

# **Integration of High-Tech Bracelets into a Tour Operating Business**

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Abstract  <p>High technology shapes the tourism industry by reducing costs, enhancing operational efficiency, and improving services and customer experience. Tour operators, as an integral part of the tourism industry, also keep pace with technological development. Some major players have already introduced the usage of smart wearable devices in their services. However, the scope of innovation remains sufficient for the integration of new solutions and applications. The study was focused on investigating the value of high-tech bracelets for travel service providers, and on understanding how tour operators can monetize that solution as an additional service.</p> <p>The inductive approach with a qualitative method was adopted for the study, which had an exploratory purpose. Secondary data was analyzed to build a theoretical background for the study and to provide a baseline for primary exploration. The collection of primary data was conducted through semi-structured interviews with five experts from the industry. All interviewees had over ten years of experience in the field of tourism and innovation. The competitive benchmarking framework was also applied in order to strengthen the results.</p> <p>The results of the study showed that the integration of high-tech bracelets would improve the competitiveness of tour operators. Moreover, it would contribute to an increase in the market share of the business. Furthermore, it was discovered that the "Freemium" was the most suitable revenue model to monetize the integration of the arm wearable technology to the services of the tour operator.</p>		
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Miscellaneous		

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# 1 Introduction

*“We are going through the age of temporary advantage and hyper-competition where organizations need constant innovation to gain a temporary benefit and move ahead of the competition for a continuous series of time.”*

*(D'Aveni et al, 2010 & Mariani et al, 2016)*

## 1.1 Background

Smart technology and digitalization are radically changing the tourism industry nowadays. Travel companies switch their services from offline to online and integrate high-tech solutions into all the steps of the travel process. Some technologies have already become an integral part of the everyday reality for both travelers and tourism providers. The others have a promising potential for the future and emerge in the industry gradually. According to the World Tourism Organization (UNWTO), the tourism sector tends to constant growth and requires the continuous introduction of innovative solutions.

Google (2011) has identified five stages of travel: dreaming, planning, booking, experiencing, and sharing. Tech-savvy travelers expect personalized services and tend to use digital platforms and smart devices at all stages: from booking the tickets to finding an affordable restaurant in a place of destination.

The competition level in the tourism industry has increased significantly. There are a lot of new market players who offer innovative tech solutions and quickly win customers back from conservative monopolies. Using advanced technologies and personalizing services, travel companies cannot lose their position in the market and offer each client something more than just a trip.

Today, wearable devices are becoming increasingly popular. Since the previous decade, this concept has gone beyond just smart glasses and watches. Currently, the

market offers many variations of wearable technology, and a lot of industries have already implemented them in the operations. The tourism industry does not stand aside; however, the widespread use of smart arm devices has not been seen yet. The research strives to study innovation in the field of wearable devices in tourism, namely in the services of tour operators.

## 1.2 Motivation for the Research

The topic for this study was chosen based on the personal interest of the author towards technological development in the tourism industry. In 2019, the author founded a tour operator company in the Netherlands for students from Dutch colleges and universities. While conducting brief market research and analyzing the closest competitors, it was identified that the company does not have a distinct advantage in comparison with the competitors. The decision to start developing a plan for introducing high technology into the company's service was made. Thus, the author came up with the idea of offering smart bracelets as an additional option for customers during a trip. From the customers' point of view, this innovation looks quite impressive. Moreover, young people are the best target audience to test technological innovation. However, in order to analyze the value of the idea from a business perspective, the author decided to conduct a theoretical study, reinforcing her findings with the industry experts' opinions. This research is a theoretical foundation for the further integration of innovative solutions into the services of the author's tour operator.

Furthermore, this research has a broader motivation and objective. At the moment, the integration of smart bracelets is was studied from only one company's perspective. However, if, in practice, the solution meets the expectations, the next goal would be to give this innovation a wider spread on the industry level. In this case, the study might become a starting point for a new step in the tourism business.

### 1.3 Research Questions and Objectives

Since the beginning of the 21st century, wearable technology has become a popular topic for investigation all over the world. Many industries have already integrated smart wearable devices into the scope of their practice. The healthcare and sports businesses are the leaders in utilizing and developing high-tech wearables today. In the travel & tourism industry, this technology is still in its inception stage of employment.

The study strives to reach the objective of analyzing a potential value that smart arm wearable devices can bring to the travel service providers and how tour operators can monetize high-tech bracelets as an additional service.

To achieve this objective, the author determined two research questions (RQ):

**RQ1:** How the integration of high-tech bracelets helps a tour operator to outstand the competitors on the market?

**RQ2:** What is the most suitable revenue model for high-tech bracelets integrated into tour operator services?

### 1.4 Structure of the Study

The following thesis is designed as qualitative research and divided into five chapters. An introduction chapter briefly familiarizes the reader with overall information on a chosen topic, explains the motivation, as well as defines main research questions and objectives. The knowledge base chapter contains a review of related literature and theoretical frameworks that give the author and the reader a deeper understanding of the topic. The third chapter describes and gives justifications of methodological choice by covering research methods and approaches, as well as data collection and analysis. The fourth chapter reports the research findings based on secondary data review as well as on information gathered from a semi-structured interview with professionals from the industry. In the fifth chapter, the author gives the

answers to research questions resulting from the data analyzed in previous chapters. The final chapter six discusses the validity of the study, defines the limitations, and suggests the ideas for further researches.

## 1.5 Glossary

Part of this study describes the applications of various high technologies. To facilitate the reader's perception of the study, the author decided to make a small glossary with a brief explanation of the main terms placed in alphabetical order.

*Artificial intelligence* - the ability of a digital computer or a computer-controlled robot to perform tasks usually associated with human intelligence. Currently, AI can show intellectual characteristics of a person, such as the ability to define, generalize, or learn from experience. At the moment, AI has not fully taken over any industry. Instead, it has evolved to provide many specific benefits in many fields.

*Augmented reality* - a digital augmentation overlaid on a real environment around us. To create augmented reality, particular objects are put into a real-time "picture" using specialized software and gadgets such as smart glasses, smartphones, and other devices with AR function.

*Big data* - a complex set of both structured and unstructured data. This wide variety of data comes with super high velocity in an enormous volume that traditional software is not capable of managing. Vast amounts of data are processed in a way that a person can get specific and the most accurate results for further efficient usage.

*Biometrics* - a science of measurement and description of the unique characteristics of the body of human beings. There is a wide range of industries that require fast and reliable user authentication. Access to a personal computer or smartphone, bank transactions, opening doors and controlling access to premises, crossing state borders, etc. Currently, the most popular ways to collect unique body characteristics are scanning a person's fingerprint, iris print, hand, face, voice, gait, and signature.



