



IT/AI Solutions for the Palm Oil Industry

Ivan Teh

Adv Fusionex International Sdn Bhd, Malaysia

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Introduction: The IT Space

The IT space is regarded as to be in the forefront of innovative thinking alongside with other innovative technologies. I am happy to be not giving a lecture but more of a sharing session with you and in an interactive session along the way. Today I would like to share our experience and in what we plan for IR4.0 and the IT technology space in an interactive way and in a friendly fashion. I hope to share some of our insights knowing that all of you are experts in your respective domains in Industry 3.0 at this point of time.

Well, very quickly, Fusionex is an award-winning organization and one of the very few organisations where you can see our presence in Hong Kong, Singapore, Japan and even United States. But we are very much a Malaysian company spanning 15 countries, across United States, across Europe and across Asia-Pacific, as a company with merchandise value transacted at RM11.6bil which is quite a sizeable value. We are one of the key companies featured by Gartner, Bloomberg, Frost & Sullivan, Forbes, Edison, Huntington Post and of course New Straits Times, Star and so forth.

Here are some of our snapshots and some of our clients: we have over 4,100 clients with 3,600 clients in mid-sized companies, a lot of big data with a lot of 4.0 banks and insurance companies, plantation companies, factories and of course manufacturers and so on and so forth.

Now, just a point to give you a perspective of how fast things are moving. In 1969 the supercomputer with a programme of 6 megabytes allowed the man to land on the moon. Today your 4G smart phone with about 256 gigabytes can do much, much more than that huge supercomputer which was the state-of-art at that time.

Similarly, data has seen exponential growth. Previously it was kilobytes, megabytes, and gigabytes and presently our devices are handling terabytes (1×10^{12} bytes). In future the increase will be to petabyte (1×10^{15} bytes), exabyte, zettabyte, yottabyte (1×10^{24} bytes), xenottabyte, shilenobyte, and domengemegrottebyte (1×10^{33} bytes). What comes next may be the end of the world?

Population Numbers of the Present World

If one were to consider the physical populations of the world, it would be China, India, Indonesia or US, etc. In IT perspective as of 2016, the order is China, India, Facebook, TenCent, Alibaba, and US (at 6th position), then Google and Indonesia (8th); this is the new world order in terms of marketing, connectivity and communications. The order in 2018 will have Google as number 1.

"Information is the oil of the 21st century. Analytics is the combustion engine" – Gartner

Current Landscape

The current landscape may be illustrated in Fig 1. The amount of digital data in the universe is growing at an exponential rate, doubling every two years, and changing how we live, play and work in the world. Big Data has changed the world forever. We have close to 8.4 billion connected devices today. By 2021, we would have exceeded 30 billion connected devices to computers and hand-phones.

But how fast is data growing and how have things changed? Fig. 2 shows the number of years of technology devices to reach 50 million uses beginning with the humble radio and ending with Facebook. The rate at which we're generating data is rapidly outpacing

our ability to analyzing them. The main challenge here is to turn these massive data streams from a liability into an asset (from a weakness to a strength).

Wouldn't it be great if you have a crystal ball where you could play back historical data/events and ask the crystal ball what could happen (predictive analytics) and of course seek recommendations (prescriptive analytics) as illustrated in Figs. 3 and 4.

The global landscape is disorientating. There is an eruption of disruptive technologies, meaning change which incumbents cannot deal/cope with. In many geographies and industries, the economies of scale are evaporating because of new players in the market where smaller business owners are more nimble and flexible. To cope with this degree of fluidity and uncertainty, businesses need to strategize, no one can assume that traditional bases of competitive advantage will last.

