

eHealth At The Network Edge

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Abstract— Information about our state of health and previous healthcare episodes has traditionally been created and held by medical professionals. This has resulted in the health record for an individual being spread across multiple healthcare providers and systems, making it practically impossible to view or share complete and accurate personal health information. Now the pervasive use of technology in the home and workplace is encouraging people to take more interest in their health, such as researching health issues on the internet, storing personal health information in their PC or in a secure web site (PHR – Personal Health Records), and selecting healthcare services from a range of suppliers. The emerging market for remotely attached medical devices will generate a new feeds of personal health data, which will need to be stored and processed. This paper, in the form of an extended abstract, discusses some of these trends and provides examples of early adopters.

I. INTRODUCTION

Information about our state of health and previous healthcare episodes has traditionally been created and held by medical professionals. This has resulted in the health record for an individual being spread across multiple healthcare providers and systems, making it practically impossible to view or share complete and accurate personal health information. Many countries now have plans to create electronic health records (EHR's) which aggregate information from many systems to create (ideally) a lifetime longitudinal record of the health history and status of an individual. There are several different approaches to building an EHR, ranging from a centralised repository of data extracted from source systems periodically, to an 'on-demand' record which is generated when needed. This record has many potential use cases, but perhaps the most urgent one is to provide essential information for emergency and out-of-hours care, including current medications and allergies, and contact points for doctors and carers. There are already working systems in this category, such as the Emergency Care Summary deployed in Scotland. Further developments are under way, to provide individualised health records, such as the HealthSpace web portal developed by the NHS in England, and iHealthRecord developed by Medem in the USA.

However there is also a growing trend for individuals to create and manage their own healthcare records, sometimes called personal health records (PHR's) which give the person more control over the content and accessibility of the data. Example of PHR's exist in the form of PC-based solutions, but the most interesting are perhaps the web-based PHR's, such as WebMD, myPHR, myNDMA, MS HealthVault and

Google Health. These combine a storage solution for an individual's health record with a range of health information, links to relevant sites, and other services. These sites appear to have significant interest. In 2006 for example, IBM introduced a PHR service for its US employees, based on WebMD technology, and by February 2008 over 80% of all eligible employees were using the service to store personal health data.

II. REMOTE PATIENT MONITORING

It is becoming clear that there are significant health and financial benefits to monitoring patients at home or in community healthcare settings, in particular for those dealing with chronic diseases such as diabetes, congestive heart failure and COPD, where early intervention can avoid emergency admission. Many new devices are being developed, and services deployed around them, which will reduce the cost of monitoring, allowing it to become more routine, and reducing the burden on existing healthcare delivery resources. The Continua Health Alliance, supported by many companies involved in the medical device, health and fitness and consumer IT market, is actively promoting the use of standards, as well as defining use cases and design guidelines. This should lead to faster adoption, by both clinicians and individuals, of devices which generate streams of health-related data. When collected over time, this could provide useful information in the diagnosis and management of a range of diseases. However, it is obvious that we do not want to generate and store large volumes of raw data, so algorithms will be needed to sift and analyse the data, so that 'at risk' individuals can be identified, and appropriate interventions can be made. It is likely that new suppliers of such 'triage services' will emerge, perhaps starting with specialist clinics, or healthcare management organisations.

III. CONCLUSIONS

The market for both PHR's and remote patient monitoring services will develop quickly and will converge, leading to a new market for companies to provide healthcare services at the 'edge of the network', quite different from traditional healthcare settings and venues. Individuals will have the opportunity to get more directly involved in their own health and wellness management, and healthcare managers will need to consider how this will change clinical and care pathways.