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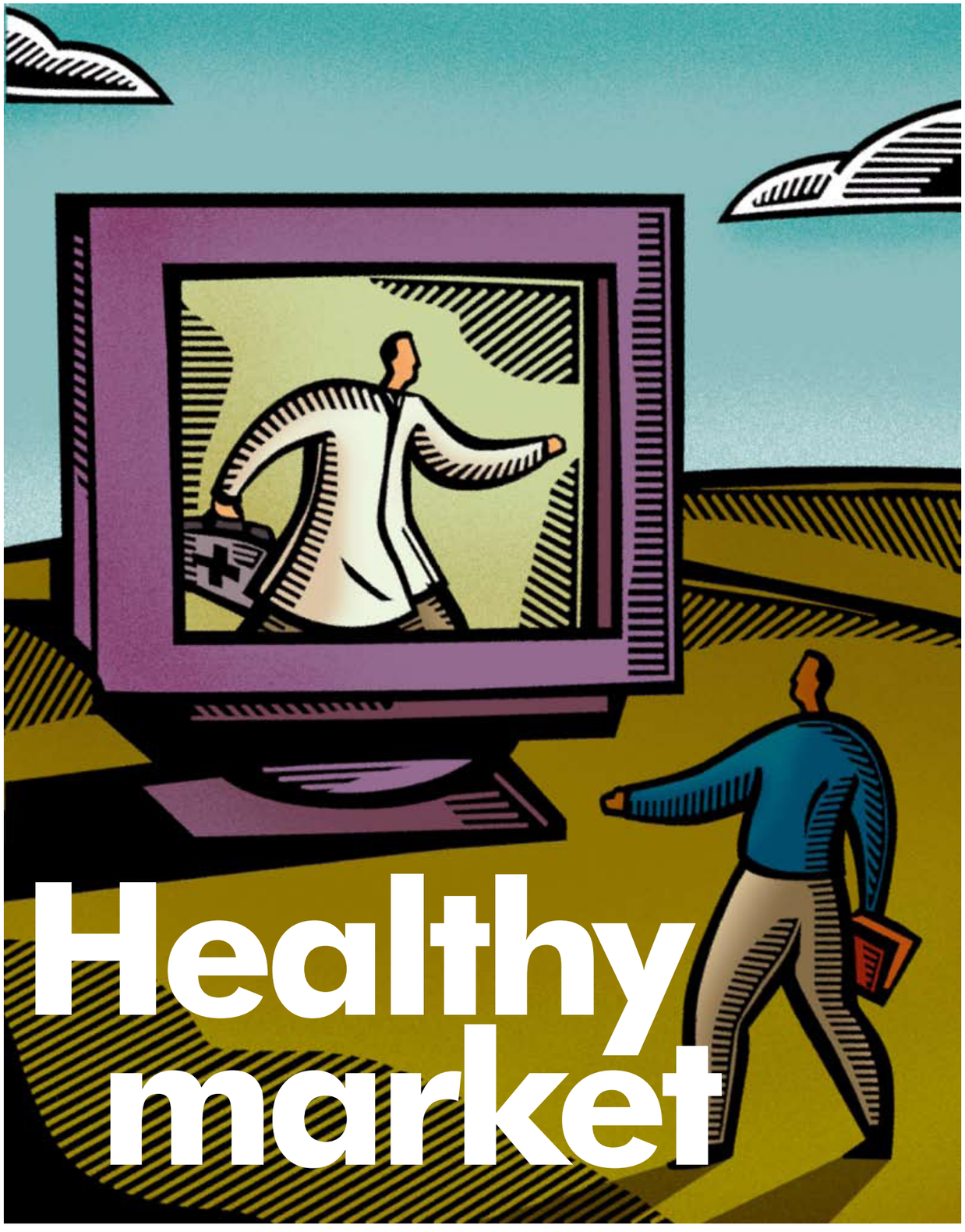


Healthy market

Umesh Neelakantan, **Kamalakar Devaki** and **Srividya Varanasi** look at the opportunities and challenges for M2M in the telehealth market

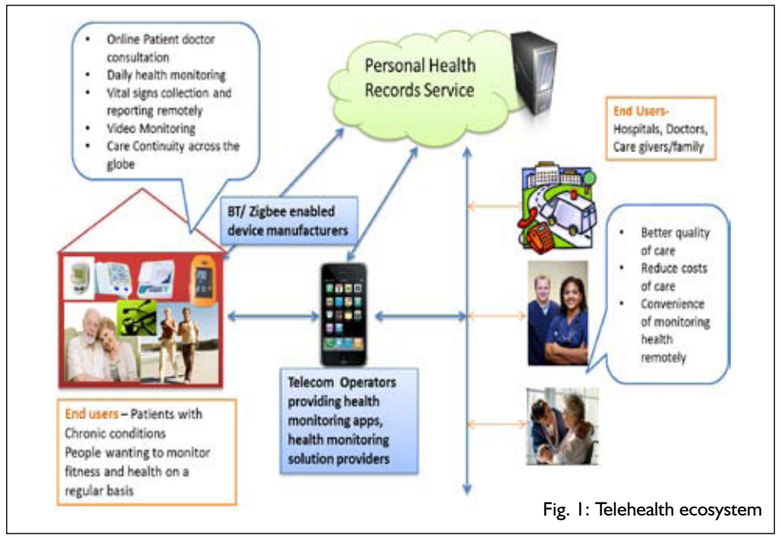


Fig. 1: Telehealth ecosystem

Telehealth is gaining wide acceptance and popularity owing to the many advantages and convenience it provides to its users, and the cost savings it offers to healthcare providers. According to various estimates, there are currently about 2.2 million people worldwide using a telehealth service based on equipment with integrated connectivity. This usage is not just limited to remote health monitoring but also extends to fitness monitoring, wellness management and remote chronic disease management.

