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Product Planning and Design education for Creative Industry development[1]

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Abstract

In recent argument to develop middle-income countries in Southeast Asian region, improvement of creative industry is insensibly discussed, which is a relevant idea to cope with problems such as, middle-income trap and increasing wages. To accomplish creative industry development, it is thought to be necessary to enhance capacity for product planning and design, in this regards, incubation program for specialized human resource should be described.

In this study, focusing on Thailand, educational curriculum for human resource to deal with product planning and design processes are mainly discussed, appropriate model is tried to be figured out. For methodologies, in combination with theoretical approach, results of questionnaire survey to evaluate product planning idea were mainly referred, original program was suggested.

As results, it is found that mushing up marketing survey and value engineering is effective, oppositely, decreasing design-related education is recommended.

1. Introduction

Middle income countries like Thailand have been achieving economic growth through successful experience in industrialization, but governments are currently eager to upgrade their industrial sector by enhancing creative industry. This perspective is crucial for middle income counties to escape from ‘middle income trap’, which is mainly caused by labor shortage and increasing wage. In this point of view, creative industry can contribute those economies in increasing value-added with limited resources. Because, creative industry is usually defined as knowledge-intensive industries, input of those are intangible goods such as, high-end technology, sophisticated ideas or design, which is usually brought by small number of skilled human resources. It will also contribute to improve productivities as a whole economic level. Among industrial sectors, art industry, media industry, software industry or design-oriented manufacturing are sort of it, to expand those economic activities, there must be essential needs to provide different types industrial policies and human resource development program, if we compare to the past period when those middle income countries had been promoting capital intensive industries. Human resource for creative industry will be demanded in various fields and processes, widely spread, but this study is trying to put main focus on product planning and design, since it is thought to be main actors to upgrade

manufacturing value-added and to enhance upper stream in manufacturing process for middle income economy.

In this study, Thailand is mainly taken as a case, current policies regarding creative industry development is reviewed, based on the idea, appropriate human resource program limited for product planning and design will be recommended. Methodologies to describe educational program, analyses depend upon experimental trial by using original questionnaire survey to professionals in product planning and design. To conduct usable survey, students belong to author's laboratory has developed product planning and design works on BOP (Basement of Pyramid) products and has presented those at exhibitions, namely Tokyo Designers Week 2012. Then, visitors of our booth have evaluated student works in line with questionnaire, which was designed to figure out focal points to create product planning and design idea.

In Thai, Ministry of Industry is sparing efforts for creative industry development to strengthen industrial structure, and Ministry of Commerce is interested in the industries for export promotion. Additionally, Office of Prime Minister is also supporting such perspectives explained above, the word 'creative' is adopted 46 times in the 11th National Economic and Social Development Plan, currently in the process[3]. This shows the trend of current Thai economic policy that they are eager to improve efficiency in industrial activities. Confirming manufacturing sectors today, many firms, even local capitals, are trying to expand their capability extend to product planning and design. In case of automotive industry, car producers, mainly Japanese OEMs such as TOYOTA, HONDA and YAMAHA, are recently establishing R&D center in Thai, which means technology transfer in product development process is in transitions. Thus, there must be increasing needs to specialized human resource for product planning, design and development. Those facts can emphasize needs to this study.

This paper is composed with 5 chapters, definition and present situation of the Thai creative industry are discussed in second chapter. And concept and analytical method to describe specialized program is explained in third chapter, then results of experimental trial is demonstrated in fourth chapter. Fifth chapter is a conclusion of this paper.

2. Definition and effects of creative industry in developing economies[4]

2.1. Framework of Creative industry

In this section, potential of creative industries especially as a strategic export goods is explained through some export statistics. And definition of creative industry is also discussed.

