Sustainable solutions and important factors for developing Smart Tourism in Estonian Cities

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Abstract

Over the last few decades, major changes have taken place in the world due to the rise of technology. Industrial mass-based cities have been replaced by post-industrial cities. At the same time, urban development is affected by both global and local processes. Knowledge, innovation and creativity are central to urban development to create a higher quality and more attractive living environment. Smart cities are part of nowadays urban development. Smart cities focus on sustainability and overall improvement of citizen’s life quality in the cities by implementing ICT solutions in different areas of cities.

This research focused on Estonian cities of Tallinn and Tartu and their smart solutions in different smart city dimensions. The purpose of this research was to find out Estonian hotel employees' views of current smart tourism solutions in Estonian cities and according to the answers to determine development areas of the cities. For data collection method, Estonian hotel employees from Tallinn and Tartu were interviewed. This research revealed that most respondents were familiar with the smart tourism solutions and it’s challenges.

Keywords: Smart tourism, smart city concept, smart city dimensions, sustainability, information and communication technology
Declaration

I, Sirle Toots, declare that the content of this research is my own contribution. Interview’s respondents consented to the use of their answers for research purposes and any other text’s taken from other sources were appropriately accredited in the text and listed in the reference chapter.
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1 Introduction

The introduction chapter presents the background of the research topic, the problem statement, the purpose for this research, research questions, limitations and overall outline of this research.

1.1 Background

There is no doubt that the rise of technology and use of big data has changed traditional tourism. The use of technology is giving an opportunity to understand travelers behavior more in depth than before. Cities and metropolitan areas worldwide, have found the potential of using information and communication technology, which is used for making cities smarter and more sustainable (Gretzel et al. 2015).

Sustainable tourism development is a way of using environmental resources optimally for developing tourism destinations, protecting their essential ecological processes, natural resources and biodiversity, respecting the socio-cultural resources and preserving their cultural heritage to keep traditional values and also to promote intercultural tolerance and understanding. Hence, sustainable tourism is ensuring long-lasting solutions for cities in a way that is friendly for the environment (Shafiei et al. 2017).

The idea of sustainable development has become one of the most widely used concepts in the tourism business world over the last three decades. It was created in response to the negative effects of globalization and industrialization. Many governments and international organizations have begun to emphasize the importance of implementing the concept of sustainable development in business, which brings social and environmental value to society as well as financial benefits. Tourism, as one of the largest economic industries in numerous countries, requires the implementation of a sustainable concept strategy and action to achieve long-term success. Development indicators are very important for monitoring sustainable tourism. They warn destination developers of a specific risk so that corrective action can be taken if necessary. (Budeanu et al. 2015).

A key feature of a smart city is the use of ICT (information and communications technology) in various areas of development in order to improve cities economic, social and environmental sustainability (Neirotti et al. 2014). According to different authors (Ahvenniemi et al. 2017; Bretta 2018; Girffinger et al. 2007) smart cities have six main dimensions that are making that city a ´smart city´. These six dimensions are: smart environment, smart mobility, smart economy, smart governance, smart people and smart living.
Although the aim of a smart city is to improve people's quality of life according to Golding & Barthel (2017) and make processes more efficient in different areas through the integration of ICT, it is necessary to examine which parties benefit more from the smart city model and which less. The impact of technology-driven living and urbanization on human health can be significant, leading to stress, depression and reduced physical activity, which in turn lead to further health concerns. Physical activity helps to strengthen both physical and mental health. Direct contact with the natural environment is also important and would help relieve these concerns. Therefore, in the smart city model, it is important to focus on the ecological balance of the city and to develop opportunities for people to spend their free time in nature and in the fresh air.

1.2 Problem statement

The aim of this research for society and science is for better understanding, how the application of ICT to different areas of life can create new opportunities to develop more efficient, data-driven systems and sustainable solutions in tourism. More and more devices are connected to the Internet today, and various sensors in cities worldwide are storing and using big data. By processing such information, we get valuable information about the processes taking place in the cities. In addition to the integration of ICT solutions, human capital, improving people's awareness and well-being, but also environmental sustainability are important in a smart city. It is an essential aspect that smart solutions are creating better and more sustainable environment for all the stakeholders. It is important to validate both, negative and positive effects that ICT can create in everyday life. This research has focused on different aspects, solutions and complications that smart tourism has created.

1.3 Research purpose

The purpose of this qualitative method study is to find out the stakeholders views of development opportunities of a smart city tourism in different areas on the example of the Estonian cities Tallinn and Tartu. In this study were interviewed, hotel employees from Estonian cities of Tallinn and Tartu, to collect qualitative data and fulfill the purpose of the research.

1.4 Research questions

What are the key elements, according to hotel employees in Estonia, that are making Estonian cities smart and sustainable?
According to hotel employees, what are the possible challenges and development areas for Estonian smart cities?

1.5 Delimitations

Tallinn and Tartu are Estonia’s largest cities by population according to Association of Estonian Cities and Municipalities (2022), with population 444,999 inhabitants in Tallinn and 94,831 inhabitants in Tartu. In this research for data collection are used these two Estonian cities as these are the two biggest cities in the country.

Bigger cities have a better level of infrastructure and that is the reason why bigger cities are attracting more and more people to live in these cities. More people means more information and communication technology users and that facilitates the adoption of new technologies (Neioretti et al. 2014).

1.6 Dissertation outline

This study consists of six main chapters for making this clearer and better to follow for the reader. The first chapter is an introduction chapter that aims to introduce the topic of the study by using subchapters about problem background, research purpose and limitations so the reader can have a better overview about the research. The second chapter presents the research methodology, this chapter includes research approach, gives an overview of different research ways and justifies and explains of research method used for this research. The third chapter is about literature review, it contains topics and theories of such as smart tourism and sustainable tourism that are important topics of this research and gives an overview of cities Tallinn and Tartu in a smart city concept. The fourth chapter gives an overview of empirical results and presents collected data of the study. The fifth chapter of this thesis is containing analysis of the empirical results and their connections with topics that are presented in the literature review chapter. The last, sixth chapter is containing conclusion and ideas for further research in the future. All the materials, that are used in different chapters have been referenced to the right author, so the reader of this research can find the right source effortlessly.
2 Methodology

This chapter describes the research approach, purpose of this research and selected methodology for the study. This chapter also outlines different important aspects that are theoretical science, deductive and inductive approaches, positivism and interpretive and describes data collection method and data analysis method that are important parts of this research. Ethics, validity and reliability are discussed at the end of this chapter.

2.1 Research approach

In this research, data collection is based on qualitative method - this is a method of text analysis that can be used to study the complete texts and its meanings. According to Lembit Õunapuu (2014) and Veronika Kalmus, Anu Masso & Merle Linno (2015), the features of qualitative or cognitive research are the study of subjective meanings, inductance or analysis based on data rather than theory, avoiding or minimizing numerical data and focusing content and communicative context. One of the criteria’s for the reliability of a qualitative content analysis is the detailed recording of the analysis process, which enables the researcher to accurately explain the formation of the obtained conclusions. This is mainly done in the form of keynotes. In qualitative research, the data is multi-layered and rich, and orientation can be difficult because different topics are intertwined. For example, the interviewee may talk about the same thing at different times during the interview. Writing memos helps the researcher to orientate in the material and to remember his / her interpretations and assumptions. A memo is like a midterm review in which the researcher writes down his or her assumptions, interpretations, explanations, and other ideas that are tested — proven, or refuted throughout the coding and categorization process (Kalmus, Masso & Linno 2015).

For more in-depth understanding of both cities opportunities, SWOT analysis was used. SWOT analysis is a well-known management tool for analyzing the internal and external environment. The name of the analysis is an acronym from the first letters of English words:
S - strengths
W - weaknesses
O - opportunities
T - threats
With the help of SWOT analysis, it is possible to get a comprehensive overview of a company, product, services strengths and weaknesses of the course of action and the threats arising from the external environment and opportunities. (Kapoor & Kaur 2017)
2.2 Theoretical science

Concepts are theoretical constructions that are created as a result of the generalization of knowledge of individual facts. Theory is one of the main hallmarks of research science. Theory can generally be called a form of research knowledge that includes descriptions and explanations of the similarities of the phenomena under study (Bryman 2012). According to Charmaz (2006) and Ŭunapuu (2014) theoretical science is a qualitative method of research that aims to generate well-founded theory or hypotheses based on empirical data. The form of a well-founded theory consists of certain principles and researches, in the course of which a well-founded and proven theory of the researched phenomenon or object develops, e.g. cause-and-effect with other phenomena, predictability of behavior, etc. A grounded theory consists of all methods of analysis and interpretation, all of which are aimed at creating a theory. Methods of analysis and interpretation - three-level coding, sampling method of theory, creation and testing of categories, writing of memos - all with a grounded theory as a separate methodology.

One of the most important methodological principles of sound theory is that scientific research is seen as a process of cognition in which knowledge develops and expands with each new step. Each new step tests the knowledge gained from the previous step and adds a new one. That is why step-by-step sampling is important. Analytical principles and techniques that characterize sound theory include simultaneous data collection, coding, analysis, and theory development. Analytical techniques that characterize a well-founded theory include inductive three-level coding, derivation of codes and categories from data, continuous checking, updating and hierarchy of relationships between categories, writing memos, and a theoretical sample used to construct a theory (Charmaz 2006).

In the case of a grounded theory, the most thorough analysis of the phenomenon under study must be achieved, thus achieving saturation of the theoretical categories - in order to achieve saturation, a theoretical sample is used in the case of a grounded theory. In the case of a grounded theory, of course, initial sampling must be used, which includes the people, institutions, etc. that are involved in the topic. However, just as we do not know in advance all the analytical categories that will emerge in a grounded theory and cannot immediately determine the final research questions in our study (Charmaz, 2006), additional data may need to be collected during coding of analysis over a period of time simultaneously. As long as the additional data collection takes place (within several units of analysis), it is not possible to give unambiguous advice on this, as the saturation of the theoretical categories may vary from study to study. It is certainly useful to use different analytical techniques to understand the saturation of theoretical categories: comparing the
properties of the categories being analyzed and the relationships between them, sorting categories, codes and memos (bearing in mind that more than one option may be suitable for sorting) and that or hypothesis). Concepts maps, diagrams, tables - all of these tools can be useful (Charmaz 2006).

Bell, Lederman and Abd-El-Khalick (2000) and Wilber (2003) are explaining this science as a trivial phenomenon that combines two aspects:

1. Subjective - the researcher's internal processes, such as understanding, intuition, experience, inference.
2. Formal - form search. Which includes the forms and formalities for carrying out research, collecting data and presenting results

For example, according to Wilber (2003), science is more of an exponential attitude, honesty, and work-based research, and its knowledge is based wherever possible on evidence, whether external as in narrow sciences or internal as in sciences. Wilber (2003) has sought to integrate narrow and broad science, more precisely the possibility of a qualitative and quantitative approach, but provided that the qualitative does not fall into the quantitative positivist limitation.

Wimmer and Dominick (2011) point out five characteristics that distinguish between research processes that follow the traditions of positivism and interpretivism:

1. The role of the researcher - the positivist researcher seeks objectivity and is separated from the data; the interprovince researcher is an integrated part of the data, without the active participation of the researcher the data do not exist.
2. A design-positivist researcher plans all research before it is awarded; the plan of the interpretive researcher is developed in the course of the research
3. Conditions - a positivist researcher conducts research under controlled conditions, while an interpretive researcher conducts research under natural conditions.
4. Measuring instruments - in psychological research, measuring instruments are separate from the researcher; in interpretive research, the researcher is the source of the data.
5. Theory Development - A positivist researcher studies to confirm or refute a theory; the interpretive researcher develops the theory during the research.

