Chapter 7
Innovation and Creativity in the Mobile Applications Industry: A Case Study of Mobile Health Applications (e-Health Apps)

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Abstract The development of new technologies, especially the Internet, has resulted in the expansion and development of the global economy. This fact has led the communication and culture industries to play an increasingly more important role in a global economy. One of these industries is driven by the development of Mobile Health Applications that aim to diagnose, monitor and follow up illnesses through applications. The objective of this research is to determine the types of Mobile Health Applications found in this creative industry and determine the future of the industry in terms of innovation and development of new applications within the health sector. The results of the research identify the types of Mobile Health Applications and their uses, and determine the future development of the industry in terms of regulation and use by the ecosystem of institutions and health professionals, with special emphasis on the privacy and personal data of their patients and users.

Keywords Creative industry · Mobile health applications · eHealth apps · mHealth

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7.1 Introduction

The development of new technologies, especially the Internet, has resulted in the expansion and development of the global economy. This fact has led the communication and culture industries to play an increasingly more important role in a global economy (Deng, 2013).

The development of these new industries means that companies must adapt their internal structure and organization to the new business models and new technologies of the twenty-first century. With the development and momentum of the sectors mentioned previously, there has been a productive reorientation towards a service economy (Crilly et al., 2018). Consequently, an increase in productive development, competitiveness, social cohesion, the promotion of cultural diversity, the dissemination of information and knowledge through the Internet and the generation of new values has finished shaping the cultural and creative industry of the twenty-first century (Abelson, Symer, Peters, Charlson, & Yeo, 2017; Housman, 2017).

The main raw material in these industries is the ability to imagine, innovate and generate new products and services that convey not only meanings through creativity, but also generate a significant amount of assets linked to intellectual property, artistic and cultural heritage and traditions (Kao & Liebovitz, 2017; Palos-Sánchez, & Saura, 2018).

This chapter focuses on the analysis of a creative industry that has evolved exponentially thanks to the development of new technologies and human being skills to carry out consumption habits and daily tasks interacting with technology (Bloomfield et al., 2016).

The transmission of knowledge has become one of the assets of the economy as we know it today. Knowledge, creation, art, business and creativity are directly influenced by technology and innovation. Innovation and the strategic position of companies are increasingly important to obtain added value over the competitors in creative industries (Chang, Pang, Tarn, Liu, & Yen, 2015).

Innovation is understood as an action of change that is a novelty, in which creative integration processes are combined to create, modify or improve a product, a service or a system. Innovation in a creative industry influenced by new technologies and the use of new devices and digital media has generated new business models and new business opportunities that cover needs that did not exist until today (Abelson et al., 2017; Ashurst & Jones, 2017; Pierce et al., 2017).

It is interesting to highlight the continuous increase of companies related to creativity and new media and, above all, the role they play in a multidisciplinary society based on diversity. The market values of new products based on technological innovation are determined by their originality, uniqueness, performance and appearance (Kao & Liebovitz, 2017).

In addition, the development of this creative and global industry has caused the labour market to demand more and more creative workers with the ability to communicate and solve problems. Moreover, the development of new digital devices, which we have already referred to, allows companies to make better decisions regarding the location of their physical headquarters, the availability and customer service time or the labour flexibility offered to their workers (Atienza & Patrick, 2011).

These industries generate and create jobs, as well as attracting investors and stimulating the global economy. Their presence contributes to the attractiveness of cities and their future residents, workers, companies, entrepreneurs and business people in any sector of activity (Abelson et al., 2017).

The objective of this study is to determine the types of Mobile Health Applications that currently make up the market and to reveal the future of the industry in terms of their regulation and safe use of these applications by patients and users.

