

Wearables for Health Tourism: Perspectives and Model Suggestion

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Abstract

INTRODUCTION: Internet of Things (IoT) has been taking wide place in our daily lives. Among different solution ways in terms of IoT, wearables take a remarkable role because of their compact structures and the mobility. By using wearables, it is very easy to sense a person's movements and gather characteristic data, which may be processed for desired outcomes if intelligent inferencing. As associated with this, wearables can be effectively used for health tourism operations. As wearables already proved their capabilities for healthcare-oriented applications, the perspective may be directed to health tourism purposes. In this way, positive contributions may be done in the context of not only patients' well-being but also other actors such as health staff and tourism agencies.

OBJECTIVES: Objective of this paper is to evaluate the potential of wearables in health tourism applications, provide a model suggestion, and evaluate it in the view of different actors enrolling in health tourism ecosystems. Within this objective, research targets were directed to the usage ways of wearables in health tourism, ensuring model structures as meeting with the digital transformation advantages, and gather some findings thanks to feedback by patients, health staff, and agencies.

METHODS: The research firstly included some views on what health tourism is, how the IoT, mobile solutions as well as wearables may be included in the ecosystem. Following to that, the research ensured a model suggestion considering wearables and their connections to health tourism actors. Finally, the potentials of wearables and the model suggestion was evaluated by gathering feedback from potential / active health tourists, health staff, and agency staff.

RESULTS: The research revealed that the recent advancements in wearables and the role of digital transformation affects health tourism. In this context, there is a great potential to track and manage states of all actors in a health tourism ecosystem. Thanks to data processing and digital systems, it is effective to rise fast and practical software applications for health tourism. In detail, this may be structured in a model where typical IoT and wearable interactions can be connected to sensors, databases, and the related users. According to the surveys done with potential / active health tourists, health staff, and agency staff, such a model has great effect to advance the health tourism.

CONCLUSION: The research study shows positive perspectives for both present and future potentials of wearable and health tourism relation. It is remarkable that rapid advancements in IoT can trigger health tourism and the future of health tourism may be established over advanced applications including data and user-oriented relations.

Keywords: wearables, internet of things, health tourism, healthcare, tourism, digital transformation

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1. Introduction

As a result of digital transformation, the life has been changing since especially start of the current century. It is remarkable to express that the rapid advancements in terms of data processing caused innovative changes in electronics. In this context, changes took effect in information and communication technologies (ICT). As the humanity has been in an innovation era since the rise of computers and Internet, resulting outcomes of ICT have started to take effect in 2000s. Thanks to the digital transformation, our daily life surrounded by digital systems and applications, which are helping us to reach to desired information or perform tasks just by using software interfaces [1, 2]. This was achieved as a result of collecting user data in databases inside data centres. Additionally, effective processing of such user data required more advanced technological solutions since user-oriented tasks took place in different fields from public services to education, financial operations to communication, and even trade to healthcare services. Although software systems have been effective to deal with the services widely, increases in data and personalized service requirements made it necessary to sense user actions and process them through advanced data systems. This became a requirement for even machine to machine interactions in wider data processing and inferring architectures. As a result, Internet of Things (IoT), which is a technological approach for communicating devices [3, 4] appeared as an innovative solution way. In IoT applications, mobile devices and wearables have a remarkable role to gather users and machines in a common ecosystem [5-7].

Wearables is a type of IoT solutions where sensors and software-based mechanisms collect the data from individual and even ensures instant feedback for improving the experience [8]. When current state of technological advancements is considered, it can be said that wearables can be in the form of smart watches, smart clothes, shoes and different types of daily life objects, which users interact with. In this way, wearables take place in many daily life tasks to collect data from user actions (e.g., walking, running, giving feedback over applications), biometric states (e.g., heartbeat, breathing, oxygen) and data-based collaborations with other IoT devices [8-10]. As among IoT components, wearables currently have the most flexible and adaptive role for supporting real-time applications. So, they have been widely used for sportive activities, travelling and healthcare solutions [11]. Recently, as a trendy area, health tourism seems to have great potential for applications of wearables. Because health tourism already combines the activities regarding healthcare and tourism.

