SUN KNOWLEDGE

ONE WORLD ONE SUN

MOBILE HEALTH

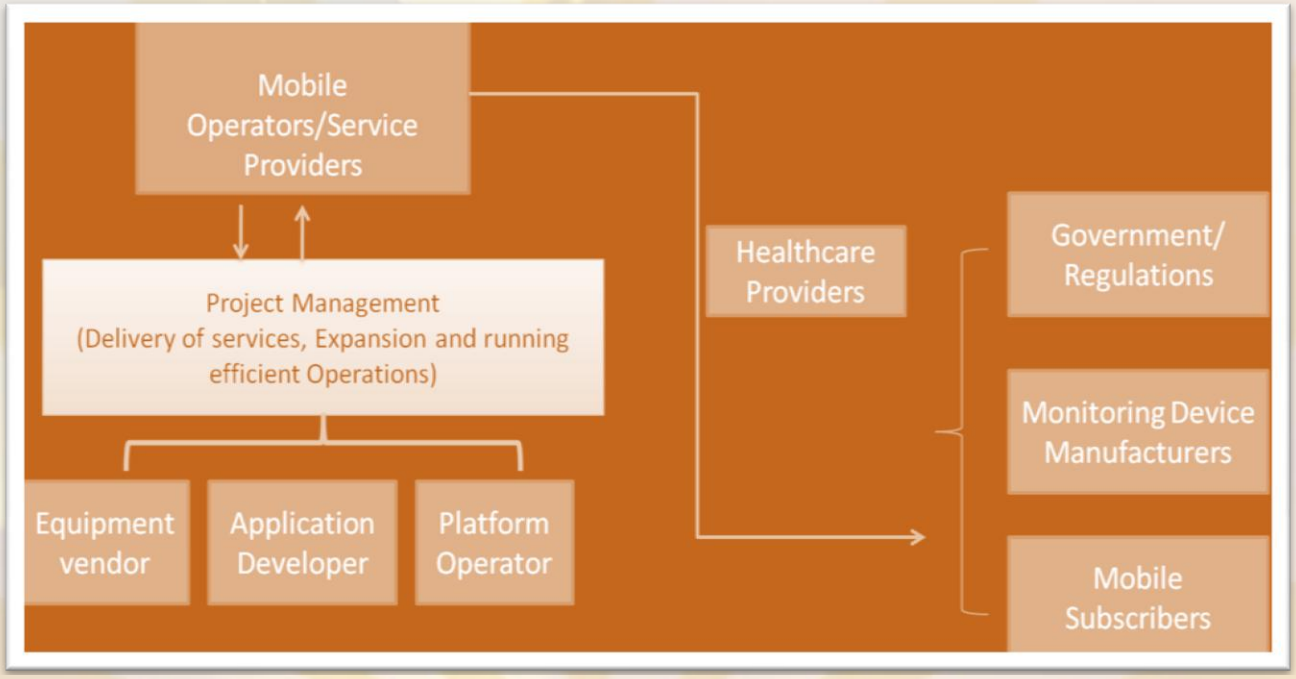
Healthcare has always been a major cause of concern for individuals, communities, organizations, and governmental entities in the United States due to shortage of healthcare professionals, prevalence of lifestyle diseases, and a growing aging population. The current U.S. spending on health care is roughly around 16.9% of GDP.

Many of the challenging issues related to rising healthcare costs can be cut down by selecting and implementing proper information technology tools which can provide a reliable mechanism for improved communication between health care providers and patients.