2.3 Qualitative and quantitative research methods

Quantitative and qualitative methods are two manifestations of the theory of science methods of research. Most of the research methodological literature distinguishes them
as opponents, quantitative versus qualitative, and tries to prove the advantages and disadvantages of one over the other. However, qualitative and qualitative are not opposites, but different ways of working on different researches. A mistake is made where one of them is absolutized, and the other is opposed. Opposition should be professional, and it is impossible to draw a clear line between these two methods, because in itself every idea from which research begins is qualitative in nature (Øunapuu 2014).

Different authors are agreeing with statement that it is difficult to define qualitative research method as it is impossible to agree with one definition. The complexity of the definition of qualitative research method is probably due to common approach that is - quantitative versus qualitative - which forces one method of research method to be contrasted with another and one to look for shortcomings in relation to another research method. In doing so, one is basically looking for the answer to the question of which one provides the "right" scientific knowledge, without noticing what role other method could play in science. (Flick 2011; Laherand 2008; Denzin & Lincoln 2000)

Qualitative method is used when researching, for example: opinions, impressions and values, interpretations and responses of the participants, patterns of conduct, processes and the laws of their operation cases. The qualitative surveys and questions are mainly so-called open-ended questions, to which the respondent can answer exactly as he or she wishes. Answers to open-ended questions can be used to enrich research with authentic citations (Uus 2007). Quantitative method - the quantities characterizing the objects used are numerical, the data are analyzed by mathematical methods and the conclusions can usually be described numerically. Qualitative and quantitative research methods are not mutually exclusive and can be used successfully in the same study. For example, you can get information with a questionnaire with both open-ended and close-ended questions, or search for an answer to your research question using a both questionnaire and interviews for collecting data (Uus, 2007).

According to Creswell and Plano Clark (2011) mixed-method research is a method that is using both qualitative and quantitative research approaches. Methodology includes philosophical views that involve the collection and analysis of data and the mixing of qualitative and quantitative methods in the various phases of research. The focus is on data collection and analysis, combining qualitative and quantitative data in a single study or series of studies. The central aim of the combination is to have a better understanding of the research problem than what qualitative or quantitative research alone would allow.

Combining qualitative and quantitative research according to Pope and Mays (1995) complement each other. They see a combination of selective and quantitative research in three ways:
• Qualitative Research is a preparatory step for quantitative research;
• The qualitative method can further collect data to validate the results of quantitative research;
• Qualitative research can be further applied if the quantitative research alone is limited (in the study of complex phenomena or areas).

To decide in favor of the mixed method, it is said that this way researchers can find more information about different research aspects. Triangulation of methods is the most common argument for choosing a mixed method in favor of research. Triangulation means that more than one method is used to solve the same issue. Undoubtedly, the triangulation of methods enriches the results of research and makes them more acceptable to proponents of both qualitative and quantitative research. Additionally, is another reason to decide in favor of a mixed method. Furthermore, it means that the results obtained by one method are refined, extended and explained by the results obtained by one method in order to reach a more in-depth understanding of the phenomena (Öunapuu 2014).

2.4 Deductive and inductive approaches

Qualitative content analysis allows for both inductive approach - data-driven - and deductive approach - category creation based on theory and / or previous research based. (Laherand, 2008) describes the inductive approach with an example, calling it a common content analysis and also Hsieh and Shannon (2005) agree this that explanation of inductive approach. The inductive approach to content analysis is similar to the analytical composition of several other qualitative analysis methods - grounded theory or phenomenology. The latter, however, go further conceptually, trying to create an original theory or a nuanced understanding of the experience, respectively. Qualitative content analysis does not set such ambitious theoretical goals, while the method may introduce new concepts or more specific levels of explanatory model goals. It is in the inductive approach to data analysis that one of the strengths of qualitative content analysis emerges - the understanding of the world of the participants in the study and the study of their interpretations and systems of meaning (Laherand 2008).

A deductive approach that is used to qualitative content analysis, where there are theories or previous studies on the phenomenon under study that are to be examined or further developed in an empirical context. Laherand (2008) calls this approach model-oriented content analysis, following the example of Hsieh and Shannon (2005), describing it as a more structured process than an inductive approach. When both theoretical and new data-based codes are used in the same study, it is a combination of a deductive and an inductive approach, combining them into a one circle. The deductive approach allows supporting
and / or expanding the existing theory; in addition, it helps to avoid unnecessary bicycle invention and saves the researcher's time. At the same time, over-reliance on theory can obscure the nuances of the phenomenon, the peculiarities of the context and the changes that have taken place over time, which have led to a strong skew of the study. Adding an inductive view allows the researcher to be open to new manifestations and to look for corrective or even rebuttal evidence. Kalmus (1999) and Laherand (2008) agree with the statement that the combined inductive and deductive approach is illustrated by the analysis of values transmitted through primitive texts and images, in which the coding of values takes place in two steps.

Qualitative research follows an interpretive tradition, which is why it aims to describe and explain social reality through people's individual interpretations, in other words, the meanings that people attach to aspects of reality. Quantitative research, on the other hand, is based on a positivist tradition. Positivists present cause-and-effect theories about the phenomena under study, make theory-based hypotheses, and test these hypotheses. The preferred way to test the hypotheses is to experiment in some way with the characteristics of the phenomena and to record the results (McNabb 2010).

### 2.5 Data collection method

Data collection for this research started with formulating semi-structured interview questions that were later used for interviewing hotel employees of Estonian cities Tallinn and Tartu. For finding participants, hotel’s contact details were found on Estonia’s Hospitality and Restaurants Union’s website ([www.ehrl.ee](http://www.ehrl.ee)). Hotel employees were chosen for interviews because of their knowledge about tourism industry trends, it was advantage for collecting answers from people who had understanding of smart tourism term and trends. All the answers were collected over the e-mail and due to the wishes of applicants, all the respondents and companies were remaining anonymous. E-mail interviews were chosen for data collection because this was a good solution to find more participants for interviews, as this way they were able to answer to the questions when it was suitable for them. Each interview was in Estonian and consisted of 17 questions about smart tourism and three questions about the respondents' demography, interview questions that are translated into English are found in the appendix. To make the text for the reader more understandable are numerical names used for each respondent (Employee 1, Employee 2 and so on).

Depending on a research type it is important step to specify right sampling method for most efficient data collection techniques. Expert sampling is a way of using experts knowledge in certain areas of research for receiving answers that require specific
experience and understanding of research topic (Etikan & Pala 2017). Semi-structured interviews allow respondents to elaborate where they would feel that it’s needed. This structure is good for identifying important themes, and it also allows for rich and detailed formation for the data collection (Kallio et al. 2016).

According to Fowler (2012) survey is a method of data collection that requires the data collector to have a very clear idea from the outset of what data he or she needs. This means that the data collector should have formulated specific survey questions to be answered when planning the survey. This is necessary because there are certain steps that need to be taken when conducting a survey. If mistakes have been made in the first stages of the study, it will no longer be possible to significantly correct the wrong decisions or mistakes made in the first stages of the study. Planning a survey begins with setting a research goal and formulating a hypothesis or research question. Next, it is necessary to define the group of people affected by this research problem, who is the general population under study. It must then be decided whether and which sample to use and how to reach these people. Here, for example, one has to consider whether to collect data through telephone, web or face-to-face interviews. Only by knowing who and how is it planned to be interviewed can you start compiling a questionnaire. The questionnaire must then be tested and corrected. After all this preparation, the data can finally be collected (Fowler 2012).

Interviewing is the communication between two or more people. One of the most important roles of an interviewer while interviewing someone is listening to them. In addition, it is good to use the body language. Body language is that part of the interview that is not part of the actual research data, but helps to achieve the research results. If the interviewer perceives the interviewee's discomfort, it is possible to ask additional questions or provide explanations. Important thing during the interview is that there are no biasing questions. The interviewee must remain free to answer questions without the interviewer interfering. It must also be borne in mind that if the interviewee does not want to answer these questions, he or she should not be forced to do so. The interviewee also has the opportunity to opt out of the interview at any time during the interview (Lune & Berg 2017).

2.6 Data analysis

The data analysis of both the quantitative and qualitative studies is based on the frequency of the characteristics. In order to avoid distortions in the results, the objectivity and repeatability of the research process, including data analysis, are considered important in both qualitative and quantitative work. Transparency of data analysis means the clarity
and transparency of the analysis methods, that is, the data analyzes must be described in such a way that the data have been collected and studied. Resolving any issues is also important in both types of research, for preventing any mistakes that can occur in data collection, coding, or analysis. The suitability of the theoretical model and the empirical data are evaluated to avoid mistakes (Hardy & Bryman 2009).

The purpose of thematic analysis (as well as other types of qualitative content analysis) is to find the meanings and understandings inherent in the data (Ezzy 2002; Flick 2011). The topics and their order are identified, in other words, what and how they are spoken, and the interpretations of the data creator (interviewee, author of the written text, etc.) are examined. Open coding is used for thematic analysis. When collecting data, the researcher formulates the purpose of the research and research questions, but in addition to the topics formulated by the researcher, the data also pays attention to what is important for the participants (interviewees, authors of written texts). In the case of a grounded theory, it is important to start with the initial sampling, which includes people or institutions who are interested in the topic. However, just as we do not know in advance all the analytical categories that will emerge in a grounded theory and cannot immediately determine the final research questions of the research (Charmaz, 2006), coding may require data collection. A code is a tag or keyword that identifies a piece of text. Coding is the main operation of qualitative analysis, in the course of which the text is divided into parts in order to thoroughly study and understand the text. It is important to highlight the hidden deep meanings of the text. Coding begins with multiple in-depth readings of texts, during which important messages, sentences and words are marked and given a keyword or code (Ezzy 2002).

The second step in qualitative content analysis is to categorize the code. A category is an analytical unit created by a researcher (or a so-called code family in software-based analysis) into which similar codes are grouped. Next, the work is done with categories, their mutual relations and hierarchies are studied, they are grouped on the basis of similarity. Categories, like codes, can be worded either in a generalized way, but relatively close to the text, or conceptually. When formulating analytical categories, it is important to pay attention to their naming and justification. (Masso & Tender 2008)

2.7 Validity, reliability and ethical considerations

With all types of researches, it is important that the research is validated and reliable. When researching the truthfulness and accuracy of data collection, validity and reliability are discussed primarily in the context of research (Elmes, Kantowitz, & Roediger 2013). Validity refers primarily to the substantive accuracy and correctness of the survey results, but it also refers to the correctness and validity of the definition of the construct created
for data collection. Reliability refers primarily to the repeatability of experimental results; inferring statistics makes it possible to determine the probability of a repeatability.

The rules on research ethics are relatively well established in surveys. Persons participating in the survey should always be asked for consent for participation to the collection, storage and use of their data in the research. If data collected will only be used in the research could be used in an anonymized or pseudonymized form, meaning that the data and analysis that are based on this data, will only be used and disclosed in a way that preserves the anonymity and confidentiality of the study participants. The anonymity and confidentiality of the study participants must be ensured even if the entire collected data is made publicly available and usable. To achieve this, it may be necessary to transcode and decrypt the personally identifiable data that is collected from the respondents. Data archives, where publicly available survey data are mostly stored, have procedures and policies in place to ensure that the data is made available for use in the research and published in a form that does not compromise the confidentiality of survey participants (Borgman 2016).

The general data protection regulation (GDPR) is helping us to protect our personal data. This regulation is made for EU companies and citizens and also international companies that have to follow this regulation when collecting EU citizens and their personal data. Some of the general data protection regulation requirements are: Requiring the consent of subjects for data processing, anonymizing collected data to protect privacy, providing data breach notifications, handling and transferring data safely across borders and requiring certain companies to appoint a data protection officer to oversee GDPR compliance. If companies don’t follow the GDPR rules, then they will have to pay penalties (De Groot 2020).