Health tourism is defined as the international travel, which patients perform for both healthcare and tourism purposes [12-14]. Patients or individuals, who perform health tourism may be called as health tourists. Health tourists desire to receive different kind of healthcare services (e.g. operations, basic treatments, well-being events) in another country where they can benefit from touristic and cultural interactions. In

detail, health tourism choice is associated with both travel desires and receiving healthcare with less costs in a different country [14, 15]. Eventually, health tourism has gained more importance as a result of opportunities for global travelling, communication, changing conditions of health services and economic benefits. As it can be understood, the globalism and the technological advancements have been triggering the popularity and influence of health tourism. So, talking about today's conditions, role of ICT and data use trigger digitalized health tourism tasks and opportunities in this manner. As it is already done in e-trade, e-banking and many other digitally transformed areas, the field of health tourism is under the influence of data and technology usage. As connected with rising IoT and wearables, potentials for health tourism applications can be improved greatly by these technological components. Thanks to use of especially wearables, it would be more effective to receive immediate signs from health tourism actors to realize a well-defined digital health tourism ecosystem.

Objective of this paper is to provide a general discussion regarding how wearables can be effectively used for advancing health tourism applications. Moreover, the paper aims to design a model of ecosystem where users and wearables work towards health tourism interactions. Eventually, it is aimed to have some recent feedback by the actors of health tourism to understand how such a model can be welcomed if applied accordingly. It is believed that the paper outcomes will be a recent and remarkable reference for further developments in health tourism. It is critical that the rise of health tourism is highly connected with the way of ICT. So, as a recent component of ICT, wearables tend to open newer doors of innovations through present needs in health tourism area.

Connected with the objectives of the paper, the rest of the content is organized as follows: The next section provides general explanations about why IoT and wearables have connections with health tourism. Additionally, it also expresses about the potentials of wearables for shaping the technological way of health tourism. After this section, the third section suggests a general health tourism model where the wearables and known components of typical health tourism applications are interacting each other. Next, the fourth section ensures a general evaluation, which was done via survey work prepared for health tourists, health staff, and agencies. This section also ensures a general discussion by moving from the obtained feedback, Finally, the paper is ended with conclusions.

2. IoT, Wearables and Health Tourism

As a result of technological improvements in ICT, it has been critical to use data and shape it according to even remote users located at different places over the world. Although Internet has been an effective way for worldwide communication and data sharing, advancements in user tools caused appear of new requirements. It is remarkable that new requirements are result of new ICT, which have been always shaped the society and the human. Eventually, cutting-edge advancements

caused the IoT to appear in the scientific literature. As a technological approach for creating networks in which devices are able to interact with their environments. The environments may include other devices, static components of the environment, and users [16, 17]. In order to achieve that, IoT devices are supported with sensors and actuators, which are electronic tools for sensing and giving feedback to surroundings. Out of hardware components, they also include specific software systems, which are based on data processing and Artificial Intelligence algorithms. Nowadays, typical IoT devices include mobile phones, tablet PCs, webcams, robotic home devices, and any type of devices employing the mentioned hardware and software infrastructure [18-20]. From a general perspective, some IoT devices may not have advanced architectures, so their roles are simpler with data transferring, data processing, improving communication of the ecosystem. In detail, typical IoT ecosystems may be explained in terms of six characteristics: sensors and actuators, devices, communication, identification, tracking / localization, and security [21] (Figure 1).

