer to producer. Services are sometimes delivered through labourers, and their behaviours are an uncontrollable factor. There can exist gaps between needs that the organization seeks to deliver and what is perceived by the customer. Sometimes services are inseparable, as they may involve customers as the product that is to be transformed, for example, hairdresser, dentist, etcetera. Here the service quality depends on the customer's input (Parasuraman, Zeithaml & Berry, 1985).
Some additional characteristics of services are also described, which are: intangibility, heterogeneity, inseparability, and perishability. Perishability can be described by the services which cannot be stored/inventoried. Here services are performances and not a physical product. For example, unbooked airline seats, empty hospital beds, etcetera (Berry, 1975; Kinsely, 1979; Sasser, 1976). Hence services are different from manufacturing products as they are most often consumed in the production process. Services can be distinguished from products as it will involve the staff either during production or delivery, or both. Customers are also involved in the process when service is provided as per the customer's needs and hence is not standardized (Swarbrooke, 2002).

2.1.2 Customer Satisfaction

Customer satisfaction is one of the most important factors to measure success in service firms. Parasuraman et al. (1985) describe guest satisfaction as a level in which the expectations are reached or exceeded. Thus service providers must understand the needs and expectations of the customers and try to fulfil them to retain the customers. Barsky et al. (1992) describe that to achieve satisfaction, the service firm must identify what will affect or hinder the satisfaction of the customers. Barsky et al. (1992) also mention that the value or importance shown by the customers towards a product/service is proportional to the satisfactory levels of the customer. Davis (1998) describes that customer satisfaction is the determining factor for success in service industries. He also states that customer loyalty and satisfaction are interrelated, but dissatisfaction will cause a loss of customers. If the customer is satisfied or if the satisfactory conditions are met, then they will most likely continue to contribute to the business. Anderson (1983) illustrates an equation for satisfaction, where satisfaction is equal to the difference between perception and expectation.
Perception is generally when the customer gets the information from previous or latest experiences, word of mouth or advertisement, etcetera. Generally, expectations are higher than the perceptions and hence achieving satisfaction is quite challenging. But if the desired service levels are achieved, the customers will surely be satisfied (Davis, 1998).
Maister (1985) describes the first law of service, where satisfaction is the difference between perception and expectation. To measure this satisfaction level, waiting time can be used as a measurement for accurate results. Satisfaction has become a field of study where researchers have conducted studies on various service sectors. Davis and Vollmann (1990) described in their study of customers' waiting time and the satisfaction levels in a fast food restaurant, the customers were more impatient during lunch time than the other times. Katz et al. (1991) describes in their study on a bank, on improving customer satisfaction with waiting lines, that the customers overestimate their waiting time in the line. Davis (1998) describes that perception of waiting time is better for prediction of customer satisfaction regarding waiting, than actual waiting time. He also conducted an analysis that explains the relation between the dissatisfaction and longer waiting time. Geissler et. al. (2011) conducted a study on the satisfaction level of the visitors in theme parks in the U.S for a time span of 10 years. Over this time span they could understand the factors that influence the customers' satisfaction. . These factors were: entertainment variety and quality, courtesy, cleanliness, safety and security, food variety, value for the money, quality of the theme and design, the availability and variety of family-oriented activities, and the quality and variety of rides and attractions.
Service firms that satisfy their customer's needs and expectations have been successful in retaining their customers and resulted in higher profitability. Hence customer satisfaction can be a way to assess the success of the service providers and their service quality (Wicks & Roethlein, 2009).

2.1.3 Service Quality and Customer Satisfaction

Service quality and customer satisfaction work hand in hand, as customer satisfaction is one way to measure service quality. As service quality involves the visitor's perception of the service received, their experience can also be the reason behind visiting the amusement park/theme park in the first place (Cronin & Taylor, 1992). Pine et al., (1999) describes the four dimensions of experience as shown in Fig 2.1: Entertainment, Education, Esthetics and Escapism, also known as 4E's.

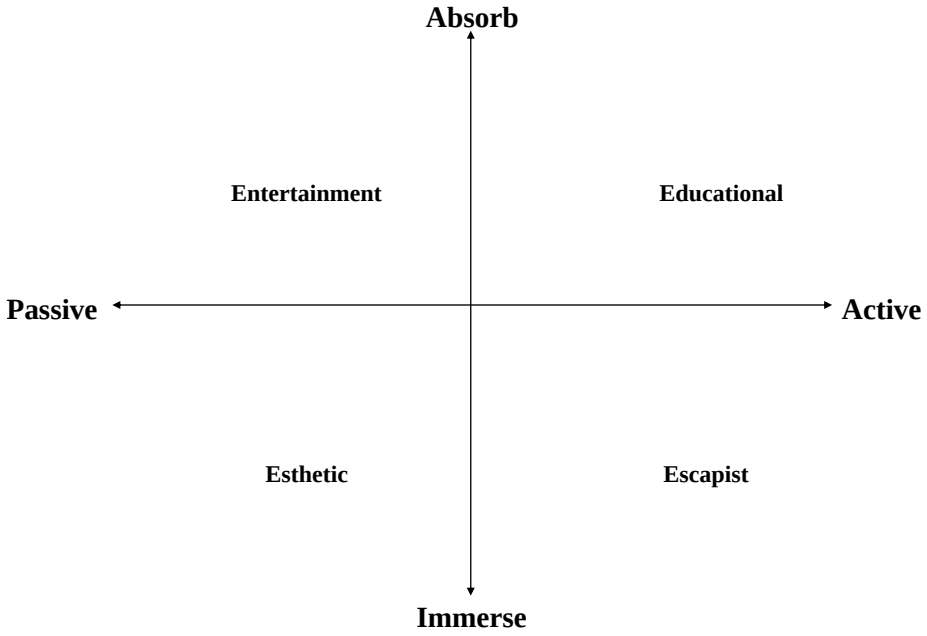

Figure 2.1: Experience Realms (Reproduced from (Pine et.al., 1999))

Experience is the characteristic that visitors take away from amusement parks, and the degree of satisfaction that the visitors had depends on the level of experience. The experience from the theme park must be in such a way where the visitors have active participation, as visitors affect the performance of the ride and thereby yielding a better and unforgettable experience. In addition to this, amusement parks must be more immersive rather than absorptive. Being immersive is ensuring the visitors are physically or virtually involved and is a part of the experience. Such experiences are known as 'escapist' experiences. Pine et al., (1999) also pointed out that experience and customer satisfaction are closely related as experiences are the memories that will not be forgotten, regardless of it being a good or a bad experience.

Wilson et al., (2008) describes that satisfaction is more broad compared to service quality, as service quality focuses on the dimensions of service, which are reliability, responsiveness, assurance, empathy and tangibles. The relationship between customer satisfaction and service quality has been argued by Zeithaml et al. (1996) as a way of clarifying interactions

Maintaining guest happiness and satisfaction is a very challenging task. Davis et al. (1993) and Katz et al. (1991) explains that one of the key reasons for getting frustrated over waiting for a ride is because it reduces their leisure time and the fun. Many theme parks and amusement parks are put in a challenging situation as the sector has become more dynamic and hence to maintain its market position, the organization strives to satisfy the customers the most (Norman, 2009). Most of the theme parks or amusement park giants face a common problem which is long waiting times. Many big players such as Disney have introduced suspended reality to kill the waiting time, but still it is not easy to maintain the expected levels of customer satisfaction.

2.1.4 Service Quality in Amusement parks

Customers often visit amusement parks or theme parks, considering it as an activity. These leisure activities can be viewed as four different categories:
(a) Complete leisure: Those activities which are performed for self-satisfaction. The satisfaction itself is the primary reason for performing it.
(b) Compensatory leisure: Those activities that are done for compensation of some other work. It can be compensated for working in a firm, etcetera.
(c) Relational leisure: The activities that are chosen as involvement with companions, and it is performed to compliment others in a relationship.
(d) Role-determined leisure: Performed to meet the expectations of others. It is more of a sense of obligation.
Birenboim et al. (2013) define a theme park as 'a recreational product that combines tangible goods and intangible services'. The amusement park/theme park sector has grown a lot and has become very competitive, and many amusement parks are becoming more innovative in bringing in new attractions and services. Birenboim et al. (2013) describe that due to the quick changes happening in the environment of amusement parks, managing service quality has become more crucial. Service quality is considered to be related to three levels of products as shown in figure 2.2 (Swarbrooke, 2002; Anton Clave, 2007). These three levels of products should be understood and must be focused on, for achieving better results in service quality. The first level is the core product, which is usually an intangible product the customer experiences, and this benefits the organization/the amusement park when the customer's needs and expectations are met. The second level is tangible products, which serves as a medium to achieve the core products. Finally, augmented products are the additional services, which are considered as attractive qualities. Services such as early opening time, very spacious car parking, etcetera, do not affect the satisfaction levels of the customers even when not provided. But there are negative factors as well, such as weather, which will have an impact if the amusement park is not well equipped. Such negative factors can also be converted into benefits by providing wet-weather facilities at outdoor attractions (Milman, 1991).

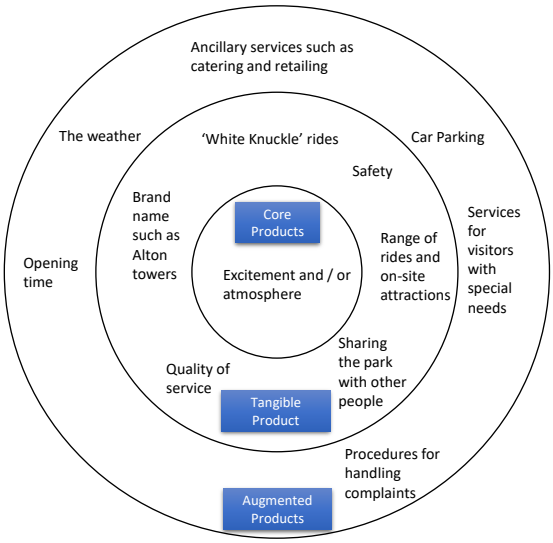

Figure 2.2: The three product model (theme park example) (Source: Swarbrooke, 2002)

Bigné et al. (2005) describe that service quality is one of the essential elements that can lead to customer satisfaction. Swarbrooke (2002) The quality in an amusement park can be described in two ways: 'as a set of outcomes' and 'as a process' as shown in table 2.1. 'A set of outcomes' is the product that the customer experiences or receives, and 'as a process' is the process that is undergone to produce and deliver the product to the customer. The table below describes the issues to focus on when looking into both aspects. The amusement park/theme park must focus on both the aspects mentioned above to gain market advantage, and equal importance must be given. Pine et al. (1999) also described that theme parks/amusement parks must not only focus on entertainment but should also keep guests engaged.

Table 2.1: Quality of attractions (Source: Swarbrooke, 2002)

As a set of outcome	As a process
The physical environment	Human resource management
The fare to use the attraction	Organizational practices
The service offered to the visitors	Advertising of the attraction
Trustworthiness in service	Supplier relationship
Customer safety	Forecasting the supply and demand
Grievance management	

Although there are numerous methods such as visitor behaviour analysis, importance-performance analysis, the number of times the services were used or the number of tickets sold, measuring emotions, and various other methods are used for understanding and measuring the service quality in the amusement parks. The methods for measuring the satisfaction levels of the visitors show many varieties in their success levels.

2.1.5 The SERVQUAL model

The SERVQUAL model, also known as service quality model, was developed by Parashuraman et al. in 1985, and it was revised in 1991. This model aids the organization to measure the gap between the customer's expectations and the services perceived. This model is widely used to measure service quality by helping organizations to identify what they need to improve to match customers expectations. Zeithaml et al. (1985) mention that there were ten service quality dimensions, which then was reduced to 5 dimensions as shown in figure 2.3, namely: tangibles, reliability, responsiveness, access, and empathy. Tangibles are where the execution of the service takes place; reliability refers to performance consistency, delivering as promised. Responsiveness is the willingness to help the customer. Access refers to the ease to obtain the information from the supplier, which can include opening hours, websites etcetera. Empathy refers to understanding the customer's query.
Based on the dimensions as mentioned earlier, service quality can be measured. For that, a questionnaire containing 22 pairs of Likert scale statements is designed. Each statement is repeated twice, the first to measure the customer's expectations and the second to measure the perceived service level. The scale is ranging from 1 to 5, where one is 'strongly disagree' and five is 'strongly agree'. The calculation based on the questionnaire is done by taking the difference between perception score and the expectation score, which will result in a gap score. If the score is leading to a positive gap, then it indicates that the expectations have been met, and if the result is negative, then it can be understood that the expectations have not been met (Zeithaml et al. 1985).

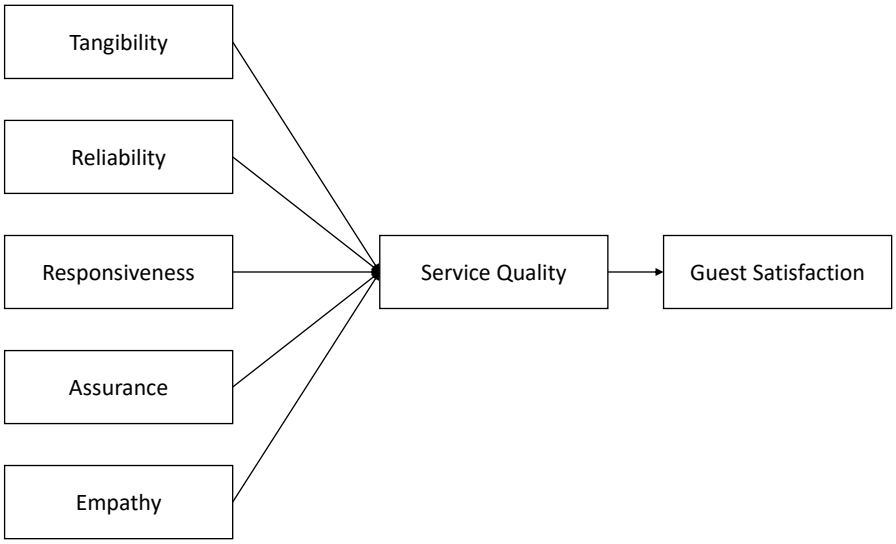

Figure 2.3: SERVQUAL model (reproduced from Zeithaml et. al., 1985)

The model is based on five gaps, which are shown in Fig 2.4, and as below:
Gap between Consumer expectation and Management perception:
This gap arises when the management or the service provider is not able to understand what the customer needs. As a result of this lack of understanding, the gap is created between what the management perceives about customer expectations and what the customer actually expects from the service.
Gap between Management perception and Service quality specification:
This gap can be seen when the service firm has already correctly comprehended the needs of customers, but has not set a performance standard in order to support the customer needs. This gap could then come up as a result of lack of resources, management indifferences etcetera.
Gap between Service quality specifications and Service delivery:
This gap is generally caused as a result of the difference between what is specified to customers according to the quality standards of the company and what the service actually delivers. This could arise due to poor employee performance or lack of proper training for staff and is created due to the inconsistency between service quality specification and service delivery.
Gap between Service delivery and External communication:
This is the gap when there is an inconsistency between what the firm states to do, majorly through its communication measures taken to convey the service to its customers, and what it actually delivers. This gap usually appears when the public relations or marketing department over promises to the customers.
Gap between Expected service and Perceived service:
It is the gap between the customer's expectations of the service and their perception from the delivery. This gap can normally occur when the customer does not

correctly understand what the service has actually provided or when they misinterpret the quality of the service provided. Pricing of the product can often lead the customers to decide on the expectations of the offered service (Zeithaml et al. 1985).

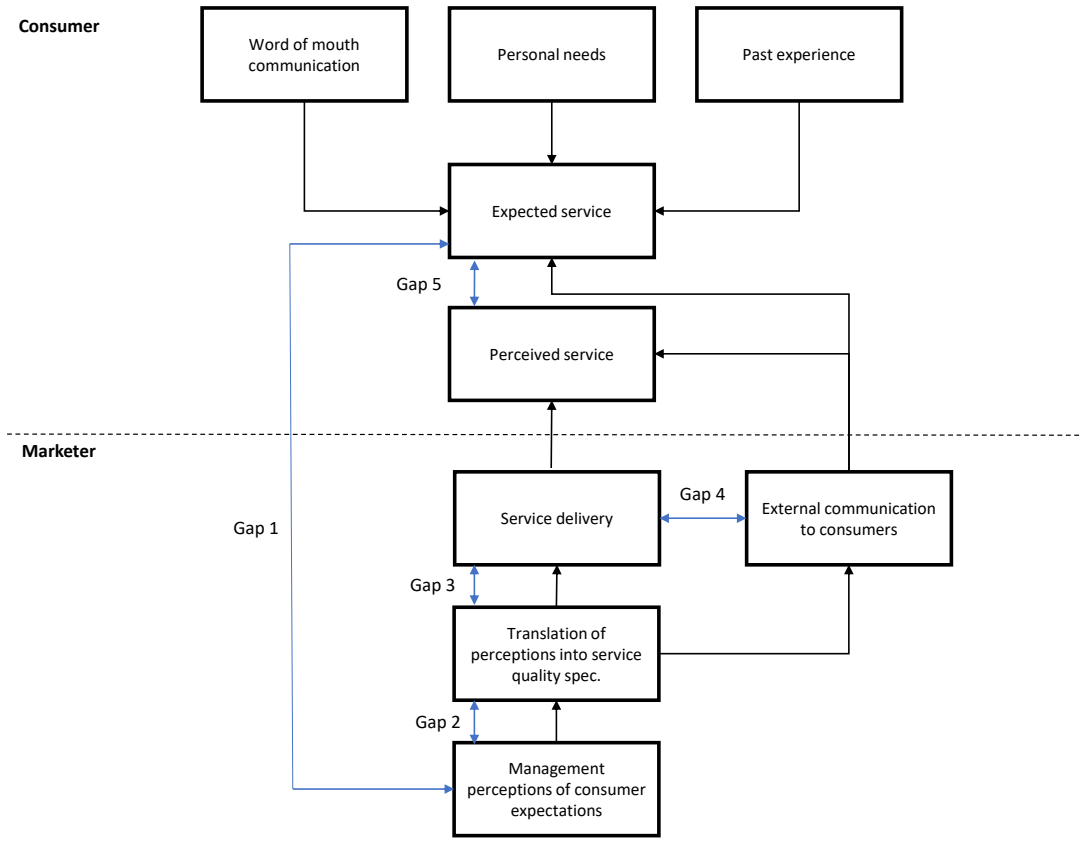

Figure 2.4: Service model (reproduced from Zeithaml et. al., 1985)

2.2 Queuing

2.2.1 Queuing process

It is a part of our daily life, waiting for our turn when it comes to services. There are countless situations as examples for people waiting in lines. We wait in a restaurant to be served, we wait at the checkout counters in supermarkets, we wait at the airport for boarding the flight, and the list goes on (Taha et al., 2004). Queues are supposed to help when a service needs to be delivered in an orderly manner. These queues or waiting lines occur when customers requiring a service arrive at a service point, just to know that he/she is behind many others who are already waiting for their turn (Agu, 2013). Generally, in a queue there are two basic elements or units. The unit demanding the service, whether it is human or a product, is referred to as customer, and the one providing as server. It is considered that the management of queues should be in such a way that is beneficial both for the ones waiting in the line to be served and also the serving one. Thus in every industry that involves queuing

for providing a service, there has been a lot of research on identifying methods to make the queue more efficient and effective (Bhat, 2015). In the early days, the studies based on queues began from one of the main research contributors, Agner Krarup Erlang, who worked for the Copenhagen Telephone Company. His works gave enormous contributions to the industry back then, when telephone calls were operated manually and had a queue system to be connected (Agu, 2013). A queue normally arises if the service required by the customer or product is not immediately deliverable by the server. The demand from the customers side can be completely dependent on external factors and can be random in nature. Based on the demand from the customers side, the server has to attend to the immediate customers in the waiting line. Adding to these, it might take different durations to serve each of the customers. This makes the availability of service also random and irregular, just like the incoming demand from customers (Sassani, 2017). Balancing the queue system has always been a dilemma for people in these industries. Generally, we see that by increasing the number of service points when the queue becomes long, and this leads to excess cost and can involve additional issues when the flow of customers' demand is irregular. This leads to the need of identifying methods that can be adapted to specific industries, where the queuing process can be balanced in terms of economy as well as service quality (Agu, 2013). The way of processing arriving customers in a queue is considered as 'queue discipline' (Berry, 2006). Among the different methods used to balance queuing processes, queuing discipline is considered as the priority rules by which each customer is served. This generally involves different methods such as 'First come first serve', 'Last come first serve', 'High value first', 'Low value first' and also random and priority based systems (Sassani, 2017).