7.2 Creative Innovation Through Mobile Applications: E-Health Apps

As we have already indicated, the development of the Internet in the first decade of the twenty-first century made companies adapt their business strategies to new consumer habits and needs (Goetzel, Shechter, Ozminkowski, Marmet, & Tabrizi, 2007). In this sense, one of the industries that has grown the most in the last 10 years has been the mobile phone industry. This sector has increased exponentially around the world, driven by the development of emerging countries and the reduction in the production cost of this type of support (Ashurst & Jones, 2017; Klein, 2018). In the mobile phone sector, different variables and characteristics that define each type of terminal have appeared.

As shown in the research by Handel (2011), one of the phone supports that has changed the mobile phone industry as we knew it is the "smartphone". A "smartphone" is an intelligent mobile phone that as a general rule must have access to the Internet (Ramtohul, 2015). This type of terminal combines elements from a tablet and a mobile terminal. "Smartphones" have computer capacity, as well as features that allow for the capacity to store data and process activities performed by a computer (Kao & Liebovitz, 2017; Palos-Sánchez, Saura, & Debasa, 2018).

These terminals are characterized by having touch screens and supporting software and applications that facilitate the basic management of a company or a business. These terminals also have Internet through 2G, 3G and 4G networks and have GPS or basic office software for administrative management (Bloomfield et al., 2016; Cho, 2016).

If we observe the market penetration of "smartphone" users, based on data from the Global Mobiles Market Report (Newzoo, 2017), we can say that there are countries where the penetration of smartphones exceeds 80% of the market. For example, in the Arab Emirates with a population of 9,380,000 inhabitants, 7,573,000 of them have access to and use the Internet every day through a "smartphone". In economically consolidated countries such as the United States, Germany or the United Kingdom, the penetration of this technology fluctuates around 68–69% with respect to its total population. Even such disperse countries like Sweden or South Korea have a "smartphone" market penetration of approximately 71% of the total population (Cho, 2016; Pierce et al., 2017).

The software in mobile terminals mentioned previously is known as mobile applications (APPs). As indicated in Au & Zafar (2008), mobile applications are

small computerized management systems for a specific task that are installed in a "smartphone" and that solve specific problems for which they are designed (Mcmillan, Hickey, Patel, & Mitchell, 2016).

It is also interesting to note that the number of applications downloaded by users who use smartphones around the world has increased in the last 5 years. This means that the total time users spend in the digital world increased by 53% between 2015 and 2017, and in particular, the use of mobile applications has increased by 111% around the world (Kao & Liebovitz, 2017).

Following the results of Statista (2018), by the year 2021 a total of 352.9 billion applications are expected to be downloaded. In addition, users of mobile applications are allocating about 75 h per month to the use and benefit of these applications (Kao & Liebovitz, 2017).

If we observe the use of applications by category, we can see how applications related to e-mail management get a total of 45% of usage percentage, applications related to tourism and the creative industry get 28% with respect to the total of application categories downloaded in the world, applications for social communication get 47% and finally, categories such as shopping and messaging applications get 40% and 45% respectively (Autry, Grawe, Daugherty, & Richey, 2010; Saura, Palos-Sánchez, & Rios Martin, 2018). There is no doubt that the use of mobile applications has become a consumption habit for users who benefit from their content (Baldwin et al., 2017; Kao & Liebovitz, 2017).

At this point, it is interesting to highlight one of the industries that thanks to innovation and creativity has revolutionized the mobile applications sector and how the chronically ill, the elderly, the youth, people with physical or mental disabilities and even top athletes, monitor, coordinate, manage, check and consult the types of dementias and healthy habits they must pay attention to in order to monitor their illness or healthy habit (Bert, Giacometti, Gualano, & Siliquini, 2014; Bloomfield, Polo-Wood, Mandel, & Mandl, 2017; Bort-Roig et al., 2017). We are talking about E-Health mobile applications, also known as mHealth or Mobile Health Applications (Abelson et al., 2017; Ashurst & Jones, 2017; Housman, 2017; Pierce et al., 2017).