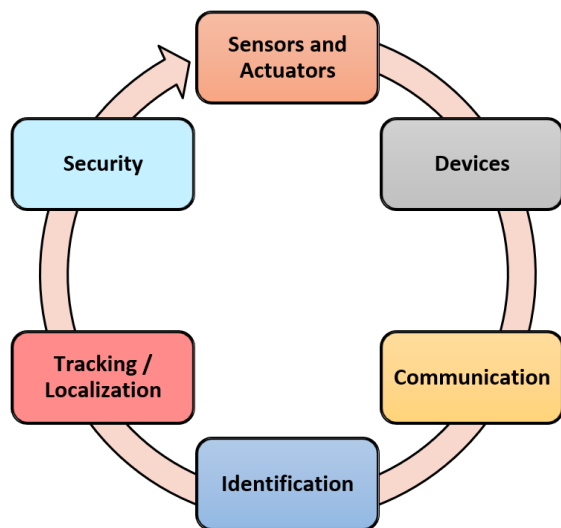


Figure 1. Characteristics of IoT [21].

Characteristics of IoT made it an effective technology to develop smart homes, buildings, and even cities. As a result of increasing development speed of the technology, last decade faced with advancements regarding IoT-based applications. All these applications have been common in daily life since IoT devices became compact and more flexible to locate in ongoing ecosystems. As a result of becoming more compact, the concept of wearables has been widely used to define such IoT devices. A typical wearable is a IoT device, which employs sensors and actuators to run according to wearer's states and actions [22, 23].

Currently, wearables have many different versions to interact with the wearer's body. As a widely used wearable, smart watch is a complicated device, which can sense many actions as well as biometrics, and run background software

for further data analyses. On the other hand, there are smart clothes, skin patches, eye-wears, and shoes, which are able to track many occurrences from muscle activity to sweat, movements to cognitive processes or emotions [24]. Multiple use of such wearables may also be associated with wider ecosystems, which are able to extend the benefits of wearables to track sportive advances, understand people's complex actions (for e.g., managerial or security-oriented purposes) and conduct healthcare applications for check-ups, diagnosis and treatments [25-27].

From a general perspective, wearables have been effectively used for specific purposes, in order to improve people's experiences and ensure improved services. Peake et al. provides a remarkable view about how wearables became consumer tools and triggered a new economy of IoT for advancing the life standards [24]. Because it is important to track actions in sportive events, wearables have already been discussed about real-time tracking possibilities. Rana and Mittal pointed the kinematic analysis thanks to wearables use [28]. Morris et al. ensures a remarkable study to focus on instant performance and training tracking [29]. On the other hand, Zadeh et al. revealed the effective use of wearables for predicting injuries during sport events [30]. As connected with advancing tracking of health state, wearables for sports have been widely studied in recent years [31-33].

One of the most critical application ways of wearables have been healthcare. Because wearables are near to track instant health signs of a person, the literature has received a high interest in terms of research studies. Iqbal et al. provides a wide review regarding application ways of wearables in healthcare and discuss about the potentials for effective diagnosis and treatment [34]. Malwade et al. discussed about effective use of mobile devices and wearables for especially ageing population [35]. Paradiso et al. developed a fabric sensor-based system (WEALTHY-a), which is a very remarkable contribution to improve flexibility and coverage of wearables in terms of healthcare monitoring [36]. In a recent study, Gao et al. developed robust and extensible fibrous mechanical sensors to advance wearables for health monitoring [37]. Recently, wearables for healthcare purposes faced different advancements in terms of sensors. These advancements include usage of innovative components such as nanomaterials and graphene [38, 39]. As a result of designing advanced ecosystems of IoT, wearables have been enrolled in even cancer diagnosis applications recently [40-42]. It seems that wearables have been widely discussed and reviewed in terms of healthcare applications [43-46].

Since wearables allow tracking for the wearer's actions, location and instant characteristic states, they have been often discussed in the context of tourism studies. Although use of wearables directly for tourism tracking has been not studies widely so far, studies so far focused on the relation of wearables and virtual or augmented reality applications to improve tourists' experiences [47-49]. Since reality applications have a remarkable role for interactive touristic visits and user-based interactions, wearables seem to be effective tool for supporting instant interaction better. On the other hand, the required interaction for users can be extended to the ones in remote places and such a mechanism can ensure

effective outcomes in rapidly arising areas such as health tourism. Because wearables have relations with touristic applications and been already effectively used in healthcare applications, the health tourism has the great potential for meeting purposes of both healthcare and tourism in innovative IoT-based solutions. Considering the today's conditions in terms of massive user and service interactions over Web environments, there are many potentials to apply wearables in health tourism.