*Blockchain* - a continuous chain of data blocks where each subsequent block is connected with the previous one through the set of records it contains. Each block stores all the information in the chain, starting from the very first block. Operations within the network are recorded and processed without the participation of a centralized server. The current state of the blockchain at a particular point in time is synchronized and managed by hundreds of thousands of computers around the world.

*Internet of Things* - connects devices to a computer network. It allows them to collect, analyze, process, and transmit data to other objects. These processes are done through software, applications, or devices. In other words, IoT is a network of networks where people can communicate with devices, and devices can communicate with each other. They can respond to environmental changes and make decisions without human intervention.

*Robotics* - one of the applied sciences that designs, manufactures, and uses automated technical systems called robots. A robot is a programmable mechanical device that can operate without human participation.

*Virtual reality* - a 3D computer environment that a person interacts with. A person is immersed in this environment by using various devices (helmets, glasses, etc.) VR makes a person be a part of the virtual world to control virtual objects.

## **2 Knowledge Base**

To better understand the topics required to answer the research questions, it is essential to study and analyze the previous studies, publications, and more fundamental sources of information. Thus, the author created a Knowledge Base chapter that includes a review of the literature and theoretical frameworks.

## 2.1 Introduction to Tour Operating Business

The tourism industry is one of the major forces of the economy in the world, and it is a business of global importance and significance (Cooper, Fletcher, Fyall, Gilbert, and Wanhill 2005, 4). Tour operators are one of the most crucial stakeholders in the tourism business. Tour operating business is an integral component of a complex web of relationships between a variety of tourism suppliers that altogether form the travel services sector (Knowles and Westcott 2014, 147-148). Tour operators engage in the collection of travel package components such as accommodation, transportation, and excursion; they assemble these components and add a particular value to create an attractive holiday or shorter getaway offer. (Leslie 2012, 73-74.)

The scheme below (Figure 1.) shows four main types of tour operators. They are categorized based on the specification of their operations and the nature of the business.

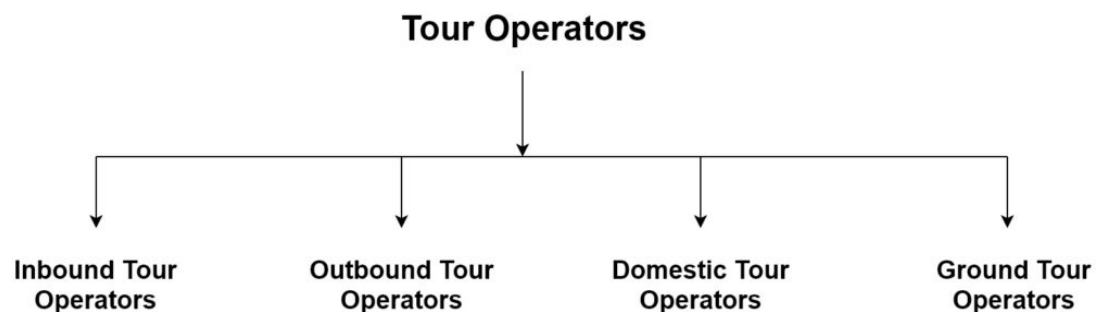


Figure 1. Types of tour operators

**Inbound tour operators** sometimes are also called **incoming tour operators**. Such organizations operate as a host and organize all steps of the visitors at the place of destination. Tour operators that arrange and promote trips abroad are called **outbound tour operators**. They specialize not only in leisure traveling but also on business trips and cultural exchange projects. **Domestic tour operators** focus on the local travelers by assembling and combining tourism components into the trip offers. They provide native travelers with attractions and other services within the home country. **Ground operators**, also known as **destination management companies**, arrange trips for

incoming tourists on behalf of a tour operator from abroad that does not have a local branch or does not have the ability to communicate with local parties such as hotels, transport operators, etc. (Saffery, Morgan, Tulga, and Warren 2007.)

## 2.2 The Use of High Technology in Tourism

### **Virtual Reality and Augmented Reality**

Virtual reality (VR), a concept that has recently gained mainstream popularity in tourism, in fact, has been around since the end of the 20th century (Philipp Wöbe 2016). Williams and Hobson (1995) claimed that from a marketing perspective, VR has the potential to revolutionize the promotion and selling of tourism. (425). Nowadays, it is possible to demonstrate tourist destinations, resorts, hotels, and other places in VR mode. The effect of complete immersion, high image quality, extensive possibilities of displaying makes Virtual Reality a powerful marketing tool. On the Virtuoso Travel Week 2018, the modern VR capabilities in tourism were demonstrated. The experts from the industry concluded that the demand for such services would experience a significant increase within the next couple of years. Moreover, the specialists expect Virtual Reality to contribute to the growth of demand for travel services. The practical examples show that a virtual presence significantly increases the chances of a customer buying a tour.

The introduction of augmented reality by travel companies enhances the interactivity of the customer experience (Carmigniani, Furht, Anisetti, Ceravolo, Damiani, and Ivkovic 2011). The researchers believe that customized augmented reality has great potential in the tourism business. Today, one of the most popular ways to use augmented reality in tourism is augmented walks. The user is in a real environment, but they can add 3D objects there using mobile gadgets or wearable devices. Some national parks in the United States provided their visitors with the opportunity to observe artificial archaeological sites in the cliffs of the park. Guests can watch the fossils found at specific places where they are passing now. (158-159).

## **Big Data**

Big data technology affects many areas of the tourism and hospitality industry. It helps to enhance customer experience through personalization, to approach every target group based on their needs and preferences, and to optimize customized capacity plans and costs relocation. (Gupta, Gauba, and Jain 2017).

Such online travel agencies as Booking.com and TripAdvisor sell millions of accommodation units and other services per year. All these transactions generate a considerable amount of information that can be used for big data development. (Sigala, Rahimi, and Thelwall 2019). Airbnb faced the challenge of connecting a large number of guests with the accommodation providers as the company has 1.5 million listings across 34000 locations and 50 million customers (Bernard 2016). It is essential to match the visitors' preferences and the available properties that fit into the desired location and the price range. Moreover, the company strives to help the property owners to set the right price for their offer. In this case, the collaboration between big data technology and machine learning can be observed. The platform analyses images of the properties, customer feedbacks, accommodation features and automatically divides cities into neighborhoods and gives the pricing tips for the hosts. The external data is analyzed too. For example, during a specific event, the recommended price for the property is higher than usual. (211-214).

## **Blockchain**

Blockchain technology is strategically used in many aspects of tourism and hospitality to achieve the goals of increasing competitive advantage, customer satisfaction, and overall performance (Willie 2019). The figure (Figure 2.) presents possible implementations of Blockchain technology for tourism industry stakeholders. Blockchain technology influences the tourism industry by building trust, allowing transparency, and secure control (Kwok and Koh 2019, 2447).



