

Development of BASE Manufacture Game in Thai

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***Abstract** Whilst conserving its educational policy and story of original game (BASE Manufacture Game), we tried to increase the opportunity to utilize it in Thailand from August 2014 to May 2015. Recognizing strong demand from business for education of engineering managers both in universities and industry, changes to make the game easier were introduced. We created a Thai version which tried to reflect Thai business culture. We developed a brand-new “Game Box”, which is packaged to make the game easy to use. We refreshed the following peripheral items; company board, card, machine, worker, and advertising to make it more modern and attractive. We also adjusted sales rules of the original game to be more suited for Thai people such as increasing/ decreasing the capacity of the market, by introducing “Situation Card”. We held try-outs sessions and conducted interviews in order to confirm that while maintaining original traditions, the new design has been merged at high level. It is possible to provide efficient training which is easier for the learner to understand and thus the game culture could then be distributed anywhere required.*

Keywords: *Business game, Board game, BASE manufacture Game, Bidding, Cards*

Authors Hamada, Kaneko and Hiji have developed various kinds of tangible board business games under the BASE Project since 2007 (Hamada et al. (2009, 2013). Hamada, as a faculty member of Graduate School of Information Sciences, Tohoku University, Japan, led the project. He managed some lectures using business games, and sometimes managed “Business Training Camp” or similar events opened to public. Some participants of lectures and events, who have been strongly interested in business game joined the BASE project to continuously upgrade the game (Hiji et al. (2011), Hamada et al. (2014)). So far, the BASE project has created nine different games (Table 1) which has been used publicly.

Table 1: List of BASE business Game

Name	Year	Main Author	Co-authors
Hospital	2007	Hamada R.	Abe T., Chiba D., Nagai H., Morimoto Y., et al.
Manufacture	2008	Hamada R.	Abe T., Ikeda T., Miyashita K., Sasaki T.
Software Creation	2009	Toma K.	Hamada R., Miyashita K., Sato Y., Hiji M.
Manufacture for Large Lecture Hall	2011	Hamada R.	Onodera K., Kumamoto M., Nirophar B., et al.
Supply Chain Collaboration	2011	Kaneko T.	Hamada R., Chawalit J., Hiji M.
Medical Device Delivery Service I	2011	Fukuoka M.	Hamada R., Okutsu T.
Supply Chain Collaboration II	2012	Kaneko T.	Hamada. R, Hiji M.
Fishery Industry	2013	Hamada R.	
Medical Device Delivery Service II	2013	Kaneko T.	Hamada R.
Video Game Industry	2013	Hamada R.	Okuta R., Toma K., Morita M., et al.

Hamada has been appointed as a visiting professor at Sirindhorn International Institute of Technology (SIIT), Thammasat University, Thailand, since 2010. We started our development and education both in Japan and Thailand. On July 2014, Hamada

changed his affiliation from Tohoku University to SIIT permanently. Hamada started two research projects on business games with Thai students. The Sakura project, with four senior students of SIIT, was one of them. This paper details its progress from August 2014 to April 2015 in SIIT.

The main objective of the Sakura Project is to introduce a revise and improvement of one of BASE manufacture game, as an educational tool for future managers in Thailand both in universities and firms.

There are many Thai employees on a queue of promotions to manager class. Recently, roles in companies have become separated vertically, and it is difficult to learn whole system of his/her company, especially for a professional in one specified skill or technique. However, it is true that without a “president’s point-of-views” of company procedures a an employee cannot be promoted by the president to senior manager status

Business game can solve this problem effectively. The game should be a new experience for the employees that play it. It is designed, to let the employee experience the responsibilities of a manager. This game will put the player in a seat of a virtual firm’s manager that needs to manage everything in the firm including hiring employees, manufacturing the product, and selling the product in the market place.