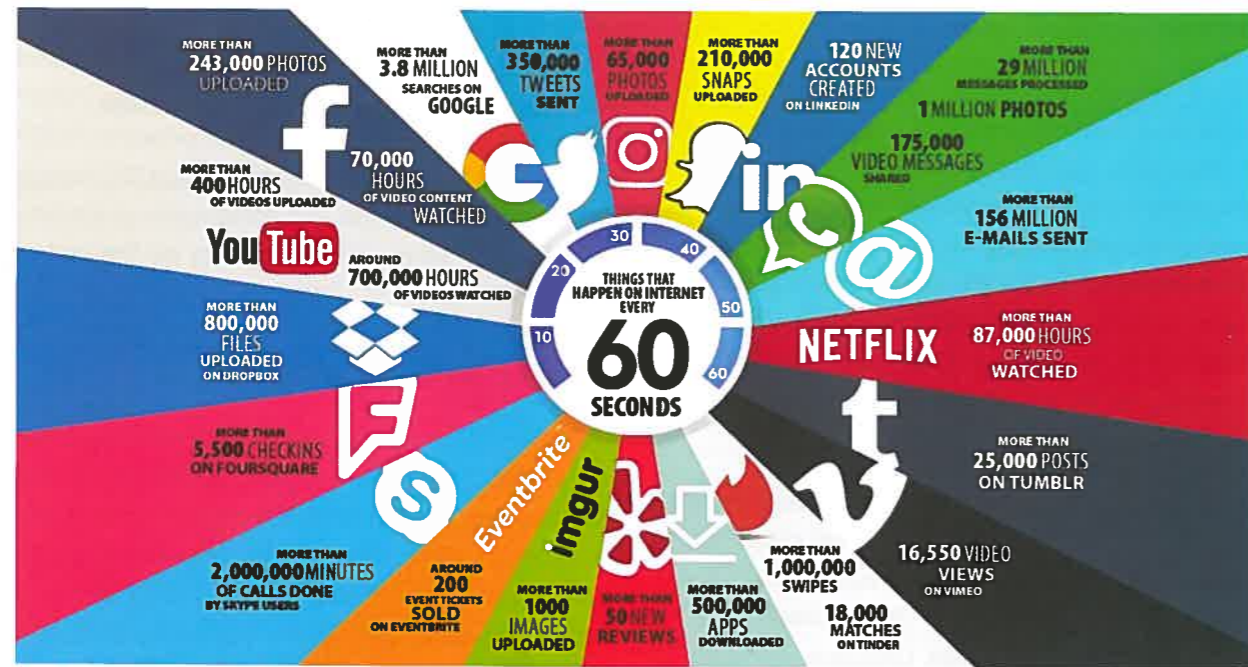


Figure 1. Things that happen on the Internet every 60 seconds

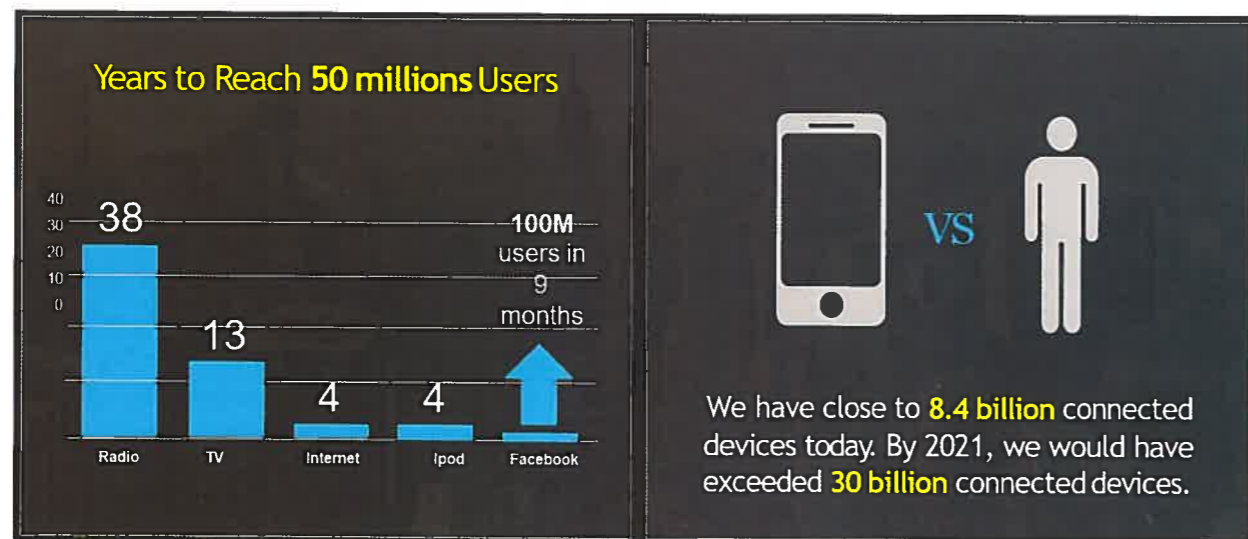


Figure 2. Changes brought about by big data and internet connectivity

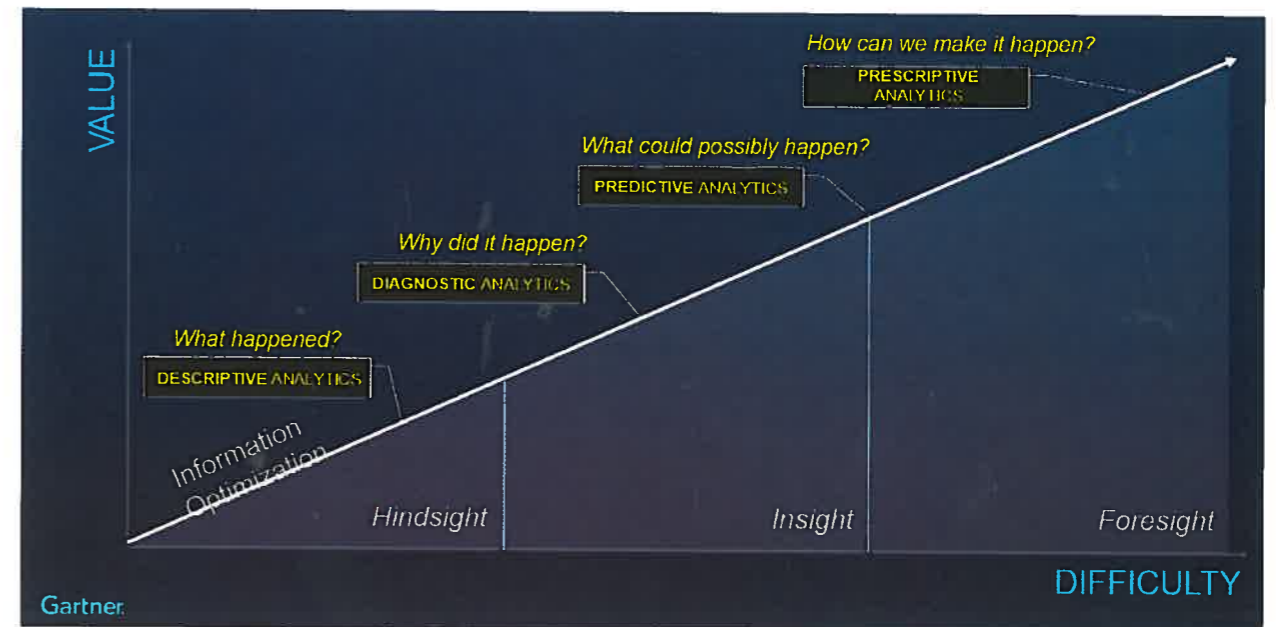


Figure 3. Analytics value escalator and some application of big data analytics



Figure 4. Some applications of big data analytics

Transformation Of The Palm Oil Industry via IR4.0

The four main pillars of the palm oil industry: 1. Plantation, 2. Mill, 3. Sustainability and 4. Markets

Plantation Perspective

- Technology deployment, if used appropriately in plantations can boost CPO production significantly
- Huge disparity between the quality/yield based on tonnes of FFB per hectare (T/Ha) across areas

- What about 'profit per tree' (PPT)? What if we could identify 10% of unhealthy/'underperforming' trees, and forecast many things?

Mill Perspective

- Interoperability and 'Smart Mills' will be key and the way forward!
- Scales, sterilizers, strippers, digesters, presses, clarifiers, decanters and dryers will be interconnected altogether, providing real information

in real time for Mill Managers and/or Process Engineers/Managers

- Intelligent Systems to support engineers to perform better

Sustainability Perspective

- Clean Development Mechanism (CDM), Water Footprint, Carbon Footprint, ISSC, Circular Economy, etc. Unfortunately, most of them have failed due to a 'sanction-based approach'.
- Imagine a simple blockchain powered scan: going back to all the steps of the value chain with related information e.g, type of harvest (manual, mechanized, robotized), environmental abnormalities (i.e. forest fires, biodiversity decline), labour abnormalities (i.e. minors working, unfair contracts), water & carbon footprint (i.e. providing industry and region average and best practices), particulate matter emissions, etc.

Market perspective