Basic framework of creative industry is firstly defined in UK, then spread around European regions, each country has selected different industrial sectors in line with their strength and interests. And it should be noted that Howkins (2001) has firstly defined creative industry and its effectiveness as industrial development strategies, governments were influenced by it. In UK, Newbigin (2010) is setting framework to encourage creative and cultural economy, policy recommendation and business modeling for creative industry is explained, but education for specialized human resource that this paper try to discuss intensively, is not written very much. In recent years, United Nations is monitoring

development transition at fixed intervals. (United Nations, 2008, 2010) Those report is emphasizing economic impact to developing economies, strategies for human resource is not fixed yet. In some case studies, like United Nations (2011a), they are simply discussing how to upgrade education at Art College and putting limited focus on art and design curriculum, lack of comprehensive education necessary for creative industry. Thus, it can be said that industrial framework is almost fixed in previous studies, but education and training method for specialized human resource is still in the process, where this study is trying to contribute.

Although several organizations are settling variety industrial sectors in different manners, typical industrial sectors categorized as creative industry are mainly 13 sectors, listed as follows[5].

1. Architecture
2. Audio-visual (film, TV, radio)
3. Performing arts
4. Libraries
5. Design
6. Art market
7. Publishing
8. Fashion
9. Software / multimedia
10. Museums / cultural heritage
11. Music
12. Crafts
13. Advertising

Considering each characteristics, it is not difficult to acknowledge those as creative economic activities. Like UNCTAD (2008) clearly explains framework, human capital is taking a basis, combination of structural or institutional capital, social capital and cultural capital are resource of creative goods and services, listed 13 industries are definitely within the range. Among those industrial types, Thai government is appointing 7 sectors out of 13, those are 2, 5, 7, 8, 9, 10 and 12. In addition to developing modern sectors, they are planning to utilize cultural capital, which is quite feasible in terms that abundant capital should be fully used to take comparative advantage as developing economies.

Among UN agencies, UNCTAD is approaching to creative industry as strategic export goods, they are providing statistics on creative economy concentrating to trade related information. It must be useful data, since many countries are supporting creative industry under export promotion policy, [6] and UNCTAD data is adopted to analyze potential in this paper.

In recent decades, export of creative goods in the world is enormously increasing in, it has performed average 10.0% of growth, from 198 billion (2002) to 454 billion US$ (2011). It is noteworthy that export amount has quickly recovered even after the recession in 2009. Comparing exports from developed and developing economies, export from developing economies has increased in 145.9% from 2002 to 2011, which is extremely larger than that of

developed economies (80.7%), effects of expansion in creative goods transactions are more contributing to developing economies.[7] In the same period, average growth of developing economies is about 10.8%, and average growth of developed economies is about 7.3%. This means, export promotion for creative goods is functioning more in developing economies.

Among UNCTAD classifications, 11 crucial sectors are picked up, variety of sectors are holding certain amount of shares, in case of 2011, although Interior (17.84%) and Jewelry (17.48%) are top two sectors, Fashion (14.11%), New media (12.99%) Publishing (15.12%) and Visual arts (9.72%) are also keeping relative amount of shares. Differently, in developing economies, share of Jewelry is the largest, which is 35.81% in 2011 and more than doubled from 2002.[8] But we have to be careful to the fact that fashion (15.34%), Interior (11.80%) and Toys (10.57%) are taking larger share, even though highly ranked sectors are similar to developed economies, there is a possibility that manufacturing (assembling) processes of those sectors are simply transferred to developing economies and the amount of export has naturally increased. If it is true, increasing in creative goods export does not always prove the increasing 'creativities' of developing nations, to reconfirm it, we have to seek for evidences that creative value-added process such as, designing, drawing or planning are really processed in developing economies. Thus, from export-related information, it is unclear to say that 'creativities' has been already expanding in developing economies. But it can be said that upper processes are gradually transferred to developing economies along with production size, at least, amount of output can support potentials that the creative value-added could be implemented and conducted in near future, if it has not been available up to present moment.