2.8 Summary

This chapter described the methodology behind this research, and it explained the approach of this research. In this chapter, it was explained the difference between qualitative and quantitative methods, inductive and deductive approaches, data collection and analysis methods to explain the preparation process for data collection and analysis. In addition to that, validity, reliability and ethics were discussed at the end of the paragraph.
3 Literature review

This chapter provides a literature review on smart tourism and topics that are close to this research area. Different definitions about smart tourism and sustainability are introduced in this chapter of literature review. Challenges of smart tourism and new trends in connection of smart tourism and smart cities are also presented in this chapter. The last subchapter of literature review is giving overview of current information and communication technology solutions in Estonian cities of Tallinn and Tartu.

3.1 Smart tourism

Buhalis (2000) describes tourism destinations as a set of tourism products that offers consumers a comprehensive experience. Traditionally, destinations are considered to be well-defined by geographical areas, such as a city or a country. Nowadays, tourism destinations are increasingly defined as a cognitive concept, that can be subjectively described by each individual consumer, depending on his or her cultural background, level of education, travel experience and purpose of the travel. According to the Estonian Statistics (2022) the development of information and communication technology (ICT) has made life much easier in different aspects. The news reaches us in real time, we don’t depend on the time of the news broadcast or the time of delivery of the newspaper. Accommodation booking, airline tickets and a taxi service are just a few clicks away on your computer or smartphone. Information for booking is available at any time. It facilitates both data retrieval and communication, it has had a revolutionary impact on how we trade and use services. With the introduction of information technology, major changes have been made in the management and production of companies: work organization is faster and more efficient. Some of the work that used to be done by humans, has been taken over by computers and robots, and the use of digital documents has increased (STAT, 2022).

The ultimate goal for smart tourism destination development is to raise competitiveness and make this destination for better place to live for all stakeholders, that includes residents and tourists. To get to this outcome, different aspects are included to make the destination ‘‘smart’’. This smartness has a big role in tourism destination’s marketing and management. The smart tourism destination is a system that takes the benefit of smart technology while developing, managing and delivering more intelligent facilities and experiences for stakeholders. The one important aspect that is defining destination’s smartness is wide use of information and communication technology devices in this place (Boes, Buhalis & Inversini 2016).
According to Silgoe, Owne and Macnaghten (2013) improvement of technology is great for new methods of making everyday life better, but also it is important to use responsible approach while making new changes. The power of technology can produce both benefit and harm at the same time. When Technology can give people more ways to simplify things, then it can also add some uncertainty. The forward-looking view of responsibility in innovation is that this responsibility is shared between different aspects. We can create responsible innovations in the future, if we are taking right steps in the present. Conventional governance focuses on product questions and especially technological risk questions, it helps to find out risk and benefit areas. The four dimensions of responsible innovation proposed are anticipation, reflexivity, inclusion and responsiveness, and they provide a framework for raising, discussing and responding to such questions that are connected directly to taking responsibility for the change. There can be different processes that can allow innovation to respond to improved anticipation, reflexivity and inclusion. A responsible approach towards innovation allows creating change that has positive impacts, instead of negative ones (Silgoe, Owen & Macnaghten, 2013).

Travelers are using ICT solutions and systems every day for planning and booking their trip, to get information about their desired travel destination and additionally paying for their trip. ICT role in tourist’s decision-making process is important because ICT services, devices and systems are helping tourists to find a lot of information about their chosen destinations, hotels, activities and experiences that are available in their travel destination. Information technology systems have a major part of nowadays tourism industry, these systems help travel organizations to have connection with their customers, compete with other companies, plan their development strategies, add value to their products, save costs and simplify their operations. The aviation industry has been using computer reservation systems since 1950s, later these systems became Global Distribution Systems (GDSs) when these systems were developed, and it became possible to book other types of travel reservations in addition to flights. These systems are still a very important part of the airline sector and other sectors nowadays tourism today, these systems are improved constantly because technology is changing constantly. Hospitality businesses are similarly using ICT reservation and management systems in everyday basis. A number of hotels are using different kinds of ICT services, for example, they have electronic locking systems, digital room keys, guest room automation, voice command technology, energy management systems, virtual concierges and self-check in terminals. Most tourism sectors nowadays are using ICT systems, including entertainment, casinos and conventions. ICT brings together different sectors of travel destinations, companies can connect with travelers using the Internet, social media and other ways using technology (Benckendorff et al., 2019).
As main purpose of smart destinations is to grow competitiveness and improve quality of life for local residents, stakeholders and tourists. Managing a smart tourist destination has become more complex, as current technological developments have made it possible to integrate resources together so that all those involved in the ecosystem of a smart tourist destination can create value. This combination of connected and interoperable technological systems increases the potential for lasting competitive advantage for tourist destinations. To take full benefit of current intelligence, destination managers need to integrate a full range of intelligence components and ensure interoperability and connectivity for both soft and hard intelligence (Boes et al. 2016).

Mets & Viia (2021) are arguing that the hospitality sector is characterized by a continuing increase in the automation of routine work and a decrease in the share of personal services. Automation of work processes allows to integrate the hotel’s work processes into a whole, to control them remotely and thus increase the efficiency of the company’s work. There is a continuing trend in catering to automate or replace work segments with self-service solutions. The use of smart applications to remotely control kitchen appliances, organize kitchen work, monitor inventory, place orders, etc. is growing. The popularity of traditional package travel in tourism is declining and independent online travel arrangements are increasing. The technology helps to manage the destination holistically, from booking tickets and accommodation to using various travel services. The share of follow-up to online bookings is growing (Mets & Viia, 2021).

In every industry, it is important to make sure to improve continuously to be more competitive and follow innovations, the course of every industry will continue to evolve, incorporate and need more technology to be successful. Many businesses in today’s tourism industry will work with systems automation. Virtual assistants can’t replace humans in tourism industry, but they can take over some easy ordinary tasks, for example taking simple orders (Kobres, 2018).

### 3.2 The smart city

The smart city's main aspect is to obtain a more efficient management of infrastructure and services. Smart sustainable cities are the best places for people to live and also are less expensive to manage (Bennett et al. 2017).

According to Lazaroiu & Rosica (2012) the smart city is a new way to measure different cities - how to make the best use of available resources and how to find alternative resources. In addition, the efficient use of financial resources is important. A number of information and communication technologies need to be used to create a smart city, in order to develop a comprehensive concept of a smart city. The most important aspect of
developing a smart city is considered to be the information and communication aspect. It helps to support the development of the city, make it more efficient and increase the rate of investment. The level of investment can also be considered very important, as it provides an opportunity to finance larger projects, helps the economy to grow and supports the use of renewable energy. In addition, transport is important - how it is organized, what public transport options are available and what infrastructure is in place for pedestrians, two-wheelers and quadricycles (Lazaroiu & Roscia, 2012).

One of the definition of a smart city concept and its six dimensions comes from a (Giffinger’s et al, 2007) published paper where it is highlighting 6 dimensions of a smart city. This model classifies smart city dimensions as: smart economy, smart people, smart governance, smart mobility, smart environment and smart living (Giffinger et. al 2007). Smart economy is sustainable and, among other things, it contains innovation and also innovative business models to imply in a city. These new business models are helping to make cities more sustainable, and also these models are helping to grow economic competitiveness while supporting interconnections between local and global economic systems. In a smart people dimension plays an important role in improving residents knowledge and also to ensure access to education and social capital also it is important in this dimension that all the individuals are treated equally.

Smart Governance focuses on making the public and integrating all different parties as a part of the decision-making process, in particular by encouraging residents to use new technologies like e-services and build trust and transparency in the public sector. The Smart mobility dimension focuses on developing a sustainable and modern transport system in the city that benefits all the parties who are using transport systems such as residents, tourists, students etc., importance is to develop more sustainable transport systems. These innovative ICT solutions that are used in smart cites are part of a plan that focuses on residents and also international accessibility to improve life in the city (Giffinger et al., 2007). Smart Mobility uses existing technologies to collect and share information with users, planners and service providers, enabling them to change mobility patterns and planning mechanisms and to increase the coherence and coordination of different modes of transport. The Smart environment dimension focuses on more sustainable environmental solutions in the modern city, and it has particular attention to the management of natural and heritage resources. Important role in the environment dimension to optimize usage of energy, air water and have a sustainable waste management plan. Smart living is focusing on residents needs to make cities more sustainable, accessible and flexible for them to improve their quality of life by increasing health and safety in the city and additionally making this more attractive for tourists. Each dimension of any smart city covers many different sub-categories, these categories affect
cities and these can be developed for making urban life better. The classifications for these dimensions are into technological, ecological, social and economic aspects, but this is not universal, as the different dimensions are to some extent related to one as to others. This indicates the complexity of smart cities. From different perspectives of the smart cities, it is good to understand what dimensions exist in the city and what changes are needed to make for improving life quality in the cities different dimensions (Giffinger et al., 2007).

According to Colding and Barthel (2017) and Neirotti et al. (2014) population growth and urbanization raise various issues that may threaten the economic and environmental sustainability of cities. However, today's cities have become increasingly complex in terms of structure, with large cities already having millions of people. In order to meet the needs of everyone, cities use different means of public transport, due to the growing culture of consumption, there are more and more innovative solutions for businesses and different service providers. It is therefore important that the cities in which people live are sustainable and able to keep up with the times. For this reason, the concept of a "smart city" has been developed with the aim of ensuring the sustainable development of the city. At the same time, these developments must address environmental and social issues. Since a smart city does not have a one definition, the author of each study can define it in such a way that it explains important aspects for the author. Different indicators are used to measure a smart city, which makes it possible to measure the sustainability of a city (Neirotti et al. 2014).

Smart solutions need to be developed to overcome the challenges of urbanization, and the integration of information and communication technologies (ICT) into different areas of life is an important part of change. These technologies must be cost- and resource-efficient and ensure the environmental and economic sustainability of cities, but also improve well-being (Ahvenniemi et al. 2017).

The size of the city plays an important role in applying smart solutions in the city, because bigger cities have a better level of infrastructure and that way these cities are able to attract more human capital. More people in the city means more ICT users, enabling the adoption of new technologies. The large mass of users also attracts entrepreneurs, who quickly see the city as a market. In addition to the size of the city, the population densities of the city also play a role. In large, more densely populated cities, there is more social interaction, which facilitates the dissemination of ideas and promotes innovation (Neirotti et al. 2014).
3.3 Sustainable tourism

The Global sustainable Tourism council (2022) defines sustainable tourism as a tourism that uses sustainable tactics. An important role in adoption to use more sustainable practices in tourism is to minimize the negative impacts of tourism and maximize the positive impacts of tourism. Some of the negative impacts that tourism can cause are economic leakage, damage to the natural environment and overcrowding. Positive impacts can be, for example, job creation, cultural heritage preservation and interpretation, wildlife preservation and landscape restoration. Sustainable tourism is a form of tourism that takes full responsibility for its current and future economic, social and environmental impacts, is understanding the needs of visitors, the industry, the environment and also host communities. Also, in sustainable tourism concept it is important that environmental, economic and socio-cultural features are all considered in tourism development. It is important that all of these three dimensions are balanced, because that is the key for a long term sustainable tourism development (Global Sustainable Tourism Council, 2022)

Three key factors that are related to sustainable development have been identified by (Hall et al. 2015):

- Economic sustainability means creating prosperity in different parts of society layers and addressing cost-effectiveness in all economic activities. Mainly this means that the viability and performance of companies is important, and their long-term sustainability is similarly essential.