2.1. Potentials of wearables for health tourism

It is important to indicate that the key mechanisms by wearables are associated with instant data collection and flexible localization over the body. Because of these mechanisms, wearables are supported by special sensors to collect different body data. In addition to the hardware components to accomplish data collecting, specific software background is developed to process the data for user interfaces. All these user-oriented features make wearables easily adaptable to health tourism applications. Because health tourism has a global coverage, wearables already provide the requirement ICT infrastructure. In addition to the established ICT tools, agencies may use specially developed software environment for connecting to inside of health tourism ecosystem they are running. In order to do that, necessary data using strategies should be organized accordingly. Eventually, there are some technical and organizational steps to take but these do not affect the fact that potentials of wearables will be able to advance the way of health tourism.

For better understanding, major potentials of wearables can be explained from the standpoint of health tourism as follows (Figure 2):

- **Instant Tracking Capabilities:** Since wearables are able to feed the ICT instantly, it is an advantage for health tourism actors to track the updates and instant flow inside the ecosystem. That gives many advantages such as starting emergent interactions for health services, performing instant communications and sharing time-sensitive promotional components.
- **Data Level Transformation:** When wearables are used, it is possible to define the whole ecosystem in the context of data world. This will allow including advanced information management features and providing simpler interaction ways for remote users. Furthermore, this allows advanced technologies such as Artificial Intelligence to process data for further inferring outputs.
- **Adaptive Interaction Ways:** As a result of using advanced algorithms inside the health tourism ecosystem, all actors are able to interact each other according to adaptive matching that may be done automatically by the software system. In this way, efficiency of the interaction, which is a golden component in health tourism activities, can be improved greatly.

- **Close Data Collection:** Since wearables are the closest technological tools for collecting data from health tourists, it allows accurate and efficient processing of user states or actions. This improves the quality of health tourism services, communication and interaction.
- **Scalable Services:** Wearables benefit from technical capabilities of the IoT. Among these, scalability allows adaptive changes in terms of communication, data storing or service adaptation. This is applicable for health tourism applications since wearables will trigger scalability mechanisms. In this way, services by agencies will be improved effectively.

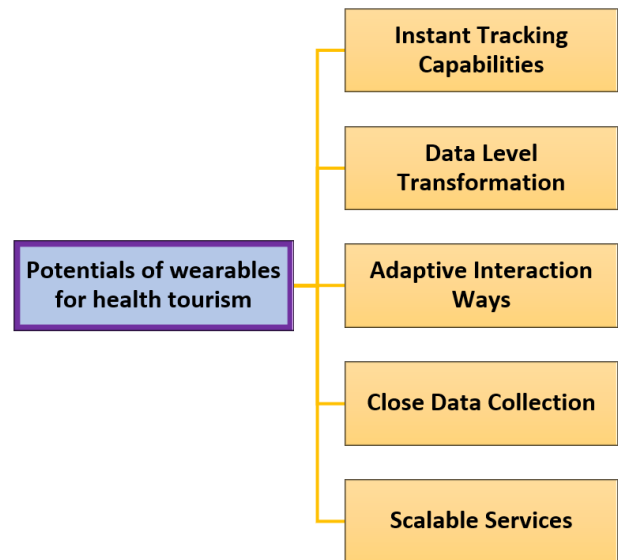


Figure 2. Factors pointing potentials of wearables for health tourism.