2.2.2 Queuing Models & Theory

As described in the previous section, literatures point out that the beginning of queuing theory is from the research works of Agner Krarup Erlang. His works focused on reducing waiting time for customers of the Copenhagen Telephone Company on calls. His work which led to 'queuing theory' as we know today was intended to make plans for circuits that can help in reducing waiting time for calls (Erlang, 1909). Queuing theory which is considered as a part of mathematics and statistics, helps in studying and modelling waiting lines. Based on these studies queuing models can be developed which can help in predicting queue lengths and waiting times (Berry, 2006). Bhat (2015) describes three distinct types of factors that affect the customers in queues; Balking, Reneging and Jockeying. Balking occurs mostly in the case of long queues, when customers decide to not join the waiting line. Reneging occurs when the customer has been waiting to be served for a long time in the line, and finally decides to leave the queue before being served. Jockeying occurs mostly in the cases where multiple lines could be seen, and the customer decides to switch lines considering that the service will be delivered faster in some of the lines. The eight design principles for waiting lines described by Norman (2008) affect every individual mentally, when considered from a psychological perspective and these must be considered while modelling queues. The management team must ensure that there exists no confusion, and in order to tackle this, a model/explanation can

be provided while waiting in queues. Customers should be kept occupied which will reduce the perception of wait time and also ensure that the wait is not too long. The management must also be fair with customers. The management team must remember to start strong and end strong. Finally, the most important one is that the memory of the event is greater compared to the experience of the event.

2.2.3 The Perception of Waiting time

Being a central theme for management practitioners, customer satisfaction has become an important issue today. Customer satisfaction can be evaluated with the help of comparisons with customer's perception of competitive offerings (Palawatta, 2015). Studies conducted on waiting times have helped in understanding that perceived waiting time explains more of customer satisfaction than expectation (Davis et al., 1998). It is considered that when customers have their expectations towards a product or service, there are three levels, where the upper level is desired level, the lower level is adequate level and the zone of tolerance is in between the upper and lower (Zeithaml et al., 1993). The time duration for which the customers feel that they have been waiting in the line is called perceived waiting time (Palawatta, 20015). There are some factors on which the perceived waiting time for a customer is dependent on. Some of these are; if the customer is occupied with something or not, mindset of the customer, anxiousness of the customer, certainty of waiting time, knowing the reason for waiting, companions of the customer etc., (Maister, 1985). When it comes to the experience for customers, it involves a lot of psychological aspects as well, that leads to what these customers perceive compared to the actual waiting time. This includes that customers' reactions to waiting times will be happening in two steps; first, the objective waiting time is getting transformed into the perceived waiting time, and second, the waiting time is compared with a baseline (Antonides et al., 2000).
Objective waiting time here refers to the actual duration, rather than what customers experience, which is considered as subjective waiting time. Furthermore, it is also found that this perception of time might also be having a lot of influence from time fillers such as information about wait durations or queue length or other entertainment forms as well. It might also be noted that there is also a lot of influence of monetary costs on waiting and fillers, which can affect the evaluations further (Antonides et al., 2000). There has been a lot of research on identifying the possibilities and challenges of different kinds of fillers that are used to reduce the perception of waiting time. It is found that these waiting time fillers can affect both the perceived waiting time and also the evaluation of the waiting (Taylor, 1994). Among the different studies meant to understand the effects of fillers on waiting time, it is seen that the type of stimuli that the filler is based on, will affect the customers perception, and some researchers say that there is an optimum level for the stimuli that a filler should generate in customers during their waiting time. It can be seen that the number of stimuli and complexity of stimuli will be affecting the perception for customers. Simple stimuli, such as easy-listening music will be reducing the perception of time, whereas, a complex stimuli will make it feel longer (Antonides et al., 2000). An interesting finding from one among these research is

that if customers are aware of their waiting duration, i.e., customers having information on waiting duration will perceive the waiting to be shorter than actual (Katz et al., 1991).
This is explained by the lack of uncertainty when customers are aware of the waiting duration, and thus they feel less stressed. Thus we can see that effective usage of fillers can mostly have a positive impact on perceived waiting time. Another finding is the monetary part of waiting lines. This can increase the customers attention to the waiting duration and thus increases the negative effect on customers evaluation of the waiting duration. This shows that the feeling of higher monetary waiting cost will reduce their willingness to wait (Petty et al., 1986). Since there is a lot of unpredictability around reducing the actual waiting times, and as it is hard to control it, it is preferable to at least reduce the perception of waiting in such cases (Garaus et al., 2019).

2.2.4 Customer Satisfaction in Queuing

In order to achieve organizational goals, effective customer service has always remained as an important catalyst. This is explained by the support that a customer can provide, when the organization delivers enough of customer satisfaction. This patronage from the customer and their satisfied experiences can help the organization achieve its goals (Agu, 2013). Customer loyalty is what brings in more prospective customers, which leads to higher profit. It is thus essential to maintain the customer satisfaction in order to gain loyalty from all the customers. It is believed that offers and discount prices can bring in new customers, but it is also important to not lose existing customers, and to make the new customers come back. It is a general perception that all service oriented industries are facing this problem of long waiting lines. There is a chance of losing customers to competitors when customers wait in queues, and this queue becomes excessive. These long waiting lines can be bad for business, if the organizations are ready to spend some money on improving the customers experience with waiting lines, it will be money well spent (Winston et al., 2001).
Our experiences in these waiting lines are significantly affecting our perceptions of the quality of these services. When we receive the service, even though it can be efficient, courteous and complete, our thoughts on how long it took them to serve us can make our perception of the experience quite bitter. Most of the research on queuing has been on queuing disciplines, models and methods to speed up queuing, but the experience of waiting is mostly neglected. When evaluating queues in an industry, it generally involves queue length and service quality. But, it is very important that the experience of the customer waiting in line is also an important factor to be measured. It is time for industries to learn how to influence the customers' feelings about the time for which they wait in queues (Maister, 1985).
Depending on the way these waiting lines are managed, i.e., based on the ways in which customers are kept engaged, some waiting lines can feel extremely long for the customer, even if the actual duration was short. In order to address this issue, most of the service providers make use of the method of using fillers. But, even in this case, it is important that the most appropriate type of fillers are used, as the wrong

ones can make the situation even worse. As an example, engaging customers in a restaurant with the menu or something related to food can turn out to be beneficial for the restaurant while the customer waits for food. But, the music played on the phone while customers wait to be connected to service centers can be quite annoying and might make the customer feel that the wait is long (Maister, 1985). In order to increase the competitiveness, these service industries should definitely focus on providing a better experience for customers, thus improving customer satisfaction. As a part of research, in order to determine customer satisfaction in queues, Kalló et al (2011) describes two parts for satisfaction levels. Out of this, the first is independent of the waiting time, and is interpreted as the initial satisfaction levels which is dependent on the customer's expectations. The second depends on the waiting time, and longer waits cause lower satisfactions. As a part of their analysis, Kalló et al (2011) identified that limit value is one of the major factors that influences waiting time, and this can also be easily controlled by the management. Limit value here means the number of products or services that a particular customer seeks at a time. Based on this limit value, customers can be differentiated into regular and express waiting lines. How this is differentiated is upto the management by the organization. It can be by placing customers buying more items than a particular amount into regular queues and the rest into express queues, which may include a premium, or can be vice versa as well.
When customers know that the service is valuable to them, they will naturally be ready to wait a bit longer. As described above by Maister (1985), using fillers can be a good method to keep customers engaged while in queue. He also says that these fillers should be apt for the service, since the wrong choice of fillers can make the wait feel longer. Another important factor that supports the use of fillers that is related to the service is that it can give customers a sense that the service has started. This is explained by his thought that pre-process waits feel longer than in-process waits. Pre-process wait here refers to the situation where a customer is waiting to be contacted by the service provider. Anxiety also plays an important role here, since the feeling that 'if I had been ignored or forgotten' by the service provider can create anxiety in the customer. Anxiety can also be a result of the general feeling that 'the other lines are moving faster than mine'. It is thus important for service providers to know what causes dissatisfaction and anxiety in customers. Customers should be asked about what causes the worry in them, and thus the service providers can work on improving those areas. A good example which shows that there can be many factors that lead to worry in customers, as portrayed by Maister (1985) is the situation at the airport waiting lines. Here, we are worried that if our ticket would be valid or not and if we would be able to board the flight. At the same time we are also worried about whether we would get our ticket money refunded if the ticket is not valid. Thus there can be several reasons for anxiety in customers and service providers should try to understand them in order to provide a better experience and thus improve customer satisfaction.

2.2.5 Digital Queuing

Wang et al (2016) mentions two scenarios of queuing systems. These are the 'waiting-in-line' scenario and the 'ticket-holding' scenario. Here they can either wait for their turn in a line, following a walking-standing-walking pattern, or they can obtain a ticket from the ticket management system and wait until their turn comes. Since it became quite evident that long waiting lines create a lot of dissatisfaction in every service industry that involves a queue, there has been a lot of research on identifying the parameters that determine the satisfaction or dissatisfaction in customers. Among these, some of the major findings were awareness of the wait duration, their level of comfort while in waiting lines and knowing if they are left unattended or not. This led to the effort to identify methods of managing queues which can let customers know about their queue status, thus improving their experience while waiting (Davis et al., 1994). There has also been studies on the effects of offering a time guarantee to the customer. Kumar et al (1997) has identified that letting customers know that they are served within a certain time and compensating otherwise will improve customer satisfaction. Research in this field has led to the use of automated queue management systems in different service based industries. A lot of banks, hospitals etc., are using automated queue systems, and have found that this makes the experience for customers a lot better (Ghazal et al., 2016). When using these queue management systems with time predictions, one problem identified was that customers draw more than one ticket, as a precaution to not lose their position. This can make the system count more tickets and thus making the overall waiting time prediction quite long than what it actually should be. Another problem identified was that, even though customers know their waiting time and the time at which their turn comes in, they tend to be at the location quite early in order to get a feeling of secured position. This normally creates some hassle around the location and makes it hard for the management to plan for space, and also creates loss for the service provider since the system can say there are no tickets available, when someone is trying to book. It is also found in studies on remote booking service at hospitals, that the system does not consider missed bookings, late arrivals and the variations in duration for each patient's consultation (Ghazal et al., 2016). There is a lot of research going on, in order to tackle these issues and many of the resulting findings are based on the use of mobile apps and the support of latest digital technology. One among them is the use of sensors to determine the progress of queues and uses it real time to give updates about the queue. In the current era of mobile phones with different types of sensors loaded into them, it gives a lot of possibilities for real world sensing and queuing improvement measures. With the use of these sensors, it is possible to completely automate the process and if developed correctly it can also be helpful in adapting to different queue patterns and changes in flow of people. This can help in keeping customers aware of their queue position and the waiting time, which helps customers to arrive at the service station just at the time specified, instead of arriving early and having to wait in long lines (Wang et al., 2016). Thus digital queuing offers possibilities for a lot of improvements over the conventional queuing system, both for the service provider and the customer. These include providing high quality customer service, reducing dissatisfaction in customers, speeding up the queue, being able to attend to all the

customers at the same time, obtaining valuable data for statistics which can be used for further improvements, and a lot more.

2.3 Implementation

2.3.1 Implementation Strategy

For any organization, it is very important to develop strategies in order to improve their processes or to take their business to further heights. A strategy involves a lot of elements that can take the organization towards its overall goal by setting broad objectives. This involves a lot of planning and dealing with the total picture, taking the organization to better performance and making it more competent (Slack et al., 2011). The overall idea of strategy creation might seem quite straight forward, like creation and implementation. Most organizations believe that when bringing up something new, its technical superiority and strategic importance will lead to its success, and then allocate resources for that. Thus it leads to a gap between the value of the technology and its effectiveness (Harvard Business Review, 2020). It is found that even when the same technology is implemented in different organizations, there is enormous difference in its success in each of these organizations.
This is explained by the difference in implementation methodologies taken by each of these organizations (Comin et al., 2007). But, if the implementation goes wrong, even the best of best strategies would turn out useless. A proper implementation of strategy is always a good iteration between planning and what should be obtained in reality. This involves elements such as communication, interpretation, adoption and action (Aaltonen et al., 2002). For a good strategic management of any project, the most important elements are strategic planning, strategic implementation and strategic control. Out of these, it is shown that the most important part is the implementation and it is also the most underestimated one (Mišanková et al.,2014). A proper implementation should satisfy the needs of the user as well as the developer and the easiest way to do this is by marketing with research on user needs and preferences (Harvard Business Review, 2020). The productivity and acceptance of a new technology is moreover determined by the effort put into its implementation. But this might also take some time and happen over time, where the productivity meets the expectations (Comin et al., 2007). Thus it can be seen that better implementation will always make new technologies more productive and this will also help in being accepted by users at a faster pace (Comin et al., 2007).

2.3.2 Pilot Study

In order to evaluate the possibilities and risks of a new project, a pilot test can help in understanding the feasibility of the project. A pilot study which is usually defined as a small scale study of the project helps in preparing for the larger project. The results from a pilot study can help in planning and modification of the main project (In, 2017). Most big projects can have many rounds of pilot studies, and this might comprise both qualitative and quantitative elements. It can start with qualitative evaluation among the researchers and then move into the quantitative

part using the results from the qualitative analysis (Tashakkori et al., 1998). Thus a pilot study is an essential part that can provide clues on several things that we might not even think of while implementing the project.
This reduces a lot of unanticipated risks and helps in redesigning or re-planning the project. In many cases, a pilot study can save time and money as it can provide data with which we can decide whether the main project can be productive or not. The beginning phases can include studies based on focus groups or in-depth interviews which should address issues regarding the implementation. This can be of great help in uncovering issues regarding the local politics that might possibly affect the main research (Van et al., 2002) .
A pilot study should be designed in order to guide the main project and should have similar methods and procedures that can yield valuable data to support the main project (Connelly, 2008). This so-called pre-testing or feasibility studies can not only help in identifying risks and possibilities, but can also be used as a medium to convince the funding bodies by showing how the main project can be beneficial and is worth funding (Van et al., 2002). Generally in research projects, the participants in the pilot study are not involved in the main research study in the concern that it would affect the results since they are already aware of the study (Van et al., 2002). But, this depends on what kind of study it is, and in the case of a pilot study intended to test the receptivity of a technology, this might not be true, and it can be easier for the participants to adapt. There are also some problems associated with pilot studies. Making inaccurate assumptions or predictions based on the results from pilot study is a major issue. Along with this, there can be problems of getting the pilot study contaminated and also related to funding. Thus completing a pilot study successfully might not be a guarantee to having an effective main research, if the above mentioned problems are not taken care of (Van et al., 2002).

2.3.3 From Pilot study to Full Scale

When doing a pilot study it is important to identify the most favorable strategies and marketing plans for full scale implementation and this can help in reducing time and effort to efficient marketing (Kaniappan Chinnathai et al., 2018). When using pilot study in order to move into full scale implementation in future, it is important to have solid plans for using feedback, keeping track of processes and plans and also proper documentation of what needs to be changed when it comes to full scale implementation (Van et al., 2002). Once the pilot project is reaching towards its end, an important concern is not to lose the know-how developed during the study, and to transfer it to day by day routines and procedures (Boscherini, 2011). In order to address the possible problems that could arise during the transition into a full scale implementation, a pilot project helps in identifying the best strategies to make the transition smooth and reduce risks (Turner, 2005). A pilot project should be a part that can support in the transition, and this can be defined into three phases such as conception, realization and transfer of results (Boscherini, 2011). When pilot study is done in the case of an innovative project, the background and environment is very important as it should be possible to execute the daily operations flawlessly, and at the same time it should be put into possible metrics and used to learn for full scale

implementation (Lynn et al., 1996). Since the implementation of a new technology can affect both external and internal environments of an organization, both internal and external views of the new technology should be considered in order to market properly (Chesbrough, 2003).

2.3.4 Implementation of Digital Technologies

In these recent years, most of the companies are stressing themselves on the implementation of digital technologies. This is because of the fact or belief that digital technologies can improve the company's efficiency and at the same time have a strong hold on the customers. But, an important concern here is that if people lack the mindset to adopt the new technology, or if the organizational practises are not proper the whole blame can be on the new digital technology (Tabrizi et al., 2019). It is obvious that digital technologies can help in improving efficiency, flexibility, cost effectiveness, speed and enhanced customization (Dalenogare et al., 2018). In a study for analysing implementation of digital technologies for automating the teaching process, it was evident that it was not possible to support the educational process since the level of human-computer interaction was not in the boundary of the natural teaching process (Svetsky et al., 2016). The main factor that supports this argument was identified as the continuity of knowledge or information transfer, that for students they should be able to get information in a continuous manner and in the case of automation with digital technology this was hard. Thus, while developing a new digital technology immense effort should be put into understanding how customers would like to use this technology and how beneficial this could be for the customers. In a study based on digital manufacturing technologies, it was identified that a successful implementation of these technologies should always be supported by the external environment, and should be supported by relevant organizational structures, internal work practices and also the stage in which the organization is technologically positioned (Gillani et al., 2020).