However, we had only Japanese version and English version and based on common ideas of manufacturing. These versions are perceived as difficult for most learners. Executives might hesitate to apply a pure English based seminar to employees. The opportunity to learn in mother tongue should be facilitated in order to allow rapid progress by students. Localization is the most important idea of Sakura Project.

Renovation is the second important idea of Sakura Project. To achieve rapid uptake, we decided to repackage our work, and rebuilt peripheral items. We decided to create “A game box” (30cm x 30cm x 30cm) to store all items to manage items effectively, and

make it possible for the game to be delivered anywhere that business education is required.

A realistic reflection of reality is the third important idea of Sakura Project. The Sakura project also paid attention to making the BASE manufacture game reflect Thai business culture. During translation and new design, we reviewed events, especially for specific happenings in this country. To include characteristics of Thai market, we developed “Flexible Market System” which made the game more competitive and fun throughout the cycle of turns and make learners feel on edge in the selling turn.

BASE Manufacture Game

The educational policy of the new game has been mostly maintained as original game as follows.

Concepts

- 1) The primary target audience is students of engineering, who have learnt basic ideas of manufacture. However, we design the game to be able to apply for people working in industry actually.
- 2) Purpose: Learners will be gained a president’s point-of-view.
 - a) Understand the basics of manufacturing
 - b) Understand sales activity
 - c) Understand basic of accounting
 - d) Understand the effects of risk and uncertainty on manufacturing and markets
- 3) Avoid adding complicated rules or exceptions to rules.
- 4) The level of goal should be flexible dependent on the purpose.
- 5) Make learners relax and enjoy the game.
- 6) Minimalize commission of teacher. Encourage learner’s awareness throughout the process of the game.

Young engineering students do not like difficult studies based on books. Teaching style may negatively influence students who subsequently avoid learning business. Traditional and

conventional lecture of management takes long time and is difficult. So we preferred a business game, because it is easy and fun. Feeling fun should be important for beginner level learner.

Features

BASE business game series is based around a tabletop game format (Except Video Game Industry Version). Manufacture game is the combination of wooden frame company board and market board, and cards. Figure 1 is the photograph of whole set of BASE manufacture games. There are four companies called (Red, Green, Blue, and Yellow) around the table. All companies are operated by two or three student groups (Company). The company is designed as a combination of factory and office. Machines, Materials, Men, and some optional pins are set on the board.

Each company has a paper, pencil, eraser and calculator to manage operation and accounting. Toward the center of table, there are five Markets (Town A to E). Companies bid in each market. There is a timer to control bidding. On the center, there are sets of "Action Card" turned inside out.

It is a tradition of BASE business games to form a group to manage company and disclose any information to rivals. If a question has been raised, student has to answer the truth. This rule improves its transparency, make a relaxed atmosphere, and increase communication of students.

Figure 1: Whole Set of BASE manufacture game



Playing process

Students form a team (company). They purchase machines, materials, hire engineers, and start manufacturing. They can sell their products every three months. They hire salespersons who go to the Market (Town A to E) to sell their products in a competitive environment. On the other hand, they have some options like research and development, advertising, insurance, quality control, developing new supplier. Every end-of-year, they have to recalculate cash amount, make up Profit and Loss statements, and a Balance Sheet. The company which has the highest retained earnings at the end is the winner. We admit the idea of months and years in this game. Students can take one action every month. Students usually play four year sessions during 16 hour lecture courses.

Initiation

Two to three students form teams and manage a company. Each team must choose a CEO and CFO. They receive a share capital (300,000 USD) and establish their company, which produces something. The CFO records share capital as income. From the second year, there are no additional capital stocks. However, they can borrow money from the bank, based on their business strategy.

Companies whose last year's result was surplus, they have to pay tax in this period.

Monthly process

We show monthly operations in Figure 2.