3. A Model Suggestion

By considering the potentials and the pointed current state of the art, this study suggests a model in which wearables, health tourism actors, and the supportive technology components are combined together to build a digital ecosystem. Although the suggestion is a high-level overview, it is possible to develop such ecosystem in terms of current conditions. Such a model may trigger also policy makers and national or international associations, ministries to establish agreements for a common platform. Figure 3 represents the general scheme of the model. It generally points the interaction among all components of an ecosystem. The ecosystem supports all actors to benefit from data and support the general purposes of the health tourism applications, by focusing on all actors' needs. It is critical that necessary ICT should be designed for the organization of all tasks performed inside the ecosystem. As moving from the general model scheme, a general working flow may be explained as under the next sub-section.

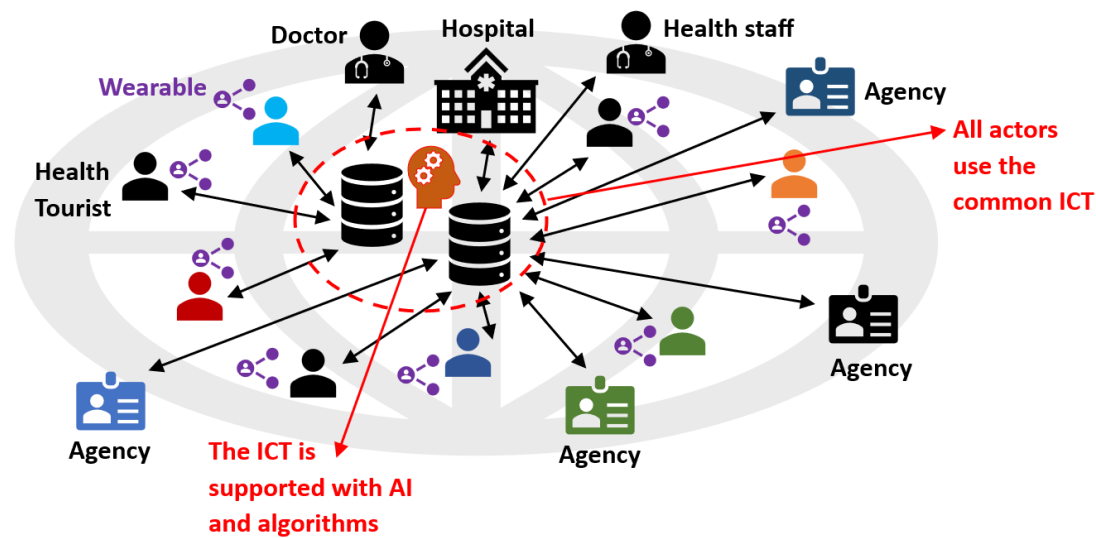


Figure 3. The suggested model of health tourism ecosystem with wearables.

3.1. General working flow

In the model, there are different kinds of wearables mostly associated with health tourists. Currently, it is possible to see that people around the world have great interest in smart watches. There are also people having other types of wearables such as shoes, clothes, bands...etc. Eventually, such wearables are able to measure a person's efforts, calories, sport activities, movements, locations, heart beats, oxygen rate and many more data depending on the sensors. In the model, these measurements are collected by data gathering algorithms, which feed processing components. The processing components adjust the data for the Artificial Intelligence algorithms. Artificial Intelligence algorithms work for giving predictive and descriptive outputs, which are useful for understanding present state of massive health tourists and producing predictive action plans for them. Also, the model already has the instant tracking mechanisms and to support tourism agencies mainly. Of course, outputs from the mentioned components are connected to also health staff including doctors and other people in the same group. From a general perspective, combination of algorithms is for building a decision-support environment, which is effective for all actors.