2.3.5 Organizational changes

By the end of the pilot project, where the things get close to full scale implementation, it is quite evident that firms introduce some kind of organizational changes internally, and also develop some processes in order to adapt to the new system easily (Van et al., 2002). In general, there can be seen new roles within the pilot testing group, such as gatekeepers, where people work on innovation scouting activities and also innovation champions who take care of administrative part and also streamlines the progress of projects (Van et al., 2002). The role of an innovation champion can evolve from that of a project manager to that of a project leader, and they act as real change agents. This role leverages the resources with a cultivational mindset, rather than a command or control type (Orlikowski et al., 1997). This helps in developing a favourable environment around the project in order to develop a mindset that makes people ready to adapt into the change and also helps in keeping the responsible personnel involved in the project. In most cases of pilot studies, there will be a need to develop a team for knowledge management, especially in the case

of technology based projects, as these can lead to open innovations which could then be patented. In some cases it might be possible to make benefit of this, as these knowledge can be tradable for profit, which in fact might change the mindset from innovation to profit (Enkel et al., 2010).

2.4 Digital Queuing in Different Contexts

As long waiting lines have been identified as a big contributor of dissatisfaction in customers of many service based industries, at least some of them are aware of the possibilities and benefits of digital or automated queuing systems. Below are some contexts where digital queuing has been implemented, and describes how digital queuing improves customer satisfaction in those industries. Even though the way these queuing systems are used in different industries, this can give an overall idea of how it works.

2.4.1 Digital Queuing in Hospitals

Hospitals play a very significant role in society, as a service sector. It is one of the fastest growing sectors due to the increasing population, and thus the number of patients that visit the facility is also increasing. Hence, to get diagnosed/treated by the doctor, patients have to stand in a queue. Most of the countries face issues in managing queues in hospitals.
Ngorsed et. al. (2016) conducted a research in a hospital in Thailand, and it could be noticed that there was inconvenience to the public with the waiting time. They proposed an alternative system to manage the queuing to reduce such inconveniences. The function of the current queue management service, that was provided by the management, was a queue card system where it displays a number according to their arrival to the facility. Although it guarantees a spot to visit the doctor, the patients must wait until they have been called upon. Some of the modern hospitals also have an automated voice system that calls out the numbers, but the drawback of such a system is if the patient is unavailable during their turn they might miss their spot to visit the doctor. The new approach was a new queue management tool that functions wirelessly. This system allows the patients to get the information about the expected waiting time and it allows each patient to know what is their status in the queue. The major advantage is that it allows the patients to access the information remotely, using their wireless device. This system almost eliminates the perception of waiting time, and acts as an efficient way to administer the data of patients.

2.4.2 Digital Queuing in Banks

Being one among the key service sectors and an important unit of the public, banks have always been trying to make their services better and better with the use of latest technology. This helps in utilizing the full advantage of the service, and thus increasing customer satisfaction, and also making the banking services more efficient. Research has been and still is going on to understand the queuing process and its

patterns, thus, making their operations more optimized and improving customer satisfaction (AL-Jobori, 2011). Ahmed (2016) describes a generic queue management system used in banks. This system consists of a screen and an automated queuing system. When the customer requests a service, which is specific according to their needs, the system generates a ticket with a token number, their service counter and the estimated waiting time, which will be shown on the screen. The system uses data from previous service requests from other customers and uses an algorithm to decide an approximate waiting time. This is based on the differences in service duration required for a variety of services and also according to data that is deducted from different groups of customers. This helps the customer to be relaxed instead of thinking about when their turn comes. They do not have to worry about their position in the queue and can have a satisfying customer experience. Further studies found that the waiting time had reduced after implementing the new system, compared to the old normal queuing system. The author proposes an addition of sensors and cameras in order to update the queue status more efficiently and effectively contributing to the system for deciding more accurate waiting times. AL-Jobori, (2011) explains in their article, another way of using different algorithms to predict waiting times in banks. The proposed queue management system checks the queue status and iterates among different algorithms to find the best suitable one which can predict the most accurate waiting times or queue positions. It was seen later that the new system reduced the waiting time when compared with the traditional queuing system. It is said that the new system will help the bank to deal with all customers fairly and will offer hassle free performance of the operations.

2.4.3 Digital Queuing in Amusement Parks

Disneyland's popularity is increasing and hence the number of visitors that visit the theme park are increasing every year, and this has an impact on the waiting time to enter the ride. Disneyland majorly has fastpass and the Six Flags Parks have a system called Lo-queue. Former one is where the visitors are given a paper ticket at the arrival to the facility, which is time bound for about an hour, this paper ticket aids the visitors in placing themselves into the virtual queue. The latter one is where a hand held device/wristband is given to the visitors at the arrival, this device consists of an RFID which enables them to add themselves into the queue, this device also notifies the user when it is time for the ride, unlike fastpass this allows the user for multiple entries and also can prioritize in the queue, these two services help the park in normalizing the demand. In 2019, Disney has introduced virtual queues for a ride 'Star wars: Rise of the resistance', this system enables the visitors to place themselves in the queue not physically but rather on a system. Visitors are separated in the form of groups and such groups are termed as boarding groups. This system notifies all the users who place themselves in the digital line, about the estimated time to visit/enter the ride, this system is more specific when compared to other alternative services offered by Disneyland such as the fastpass system. On the other hand, implementing such a system results in lowering the capacity of the facility which forces the theme park to develop on rides, and other attractions (Bloom.S, 2014).

Universal offers services for the visitors to avoid long queues, which they have classified into three options; standby, virtual and express pass. Express pass provides the visitors to bypass the waiting line on any attraction. The visitor that buys express pass receives a barcode that shall be verified during the arrival and they are permitted to the express line, also known as fast moving lines. They also have a product called Ubot which can be rented, and this displays a message when the visitors have added themselves on to the waiting line. There are other products as well which are wearable and are given during the arrival. This device is also used to put themselves on a ride, and it displays a message "time to ride". This system allows one reservation at a time ensuring equal opportunities for all the visitors (Universal studios, 2018).
Six flags magic mountain also have similar services that allow the visitors to add themselves into the virtual queues, they have three service levels and the priority levels vary with the type of pass that the visitors possess. The first is the regular pass, and this pass provides one high demand ride and unlimited reservations for other existing rides. The second is called gold pass, and this pass allows the visitors to reserve for two high demand rides and reduces around 50% wait time. Finally the platinum pass provides reservation of four high demand rides and it reduces around 90% wait time, these reservations can be made by the hand held device that the park provides to all the visitors.
Legoland in the UK have also adapted to virtual queuing which provides the opportunity for visitors to be free from standing in line. It is based on FCFS (First come, first serve), the rides can be reserved using their device and this allows the visitors to take a breather. This system is similar to that of Disneyland, it also provides the information on the ride time, the estimated wait time (Legoland, 2020).

2.5 Ongoing Research and Developments in Digital Queuing

Even though there is a lot of research going on to reduce queue length or waiting times, queues are definitely an essential element in making operations smoother and disciplined, and will also help with planning the activities. The major concern now is the efficient use of latest technologies, in order to make the queuing process more efficient and hassle free. From a lot of research as mentioned in previous sections, knowing the waiting times in queues can help in better planning and also helps in increasing customer satisfaction. Automated queuing based on a ticket system, where customers request for a particular service and the system generates a ticket with an estimated waiting time has already been proven beneficial in sectors like banks (Ahmed, 2016). Some researchers have worked on the use of latest technologies that are integrated into mobile phones in order to collect more accurate data that will help in improving the queuing process.
Wang et al (2016) describes that the traditional way of accurate queue evaluation with the help of cameras and infrared sensors is not so efficient and is a lot of investment to get it working right. Wang et al (2016) in their article, proposes a mobile based crowdsensing system, CrowdQTE, where the sensor loaded mobile phones are

utilized to evaluate queues and provide real time updates. The proposed system makes use of the accelerometer sensor which detects motion and then connects it with ambient contexts to automatically evaluate the queuing behaviour. The initial study was for two weeks using some of the commercially available smartphones, and the results showed that the new system was very effective in determining queuing status. Ghazal et al., (2016) proposes another system with the help of mobile based technology and Internet of Things (IoT). Here the customer gets an application and then they can be in the queue by tapping their NFC enabled phone on a registering unit. A QR code scanning option is also available if NFC is not available. Once this is done, they can either leave the waiting area or can look into the entertainment options, magazines, TV streaming or games in the application. When they are ready to be served, a notification is sent to their mobile phones, with their ticket details and serving counter. This system involves the use of geofencing with the help of Global Positioning System (GPS), where the customers are supposed to be within a specific radius of the service point, in order to avoid false bookings. They also state that the use of geofencing will be helpful in making the dynamic time prediction algorithm more accurate, as the system can understand how long it will take on average, for a customer to arrive into the service point from their current location. Customers will also be able to swap tickets with this system, in necessary cases, such as in a situation where someone feels they might not make it on time. Thus customers who are onsite can get their service delivered faster in such cases, without any extra expenses. The overall effectiveness of queuing and its operational performance will definitely be improved with this proposed system. Rinne et al., (2016) mentions that while using GPS based geofencing and location based services, it is important to see through the challenges such as the phone running out of battery and errors and delays in reporting locations. Thus it is quite evident that the right use of the right technology can definitely help in reducing waiting times and in providing a better queuing experience for customers.

3

The Case of Liseberg

The subject that is focused in this case is related to the implementation of digital queuing system at Liseberg, which is one among the leading tourist attractions in the Nordic region. With around 3.2 million visitors annually, Liseberg is working towards the improvement of customer satisfaction, which is hindered by the long waiting lines in front of rides. Once the visitors enter the park, they need to buy tickets for the rides that they are interested in. A major part of customer dissatisfaction comes after this point, when they buy the tickets. Most of the customers have no means to know how long it takes for them to enter the rides, neither to know when is the exact time at which they can enter the rides. This results in visitors crowding in front of rides, as they do not have any idea of their ride times. These long waiting lines have resulted in customer dissatisfaction over the past years. Liseberg has been conducting surveys to identify the levels of satisfaction for visitors among different categories as shown below in Fig 3.1.

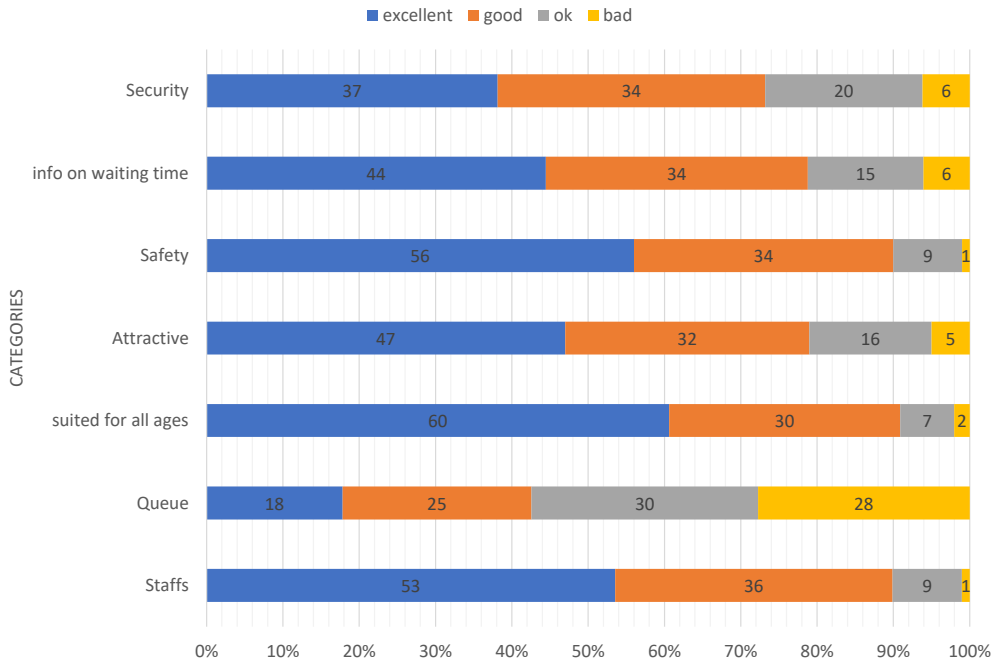

Figure 3.1: Customer satisfaction (Source: Liseberg)

It can be seen from the figure above that the highest levels of dissatisfaction is seen in the category of queuing. Over these years, Liseberg has been working on measures

to improve the queuing process and thus develop customer satisfaction. The IT department at Liseberg has developed a digital queuing system in order to tackle this issue of long waiting lines. This new queuing system works with the help of a mobile application and also through the official website of Liseberg. The ticketing system has also been changed compared to the previous years. Now the visitors can get an all in one ticket at the entrance instead of individual tickets for each and every ride. Once the ticket is bought, visitors can use the mobile application or website to book the rides of their choice. The system then estimates a ride time for that particular booking, which is estimated based on previous bookings for the same ride. Thus the visitors can come to the ride at the specific ride time mentioned in their booking. The mobile application system notifies the visitors just before the ride time as well. Now with this new booking system, visitors are able to know how long it will take for them to enter the ride instead of waiting in long lines in front of the ride without knowing their ride times. Visitors can utilize this time to experience the other attractions in the park, visit restaurants or anything else of their choice. With the help of this, a lot of customers can be served with very less time. In case if someone is not able to book rides through the application or through the website, Liseberg also provides an option of buying a printed ticket at specific booking counters.
The main challenge that Liseberg is facing is on how to make visitors adopt the new queuing system, when there is a general perception that people in Sweden love to stand in lines. Customers who belong to older age groups might not be so willing to change when it comes to using the mobile application for booking rides. There are many other accompanying challenges with the implementation of the digital queuing system. Apart from the challenge of making visitors adapt the new technology, when Liseberg is still providing printed tickets, there is a challenge for changing ride times for those visitors with a printed ticket, in case of breakdowns or maintenance. Another challenge is deciding the number of queues that customers should be able to book at a time. Currently, the system allows customers to book only one ride at a time, and they need to wait until that ride is completed in order to book the next one. So in case of a breakdown or maintenance, the ride time is postponed and a notification will be given in the mobile application, but customers are not given an option of booking another ride instead of the one under maintenance. Another challenge related to maintenance issues is to see what happens in case of a breakdown in the last round of the ride, as the park is not supposed to stay open after a specific time according to the government regulations. Liseberg believes that with the help of the new system, bookings can be limited and thus they can spread out people among different rides, instead of everyone waiting for the most popular ones. A pilot study was planned at the beginning of the implementation process, but due to the Covid-19 situation, changes had to be made. Initially, the pilot study was planned only on one particular ride, which is called Underlandet. The reason for choosing this ride as a pilot project was that it was intended for kids and there would be parents who wait stressfully in lines for a long time. Because of the Covid-19 situation this plan was dropped, and the digital queuing system had to be implemented in 15 rides, so that visitors do not have to take the risk of getting infected while standing in waiting lines.

4

Methodology

This chapter describes the research methods used for the thesis and it also presents various methods that were used for gathering data. This chapter ends with the ethical considerations and elements of research quality.

4.1 Research Design

A combination of both quantitative and qualitative data has been used in this research. Because of this the research was conducted with the help of both inductive and deductive approaches. A deductive approach is where a theory is used to derive observations based on that theory, and an inductive approach is the other way around where a theory is derived based on observations (Bryman and Bell, 2015). Qualitative data was extracted through the inductive approach by conducting interviews of members in the project team. Deductive approach has been used in order to compare the findings from the inductive methods. Deductive approach was taken with the help of surveys, which were sent out to customer groups. The combination of these two approaches helped to complement each other and thus providing good understanding and inferences about the case. The deductive approach helps in deriving a theory and the combination of inductive approach helps in testing the observations against the derived theories (Eisenhardt and Graebner, 2007).
A case study design has been followed to conduct the research. Bryman and Bell (2015) explains a case study as an intensive and detailed analysis of a single case, being concerned with the specific nature and complexities of the case. Case studies can be employed to do both qualitative and quantitative research, even though it is mostly associated with qualitative studies (Bryman and Bell, 2015). The case study has been taken through both idiographic and nomothetic approaches, where the study and findings focus specifically on the case in the former, and on a more general way in the latter. The case chosen was having a change process undergoing parallelly with the research, and this helped by providing a good opportunity to learn and suggest improvement measures. As mentioned by Stake (1995), instrumental case studies are those where a particular case is being focused in order to explain things in a broader perspective and to see how it differentiates itself from a generalized view. This approach of an instrumental case study has been followed in order to see the peculiarities of the case under research and also to understand what can be carried over to more generalized areas. Various methods have been followed in order to support structured observations, official statistics and to analyse information obtained from the stakeholders. These methods are described in the following section.

4.2 Research Method

According to Bryman and Bell (2011), research design helps the researchers in structuring the thesis better. This chapter explains the methods and procedures used for collecting data and evidence for analyzing the issue under study and to uncover new information.

4.2.1 Literature Study

Bryman & Bell, (2011) describes that literature study aids researchers in creating or developing the existing research. This also helps the researchers in adding the knowledge, thereby enhancing the existing methodology. Literature study also opens up some new tools that can be useful for the research. It provides a strong justification to the research questions and helping the researchers in clarifying the subject. Fig.4.1 portrays the five step method which can aid in obtaining a strong result for a literature study. This research has followed these five steps to develop the literature study.

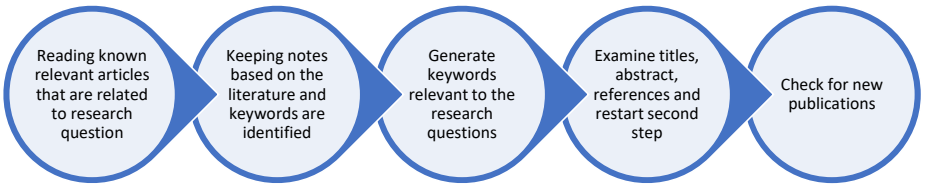

Figure 4.1: Five step method (Reproduced from (Bryman & Bell, 2015))

The foundation of this study was based on literature study, and in order to gain basic understanding of the topic, the review was conducted in a semi-structured way. This has helped in increasing the understanding of the topic. The study was initially based on keywords such as, queuing, surveys, customer satisfaction, SERVQUAL model, service quality, implementation, digital technologies, pilot studies and amusement parks. This gave an opportunity to understand the gap in the academic and actual practices. Google Scholar and Chalmers university library website have been utilized as the main sources for relevant books and academic articles. A snowball sampling method was used as an additional strategy where the references from relevant papers were used to obtain more relevant content (Bryman & Bell, 2011).