Figure 1. is trying to define creative industry that is consisted with various spices of industrial sectors. This chart is mapping typical industrial type in relation to capital-labor ratio (K/L) and labor productivities (X/L). In our general understandings, during the long term transition of industrial development, industrial economy has succeeded to improve productivity by increasing capital-labor ratio, it is a transition from labor intensive industry to capital intensive industry.

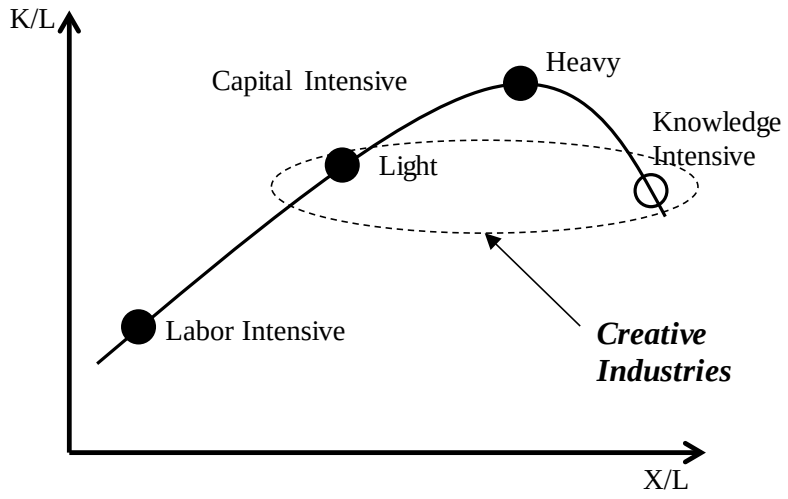

Figure 1. Positioning of creative industry
Source: by author

Thailand also accomplished to transform their main industrial sector by shifting it from labor intensive industry to capital intensive industry in line with principle. Moreover, the economy is becoming larger (K/L) and more efficient (X/L) by having Heavy industry, it is necessary for continuous growth under shortage of labor force caused by economic growth.

On the other hand, accounting for characteristics of creative industry, which can be summarized as knowledge intensive type, capital-labor ratio (K/L) could be smaller than Heavy industries, because it is heavily depend on human skills rather than capital input. And the fact that smaller number of knowledgeable labor bring about larger output in efficient way, labor productivities is projected to be larger than capital intensive industries. And it should be noted that there are creative industries exiting that productivity is smaller than Heavy industry but capital input can be reasonable. In this type of creative industry, we can imagine compact business by designers, which is not invested a lot and operated by few staffs, however productivity is better than labor intensive industry due to better value-added by design/knowledge.

Having said that, creative industry can be launched by smaller capital, which is adoptable for developing economies facing to capital scarce.[9] It is also advocating middle-income countries forced to provide against labor shortages and increasing labor costs, reforming economic structure by enlarging share in creative industry is effective formation to sustain economic growth.

2.2. Case of Thailand

In this section, potentials of the Thai creative industry will be reviewed by statistics, then, projected and ongoing policies to encourage creative industry by the Thai government is reviewed.