As typical IoT components, wearables are working inside the system to feed all actors by activating the following features:

- Wearables connected to health tourists measure their health states and allow system algorithms to predict probability of future visits. These data are also stored to have past health state record, which is used by predictive algorithms of the ecosystem.
- Visits for health tourists are determined and planned in terms of needed healthcare services, target countries, locations, and agencies. Like health state data, these visit-planning data are stored to ensure past health tourism activities.
- Storage of health state and visit data are used by specific algorithms to create outputs, which are for adapting the whole ecosystem for potential service interests, active resources and the general state (of health tourism activities) globally.
- Health tourists are able to feed the system with not only their states but also feedback they give over special software systems. These systems are developed also to inform health tourists about promotions, their membership states (if applied), recommendations on contacting with other users, and reaching out to the tourism agencies or health staff. These systems are critical to ensure connections among health tourists, tourism agencies, and health staff.
- Tourism agencies are able to track state of health tourists instantly. The concept of state here is not related to detailed medical information (like tracked by a doctor) but general information, which is useful to detect potentials of health tourism contact and also any emergent health state. The agencies are also provided with decision support tools, which reveal predictive and descriptive outcomes (e.g., current distribution of health tourist intensity, positive / negative distribution by past health tourists, potential health tourists matched with planned promotions) associated with health tourists. The system also runs recommendation systems for giving suggestions to

agencies about potential health tourists, optimum touristic routes, and healthcare services that will have more interest in the future.

- Tourism agencies can be connected to healthcare services through ICT. In this way, they are able to see status of active health services in hospitals. The ecosystem matches health tourists with corresponding cities as well as hospitals, by considering their current state, past healthcare service experiences, and touristic / cultural interests.
- Except from wearables and the IoT infrastructure, tourism agencies are able to manage the whole ecosystem in terms of their costs, incomes and any other managerial activities.
- Health staff is most likely to track the health tourists for their medical states. Especially doctors inside the ecosystem are able to collaborate with tourism agencies to track health tourists instantly in the context of as a matter of their professional responsibility. Along with the rest of health staff, they are able to track the status of hospital as well as medical resources (e.g., equipment, service availability). Also, doctors are able to be in touch with tourism agencies to plan automated service plans.
- The ecosystem already supports all actors in terms of instant communication (through direct messaging or video conferencing). Additionally, the ecosystem may include software applications (over Web and mobile venues) specifically designed as social media-oriented health tourism environments where users interact and share information / ideas.
- In terms of data storage and operations, the ecosystem is built on a cloud-based approach where cloud services are employed for scalable and robust enough infrastructure, which is necessary for running the software environment of the suggested model. Such a cloud-based system is supported with also advanced computers working inside cyber security and privacy sensitive methodologies.
- Inside the suggested model, there are also other IoT devices including sensors, computer vision-based cameras, smart medical tools, smart mobile technologies to improve the variety and scope of the data. Depending on the components owned by health tourists or located in hospitals and tourism agencies, it is possible to use multi-modal data (e.g., medical images, voice data, photos by health tourists, camera recordings) to improve the interaction capabilities. These capabilities may include visual tracking, detailed medical image analysis, remote diagnosis by doctors, remote pre-meetings with agencies to plan activities or promotional content enabling health tourists to see target countries and hospitals before they plan and approve their services.

The suggested model provides a wide ecosystem for expanding the health tourism capabilities according to needs for global communication. At this point, advantages of wearables and IoT components are used accordingly for

real-time data flow and enhanced interaction as well user experience. As the model considers the human factor and healthcare services mainly, it is important to have some feedback by potential / active health tourists, health staff, and agent staff (tourism agencies). So, the model was evaluated through a survey work as explained under the next section.

4. Evaluation

The suggested model was evaluated by using the feedback by a total of 30 people within the groups of health tourists (10 people), health staff (10 people), and agency staff (10 people). 5 people were active health tourists with the ages of 28, 37, 25, 67, and 72 respectively. The rest of health tourists were chosen as potential health tourists, who are interested in taking part health tourism activities in the future. Active health tourists were associated with hair implant (28, and 37), wellness and dental operations (25), physical rehabilitation (67), and eye operation (72). Health staff were a total of 6 doctors and 4 assistive health staff. Finally, the agency staff were a total of 7 agency owners, and 3 agency support staff.