Figure 2: Monthly Operations of BASE manufacture game



1. The CEO draws “Action Card”. 80% of action cards provide usual business opportunity and 20% is happening.
2. The CEO makes a decision from the following:
 - 1) To buy new materials
 - 2) To compile existing material for the products
3. The CFO calculates material cost or manufacturing cost.
4. The CEO decides management action.
 - 1) To hire new engineers or salespersons
 - 2) To buy new machinery
 - 3) Finance
 - 4) Other optional actions (Research and development, advertisement et seq.)
5. The CFO calculates all expenses and withdraws total expense from the cash at the end of last month.

Most students start their company with one engineer, one machine, and one salesperson. They usually purchase machines on the first month. On the second month, they hire engineer. On the third month, they buy materials. On the fourth month, they start manufacturing. It takes two months to finish manufacturing. The first sale is available at the end of the sixth month. Their cash reserves were quickly reduced and students were forced to fear of cash shortages.

Sales process (Bidding)

Sales periods are not included in monthly operations. Sales opportunity is reserved every three months, and price will be decided by face to face bidding. If we start the game from January, we have bidding session on March, June, September, and December. Students put items within limited time, and decide its price. Following the guidance of bidding master, they disclose their price, and number of sales and prices would be determined.

After the first sale, they learn the basic operation; start to read the manual carefully and establish their own business strategies. They extend their business and increase surplus until the total number of customers is below the capability of manufacturing in three months. Once the market become full, they invest on research and development or on advertising. The average price will gradually decrease. Sometimes it becomes lower than breakeven. However, they can't stop selling to maintain the company. Throughout there is serious price competition on the same products, they will realize the meaning of "innovation".

Closing process, accounting

At the end of year, the CFO must finish following work.

- 1) Reconfirms all revenues and expenses.
- 2) Checks amount of cash.
- 3) Compiles P/L and B/S.

We do not use computers in the calculation process. The purpose is to make students learn the strict requirements of correct numbers in business. After confirming all companies have finished calculations, we can proceed to the next year. In case we need, the teacher provides some comments and tips.

BASE Manufacture Game (Thai Version)

We started Sakura Project from enjoying existing game in September 2014. At the beginning of the days, we simply enjoyed original games. Students are all Thai, and claimed some difference of original game and Thai business culture. We pointed out three key ideas to improve the original game:

- 1) Localization: If we aim to share wonderful experience, there is an unavoidable need to create a Thai version. We should also pay attention to reflect Thai business culture.
- 2) Renovation: The oldest set is created in 2008 and never been updated fundamentally. We considered that this is a good timing to try new design based on Thai people's sense, and to improve mobility.
- 3) Improvement of sales rules: In present game, there are only five markets and the total number of sales does not exceed 24 per one bidding session. However, innovation sometimes creates new markets, and volume of the existing market should be more flexible.

Localization (Translation into Thai)

We translated the cards so that Thai people can easily play this game thus focusing only on Thai people. This will make things easier to understand for Thai people especially when we are pitching this idea to a Thai firm, for those who are familiar with English they can play the English version but if some of the employee are not educated enough to know English, they need to use these translated cards, it will be very helpful for them and for them to play this game.

We carefully selected topics of happening cards (Figure 3) which are common in Thai Business. For example, currency depreciation, inflation, or political confusion has been introduced. Translation is only on cards. Indications of company board are quite easy to understand, and omitted to be translated.

Figure 3: Image of Thai Cards



We also redesigned the back cover of the action card to make it more appealing and exciting to draw as well as correct errors in original cards (Figure 4).

Figure 5: Redesigned Action Card (Left) and Present version (Right)



Renovation

In Original version, all items were all made of woods. BASE manufacture game needs to move around a lot of pieces on a small company board, and students often caused falling off incidents, or missing items. In terms of management of business game as equipment, it was difficult to control exact number of items in different sets. So we decided to redesign every item - Company boards, Material, Worker (into human figure) - to put a magnet on most items to improve operational convenience, and decided to create a box to store these items effectively.