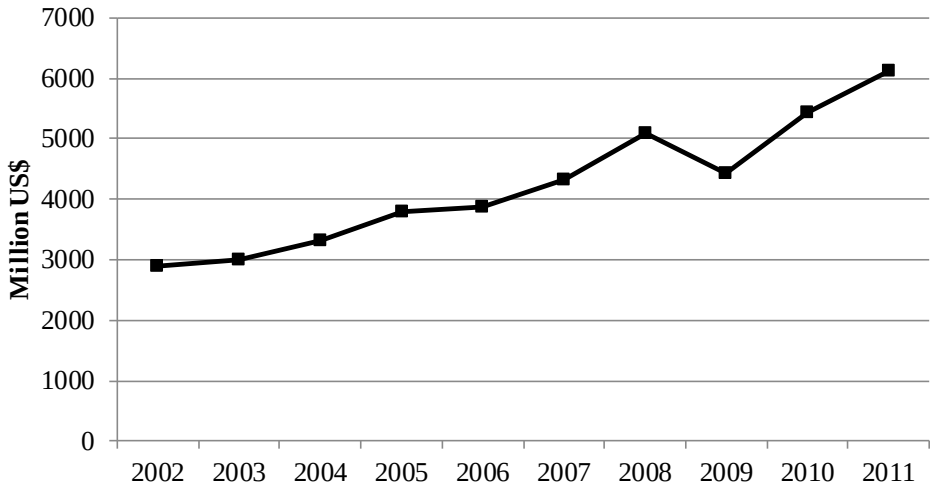

Figure 2. Export of creative goods, Thailand
Source: UNCTAD web, statistics on creative products

Figure 2. is explaining rapid growth in the Thai export for creative goods, which has increased from 2.8 billion to 6.1 billion US$ in 10 years.[10] From 2002 to 2011, before launching creative industry policy, it has grown up in average 9.14%, it is quite rapid if we are considering its macroeconomic growth in the same period, even it is smaller than average growth of total developing economies (was 10.08% in the same period). In recent three years from 2009 to 2011, it is currently growing with 17.58% growth rate in average, it is after the period of world recession.

To know contributions of various industrial sectors, Figure 3. and 4. are displaying export amount by the share to total world exports. Detailed Data also support us to reconfirm presences and comparative advantages in the world market. As in Figure 3., unfortunately, total export is losing its presence a little bit, which is from 1.46% in 2002 to 1.35% in 2011. But Paperware industry sector (1.43% to 3.84%) and Film industry sector (0.50% to 7.88%) increased in very well. Paperware industry sector was exporting 0.81 million US$ (2002), and increased to 2.66 million US$ (2011), remarked 18.41% in average growth rate. Film industry sector developed from 2.26 million (2002) to 38.74 million US$ (2011) with average growth rate of 44.0%.[11] Those are still small amount in the market, but in terms of presence in global market, those sector can be candidates to give preferential treatment in development policy. As far Film industry sector, its growth is recognized as consequences of promotional activities by the Thai government.

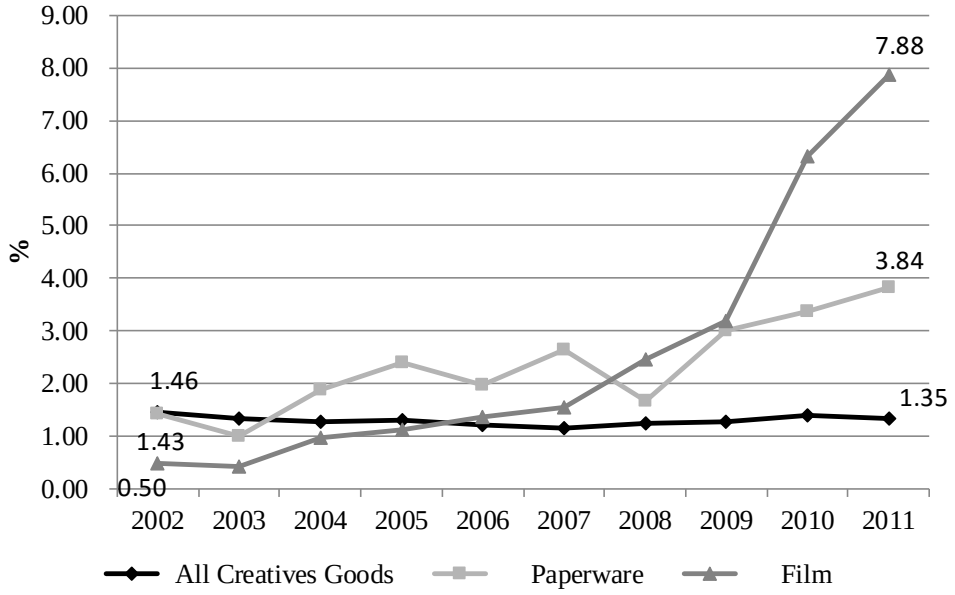

Figure 3. Export of creative goods, Thailand (% to total world)
Source: UNCTAD web, statistics on creative products