The Machine-to-Machine market for telehealth is currently around US$3.6 to 4.0bn and is expected to grow at a CAGR of 15%. Indeed, this market attractiveness has led to the development of an ecosystem around the telehealth business that encompasses medical device manufacturers, health care providers, app developers, health data and information storage providers, and remote monitoring technologyproviders.

Ecosystem

The traditional telehealth system consiste of a box, with interfaces to various measurement instruments for vital parameters such as blood pressure and glucose level for example. Now though, with the proliferation of smart mobiles, the gateway functionalities have moved to the device as shown in the typical architecture in Fig. 2. The key components of such a system are shown in Fig. 3.

Market drivers

The consumers' need for convenience and comfort is stimulating interest in telehealth. Telehealth provides us with the ability to monitor chronic health conditions regularly from the comfort of our own home without having to visit the clinic on a regular basis. While nearly everyone agrees that there are benefits by adapting telehealth, the key question remains: Is there a willingness to pay?

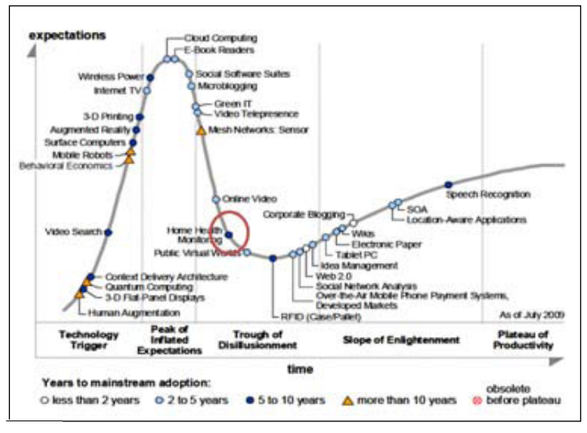
A recent survey by Price Waterhouse Coopers in the USA has revealed that 56% of worldwide consumers like the idea of remote healthcare and 40% of them are willing to pay for the device together with a monthly subscription fee. This would then allow data to be sent to a doctor or for the patient to receive reminders to take their medications, access medical records and track their health.

Among those willing to pay, 64% said they would spend $5 per month for subscriptions and would buy a remote monitoring device if it cost them less than $50. This means that even if only 40% are willing to pay $5, then the potential market size would be around $7bn.

So how easy are they to use? Multiple >

> "While nearly everyone agrees there are benefits by adapting telehealth, the key question remains: Is there a willingness to pay?"

Fig. 4: Hype cycle for emerging technologies, according to Gartner



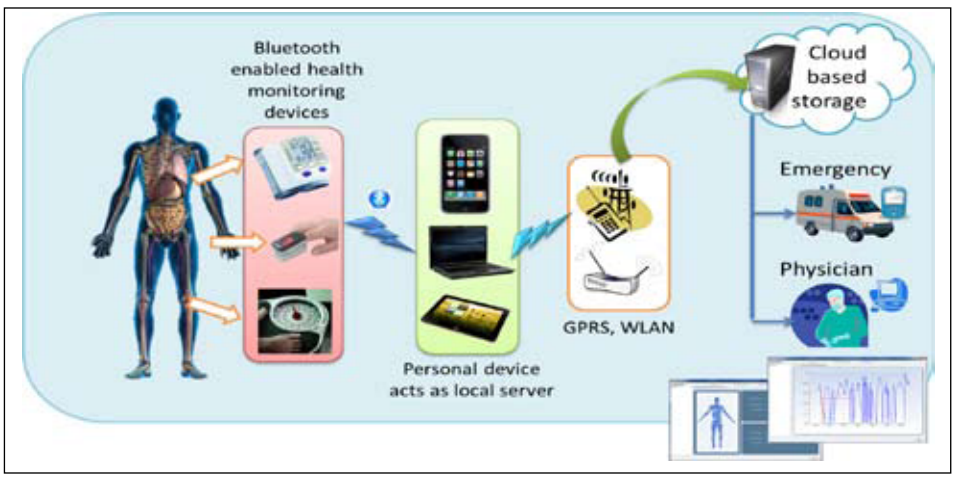


Fig. 2: Typical architecture for a telehealth system

sensors are currently available that can accurately sense various patient related data. These sensors can now be used by individuals within the home settings and some of the already existing remote monitoring devices are priced less than $50. However, new business models can and will be used to encourage more people to use remote health monitoring.