The latest addition in this domain is Mobile Health (commonly called mHealth) which has already begun to transform health delivery system. mHealth involves using wireless technologies such as Bluetooth, GSM/GPRS/3G, Wi-Fi, WiMAX, and so on to transmit and enable various eHealth data contents and services. Usually these are accessed by the health worker through devices such as mobile phones, smart phones, PDAs, laptops and tablet PCs. mHealth can be beneficial in the following ways:

- ✓ Increased access to healthcare and health-related information, particularly for hard-to-reach populations
- ✓ Improved ability to diagnose and track diseases
- ✓ Timelier, more actionable public health information
- ✓ Expanded access to ongoing medical education and training for health workers

The below diagram shows a basic mHealth business model:



*Source: http://healthcareindia-drruchibhatt.blogspot.com/2011/01/mhealth-india-proof-of-concept.html

Mobile Health Technology Trends:

mHealth has seen a number of trends lately. In fact, with every passing day, a new trend is observed in this sector. We have tried to incorporate important trends which are likely to prevail for a longer term.

1. Mobile phones help in detecting airborne toxins present in the air.
2. Smart phones will enable people to make health care payment using a highly encrypted program that will safely store and transmit data without letting a third party interfere. This will help in reducing paperwork for medical payments and also speed up the process greatly.
3. Smart phones can help to keep health records. Using phones to download, transmit, and organize medical records can greatly reduce clerical errors and make it easier for health care professional to learn about patient's medical history quickly and easily.
4. Cell phones help to monitor physical activity and weight loss. These statistics will encourage people to think about the importance of physical exercises.
5. Smart phones can also be used for diagnosis purposes. This is solely because of advancement in software technology. This will slowly change the way doctors do business. The latest technology being Optical imaging which helps in diagnosing and staging of cancer, cardiovascular diseases and other fibrotic diseases.
6. Smart phone can serve as a health Internet by having national archive of health data which would vastly improve health services by cutting down on repetitive forms and ensuring that a patient's health history is accurately and thoroughly communicated between health professionals in different parts of a country.
7. The idea of "telehealth" is a trend that's moving toward lower-cost health care enabled by mobile communication and video. Laptops, tablets, and (with the iPhone 4) smart phones are capable of video conferencing, and that remote version of a face-to-face chat is a great way for medical professionals to "visit" and chat with patients even though they might be far apart. This will help in reducing transportation cost for everyone involved.
8. Smart phones can be used as one device for communication in hospitals. This will reduce confusion, increases efficiency, and saves money, all of which make for a better-staffed and more profitable hospital.
9. Mobiles X-ray machines have come into existence. They are especially useful for disaster relief**.** As an example, one can think of the earthquake that struck Haiti in January 2010. This trend is sure to grow as mobile power sources become more prevalent and as medical technology places a greater premium on portability.
10. Health data visualization has also seen a phenomenal boost in the market. New sophisticated graphics that communicate the complexities of nationwide health trends is the one of the very latest trend.
11. Web-based healthcare business models cut costs. Its approach to healthcare will help small medical practitioners who cannot afford the huge price tag of traditional client server EHR systems. Shrinking sales forces of web-based models will help offset the cost of accelerated product development and thus bringing new product features to users at a rapid pace.
12. Social networking among doctors has also seen a tremendous rise. The likes of Facebook and Twitter help doctors build their brands and communicate with their patients.

Mobile Health Application:

The availability of smart mobile devices and 3G gadget presents an ideal platform for monitoring and managing health status at the individual level. More than thirty-five percent of American adults currently own a smart phone and it is projected to increase in coming years, possibly reaching 86% by 2015. In 2011, health care applications with tracking functionality have become available in Apple's iTunes store as well as on Google's Android Market thereby addressing health care needs faced by users and health care providers. Smart mobile devices users will be able to track and share critical health metrics like blood pressure, blood sugar, weight, etc with their health care providers via the devices' Internet capabilities.