- Social sustainability is respect for human rights and the creation of equal opportunities in society as a whole. The emphasis is on local communities by maintaining and strengthening their life support systems, respecting and recognizing different cultures and oppression is avoided.

- Environmental sustainability means managing and protecting natural resources. Especially important are non-renewable and living resources. Measures to reduce air, water and land pollution and to protect biodiversity and the natural heritage.

Kozak (2014) and (Shafiei et al. 2017) argue that, it is fair to say that highlighting local culture heritage and tradition is only possible in good cooperation with businesses and local governments. It is often a problem to understand the phenomenon of a product or service that new solutions bring, and to see and define clearly the characteristics of what is being reflected. The use of innovative solutions is essential, for success in sustainable
tourism management. Additionally, well-functioning cooperation between different tourism stakeholders is a source of success for the tourism industry.

To ensure the sustainability of tourism businesses, managers must be innovative, differentiated by the company’s products and services. The diversification of target groups leads to the need for products and services that are specific and adapted to different cultures. The personal qualities, responsibility and decision-making skills, necessary for leadership are important to the leader, because resources, processes and people must be managed well and sustainable way (Mets & Viia 2021).

Sustainable destination development goals are necessary to achieve destination’s better and more sustainable future in the tourism industry. Important for stakeholders is to work together because this is helping tourism destinations to survive these days. Stakeholders should change their approach of being competitive to work together with each other and have an approach of principle of shared value. Stakeholders working together is more effective and leads to better outcomes for all. Different stakeholders, their relationships and their decision-making processes have an effect on tourism destinations, that are either positive or negative impacts. Stakeholders collective work in the tourism industry means that destination’s stakeholders are working together and are engaging in strategic decision-making, and they develop a new shared knowledge of what is needed at destination level to achieve their goals. Strong stakeholder relationships benefits individuals, workplaces, tourism destinations and communities. Collective leadership management is needed at the destination level to motivate, support and drive desired destination stakeholder behavior. More effective use of resources in destination is making the destination’s position more competitive, and also it gets more attractive for the local community to live and tourists to experience (Fang et al. 2020).

3.4 Challenges for smart cities and the digital divide

According to Silva et al. (2018) There are multiple challenges that developers of smart city are facing, and these challenges can be in all areas of development like are cost of design, implementation of big data collection and also operation stages of development. A major factor of designing and maintaining a smart city is keeping the cost of a new design as low as possible, because this way it is more realistic that this new design plan is actually implemented in the real world. Important is also to make sure that every day operational costs are as low as possible for making this new smart city plan sustainable for the city. Modern cities are focusing on renewable energy sources to make cities operation more sustainable and reduce the carbon footprint on the planet. Hence, that can be challenging to develop a lifetime smart city with cost optimization (Silva et al. 2018).
The Internet of things (IoT) is giving us the opportunity to develop and improve smart cities, but gathering big data and using all types of ICT solutions in tourism comes with a security concern. The goal of digitalizing cities is to minimize human involvement, but by doing so it’s important to keep things secure and private to prevent big data’s use in a harmful way for society (Habibzadeh et al. 2018).

Right and sustainable management in different areas of the smart city is extremely important. Waste management is a complicated issue in modern cities due to environmental pollution and land filling. Smart waste management systems like separating the waste and reusing reusable materials are key for cities to manage waste in a more sustainable way. Choosing right strategies for failure management of natural disasters such as floods, earthquakes, etc. and also failures of systems such as unavailable network can be a challenging task for smart city developers. The challenge in that is to find the right strategies that it has to be cost-effective and highly effective to operate and also effective to take things back to normal as soon as possible (Silva et al. 2018).

The smart city concept is possible because of improvement of technology, and it’s a proven new way to manage and improve cities sustainability. Cities around the globe are constantly improving and introducing new digital services to imply in a city. (Yuan & Jia 2021, Kolotouchkina et al. 2022). Although the idea is good, and it has a lot of positive sides, there are hence some downsides of smart concept like is a “digital divide” among the elderly. Elderly people around the world are facing many problems in their everyday lives because of digitization. Particularly it affected elderly people during the COVID-19 pandemic as more and more mobile device based payment methods and using QR code in different public places to minimize human contact (Yuan & Jia 2021). Elderly people aren’t the only ones that “the digital divide” is affecting. It’s also making day to day life for people with disabilities harder as all the applications aren’t as accessible for them like these are for people without disabilities (Kolotuchkina et al. 2022)

Social inequalities can also arise in situations, where a smart city project to improve an urban aspect is funded through tax increases or other commitments that affect local residents. In this situation, people often suffer financially. In terms of location, there are inequalities in mobility depending on each household individual needs. The construction of a new tram line or the introduction of a bus line will be of particular benefit to those who frequently use public transport and live in the areas where new public lines are introduced. For others, those who don’t live in the area or are using cars instead of public transport, they don’t benefit from this (Beretta, 2018).
3.5 ICT solutions in tourism and new business model trends in the world

Recently, the social media has played an important role in the development of tourist attractions, behavior of consumers and suppliers. Travelers use social media as an important tool, in travel planning and during the decision-making process. In addition to that, the impact of social media has changed the decision-making processes for consumers, social media also shares experiences and knowledge. Social media plays a particularly important role in destination’s management, marketing, product development, and it is a research tool for travelers. Social media is becoming an important element of a nowadays marketing strategy, being an aid to a global audience without having to spend large sums of money. As a result, it is a major challenge is for developers and tourism professionals, to be able to take advantage of technologies and business opportunities in combination with social media (Jovicic, 2017).

Over the past decade, the business models of the sharing economy have significantly changed the way we live. Many aspects of our daily lives are possible thanks to the sharing economy. The ability to use the car sharing service has changed our movement habits, the ability to order food at home via smartphone has changed our eating habits and the Airbnb web platform has changed the way we rest (Sigala, 2019). Nowadays, as technology is advanced and the internet is accessible for most of the people, it has become possible for developing new types of business models like is sharing-economy. Although the digital economy requires smart applications to compete effectively, there is a need to understand how most companies develop, use, and manage software. On a daily basis, hundreds of thousands of tourists no longer choose to stay in a traditional tourism business, such as a hotel, but instead use Airbnb to stay in their travel destination. It is an online platform through which ordinary people rent their accommodation to tourists. Founded in 2008, Airbnb has grown very rapidly in recent years (Guttentag, 2016).

Due to the different models used, the sharing-economy has different interpretations, making it difficult to give a single official definition. The European Commission uses the concept of a sharing economy to refer to ’business models where cooperation is facilitated by platforms that allow open trading for the temporary use of goods or services that are often provided by private individuals (Raudkivi, 2017).

The sharing economy comprises three types of actors:

1) Service providers who share assets, resources, time and/or skills: these may be private individuals providing services from time to time (“user-to-user service providers” or
service providers who operate on the basis of their professional skills). ("professional service providers");

2) Users of those services;

3) Intermediaries who connect service providers to users through a web platform and who facilitate communication between them. Transactions in the sharing economy do not generally involve a change in ownership, and may be made for profit or non-profit purposes. This differs from conventional business in that, instead of businesses, individuals have emerged as sellers of goods and service providers, with the opportunity to participate flexibly through platforms by sharing their underused resources, often while continuing to work at the site (Raudkivi, 2017).

Reputation plays a major role in the models of the sharing-economy. Ratings and feedback are possible due to the technology, and it allows visitors to read other visitors' feedback about the service provider and the service. After booking through the Airbnb web platform, visitors will rate the accommodation provider and the accommodation, as well there is the opportunity to write a comment and the hosts will also be able to rate the visitor. This gives a good overview of the feedback for those who are booking accommodation through the online platform. It is clear that no one wants to bet on a poorly rated accommodation provider, and no one wants to accommodate poorly rated visitors (Paul, 2019).

The development of the sharing economy from the accommodation and transport sector has moved into the conference business and operates in destinations (AirBnb, Uber etc.) (Koda, 2017).

The Global Trends Report identified the main trends, three of which are closely related to the development of ICT or the design of distinctive services for a specific growing tourism segment:

- Smart City solutions for tourists, which are different ICT solutions for sustainable mobility in the city and the development of ecotourism in the urban environment, but which also help the city visitor to plan their trip very conveniently.
- Hipster Holidays (a type of alternative tourism) is a growing trend, differentiating the demand for non-traditional tourism services, traveling to get to know the local people and their way of life, looking for opportunities for alternative dining and a different travel experience.
- Travel 3.0 is a technology that uses existing data to create personalized offers before and during a trip (Koda, 2017).
3.6 ICT technologies in Estonian cities

According to the Statistics Estonia (2021) 523.3 thousand households in Estonia have internet connection and 97% of Estonian businesses are connected to the internet. As the only country in the world, Estonia offers foreign citizens the opportunity to use its public e-services: set up a company online, digitally sign and send encrypted documents, make secure transactions in the Internet bank and declare payments electronically (RIT, 2021). Dozens of different smart projects have been implemented in larger Estonian cities, such as Tallinn and Tartu. For example, smart transport solutions have been developed in Tartu - CNG buses have been introduced, an efficiency analysis of bus lines has been carried out, which combined several data sets (including mobile data), and an electric bicycle network has been connected to public transport. Smart traffic lights have been installed at 45 intersections in Tallinn, which makes public transport faster and more efficient, as it gives the transport advantage to public transport vehicles. These smart solutions are convenient for locals and tourists (TalTech, 2020).

The first capital in the world to make public transport free for its residents was Tallinn in 2013. Five years after this, in July 2018, all counties in Estonia started offering a free transport system, and it has risen Estonians overall public transport use by about 15%. Free public transport has also positive effect on Estonian’s elderly residents’ health by providing them an option to move around and be more active (Jegelevicius, 2020).

3.6.1 Tartu

According to (Giffinger et al. 2007) research where 70 different European cities were evaluated based on six smart city dimensions, Tartu got overall 40th place. All dimensions were studied separately, Tartu got the highest score in the smart people category. That means the city has a good education system and educated people. Next category from best to worst were in the following order: governance, economy, mobility, environment and lastly smart living. That meant that the overall quality of life wasn’t so good for the stakeholders.

Tartu In a situation where many cities in today’s world have set themselves the goal of becoming a smart city in the arms race with technology, Tartu has always set the focus of its smart city on people. According to Tartu, “smartness” is not defined by how many sensors there are in the city, but by the fact that we can understand what problems we are going to solve. We want to grow and be part of a great global economy and culture, while maintaining the values we care about most: greenery, multiculturalism, compactness and security. A smart city is not an end in itself, but a way of thinking that helps shape our
own urban environment. The Smart City brand is a tool to spread this message and mindset (Tark Tartu, 2021).

One of the features of a smart city that Tartu has a bicycle circuit that consists of over 94 bicycle parking areas and 750 bicycles. There are two types of bicycles – electric bicycles and ordinary bicycles. Electric bikes are good because these promote cycling among people who are not so physically able. The electric bikes are equipped with an electric motor, which makes the bike move easier and faster. The Tartu bicycle circuit has been very successful from the beginning. Bicycle parking areas are coring large part of the city area. More than six million kilometers have already been covered by bicycles in Tartu. Cycling also promotes the city's tourism in Tartu. It offers tourists a new alternative to public transport and it helps to promote the image of a smart and sustainable destination in Tartu. Tartu has improved the image of its smart tourism destination in recent years, for example in the form of bicycle traffic and a renewed public transport network. Services are becoming better and simpler, and city residents are being more involved, and that is an important factor in a smart city. The development of Tartu towards a smart destination gives tourists the opportunity for self-fulfillment, and the environment offers them a sense of security and versatility. Residents can connect their free public transport card with their bicycle card, to make moving around in the city more convenient, city’s residents can use it for free for one hour and then have to pay €1 for every additional hour per ride (Tartu rattraringlus, 2022).