4.2.2 Interviews

Bryman & Bell (2015) argues that absence of errors such as poor worded questions and unclear questions must be ensured prior to the interviews. Also, errors in recordings must be avoided, such as choppy audio which makes it difficult for the interviewee to understand and must be taken care.
The method that was used here was purposive sampling, where the participants selected were directly related to the project who are from different functions within the

Table 4.1: Interviews

Sl.No.	Designation	Purpose	Duration
1.	Head of attractions operations	To understand the purpose and reasons behind the change towards digital queuing system.	90mins
2.	Marketing /Newsletters	To plan on sending out the questionnaire and strategies to obtain maximum responses.	30mins
3.	Online Specialist	To understand the functionality of the digital queuing system and the mobile application.	60mins
4.	Personal coordinator/Arbetsledare	How the new system would affect the current setup and what kind of changes would it bring in.	60mins

organization. A purposive sampling/selective sampling is where the authors choose the participants that align with the research goals. The whole project team consisted around six to ten members, but there were only four that met the authors' requirements and were interviewed. The interviews were conducted via Skype/Microsoft Teams which were semi structured and the duration ranged from 30-90 minutes. The interview questions were sent out to participants prior to the meeting. The style of questioning is most often semi formal and there is no fixed sequence or phrasing of the questions compared to a structured interview. The purpose of the interviews were for the authors to understand about the technology, its implementation and major changes happening as shown in table 4.1. These interviews also gave insights about Liseberg and the way the technology is being perceived by the interview participants. As the interviews were semi-structured, there was room for asking follow up questions based on their responses which gave more insights about the project. Some of the participants were interviewed several times for deep understanding. The interviews were audio recorded and transcribed within 24 hours (Bryman & Bell, 2015).

4.2.3 Questionnaire

Bryman and Bell (2015) argues that using questionnaires as a method of gathering data is cheaper and quicker to administer, the interviewer effect is absent, and it also gives convenience for respondents to answer. This method enables the researchers to

ask questions directly regarding the research questions. (Snijkers & Ebrary, 2013) argues that the respondents must be made comfortable and made interesting for them to complete the survey, hence beginning the survey with closed questions makes the respondents comfortable. The questions must be written in layman's language as not all respondents are not from a similar background (Dillman, 2000).
Length of the questions play a major role for the respondents to answer more effectively. If the questions are too long there is a high chance of low response rate or high chances of choosing neutral option in scale based questions. This is also applicable if the surveys consume more time. It is also necessary to not gather more demographics data, as this creates a discomfort for the respondents and they may tend to feel that their identity may be revealed (Hippler et al., 1987). Pre-testing the questionnaire must be conducted to know whether the respondents understand the questions asked. Researchers should select a group of five to ten people and the questionnaire must be sent or researchers can also be present with the group to obtain live feedback. The group must focus on whether the questions contain any unfamiliar words, clarity of questions, typo-errors, or any other error. The received feedback must be rectified before sending it out officially (The Pennsylvania State University, 2016).

The researchers main concern was to determine the customers' behaviour towards new technology and the best way to reach them was to circulate the questionnaires that addresses the research questions. The questionnaires were designed in a way where it was divided into 5 segments namely; Demographics and general data, Customer behaviour towards queues, Customer satisfaction, Features of the new technology and the final segment focused on time perception. As this technology was not experienced by the customers at the time of the study, a detailed yet concise description was mentioned about the technology which provided them an opportunity to picture themselves in the situation and understand how this new technology will influence them. A tailored questionnaire was prepared and was supposed to be sent out to selected customer groups by Liseberg. But due to the pandemic situation, the regulations from the Swedish Government did not allow this. The questionnaire was then circulated among the colleagues and connections around Gothenburg, which consisted mainly of an international population along with Swedish nationals. Unlike interviews the survey was close ended questions which generated accurate results based on their experience.
The questionnaire began with an introduction informing the purpose of the survey, and the estimated time to complete. The first segment consisted of general data and demographic questions such as, age, prior visits to Liseberg, with whom they usually visit, which season they prefer to visit, which ride they felt had the longest wait time, residential status and previous usage of Liseberg app. The questions from segment two to segment five were designed in likert scale format with the options ranging from 'strongly disagree' to 'strongly agree'. The second segment focused on respondents' behaviour towards queues, the third on customer satisfaction, fourth towards the features of the technology under study and the final segment focused on time perception. The number of questions for each section varied from five to six questions as too many questions will result in high disengagement towards the survey and hence resulting with less accurate answers. The questionnaire was cre-

ated on google forms and was tested among peers and once it seemed error free, the final version of questionnaire was circulated via social media such as groups on facebook, whatsapp and LinkedIn, in order to obtain a wide spectrum of respondents. The quality of answers could vary as it is difficult to predict the honesty of the respondents. Since there is a possibility of respondents skipping some questions, all questions were made mandatory. Using likert scale methods the respondents can express their thoughts by agreeing or disagreeing to the statements.
Once the results from the customer survey was obtained, another version of the survey was created and sent to the management team at Liseberg. This was focusing on service provider perspective i.e., service offered by Liseberg to customers based on the current system and also to see how Liseberg has understood their customers behaviour.

4.2.4 Ethical Consideration

In the ethical perspective, Greener, S. (2008), argues about the key themes and strategies which are to be anticipated, namely participant anonymity, informed consent and objectivity. Bryman and Bell (2015) also focuses on four areas namely; harm to participants, lack of informed consent, invasion of privacy, and deception. Hence these criteria became the utmost priority before the conduction of research and gathering of data. Bryman and Bell (2015) also states; for an interview the ideal approach would be to video record the interview and transcribe later.
The selection process of the participants for the interview was based on one criteria, being directly related to the topic. The participants were informed about the research goals and the purpose of study. All the interviewed participants' were informed well in advance about the anonymity, informed consent, and how the gathered information will be handled and stored. The selected participants were informed prior about the interview and the semi-structured interview questions were sent out in advance. As the authors were not able to video record the interview, they were audio recorded and transcribed later with the consent of participants. The information obtained from the interview shall remain secret and shall not be shared with any third parties.

4.2.5 Trustworthiness

Reliability and validity are to be addressed while conducting a research as they constitute the set of measures for the quality of research. Reliability is the consistency of measures and validity refers to the measurement of the right elements that needs to be measured and hence the interviewee that were chosen were closely related to the project and had enough knowledge about it with respect to their domain. To determine reliability and validity of the study, there are four aspects that need to be addressed, namely credibility, transferability, dependability, and confirmability (Bryman and Bell, 2015). Credibility is associated with the integrity of the study, literature reviews, interviews, surveys and secondary data analysis to show that the obtained information is credible. Together with these gathered information the con-

clusion of the study made is also subjected to credibility. The data gathered from interviews were later verified with a survey, which contributes to triangulation. The conducted interviews were recorded which helped the authors to validate the findings with other involved team members from the organization (Bryman and Bell, 2015). Transferability refers if the findings can be applied in different settings or a similar event. The conducted study by the authors focuses on amusement parks on a general level but is not limited to any particular setting and it can be generalized in various areas where it could be applicable. This study can be applicable outside Sweden as well, by taking cultural differences into account. Confirmability refers to the ability to demonstrate that the data gathered is not biased. The chapter 5 that is presented is in its entirety. All the data gathered via interviews provided the authors to have an objective view and is not biased. Dependability refers to the constancy and reliability of the data over similar conditions, and to ensure dependability the supervisor from Chalmers and the project sponsor gave continuous feedback and evaluation on the work (Cope, 2014; Bryman and Bell, 2015).

5

Findings

This chapter shows the results that were gathered from interviews and the survey. The primary information is obtained via questionnaire and is believed to contribute well in this research. Suggestions and discussions in the following chapters are based on these findings. The chapter begins with the demographic details of the survey participants and then the following sections focus on Customer Behaviour towards Queuing, Customer Satisfaction, The mobile application, and Time perception.

5.1 Visitors' perceptions through survey

5.1.1 Demographics

The questionnaire was sent out via social media and it covered a wide range of audience from different age categories. In a period of three weeks there were 73 responses received. Around 97.3% live in Sweden and the remaining 2.7% does not currently reside in sweden. They were categorized into four age categories with 18-25 as the first category, 26-35 as the second, 36-45 as the third and finally 46+ as the last age category. The categories were chosen in this fashion because it becomes easy to differentiate the audience into youth, adult, elderly. There were 31 respondents in the 26-35 age category which contributed to 42.5% of the response received and 37% accounts to respondents within the age of 18-25. Among the respondents 89% of the sample population have visited liseberg before. Around 73.8% of the respondents love to visit the park during summer rather than other seasons (Christmas or Halloween).
87.5% of the respondents have visited the park with a primary objective of experiencing the rides and only around 12.5% people visited the park for sightseeing, visiting restaurants, and hanging out with friends and concerts. When questioned whether they have used the Liseberg app before, it was surprising to see around 80.8% of the population have not used the app before.
Experiences from an amusement park/theme park are directly correlated to customer satisfaction yet experiences vary from each individual hence resulting in a wide spectrum of satisfaction levels. People generally visit an attraction either alone or along with their family/friends/colleagues for satisfaction and their behaviour varies with respect to the group they visit. Thereby, it becomes important to understand which population dominates. Hence this was addressed in the survey, and the results show that around 81.1% of people visit Liseberg with their friends and family. When questioned on which ride they experienced the longest waiting time, among the people who visited Liseberg before, there were 55 responses among which around 36.37% pointed out Helix, followed by Balder which accounted for 18.18%. The questions that were asked in the later sections were mandatory in order to obtain full response.

5.1.2 Customer behaviour towards queuing

Customers' attitude towards queuing was tested in one of the sections of the survey. The question in this section was asked in a way where it focused on general queues and then focusing on digital queues. 60.3% among the respondents were adamant that they preferred digital queuing over standing physically in lines, followed by 19.2%. None of the participants had responded that they wanted to stand physically in a line. This shows that the majority preferred digital queuing and there was no one who was completely against digital queuing. There were accompanying questions that were meant to understand the reasons for standing physically in lines, if someone wanted to do so. When it comes to customer enquiry about different rides at the ticket counter, the majority of the respondents did not want this or it does not matter to the others. 38.4% of the participants were sure that they did not want to be in a queue in front of the ticket counter, in order to clarify their queries regarding rides or attractions, whereas a situation of enquiry while buying tickets did not matter to the majority of the remaining participants and only one participant (1.4%) wanted this as a necessity. A high proportion of the population (87.7%) said that they will not prefer to buy tickets from a ticket counter, as they are not unfamiliar with mobile applications. Meanwhile, it is 74% who completely agreed that they would use a digital queuing app so that they can save waiting time. When questioned about pre-planning the rides before reaching the park, 27.4% disagreed and responded that they are not going to plan the rides before reaching the park. While 16.4% remained neutral on this question, 56.1% agreed and responded that they will be planning the rides in advance.

5.1.3 Customer Satisfaction

The survey had questions which were intended to understand certain features and situations that might affect levels of customer satisfaction. When the respondents were asked whether they would prefer an "all-in-one" ticket that includes all the attractions for a fixed price instead of buying separate passes for each and every attraction, 80.9% agreed and are willing to buy such an option, among which 65.8% strongly agreed. On the other hand, 12.3% disagreed to this, in which 6.8% strongly disagreed which indicates that they are not comfortable with such an option. It was surprising to see that 46.6% of the respondents remained neutral and showed neither satisfaction nor dissatisfaction when it comes to the necessity of entertainment options while waiting in a queue, provided the queues are short. There were about 26% of the respondents who disagreed, among which 8.2% strongly disagreed, i.e., they would not like to be engaged in any kind of entertainment while waiting in a short queue. It is only 27.4% of the respondents who would prefer some engaging entertainment even during a short waiting time, out of which the ones who strongly agree were only around 15%.
80.9% of the respondents would like to choose a time slot that is convenient for them rather than being given a specific time, out of which 52.1% strongly agreed to this. 16.4% remained neutral to this and 2.7% disagreed on choosing a time slot by themselves. When questioned on how they would feel if they were asked to stay in the same queue when the ride is under maintenance for a short time, about 56.2%

disagreed, out of which 37% strongly disagreed which means that in such situations they prefer to skip the current ride that they were waiting for. It is surprising to see that 22% are willing to stay in the same line, where half of them strongly agree to this. On the number of rides that can be booked, 49.3% of the respondents disagreed with the statement which asked if they would prefer booking one ride at a time instead of booking many rides, although they would have to wait until the current ride to finish, out of which 16.4% strongly disagreed. 24.7% were neutral and were fine with either reserving one ride at a time or booking multiple rides at once. 26.1% of the respondents prefer booking one ride at a time.

5.1.4 App

The survey had questions which helped in gaining feedback from customers regarding certain features of the mobile application. The respondents were asked whether they would require an introduction on the functionality of the app for booking rides and on how to use it. This question could also be related to the question in the previous section about being comfortable with mobile applications. 74% agreed that they do not need any introduction, with more than half of the respondents (56.2%) strongly agreeing to this. 12.3% disagreed and responded that they would want an introduction to the app on how to book rides, where 6.8% among this strongly disagrees. Meanwhile there is 13.7% of the population who are not sure if they need an introduction or not. On questioning if the respondents would prefer the app to have the possibility to reserve their rides in advance i.e., even before reaching the park, 60.3% agreed out of which 38.4% strongly agreed that they would prefer to reserve the rides in advance. 23.3% of the population responded neutral which signifies that they will not be dissatisfied if this option is not available. Around 80.8% of the respondents prefer to have English also as a language option in the app, even though there can be a good number of international respondents who live in Sweden. Around 55% of the respondents preferred a self ticketing scanning and an automated gate system over a person who is manually checking the tickets. 20.5% prefer a person to check the ticket before entering the ride over a self ticket scanning and automated gate system. Over 76% of the population agreed that they would like to have the possibility through the app to know what they can do in the park while waiting for their ride. Around 88% of the respondents expect the app to have an option for sending QR codes or tickets to all the members who accompany the person who books the rides.

5.1.5 Time Perception

It is important to understand the dimension of time perceived, as it shows the customers behaviour towards waiting in line. To understand the behavior towards long queues, even though it is moving at a faster pace, around 31.5% respondents conveyed that they do not feel anxious or frustrated during such situations, around 21.9% somewhat agreed and 17.8% respondents totally agreed that they would feel anxious under such a situation. It was surprising that around 38.4% of the respondents would still feel dissatisfied even if the amusement park provided some kind of

entertainment while waiting for the ride, around 21.9% of the respondents found it important to have some kind of entertainment while they wait. It is important to understand whether the customers will arrive at the ride location at the exact time that is mentioned in the ticket or will they arrive prior or later to the mentioned time, it was found that 34.9% respondents agreed that they would arrive at the mentioned time and around 32.9% were neutral which indicates that some of the respondents may arrive earlier than the time of ride.

5.2 Management Perception

It was necessary and important to understand the management perception, through interviews and survey conducted with the management team the following data was gathered.

5.2.1 Customer Behaviour

When Liseberg was interviewed to identify how they have understood their customers, variations could be seen at least in some of the segments. When it comes to customers' acceptability of standing physically in lines even when digital queuing is provided, both Liseberg and customers disagreed, where a large majority of the customers strongly disagreed. The result was identical with the question on using mobile applications, where a substantial number of respondents highly disagreed with being unfamiliar with mobile applications, while Liseberg also disagreed. When it comes to having an option of inquiry about rides in case of buying tickets at the counter, both Liseberg and customers had nearly the same opinion where both disagreed, even though it was not strongly disagreed. When questioned whether customers would pre-plan their rides before reaching the park, Liseberg remained neutral. But a large majority of the customers had strongly agreed.

5.2.2 Customer Satisfaction

The management team of Liseberg assesses their customers' satisfaction every year and the satisfaction is measured on various perspectives as shown in fig.3.1. It can be understood from their historic data that customers were not satisfied regarding queues. The authors wanted to focus on the queue dimension and particularly on the new digital queue technology. From the conversation and interviews with the management team, it was understood that the current state of the technology does not give the degree of freedom for the customers to choose a time slot, whereas, the respondents prefer to choose a time slot that is comfortable for them. The technology does not have an option of swapping queues between rides and cannot reserve for multiple rides at the same time yet. Whereas, the respondents strongly feel that there must be such provision given. The management team have also planned on selling 'all in one' tickets which makes it hassle-free for the customers when compared to existing options, and the respondents (65.8%) also strongly agree that such an option must be available. Liseberg perceives that there must be some sort of entertainment while customers wait in line, the majority of the respondents

are unbiased towards entertainment but on closer examination, approximately 50.2% of the respondents feel that some sort of entertainment is needed.

5.2.3 App

When implementing a new technology and while introducing it to customers, it is important to know what customers need or expect from the technology, and what can be delivered. As in the previous sections, questions were asked to Liseberg, to know the differences between the features that Liseberg provides through the app and what customers expect from this. Majority of the customers had the same opinion as Liseberg that they are good at understanding how apps work and they do not need an introduction. Still, there are 12.3% of customers who said that they need an introduction on how to use the app. More than half of the respondents expressed that they would like to book their rides in advance, but as of now this is not possible with the app that is provided by Liseberg. This was the same case with having English as a language option, but currently the app is available only in Swedish. When asked about having an automated gate system instead of a person checking tickets manually, most of the respondents agreed to this whereas Liseberg disagreed. While the app can help customers know what they do in the park while waiting for their rides, it does not have an option for sending the tickets or QR codes to the phones of people who accompany the person who booked the rides. This is something that customers expect from the app, but is not available currently.

5.2.4 Time Perception

The authors were intrigued to understand about the time perceived from both the dimensions. The management team strongly believed that customers may be frustrated/ anxious when the queues are long although moving at a fast pace, whereas the majority of the respondents (31.5%) do not feel frustrated if the queues are moving at a fast pace. As Bergman (2010) argues that there are no fully satisfied customers and hence they are known as not dissatisfied customers. When looking into attractive qualities such as entertainment while waiting in lines, it was surprising that both management and the respondents felt that the customers would be dissatisfied even though there would be some kind of entertainment. Liseberg expects the customers to arrive at the ride location at the exact time mentioned in the ticket,and the respondents expressed that they would arrive at the mentioned time. The majority of the customers agreed that they would arrive at the exact time, but on the other hand there was around 32.9% who remained neutral which may signify mixed responses which means maybe late, maybe early or maybe on the exact mentioned time.