Figure 2. Implementations of Blockchain for tourism industry stakeholders

One of the applications of the blockchain in the tourism business is a unified platform that stores information about different branches of the same hotel company. The database contains information on the equipment (such as furniture, dishes, etc.) and information about the availability of this equipment on a specific date. Thus, if one of the locations of the hotel chain has an event and there is not enough inventory, it can be borrowed from another branch of the hotel. It will reduce unnecessary expenses for the purchase of excess items. Travel agencies and tour operators employ blockchain too. A German company TUI is the largest tourism chain. They are one of the first from the industry that began to implement blockchain in their business. They built a secure environment for exchanging customers' data and transactions. In the future, the company is planning to develop a blockchain platform that connects, e.g., tour operators, airlines, and hotels that have real-time access to the traveler's data and can react to issues such as lost baggage immediately. (ibid., 115)

### Biometrics

The biometric system is one of the barrier security systems used in tourism and hospitality not only as a protection of physical entry but also as a protection of

transactions (Kelly 2010). Like many other high technologies in tourism, today, biometrics is mainly used in hotels. For example, in one of the hotels, a biometric access system to the minibar is provided, which reads the age of the guest and does not allow opening the bar if the person has not reached a certain age. Another hotel is developing a VIP service solution. A system is developed to scan the biometric data of a person at the entrance; when a guest comes at the reception, an employee can greet him/her by name. (NEC showcases 2013). In addition to the methods as mentioned earlier of using biometrics, tourism companies can investigate other areas of application such as assistance in marketing analysis, improving security systems, and quick check-in for flights and other transport.

### **Robotics**

While a lot of people are concerned that robots will take the job places, in the tourism industry, robots either work with people or do hard physical work (Ivanov, Gretzel, Berezina, Sigala, and Webster). For example, in one of the hotels on the registration desk, robots perform monotonous work that requires continuous attention; namely, they check personal data and accept payment. At this time, hotel staff walks around the lobby to help with questions or offer guests drinks (Bowen and Morosan 2018). As another application of robots in tourism, consider an example from Geneva International Airport where a bag-drop robot has been tested. He meets guests on the street, scans a boarding pass, prints a label on his luggage, and picks it up for loading (Hristov, Ivanov, Berezina, and Webster 2017).

### **Artificial Intelligence**

Although artificial intelligence remains challenging to understand technology, it is successfully introduced into the tourism and hospitality industry. Recent studies have shown that major market players, such as Google Travel and TripAdvisor, applied artificial intelligence to many internal and external tasks. (Samala, Katkam, Bellamkonda, Rodriguez 2020). One of the most popular ways to use artificial intelligence is chatbots. Today, almost any travel website has a built-in bot that answers visitors' questions and in text form searching for answers around the company database.

However, there is another appearance of travel chatbots, which some travel providers have already begun to use. Voice travel chatbot is built into the rental car and tells the passenger the story and interesting facts about a particular place through which they pass. This solution is ideal for individual travel lovers who do not want to join the group but, at the same time, are interested in curious information about destinations. (Boiano et al., 2019).

### **Internet of Things**

Even though the concept of the Internet of things appeared a little over a decade ago, the use of this technology in tourism and hospitality is a relatively recent phenomenon. The Internet of things is directly connected with big data and has excellent potential for development. In some hotels, the guest can already find voice assistants helping them to adjust the temperature and humidity in the room or order food. (Nadkarni, Kriechbaumer, Rothenberger, and Christodoulidou 2019).

### **2.3 Wearable Technology**

Wearable technology is a common name that covers a wide variety of devices worn directly on or loosely attached to a person (Godfrey, Hetheringtonb, Shum, Bonato, Lovell, and Stuart 2018). Two main criteria differentiate wearable devices from portable gadgets such as smartphones or earbuds. First of all, the Internet of things is the technology behind almost any wearable device. For instance, headphones are not wearables because they are connected to a smartphone, but they do not exchange data with any network. Secondly, wearable devices work with space, analyze the changing environment, and interact with it. Geolocation services are one of the main components of the functionality of most types of such devices. The ultimate goal of wearable technology is to make everyday tasks easier and more efficient. Every smart device can be defined as an independent wearable technology that invades every aspect of the user's life. Such technologies continuously collect and process an incredible amount of data. (Cranny-Francis and Hawkins 2008.)

Nowadays, the concept of wearable technology has gone beyond smart glasses and watches. Figure 3. shows a wide variety of intelligent devices that currently exist on the market. Technological development made it possible to turn ordinary clothes into an entire system of smart gadgets. As for now, high-tech clothing has only recently begun to conquer the market, and it is not yet as accessible for mass usage use as other devices

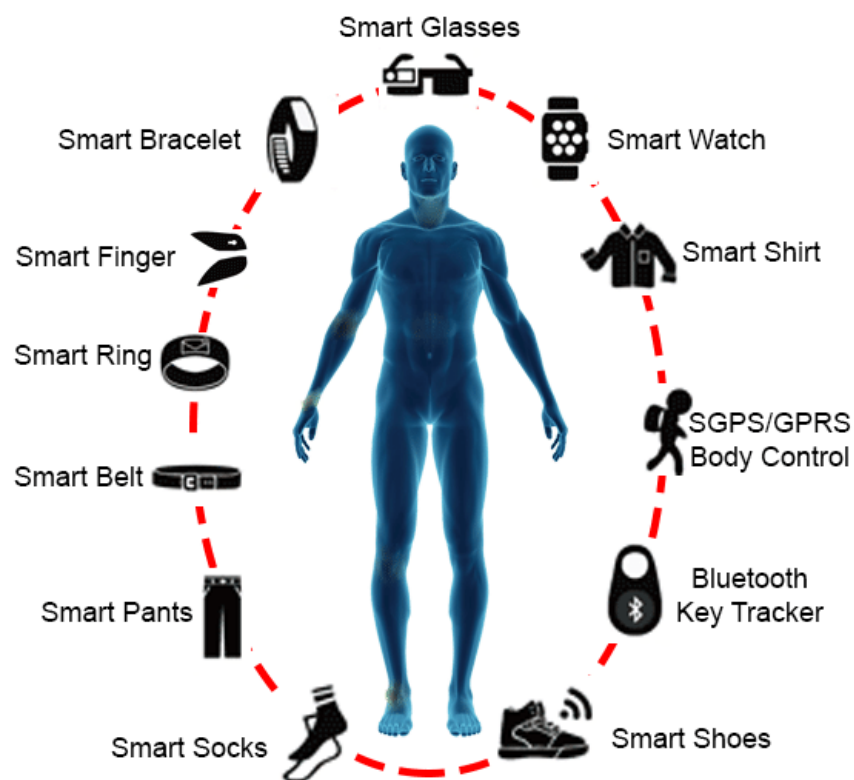


Figure 3. Smart devices (adapted from Junqueira H. 2018)

At the moment, the most popular and frequently used wearable device is smart bands. They have the broadest range of applications in such industries as healthcare, sports, childcare, and many others. Moreover, the scope of the use of smart bracelets is increasing every year. The bar chart below (Figure 4.) shows a significant increase in the growth of purchased smart bracelets by one and a half times in almost every analyzed region during the last two years.