Among the related survey respondents, 17 people (3 potential health tourists, 2 active health tourists, 4 doctors, 2 assistive staff, 4 agency owners, 2 agency support staff) were from Mexico while 13 people (2 potential health tourists, 3 active health tourists, 2 doctors, 2 assistive health staff, 3 agency owners, 1 agency support staff) were from Turkey. Each survey respondent-group was asked to give feedback for 10 statements, as based on the Likert Scale (1: Totally Disagree, 2: Disagree, 3: No Opinion, 4: Agree, 5: Totally Agree). In this context, Table 1, 2, and 3 respectively provides the findings for the feedback by health tourists, health staff, and agency staff.

Table 1. Survey statements and findings for health tourists.

No.	Statement	Feedback					Avg.
		1	2	3	4	5	
1	"This model will be effective in the area of health tourism."	0	0	1	1	8	4,7
2	"This model may have risks in data privacy."	4	2	1	2	1	2,4
3	"This model may detect different tourism interests."	0	0	1	1	8	4,7
4	"I can get effective treatment thanks to this model."	0	1	1	1	7	4,4
5	"This model will improve communication and interaction in health tourism."	0	0	0	2	8	4,8
6	"I do not want to take part in such a model / system of health tourism."	7	1	2	0	0	1,5

7	"Wearables in this model will make the health tourism enhanced."	0	0	1	1	8	4,7
8	"I can get good health service experience thanks to this model."	0	0	1	3	6	4,5
9	"I believe this model will improve my tourism experiences."	0	1	1	1	7	4,4
10	"This model can be used effectively for all kinds of health tourism."	0	0	1	1	8	4,7

It can be seen from Table 1 that health tourists generally think positive about the suggested model in terms of the using features and the innovative mechanisms that are provided through the general ICT structure and especially wearables.

Table 2. Survey statements and findings for health staff.

No.	Statement	Feedback					Avg.
		1	2	3	4	5	
1	"This model will be effective in the area of health tourism."	0	0	0	1	9	4,9
2	"This model will be effective to track health tourists' instant medical states."	0	0	1	2	7	4,6
3	"I would like to take part in a health tourism application in which this model is used."	0	0	0	1	9	4,9
4	"This model will support my decision support."	0	0	1	1	8	4,7
5	"This model will improve communication and interaction in health tourism."	0	0	0	1	9	4,9
6	"I find this model innovative in terms of improving health tourism."	0	0	0	3	7	4,7
7	"I do not think that wearables in such a model will be effective to improve health tourism experiences."	7	1	1	1	0	1,6
8	"This model will improve my performance in tasks."	0	0	1	1	8	4,7
9	"I believe this model is good to track state of healthcare resources."	0	1	1	2	6	4,3
10	"This model will improve my health tourism experiences."	0	0	1	2	7	4,6

As like the health tourist, the health staff also thinks positive about the suggested model. As it can be understood from Table 2, people from health sector finds the technological background of the model effective. They also think that the model will be a solution to improve their performance and tracking capabilities. They also think that

the suggested model will have advantages in terms of health tourism applications.

Table 3. Survey statements and findings for tourism agency staff.

No.	Statement	Feedback					Avg.
		1	2	3	4	5	
1	"I find this model effective for tourism agencies."	0	0	0	2	8	4,8
2	"This model can be used to increase income in terms of health tourism business."	0	0	1	1	8	4,7
3	"This model may take different health tourists' interests."	0	0	0	1	9	4,9
4	"Thanks to this model, I can have good health staff in health tourism applications."	0	0	1	1	8	4,7
5	"This model will improve communication and interaction in health tourism."	0	0	0	1	9	4,9
6	"I do not want to take part in such a model / system of health tourism."	8	1	1	0	0	1,3
7	"Wearables in this model will make the health tourism an automated global platform."	0	0	1	1	8	4,7
8	"I can decrease health tourism costs better, thanks to this model."	0	0	1	2	7	4,6
9	"I do not believe this model will improve my tourism experiences."	7	1	2	0	0	1,5
10	"This model can be used effectively for all kinds of health tourism."	0	0	2	1	7	4,5

As based on the findings in Table 3, the model was found positive by tourism agencies, too. As different from the other groups of respondents, tourism agency staff believes that the model will be an effective solution in terms of their business considering income and cost balance.