6

Analysis and Discussion

In order to analyze the findings, the information from the survey and the interviews and survey with the management team members were compared in different ways. This is done in order to identify the factors that would lead to customer dissatisfaction and also to identify the differences in how Liseberg thinks customers would perceive certain factors when compared to what customers actually think of those factors. Some graphical methods are also used to show the extent of gaps between customer expectations and management perceptions. The survey and its analysis is inspired by the servqual model and thus it is used in order to relate the identified gaps with the ones proposed in the servqual model.

6.1 Gap Analysis

Figures 6.1 to 6.4 below shows the gaps between how customers would respond to certain scenarios, what they expect and how Liseberg considers that their customers would do so. The gap shows the levels of understanding that Liseberg has about their customers and can help to identify improvement areas. The availability of some features in the app is also analysed here.

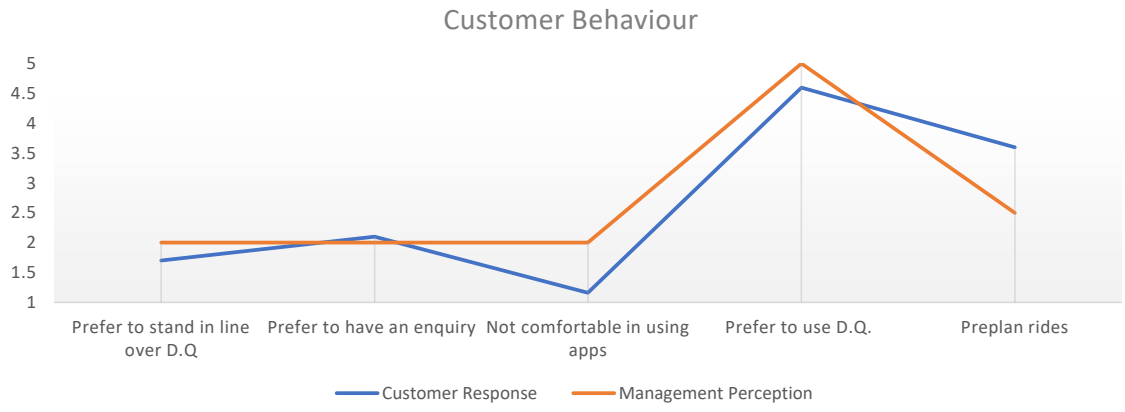

Figure 6.1: Customer Behaviour

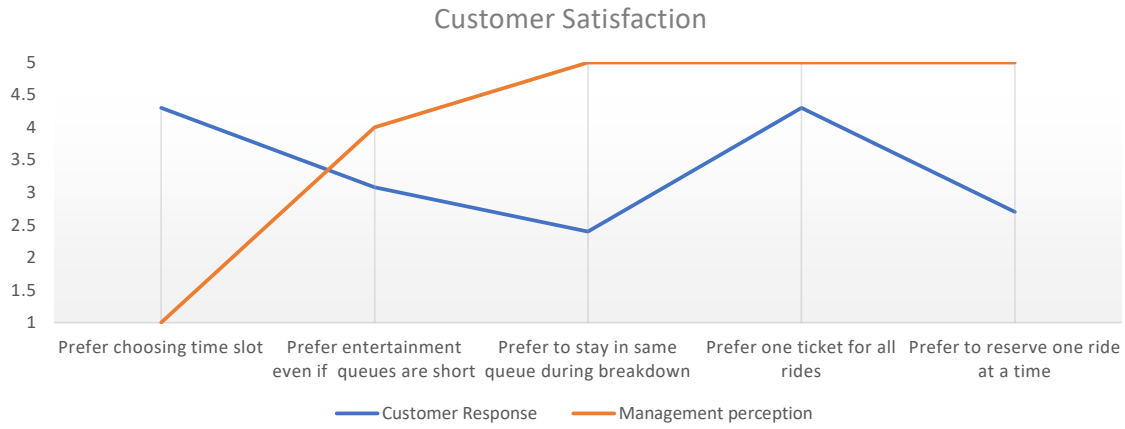

Figure 6.2: Customer satisfaction

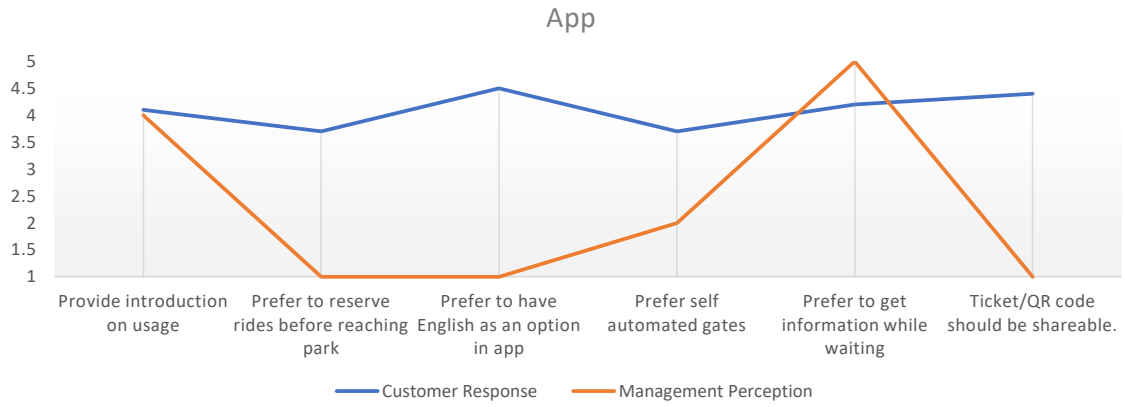

Figure 6.3: App

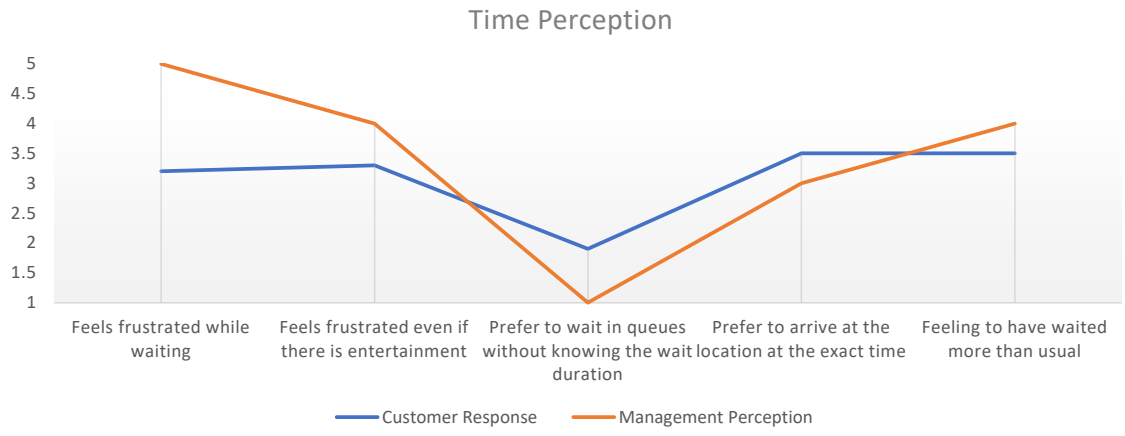

Figure 6.4: Time Perception

From the graphs above, it could be seen that the highest gaps exist in the case of the app and how Liseberg has understood the factors leading to customer satisfaction. This shows that there are a lot of features for the app that Liseberg could add in future in order to increase satisfaction among customers and make it more functional

at the same time. The queuing process could also be changed according to the expectations and needs from customers in such a way that it makes the digital queuing system more convenient and acceptable by customers, provided there is no technical hindrance for changing these.

6.2 The relation between the identified gaps and the Servqual model:

From the interviews and surveys conducted, the authors could articulate the gaps that exist between consumers and the management and they are related to gaps proposed by the servqual model. This is done in order to support the fact that the survey was inspired by the servqual model. Considering the survey sample size of 73 which consisted mainly of the young population, the percentage of dissatisfaction would scale up accordingly when compared to a larger population. The young population in Sweden (age group: 15-24) accounts for 1110953 according to Wikipedia (July 2020), and the relative number of dissatisfaction levels will be much higher when compared to the survey sample. The discussion based on these gaps is as follows:

6.2.1 Gap between Consumer expectation and Management perception

This gap is formed when there is a difference in the expectations of customers about the service provided and what the company provides in reality. Liseberg have not fully looked into whether customers pre-plan the ride that they would like to visit and when the participants were questioned it was understood that a majority of the respondents (56.1%) pre-plan the rides that they would be visiting. Since the majority of the customers would have already decided on which ride they would visit, it is important to understand the area in which the customers' influx is high which will also help in better planning of rides and better distribution of the crowd. Meanwhile it has to be kept in mind that the number of visitors at a time could be lesser than what it used to be before, as with the digital queuing system visitors might be coming to the park close to their ride times. This will also help the management team to analyse in various perspectives such as economical, logistical, and entertainment related. Management teams can plan more efficiently in staff management, and this data can also create smoother flow patterns of the customers at liseberg when overseen. The second service that the customers would prefer to have is to digitally change lines/queues, preferably with the next available time slot for another ride when the current ride gets cancelled or gets postponed. According to the interviews it was understood that the app does not have such services yet, and the absence of the service can create dissatisfaction among the customers. In addition to that, according to the survey, a large number of respondents would prefer reserving multiple rides at the same time which can save time for them. The app does not have such an option yet and this gap must be addressed and must be taken

into consideration as this can also lead to dissatisfaction among the customers.
Considering the functionality of the app, it does not provide the possibility of having different language options. It was noticed from the survey results that around 80.8% want English as a language option, and it was also noticed that only 19.2% have used the app before. Lack of English language option could be one of the reasons for a majority of the customers not using the app, considering the fact that in the survey results, there is a good number of international respondents who live in Sweden currently. Since there are a lot of visitors who are not natives of Sweden, adding English as a language option would definitely improve satisfaction among the international visitors. A large population prefers to reserve a place or book a time slot even before reaching the park. The management team must also shed some light upon such a service which will result in higher satisfaction among the customers. While the management team believes that the change into an automated gate system at the entrance to rides might not be so well received by customers, it was surprising to see that 56.2% of the respondents were ready to change and accept that there is no need of a person standing at the entrance and checking tickets manually. Finally more than 87% of the respondents expect the app to have an option that sends tickets or QR code to the phones of all the members that accompany the person who booked the rides. This must be regarded as one of the most important services that must be provided to avoid dissatisfaction from the customers. In case if the person who booked the rides is not able to accompany the others, they should be able to enter the rides and for this all the members in the booking list should have the possibility to get the tickets.
Hence authors would suggest the management team to consider these, at least as premium features in order to improve the satisfaction levels among visitors.

6.2.2 Gap between Management perception and Service quality specification

This gap exists when the service firm comprehends the needs of customers, but is not able to deliver what they have understood, due to some constraints. In this case, the service provider might have correctly comprehended the needs of the customers, but might not have set a good performance standard. When customers are asked to change into a digital queuing system with the use of an app or website, as many other services are currently doing, customers are expecting that they would be able to choose a time that is convenient for them to enter the ride or at least a time frame within which they can enter the ride. But according to the current status of the booking system that Liseberg provides, the system will provide a time for customers, at which they should enter the ride. Most of the customers would definitely compare or consider the app that Liseberg provides, to the ones that they might have used before or currently using in other firms such as for booking movie tickets, bus tickets or even flight tickets. In all these situations, they have an option to choose according to their convenience. In today's scenario where digital technology is very well developed, customers might be aware that it should be possible to setup the system in such a way that the ride time could be chosen by customers at the time of booking, or at least they expect it to do so. The same gap could be

seen in case of the situation regarding breakdowns of rides or maintenance where customers would want to change their booking to another ride instead of waiting for the same ride until the maintenance work is finished. This can be a big issue especially when someone has booked a ride at the latest hours of the day, and if the ride goes into maintenance work, they have to wait until the next day as the park is not allowed to operate beyond a certain time in the night hours. Most of the customers expect the system to let them book another ride in case of breakdowns, instead of waiting in the same queue. It should be possible for the system to know which rides can be booked next or which of the rides have free positions to be booked at that particular time, and these rides could be given to be booked for those people who are in queue for a ride under maintenance. Another situation is regarding the number of rides that customers can book at a time. According to the current feasibility of the booking system it lets customers book only one ride at a time and they have to wait until that ride is finished in order to book the next one. In the survey, most of the respondents expressed that they want to book multiple rides at the same time instead of just one. This justifies the fact that most of the customers pre plan their rides and thus they know which rides they would like to visit. In this case, the booking system should let them book the rides that they want to, provided that they have bought the ticket. During the interviews with the management team, it was found that Liseberg is aware of such needs of customers, but is not putting effort to increase the performance standards, or to meet all the needs of their customers. Also, during the interviews, some of the members from the management team had expressed their thoughts for age old people having trouble with using mobile applications for booking rides. Even in this case, the current application does not provide any kind of introduction on how to use the application for booking rides. This might not be a necessity for young people who are now familiar with mobile phones and using applications, but for people who belong to the older age groups it would definitely be a necessity to have an introduction at least for the first time when they start using the application.

6.2.3 Gap between Service quality specifications and Service delivery

This gap indicates poor service quality and the gap between quality specifications and delivery to the customers. These gaps could not be analysed because the service has not yet been implemented and is not open to the public. Considering a situation where a digital queuing system is implemented, the following are the possible reasons that might cause and may even widen the gap. Ineffective recruitment is considered as one of the main causes of the gap, for instance, if the workers are not properly recruited or not allotted for the right job during a peak season such as summer, this can lead to a gap. Failure to match supply and demand, lack of empowerment, perceived control and framework,are some of the main reasons in creation of this gap. Taking the new technology into account it may cause issues, such as, customers not being able to comprehend the system, and some may even experience failure.
The employees must be well equipped and educated about the system as they would

be representing Liseberg. Well equipped staff results in effective customer management thereby reducing any possibility of dissatisfaction.
Liseberg's employees consist majorly of part-time or seasonal employees who get hired based on the seasonal demand and this becomes a quite challenging situation for the management team to educate the seasonal employees who are fluctuating based on demand. The fixed employees should also be informed and educated about the functionality of the system.

6.2.4 Gap between Service delivery and External communication

Consumer expectations based on the statements from the management can be the main reason for this gap. Customers expectations are highly influenced by the marketing and advertisements. When these assumed expectations from customers are not fulfilled at the time of service, this can lead to a gap and dissatisfaction.
When Liseberg says that the new digital queuing system will allow customers to save time by not wasting time in long waiting lines, customers might expect that they will have an option to book rides according to their convenience. But how the booking system works in reality is different. As explained in previous chapters, once the visitors buy the 'all in one' entry ticket at the counter, they need to book the ride of their choice and the booking system will be providing them with a ride time. In case if the ride time that they get from the system is making it late for them to enter the ride, this can cause dissatisfaction as it might not be according to their expectation or assumption of the service. A proper analysis of this situation can take place only when the park opens and when customers experience the system by themselves.

6.2.5 Gap between Expected service and Perceived service

It is the gap between perceived service and expected service. This gap can occur due to various reasons and is related to the background of the visitors as well. Both family and friends groups can be put into unconditional leisure or relational leisure categories. People from these categories visit the attraction for self satisfaction and not through external compulsion and hence they will have higher expectations and may become dissatisfied if their expectations are not met. Since the new system is not experienced by visitors yet, it is a challenging task to understand how they perceive the new system. The purpose of the survey was also to understand customers' previous experience with similar services and based on this, their expectations regarding the new technology offered by Liseberg. Once their expectations were identified, this has been compared with the interview results from Liseberg to see what these customers might perceive when they are at the park next time. The best way to close this gap is to understand the target market and their needs and expectations and improve the quality of the service accordingly. This gap can also occur when the customer misunderstands the service provided. It could be seen from the survey that having an entertainment option while waiting for the ride is not so important for the majority of the customers, whereas Liseberg thinks it is

required to have this feature. There is a chance that at least some of the customers might think that more effort should be put into other features of the app than on entertainment options. This is mainly because they might have a perception that with the introduction of the digital queue, the waiting time can be quite short and it is not important to have entertainment options. Liseberg can utilize these resources to provide better service through the app if that is viable. This is not different from the situation where customers have a necessity of choosing a time slot, booking multiple rides and changing rides in case of breakdowns. As we could see from previous sections and the survey that these are elements of a digital queuing system that customers expect to have, but as per the current system provided by Liseberg, customers might not be able to perceive these features when they are at the park. This might lead to dissatisfaction.

6.3 Implementation strategy

The initial plan was to implement the digital queuing system as a pilot project in one of the new rides 'Underlandet'. But due to the unexpected situation created by the 'Covid-19 pandemic' the management team decided to implement it in 15 rides instead of the initial plan of starting with one ride. This was mainly due to the social distancing concerns where it might not be good for the visitors to stand in lines to buy tickets. As (In, 2017) argues that to analyse and determine the risks that are involved, and also to analyze the scaling feasibility, a pilot test is required. A better strategy for Liseberg would definitely have been to start off with one ride, but due to the pandemic situation this is not a viable option. Even though direct implementation in 15 rides at once is not the best strategy, the situation has forced Liseberg to do so. Having a pilot study as planned initially with Underlandet would have helped Liseberg to understand how customers would respond to the digital queuing system and also to make necessary changes and improvements for aligning it with the overall strategy. As Mišanková et al.,(2014) mentions, implementation is the most important part in the strategic management of a project. The beginning phases could have included interviews or focus groups based studies which should have addressed the issues regarding implementation. The impacts of not having an effective pilot study could be seen as reduced to a good extent in the case of Liseberg, as the management team has been in contact with other amusement parks where similar queuing systems have been already implemented. The marketing or newsletters team could have taken measures to understand what customers expect from such a system. The fact is that digital queuing is being used in different contexts as explained in previous chapters and most of the visitors would have already experienced something similar, maybe in another context or industry. This will be imparting certain impressions within those visitors at least and thus they would be having higher levels of expectation from the new system. Since there is a possibility with digital technologies for adding features or changing existing ones without a lot of investment on hardware or equipment, understanding the needs and expectations of prospective customers would have given Liseberg the possibility to release the app and the booking system with more possibilities and features that visitors would appreciate. As it could be seen from the results of the survey that

visitors are not interested to stand in long waiting lines and are ready to accept digital queuing system, the possibility of a situation where it will not be accepted by visitors could be considered negligible. It could also be seen that in some areas, visitors are ready to accept automated systems, such as the entrance to rides, instead of someone manually checking their tickets. Liseberg can thus reduce the number of employees at least in some areas which can help in improving the consistency and quality of the operations and reduce operating cost at the same time. Even when there are a lot of advantages for having a digital queuing system, there could still be a small percentage of visitors who might not be willing to change. This could probably be due to their lack of knowledge about the benefits or due to their concern regarding personal data security or something similar. In order to make them adopt the new technology, the marketing team can develop measures such as advertising campaigns which will help the visitors understand the new system better along with its benefits.

