# Managing technology

We later used type writer to type on paper, then type into computer. Now, with the help of some software, we don't even have to type. We can " speak" or " talk" for computer (or other devices like smart phone, tablet, etc) to " type" for us. Thanks to technology, we now have " text-to-speech", " talk-to-type", and " talk-to-text". As technology changes, businesses had to change to survive the IT impact. Business uses the 10 drivers as guidelines to decide what and how much to change to gain a competitive edge and market shares.

Business needs to carefully analyze all drivers to see which driver works because not all drivers work for all business/industry. It can give business the competitive advantages if technology is implemented to support or enhance the core functions or the strength of the business. It can also be a waste of capital investment and time if technology is implemented for the wrong reasons. Like the case of Levi Straus, investing millions into e-commerce trying to achieve " electronic deliberatively" directly to customer proved to be unfruitful because retail and dealing directly with customer were not Levi Straus' strong core business.

Quickly recognized their weakness, cut the loss and concentrate on their strength, making clothing, Levi Strauss' brand name is still going strong today, sustain enough market share to survive and grow. IT has drastically changed the entertainment industry. For movie industry, some movies are now made entirely without actors and actresses being on the set but are made in offices and data centers. Instead of shooting scenes of the movies at various location, animation movies are made with artists and system

administrators working in offices and data centers, replace camera and lights with powerful servers, potables of storage and databases.

For music industry, technology enables artists to connect and sell directly to the fans, bypassing the middlemen of record/label companies increase the artist power, and deliver music to the consumers faster and cheaper[3]. Internet radio like Pandora, Spottily and Tunnel delivers personalized music without much advertisement; some has no advertisement at all. IT has also changed the publishing industry. Magazines and Newspapers went digital. More and more books are now offered e-book version. Writers can have their website and sell directly to their fans bypassing publishing companies.

Many companies offer assistance for writers to self-publishing for a small fee. Distribution of books was also changed because of technology. Majority of brick-and-mortar bookstores were closed, replaced by online bookstores. For data center, IT landscape has also changed dramatically in the last few years. For decades, IT infrastructure consists of three separate pillars: compute, storage, and network. A lot of big corporations have quickly changed to cloud computing using converged infrastructure which has compute, storage, and network as one unit.

Converged infrastructure is semi-pre- built, preconceived using reference architecture. It is like cookie cutter. It not Just saves power and decanter space, but also save time to rack and stack, cable, and infringe each component. Since it comes as one unit, it also offers one management console to manage all three components, hence save time on managing all three components. Information Technology (IT) increases productivities,

enables many capabilities to businesses such as online store, work from anywhere, but not without some significant cost.

The cost of IT is like an iceberg. The cost of acquiring new software, hardware, and IT personnel are Just the top of the iceberg. What hidden are the costs of managing those assets, including but not limit to, securing, upgrading, refreshing those assets, and how to quickly implement changes to adapt to the changes of hardware and software. At the height of its success in camera film business, Kodak employed 140, 000 employees and had a market value of $28 billion.

Kodak filed bankruptcy (chapter 1 1) in 2012 after years of struggling to restructure to adapt to an increasing digital world. Kodak failed not because it missed the digital age. It actually created the first digital camera in 1975. It failed because instead of marketing the new technology, the company held back for fear of hurting its own ash cow film business, even well after digital products were reshaping the market [4]. Digital world not Just changed Kodak, it also changed how we record and keep pieces of our memories. According to memory. Mom, 83% of photos taken in 2011 remained digital. Even though 52% people think that it is important to print digital photos. More and more photos are not kept in photo albums but are shared with friends and family in social media sites and are kept in computer hard drives and other types of storage devices (thumb drive, memory card) and recently on the Cloud provided by numerous providers (Apple, Google, photometer, etc. . 67% people said they share their photos with their friends and families. Technology has drastically changed the way we shop.

More and more people are attracted to online shopping. The e-commerce sales compound annual growth rates from 2012 to 2017 are approximately 57% for China, 44% for India, 21% for Mexico, 14% for US [5]. These statistics include online shopping for both pure play as well as brick-and-mortar models. Instead of standing in line days ahead in a bitter cold weather (for some states) for Black Friday deals, people can get the same deals in the comfort of their arm bed. Technology also changed the way we do banking. More consumers are embracing online banking.

Statistic shows that 81% of people who managed household finance did at least once online banking and 19% of people who use mobile phone banking in the 12 months period [6]. We can deposit check without going too bank. With e-payment, we don't need to carry cash with us. Technology enables convenience but also exposes us to hacker and identity theft. With digital and social media world we live in today, our privacy is at stake. It is extremely hard to keep your privacy private. Most of the sites we go on today require us to give them some piece of personal information or not using their sites.

Some of the information was collected without us knowing about it. Smart phones have location enabled and sent data back to the providers without our knowledge. Applications such as Google, Yelp, etc. , automatically track your where about and automatically tell the whole world exactly where you are at any moment in time. Technology changes are inevitable. The speed of change is getting faster and faster. Managing technology is not simply about chasing after the change, or buying/implementing newest genealogy.

Managing technology is more about recognizing the change early, embracing it, analyzing it, quickly setting direction for the company to adapt or respond to the change, thinking outside the box, and being flexible and ready to change course. Having a clear direction and use technology changes to maximize the company strength may give the company the competitive edge to survive, grow and be successful. For our personal lives, we need to be vigilant to make sure to keep our private information private, safe, and secure to prevent criminals using technology to destroy our financial lives.