Cycling promotes the visit to tourist attractions. With the cycle, it is possible to set your own trajectory, and you can also get to places where it is harder or impossible to get with other types of transportation. Cycling gives tourists the opportunity to take part in the local culture and experience the cities like the locals. Visits to tourist sites are enhanced by the existence of cycle paths and good infrastructure, where tourists feel safe when cycling. The increase in cycling among tourists also creates new opportunities for the city to develop tourism - tourists have a desire for different cycling tours and new tourist attractions. Bike tours can be offered with a guide, or tourists can visit interesting places on their own (Nilsson, 2019).

3.6.2 Tallinn
According to Tallinna Ettevõtlusamet (2019) the international ambition of the city of Tallinn is to become the leading center of the smart city in the field of sustainable and innovative smart destination among the smallest capitals in the world. The city also aims to set an example for other cities in the Baltic Sea region in the digital development of local government. The theme of the smart city is nothing new or separate, but covers aspects covered by different aspects and the city's development plans. The Renewed Development Plan of 2021 emphasizes values such as local citizens' association,
childhood, a suitable home, a safe everyday life, a higher proportion of quality time, good health, a desire to learn, responsibility for the future, good human relations and a high competitive smart destination. The implementation of public services and information technology developments in the city of Tallinn already follows the principles of a smart city, where constantly evolving technology is a strategic driving force to ensure the sustainable development of the city, the continued quality of life of the city residents and further economic development (Tallinna Ettevõtlusamet, 2019). Tallinn has a goal to be an internationally attractive smart destination and a competitive leader in a wonderful new economy and in an innovative, balanced, green and safe urban environment. The main target group of the city’s enterprise policy is start-up micro and small enterprises, especially those that are able to stand out in terms of export performance, innovation and technological development. The focus will also be on vigorously improving the quality and quantity of human capital and creating an urban space that fosters innovation and breaks down barriers (Tallinna Ettevõtlusamet, 2019).

In comparison, of Giffinger’s European Smart Cities 2015, Tallinn stands out with strong performance in the dimension of smart people, as measured by indicators on education, lifelong learning, ethnic diversity and open thinking. In the field of smart people, Tallinn is almost on a par with Helsinki and Copenhagen and is much better than the European average. In other areas, Tallinn isn’t doing that well, like these two Nordic countries. However, Tallinn surpasses its southern neighbors Riga and Vilnius, in almost all six areas of the smart city concept. The most similar, below the European average, are the Baltic cities in the field of smart economy. In the field of economy, Tallinn is most affected by productivity and labor market indicators. In addition to the field of economics, Tallinn has scored below average in the field of smart governance, more precisely due to indicators of bureaucracy (Giffinger and Sutiner, 2015).

According to Easyparkgroup’s (2022) study that was conducted in different size cities in the World and Tallinn got overall 33rd place out of 50 in its category where is compared Metropolitan areas with 50,000 to 600,000 people. Easypark study compared different areas in these cities that are used in the smart cities to make cities more sustainable and intelligent. The first area that is evaluated is the digital life of local residents. It focuses on how technology is used in different cities to improve educational facilities and healthcare innovation system, also important in this category is that the amount of technology that has been adopted on an individual and governmental level in the city. The next category is the mobility of innovation of each city that was evaluated and in this category was compared of parking innovation, traffic management and how green and sustainable is the transport in the city. The third category is business tech infrastructure of each city that was studied in this research. This category contained different factors like business innovation, the prevalence of E-payments and overall internet connectivity.
The last category that was evaluated in this research was the environmental footprint of each city. In this category was considered the environmental footprint that the city leaves on the climate, overall waste management, how many green buildings there are in the city and how widespread the use of green energy is in the city. Under each category were rated different sub categories to get a better overall picture, the scale that was used was 1-100. Digital life rankings for Tallinn were the following: citizen adoption 93.30, government adoption 84.78, healthcare innovation 63.40 and tech education 56.43. The second category that was about mobility innovation rankings for Tallinn were: parking innovation 57.83, traffic management 51.11 and clean transport 71.17. Business tech infrastructure was the highest ranked overall category for Tallinn, business innovation was ranked 88.94, E-payments 90.31 and internet connectivity 68.48. Environmental sustainability category got lowest individual overall rates where green energy was ranked 59.03, green buildings 65.65, waste management 52.98 and climate response 85.70 (Easyparkgorup, 2022).
4 Empirical results

The empirical results chapter presents collected qualitative data from the interviews with Estonia’s hotel employees, it contains the interviewees' thoughts and quotations and presents their views on different topics. In this chapter, each interview question is discussed separately for making the results for the reader easier to follow.

4.1 Interviews with Estonia’s hotel employees

In total, 35 email interviews were conducted with hotel employees in Estonia, 21 of these interviews were with Tallinn’s hotel employees and 14 of the interviews were with Tartu’s hotel employees.

As mentioned in chapter of literature review, there are six main dimensions that are important aspects of every smart city and in this master thesis these dimensions were used for creating the interview questions. The main focus of the smart city concept is that it is using information and communication technology to improve these six dimensions and make stakeholders' life more sustainable and better. Interview questions were divided into different blocks, starting with identification block for better understanding and identifying respondents’ locations and demographics. The aim of the questions in the second block is to analyze Tartu and Tallinn features as a smart city. The questions cover different dimensions of a smart city that could be promoted in one aspect or another, and additionally, these questions are identified by current smart trends and solutions in Estonian cities. The third block is focusing on sustainability and identifying how sustainable are Tartu and Tallinn currently.

Each interview started with questions that were about the interviewees age, job title and location. For a better overview of this block of information, hotel employees demographics is presented in table 1.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Gender</th>
<th>Age group</th>
<th>Job title</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
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<td>F</td>
<td>20-35</td>
<td>Front desk supervisor</td>
<td>Tallinn</td>
</tr>
<tr>
<td>Employee 2</td>
<td>F</td>
<td>36-50</td>
<td>Receptionist</td>
<td>Tallinn</td>
</tr>
<tr>
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<td>M</td>
<td>Under 20</td>
<td>Receptionist</td>
<td>Tartu</td>
</tr>
<tr>
<td>Employee 4</td>
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<td>20-35</td>
<td>General manager</td>
<td>Tartu</td>
</tr>
<tr>
<td>Employee 5</td>
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<td>Receptionist</td>
<td>Tallinn</td>
</tr>
<tr>
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<td>Human resources assistant</td>
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</tr>
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<td>Tartu</td>
</tr>
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<td>Receptionist</td>
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<td>Tartu</td>
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<td>Night auditor</td>
<td>Tallinn</td>
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<tr>
<td>Employee 35</td>
<td>F</td>
<td>20-35</td>
<td>Conference manager</td>
<td>Tallinn</td>
</tr>
</tbody>
</table>

Table 1. Interview participants demographics. Source: Illustration and data by author

Demographics results offer a more comprehensive view of hotel employees who were interviewed. As seen on table 1, most interviewees were in the age group 20-35 and most of the interviewees were working as a receptionist. Respondents were in a different age groups and also had various job titles were presented.
4.2 Smart city dimensions in Estonian cities

The second block of interview questions covers different smart city dimensions for analyzing current smart city trends in Estonian cities. This block started with a question where hotel employees were asked to answer how they would describe smart tourism.

Respondents from both mostly cities agreed with the quite similar definition of a smart tourism, and mostly it was described as: a form of tourism that involves a lot of information and communication technology, different devices and big data. Interesting was that three of the respondents haven’t ever heard of a smart tourism concept. Employee 4, general manager from Tartu wasn’t heard about smart tourism before and her response to describing smart tourism was the following:

“This is the first time I have heard such an expression. I understand this in two ways: 1) tourism is done wisely, the company is with sustainable and capable of development mindset. 2) Today, buildings built in terms of IT are called "smart" buildings. Autonomous restaurants / hotels - this is all our future. Smart IT solutions help people to work much easier, or eliminate their role at work completely.’’ (Employee 4).

As smart devices are a part of the smart city, the second question of this block was for finding out that what are most used smart devices in Estonian hotels in order to improve the customer’s experience. The most popular answer was that their hotel is using self check-in options, out of 35 respondents, 26 said that their hotels are using this option. Some of the respondents mentioned that their hotel’s don’t have any smart solutions currently for customers, but their companies have plans in the next few years to start using some more smart solutions.

“I think that part of being a modern company that is offering the best for their clients is constantly improving their business models and systems that are used to offer up-to-date solutions. In our hotel we are offering self check-in options to our customers, and we are trying to improve our service quality and used technology constantly for improving the customer’s experience.’’ (Employee 31)

The next questions were about each smart city dimension for finding out what is current situation of each dimension in Estonian cities. Respondents were asked to describe development areas of each dimension individually. The first dimension that was asked about was smart economy. Overall, respondents from Tartu described that the smart economy is very well-developed in their city as a lot of smart device based solutions are used. Respondents mostly mentioned that bicycle circuit and free public transport for the residents are solutions that make Tartu in their opinion, economically smart. Most
respondents from Tallinn also mentioned that, in their opinion, one of the best solutions that is used in the city is free public transport. Respondents from both cities were in agreement that, free public transport system that Estonian cities offer is innovative on global bases, as they don’t know a lot of other countries that use this kind of system for improving their cities residents' lives. Many respondents additionally mentioned that free public transport is benefiting all parties, for residents because they save money on transport and for small businesses nearby the city as more tourists are visiting the area and that rises revenue of the businesses outside the city.

"This free public transport system is beneficial to all parties, for residents because they save money on transport and for small businesses nearby the city as more tourists are visiting the area and that rises revenue of the businesses outside the city." (Employee 28)

The question that was about smart governance and public comprehensiveness in the government’s decision-making process, hotel employees from both cities have different opinions on this. From the respondents' answers, it turned out that employees in Tartu felt more that their voice is heard than in Tallinn. Overall, employees from both cities were in an opinion that the government should be more collaborative with the public. Smart environment dimension and cities use of natural recourse was the topic where some respondents disagreed about how things are managed currently.

"It is good that the city is developing constantly and a lot of new projects are currently in planning, as this is for better future and solutions that are improving residents every day’s lives and attracting more tourists." (Employee 22)

Others, Employee 4, 15 and 31 are disagreeing with this opinion, as they see that new developments and buildings are the reason why parks and other natural areas in the cities are destroyed. Overall, most respondents for both cities were in a similar opinion to Employee 4, 15 and 31, as they see that things are currently handled poorly and not in a friendly way to an environment. The next dimension that was discussed with the..."
respondents was about quality of life in the city. Respondents from both cities were in a belief that it’s expensive to live a good quality life in Estonia. Employees in a manager position all agreed that their quality of life is good, but some respondents from non-management level mentioned that for them, it’s hard to pay the bills and live life according to their standards. The last dimension that was discussed with interviewees was about education importance and government strategies in the cities. Respondents from the both cities were in the same opinion that they think that their cities residents are valuing importance of education. Many respondents from Tartu highlighted that Tartu is a well-known university town in the world and welcomes a many new students from all over Estonia and the world every year. Hence, education is really important in their opinion. Additionally, respondents from both cities are in an opinion that the Estonian government has done and has planned many sustainable projects for improving life in Tallinn and Tartu.

The most developed smart city dimension in Estonia’s hotel employees opinions was mobility, 15 respondents from Tallinn and 11 respondents from Tartu agreed on that. Comments about why they thought that it is the most developed area, they highlighted that both cities offer very good public transport system and that it is free for its residents.