Oppositely, as in Figure 4., Fashion, Interior and Toys industry sectors have been decreasing presences to the world. As far Fashion industry sector, it has once declined to 203 million US$ from its 308 million in 2002, then gained up to 303 million in 2011. During the period, share to total export from Thailand has declined from 10.66 to 4.95%. Interior industry sector, it was formally one of leading industries highly accepted in global level, once increased in 1,051 million US$ from 902 million in 2002, but declined to 926 million in 2011, accordingly, share in total Thai creative economy changed from 10.66 to 4.95%. Toys industry sectors has sharply declined from 221 million to 206 million US$ from 2002 to 2011, share in Thai also decreased from 7.64 to 3.36%.

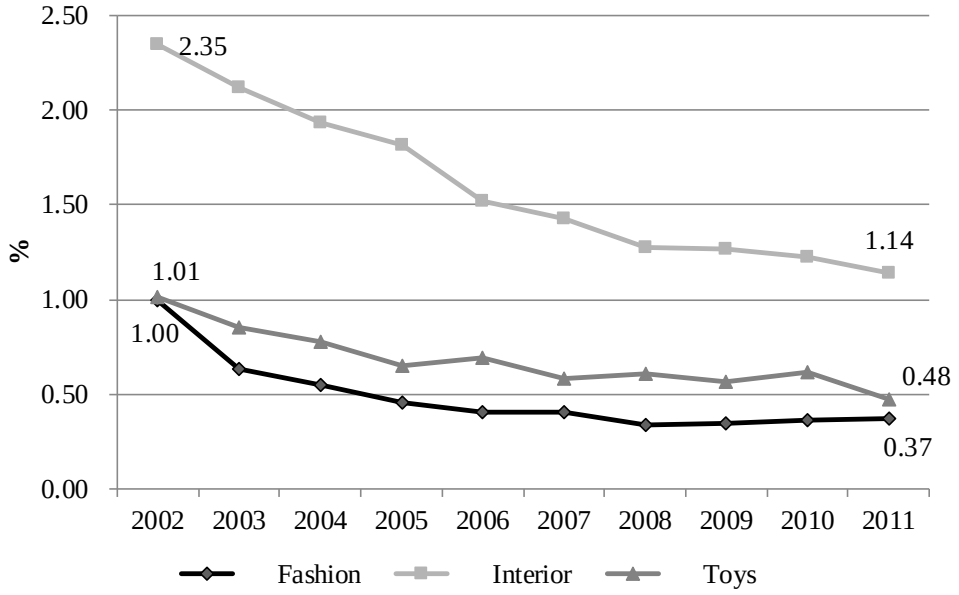

Figure 4. Export of creative goods, Thailand (% to total world)
Source: UNCTAD web, statistics on creative products

Creative industry development policy in Thailand, a comprehensive framework, has just launched in recent years. Bhatiasevi and Dutot (2014) explains Thai development strategy very clear by comparing it to Canadian case. In Figure 5., framework of their strategy is summarized, which is mainly driven by Ministry of Industry. As discussed in the previous section, the Thai government has selected 8 sectors for targeting activities, and 13 industrial sectors and 2 sectors are defined as related economic activities. To promote those industry, Ministry of Industry has provided 6 commitments. Commitment 1 is to strengthen capabilities of related human resource in Thai, it is a basement to attract creative industry known as knowledge-intensive activities. If the program will be designed with involvement of capacity development for creativity, not only technological skill training, educated human resource will be a future potential for Thai creative industry in the long run. Learning from experience in UK, spreading creative economy to regions will cope with regional economic development and cultural industry could be developed through supports.

