1. (a) Oracle's CEO Larry Ellison once commented that "The interesting thing about cloud computing is that we've redefined cloud computing to include everything that we already do…," and "I don't understand what we would do differently in the light of cloud computing other than change the wording of some of our ads." Could you explain in a traditional IT vendor's point of view (i.e., Oracle's point of view) why he would argue that current IT solutions have no difference from cloud computing? (10%)

   (b) In your opinion, what are the key differences between "private cloud" and traditional in-house IT systems? (10 %)

   (c) What are the key differences between public cloud and a conventional data center? (10 points)

2. Software as a Service (SaaS) is one of the most popularly adopted cloud services. Service Quality is a very important element if we want to deliver IT as a service. According to Lewis and Booms (1983), service quality is a measure of how well a delivered service matches the customers' expectations. Both SLA (Service Level Agreement) and QoS (Quality of Service) are well known terms related to service quality. What's the difference between SLA and QoS? (20 points)

3. Open data and data mining service

According to Wikipedia, Open Data is defined as follows:

Open data is the idea that certain data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control. The goals of the open data movement are similar to those of other "Open" movements such as open source, open hardware, open content, and open access. The philosophy behind open data has been long established (for example in the Mertonian tradition of science), but the term "open data" itself is recent, gaining popularity with the rise of the Internet and World Wide Web and, especially, with the launch of open-data government initiatives such as Data.gov.

For example, recently the Taiwan government initiated a new regulation that property trading data including the location and price has to be recorded and publicized (不動產交易實價登錄), so that the general public can access the up-to-date market price of land and building. It is a type of open data which is accessible by the general public. Take this example as an exercise for you. Please create a prototype service accessible by users' smartphone by taking the trading price and location as inputs. You should draw the interface of the application on smartphone screen based on the interaction between users and the application (10%). Then, you should justify the impact of your service on the society as a whole given the business model you design (10%). Notice that you can use different sources of open data if the prototype service needs even these sources of data are not available at the current stage.

4. PHR service innovation

According to the Wikipedia, the followings are brief information of a Personal Health Record:

> A **personal health record**, or PHR, is a health record where health data and information related to the care of a patient is maintained by the patient. This stands in contrast with the more widely used electronic medical record, which is operated by institutions (such as a hospital) and contains data entered by clinicians or billing data to support insurance claims. The intention of a PHR is to provide a complete and accurate summary of an individual's medical history which is accessible online. The health data on a PHR might include patient-reported outcome data, lab results, data from devices such as wireless electronic weighing scales or collected passively from a smartphone.
>
> It is important to note that PHRs are not the same as electronic health records (EHRs). The latter are software systems designed for use by health care providers. Like the data recorded in paper-based medical records, the data in EHRs are legally mandated notes on the care provided by clinicians to patients. There is no legal mandate that compels a consumer or patient to store her personal health information in a PHR. PHRs can contain a diverse range of data, including but not limited to: allergies and adverse drug reactions, chronic diseases, family history, illnesses and hospitalizations, imaging reports (*e.g.*, X-ray), laboratory test results, medications and dosing, prescription record, surgeries and other procedures, vaccinations, and Observations of Daily Living (ODLs).
>
> There are two methods by which data can arrive in a PHR. A patient may enter it directly, either by typing into fields or uploading/transmitting data from a file or another website. The second is when the PHR is tethered to an electronic health record, which automatically updates the PHR. Not all PHRs have the same capabilities, and individual PHRs may support one or all of these methods. In addition to storing an individual's personal health information, some PHRs provide added-value services such as drug-drug interaction checking, electronic messaging between patients and providers, managing appointments, and reminders.

With the above brief of a PHR, Google launched the Google Health service in 2008 to store users' health records. However, Google announced the discontinuity of this service as follows:

> When we launched Google Health, our goal was to create a service that would give people access to their personal health and wellness information. We wanted to translate our successful consumer-centered approach from other domains to healthcare and have a real impact on the day-to-day health experiences of millions of our users.
>
> Now, with a few years of experience, we've observed that Google Health is not having the broad impact that we hoped it would. There has been adoption among certain groups of users like tech-savvy patients and their caregivers, and more recently fitness and wellness enthusiasts. But we haven't found a way to translate that limited usage into widespread adoption in the daily health routines of millions of people. That's why we've made the difficult decision to discontinue the Google Health service. We'll continue to operate the Google Health site as usual through January 1, 2012, and we'll provide an ongoing way for people to download their health data for an additional year beyond that, through January 1, 2013. Any data that remains in Google Health after that point will be permanently deleted.