7
Conclusion

This chapter aims to sum up the findings and discussions in relation with the research questions.
The methodology used for this study is aimed at answering the following research questions:

RQ 1: What should be taken care of while implementing a new digital technology in amusement parks and how can this process of new technology implementation be made smooth?
The management team must strive to avoid poor implementation as it is the most important part in getting a project aligned to the management strategy. Prior to implementation of the new technology the management must consider listening to the voice of the customers which will help the team in getting some idea on the level of understanding that customers have about the new technology. This will also help the team to understand on what level the implementation is required. The management team must also focus on proper education for the staff as they would be the first point of contact. Creating a short SOP (Standard Operating Procedure) for all the respective personnel helps in easier knowledge transfer. If they are ill-equipped, then there are high chances that this can lead to customer dissatisfaction. In addition, pilot tests should be conducted as these tests are one of the most important and effective ways to understand the risks and possibilities involved while implementing the digital technology and hence these identified pressure points can be rectified while scaling up. Marketing campaigns can support a smoother implementation of digital technology, as it is one way to communicate to the customers about the technology and on the changes taking place which will ensure that the customers know what to expect. This will also create a curiosity which could result in more visits to the park. Having good information about developments in the field of digital technologies, especially queuing systems is a necessity. This can be from different contexts also, other than amusement parks. This will help in identifying what are the latest trends or what visitors would expect from the new system. In order to support this, proper disposal of staff who are well versed in digital technologies are also required. During the initial phases of the transformation process, both the new technology and the system that was in use prior to that could be used simultaneously in order to reduce the sudden impact of a big change and will help in making the transition smooth.

RQ 2: How to efficiently utilize pilot testing for full-scale implementation of the digital queuing system in amusement parks?
Choosing a ride that can help in identifying the effects and consequences clearly is of utmost importance when pilot study is conducted. The selection of this ride or attraction should be done in such a way that the chosen ride and the measures taken for the pilot study should not affect other attractions or rides by any means. This

should also not affect customers and their expectations from the park. In order to achieve this, an efficient and effective way of planning the pilot study is required. There should be proper systematic methods for identifying challenges and to document the required findings which could be taken into the full scale implementation in future. During the planning process, care should be taken to identify a suitable time horizon for the pilot study, within which the studies could be developed in the best possible way. While translating the findings with consideration for full scale implementation, the differences between the ride under pilot study and the rides for full scale implementation should be taken into account. Customer preferences can also vary based on their interests towards certain rides and this can also affect the way they will accept the digital queuing system for all the rides in future. Both before and during the duration of pilot study, the marketing team can take effort in developing methods through which visitors can be made to adopt this technology, such as through advertisements which focus on the benefits for visitors while changing into a digital queuing system.

RQ 3: What effects and consequences of digital queuing can be seen in amusement parks?
From the literature study and also from the case, it could be seen that a big reason for customer dissatisfaction in amusement parks is the presence of long waiting lines and the duration of these waiting times. It could be seen from the literature that in most of the studies, digital queuing systems have helped in improving customer satisfaction by reducing waiting time. Visitors can buy their tickets and come to the ride at the time specified instead of arriving early and waiting in lines. Apart from this, digital queuing can help in making the management process a lot easier and in providing more solid data for the management team which they can use for future improvements and to develop better statistics. The introduction of such technology helps the management team to understand the customers better, and this can be used for improvements. With the usage of the digital queuing system and the app, customer feedback can be collected in a much easier way and this can be used as an opportunity for developing improvements and changes, while bringing changes in the digital platform is not very resource consuming if properly administered. As seen from the survey results, visitors are ready to accept digital and automated technologies and this can help in reducing the number of staff required at each service point. This will help in reducing the operating cost to a good extent. Another consequence of having less staff in some areas and replacing it with automated systems is that the consistency and quality of service can be improved and the risk of dissatisfaction due to staff behaviour can be removed. Meanwhile this can create some insecurity for some of the employees at least in the beginning phases of implementation and the management should take responsibility to have proper communication regarding these issues.
Another concern for customers might be the security of data that they provide through the app or the website. In order to book tickets, visitors will have to provide their personal details and this in some cases might lead to dissatisfaction as they might be worried about their details getting shared with the public or being misused. This might lead to difficulties for the management in making customers

adopt the new technology. In case of full scale implementations, the whole park will be working based on the digital queuing platform and in this case, it is a necessity to maintain a strong IT team who are well versed in troubleshooting the system.
Since digital technologies have developed a lot during the past years and visitors might have experienced digital queuing systems in some or the other form in different contexts, it is high possibility that visitors will be comparing the user friendliness and features of the system. This brings the need to keep it updated along with industries in similar contexts and provide features that visitors would expect.
With the introduction of digital queuing, visitors can be distributed in a better way around the park thus helping in reducing overcrowding around some areas or attractions. This can also help in developing better flow patterns and help in running the facility at optimum capacity. After all, considering the situation of pandemics where social distancing has become a necessity, a digital queuing system is the best possible way to run the industry by avoiding visitors standing in waiting lines.

From the study and the data gathered from Liseberg, the authors conclude that the long waiting lines and its duration are the main reasons for dissatisfaction among the visitors. It was also noticed that the majority of the customers will be ready to accept digital queuing and related automated systems. The authors have displayed the possible challenges and opportunities that may help Liseberg's management team to develop a proper implementation strategy for the digital queuing system, and would recommend that in future it would be best for Liseberg to understand the voice of customers which translates into the needs and expectations. Due to the pandemic situation, the survey results gathered cannot be considered to be exactly the same as that of a typical population of visitors at Liseberg, and we suggest to take this into account while translating the results into a regular visiting population. This will definitely help Liseberg to improve customer satisfaction on queuing.

Among all the recommendations mentioned above and in the previous chapter, the most notable ones are briefed as below:

Recommendations

Conduct surveys which can help in understanding what visitors need or expect

Compare the app, the queuing system, and its features with similar systems that exist across different industries

Introduction of digital queuing system will reduce front end work but increase back end work; hence a strong and well motivated team is required

Include option for sharing tickets/QR codes with people who accompany the person who booked

Include options for pre-booking rides and to have multiple bookings at once, at least as a premium feature.

Digitally change queues when the ride gets postponed or delayed.

Have English as a language option in the app, after considering the population of international visitors.

Can have automated gates and related systems, and plan staffing and logistics accordingly.

Get visitors attracted to certain rides by making use of an introduction for the app.

Provide proper education for the staff on digital queuing system.

8

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A

Appendix 1

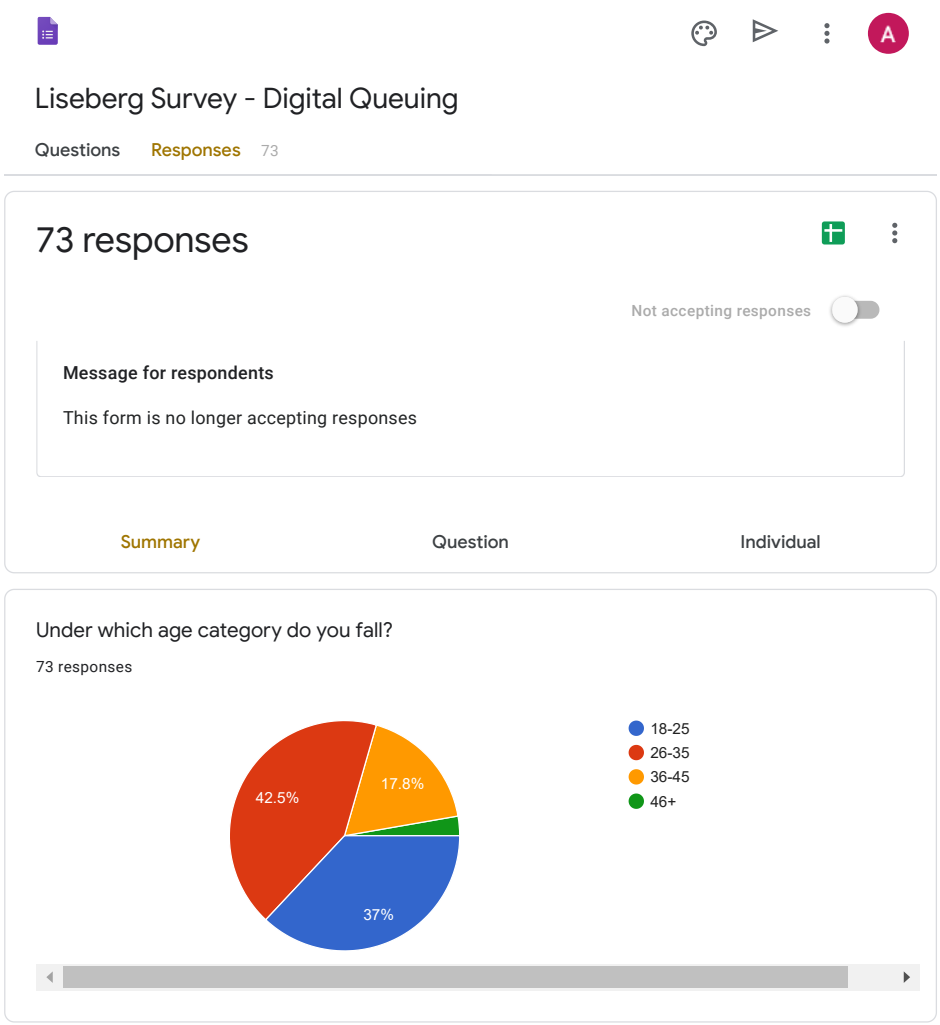
Interview Questions

1. Does the app have information such as popularity, total ride time, what kind of experience the rides provide, etc. about the rides?
2. Technology perspective, how does the system work?
3. Can the application be accessed through the web instead of an app?
4. What kind of economic benefits and its economical advantages over normal queuing
5. Does the app provide introductive guidance on how the whole system works?
6. Are there any additions/removal of features when changing into digital queueing?
7. Will the app have English also, as a language option?
8. As per the recent plans, are you planning to have an enquiry personnel near the ride?
9. Will the 15 rides be used as a pilot study? If so, what do you expect to learn from it and carry over to other rides in future?
10. What is the basis for selecting these 15 rides? Do you think it would have been better to start with 1 ride, instead of 15? In this case, what is done to reduce the drawbacks of not having an effective pilot study?
11. While implementing this new technology what were the challenges you faced?
12. What have you done/taken care of, to make the implementation hassle free
13. What was the time frame for planning, execution and the measures that have been taken to control any future issue?
14. Who all were involved in planning? Were there separate teams? Was there any organizational changes during execution of this technology?
15. What were the findings from the test?
16. Do you think there would be any drawbacks of digital queuing over normal waiting lines?
17. Will there be any changes in organizational roles after the implementation?
18. How do you identify customers' expectations?
19. Do you think customers would pre-plan their rides?
20. Does the app let them book their rides in advance?
21. Are customers allowed to choose a time slot that is convenient for them?
22. Are entertainment options important for visitors who are in queue?
23. Are customers allowed to book multiple rides at once?
24. Would customers be happy with automated gate systems instead of a person checking tickets manually?
25. Does the app provide an option for sending tickets to people who accompany the person who booked?

B

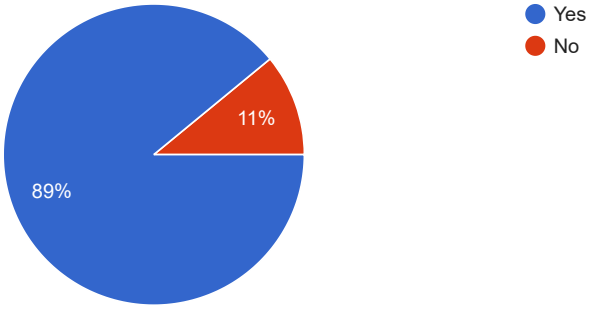
Appendix 2

Survey Questionnaire



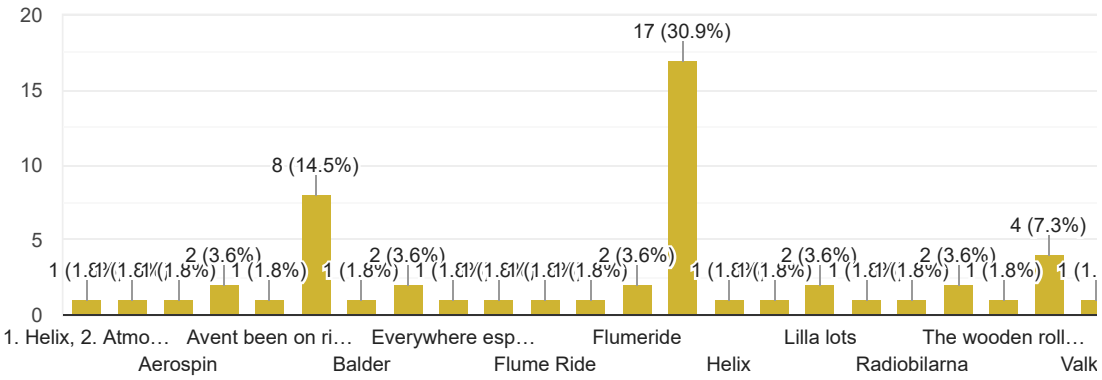
Have you visited Liseberg before?

73 responses



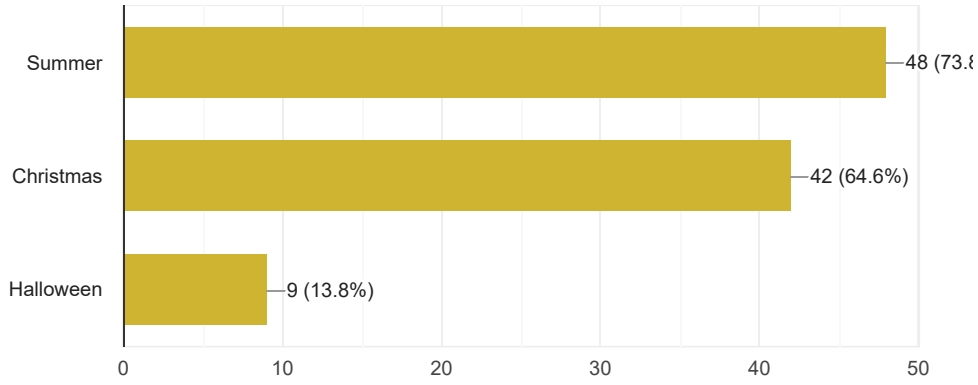
If yes, in which ride did you experience the longest waiting time?

55 responses



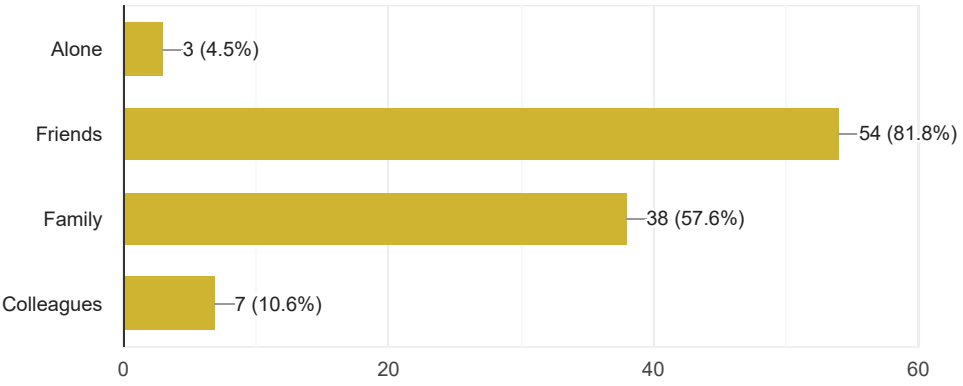
In which season did you visit Liseberg?

65 responses



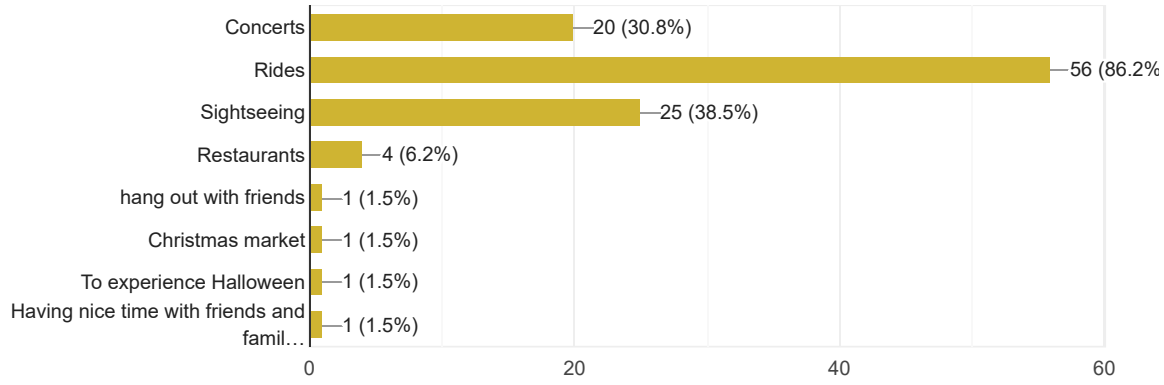
With whom do you visit Liseberg?

66 responses



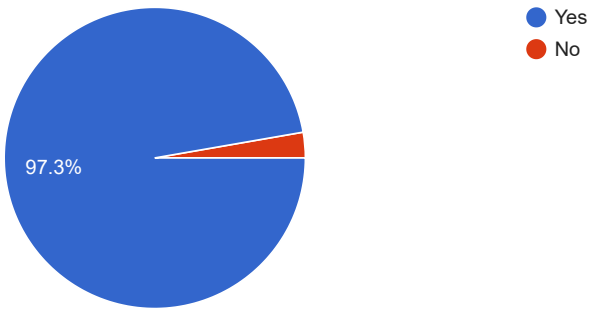
Why do you visit Liseberg?

65 responses



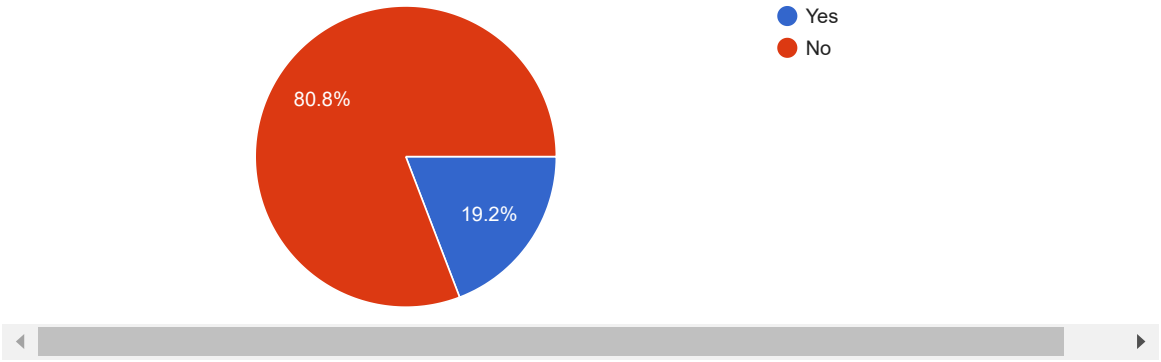
Do you live in Sweden?