Commitment 4, 5 and 6 in Figure 5. will support creative industry in present by providing infrastructure to grow up. Like in Commitment 3, government are apt to think such a marketing support is sufficient to increase business and its export amount, but capacity development should be proceeded in advance to raise attractive qualities of the industry. In the case of Thai government, most of provisions are projected to do so, this strategy can be highly evaluated as a productive support from public sector.

Reviewing this policy, selected industrial sectors are general industries already existing in Thai economy. If we expect creative industry as more ‘design-oriented works’, those are giving different images to us, likewise, any new economic activities were hardly

explored in this perspective. In describing creative economic activities, we apt to think that sophisticated person create some design-oriented products and sold in a high sense retail. But in macroeconomic level, remaking sufficient amount of output just by attracting artistic, styling or designing elements is too wishful. Thus, it should be understood that Thai government is taking realistic approach to improve ongoing economic activities for creative industry development.

Figure 5. Creative industry development policy in Thailand
Source: Ministry of Industry, Thailand

3. Development of specialized curriculum for product planning and design

3.1 Concept of the curriculum

In the last chapter, definition of creative industry and government policy are reviewed. In response to the discussion, essential knowledge to deal with creative industry in the process of product planning and design will be discussed in this chapter.

It is often said that improving creativity is essential for creative industry, so design related subject, capable to develop their imagination, should be thought to improve creativity. But, reconfirming product planning and design process in manufacturing sector, professionals are not creating and fixing output according to their creative talent. They are more depending upon marketing survey, trend survey, and continuous improvement to current

products. Their activities are also suffered by managerial constrains, such as costs, scheduling or production capabilities. Having said that, understanding in marketing, management and production process must be necessary conditions to be a good product planner and designer.[12] So to speak, creative human resource in creative industry should not behave as an artist, but required to work according to market demand and preferred to output feasible idea from production perspectives.

Marcella and Rowley (2015) is also suggesting eligibility of adopting project management tools to improve creative industry. Even though professionals in creative sectors are heavily depend upon their creativities in the business, analytical mindsets are demanded for creative professionals in idea management and project management. This Findings also support ideas to involve management-related subject for product planning education.

As results of discussion above, this study tries to develop curriculum in combination with, marketing research, concept making, design study and production engineering. Idea to combine various subject for the curriculum, which is according to the idea of Veselá and Klimová (2014). They are resulting that interconnectivity of artistic, economic and legal fields with the study of foreign languages must be supportive to supply necessary human resource.

3.2 Model

In line with concept shown in the last section, this study will define that quality of product planning and design (TOL) is defined by concept make (CPT), marketing strategy (MKT), needs survey (SUR) derived from marketing survey, design (DEG) and consideration to production process (PRD) to guarantee its feasibility, the model can be formulated as below.

$$\mathrm{Tol} = \mathrm{f}(\mathrm{c}, \mathrm{Cpt}, \mathrm{Mkt}, \mathrm{Sur}, \mathrm{Deg}, \mathrm{Prd})$$

To be able to estimate the model above, necessary data was tried to collect by experimental trial, which is processed as follows. Firstly, students belong to author's laboratory experienced product planning and design works, finalized output was provided as materials for experiment. To increase accountability, assignment was fixed as development of BOP products, it has contributed to keep similar environment to carry out planning and designing in developing economies. Secondly, five product planning and design works were presented in 'Tokyo Designers Week' held in October 29th until November 4th 2012. The event is famous among planners and designers in Japan, location and opportunity is suitable to conduct this experiment. As in Figure 6., each works was summarized in one board, contents of which were naming, concept sentence, explanation of specifications, results of demand survey, suggestion of lifestyle with new product, and styling. Thirdly, questionnaire sheet was designed to evaluate student works. Table 1. explains evaluation methods in questionnaire sheet, all students works were judged in 7 scores, which is functioning to supply necessary data, since 5 evaluation points are same as independent valuables in the model. Finally, to earn samples from professionals in creative industry, questionnaire sheet

was collected from visitors of our booth. This trial was successfully completed by collecting 920 sample data from 184 professionals. Those collected data is adopted to realize multiple regression model. And coefficients in each independent variables will be findings of analysis, which explain degrees of importance among components to consist product planning and design.