- No food processor or palm oil refinery will want to take any chances with palm oil of uncertain origin and hence, end up with a product beautifully displayed on the shelf with low or no sales
- It is a big opportunity for those groups which want to add more value to their commodity (premium), and likewise satisfy the demands of their

buyers who seek to cater more exigent markets. Conversely, those who lag behind might experience commodity price fluctuation and price penalties on their products for lack of quality/transparency/compliance.







Key Problem statements

1. Rising production cost
2. Shortage of labour
3. Unpredictable yield per hectare, oil per hectare
4. Product quality inconsistency, penalties, etc
5. Overly complicated production line, lack of visibility
6. Legal & compliance concerns/environmental issues

Benefits Of Smart Manufacturing To Palm Oil Producers

- ✓ Reduced carbon footprint
- ✓ Optimized manpower requirement
- ✓ Reduced water usage
- ✓ Eliminate use of extreme heat generating from centrifugal systems (decanter, purifier, separator)
- ✓ Improved milling efficiencies & CPO quality
- ✓ Efficient effluent (liquids & solids) handling (short HRT)
- ✓ Environmental friendly & green technologies
- ✓ Optimized production output

Key Takeaways And Our Recommendations

	Build skills and capabilities (either in house or through partners)
	Start building a partner ecosystem. Get advice from experienced partners
	Focus on driving operational efficiencies, with quick wins, tangible value & ROI
	Look at adjacent industries to identify opportunities and potential threats
	Develop a 'flexible, agile' solutions roadmap. Anticipate & expect 'change'.
	Identify the 'neglected', 'un-mined' data. Work on a 'quick-start' program but with a clear roadmap and overall strategy
	Don't wait. Start now, start small, think big with a vision, and scale fast. It doesn't need to be a costly exercise! Partners like Fusionex can help

