

A Study on the Contents Development Process for Successful Market Entrance

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ABSTRACT

Contents industry is growing into a versatile area whose contents can be embodied through not only traditional media such as theater and TV, but also new ones such as the internet, mobile unit, PDA, DMP, etc. In addition, highly advanced computer technology and contents are harmoniously combined for image development featuring multi-channels, which produces various contents, and thus, creating synergy effects with other key industries such as IT, strengthens the domestic economy as an industry of value expansion and new high value items. To this end, this study is to present development plans that are highly productive and valued to domestic contents development companies. For this, the focus was put on the fact that concurrent engineering, which is the mechanism bringing very beneficial effects to existing analog product development processes, and the team system have significant, positive effect on the company productiveness and competitive market values among digital contents related companies, especially contents businesses.

Keywords: Contents Development, Contents Industry, Contents Development Process, Contents Customers

1. INTRODUCTION

Since contents basically have the limited market structure and fixed user system compared to existing products, animation industry itself should create new investment paradigm, through which in limited markets, life force can be brought into the products so that they can be repeatedly reproduced, and variables in the market can be applied to the fixed user system so as to vary the products according to the age group, and thus to maximize the market potential.

Domestic contents(animation) industry includes more than 200 companies with more than 10,000 employees, which can yearly produce 2500 episodes of TV series(30mins), but realistically, only 300 episodes are yearly produced.[1]

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This study, therefore, aims to prove that well recognized major plans to strengthen competitiveness in existing manufacturing and production systems have excellent effectiveness in animation industry as well so as to present provide domestic animation companies with specific competitiveness strengthening plans.

The competitiveness of the contents development process is of greater importance. Especially, only when a company can provide customers with quality products reflecting their demands at the reasonable price right on time, it can survive in the market, and this principle is more and more strictly applied. Thus, well recognized competitiveness strengthening plans in the new product development process should be the top concern, and this study examines this aspect centering on domestic contents(animation) companies.

2. PRELIMINARY STUDY

For a company to pursue growth and prosperity, consistent production of new products is of great

importance in general. Booz et al.[2] conducted a research on company profits for 5 years among more than 700 of the top 1,000 companies selected by Fortune, and it turned out that more than 30% of the profits came from new products. It also turned out that the contribution rates of technology-centered new product development accounted for 40% of all. In other words, the higher the technology accumulation rates, the higher contribution rates new products made.

The new product development process in concurrent engineering or sequential engineering, consists of the seven stages: designing of the object, study on possibilities, development, designing, process planning, production and assembly, and distribution.[3] Concurrent engineering is a structural system concentrating all activities related to development and production of products on one goal, and proceeding in cooperation with other sections and parallel process simultaneously.

The effectiveness of concurrent engineering in various aspects of the new product development process has worked in establishing basic principles of concurrent engineering for the development process of new products that are supposed to enter the market[4], but the extent of introduction and execution of concurrent engineering, and that of positive effects vary according to each company[5-7]. In fact, this study clarified that the extent for company-wide concurrent engineering and inter-division cooperation are embodied through the team system affected the competitiveness among companies.

The most effective way to pursue integration and maximization of the effect of concurrent engineering is to create a multi-functional project team. True, it has been well known that the multi-functional project team is a major factor to accelerate development of general products as well as new products[8]. The project team selects the optimal technology, resource, and human resource related to production, designs the process, and sets

up the operation standard and the production method. Thus, the project team, from marketing to IT, should consist of professionals in each division.

3. SETTING UP OF THE STUDY HYPOTHESIS

The hypothesis will be set up based on the factors expected to affect the profitability of a digital contents company, and factors whose effects have been proved in the study on traditional manufacturing companies. This will be clarified empirically. The major study variables include customer satisfaction orientation, price competitiveness, domestic market orientation, overseas market orientation, etc.

The multi-function project team is well known as the most efficient method to maximize the effect of concurrent engineering in developing new products through high level, company-wide integration[8]. The team system improves customer satisfaction, and as the development proceeds, required modification works are drastically reduced, which cuts down the general development expense, and thus contributes to contents profitability. Against this background, the following two hypotheses will be examined.

Hypothesis 1. Customer satisfaction orientation has positive relation with contents profitability

Hypothesis 2. Team system maturity has positive relation with contents profitability

Since contents companies should produce new works every time, the production activity itself is the continuance of new product development, and thus technology independence, securing high quality, creativity effectiveness, and customers' cost saving, has positive relation with contents profitability.

Hypothesis 3. Technology independence has

positive relation with contents profitability.

Since contents industry should be equipped with state-of-the-art hardware to support the structural establishment of an effective team system, contribute to technology independence, and provide the basis for creative contents production. Therefore, hardware excellency has positive effect on the team system, technology independence, contents creativity, etc., and as a result, it has positive relation with contents profitability.

Hypothesis 4. Hardware excellency has positive relation with contents profitability.