Figure 6. Testing site and student works
Source: by author

Table 1. Components of Questionnaire

unit: points

Evaluation items	low		**Score scale**				high
Overall evaluation (tol)	1	2	3	4	5	6	7
Concept making (cpt)	1	2	3	4	5	6	7
Marketing strategy (mkt)	1	2	3	4	5	6	7
Needs survey (sur)	1	2	3	4	5	6	7
Design (deg)	1	2	3	4	5	6	7
Consideration to production (prd)	1	2	3	4	5	6	7

Source: by author

4. Results and findings

In the last chapter, evaluation model for product planning and design was confirmed and data collection method through experiment was also explained. Regression results are shown in Table 2. And 3.

In Table 2., results that is including all valuables in the model, contributions of concept making (CPT) and marketing strategies (MKT) are emphasized very much. It is noteworthy that consideration to production (PRD) has been contributing as the third largest variables, which means, feasibility of product planning and design is highly recommended as a realistic idea. Quality of needs survey (SUR) is coming after consideration to production, it seems that market potential is not valuable compare to marketing issues. This could be understood that idea should not be pulled by demand all cases, communication to market through concept make and marketing strategy is more important.

Table 2. Result (Full model)

Dependent Variable: TOL
Method: Least Squares
Sample (adjusted): 3 920
Included observations: 691 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.529874	0.10373	5.108187	0
CPT	0.3631	0.028253	12.85187	0
MKT	0.195645	0.03183	6.146658	0
SUR	0.115401	0.02694	4.283614	0
DEG	0.097835	0.025027	3.909168	0.0001
PRD	0.166807	0.027937	5.970769	0

R-squared	0.711987	Mean dependent var	4.560058
Adjusted R-squared	0.709885	S.D. dependent var	1.436712
S.E. of regression	0.773847	Akaike info criterion	2.33376
Sum squared resid	410.2049	Schwarz criterion	2.373165
Log likelihood	-800.3141	Hannan-Quinn criter.	2.349002
F-statistic	338.6727	Durbin-Watson stat	1.996634
Prob(F-statistic)	0		

Source: by author

As most valuable findings from analytical results, contribution by design (DEG) is not confirmed very well. In discussion above, it is somewhat general understanding that planners and designers working in creative field are very much depend on drawings, but according to survey results, professionals are judging works from the perspective on marketing points. Table 3. also shows result of regression except consideration to production, since it is a different element in terms of manufacturing process and typical designers hardly reach their consideration to the processing matters. In this case, contribution of design element has not been significant again. On the other hand, needs

survey has become lowest among variables.

Thus, in evaluating product planning and design idea, contribution of management related elements such as concept making and marketing strategy are crucial compare to design, which is supporting hypothesis of this study.

Table 3. Result (Exempted production process)

Dependent Variable: TOL
Method: Least Squares
Sample (adjusted): 3 920
Included observations: 714 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.673732	0.103598	6.503306	0
CPT	0.404238	0.028365	14.25115	0
MKT	0.258646	0.030616	8.44819	0
SUR	0.112855	0.02706	4.170534	0
DEG	0.123428	0.024545	5.028624	0

R-squared	0.690193	Mean dependent var	4.556022
Adjusted R-squared	0.688445	S.D. dependent var	1.443785
S.E. of regression	0.805879	Akaike info criterion	2.413211
Sum squared resid	460.4534	Schwarz criterion	2.44522
Log likelihood	-856.5164	Hannan-Quinn criter.	2.425573
F-statistic	394.8805	Durbin-Watson stat	1.927973
Prob(F-statistic)	0		

Source: by author

According to analytical findings demonstrated above, this paper try to describe combination of curriculum for product planning and design. In Table 4., five evaluation points are listed in the left hand row, and each parameters are also listed in the next. Then, each evaluation points are taken as teaching fields and allocations to teach those are calculated by amounts of coefficient. In this case, teaching concept making should be spared 38.7% of overall curriculum, in the next, 20.8% of time/effort should be spent to teach marketing strategies. In those teaching fields, trend survey, idea management, branding, copy writing, presentation, marketing study, sales promotion, IP management and project management will be possible subject to instruct in improving concept making and marketing strategies.