The second most developed dimension in respondents opinion was the economy, six respondents from Tallinn and two from Tartu are supporting that view. Employee 31, general manager from Tallinn, is describing that why he thinks that the economy is the most developed area in Tallinn’s smart tourism concept:

"A smart economy dimension in my opinion is primarily an economy that strives for innovation and productivity and seeks to match businesses and labor needs with business models that are competitive at both local and international levels. I think that is very well established area in Tallinn as the city is a home for multiple startups and well established businesses." (Employee 31)

One respondent, Employee 11, marketing manager from Tartu said that in her opinion the most developed dimension is smart people:

"It is not only that Tartu has a university, which is an important institution and perhaps attracts other important institutions here. Rather, the university here - as in other real university towns - influences the general way of thinking and thinking - even in areas of life that have nothing to do with university or science. It affects the way of thinking of Tartu’s residents, but also of all those young people who are coming here to study at the university." (Employee 11)
The least developed smart city dimension in 11 Tallinn’s and seven Tartu’s hotel employees opinion was smart environment. Mostly respondents said that it’s because of parks and nature reserves that are destroyed to make a space for new buildings that are part of cite's new developments.

“A small park was reticently destroyed near my home. Such activities kill birds, animals and destroy whole ecosystems. It is painful and traumatic to know that such destruction is happening every day and that essentially nothing is being done to stop it.” (Employee 2)

“Cities are not only facing the challenge of how to preserve and save green spaces, but also how to improve the quality of green spaces, without compromising the balance of the ecosystem.” (Employee 14)

Others, eight respondents, six of them from Tallinn and two from Tartu thought that smart governance is the least developed smart city dimension in Estonia. The reasoning for this was that they feel that the government doesn’t really value public opinion. Opinions about the least developed dimensions were mentioned also, smart people, living and mobility.

“ In my opinion, the least developed area in Tartu is mobility, because Tartu doesn’t have a good international airport. We do have a small airport, but to be an international smart city, I think that it also means that we supposed to have good airline connections with the world. At the moment, direct flights are only between Tartu-Helsinki route.” (Employee 32)

The next question was to determine respondents' opinions of the downsides of smart city developments. Many of the respondents mentioned that technology can be a problem as it doesn’t always work like it supposed to be, and it can cause problems with customers using technology. As a smart city, developmental disadvantage was in many answers reflected concerns about the environment, and questions if it is always taken care of if these new developments are made in the cities. Additionally, it was mentioned that as smart cities are storing big data and a lot of people’s confidential information, it raises security risk when such information is getting into the wrong hands.

“Declining demand for employees as robots take over. As a result, the following areas of work in the tourism industry can become a problem: people's own smartness (can they check in to "eHotel"); people's wish to be assisted by a person)” (Employee 4)

Five of the respondents mentioned that the biggest downside that smart cities' development can cause is that it can be a harm to nature and the environment by tearing down parks/forests for making space for new developments in the cities. Out of 35 hotel
employees, six had an opinion that development of smart cities doesn’t have any downsides, because, in their opinions, smart city is a way for a better future. Everyone who was in an agreement that smart cities don’t have any downsides were in the age group of 35 years-old or younger.

“I actually don’t think that I can think of any downsides when it comes to the smart city concept. I personally enjoy that if devices can be connected to one to other and these new solutions that are possible because of technology.” (Employee 10)

Sharing-economy based platforms were considered as a threat to traditional hospitality providers, in 11 respondent's opinions. Most respondents, 24 of them, were in a belief that different technology and smart solutions are definitely something that are more helpful than harmful to the hotel industry.

"It depends on one’s perspectives how would you want to see if on ICT based solutions are good or bad for you. I see this as an opportunity for the hotels to become more sustainable and improve their offered service’s in different areas.” (Employee 11)

"Technology is definitely beneficial for the hospitality industry as we are able to offer more versatile options for our customers.” (Employee 31)

The next question was about the advantages and disadvantages of current smart tourism solutions in Estonia. Advantages, that respondents mostly mentioned, were that technology has improved lives for all stakeholders in cities and additionally, better public transport and sustainable solutions for cities residents were mentioned.

"I think Tartu's size is the biggest advantage for the city, as a population of around 100 000 it's not too big to develop a good sustainable city that works well in all areas and also the city is not too small to attract new services providers and businesses to the city.” (Employee 8)

"As public transport is free for all the city’s residents, it is the best current advantage that I can think of.” (Employee 26)

Mainly respondents saw that the disadvantages, of a smart city concept, are environmental damage, technology failure and security risk as a lot of services are connected to the technology and when devices aren’t working properly then it can cause problems. On the disadvantages side, it was also mentioned that some cities may use the image of a smart city for branding and marketing purposes without applying the actual concept of a smart city and that bigger companies can be more successful adapting the
smart city model. One other problem that was mentioned was that elderly people may face difficulties when cities start using too much technology.

“Switching to smarter solutions requires resources that are much more difficult for smaller companies with fewer customers and revenue. Larger hotel chains have an advantage of making it much easier to adapt to new solutions.” (Employee 4)

“Privacy, a very simple example of disadvantages - you buy cameras, put them everywhere around the house, and you expect to protect your property, your privacy. But since half of the world can actually get access to your camera, it actually reveals everything you have at home, what do you do on an everyday basis and that way you can accidentally provide access to your life for people who don’t have the best intentions. We have thousands of this kind of cameras all over Estonian cities.” (Employee 6)

### 4.3 Sustainability in Estonian cities

The next block of questions were for finding out about how sustainable Estonian cities are and solutions used in hotels. All respondents of the interviews said that, in their opinions, their companies are sustainable. Mostly respondents said that their companies are continuously improving their services, used technologies and software and this is why they think their companies are sustainable. Long term history on market, good waste management and recycling were also mentioned, in many of answers to justify their thoughts about their companies'sustainability.

“Our company is sustainable, we have been on the market for more than 20 years, and when analyzing economic indicators, we have been on a stable growth trend for most of that period.” (Employee 4)

“Our company's policy is a long-term and adaptable business that produces stable added value. It seeks to ensure economic growth, product quality and the well-being of workers and customers through environmentally conscious planning, the sustainable and innovative use of limited resources, the application of new technologies and the recycling of materials. At the same time, supportive legislation, the investment environment and public awareness and attitudes are also important for us.” (Employee 15)

Out of all descriptions about sustainability, it can be said that it was mostly described as a collaboration between different parties that make a system whole. In other words, the sustainability of cities is stated by respondents in how well existing resources can be used for the benefit of the city. The use of technologies can increase sustainability was mentioned multiple times. In addition, it was mentioned that to the application of new
technologies, the smart sustainable city applies new practices and ways of thinking for improving overall sustainability. At the same time, a lot of the interviewees mentioned the benefits of a smart city when indirectly mentioning both economic, social and environmental sustainability. Throughout, all interviewees believe that the sustainability increases people's well-being and quality of life in cities. Some interviewees also pointed out convenience, innovation in services and efficiency of processes as important factors for sustainable tourism.

“Sustainable development is the art of balancing, aiming to strike a balance between economic growth, the social sphere, the natural environment and other areas of life, and seeking opportunities to ensure the continuation of a full society for present and future generations.” (Employee 23)

“When managed well, tourism can play a positive role in the social, cultural, economic, environmental and political development of a destination, and it is a significant development opportunity for many countries and communities. However, uncontrolled tourism development can have a very detrimental effect on natural resources, consumption patterns, pollution and social systems. The need for sustainable planning and management is essential for the survival of the industry as a whole.” (Employee 35)

Factors that make city tourism more sustainable in several respondents views were connected strongly to opinions that management has to be thoughtful in all areas of businesses so they could co-work with the stakeholders to make life in the city more sustainable.

“′ The local government must find the right person to deal with it. Every situation is different and competent people should be able to make the right decisions.′” (Employee 4)

“′ When choosing tourism services, it makes a big difference if you follow the principle of responsibility: choose food and handicrafts produced from local raw materials and service providers that follow the principles of environmental protection in waste management, saving energy and water.′” (Employee 14)

“′ The quality of both the natural and man-made environment is important for tourism. However, the relationship between tourism and the environment is complex. This includes a number of activities that may have adverse effects on the environment. Many of these impacts are related to the construction of general infrastructure, such as roads and airports and tourist information centers, including resorts, hotels, restaurants, shops, golf courses and marinas. The negative effects of tourism development can gradually
destroy the environmental resources on which a particular region depends.” (Employee 31)

The last question of the interview was for finding out hotel employees' opinions about Estonian cities overall sustainability. Respondents had to choose answers on a scale one to ten to rate how sustainable is in their opinion overall tourism in Estonian cities, one being not developed at all to ten that meant that sustainable tourism is very well-developed in Estonia. Additionally, all respondents commented on their choice of why they choose a specific rate. As shown in Figure 1 below, the majority of respondents were in an opinion that sustainable solutions need more improvement in Estonia, as 23 of respondents choose to rate Estonia’s sustainability with the rate of 5 or lower.

“'As I think that, the sustainable development of society must be seen as a people-centered or purpose-oriented development, that ensures that social justice and people’s quality of life improve in line with the resilience of natural resources and ecosystems. In Estonia, there is still a lot of work that needs to be done in these areas.'” (Employee 26)

“'Many smaller towns have to wonder how to meet the expectations of the smart sustainable tourism in terms of the quality of services, when the expectations are comparable to those with a higher standard of living, but the economic capacity and living standards of their city are lower. The compulsion to develop and seek better solutions for the benefit of its inhabitants is certainly one of the important influences for small towns for increasing their cities'sustainability.'” (Employee 32)

Figure 1. Interview results. Source: Own illustration
Seven of respondents rated current sustainability in Estonian cities with rate five.

"You can be sustainable just because your processes are implemented, that means you are sustainable. When we talk about sustainable development, we are already talking about following the principles that ensure that we do not harm the environment in any way, that we are in line with the economic model, and that we are contributing to the socio-social model, that then they have a different content, most individuals and companies have an option of how sustainable they would like to be. There are some areas that are need to be improved. ” (Employee 31)

Out of 35 respondents, 12 were in an opinion that Estonia’s current sustainable solutions are above average, as they choose to rate with a rate 6 or higher. A generalmanager from Tallinn explained why he chose to rate overall sustainability with grade 8:

‘‘ Sustainability does not only mean environmental friendliness, but also has a clear economic and social dimension and concerns very specific areas and solutions in everyday life, including the green approach. Take, for example, green construction, which has a direct bearing on sustainable development in the real estate sector and the renewable energy industry. I think Estonia is doing very well on keeping things sustainable and in balance. ’’(Employee 23)
5 Analysis and discussion

In this chapter, the reader finds analyses of key topics, that were identified from the empirical results chapter using thematic analysis method and theory from the literature review. Main key codes were found based on the interview respondent's answers. SWOT analysis of the Estonian cities of Tallinn and Tartu is also part of this chapter.

5.1 Identified themes

<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
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| **Smart city concept**                          | • Technological solutions  
|                                                 | • Innovations                                                       |
|                                                 | • Big Data                                                           |
|                                                 | • Sustainability                                                    |
|                                                 | • Quality of life                                                   |
| **Factors influencing the development of a smart city** | • Government                                                      |
|                                                 | • Size of the city                                                  |
|                                                 | • Digital divide                                                    |
|                                                 | • Risk of failure                                                   |
|                                                 | • Financial resources                                               |
|                                                 | • Collaboration with stakeholders                                   |
| **Sustainability**                              | • Resourceful usage of natural resources                             |
|                                                 | • Cleanliness                                                       |
|                                                 | • Recycling                                                         |
|                                                 | • Solutions that last for decades                                   |
| **Smart city dimensions**                       | • Effective transport solutions                                      |
|                                                 | • Education                                                         |
|                                                 | • Environmental friendliness                                        |
|                                                 | • Human capital                                                     |

Table 2: Themes generated from key codes. Source: Illustration by author

Four themes were identified during the thematic analysis process of interviews with hotel employees in Estonia, these themes were: the smart city concept, factors influencing the
development of a smart city, sustainability and smart city dimensions. Next, it was analyzed how these different themes are in connection with materials used in the literature review chapter.