In consideration of the fact that animation contents are highly advanced creation works, it has close relation with technology independence. If the excellency of the team system, technology independence, and hardware is secured, competitiveness and creativity can be embodied in contents works in practice, which leads to contents profitability. Thus, the fact that contents improvement strategy and contents creativity have positive relation with contents profitability will be clarified in the following two hypotheses.

Hypothesis 5. Contents improvement strategy has positive relation with contents profitability.

Hypothesis 6. Contents creativity has positive relation with contents profitability.

The meaning of price competitiveness can be varied depending on whether the market pursued by the contents company is in or out of the country. When it is a domestic market, it means quality competitiveness regarding customer satisfaction in specific aspects, while price competitiveness based on international standards when it is an overseas market. Although contents industry features do not pursue price competitiveness through mass production as manufacturing companies do, price competitiveness has positive relation with profitability in both markets.

Hypothesis 7. Price competitiveness has positive relation with contents profitability.

The study result of Cooper et al.[9] presented two new approaches for successful product development, first of which is the market situation such as the potential scale and growth possibility, which is regarded as having positive relation with product development programs. The market factors of this study combine market attributes such as growth rates and scale with market needs. The role of market needs and pull has been clarified by other researchers[10-12], but the importance has yet to be highlighted. This study, therefore, uses the following two hypotheses to clarify the influence of the difference between domestic and abroad markets in terms of the market scale, growth rates, profitability, etc. so as to identify which market has positive relation with company profitability.

Hypothesis 8. Domestic market orientation has positive relation with contents profitability.

Hypothesis 9. Overseas market orientation has positive relation with contents profitability.

4. EMPIRICAL STUDY

4.1 Sampling Design and Data Collection

To get empirical data on the general condition of domestic animation businesses, a survey was conducted regarding theater and TV animation production companies, and the result was analyzed. 143 questionnaires were collected, and 123 was used excluding the less reliable ones.

4.2 Frequency Analysis

The business styles of examined companies were classified into market development, open acceptance, and out-sourcing, and the distribution rates are as in Table 2, Company classification and business style according to the major task compo-

Table 1. Survey Items

Contents	Number of Questions
Data on responding companies(sales, service, business style, customer class, etc.)	6
Profitability of contents	3
Activation of team system establishment and functions	7
Technology independence and cutting-edge hardware conditions	5
Questions on factors affecting contents quality	3
Customer satisfaction orientation	3
Extent of efforts put forth in developing and improving contents creativity	4
Price competitiveness compared to other competitors	2
Self-evaluation of domestic/abroad markets	4

sition, the market development business style accounts for the major rates(70.3%). However, the rates of this market development business style account for 74% in average among companies including production tasks, while 50% among those excluding such tasks. Besides, the rates of the out-sourcing business style among companies including production tasks account for 5%, while 50% among those excluding such tasks, which is 10 times. Thus, it turned out that whether or not production tasks are included affects a lot the business style.

The characteristics of domestic animation companies revealed through the survey analysis are as follows: First, 64.4% of the companies perform two or more tasks among pre-production, production, and post-production simultaneously. Second, among the business styles of market development,

open acceptance, and out-sourcing, 70.3% of the companies adopted the market development business style. Third, the rates of companies that use common softwares without modification account for 51.5%, while 14.4% had the ability to modify the software. 34.1% of the companies could develop software for themselves. Fourth, the most effective factor to the final quality of contents is expertise of the developing human resource.

4.3 Factor Analysis

The KMO(Kaiser-Meyer-Olkin) value of variables was 0.706, which is very suitable for factor analysis. In addition, since the significant probability of Bartlett examination is less than 0.001, the correlation matrix among variables turned down the identity matrix, that is, null hypothesis that every correlation coefficient is 0, and the factor anal-

Table 2. Company classification and business style according to the major task composition

	A	B	C	Frequency	Rates(%)	Market development	Open acceptance	Out-sourcing
Composition of Major Tasks	○	○	○	42	35.6	29(69.0%)	12(28.6%)	1(2.4%)
		○		24	20.3	20(83.3%)	2(8.3%)	2(8.3%)
	○	○		20	16.9	18(90.0%)	1(5.0%)	1(5.0%)
		○	○	14	11.9	7(50.0%)	6(42.9%)	1(7.1%)
	○			14	11.9	7(50.0%)	0(0.0%)	7(50.0%)
		○	4	3.4	2(50.0%)	0(0.0%)	2(50.0%)	
Total				118	100	83(70.3%)	21(17.8%)	14(11.9%)

(A: Pre-production B: Production C: Post-production)

ysis can be followed. The analysis result including reliability verification is as in Table 3. Factor analysis and reliability verification. Through the principal component analysis, the data were divided by lineal variation, and centering on eigenvalue 1 and the scree plot inflection point, 10 factors were selected. The accumulated rates of these factors' dispersion account for 64.6%. Variables of each factor were selected among those with more than 0.4 factor loading value after Varimax in consideration of the survey items. The common attributes of these variables were defined to describe the factors. For stability and prediction of the measurement, Cronbach's Alpha was produced, and the Alpha value of the domestic market orientation

was 0.5082, while other factors have more than 0.6 values, which indicates that there is no problem with the reliability.