Teaching production related subject is demanded (17.8%) and relevant. When planner and designer would improve knowledge on production, their idea could be more feasible and widely spread. For example, knowledge on various material will help their idea more concrete and plentifully. Learning production engineering is essential to expand their business. Without having image of mass production, creative idea will not produce enormous output, which is one of necessary pattern for creative industry, which is possible to

bring about larger output from smaller input. For in-house planner and designer, learning value engineering is functional, because most of their activities are derived from ongoing sales products. Considering process to conduct value engineering, it is a feasible for planner and designer to think about products and services in depth. And science and engineering background is not always required, they are possible to choose combination of functions and to reconfirm costs. Having said that, it is accountable to teach value engineering in the curriculum of product planning and design. Oppositely, teaching design related subject is not recommended very much.

Table 4. Expected curriculum for Product Planning

Evaluation items	Coef.	Allocation (%)	Expected subjects
Concept making	0.363	38.7	Trend survey Idea Management Branding Copy writing Presentation
Marketing strategy	0.196	20.8	Marketing Sales promotion IP management Project management
Needs survey	0.115	12.3	Consumer survey Potential demand survey
Design	0.098	10.4	Drawing Graphic Coloring
Consideration to production	0.167	17.8	Value engineering Material science Production engineering

Source: by author

5. Conclusion

In this study, in response to increasing needs to specialized human resource to develop creative industry, educational method for product planning and design is tried to be figured out. Both theoretical and policy review have raised critical needs to human resource who can support the industry by exhibiting their creative talent. But it also suggests that marketing and management knowledge are also demanded to contribute creative industry, analytical results by original model and data proved it.

As the end, this study resulted that product planner and designer should be incubated

in combination with, marketing, production, and design fields of study, teaching more in marketing and production, teaching less in design is the best mix. It is said that importance of marketing is emphasized more than design, and value engineering can be possible tools for planner and designer to increase their knowledge on production.

In the further study and project, detailed curriculum will be designed by using findings of this paper, and demonstrated in some university in Thailand, which is expected to support creative industry development of the nation.

Notes

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[3] NESDB (2011)

[4] Part of this chapter is a revised version of discussion paper presented as, Kurokawa, M. (2013) Strategies for Creative Industry Development, *Discussion Paper Series*, *The Society of Regional Polices, Takasaki City University of Economics*, No. 2013-03 (http://www1.tcue.ac.jp/home1/c-gakkai/dp/dp13-03)

[5] UNCTAD and WIPO are differently selecting industries, one is for providing trade-related statistics, the other is for intellectual property rights protection, but those are quite overwrapped.

[6] Material data is supplied by UNCTAD as following link, (http://unctad.org/en/Pages/DITC/Creat iveEconomy/ Statistics-on-world-trade-in-creative-products.aspx), namely, Statistics on Creative Products.

[7] Data for developing economies are excluding data of China due to its huge share, holding around 50% to total developing nations.

[8] Jewelry is said to be a potential sector, but increasing trade amount seems to be influenced by instabilities of material market price.

[9] In this argument, investment for human capital occurring in advance is ignored and mainly concentrating on production level.

[10] In this section, UNCTAD data on Thai creative industry export is referred again.

[11] The growth of film industry is driven by government effort by attracting oversea project. See http://www.thainationalfilm.com/site/.

[12] In this point, it should be noted that in-house product planner and designer are always conducting product development division and trying to concrete their idea to be more realistic.

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