You may be wondering why Google terminated its service. A report from Information Week lists 5 reasons of the failure of Google Health services as attached. From the information you obtained, please answer the following three questions:

1. Please specify a service value network for a PHR service. Once you specify the value network, please comment on the possible reasons of the failure of Google Health service. (10%)
2. After learning the lesson of the failure of Google Health service, if you plan to launch a PHR service in Taiwan for Taiwan users, what would be your system architecture and business model? Please identify the stakeholders of your service system, and specify their corresponding service propositions, so that the value exchange among different stakeholders results in successful business operations using PHR information. (20%)

InformationWeek
THE BUSINESS VALUE OF TECHNOLOGY

5 Reasons Why Google Health Failed

What doomed Google's online personal health record system? For starters, consumers haven't bought into the basic idea. Last week, Google confirmed what had been rumored for quite some time: The company is pulling the plug on Google Health, the online personal health record system that they launched in 2008. The service never really took off, and here are five reasons why:

1. Consumers, for the most part, just weren't interested or didn't even know what a personal e-health record is.

Despite all the attention e-health records have been getting from healthcare providers since the HITECH Act was passed in 2009, consumers are still pretty oblivious to offerings that allow them to electronically compile and manage their health data. In fact, an IDC Health Insights online survey of 1,199 consumers earlier this year found that only about 7% of respondents reported ever having used a PHR, The leading reason for consumers not using a PHR? About half said they haven't been exposed to the idea of using a PHR. In a similar survey done by IDC five years ago, 52% gave the same reason for not using a PHR. Not exactly progress.

2. Consumers who are aware of PHRs tend to use physician, hospital, and even health-plan portals to keep track of their records.

That's because, unlike Google Health and many other consumer-oriented PHRs, the bulk of the patient's key data--like test results--is already available in the record, supplied by the provider or health plan. Also, unless patients have a chronic or serious health issue, they only use personal health records very sporadically. By the time many healthy patients have another occasion to use a PHR after it's been set up, they probably have forgotten they even started a record and can't be bothered.

In fact, of consumers that have tried PHRs and stopped using them, 15.9% said they didn't want to spend time entering their data and 22% didn't see value in doing so, according to the recent IDC survey.

3. Lack of provider relationships and other data sources.

There weren't enough third-party sources allowing patient data to be imported to Google Health, with the exception of a handful of big name providers, including Cleveland Clinic and Beth Israel Deaconess Medical Center in Boston, and some more recent partners, like University of Pittsburgh Medical Center and Sharp Healthcare, as well as a few large national pharmacy chains like CVS and related partners like SureScripts. Google Health also lacked relationships with big labs so consumers weren't able to access their test results, which is one of the key attractions that often get patients using PHRs.

"One of the key insights we've developed over time is that in PHRs, connections to providers, and having an open platform" to support the import of data from multiple sources and applications, including medical devices, is "vitally important," Nate McLemore, general manager of business development and policy in Microsoft's Health Solutions Group, said in an interview with *InformationWeek Healthcare.* Microsoft's PHR platform HealthVault currently has about 300 third-party applications, including about 10% of which "also supported Google Health," he said.

4. Google lacked other communication and convenience features that patients look for when dealing with their health information electronically.

That includes secure messaging with healthcare providers and being able to schedule appointments. Both those capabilities are typically found in provider portals offering PHRs.

In recent months, Google Health had shifted gears a bit with its services and third-party relationships, hoping to make the site easier to use and more appealing to fitness buffs. That included new tools to let consumers monitor and record their daily physical activity, as well as help patients with chronic conditions like high blood pressure track their health-related goals. That required Google Health to forge

relationships with makers of wearable health device makers. Apparently those new capabilities didn't exactly attract the masses, either.

5. Privacy and security concerns by consumers, whether warranted or not.

While Google officials said they didn't hear many concerns about privacy from consumers, fears about security and suspicion by some patients about whether Google Health had ulterior motives for collecting their health data was undoubtedly a factor that stopped some from using Google Health--or any online service for that matter--to store their personal health information.

"We all have our irrational fears," said Lynne Dunbrack, IDC Health Insights program director in an interview with *InformationWeek Healthcare*. "And some consumers undoubtedly had fears that their health information would show up in a Google search."

If Google had had more patience with patients (and doctors) getting comfortable with online e-health records, and had addressed some of its major weaknesses, the service might've become much healthier (pun intended).

By the way, Google just introduced a social networking service to compete with Facebook. Does that mean Facebook is working on a PHR? Probably not. However, Microsoft recently added capabilities to allow users to log into their HealthVault accounts using their Facebook credentials. I suppose that's one way to entice consumers into using a PHR.

By Marianne Kolbasuk McGee, InformationWeek June 29, 2011.

URL:

http://www.informationweek.com/healthcare/electronic-medical-records/5-reasons-why-google-health-failed/231000697