5.1.1 Theme - the smart city concept

The smart city concept in definitions of respondents reflected that mostly they associate smart city and tourism concept with a technological aspect, innovative solutions and big data. As other important factors were mentioned that smart cities must value all stakeholders and current and future solutions should be sustainable for all types of businesses and people. According to the answers, the understanding of the smart city concept was very similar for both cities representatives. Similar to their definition is also that how Lazaroiu & Rosica (2012) describe the smart city concept. Their published paper suggests that a large part of the smart cities creation’s process is creating more sustainable solutions for the stakeholders by using big data and information and communication technology. By using the ICT solutions in a right and sustainable way, it helps to cities raise their competitiveness and financial resources and this way quality of life becomes better (Lazaroiu & Rosica, 2012). An interesting finding was that respondents from Tallinn were all familiar with a smart tourism concept, but three of the respondents from Tartu heard about this term for the first time during the interviews, whereas they did describe it in a similar way to other respondents who were similar with the definition.

5.1.2 Theme - Factors influencing the development of a smart city

During the analysis of the interviews, it was identified different actors that respondents believed to influence the development process in a smart city. Mostly was mentioned that finances and collaboration between different stakeholders are essential factors in the development process. The collaboration importance was mentioned also by (Fang et al. 2020), they suggested that local stakeholders should work together instead of competing. Through implying collective leadership, it is possible to achieve better results of more sustainable development, which benefits locals and attracts more tourists to the destination (Fang et al. 2020). Additionally, respondents mentioned the government’s involvement in residents lives, size of the city, digital divide and risk of failure as critical factors to consider in a development process. The size of a city plays a significant role in developing a smart city, as very often bigger cities have more resources, hence they are able to use more money for developing new smart solutions (Neirotti et al. 2014).
5.1.3 Theme - Sustainability

Sustainable management of resources according to Kozak (2014) and (Shafei et al., 2017) is only possible when all stakeholders are working together towards the same goal, that ensures that all areas for creating a sustainable environment are covered and working in sync. Additionally, (Shafei et al., 2017) argue that, it is essential for sustainable development goals for having long-lasting solutions for cities, without causing any harm to the environment. According to the interview answers, it can be concluded that Estonian hotel employees were in the same opinion as Kozak (2014) and (Shafei et al. 2017), highlighting the importance of meaningful usage of natural resources and long-lasting solutions. Three key factors that are part of sustainable development were identified by Hall et al. (2011), these were, economic, social and environmental sustainability. These three factors were mentioned more or less in most of the interview answers. Hence, it can be said, that sustainable and long-lasting solutions were really important factor for Estonian hotel’s employees.

5.1.4 Theme - Smart city dimensions

The (Giffinger et al. 2007) smart city model suggests that smart cities have six different dimensions that are: economy, environment, mobility, living, governance and people. Mobility turns out to be the most developed smart city dimension in Estonian cities, that is because of free public transport options and additionally bicycle circuit that is in Tartu. Free public transport courage’s citizens to use public transport and more bicycle users are way for a greener and more sustainable thinking. One other dimension that was really important for many respondents was the environment and usage of natural resources. Respondents from both cities were in overall agreement that smart cities have to be environmental friendly and benefit stakeholders. Those respondents who were hesitant about smart technology that is used in all dimensions were most concerned about the lack of reliability (what happens when the power goes out?) And the lack of information about the smart technology to be installed. With regard to reliability, it was repeatedly emphasized that, in the event of a power failure, for example, viable alternatives would be needed to "keep the house running". These topics were most common in all age groups.

5.2 SWOT analysis of the cities

Following analysis of respondents answers, different advantages and disadvantages of Tallinn and Tartu were detected. SWOT analysis using (Giffinger et al. 2007) model about both cities was made for getting better overview about Tartu and Tallinn by identifying their strengths, opportunities, weaknesses and threats. SWOT analysis was
made separately for both cities for getting better overview of the cities individual advantages and disadvantages.

5.2.1 Tartu SWOT analysis

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good transport solutions</td>
<td>Distance from international airport and bigger cities</td>
<td>Using the size of the city for implying different new eco-friendly projects</td>
<td>Residents move to a bigger city where they have more possibilities</td>
</tr>
<tr>
<td>University</td>
<td>Public’s voice isn’t valued</td>
<td>Developing infrastructure</td>
<td>Opportunities are limited as city isn’t big enough</td>
</tr>
<tr>
<td>Size</td>
<td>Lack of planning of greenareas</td>
<td></td>
<td>Security risks</td>
</tr>
<tr>
<td>Innovative solutions</td>
<td>Too small for some projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure</td>
<td>Digital divide</td>
<td></td>
<td></td>
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<tr>
<td>Wi-Fi</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Educated people</td>
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<td></td>
<td></td>
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<tr>
<td>Bicycle circuit</td>
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*Table 3: SWOT analysis of Tartu. Source: Illustration by author*

People are the most important part of cities. The importance of human capital in terms of urban and economic development can certainly not be underestimated. The more human capital and the higher the productivity and skills of this human capital, the more potential the city has. As a university town, Tartu has a strong educational base and numerous students graduate every year. The city can work with educational institutions to help promote education. It is important for Tartu that students, even after their studies, see themselves working and living in a city there. In a situation where cities are competing for human capital, smaller cities need to prove themselves and stand out. The quality of a good living environment and the possibility of self-fulfillment are some of the factors that help attract human capital to the city. The second question is how people will find out and notice that these opportunities that exist in the city. Marketing and communication
play an important role here, in order to show Tartu both as a good place to live and as a place to visit for tourists. The image of a smart city helps to attract the people there for work or investment, and it helps to promote tourism (Colding & Barthel 2017). Tartu has a good opportunity here to skillfully to point out its advantages and make itself visible for attracting more human capital. On the critical side, it is pointed out that some cities may use the image of a smart city for branding and marketing purposes without applying the concept of a smart city (Ahvenniemi et al. 2017).

Unfortunately, Tartu does not have an international airport, this is a major disadvantage for the city, as it decreases connection with the rest of the world. At the moment, it is possible to fly from Tartu once a day to Helsinki, from where it is possible to fly on to the rest of the world. The nearest airports to Tartu are Tallinn Airport and Riga Airport, both airports are a few hours drive away. However, while two close international airports are quite convenient for Tartu residents to travel or move abroad, it is rather difficult for the rest of the world to find their way to Tartu. From this aspect, Tartu will definitely remain in the shadow of the capital city, Tallinn. For Tartu, it would be beneficial, if the city can increase connections with the rest of the world, by introducing new flight routes from Tartu’s airport or some other way. One of the strengths of Tartu is the size of the city, with population around 100,000 it is perfect for introducing new projects, as the city isn’t either too big or too small. In the development process for new projects it is a must, to take into account, that as many as possible citizens and target groups in society would benefit from innovation to prevent social inequalities (Beretta 2018). It is also important for the city to explain why any changes are being made and for citizens to have enough opportunities to ask and receive information about the innovations that are being made.

A city and a smart city can never be fully completed, because it must always keep developing to keep pace with modern solutions and people's wishes and needs. Changes towards the concept of a smart city will certainly take a long time (Shafiei et al. 2017). Tartu has certainly already taken big steps towards a smart city model. Citizens and the city government have a clear interest in implementing smart solutions that are environmentally friendly and increase the efficiency and convenience of processes. With regard to new transport solutions, so much has already been done in Tartu - the interviews answers revealed that respondents are very satisfied with the free public transport and bicycle circulation service and there is also an expectation for its further development. Tartu has a bicycle circuit that offers tourists the opportunity to discover their destination in a more environmentally friendly and convenient way, and that is a crucial part of a smart city, to ensure environmental friendliness. Hence, it is a good opportunity for locals to increase their physical activity through their daily activities. Cycling is best suited for tourists who want to be active during their holiday, but at the same time experience the city like the locals. Through electric bicycles, the service is also suitable for older people...
who cannot cover long distances with ordinary bicycles. Tartu has a lot of opportunities and development areas for creating more sustainable and creative smart city solutions.

5.2.2 Tallinn SWOT analysis

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free public transport</td>
<td>Lack of planning for green areas</td>
<td>Better collaborative leadership in different areas</td>
<td>Social stratification, major social disparities</td>
</tr>
<tr>
<td>Information technology is well-developed</td>
<td>Low quality of infrastructure and housing</td>
<td>Developing infrastructure</td>
<td>Insufficient financial funds for development</td>
</tr>
<tr>
<td>International airport</td>
<td>Public’s voice isn’t valued</td>
<td>Goal for being an influence as a sustainable and green capital in the world</td>
<td>Security risks</td>
</tr>
<tr>
<td>Wi-Fi</td>
<td>Planning developments</td>
<td>Financial support</td>
<td>Bureaucracy</td>
</tr>
<tr>
<td>Innovative solutions</td>
<td></td>
<td>Attract investors</td>
<td>Size</td>
</tr>
<tr>
<td>Multiple start-ups</td>
<td></td>
<td></td>
<td>Threat for environment</td>
</tr>
<tr>
<td>Educated people</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good size for developing projects</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4: SWOT analysis of Tallinn. Source: Illustration by author

The results of the SWOT analysis show that among the greatest opportunities of the city of Tallinn are the stronger use of the image of being a sustainable and green capital city. In terms of threats, Tallinn must take into account the financial aspects, social stratification, bureaucracy, as well as several threats related to Estonia's small size. Size can be considered both, strength and threat, as Tallinn can be perfect for some projects, but also too small for others. While the biggest strengths were Tallinn's educated people, strong business environment and new ICT solutions, in terms of weaknesses, attention must be paid to data congestion, lack of a smart city strategy for considering keeping and
developing green areas, limited cooperation and energy intensity of the economy. Throughout the interviews, it became clear that becoming a smart city is important that the collective leadership is working well of all parties in the ecosystem. Fang (et al. 2020) agree with the argument that collective leadership is one of the most important factors for developing a sustainable city, as only when all parties work together it is possible for city to perform best in all areas. Therefore, Tallinn should cooperate even more actively with all parties - negotiate with them, allow testing and not set regulatory barriers, and if possible also provide financial support for better development opportunities where necessary. All interviewees considered it important to increase the points of sync between the new developments and sustainability. There should be a closer and more systematic exchange of knowledge between the public’s voice and government decision-making process. Various answers reflected this as a development opportunity.

As the capital of Estonia, Tallinn has a number of important advantages that can be exploited for the development of a smart city if it can overcome the main weaknesses, by improving domestic and international cooperation, better pooling resources for common goals and attracting direct investment, talent and investors. The implementation of the public services and information technology developments of the city of Tallinn already follows the principles of a smart city, where constantly evolving technology is a strategic driving force to ensure the sustainable development of the city, the continuing improvement of the quality of life and further economic development. Neirotti et al. (2014) points out that the goal of a smart sustainable environment is to protect and manage natural resources and relate infrastructure in this process with the aim of ensuring sustainability through technologies. Tallinn could be an internationally attractive destination and a leader in a competitive new economy in an innovative, balanced, green and secure urban environment as a capital city of Estonia. The main target group could be of the city’s enterprise policy is start-ups and small enterprises, especially those that are able to stand out in terms of, innovation and technological development. There is also a strong focus on improving the quality and quantity of human capital and creating an innovation-friendly, barrier-breaking and inspiring urban space. However, not any single smart city dimension can make Tallinn a smart city alone. The city government is not the only aspect that works to make Tallinn a smart city - in order to achieve faster and better results, the has to cooperate with several parties. The ecosystem of the smart city of Tallinn should include different businesses located in the city, business support structures as well as research and development centers. As many innovation institutions and support structures are concentrated in the capital, the preconditions for a strong cooperation platform are already in place. In order to be a smart city and get even smarter, close cooperation is needed between the other Estonian cities, businesses and universities. Today, the city cooperates with almost all parties in the innovation and sustainability, but
there is definitely opportunity to work even better with different parties. A prerequisite for the development of a new creative and innovative urban space is important to include the public in the planning process. Among the biggest threat to Tallinn as a smart city are, in addition to the general climate, security and energy risks that can be part of threats for developing any smart city. Tallinn’s development areas should focus more on the ways in which the aspects could be turned into Tallinn's strengths, like the city government's openness to innovation and including the public in the decision-making process and the ease of testing new solutions. For increasing the overall well-being of city’s residents, the innovative smart city will attract more investors, tourists and other stakeholders to the city.

