CREATING A MARKET FOR TECHNOLOGIES IN THAILAND

By

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We cannot bring technologies into a market if there is no market for technologies in the first place. Therefore, the primary need is to create a technology market – not for the consumer but for businesses.

We could launch the discussion on this with a question: Why wasn't the iPod developed in Thailand? Although it is Thailand that is mentioned, the question is applicable to almost all developing countries. Thailand has all the capabilities necessary to produce something like iPod; in fact, much of the components inside an iPod are made in Thailand or countries like Thailand. The country also has product designing and styling capabilities to make a product like iPod.

That leads to another related question: Why should Thailand develop a product like iPod when it can be bought from Apple? The reason is the bottom line – all of the hardware that go into the iPod, all of which are typically made in Asian countries, cost US$145 (Table 10); Apple takes US$155, although it has not provided any of the hardware. This is an important point to remember: in a creative economy, one gets paid more to create than to manufacture.

Table 10: Pricing and costs of an iPod

Component	Price (US$)
Hard Drive	73.39
Display Module	23.27
Video/Multimedia Processor	8.36
Controller	4.94
Insertion, test, and assembly	3.86
Battery	2.89
Memory ROM	2.37
Back Enclosure	2.30
Mainboard PCB	1.90
Mobile RAM	1.85
Subtotal for 10 most expensive inputs	125.13
All other inputs	19.28
Total cost of all iPod inputs	144.40
Apple Profit	154.60
Retail Price	299.00
(Source: Personal Computing Industry Centre, University of California, Irvine)	

What does Apple do to get that US$155? They did the design, the supplies management, innovation business model and they got its valuable brand; but the most important thing that Apple did is that it created a mass market for good design! Why is this important? Before Apple came along, nobody had thought that electronics should look good, or it should be easy to use or it should come in attractive colours. Apple did that and created a value market. This is the key point of this presentation: creating a market for science and technology (S&T).

How do you create a market? Let us consider two people: Bill Gates and Fred Terman. In the 1970s, when software was something that was included with the hardware for

free, Bill Gates took a stand against free information sharing culture. His words are important: "Hardware must be paid for, but software is something to share. Who cares if the people who worked on it get paid? Is that fair?" He went on to say that this prevents good software from being written: "Who can afford to do professional work for nothing?"

I think this is the state of technology development in Thailand today: researchers are not willing to charge for research and companies are not willing to pay for research. Researchers often view commercialization as contradictory to the value of science. They (and often policymakers) also believe giving away a technology can help more people. The technology, itself, is only one step in the process of creating impact; product development, distribution and other marketing functions must also be "paid" for. But this does not happen. Even large companies always want things for free.

Let us turn to Bill Gates again, around the year 2000. His attention turned to what he calls the "Grand Challenges in Global Health", which focused on 14 major global health challenges to create breakthrough advances for those in the developing world. The goals included developing new vaccines, improving existing vaccines, controlling insect vectors, limiting drug resistance, curing infections and so on. To achieve them, Gates brought together scientists, engineers, public health professionals and entrepreneurs. The effect was that he created a market for curing diseases in the developing world. Suddenly companies, researchers and venture capitalists all became more interested in solving healthcare problems in the developing world.

Fred Terman, an electrical engineer, is the person credited with building up Stanford University as an engineering school and leading it to achieve the name that it has today as a premier engineering education centre. He said: "When we set out to create a community of technical scholars in Silicon Valley, there wasn't much here and the rest of the world looked awfully big. Now a lot of the rest of the world is here." This is the mindset required for market creation.

Once he was determined to move the centre of engineering from the East Coast of the United States to the West Coast (Palo Alto, California), Terman encouraged his students to open companies. William Hewlett and Dave Packard (who co-founded Hewlett-Packard, now one of the world's largest information technology companies) and Charles Litton (who designed and built the first practical glass blowing lathe that revolutionized the vacuum tube industry) were some of those who paid heed to Terman.

He encouraged companies to be near Stanford University by establishing the Stanford Research Park and then encouraged companies to stay linked. For Stanford University students, these moves offered contract research, company employment opportunities, and continuing and professional education.

Some obvious rules for creating a market are:

- Needs sellers and buyers;
- To sell, a seller should feel that he/she is receiving more than the costs;
- To buy, a buyer must feel that he/she is getting more than what he/she is paying; and
- To buy, a buyer must feel that he/she is getting something that cannot be got elsewhere at a lower price.

In other words, "value" has to be created for both buyer and seller.

In a technology market, there are three ways to create value for the customer:[23] help reduce cost (C) through using cheaper materials, more efficient processes, etc.; help sell at a higher price (P); or help sell products in more numbers (Q). However, the challenge is that these three ways are not equal in potential. For instance, P and Q are unlimited. If technologies are developed that would help companies sell products at higher prices or higher numbers, the benefit is unlimited. But C is limited; technologies that help reduce costs have theoretical limits.

Unfortunately, most of the technologies that we work on are for producing at lower costs (C). The orientation is towards becoming a low-cost supplier. This needs to be changed, and we should be looking at technologies that have unlimited benefits (higher P and Q) and therefore more value. Companies should be willing to pay for such research and technologies; that would drive better research, which would ultimately help companies.

At the National Science and Technology Development Agency (NSTDA), we are putting an emphasis on "inventing for impact" so that researchers will look to commercialization of research as impact creation. To link researchers and businesses, we run a series of events such as Lab-to-Market Boot Camp, Idea-to-Product Competition and Techno-preneurship Prizes.

To conclude, value is not intrinsic; it is determined by what somebody is willing to pay. We can increase this value by:

- Making products that are valuable and different;
- Finding the right customers;
- Selling at the right place;
- Making something easy to buy;
- Making something easy to use; and/or
- Lowering the uncertainty of being satisfied.

So, where do we go from here? Thailand and other developing countries could attempt to solve problems "at home". We could pursue things we can be great at, such as:

- Personalized education – developing countries stand to gain the most from personalized education;
- Information for rural people – this would empower rural people as consumers;
- Urban wellness – some of the biggest cities are in Asia, and we could develop expertise in how to live in cities;
- Agricultural expertise – especially organic farming; and
- Language and culture-specific applications – such as software and eco-tourism.

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[23] Companies, not individual consumers.