Innovation and creativity in the development of mobile applications has given rise to the fact that the telemedicine and E-Health sector has established itself as one of the sectors that has received more investment in recent times if we observe the mobile applications sector (Handel, 2011; Pierce et al., 2017).

7.3 Theoretical Framework and Literature Review

In the last decade, many researchers have shown interest in the study of how users use applications on their mobile phones. Therefore, the study of how users behave when they use a mobile application and their consumption habits have become key factors for research in this field (Kao & Liebovitz, 2017).

In this sense, Kim and Xie (2017) indicate that care and support for patients and the sick through the use of new technologies has become widespread in recent

years. The industry known as Telemedicine or e-Health has become a key factor for the improvement, analysis, study and development of medicine and care for patients and the sick. Thus, Electronic Health or e-Health is defined by Eysenbach (2001) as "health services and information delivered or enhanced through the Internet and related technologies".

Within the field of e-Health mobile applications, many supports have appeared that provide services to promote communication between patients and care staff, health education, recommendation portals, Wellness management to measure calories and follow a dietary process, Disease management to monitor diabetes and asthma, Self-diagnosis to identify symptoms and early diagnoses, Medication reminder to remind patients of the consumption of medicines and Physical medicine and rehabilitation to follow rehabilitation processes and therapies in different stages (Ashurst & Jones, 2017; Atienza & Patrick, 2011; Bloomfield et al., 2016; Cho, 2016).

As we pointed out before, in this research we focus the object of study on the Mobile Health Application. The term "Application" or "App" refers to a self-contained program or piece of software that is designed to fulfil a particular purpose and usually optimized to run on mobile devices, such as smartphones, tablet computers and some wearable devices like smart watches (Kao & Liebovitz, 2017).

In this sense, Mobile Health Applications are applications related to health and aim to improve patient care, disease diagnosis or diagnosis monitoring, as well as communication between care specialists and patients (Grundy, Wang, & Bero, 2016). Such is the use of Mobile Health Applications by users and the relevance of their study that the Food and Drug Administration (FDA) of the Federal Agency of the US took the initiative to regulate Mobile Health Applications within the so-called Digital Health Innovation Plan which initiated its activities in August 2017.

Mobile Health Applications have the potential to increase the quality of processes related to Health remotely and on a global scale, allowing us to monitor the risks, symptoms and protocols of consumers and patients of these applications (Hoque & Bao, 2015). It is interesting to note that the interest of consumers towards Mobile Health Applications has increased at the same time as the use of new technologies in the health and care sector (Abelson et al., 2017).

It is worth highlighting that the two categories related to Mobile Health Applications in app stores are those that are at the top of the rankings of applications by subjects, on the one hand, the categories of consumer-facing mHealth apps are wellness management such as fitness, lifestyle modification, and diet and nutrition and chronic disease management such as mental health, diabetes and cardiovascular diseases (Kao & Liebovitz, 2017).

Kao and Liebovitz (2017) study the influence of Mobile Health Applications and users' behaviour on these types of applications and analyze the current state of the sector and user barriers on users' behaviour. In addition, Baldwin et al. (2017) investigate access to information from applications that monitor diseases to detect disease symptoms through e-Health Apps. They focus on the benefits of access to information and the ease of tracking disease symptoms with the use of Mobile Health Applications (Jeon & Park, 2015).

Covolo et al. (2017) perform an analysis of the influence between e-Health Apps and their health improvement based on a healthy life. In their research, they evaluate the evidence of the use of Mobile Health Applications to increase the chances of users leading healthier lives thanks to the use of these applications.

To measure the impact of these types of applications, we have carried out a systematic literature review to compare the increase in the use of these applications with the interest they arouse in researchers (Kao and Liebovitz, 2017; Saura, Palos-Sánchez, & Suárez, 2017) (Table 7.1).