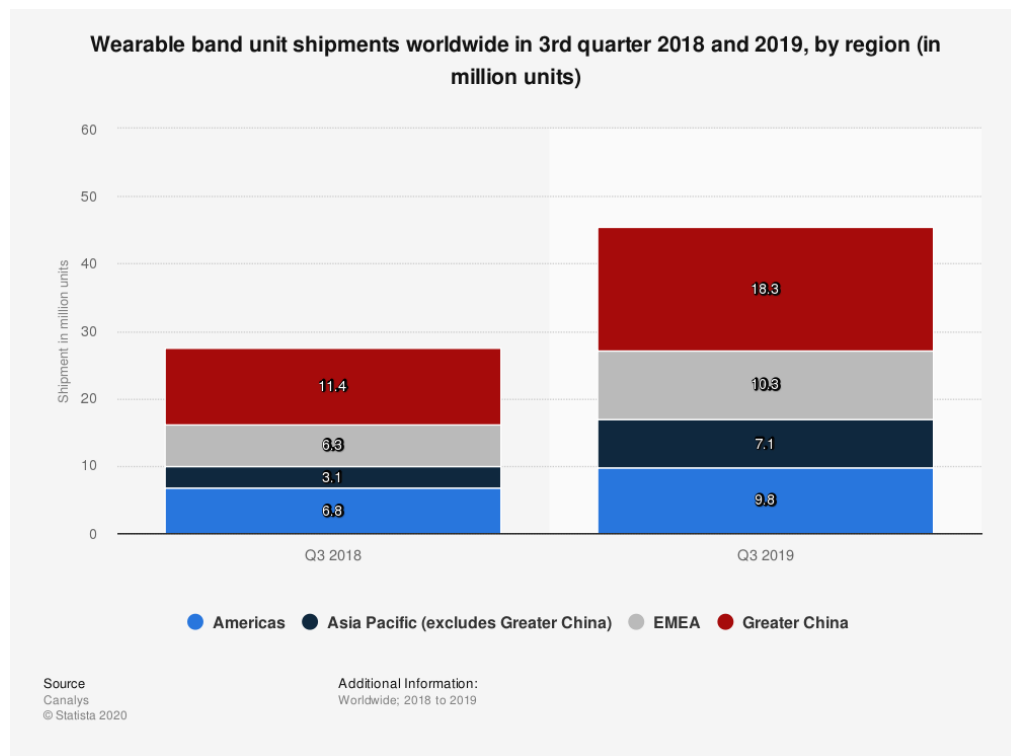


Figure 4. Wearable band shipments 2018-2019 (adapted from Statista 2020)

## 2.4 Current Use of High-Tech Bracelets in Tourism

According to the forecasting research conducted by IMARC Group (2018), the global market of smart bracelets has demonstrated the tendency to reach a high volume of sold units since 2017. For now, the major market share is taken by the sports industry with their smart fitness trackers. However, the hospitality industry gradually starts adopting the usage of smart bands as well. Among all the branches of the tourist business, hotels were the fastest and the most pragmatic in introducing smart bracelets (Bilgin Sarı 2018, 33-40). At the beginning of the 2000s, the hotels conducted a major change when ordinary metal room keys were replaced with electronic key cards. Both customers and hotels themselves appreciated this innovation. Today hotels move one step further towards technological revolution by replacing cards by smart bracelets that can be used not only as a key but also as a climate controller and as a payment method for services provided inside the hotel.

City Hub is one of the most innovative hotels located in several cities in the Netherlands. This smart hotel differs from others not only because of futuristic design but also in smart bracelets as a key feature of its service. As in many modern hotels worldwide, City Hub bracelets work as the keys to rooms and as a payment method for services provided inside the hotel. However, there is one function that, at first glance, seems simple but a brilliant idea, in fact. These smart bracelets have a built-in Internet hot spot that can distribute Wi-Fi to any user device within the Netherlands. The technology delighted foreign guests who did not have access to the Internet outside their country. In the future, the City Hub hotel plans to expand and open new locations of smart hotels around the world.

Another example of the current use of smart bracelets is the Disney theme park. Although the entertainment business is not part of the tourism industry, certain intersections are visible. Magic Band is a smart bracelet presented by the company in 2014 aimed at improving the overall experience of visitors and personalization - one of the trends of recent years. This smart bracelet combines several technologies that work together to achieve the best result; among these technologies are the Internet of things and big data. The same as in hotels, this bracelet works as an access key to all the resort premises as well as payment methods in local stores and restaurants. As for personalization, the guest can set up their individual bracelet by pre-entering the attractions to be visited and their name. Thus, the park's animators will be able to address guests by name, which will undoubtedly increase satisfaction, especially among children. Moreover, bracelets help to collect data about the specific attractions that the guest visited, to calculate the time spent there, etc. By processing all this information, the company can create a development and improvement plan for the park services, as well as draw up a personalized plan for the guest if they decide to come next time.

## 2.5 Innovation Monetization

Innovation is one of the most crucial business growth factors. Today, more than ever, companies must innovate in order to survive. But successful innovation is a

challenging task. (Ramanujam and Tacke 2016.). According to the article at Harvard Business Review by Sarah Green Carmichael (2014), 72% of all innovative products or services do not meet their revenue goals. One-fourth of companies admitted that none of their new offerings met its profitability targets. (The Silent Killer of New Products: Lazy Pricing). Ramanujam and Tacke (2016) summarized the most common mistakes when trying to monetize innovation.

**Too many functions.** A lot of companies believe that inserting as many functions as possible to the innovative product/service is a smart move. Often, the output has the opposite effect. A superficial analysis of customer needs leads to the fact that at first glance, a wide range of functions does not satisfy the basic needs of the consumer. Thus, often, a business spends many unnecessary expenses that could have been avoided otherwise.

**Hidden treasure.** Often, an innovative product or service fails due to an improperly built marketing strategy. In this case, there are two possible scenarios. The innovation does not fit into the overall business concept and does not correlate with the main activity of the company. The innovation might not be well advertised; thereby, customers do not get enough information to facilitate the purchase of a service product.

**"Living dead"**. Sometimes it happens that the innovation introduced into the business is not needed by the consumer. Such a case can happen for several reasons. Perhaps the company found the wrong answer to the right question or provided a solution for an issue that no one had. In this case, the innovation turns out to be unclaimed and quickly wanes, entailing financial losses.

