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DEVELOPING MOBILE APPLICATIONS FOR HEALTHCARE DOMAIN

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ABSTRACT

Mobile health applications have met a continuous growth worldwide due to the importance of medical domain for country prosperity and also due to the latest advances made in what concerns mobile devices and communication technology markets. Mobile solutions for healthcare generate important business opportunities based on price cuttings, performance growth and integration of new technologies. This paper aims to identify and analyze the importance of using mobile technologies for developing healthcare solutions and also to describe a proposed medical application as a telemedicine solution which can be used to improve care services.

Keywords

Telemedicine, mobile application, healthcare, technology.

1. INTRODUCTION

The progress made in the last decades in computing technology and especially in what concerns mobile technologies and devices have an important impact on the healthcare industry in terms of improving access, reach and quality of care services provided to patients.

Mobile healthcare application are involving the integration between different information and telecommunication technologies which are providing capabilities and solutions that are able to allow healthcare providers opportunities for the transmission of public health messages, wellness and health resources to patients who are at some distance from them and also to provide supporting tools for improving medical care services.

The main concern regarding healthcare providers consists in the fact that mobile health application adoption will improve the operational efficiency by reducing paper and unnecessary process through paper documentation, especially in what concerns patient registration, scheduling of clinical visits and operational resources, discharge management tasks including planning for referrals, education for chronic disease patient etc. On another hand, will also improve clinical audit and also enforce specific protocols such as patients order entry, coding or billing. By integrating electronic medical records, mobile application are improving customer satisfaction due to the cutting down of the repeating collection of information needed to be written each time [1].



2. OVERVIEW ON TELEMEDICINE FIELD

Medical and IT professionals are linked together through the means of technological advancements and from this fusion, telemedicine domain has been developed in order to enhance care services and to provide a sustainable healthcare system. The history of telemedicine field goes back about a century ago when the traditional telephone was invented [2]. At that time, medical advices were given to patients by physicians over the telephone. As information technology advanced continuously over the past decades, a large number of medical services started to be supported by IT infrastructure and different medical applications have been created. To name a few of this types, by integrating information technologies in medicine systems for drug description and prescription were developed, also patient monitoring, remote operations and surgeries, different medical databases, tools for medical diagnosis and so one.

The main objective of telemedicine is to facilitate the possibility of providing medical services remotely. From this point of view, amongst numerous advantages, one of principals' conveniences consists in reducing the need and time spent for clinical visits.

In figure 1, a number of services that telemedicine is capable of providing are listed.

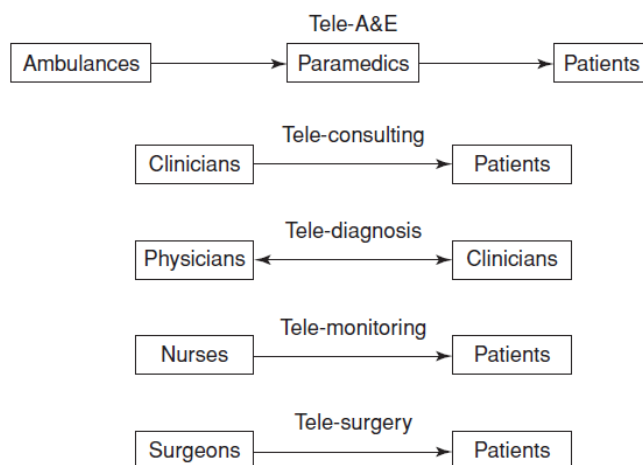


Fig 1: Telemedicine subcategories

Tele-diagnosis subset helps healthcare experts' providers to carry out medical diagnostics from a remote location. Tele-A&E (Accidents and emergency) involves high resolutions images and vital signs collected in a remote location from patients who have to be transferred to a hospital and delays are needed to be minimized. Telemonitoring [3] involves is helpful for patients who are recovery from home and needs to be in permanently contact with their physicians in order for them to be monitored by those and tele-consultation lets health providers to delivery medical advices to patients, remotely.

Therefore, by integrating information and communication technologies in order to develop medical application and systems, healthcare services are no longer restricted to specific locations and the process of care delivering for assisting patients, especially elderly and children, has been improves considerable.

3. MOBILE TECHNOLOGIES AS A SUPPORT FOR TELEMEDICINE

Mobile telemedicine is one of the advanced technologies developed by exploring the advantages of wireless multimedia communication which involve high data transmission rates, high reliability etc. Many types of mobile technologies can be used for telemedicine services, ranging from cell phones to smart phones, tablets or iPods. All of these devices are increasingly offering many features beyond voice and text messaging functionality, this allowing the possibility of



developing different medical application categories which can be used to improve the quality of care and to improve health services remotely.