1) Company Board and Market Board

On the first layer, we used wood for the base of the board. On the second layer, we put magnet in order to manage items

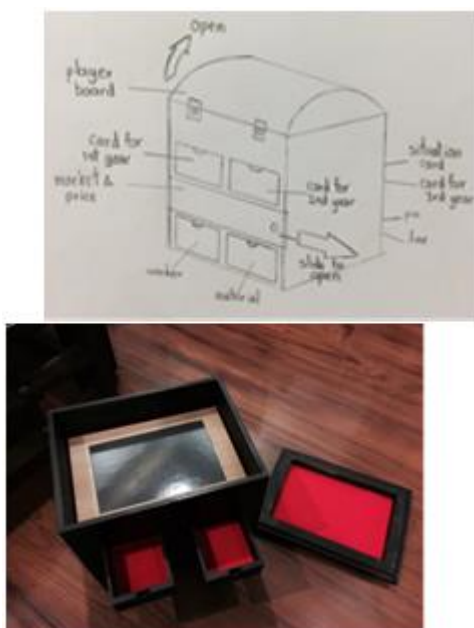
conveniently. We put designed paper on top of the magnet and laminate. For the last layer, we put the wood on top it to protect the second layer. All of woods need to be lacquer so the play boards can be waterproof.

2) Improvement of Packaging

Packaging is one of the most important factors for providing players a strong initial impression and subsequent interest. The original version does not have idea to bind all items in one package. A suitcase was used to carry two or three sets of games. In the new design, there are four stories with the inside of velvet. First story, we put in the company boards. Second story, we put in cards for each stage. Third story we put in the market and the prices. Fourth story we put in the items, machines, materials, pins, and workers. Curve Japanese design/pattern on the bento's lid for beauty and remind of the Japanese style. Bento box will made of wood with the colors of black and gold. With this redesign, it makes the game more attractive to the players that are going to play and make it more valuable encouraging students to keep it and nurture it. Finally we made a package which is very efficient for storage of every component, including the player board and other big components.

We have four drawers which would contain things like the representatives for workers, engineers, 1 production lines etc. so that they don't get mixed up with each other and we don't have to carry a separated box of containers that contain every representative like before. Now we can carry only one box and you can set up the game anywhere anytime.

Figure 6: Game Box (concept design (Left) and its package (Right))

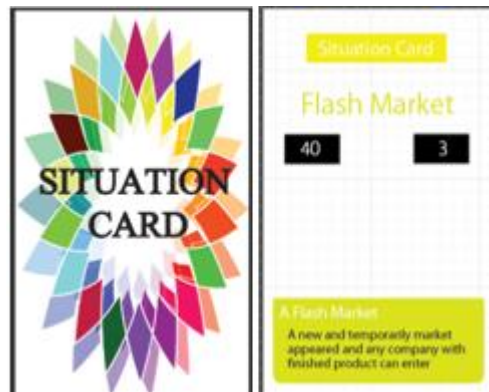


A realistic reflection of reality; Flexible Market System

Many Thai students complained that bidding is too severe and felt discomfort on perfectly controlled “markets”. Thus, we introduced new rules called “Flexible Market System” and “Situation Card” on sales period to reflect Thai business culture more effectively (Figure 6).

The first player has to pick situation card at the beginning of sales period. It will open a new market, increase some market capacity, or reduce market space, in order to increase more challenge and surprise for the students. They will need to plan carefully for their move in the market otherwise they may lose profit. Applying careful planning by instructor, we can create a very competitive environment depending on the situation that the market is in; it is one of our main objectives to make students to learn “risks and uncertainty of markets”.

Figure 7: Example of Situation card



We also revised the rules of bidding. The most important change is time limitation. According to the present rules, bidding master set market time to 2 minutes. It is quite long and it gives too much opportunity for the player to think in the 2 minutes. If we decrease time down to 1 min player won't have time to think about the risk they need to act before others do so this will be the main event for the sale period. It will create a very 'on-edge' feeling for player to be able to think on their toe and come up with a strategy to beat other players in this time limit.