**Too low price and incorrect revenue model.** Even in a successful scenario, when both consumers and the market need a particular innovation, the company can face a failure. An understated price or an incorrectly chosen revenue model can turn a potentially successful product or service into another failure and losses.

## 2.6 Revenue Models

According to Wirtz, Pistoia, Ullrich, and Göttel (2016), the revenue model is a subordinate model to the business model. Afuah (2004) explains the revenue model as a framework for monetizing the business model and generating revenues. There is a big list of different types of revenue models; however, below, the author describes only three of them that apply to services and tools and optimal for small ticket price items.

### **Subscription Revenue Model**

The main characteristic of the subscription revenue model is that the client pays a fixed amount for a product or service on a regular basis (monthly, annually, etc.). To successfully implement the subscription revenue model, it is necessary to continually provide the customer with the value so that he wants to update the subscription. Typically, the subscription-based system is provided by companies supplying their brand or service to the client regularly; it can be food services, streaming platforms, etc. (Lofti, Kesidis and Sarkar 2014).

### **Product is Free, But Services Aren't**

The name of this type of revenue model speaks for itself. When using this model, the client receives a product, for example, some device for free, but all subsequent operations and services require payment. This revenue model can serve as a useful marketing tool because customers tend to appreciate companies where a particular product or service is provided for free. This model may not be efficient and is quite tricky in the long run, but many companies can benefit from it at the beginning of their journey.

### **Freemium Model**

Research shows that people love free products and services. Many online resources such as Internet libraries, movie portals, etc. actively offer users free trial weeks, counting on the further purchase of a paid tariff plan. A slightly different way is used by services such as corporate software, grammar checking tools, etc. They offer two or more packages with a different set of features and functions available. A free package may include limited access to resources, a limited number of users, or a lot of pop-up ads. The revenue model described above is called freemium. (Huang 2016). The freemium model means providing a product or service with basic capabilities for free with the intention of persuading a sufficient number of customers to pay for a full version. Studies by Google Play and Apple Store have shown that more than 90% of all revenue comes from applications working on the freemium system. (16-18).

### **Pay per Use**

Pay per use revenue model is especially popular among software companies. They do not charge advance payments from the user but make up the final payment only for those services that the client used. Quite often, this revenue model is also used by B2C companies, for example, the fee for the number of kilometers driven by a rented car, the number of copied pages on a printer. This can be used as a replacement for a subscription model. For customers, such a system is desirable since they do not feel the pre-established boundaries. (Gebauer, Haldimann, and Caroline 2017).

### 3 Methodology

The following chapter describes the theory of research methodology and gives justifications on procedures and techniques used in this study to determine, select, and process the data.

#### 3.1 Research Purpose

There are two types of academic research, fundamental and applied. Fundamental (or basic) research aims at the formation of theory and focuses on generalization. Research concerning a natural phenomenon or relying on pure mathematics is known to be fundamental. Applied research aims at finding a solution to a particular problem in a society, industry, or business organization. Thus, the discovery of a solution for a practical issue lies in the core of applied research. (Kothari 2004, 3.) This study strives to ascertain how the integration of technological solutions might help tour operators to be more competitive in the tourism industry market, as well as to determine the most suitable way to monetize this innovation. Thus, this study is considered to be applied research with possible further implementation.

The classification of research purposes includes three main types which are descriptive, explanatory, and exploratory. In some cases, however, more than one type can be applied (Saunders, Lewis, & Thornhill 2009, 139).

According to Nassaji (2015), the main objective of descriptive research is to characterize all important aspects of a phenomenon. (129.) Descriptive research represents the current state of the event at the time of the study. The reader of descriptive research should be able to envision the broad picture of the studied phenomenon; however, the discussion of why and how it occurred is not presented in the study. (Salkind 2017, 160-161.)

## 3.2 Research Approach

Generally, there are two primary research approaches recognized: deductive and inductive (Saunders et al. 2009, 124). However, some experts say that there is a third alternative, abductive reasoning. According to Bryman and Bell (2015), abductive approach is set to address weaknesses associated with deductive and inductive approaches. Application of abductive reasoning in practice is challenging, and the researchers are advised to stick with traditional deductive or inductive approaches when working on research for the first time. (27).

A deductive approach is designed to verify theory and to narrow down the general rules to specific conclusions. A deductive research approach is generally linked to a quantitative research method. The application of a deductive approach begins with analyzing the theory retrieved from previous studies, books, or academic journals and articles. In order to create a hypothesis and test a theory, the investigator should develop a research strategy. (Saunders et al. 2009, 124-126).

The one adopting an inductive approach should begin from making observations and then move towards creating the generalized conclusion. Inductive reasoning is usually applied when there is not enough knowledge available regarding the research topic. Commonly, an inductive research approach is chosen to work with qualitative data and to use multiple data collection methods to build different views on a studied subject. (ibid., 126.)

Since this research explores the potential of an innovative solution in the tour operating business, there is not enough initial information and secondary data available. Therefore, the author utilized an inductive reasoning approach.

## 3.3 Research Methods

To differentiate between various ways of collecting and analyzing data, the researcher has to decide on the method of the research. The further direction of the

study will depend on this choice. There are two main research methods, quantitative and qualitative. The difference between the two is the focus on numbers/statistics or words, correspondingly. For the quantitative research method, the process of collecting information is in the form of surveys with the subsequent compilation of statistical graphs. For a qualitative study, various types of interviews are most suitable, followed by the division of information into categories. For research, the author can choose a mono method; in this case, either a quantitative or qualitative method will be applied to all research questions. The researcher also has the opportunity to choose a multi-method, in which he/she can use several techniques of one of the methods but not mix them. There is a third option when a researcher combines a quantitative and qualitative method in his/her work; then, this is called a mixed method. (Saunders, et al 2009, 151-152.).

For this study, the author chose a mono-qualitative method since it is most suitable way for achieving the goals and objectives of this work.

### 3.4 Data Collection

For this qualitative research, the author used different methods of collecting information for each of the research questions. For the RQ1, the primary method of collecting data was a semi-structured interview with industry experts. The competitive benchmarking framework was also applied in order to strengthen the idea of the competitiveness of the studied innovation. According to Bekhet and Zauszniewski (2012, 3), using two sources of information limits the weakness of using only one resource and improves the power of the results. To answer the RQ2, the author collected secondary information and made her conclusions on this subject without collecting any primary data.

