INFO5992 Introduction to IT Innovations

Week 4

Tutorial 4: Cognitive IT Services and its Value Chain / Network

In this week's Lecture, we studied the concept of 'Disruptive Innovation' defined by Christensen to mean an innovation that, i.e. *"they create new markets or change the value network in an existing market"* and discussed several examples, such as Canon, Cisco and Airbnb. In all these examples, they were possible to become disruptive through the emergence of new technologies.

1. Can you describe the underlying technology, the idea/invention, and how it is used to provide the above cognitive services?

    - Web interface
    - GPU
    - Cloud computing
    - Machine learning
    - Digital image processing
    - Natural language processing
    - Cognitive computing
    - Data mining

2. Can you identify how existing companies that are using the technology?

Company name	What they did	Benefit they got
Kohel	Voice home control	Increase profit and make new market Improve reputation by using high tech
AudioBurst	Keyword extraction from the video	Increase convenience of searching video for user
Netbank	Personal assistant	Increase efficiency and reduce the cost
Codysoft	Digital table for ordering food	Increase coolness -> increase customer satisfaction

3. Can you think of a new business model using the cognitive service (technology)? Does it have the attributes to be a disruptive innovation? Answer this in terms of
    - Does it gain a foothold in a low-end market that has been ignored in favour of more profitable customers?
        i. Yes, it is often more cost effective, do not have to build from scratch, requires low or no maintenance. Earlier customers had to outsource or hire expensive resources with necessary skill if it lies outside the firm boundary. But now they can use these available APIs. Developers with no knowledge in machine learning can use it too.
    - Does it create an entirely new market, turning non-customers into customers?

i. **Yes it can**, example: Smart home system will be attractive to disabled people, elderly people who need assistance in their daily life and young customers who are willing to accept and try new technologies.
ii. **Not necessarily:** University students also can easily use of these APIs to create innovative businesses (start-up) and there are so many firms that started over night with an idea that exploits APIs.
iii. **However**, new features not always attract potential customers into actual customers.

- Does it begin with low-quality offerings, then eventually captures the mainstream market by improving quality?
    i. **Yes**, it begins with low quality. Machine learning & AI – more data the better. So as more customers embrace the technology, more data is captured that helps improve the algorithms (huger training sample, outliers can be identified).
- Consider the features and usability of the APIs. Where are APIs typically involved in a value chain?
    i. Smart home system will improve the user experience
    ii. Product Development Stage – depending on customers' requirements or functionalities, an application might interact with many different APIs.
    iii. Cognitive services are at the start of the value chain – from it, we are starting to see middlewares (e.g., companies that use CS to provide solutions) as well as new devices that are enabled or designed for CS, and companies optimising / customising to different industry needs.
- Do you think MS cognitive services will be easy to use the service and innovate with it for a new business? Is it creating a new value network?
    i. **Yes**, it is easy to use and allows to quickly implement the complex intelligent features. With a novel business idea where simple technologies can satisfy, these APIs might be already enough to satisfy the needs.
    ii. Use of APIs may change the existing value network, for instance, removal of some of process that can be automated through the use of APIs.

4. [Optional / Homework] There are other competing services, including IBM Watson (https://www.ibm.com/watson/), Google upcoming deep mind (https://deepmind.com/), etc. Referring back to the innovation concepts we discussed last week, do you think there is an agreed 'Product Category', and an emergence of a dominant design? Note here that dominant design does not necessarily mean only one product has to win, e.g., Apple and Android.
    - Opinion: Yes
        i. The three given examples can be categorised into cognitive services. The emergence of dominant design of such cognitive services are all based upon the use of machine learning and AI technologies.
    - Opinion: No
        i. Because each of the given example are targeting specific industry/field, although their functionalities seems to be similar, there is yet a specific dominant design or industry to include all three examples.