Evaluations

We completed development on May 2015, and aim to seek possibility of the game especially in mid-class firms. We offered two company owners the chance to try out BASE manufacture Game to investigate possibility of use.

- 1) Mrs. Sirima Boonyunurak , Owner of Novatex, a manufacturing company focuses on chemical for textiles:

“At first, I thought how a ‘Game’ will help or motivate any of the employees in any cases at all but this game is different from what I have in mind. It is a very useful game to be able to teach and have fun at the same time for the staff, this game can teach a lot of things to the staff especially the ones that are not fully aware or understand how hard it is to be a manager and have to manage

everything in the business from hiring employees to distributing the finished goods to the customers and retailers. At first the game was quite complicated but when we start to understand the main concept of the game and the rules, it is an enjoyable and informative experience. The game itself is very competitive especially when we have to compete with other players in the selling period. The game have a good grasp on the reality of being a manager in a manufacture firm, if the employees play this game correctly and strictly follow the rule of the game, I think it will alter their perspective of the manager for them, because they can experience, even just a little, the pressure and the responsibility to be a manager, and the employees can start to see how a manager feels like and maybe it will be a motivator for them to climb up to be a manager one day. So in conclusion, I am sure that it will be worthwhile for the employee in my firm to play the Manufacture, but only when they have leisure time of course”.

- 2) Ms. Rungnapa Chumprom, owner of Amata Garment Factory, one of the biggest women laced blouse manufacturer in Thailand stated:

“At first I was skeptical of the idea of teaching the staff and employees with ‘Game’, because the concept of games in the world is only to have fun and I can’t see how a game can teach or let the employees experience anything useful other than an enjoyable experience. But when I tried this game, it was different. The game itself is very deep in the detail of an actual firm and how a manager feels. That is a very important perspective that an employee in every manufacture firm needs to know so they can motivate themselves to work harder to climb up the organizational structure or just simply know how difficult it is to be a top manager that runs a business. It is very useful to the point that some of my employees come to ask me after I played the game that is it really that difficult to be a manager? And they started to think that if they want to be a successful manager they should start working hard and find something new to learn every day in order to be a manager. I agree that this game is very educational to the employee and let them experience something very hard to find these days especially with a big firm like ours, it is very hard to let them sit in a manager chair and experience it hands on, this is where this game comes in. With

the balance sheet included, I myself need to get a hang of it because Amata Garment Factory is a very old-fashioned firm that do everything manual and traditional so we never experience any real balance sheet before and it have sparkled my knowledge that maybe we can use the balance sheet in our firm? That is something from the game. Lastly I want to recommend this game to all manufacture firms out there which they need their employees to experience the 'Manager's Seat' and let them be motivated, educated and yes, have fun at the same time."

We got very positive feedback from our test panel. They seems to have fixed idea on "game" as a kind entertainment or recreational activity, and lack the idea that game is common tool to learn. After they took a look and tried out in short exercises, it is commonly recognized that business game might be a good tool for employee's training. It must be raised from good balance between solid tradition of BASE games and high quality renovation. The tradition of BASE manufacture game are conserved, and it is ensured to proceed to next step in Thai business culture.

Conclusion

The purpose of the Sakura project is to improve the existing game and make it more attractive, more efficient and have more impact to the players playing this game in Thailand. We decided to make this game more competitive and not focusing too much on learning only, but applied gaming method that we can learn new things of the manager position by having fun and compete with your colleague or friends.

Reconsidering the largest reason we preferred this project is to help employees in Thailand understand "Manufacture Business" as a whole not just the work they assigned to do, they'll understand and learn how to be a good General Manager through this game. Based on this belief, we established three major policies, and worked mostly on tangible dimension. By interviews, we recognized that many people in Thailand consider that games are just entertainment or a waste of time. To develop a common understanding that gaming is an effective way to learn is an important role of the university. We have to testify its effectiveness in next project. Then, we can develop a game even more and make it capable with other type of firms, not just manufacturing.

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