73 responses



Have you used the Liseberg app before?

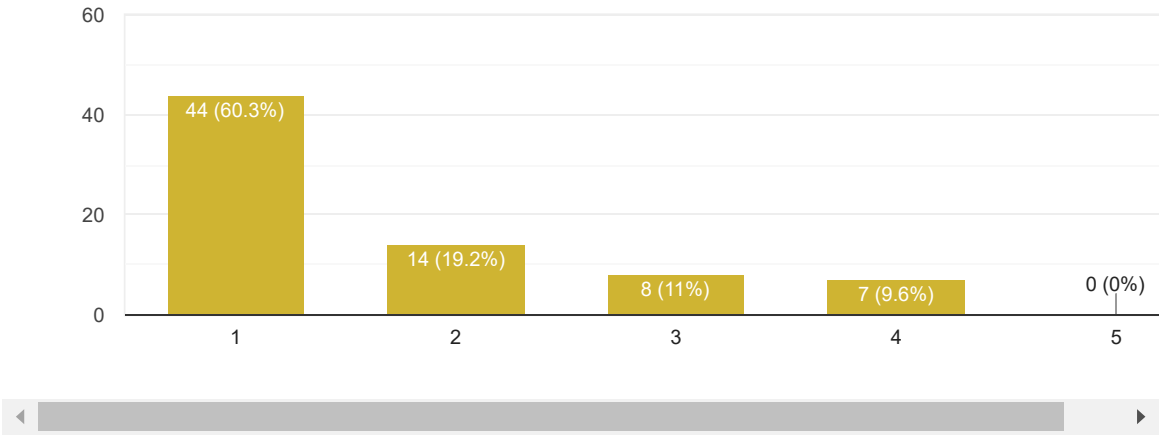
73 responses



Questionnaires

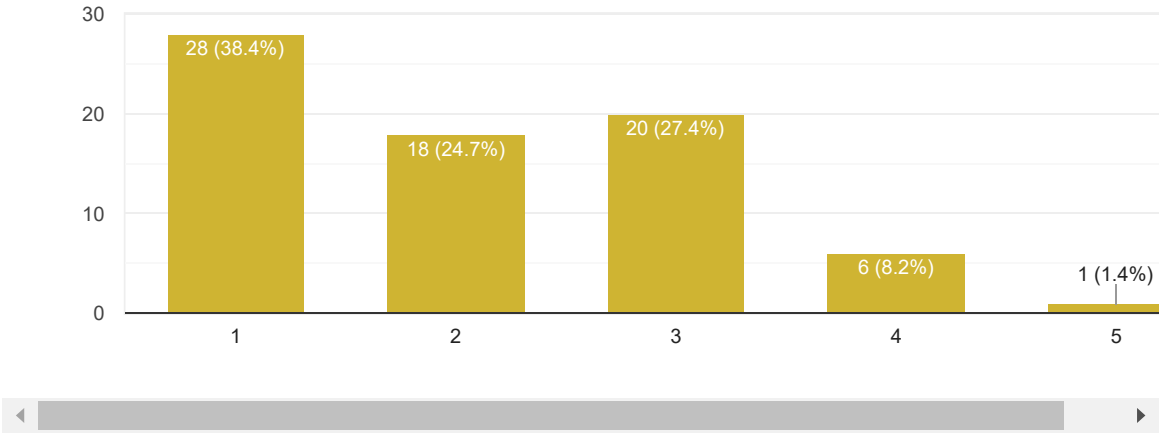
I prefer to stand physically in a line even though I have been given an option of digital queuing

73 responses



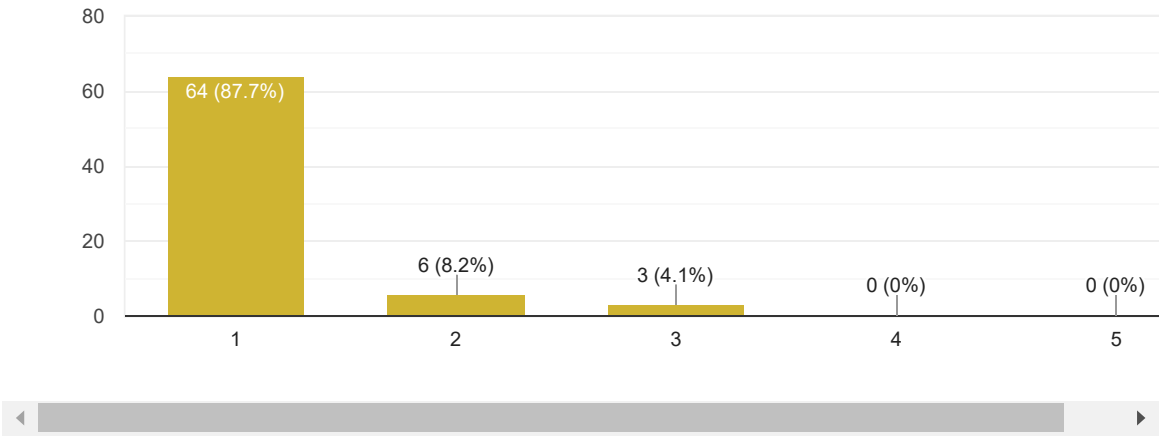
I prefer to buy tickets at the counter so that I can enquire about different rides.

73 responses



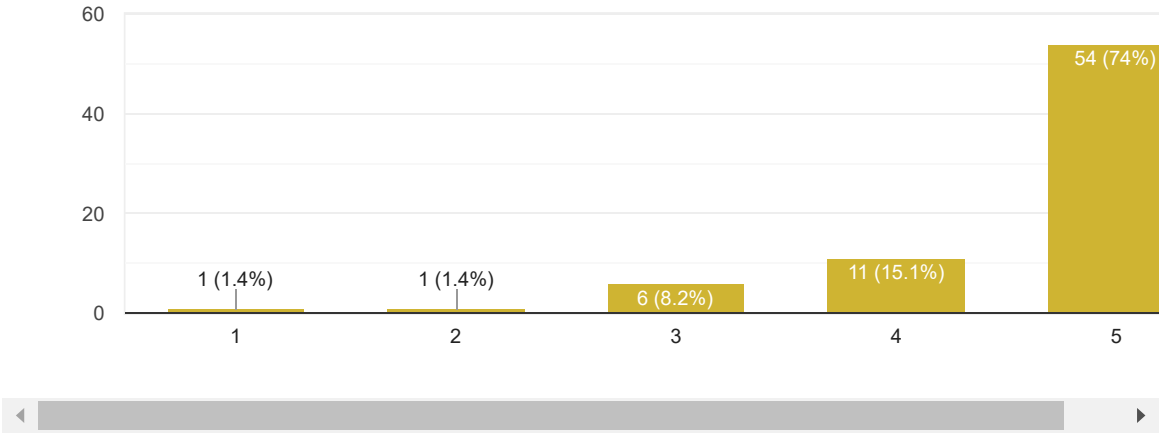
I prefer to buy tickets at the counter because I am not comfortable with using mobile applications

73 responses



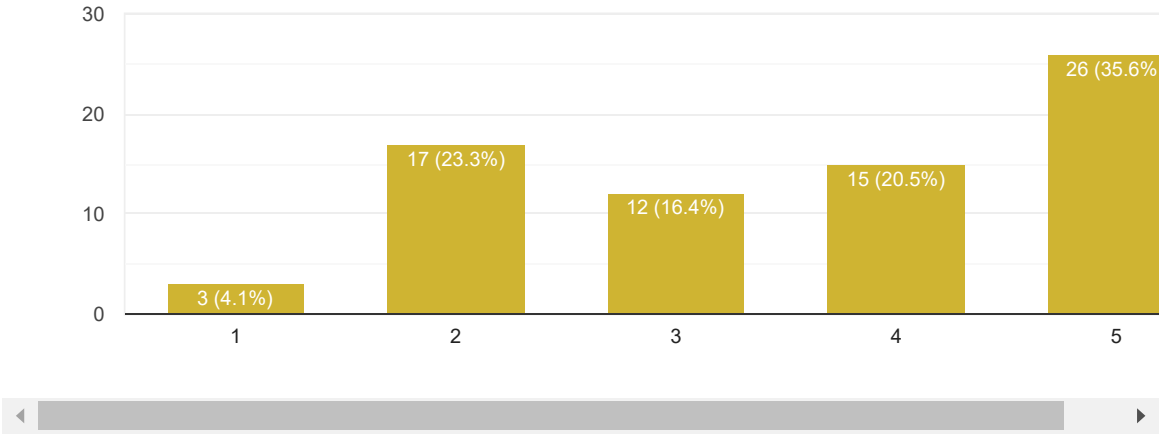
I prefer to use a digital queuing app so that I can make use of the waiting time.

73 responses



I would preplan the rides that I would like to visit, before reaching the park.

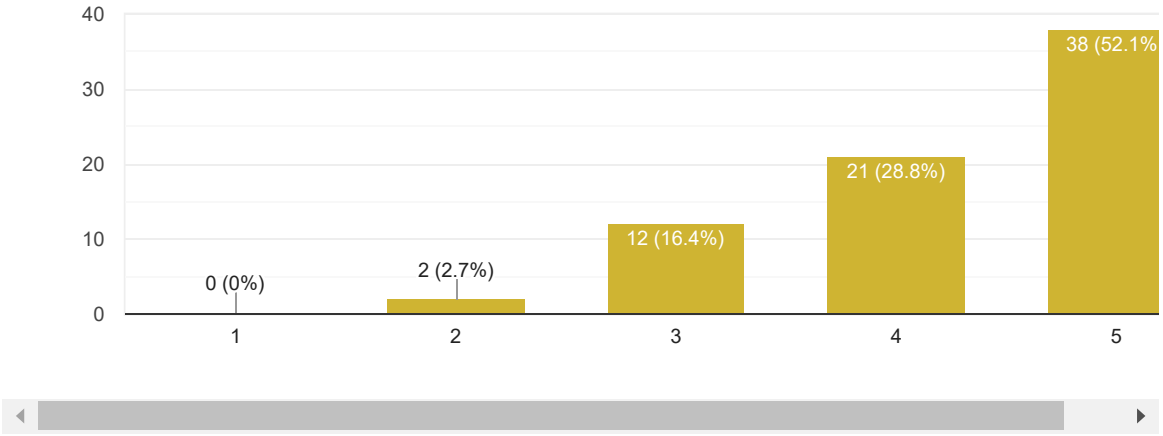
73 responses



Customer satisfaction

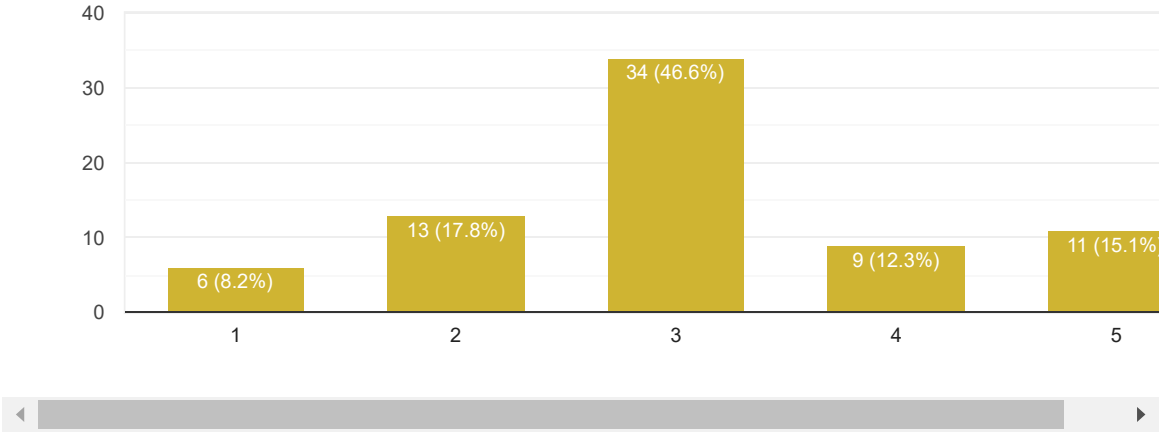
Once I buy the entry ticket, I prefer to choose a time slot that is convenient for me, instead of being given a specific time to enter the rides.

73 responses



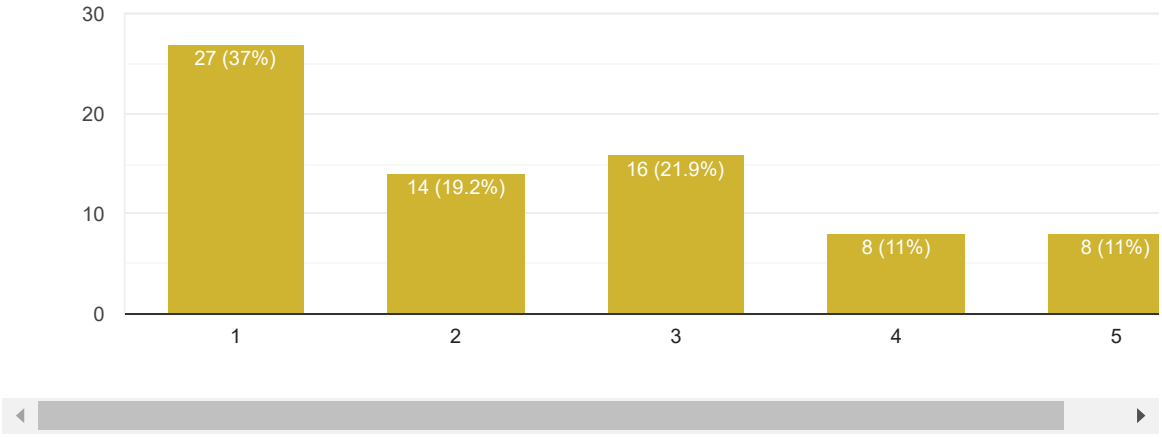
I would prefer to be engaged in some entertainment (such as games, talk shows, or cooking programs) while in the queue, even though the queue is quite short.

73 responses



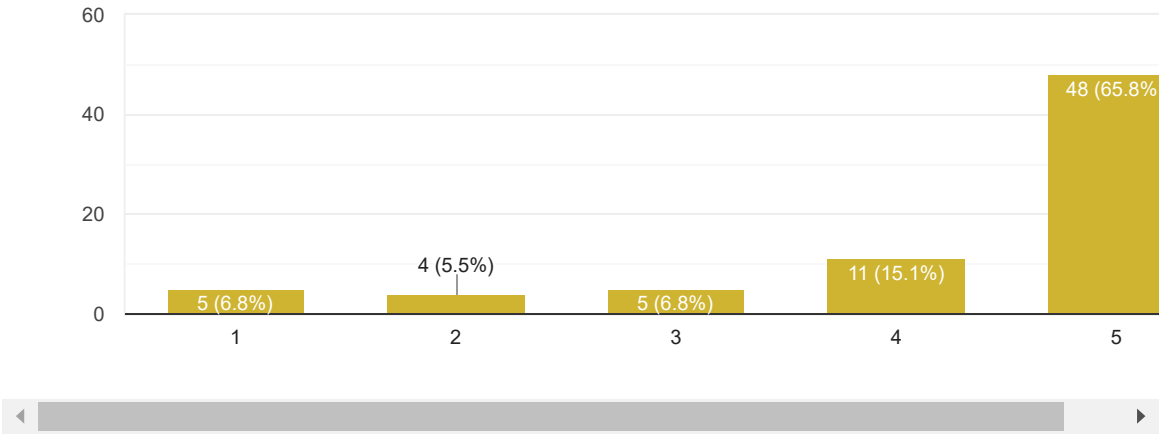
In case if the ride that I am in the queue goes into a breakdown, I would prefer to stay in the queue for the same ride, even if the ride time gets postponed.

73 responses



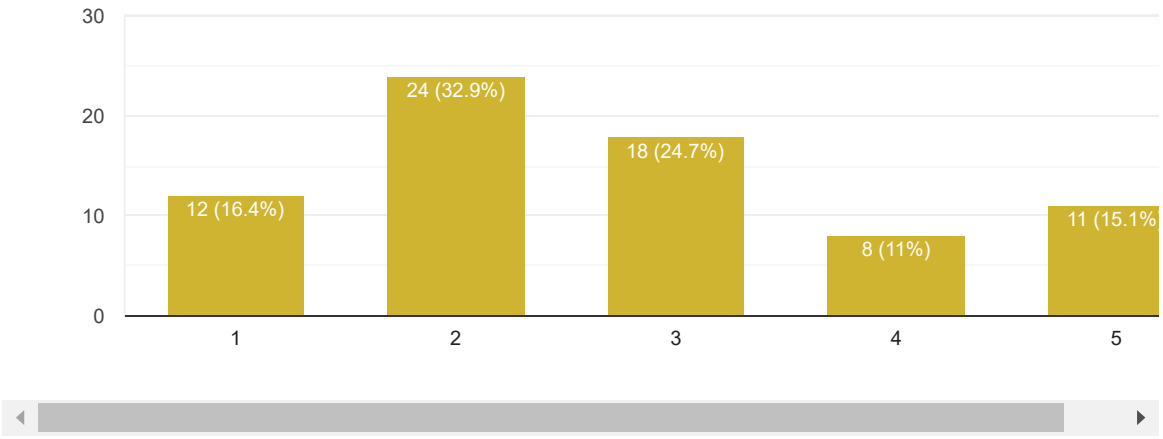
I would prefer an 'All-in-One' ticket, which includes all the attractions for a fixed price, instead of buying separate passes for each and every attraction.

73 responses



I would prefer to reserve one ride at a time, instead of booking many, even though I have to wait until my current ride finishes, to book the next one.