The data collection process for qualitative research includes various types of interviews, such as focus group interviews or one-on-one interviews (Pharm 2015). Regardless of which method of collecting information, the researcher chooses, the data obtained by the qualitative research method is always associated with large and



complex volumes of information. In order not to get confused in this massive pool of information, it is necessary to take handwritten notes or make an audio/video recording of the interview. The second option can only be implemented with the permission of the interviewee. (226-231). For this study, the author made paper notes during the interviews, and later, after each meeting, completely restored information by keywords and sentences. Therefore, it was necessary not to delay the processing of each interview so as not to lose relevant data.

### 3.5 Competitive Benchmarking

The term benchmarking refers to a continuous process of examination of the services, products, etc., quality of the company based on the internal work, competitors' performance, or industry. By using this tool, a company continuously strives to enhance the performance to stay relevant on the high-competitive market. As a summary, the author created a diagram (Figure 5.) that presents different types of specifications of benchmarking. For this study, only the competitive benchmarking has particular importance; the author decided not to describe in detail other types of benchmarking. To apply competitive benchmarking, the organization has to collect information about competitors-enterprises operating in the same industry or research the experience of the business partners.

Depending on the purpose and expected results, the researcher can choose a scope of competitors to be analyzed, for example, close (in terms of location and product/service provided) competitors, or analyze a broader circle within the industry. Moreover, the researcher can independently establish the metrics by which benchmarking will be conducted. To conduct proper competitive benchmarking it is necessary to choose the market-leading competitors. This status of a certain organization can be measured by various criteria such as the size of the customer base, annual turnover, and even the number of subscribers in social networks.

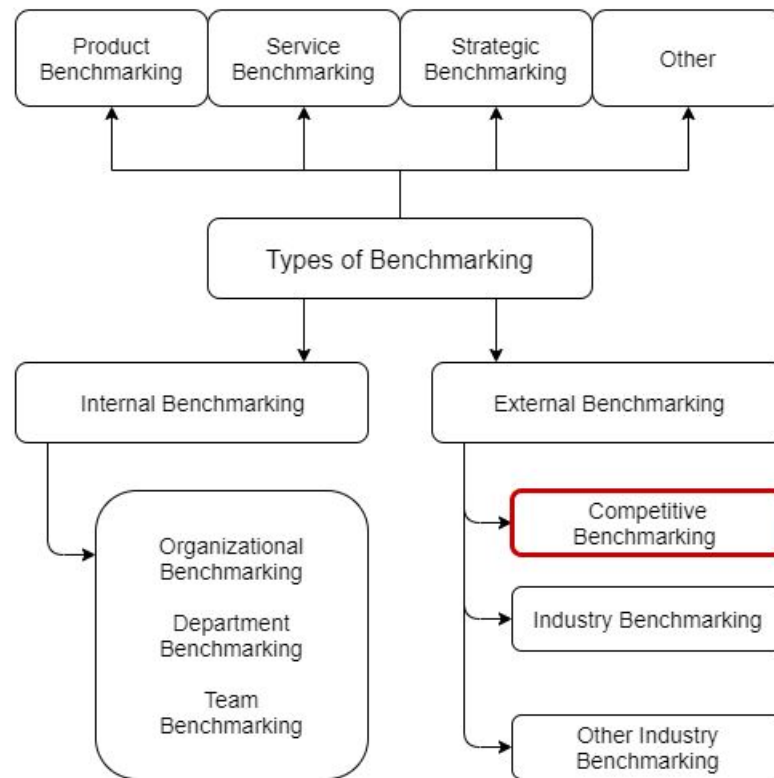


Figure 5. Types of benchmarking

According to Wöber (2001), benchmarking is a suitable tool for all types of profit-oriented organizations operating within the tourism industry, including accommodation suppliers, restaurants, airlines, and **tour operators** & travel agencies. (10).

## 4 Results

This chapter describes the process of the research and demonstrates the findings by bringing together the results of all applied methods of data collection.

### 4.1 Interview Process

Conducting in-depth interviews is an integral part of qualitative research. In order to gather valuable primary data, the author contacted five experts from the industry who agreed to give their opinion and share some insights related to the research topic. Due to the restrictions imposed by COVID-19, all interviews were held online.

That fact significantly accelerated a meeting scheduling process and created a more informal atmosphere during the discussion. To find the right candidates for the interview and their contact details, the author, first of all, browsed LinkedIn and sent a request with a short message explaining the purpose of connection. After the person agreed to participate, the author shared with him/her an introduction to the research and an interview framework that are attached in this thesis in the Appendix. A semi-structured interview was chosen as a research method to enable the author to create open-ended questions that allow new ideas to appear during the discussion.

The author has chosen interviewees based on their professional profiles and experience related to the study. All participants gave their permission to mention them in this paper. The table below depicts the names in, field of expertise and the background of each respondent (Table 1.).

<b>Interviewee</b>	<b>Area of specialization</b>	<b>Background and position</b>
<b>Croce Valeria</b>	Research Analytics	A research analyst with over 15 years of experience working for international organizations. Also acts as International Liaison Officer for UNWTO Academy and as International Relations & Insights Manager at Eurail BV.
<b>Mäkelä Anne Maria</b>	Sustainable Tourism Tourism Marketing Development and Innovation	Sustainable Tourism Consultant with more than 20 years of experience; contracted by UNWTO, UNDP etc. in various destinations in Asia, Balkans, Africa.

<b>Siltanen Henna</b>	Tourism Management Tourism Digitalization	Tourism Specialist at JAMK University of Applied Sciences with an experience of living in 11 countries and worked for 4 international travel companies.
<b>Elbers Lobke</b>	Innovation in Tourism Digitization and Technology in Travel	A specialist in the field of innovation, technology and digitization in travel. Manages the Next Tourism Generation project and implements the first European tourism skills hub (EC) and the Student's League in the Netherlands (UNWTO).
<b>Lim Andrew</b>	Innovation in Hospitality	Professor (Lector) of Innovation in Hospitality and Technology entrepreneurship

Table 1. Background of the interviewees

During the primary data collection process, the respondents shared their thoughts and suggestions about all the aspects of the interview. The author divided the interview into the five main topics and presented the recommendation quotes from the interviewees (Int.)

## 4.2 Technology Trends in Tourism

When discussing the integration of the smart technologies in the tourism business, all respondents agreed that today it is almost impossible to imagine the tourism

industry without technological development ("There is no doubt that smart technologies are well established in the tourism industry. The development of new tech services and applications is becoming an integral component in our business "-int.4). Respondents listed the leading technologies that more than others are revolutionizing the tourism industry ("Of course, all modern technologies somehow have an impact on the tourism industry today, but among the terms that we hear daily, virtual and augmented reality, artificial intelligence and of course the Internet of things are undoubtedly leading "-int.2). Experts mentioned that technological development in tourism is not progressing at the same pace everywhere ("Today, many areas of tourism are associated with technological development. However, there are still many places where tourism has remained quite traditional and even a conservative industry. Therefore, I would not say that the technological revolution covered everyone equally this industry "- int.5). Respondents also doubted the total transition to smart tourism ("Tourism, first of all, is the acquisition of new emotions and impressions, and technology should contribute to this and not completely replace the physical journey of people around the world. Yes, in the current situation with COVID-19, technology shows itself in action. But in regular times, VR, for example, will never totally replace mobility "- int. 1).