The key segments of mHealth applications, descriptions and potential benefits and Savings examples are given below:

Application	Description	Potential Benefits & Savings Examples
Education and Awareness	Primarily one-way communication programs to mobile subscribers via SMS/text messaging in support of public health, behavior change campaigns.	• Improved awareness • Enhanced quality of care through education • Saved time and travel cost from distant learning • Decreased cost per impression
Data, Health Record Access	Applications designed to use mobile phones, PDAs, or laptops to enter and access patient data. Some projects may also be used by patients to access their own records.	• Improved data accuracy • Saved office supplies • Reduced time for collecting and transcribing data by medical personnel • Increased productivity within health system • Enhanced quality of care
Monitoring/ Medication Compliance	One-way or two-way communication to patient to monitor health conditions, maintain care-giver appointments, or ensure strict medication regimen adherence. Some applications may also include inpatient and outpatient monitoring sensors for monitoring of multiple conditions (such as diabetes, vital signs, or cardiac).	• Improved medication adherence and reduced disability adjusted life years (DALYs), medication cost, general health care cost • Improved service because of better monitoring • Saved travel time (both doctors and patients) • Reduced expense for hospital stays • Saved time for doctors through access to automated medical history • Saved resources from fewer missed appointments
Disease/ Emergency Tracking	Applications using mobile devices to send and receive data of disease incidence, outbreaks, geographic spread of public health emergencies, often in association with GPS systems and back-end applications for visualization.	• Enhanced disease surveillance and control
Health/ Administrative Systems	Applications developed for "back office" or central health care IT systems allowing for access by and integration with mHealth application. Such applications often tie in to regional, national or global systems.	• Reduced IT/MIS cost • Reduced cost from better IT integration, reduced compatibility problems, ease of upgrades
Analysis, Diagnosis and Consultation	Applications developed to provide support for diagnostic and treatment activities of remote care givers through Internet access to medical information databases or to medical staff.	• Increased productivity within health system • Enhanced quality of care

*Source: Sizing the Business Potential of mHealth in the Global South: A Practical Approach by Vital Wave Consulting

Some other mHealth technologies include the following:

- Drug databases
- Medical calculators
- Reference programs
- Decision support for both physicians and nurses
- Documentation tools (EMR entries, dictation capturing, etc.)
- Capturing vital signs and health symptom tracking (weight, blood pressure, etc.)
- Patient history accessing, managing, and documenting
- Learning (continuing educational tools)
- Practice tools
- Communication managers
- Financial tools (coding, eligibility determination, etc.)

MOBILE HEALTH FOR MEDICARE AND MEDICAID:*

The Medicare and Medicaid Electronic Health Records (EHR) Incentive Programs will provide incentive payments to eligible professionals, eligible hospitals and critical access hospitals (CAHs) as they adopt, implement, upgrade or demonstrate meaningful use of certified EHR technology. Sometimes, people tend to get confused when they use the terms Electronic Medical Record (EMR) and Electronic Health Record (EHR) technology. Both are providers and vendor of health care facilities. For the purposes of the Medicare and Medicaid Incentive Programs, eligible professionals, eligible hospitals and critical access hospitals (CAHs) must use certified EHR technology. Certified EHR technology gives assurance to purchasers and other users that an EHR system or module offers the necessary technological capability, functionality, and security to help them meet the meaningful use criteria. Certification also helps providers and patients be confident that the electronic health IT products and systems they use are secure, can maintain data confidentially, and can work with other systems to share information.

The Medicare EHR Incentive Program

- The Medicare EHR Incentive Program provides incentive payments to eligible professionals, eligible hospitals, and CAHs that demonstrate meaningful use of certified EHR technology. Key conditions are as follows:

    - ✓ Participation can begin as early as 2011.
    - ✓ Eligible professionals can receive up to $44,000 over five years under the Medicare EHR Incentive Program. There's an additional incentive for eligible professionals who provide services in a Health Professional Shortage Area (HSPA).
    - ✓ To get the maximum incentive payment, Medicare eligible professionals must begin participation by 2012.
    - ✓ Incentive payments for eligible hospitals and CAHs may begin as early as 2011 and are based on a number of factors, beginning with a $2 million base payment.
    - ✓ For 2015 and later, Medicare eligible professionals, eligible hospitals, and CAHs that do not successfully demonstrate meaningful use will have a payment adjustment in their Medicare reimbursement.