Sensors can also now be integrated into our lifestyle making them easy to use. Patients no longer have to go out of their way or wrap devices around arms to get their health data monitored. Sensors can be inserted into clothing; pills with chips are digestible; and there can even be sensors in bathroom fixtures to measure weight, body temperature and other vitals.

Many data transfer technologies and standards are in place now to help health data from sensors be transferred to commonly used devices such as PCs, PDAs and smart phones. Also, technologies such as cloud computing are making it easy and economical to share health and fitness data on a real time basis and can be accessed from anywhere via the internet. Advances in low energy technologies such as Bluetooth Low Energy and Zigbee use minimal battery power and the power of the internet has made information totally ubiquitous. Furthermore, the power of the cloud will also further reduce the costs of monitoring the data.

Challenges

However, there are challenges and for telehealth technology to climb up to the plateau of productivity, these need to be addressed.

Lack of interoperability has been the key barrier to enabling ubiquitous connected health and wellness devices and this interoperability among devices and applications is critical to driving down data collection and management costs.

Now, with the emergence of HDP, SDP and advancements in Blutooth and other wireless technologies, the data sharing between devices has become easier as these standards have a definitive way of sharing the data.

For example, HDP has 16 profiles to pull various types of vital parameters from various health devices and increased use of such profiles enables much more interoperability between devices.

Security is also an issue as telehealth devices work by transferring patients' health information wirelessly through cyberspace. Three quarters of all medical data are already on mobile or portable devices. And with the internet vulnerable to corruption or interception there is a genuine concern on the security of data that are being accessed remotely. Data corruption can also be caused by viruses, worms and web crawlers initiated by malicious individuals or by companies seeking to gain information.

However, the most vulnerable part of a wireless medical device is the middleware that sits on top of the operating system and provides the management, transmission and receipt of information. Therefore, as new wireless applications for medical monitoring are developed and commercialised even greater care needs to be taken to protect the security of the data.

Return on investment and total cost of ownership of remote health monitoring is a greater challenge for hospitals and care givers while willingness to pay is a limiting factor for home health monitoring by individuals. Hence, health monitoring system providers have to adopt new business models to drive greater adoption and derive larger scale benefits. Strategies need to be devised to reap the benefits of this two-sided market and, while some providers are subsidising the patients, others are focussing on low price large volume business models.

Conclusion

There is nevertheless huge potentiality in the telehealth market with the benefits reaped through intelligent business models and robust technologies. There are several companies across the globe that are focussing on this booming segment. These include device manufacturers, technology providers, cloud service providers and TSPs. It is difficult to succeed in this segment all alone and creating the right kind of partnership is the key. Indeed, with great challenges come greater opportunities to collaborate and create business for each other. ■

The authors all work for Mindtree – Umesh Neelakantan is domain head for M2M and consumer systems, Kamalakar Devaki is senior architect and Srividya Varanasi is product manager

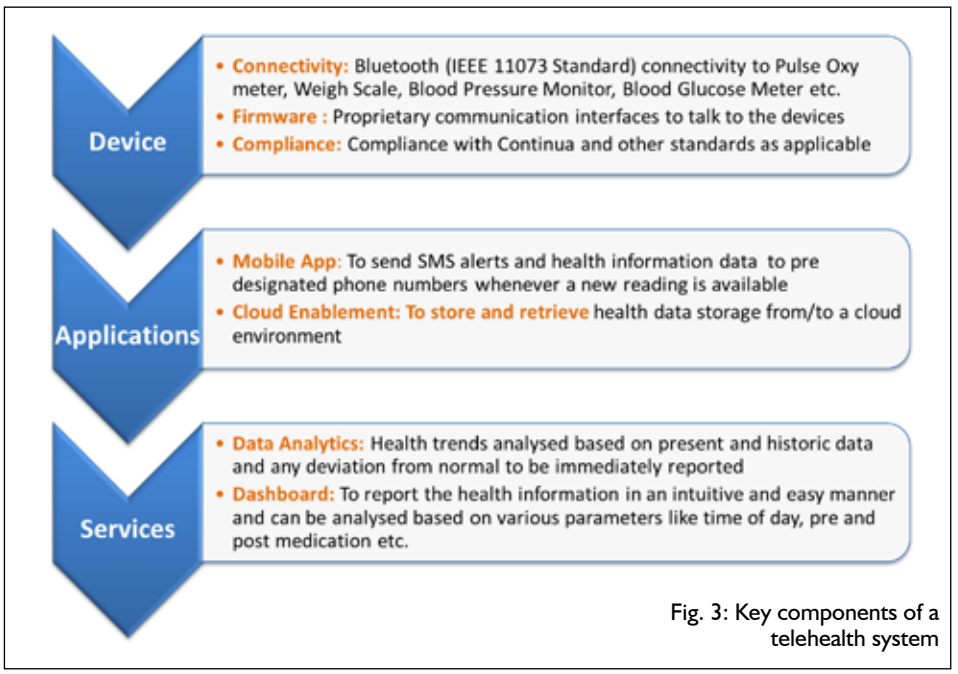


Fig. 3: Key components of a telehealth system