### 4.3 Main Challenges

When discussing the main challenges linked to the introduction of high technology in tourism, respondents identified quite diverse and non-surface problems. Respondents identified that many customers are not ready yet to accept technological innovations ("Despite the fact that tourism is associated with something active and energetic, do not forget that today tourism is quite popular among senior travelers as well. It is difficult, uncomfortable even scary for older adults to learn how to use new technologies before, during, and after the trip. Therefore, technological development will take a lot of time to gain an appreciation not only among young travelers but also among older people "- int.3). Specialists also paid attention to the problem of the lack of readiness of the general infrastructure for some technological innovations ("Many innovative solutions in tourism do not require physical adjustment because

they exist online. But the introduction of some technologies still requires external changes and updates. I believe not all countries, cities, or other smaller establishments are ready to entirely or partially change the infrastructure for this or that innovation “- int.4). The experts also mentioned the security issue and the legal side of the question (“One of the toughest challenges for travel companies that integrate smart technology into their service is to provide the customers with complete security including personal data. With some technologies, it is incredibly complicated to implement, and even more complicated to assure the customers that their data is safe, and they have nothing to worry about while using these technologies “-int.1).

#### 4.4 Company Competitiveness

In a more specific discussion about smart bracelets as an innovative solution researched by the author, respondents gave their assessment of the competitiveness of the company that introduced these technologies. Experts noticed that using this technological solution by a company may become only a temporary advantage in the market of tour operators (“I believe that this solution can bring a company a short-term advantage because, after some time, this kind of things will become a requirement” -int. 2). Respondents suggested that in the long run, a travel company that takes advantage of its innovation by isolating itself from others may fail (“In the tourism business, the company cannot survive to be an independent island; there has to be cooperation, and the environment should be ready” -int. 1). Interviewed experts also examined the question of competitiveness from a financial perspective (“I don’t think that the introduction of smart bracelets will help to increase a market share, but this will most likely increase the company’s profit and reduce unnecessary losses caused by the problems arising before using bracelets. You said that one of the main issues is that travelers are late by the time of departure on the way back, so you have to wait for them. As a result, you lose money because the bus company will charge you more for downtime. If smart bracelets send the customer a push notification about the time left before the departure, such financial losses will be minimized “-int.5).

## 4.5 Customer Satisfaction

Even though this study is mainly aimed at studying the introduction of innovation from the business perspective, the author decided to consider this topic from the customers' point of view because a product or service does not make sense if it does not benefit the user. Upon learning that at the first testing round, the primary target group for using smart bracelets will be students and young adults, respondents agreed that innovation would be successful among clients ("Tourists are known to be early adopters when it goes to technological innovation. I think the travelers, especially students, are definitely ready for this solution"- int. 2). Analyzing the existing solutions and their application in tourism and hospitality, respondents proposed an idea for a good way to attract the customers ("This solution has a good potential to cooperate with the insurance company, which provides special reductions for people who use smart bracelets to control their health conditions during the trip"- int. 3). However, respondents doubted some aspects of implementing smart bracelets ("From a business point of view, this idea seems to be valuable and useful, but I am not sure about the customer perspective. Some people might not like it because it is something they should wear no matter the weather conditions. If it is too hot and sunny, they might not like the idea of wearing an extra thing on their arm"- int. 4).

## 4.6 Future Potential

Since one of the motivations for this research was to identify the potential for the wider spread of smart bracelets around the tour operating business, the author asked the experts for their vision on the future of this innovation. In general, respondents see a good potential for further expansion of this solution ("If one company manages to prove that this technology works and brings excellent results for both business and customers, the rest will follow. In this case, your company may become not only a tour operator but also a travel tech company and conduct a B2B supply of smart bracelets to other market players"- int.5). Previously, respondents have already mentioned the challenge for tourism innovation to fit into the infrastructure. They thought smart bracelets were no exception ("To integrate such

technology, you should think of the overall infrastructure first. The Netherlands, of course, is one of the most advanced countries in terms of tourism technology and modern infrastructure" - int. 1). Moreover, respondents agreed that not all tour companies would like to deal with high technology ("In Finland, for example, many participants of the tourism industry are small family businesses or businesses for retirement that does not care that much about the technology"- int. 2). Since smart bracelets are already used by some hotels, amusement parks, and cruise liners, interviewees questioned the use of this innovation in open areas ("It seems to be challenging to integrate such technology in a not closed environment like a cruise ship or hotel" - int. 4).

#### 4.7 Benchmarking Process

For competitive benchmarking, the author selected three closest competitors in terms of the customer target group, offered services, and the location. For this process of benchmarking, only the publicly available data was collected and analyzed. Since the author did not have direct contact with the competitors' representatives, no company names would be mentioned. The table below presents a brief description of each benchmarked tour operator.

Benchmarked company	Location	Features
<b>Tour operator 1</b>	The Netherlands	<p><b>Activity:</b> Trips to the most popular events in Europe</p> <p><b>Target Group:</b> Students with Membership in Student Associations</p> <p><b>Technology:</b> None</p>



<b>Tour operator 2</b>	Germany	<p><b>Activity:</b> Europe bus tours</p> <p><b>Target Group:</b> Students and young adults</p> <p><b>Technology:</b> Uses WhatsApp to connect with all participants of the trip</p>
<b>Tour operator 3</b>	Switzerland	<p><b>Activity:</b> Short trips as well as long vacations with the possibility of personalized trips</p> <p><b>Target Group:</b> Students</p> <p><b>Technology:</b> There is a chatbot on the website; also the company uses the booking system powered by the software with integrated Business Intelligence tools</p>

Table 2. Benchmarked tour operators

To conduct a proper benchmarking, the company has to choose the competitors that are the leaders on the market. Companies selected by the author have a significant market share and are very popular among travelers. The closest competitors were chosen based on physical location since the author's tour operator shares the same

market with these companies and potentially the same customers. For the analysis, the websites' browsing was conducted to identify specific activities, a targeted group, and the level of technological development of the competitors. From the above table (Table 2.), it is clearly seen that the closest competitors do not introduce high technology in their business.

## 5 Discussion

The following part of the study explains the results described in the previous chapter and also provides the answers to the research questions. In conclusion, the author identified certain limitations of this study and presented her recommendations for further research on the integration of high-tech bracelets into the tour operating business.