7.4 Types of Mobile Health Applications

7.4.1 Mobile Health Applications for Professionals

They are applications that aim to train professionals, as well as those aimed at the use by health professionals. Applications for consulting technical data, access to specialized databases on health or monitoring of patient diagnoses are included among those applications. These applications have become a support service for health professionals, since their management is quick and easy and can offer them considerable advantages over consultation in larger physical devices, such as the computer (Baldwin et al., 2017).

Professional health applications have become a tool for the development of consultations and diagnoses by health professionals, and even for the management of these patients and their data regarding each disease. In addition, international regulation helps health centres and hospitals increasingly support initiatives related to the use of these tools by health professionals, as long as they improve the processes of diagnosis, following-up and monitoring patient data safely (Kelly, Wills, & Sykes, 2017). In Table 7.2, a list of Mobile Health Applications used by health professionals is shown.

7.4.2 Mobile Health Applications for Patients

Health applications are aimed not only at professional use to improve diagnosis and patient follow-up, but are also developed with the aim of improving each of the patient's actions to cope with his/her illness (Limato, Ahmed, Magdalena, Nasir, & Kotvojs, 2018). There are health applications, whose aim is to enable the patient to diagnose symptoms before going to the health professional's appointment or simply to be a reminder of the medicine dose that must be taken to relieve the pain of a particular symptom. In addition, there are Mobile Health Applications for patients whose goal is to connect these patients with other patients with the same disease and thus help them exchange feedback on how to perform different actions related to their disease (Lin & Yang, 2009). There are also Mobile Health Applications for patients, whose objective is to inform about the price of medicines and their prescription, providing legal information on where they can buy the medicines or how they should request the prescription to obtain them (Baldwin et al., 2017).

Table 7.1 Systematic literature review

Authors	Research objective	Creative industry	Description
Housman (2017)	Objective, the study of social media health through the evaluation of Mobile Health Applications	Well-being assessment through Social Networks	It focuses on the increased use of social networks and the factors that affect the relationship and the use of Mobile Health Applications by users. It analyzes social acceptance by web-based communities on Mobile Health Applications
Handel (2011)	It studies the use of mobile applications focused on Health and Wellness	Monitoring of healthy habits through an application	It studies Mobile Health Applications for health, weight loss, following a healthy diet, preparing healthy food, glucose tests, monitoring diabetes, monitoring calories consumed, diagnosing diseases, meditation, yoga, the time you should sleep at night or the incentive to follow sports activities
Atienza and Patrick (2011)	Care for sustainability and mobile applications	Sustainability of ICTs through e-Health mobile applications	They focus their attention on the study of the sustainability and care of Mobile Health Applications and the indicators for their acceptance and use in the consumption of applications based on new technologies
Bloomfield et al. (2016)	Identification of SMART objectives through e-Health Applications	Decision-making through Apps	They focus their attention on the implementation of SMART objectives in the behaviour of Mobile Health Applications users
Cho (2016)	Acceptance of the technology that boosts Mobiles Health Applications	Measurement and acceptance of technology in Apps	It focuses its attention on the study of the impact of post-adoption beliefs on Mobile Health Applications, based on the micro-mechanism that determines the continuance intentions to use health apps, theoretically relying on the post-acceptance model (PAM) and the technology acceptance model (TAM)
Klein (2018)	Sedentary lifestyle of employees at work	Improving work efficiency with Mobile Health Applications	They investigate the improvement of employee sedentary lifestyle during working office hours, for which they study the user's behaviour and acceptance through the Mobile Health Application that they install in their mobile phones
Ashurst & Jones (2017)	Acceptance by people who have diabetes and their treatment with e-Health Applications	Improvement of chronic patients through e-Health Applications	They study the acceptance by people with diabetes and its measurement and monitoring with the use of two Mobile Health Applications to measure their acceptance and performance after using these applications
Abelson et al. (2017)	Measuring patient sacrifices to use Mobile Health Applications	Decision-making through Apps	They focus their research on determining the greatest sacrifices that patients are willing to make with the use of Mobile Health Applications
Pierce et al. (2017)	Acceptance of the use of Apps for health	Health and Mobile Applications	They analyze the Perspectives on the use of acceptance and commitment therapy related to mobile health applications