4.1. Discussion

In addition to the model suggestion, short surveys have been useful to have better idea about how such a model could be accepted from the view of actors. They allowed to understand perspectives by different actors inside the health tourism. As based on the evaluation findings, the following discussions can be made briefly:

- Health tourists find use of wearables in health tourism effective. They believe that the suggested model will

improve their healthcare service and ensure better communication with agencies.

- Health tourists believe that their interests in different types of touristic visits can be effectively detected as a result of wearables, which will track also their actions and feedback. They feel a little anxious about data privacy, but it seems the current technological trend and advantages with the wearables enhanced health tourism successfully lowers them.
- It is remarkable that health staff believes the model will be innovative to improve health tourism from the point of tracking patients and healthcare resources. This is because technological advancements have been always effective to improve healthcare applications. Health staff thinks that wearables will provide more accurate patient data for them. Additionally, they believe that use of data and advanced algorithms will ensure decision support and improve their performance. So, as an innovative tool of IoT applications, wearables are accepted greatly by health staff inside the health tourism scope.
- When the responses by all actors are evaluated in the communication perspective, it is believed that wearables will improve the capabilities for instant communication and tracking. This is too critical that global way of health tourism needs instant interaction, so wearables seem a supportive component to achieve this in an ecosystem.
- The suggested model is highly accepted by health tourism agencies. Use of wearables and IoT mechanisms can improve features of current software systems, which are not synchronic enough to track immediate changes in terms of health tourists, resources, health staff and any other factors connected to the built ecosystem. So, a system with wearables is found by agencies as an effective environment to run an automated global platform. As general, this may be because agencies want to provide quality health tourism services and improved income as well as reputation.
- Although investment is needed for using wearables and the associated IoT infrastructure in health tourism, agencies believe that it will optimize applications and increase incomes while decreasing costs in longer terms.
- Health tourism is widely open for technological innovations. Since it is a global business, improved ICT is a necessity for the existence of health tourism in the future. The suggested model promises this accordingly. The findings for the surveys approve the high interest from the health tourism sector for technological developments. In this context, wearables have an essential place in the developments.

5. Conclusions

This paper generally examined the role of wearables in health tourism and ensured a recent perspective to understand how use of wearables is acceptable from the health tourism scope. After explaining some about why IoT and wearables (as IoT components) have remarkable potential in innovative health tourism solutions, the paper suggested a model of wearables-based health tourism ecosystem and had some feedback for the model. In terms of feedback by health tourists, health staff and agencies, it seems that use of wearables with IoT perspective would improve the health tourism experiences greatly. Although there is currently a high level of digital transformation inside health tourism, employment of the suggested model may need time to become a global tradition. However, the authors believe that such advancements will happen in the near future. Actually, rapid developments in ICT already covered all fields to make digital transformation alive in almost all types of daily life tasks. Similarly, advanced technology finds the way easier when it comes to data usage and processing for desired objectives. Because of this, different fields are interested in employing advanced technology in their applications. Healthcare and tourism are located under the umbrella of health tourism, which has relations with ICT. Because of the relations with ICT, the health tourism is sensitive to technological potentials and changes. As based on this, the study in this paper pointed the current interest for wearables and high potential in health tourism accordingly.

Outcomes from the study are reference for further studies. It is suggested to perform further evaluations and perform some pilot studies to see how health tourism scenarios are improved accordingly with the relation between wearables and health tourism. Such studies may be done in different locations of the world so that an average overview for the global state can be obtained. It is also required to have interdisciplinary studies to go further about technological developments along with user, healthcare and business-based evaluations.

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