### 5.1 Answers to the Research Questions

The main objectives of the research were to understand the value that smart arm wearable devices can bring to the travel service providers and find out how travel companies can monetize high-tech bracelets as an additional service. To reach those objectives, the author came up with two research questions. By conducting the analysis processes mentioned earlier, the author was able to provide the answers.

#### **How the integration of high-tech bracelets helps a tour operator to outstand the competitors on the market?**

The introduction of any innovation in the company is a significant risk. However, in order not only to survive but also to stand out among the competitors in the market, the company has to innovate. This statement applies to all industries, including the tourism and hospitality business. Competition is a driver of progress; in its absence, the company stops developing. The need for innovation can be determined by both the needs of customers and the new industry requirements.

Analyzing the primary and secondary data, the author realized that the integration of smart bracelets would provide just a temporary competitive advantage. However, upon closer inspection, this is not an issue since if several rounds of testing are successful, the company plans to have a more comprehensive scope within the industry. Thus, the revenue model of this innovation would be shifted from B2C to B2B system. Observing the near future plans, there is no doubt that for the short term, the company can still gain a competitive advantage. The integration of smart bracelets will help this tour operator to outstand from competitors for several reasons:

- this company will be the first among the closest competitors who introduces technology into its service; thereby it will grab the attention of customers,
- this innovative service fits into a narrow niche not yet occupied by tour operators, and
- a young target group tends to be enthusiastic about new technologies and adapt quickly to innovations.

#### **What is the most suitable revenue model for high-tech bracelets integrated into tour operator services?**

For the successful integration of smart bracelets into the operator's tour service, it is necessary to develop a scheme in which all travelers of a particular trip used this solution. Otherwise, the most important purposes of using smart bracelets will not work, namely, automatic check-in and check-out from the bus and push reminders about the upcoming pickup time. If only some of the customers use the bracelets, the organizers will have to recount the people present manually anyway and will probably be delayed.

After analyzing the information about different types of revenue models, the author concluded that the most suitable option for the innovation studied would be Free-mium. Thus, the tour operator can include a bracelet with a basic set of functions in the trip price. Still, users will have the opportunity to activate additional features

such as a hot spot that allows them to distribute the Internet to any device anywhere during travel and many other features.

## 5.2 Limitations of the Research

Since the results of this research have future potential to be implemented to the business, the author decided to avoid interviewing direct competitors, namely the owners or research & development specialists of other tour operators. This condition significantly reduced the range of candidates with suitable profiles for the interview. As a result, the number of interviewed experts decreased to the minimum possible threshold of five people (who agreed to participate) for qualitative research of this scale. Thus, the amount of obtained primary data might not have been enough to create a bigger picture and to get more detailed results.

Another factor that possibly influenced the research is the limited geographical coverage. Collected secondary data is quite generalized in terms of the origin of the information sources. At the same time, the material gained from the interviews is more oriented towards the European market, even though all respondents have international work and research experience.

## 5.3 Suggestions for Future Research

As previously mentioned in the limitations section, the research was concentrated on the exploration of the European market, even though the search for secondary data was not limited to a specific geographical location. Thus, future researchers will have the opportunity to expand the territorial boundaries of the study and explore other markets other than Europe. Studying this topic from different national and cultural perspectives will help to figure out whether this innovation has a potential worldwide.

Since this study was conducted from the company's perspective, the alleged functions of smart bracelets for tourists were superficially indicated. In subsequent

studies, one can consider the same subject from the customer point of view. The study might look into the wishes of the users as well as identify a set of bracelets' functions by conducting a quantitative questionnaire among the potential users.

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## Appendices

### Appendix 1. Interview invitation letter

“Hello Recipient,


I am a student at JAMK University of Applied Sciences in Finland. Currently, I am working on my Bachelor thesis: "Integration of High-Tech Bracelets into a Tour Operating Business. "

I believe your contribution as a Position/Experience would be extremely important for my research. I would be grateful if you agree to take part in a small interview. If you would have such a possibility to have a twenty-minute online meeting this or next week, I will be happy to share with you an introduction to my research, as well as an interview framework.

Thank you for your time.

Best regards,  
Daria”

## Appendix 2. Research Introduction



# INTEGRATION OF HIGH-TECH BRACELETS INTO A TOURISM BUSINESS

## RESEARCH INTRODUCTION

**RESEARCH BACKGROUND**

Smart technology and digitalization are radically changing the tourism industry nowadays. Travel companies switch their services from offline to online and integrate high-tech solutions into all the steps of the travel process. Some technologies have already become an integral part of the everyday reality for both travelers and tourism providers. The others are still in an experimental phase. However, they have a promising potential for the future and emerge in the industry gradually. The integration of high-tech bracelets into the tourism industry is an innovative solution that will enhance the safety, comfortability, and customer experience of travelers.

**RESEARCH QUESTIONS**

RQ1: How integration of high-tech bracelets helps a tourism company to outstand from the competitors on a market?

RQ2: What is the most suitable revenue model for high-tech bracelets integrated into a tourism company services?

**RESEARCH OBJECTIVES**

RO1: To understand the value that smart arm wearable devices can bring to the travel service providers.

RO2: To understand how travel companies can monetize high-tech bracelets as an additional service.


WHAT?	WHY?	HOW?
<ul style="list-style-type: none"> <li>High-tech bracelets in tourism</li> <li>Company competitive advantage</li> <li>Innovation monetization</li> </ul>	<ul style="list-style-type: none"> <li>Tourism tech development</li> <li>Company image improvement</li> </ul>	<ul style="list-style-type: none"> <li>Study previous researches</li> <li>Read companies' reports</li> <li>Conduct market research</li> <li>Interview specialists</li> </ul>

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## Appendix 3. Interview framework



# INTERVIEW FRAMEWORK

**CASE DESCRIPTION**

Company X is a tour operator. It provides students and young adults with travel activities. To enhance the safety of travelers and increase customer experience the company starts the integration of high-tech bracelets as an extra service. The smart bracelets have the following functions:

- Automatic check-in/check-out at the bus
- Sending notifications regarding the trip schedule
- Tracking the heartbeat and analyze that data to estimate the health condition of the user
- An emergency button that can send live location, etc.

Why separate device and not a phone App?

- Does not run out of battery because of other ways of usage
- Capable of tracking health issues
- Works in spite of the location

**SEMI-STRUCTURED INTERVIEW**

```

graph TD
    A[High-tech in tourism] --> B[How technology trends revolutionize tourism industry nowadays?]
    B --> C[What are the main challenges?]
    D[Competitive advantage] --> E[What impact will high-tech bracelets have on the company's performance?]
    E --> F[How the solution will affect customer satisfaction?]
    G[Does this solution have a lot of potential for a wider spread within the industry in the future?]
    E -.-> G
  
```

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