The Medicaid EHR Incentive Program

- The Medicaid EHR Incentive Program provides incentive payments to eligible professionals, eligible hospitals, and CAHs as they adopt, implement, upgrade, or demonstrate meaningful use of certified EHR technology in their first year of participation and demonstrate meaningful use for up to five remaining participation years. Key conditions are as follows:

    - ✓ The Medicaid EHR Incentive Program is voluntarily offered by individual states and territories and may begin as early as 2011, depending on the state.

    - ✓ Eligible professionals can receive up to $63,750 over the six years that they choose to participate in the program.

- ✓ Eligible hospital incentive payments may begin as early as 2011, depending on when the state begins its program. The last year a Medicaid eligible hospital may begin the program is 2016. Hospital payments are based on a number of factors, beginning with a $2 million base payment.
- ✓ There are no payment adjustments under the Medicaid EHR Incentive Program.

*Source: CMS Incentive Programs

MOBILE HEALTH COMPANIES:

A number of companies are trying to get into mHealth market which has great potential by focusing on a variety of conventional, hybrid and new technologies that are creating new business models. Many of the players have already established relationships with healthcare providers and payers and thus benefiting on large global scale. Some of the major companies in this line based in US are as follows:

3Cinteractive, L.L.C.	CTIS	HUB Technical Services	NowPos
ABT Associates	Dexcom	Ideal Life	Numera
Airstrip Technologies	Diversinet	IEEE-EMBS	Openstream
Amcom Software	Echo Therapeutics	Independa	Qualcomm Wireless Health
American Telecare	Elbrys Networks	InterSystems	S3Group
Apple	Empirix	iProjects	Sotera Wireless
AT&T	Epocrates	Jhpiego	Systematic
Authentidate	Ergonomic Group	Knowledge For Health	Telcare
Aventyn	Extension	Kony Solutions	Temptime Corporation
Beyond Lucid Technology	GHA Technologies	Lifecomm	Vesag
BodyMedia	GlobalMed Technologies	Mad*Pow	Vignet
BoxTone	Great Connection	Mass High Tech	Viterion TeleHealthcare
C4U Technologies	GreatCall	MDCare Global	WellDoc
Calgary Scientific	GSMA	MedApps	West Wireless Health Institute
CardioNet	Happtique	mHealth Alliance	Winmagic
Cisco	Healthrageous	Mobisante	WorkSmart Labs
Continua Health Alliance	HealthRx Corporation	Motion Computing	Xirrus
Cox Media	Hello Health, Inc.	Nonin	

Some of the other big player based out of US are 3G Doctor, ANT+, Cinterion Wireless Modules GmbH, CSE Healthcare Systems, Daintel, IVT Corporation and TeleMedCare.

MOBILE HEALTH FOR COST CONTAINMENT AND BETTER HEALTH OUTCOMES:

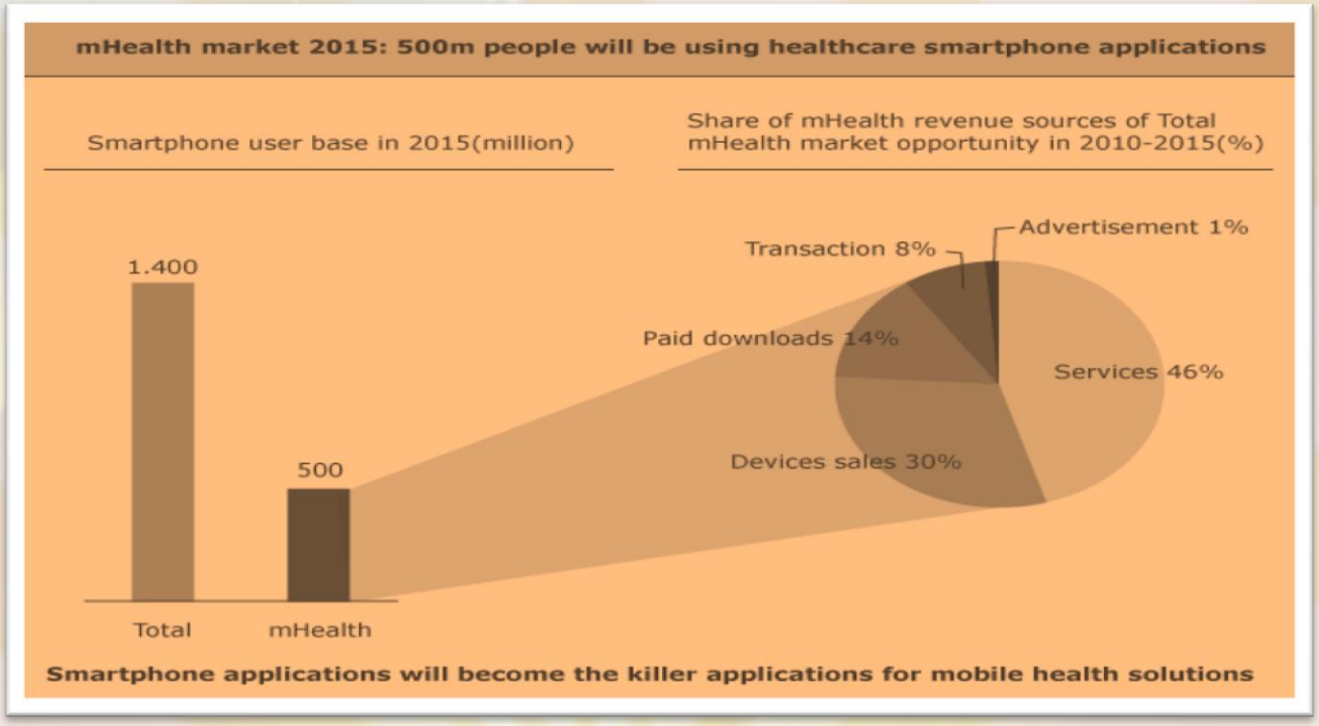
The mHealth market operates on the presumption that technology alone in health care sector has great potential to promote a better health communication. This will eventually lead to achieving healthy lifestyles, improving decision-making by both health care professionals and patients and perhaps enhancing healthcare communication in places where this was not possible before. Thus, mHealth will lead to cost containment and better health outcomes in the longer run.

Efforts are in progress on how Healthcare and technologies can improve health outcomes as well as generate cost savings in different countries. Overall, it can be said that mobile communication technologies are tools that can be leveraged to support existing workflows within the health sector and between the health sector and the general public. In this area of interest, the mHealth objectives are as follows:

- ✓ increased access to healthcare and health-related information
- ✓ improved ability to diagnose and track diseases
- ✓ timelier, more actionable public health information
- ✓ expanded access to ongoing medical education and training for health workers

FUTURE OF MOBILE HEALTH MARKET:

The addition of mHealth in healthcare has certainly been accepted by the market and the future looks very positive. The fact that one can use applications on the go and their refined ergonomics undoubtedly contributes to their success. In fact, it is predicted that the US market could top $4.5 billion in 2014. It is also estimated that by 2015, nearly 500 million people around the world will be using health applications. The diagram below illustrates the point which is surveyed by research2guidance.



Also, in another research report by Pyramid Research, it is anticipated that around 600 mHealth applications will be in use as compared to 200 million mHealth applications which are in use today by end of 2012. It is also expected that the smart phone users will at least use one mHealth application by 2015.

It is believed that in the years to come mHealth applications will cease to be distributed only through the application stores as is currently the case, and that traditional healthcare distribution channels like hospitals and specialized healthcare product vendors will become the predominant distribution channels. This take was suggested in a survey done by research2guidance. The diagram below indicates possible distribution channels:*

*Source: Research report by research2guidance

However, there is one cause of concern prevailing at current status i.e. wireless carriers are not sure of suitable mHealth business models and thus they have not yet made significant efforts to place their stamp on the industry. What is holding them back is that they are not clear about medical reimbursement rates for mHealth services and devices. But, the future looks extremely interesting both in terms of research and business perspective.

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