In a relatively short period of time, mobile application has penetrated significantly into worldwide society, capturing an entire range of users with different ages, experiences, jobs or studies. Such progress has build upon a long history of use of communication devices and a rapid adoption of them. Today's main mobile healthcare application are grouped in some main categories as shown in figure 2 [4].

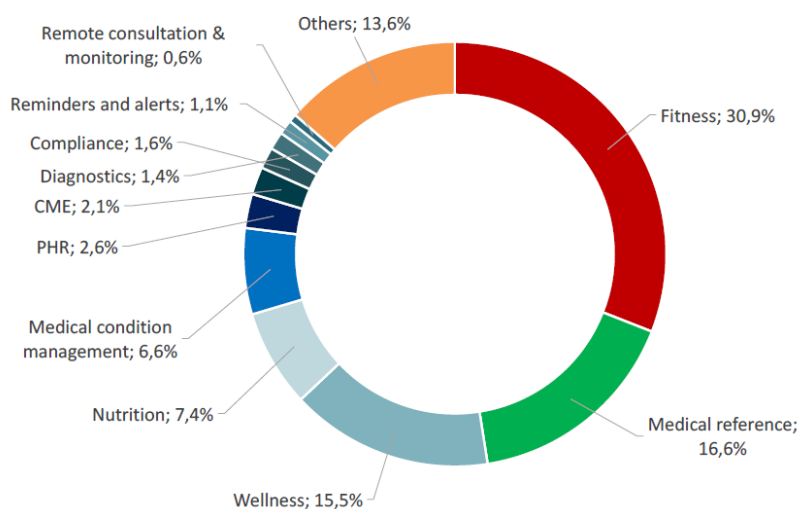


Fig 2: Mobile healthcare application categories

Two of the most downloaded medical applications, according to a report developed for market analysis on the current status and future impact of m-Health app made by “research2guidance” are represented by “Medical reference” (with a percent of 16.6% from total) and “Wellness applications” (15.5%).

The first category, e.g., Medical reference applications, are providing information about drugs, diseases, symptoms and give instructions about the how to take drugs or what to do in case of experiencing different symptoms or pain. These applications also describe locations of pharmacies and medical clinics. On the other hand, Wellness applications describe different relaxation solutions, yoga instructions or beauty important advices and tips.

Nutrition applications help their users to better keep track of their diet and also inform them about different vitamins, calories and fat content as well as socio-economic aspects of different food products. Medical condition management applications help users to track, display and share user’s health parameters, medicament intake, feelings, behavior or provide information on a specific health condition e.g. diabetes, obesity and heart failure.

Even though they capture notable event and press coverage, all other m-Health app categories (PHR, CME, Diagnostics, Compliance, Reminders and Remote monitoring apps) are significantly smaller in size than the ones mentioned above but as the advancements in IT infrastructure will increase, all of these will become more popular [5].



4. RELATED WORK: A PROPOSED MEDICAL APPLICATION FOR TELEMEDICINE

The modular structure of the projected prototype application for telemedicine is shown in figure 3 and describes the two main categories of users this solution applies to and which are represented by physicians and patients, and also the main features each of them have access to.

Both categories have access to different medical databases including information about latest research in medicine, drugs, disease description of symptoms and treatments, latest scientific articles written in this field by researchers and experts, human anatomy and so one.

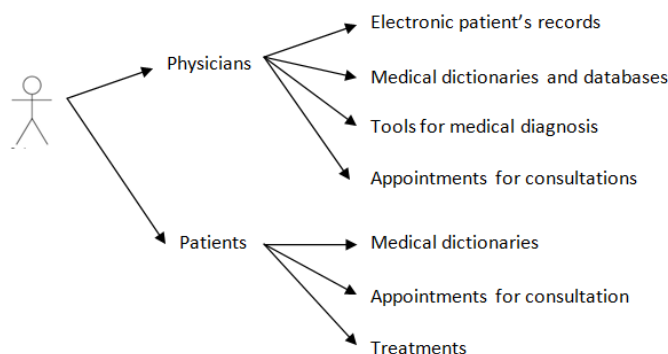


Fig 3: Proposed telemedicine solution – main features

When logging, the user is redirected based on his login account type and from the main menu he will have access to different features. The described solution provides access to medical reference materials, especially the latest researches done in medicine field, approves drugs and their descriptions and so one. Also, for physicians, it provides access to patient’s medical records (list of treatments, surgeries, diseases, allergies etc) which will avoid data from being collected from paper forms and thus, eliminating the time lost with unnecessary document workflows.

5. CONCLUSIONS

Mobile healthcare application developed based on the integration between different information and telecommunication technologies are providing capabilities and solutions that are able to allow healthcare providers different opportunities for the transmission of public health messages, wellness and health resources to patients who are at some distance from them and also to provide supporting tools for improving medical care services which, overall, have a strong impact on improving the situation from the medicine domain which represents one of the main actors involve in the process of improving a country prosperity and economy.

6. ACKNOWLEDGMENTS

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