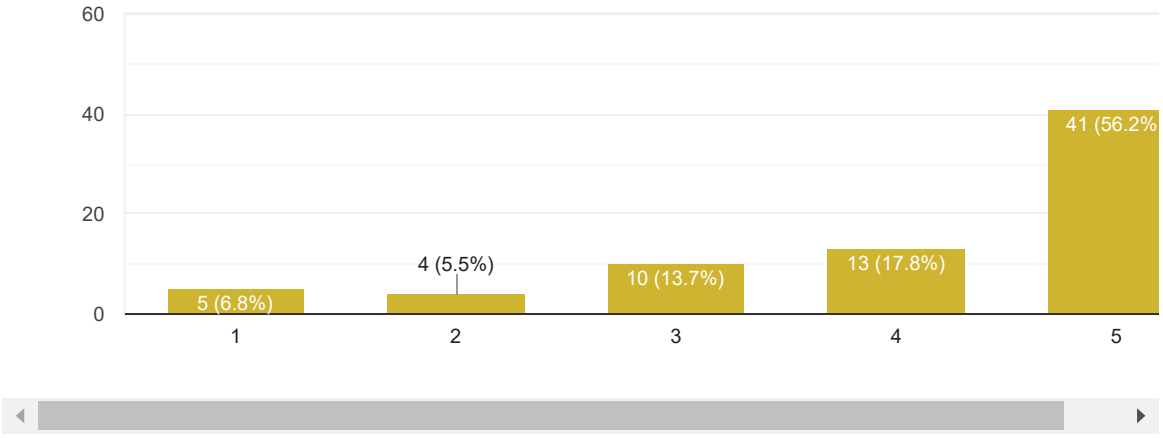
73 responses



App

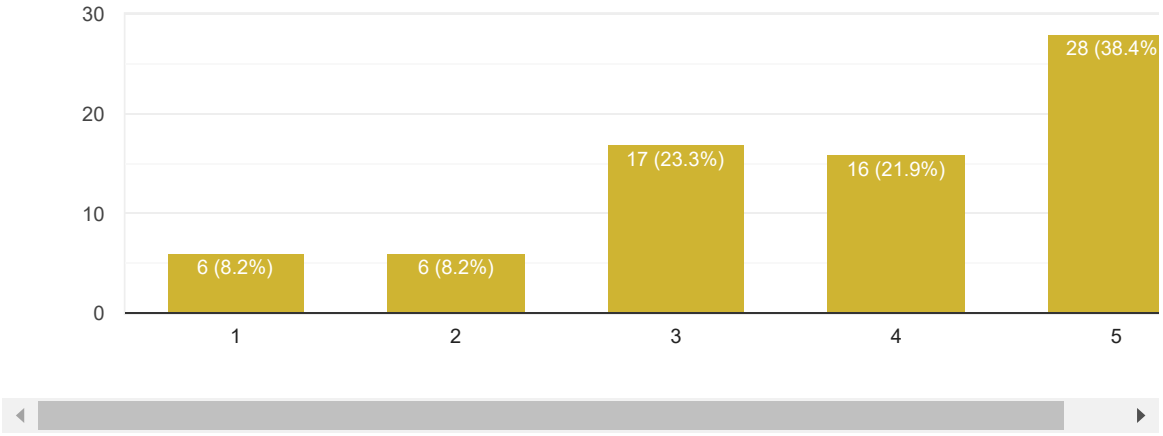
I am quite good at understanding how apps work and I do not need an introduction on how to use the app for booking rides.

73 responses



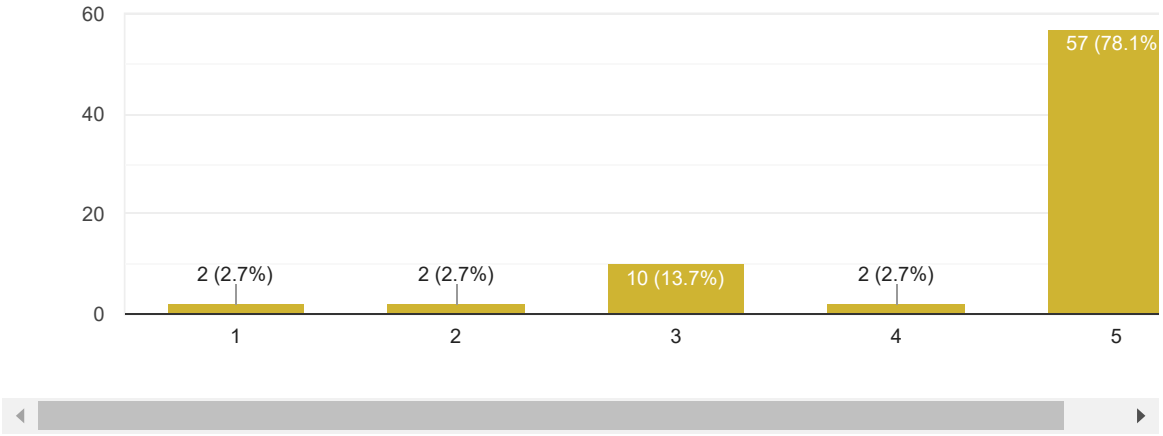
I would prefer to reserve my rides in advance, before reaching the park.

73 responses



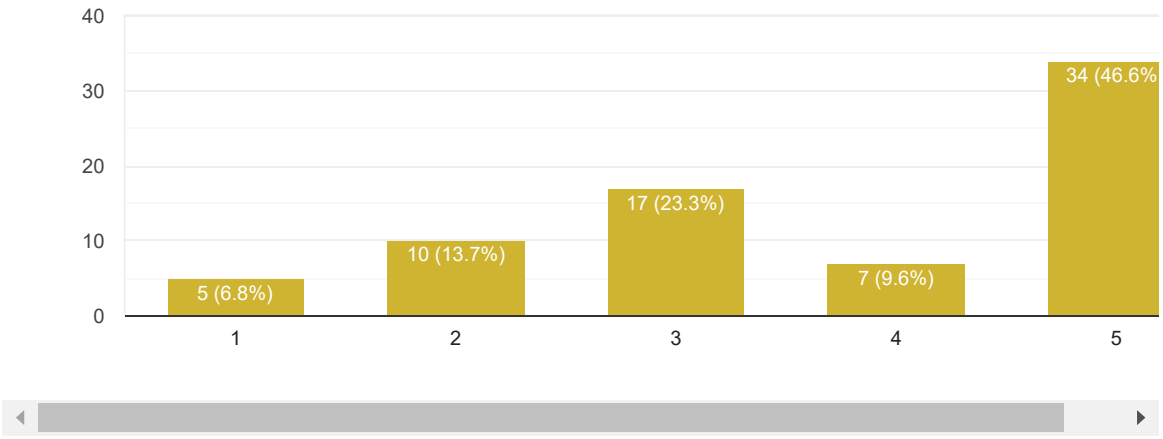
I would prefer to have English also, as a language option in the app

73 responses



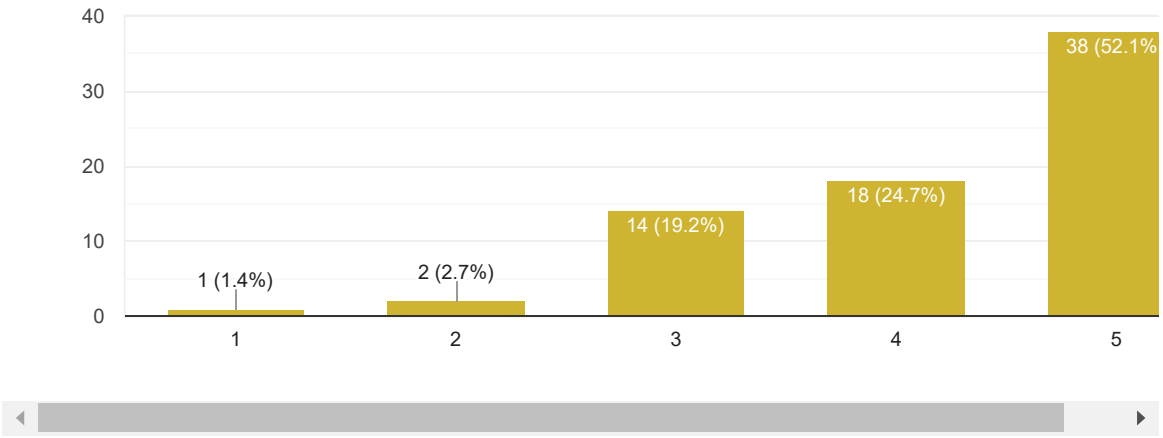
I would prefer to have a self ticket scanning and an automated gate system at the entrance to rides, instead of a person checking my ticket

73 responses



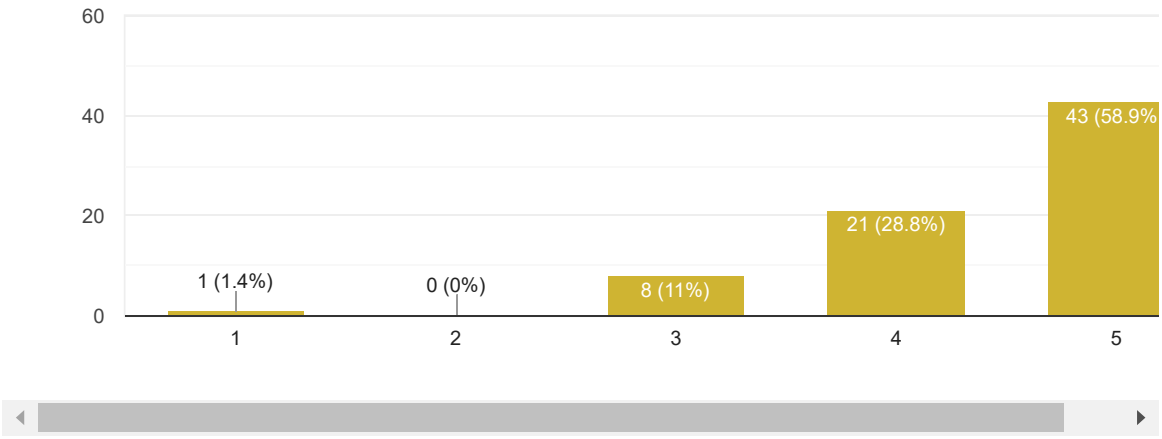
I would like to know what I can do in the park, while I am waiting for my turn in the ride.

73 responses



I would expect the app to have an option for sending QR codes after booking, to the phones of all the members who accompany me.

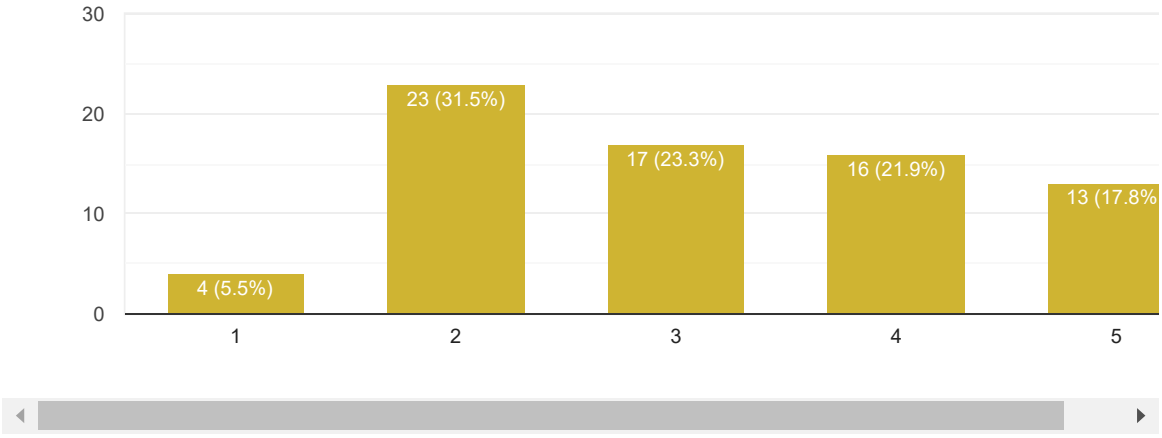
73 responses



Time preception

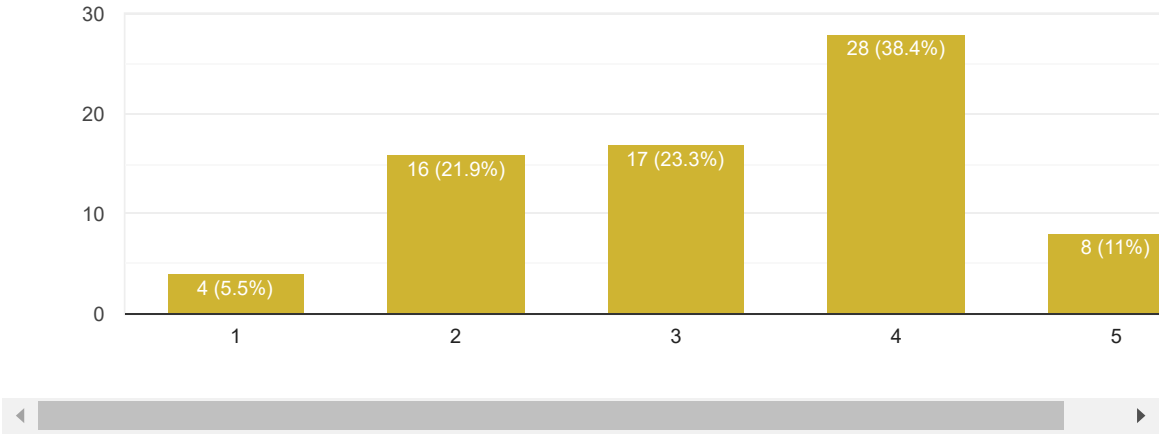
I feel frustrated/anxious when the queue is long, although it is moving at a quick pace.

73 responses



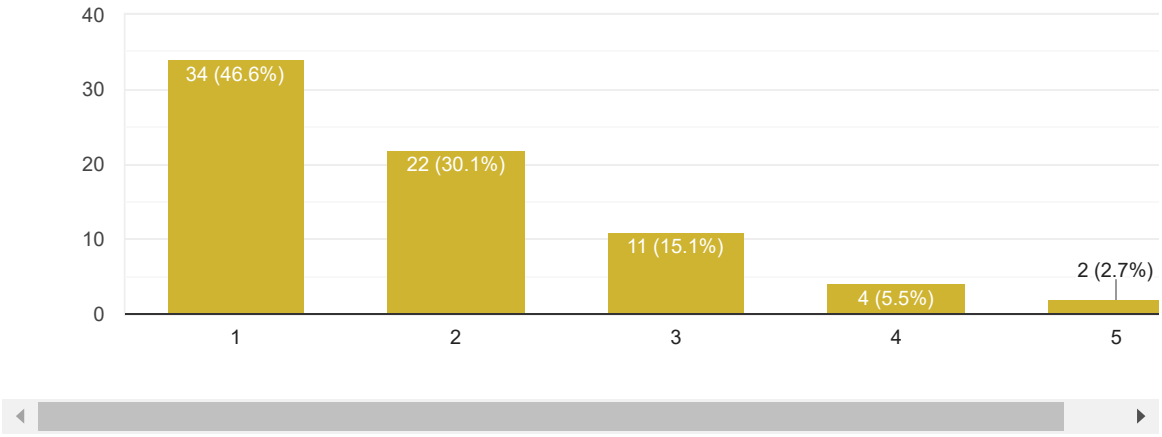
Even if the amusement park provides some kind of entertainment while waiting for the ride, I might still feel dissatisfied.

73 responses



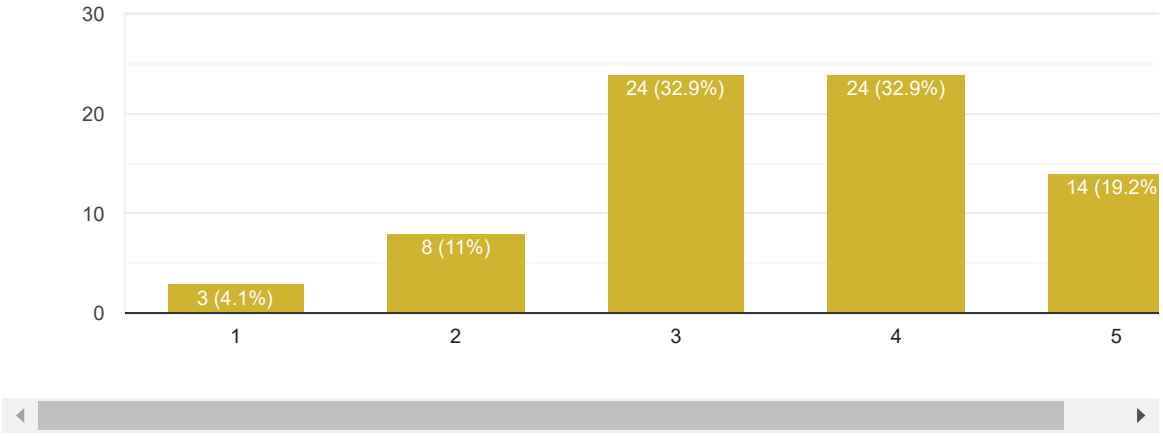
I would prefer to wait in a queue, regardless of the waiting time, rather than knowing the duration of my wait time.

73 responses



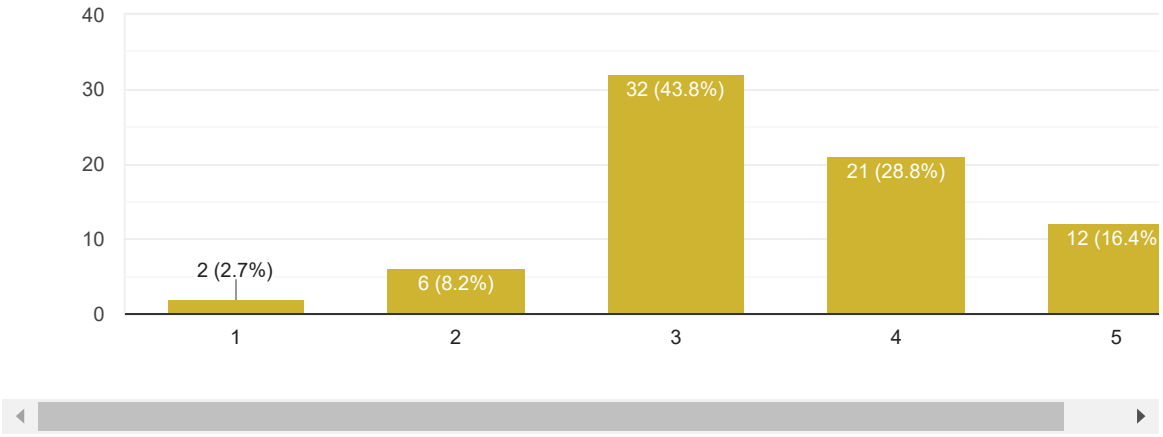
I prefer to arrive at the ride location, at the exact time mentioned in my ticket.

73 responses



Based on your previous experiences of waiting in lines, have you felt that you wait for a long time, even though the actual waiting duration might have been comparatively short than what you experienced

73 responses



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