5.3 Discussion

The analysis of the interviews revealed that the implementation of the smart city model is influenced by many city-specific as well as governmental factors in Estonia. Analyzing the smart dimensions of the cities Tallinn and Tartu, it turned out that every smart city dimension is in some way implemented in both cities. It is also clear that smart solutions are planned for each dimension in both cities in the future. The development of smart cities has been facilitated by different projects that benefits multiple smart city dimensions in the cities. The solutions included different innovations like the free transport and bicycle circuit project will improve the situation in mobility dimension.

The size of the city plays an important role in determining how much human and financial resources these cities have. It is clear that larger cities have an advantage in this area. However, this does not mean that it will be more difficult for smaller cities to implement smart solutions, as an example, Tartu is very developed in different smart city dimensions. In smaller cities, the speed of administration is often higher and various projects are easier to implement. People are an important part of both, Tallinn and Tartu and the education level of human capital determines the development and potential of cities. A high-quality living environment is important for residents, influenced by the availability of infrastructure, the availability of jobs, opportunities for self-fulfillment, environmental friendliness and leisure opportunities. Quality of living is definitely one of the areas where both cities could improve their strategies in order to provide a better living environment for their residents. Shafei et al. (2017) highlight that smart cities aren't completed, and new projects and ideas are implemented constantly. Hence, if cities can offer constant improvement in the life quality, then people also want to live there, which is very important for the long-term sustainability of cities.
As a justification for the cities’ sustainability, it can be explained that while productivity can lock the local government in making existing ideas and activities better, highlighting the new values that allow innovations to be started. Innovation is when the same thing is done differently and not just more efficiently than before. Climate neutrality, biodiversity, demographic change, are some of the areas of the cities that could be improved in the cities of Tallinn and Tartu as these are some of the many areas of concern in the urban areas. The need to develop and keep public urban green spaces like parks and playgrounds was also highlighted in both cities, as there is a concern if existing green spaces are well-enough taken care of. The specific proposals differed somewhat, but everyone was interested in more sustainable projects that would raise the overall quality of life in the cities. As strategic development directions emerge from the needs Tallinn and Tartu urban areas, it is possible to focus on each dimension with different idea for developing it wisely. In the case of the Tallinn urban area, it would be necessary to contribute to the comprehensive development of the public transport and light traffic network; in addition, suburban centers would need to be developed to reduce the need for residents to enter the city. In the city of Tartu, funds should be directed to the improvement of connections with the rest of the world, as this would increase Tartu’s visitors count and also that could help to implement new projects in the city. As two of the biggest cities in Estonia, it is necessary for both of the cities to work together for the same goal, that is to be more sustainable and adapt innovative solutions to improve Estonia’s residents and visitor’s lives.
6 Conclusion

This conclusion chapter presents final conclusions and answers the research questions formulated at the beginning of the research paper. Besides this, the idea of further research is presented in this chapter. The research was aimed at researching of what the concept of smart tourism is and what knowledge do hotel employees in Estonia have about this concept.

6.1 Conclusion of the research

This study was focused in the two biggest Estonian cities that are Tallinn and Tartu. The improving technology and development of smart cities has created new business models and changed the way of traditional ones. In the development of smart city, the main focus has to create more sustainable life and solutions through implementing information and communication technology solutions in the cities for better solutions in different areas of cities. In connection to that, there is also a need for more effective involvement of various stakeholders in order to make it work. Involvement of different stakeholders is necessary for understanding each of them needs and then make smart city model working according to that. Smart solutions can create the digital divide depending on user’s ages and backgrounds, hence smart solutions aren’t benefiting everyone. It is important for future smart cities to consider possible innovations with also elderly residents, noticing their needs and helping them when it comes to teaching or implementing new projects or smart solutions in the cities. As the concept of smart city is still quite new, some of the stakeholders could have a confusion or wrong understanding of what that exactly means, that’s why it is important to raise awareness about this topic.

Currently, as the smart city concept becomes more popular, different aspects of smart cities have been studied. In this research, was introduced different smart city dimensions and also different approaches of smart city dimensions. Some definitions of smart cities were more general and some other definitions focused more on the ecological, technological, economic and social aspects. Sustainability and its importance was one of the key elements that was part of each definition of smart city. While comparing different approaches, it can be said that a city is smart if environmental, economic and social sustainability in the city are ensured. Technology is a tool for implementing new solutions in the cities. The smart city model and different dimensions give important guidelines of what to follow and how to promote sustainability and other important areas of the model. Different dimensions that are main dimensions of smart cities were all covered in this research. These dimensions were: economical dimension, mobility dimension, quality of life dimension, governmental dimension, people dimension and environmental
dimension. In can be said that, after analyzing respondents' answer, each of these dimensions is represented in both Estonian cities, but some of these need to be improved in order to raise overall life quality. Cooperation between the various parties in the tourism sector, early identification of threats and more effective and targeted marketing of both tourism products and the tourist destination, starting with even more attractive websites, will help to prevent a negative impact on the further development of the region's tourism industry.

With the help of the smart city model, it is possible to understand what factors influence the development of cities and what changes can be used to ensure the sustainability of cities. Analyzing the different factors help to understand where the city's potential lies and what steps need to be taken to make the city smarter, depending on the city's characteristics. The environmental, economic and social aspects of cities include the six main dimensions of a smart city: smart economy, smart mobility, smart governance, smart environment, smart living, smart people. The smart city model helps to understand what dimensions the city has, what areas these dimensions cover, how they affect each other and what steps should be taken to improve environmental, economic or social sustainability.

Estonian hotel employees were mostly familiar with the term of smart tourism and it’s benefits for the society, as their answers of the interviews showed. Urban development must take full account of the various challenges and innovative solutions at local, regional, national and international level. Cities need to work more closely with stakeholders, including businesses, universities, the non-profit sector and, above all, their citizens. All respondents of the interviews considered sustainability as a major factor and key element in smart cities' development. Sustainable tourism is a form of tourism that takes full account of current and future economic, social and environmental impacts, paying attention to the needs of visitors, industry, the environment and host communities. The consensus was reflecting in respondents' answers that the natural cultural heritage is a value that brings stakeholders and economic benefits to the region. Consequently, it is necessary to respect and comply with the requirements of nature protection in order to ensure the sustainable development of the cities and also nature tourism.

Sustainable tourism maintains tourists' satisfaction by providing them with a diverse experience. Using the smart city model, it was possible to understand what factors influence the development of cities and what changes can be used to ensure the sustainability of cities Tallinn and Tartu. When analyzing the different factors that were environmental, economic and social it helped to understand where the Estonian cities potential currently stands and what steps are needed to be taken to make the cities smarter, depending on the both city's individual characteristics. These three characteristics are
included in the six main dimensions of a smart city: smart economy, smart mobility, smart governance, smart environment, smart living and smart people. The smart city model helps to understand what dimensions individually each city has, what areas these dimensions cover in the city, how they affect each other and what steps should be taken to improve overall sustainability. The purpose of the interviews was to involve hotel employees in the research as experts, especially in identifying significant development trends, to reveal their general effects and the effects arising from Estonia’s position, and to assess the relevance of different smart city dimension objectives and indicators. Interviews were conducted by email. Semi-structured one-on-one interviews were preferred as a data collection method because they allowed for a pre-defined definition of topics and focus, as well as for further opening of topics if it was necessary. The interviews revealed some very specific assumptions and steps to improve the smart city models in Estonian cities of Tallinn and Tartu. Some respondents were in an opinion that smart cities developments are harmful for the nature and also are creating security risk as people were afraid about their data to be stolen.

In order to change these attitudes, people should have an understanding of why one thing or another is implemented in a smart city and how it increases their life quality. This means that transparency and specificity are crucial for any initiative so that decision-making processes as a whole can be monitored. In order to avoid negative attitudes, it is important to create an understanding in people of how different decision-making positions have been reached. Effective public’s voice involvement could help a lot in this area. Involvement must be consistent so that people have time to adjust and no contradictions arise. It is also important for the public sector to set a good example at all levels and to act in accordance with the principles that are expected of the public.

6.2 Further research

The analysis of empirical data reveled some of the ideas to consider for further smart tourism research in Estonian cities. In both cities urban planning it is necessary to take in account of different stakeholders views and opinions by conducting surveys for getting this information. While planning on developing new green areas or playgrounds in the cities, it could also be helpful to get information from locals by investigating their needs in order to provide the best and most sustainable solutions. For the different sides of views, it could be helpful to include the public in the research process, as this research only included hotel employees then when the public is included, results may differ.

For a better nationwide overview of Estonian cities, and it’s smart solutions, it could be helpful to include also smaller cities than Tallinn and Tartu and their stakeholders in the research. Stakeholders that could be included in the survey could also be employees of
different occupations for investigating views of different perspectives. It could be useful to conduct a nationwide survey by asking people for their knowledge and views of environmental, economic and social sustainability levels. Different research on the smart cities benefits cities and local authorities to understand what needs to be done to ensure urban sustainability and human well-being. For creating the best and most sustainable smart city solutions for each dimension in Estonia, it is necessary to study each dimension separately and make correct changes according to that dimension.
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Appendix

Interview questions for hotel employees.

The purpose of this study is to find out the development opportunities of a smart city tourism in different areas on the example of the Estonian cities Tallinn and Tartu.

1. Please choose your age group.
   - Under 20
   - 20-35
   - 36-50
   - Over 50

2. What is your job title?

3. Please choose your location:
   Tallinn
   Tartu

4. How would you describe smart tourism?

5. What kind of smart technology devices/solutions are most used in your company to enhance customer experience?

6. Smart city context contains six different dimensions that are mentioned below, please comment how developed are these dimensions in your opinion in Estonian cities and what dimensions need more improvement and why:

   Smart economy- how sustainable and innovative systems/ideas are used in the city

   Smart mobility- very good modern and sustainable public transport systems,

   Smart Governance- public is included in governments decision making process

   Smart environment- Sustainable management of natural resources

   Smart living- quality of life
Smart people- importance of education, government strategies

7. Please comment what dimensions out of 6 are most developed in your opinion and why?

8. Please comment that what dimensions out of 6 are least developed in your opinion and why?

9. In your opinion is there any downsides of developing smart cities? (If you answer yes then specify)

10. Do you consider raise of technology as a threat to traditional hospitality providers (Growth of platforms like Airbnb) or do you see this as an opportunity (more smart solutions in hotels) for companies?

11. What do you think are the biggest advantages and disadvantages if you think about current smart tourism solutions in Estonian cities?

12. Would you consider your company sustainable? If yes then what are the practices that your company has adopted to became sustainable?

13. How would you define sustainability in tourism?

14. What are the important factors to consider in your opinion to make city tourism more sustainable?

15. On a scale one to ten how sustainable would you rate overall smart tourism solutions in Estonian cities? (One needs development-Ten very developed) Please comment why do you think so.