Source: Author's

Table 7.2 Mobile health applications for professionals

mHealth app	Description
Health 2.0	Guide to visualize content on Telemedicine among professionals. You can find related videos about health on applications, health education, medicine and consultations related to hospitals, institutions or administration
Idoctus	Application that develops a diagnosis on the treatment for patients. It is aimed at professional doctors and links diagnoses with scientific sources of updated clinical content
Vademecum	It allows us to look up drugs in different countries around the world, as well as therapeutic indications, warnings and precautions, contraindications, adverse reactions and side effects. In addition, alerts related to kidney failure, breastfeeding or pregnancy, among others can be set up
Epocrates	Through this application, you can consult prescriptions and safety information about medicines, as well as their brands and if they can be bought over-the counter. In addition, you can know the approximate sale price and adverse drug reactions
Bot Plus 2.0	It is an application aimed at pharmacists and professionals in the health sector that allows access to reference information, in this case in Spain, on the subject of medicines with the specialized database Bot Plus 2.0

Source: Author's

Table 7.3 Mobile health applications for patients

mHealth app	Description
Cardiograph	Application that aims to measure the patient's heart rate. For its use, the user must put his/her index finger on the device camera and it monitors his/her heart rate. It collects information about the patient and compares his/her medical record
i-Hear Free	Application that performs an audiometry test. In this case, the user must have headphones on and should mark when the noise begins and ends
Medcitas	It is a health platform that puts health professionals and patients in contact, enabling making appointments with health professionals
Doctoralia	Application that allows you to search for professionals and medical centres specialized in dementia or other specific disease symptoms
Medisafe	Application that reminds you about the medication and pill management. It reminds by taking into account the effects of each of the medicines taken by the patient

Source: Author's

In addition, the development of Mobile Health Applications for patients has led to the emergence of consultation platforms for professionals in specific health sectors, which offer their services instantaneously through telemedicine. Table 7.3 identifies a series of Mobile Health Applications for patients.

7.4.3 Mobile Health Applications for a Healthy Life

Another use of Mobile Health Applications is to improve the day to day of people suffering from some type of disease or dementia, and also to increase the sports activities they do. In this sense, the applications of Mobile Health Applications for a Healthy Life monitor the main physical activities done by users, as well as providing

Table 7.4 Mobile health applications for patients

mHealth app	Description
Endomondo	It is an application that allows us to monitor the main indicators when a user does sports such as geolocation, calories consumed or activity tracker according to the type of sport that has been done
Moves	Application that monitors daily activities to determine the number of calories consumed. It provides information about the distance travelled, the steps, the duration and the calories per activity
Fitbit	Application that designs plans to eat better and to follow a healthy diet. You can control your weight and sleep better. You can also monitor food according to the type of calories
Unobrain	Application that enables us to do brain training and mental agility exercises and that aims at being faster at processing information
Runkeeper	Application to do physical exercise. It allows you to consult statistics such as race pace, bicycle rides, training exercises and other sports activities through the phone GPS

Source: Author's

several tips for leading a healthy life (Baldwin et al., 2017). Eating well, healthy lifestyle habits such as sleeping more hours or counting the number of calories in a product are the characteristics of these applications. In recent years, their use has increased mainly due to the boom of applications to monitor sports activities and link data to a daily routine of healthy activities (Lin & Yang, 2009; Madsen, 2018). Table 7.4 shows some examples of Mobile Health Applications for a healthy life.

7.5 Regulation of the Creative Industry of Mobile Health Applications

An increase in the use of e-Health applications in recent years has led to the emergence of new initiatives for their regulation regarding their use and quality verification. In this regard, we can highlight that in the United States, the Department of Health and Human Services, Food and Drug Administration (FDA) has decided to regulate and recognize a wide variety of medical functions that come from e-Health apps. The rapid growth of the industry and the innovation of these mobile applications has led to taking into account the potential risks and benefits they can have for public health.

In this regard, we must emphasize that the FDA published a report known as "FDA Mobile Medical Applications: Guidance for Industry and Food and Drug Administration Staff", in which reference is made to different applications by subsets within the health industry, indicating in addition, that many of them refer to regulatory supervision by professionals. They also indicate that the use of these types of applications is linked to medical tools or devices and their functionalities can sometimes involve risks for the safety of patients who use them, in the case in which the applications may not work properly or are configured incorrectly.

In addition, the FDA identifies those e-Health mobile applications that are aimed at the diagnosis of a disease, treatment or any type of prevention. The FDA specifies in the indications for regulated applications that the purpose of these should be to help patients, in this case users who use the applications themselves, to self-diagnose a disease or specific treatment conditions or suggestions for these treatments. It also indicates that tools must be provided to users or parties to organize and track their personal health information. Regulated applications must provide tools to access information related to patients' health conditions, as well as the treatments being followed through the application.

The FDA further indicates that the applications should help patients document, show or communicate medical conditions that are potential for providers and their medical care. These applications should also automate simple tasks for providers of medical assistance for patients.

Another potential feature of these applications is that they should allow patients and providers to interact with personal health records or PHR and electronic health record (EHR) systems. Finally, health applications must transfer, store and show each of the data collected in the medical device that complements the operation of the application itself.

In addition, regarding the regulation of the creative industry of Mobile Health Applications, the guide published by the FDA refers to the standards that the devices must establish as well as recommendations designed to help the developers of the applications to generate sufficient technology safely.

Regarding regulation on Mobile Health Applications in the European Union, we must highlight the publication of the Green Paper on mobile health, published by the European Commission in 2014. The publication of the Green Paper on mobile health aims at initiating contact with a broad consultation of interested parties on the barriers that exist on issues related to mobile health, as well as identifying the strategies to develop the potential of this industry in the medium and long terms.

The document published by the European Commission aims to analyze the state of the creative industry of Mobile Health Applications for health care, as well as to establish some general recommendations regarding data protection, information transparency, legal and regulatory framework aspects, as well as the identification of the responsibilities derived from the safety of patients with the use of Mobile Health Applications.

The green book aims to be a reference framework for the exchange of information related to Mobile Health Applications, as well as to stimulate innovation among the parties and providers interested in the development of these types of applications. The big difference regarding the regulation of this creative industry in the European Union compared to the US is that in the former, there are no binding norms of requirements or delimitation characteristics in terms of life and well-being. Authors such as Limato et al. (2018) indicate that there is a Directive on medical devices, but it is non-binding for the Mobile Health Applications industry.

While it is true that most applications of Mobile Health Applications are developed in the USA (Covolo et al., 2017), European developers are beginning to

build a significant number of health applications with an increasing trend in the coming years. Thus, the US and the European Union are positioned as leaders in this industry at global level.

In this regard, we must highlight the European Directory of Health Apps 2012–2013 (Madelin, 2013), which was published by the organization itself and presented in the well-known European Health Forum, in which the keys of the application sector and its regulation in the European environment are updated (Moores, 2012).

As with the health applications regulated by the FDA, the European Directory for Health Apps recommends a series of health applications that comply with requirements authorized by consumer associations of health-related products, also referring to the link of these applications with the Directorate General for Communications, Content and Technology of the European Commission (DG CONNECT), which only includes applications for patients, not applications for professionals.

The applications included in the directory are categorized by specialization (Melzner, Heinze, & Fritsch, 2014). The apps are only included in the directory if they have been reviewed in some way by a group of patients, or a consumer-oriented authorized organization. This directory includes about 200 mobile health applications that are safe for the use and monitoring of diseases and other diagnoses as a reminder of medication, illnesses, physical exercise and stimulators for physical disability. Among other data, these applications provide data on the operating system, the language they use, summaries of patient data and check-ups.

7.6 Exploratory Analysis

After the analysis carried out on mobile health applications, we can see how the list of applications in this industry continues to grow by adding, for example, sensors that measure health-related characteristics, new product associations or new functionalities based on the development of new technologies such as geolocation or thermal measurement.

In addition, the Mobile Health Applications market is continuously growing. We can point out that according to Ashurst and Jones (2017), in the last year a total of 100,000 new health applications were added to all app stores, which means that there are approximately 300,000 mHealth applications available for downloading in app stores. Furthermore, in this sense we can highlight that nearly 15,000 new applications have been generated since 2015 within this industry (Ashurst & Jones, 2017).

Although it is true that the mHealth industry is increasing, the rate of downloads has slowed down in recent years. Users recognize the functionalities of these applications, highlighting their multi-platform feature, that is, they are available in the two main application and software stores, Apple iOs (App Store) and Google Android (Google Play) (Liu, Zhu, Holroyd, & Seng, 2011). Note that about 75% of mHealth applications are developed for these platforms, a fact which users highlight for use by the industry to which they belong.

It is a fact that the mHealth industry is consolidating as a market in which professional health applications are consolidating thanks to legal initiatives to regulate the industry. These initiatives contribute to the security sector, security that users perceive in order to use them and diagnose diseases or treat dementias related to them.

Moreover, users have some concern about the processing of their personal health by the applications. These data range from sick time, consumption habits, working hours or calories to sports time. The concern regarding this area makes users detect that the regulation of these applications makes their use safe and therefore, they tend to use them in a positive way.

Besides, their use by doctors and health professionals also causes patients to detect that the use of these types of applications can be positive for their health, mainly due to the link between the reciprocal communication relationship between the health worker that diagnoses the disease and the patient who wants to carry out monitoring on a continuous and live basis, for example, through the use of an application.

In addition, the integration of these applications in the healthcare system should evolve little by little, mainly due to the development of technologies linked to the use of these applications, so that health professionals and patients can see that they are valid formats for the care of people and the monitoring of diseases and diagnoses.

7.7 Conclusions

The industry of Mobile Health Applications has been the object of study in different investigations over the last decade (Lin & Yang, 2009; Madsen, 2018). After the analysis carried out in this study, it can be said that the Mobile Health Applications industry is a market in development, which is constantly expanding, while developing new hardware and software technologies that can improve their effectiveness such as geolocation, development of devices that monitor heart disease or that monitor the patient's illness.

It is an industry that still does not generate profitable earnings, but long-term added value for professionals or health centres that use them as support for the activities they perform within the specific field, depending on the patient's dementia or illness.

Everything seems to indicate that in the coming years the use of Mobile Health Applications will have increased in the professional field, while health systems evolve to increase the use of new technologies in their centre. Health applications can become the main channel for the distribution of new formats for measuring and diagnosing diseases that connect the patient and the doctor. The applications with the most impact in the future will be those that enable us to collect information, to receive diagnosis and treatment through telemedicine and those dealing with prevention.

Regarding the impact on the industry, the advice and monitoring, as well as coaching through these types of applications can generate a transformation in terms

of the structure of the industry. In addition, the regulation of these applications begins to be clarified, so that users can determine and detect which ones are safe for their health.

Therefore, we can conclude that Mobile Health Applications are consolidating in an industry that evolves while developing new technologies in the sector. One of the objectives of this evolution is to improve communication between the patient and doctor or health professional in order to increase prevention, diagnosis and treatment rates. Issues relating to privacy and data security remain the characteristic that must be improved and regulated to make users feel safe with their use.

The limitations of this study are related to the number of investigations consulted, to the development of the creative industry itself and to the number of Mobile Health Applications consulted. This study can be used for other research in this field.

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