4.4 Correlation Analysis

The correlation among factors drawn out through the factor analysis is as in Table 4. Correlation Coefficient.

The contents profitability is correlated to the team system maturity(.447), technology independence(.521), and contents creativity(.343).

The team system maturity is correlated to contents improvement strategy(.415), and technology independence(.402), while contents improvement

Table 3. Factor analysis and reliability verification

Factor	Variable	Operational definition	Factor loadings	Eigenvalue	Variance rates (accumulate)	Reliability
contents profitability	v32	contribution of contents developed or under development to sales and earnings improvement	.668	2.565	19.414	.7927
	v33		.746			
	v34		.618			
customer satisfaction orientation	v10	reflection of customers' response and preference in contents development	.702	2.505	26.184	.6641
	v11		.609			
	v22		.626			
team system maturity	v01	participation of the members of planning of contents, technology, marketing, and sales divisions in analysis of customer needs, technology trend, and new product planing	.752	4.618	12.482	.8606
	v02		.733			
	v03		.666			
	v04		.639			
	v07		.763			
	v08		.749			
	v09		.590			
technology independence	v06	relation between contents related to design, technology, and development, and existing technologies	.680	1.963	55.594	.6297
	v26		.639			
	v27		.523			
hardware excellency	v24	attitude toward cutting-edge hardware securing and purchasing	.742	2.177	44.642	.7241
	v25		.798			
contents improvement	v12	contents improvement through consulting company, professional group, and community	.565	1.763	60.359	.6290
	v13		.518			
contents creativity	v28	duplication of contents with those of other companies developed or released in the market	.585	2.090	50.290	.6778
	v29		.611			
price competitiveness	v30	price competitiveness compared to quality and those of contents of competitors	.793	2.232	38.759	.7394
	v31		.850			
domestic market orientation	v14	positive evaluation on domestic market growth rates	.490	1.553	64.556	.5082
	v35		.706			
overseas market orientation	v36	positive evaluation on overseas companies and overseas market growth rates	.884	2.420	32.726	.8594
	v37		.877			

Table 4. Correlation Coefficient

	contents profit- ability	customer sat- isfaction orientation	team system maturity	technology in- depend- ence	hardware excellency	contents improve- ment strategy	contents creativity	price com- petitive- ness	domestic market ori- entation	overseas market ori- entation
contents profitability	1.000									
customer satisfaction orientation	.050 (.293)	1.000								
team system maturity	.447 (.000)	.276 (.001)	1.000							
technology in- dependence	.521 (.000)	.013 (.444)	.402 (.000)	1.000						
hardware excellency	.286 (.001)	.188 (.019)	.346 (.000)	.326 (.000)	1.000					
contents improvement strategy	.166 (.034)	.398 (.000)	.415 (.000)	.098 (.141)	.201 (.013)	1.000				
contents creativity	.343 (.000)	.127 (.082)	.138 (.065)	.389 (.000)	.225 (.006)	.029 (.374)	1.000			
price com- petitiveness	.285 (.001)	.051 (.289)	.220 (.007)	.266 (.002)	.168 (.032)	.068 (.230)	.255 (.002)	1.000		
domestic market orientation	.294 (.001)	.406 (.000)	.210 (.010)	.232 (.005)	.298 (.000)	.259 (.002)	.237 (.004)	.148 (.052)	1.000	
overseas market orientation	.227 (.006)	.026 (.386)	.090 (.162)	.246 (.003)	.231 (.005)	-.169 (.031)	.338 (.000)	.043 (.318)	-.022 (.407)	1.000

strategy and technology independence(.098) are not correlated. Hardware excellency(.346) also has correlation, which indicates that for the team system to be effective in consideration of the animation industry features, as well as the cooperative relation among divisions and members, state-of-the-art hardware should support the system.

The excellency(.326) of technology independence and hardware, the correlation between technology independence and contents creativity(.389) turned out to be higher than the correlation between contents creativity and hardware excellency(.225). This seems to indicate that introduction of cutting-edge hardware cannot secure contents creativity, but supports the team system

so as to heighten technology independence and thus produce contents creativity.

Price competitiveness is correlated to contents profitability(.285), technology independence(.266), and contents creativity(.255). Based on the team system, equipped with professional development human resource and hardware excellency, contents improvement strategies are accumulated and advanced to independent technology. This technology embodies contents creativity, improves price competitiveness, and eventually secures contents profitability.

Hardware excellency is correlated to domestic market orientation(.298), and overseas market orientation(.231). It seems that the meaning of ex-

cellency varies according to the market. 80.1% of the companies stated that the final quality of contents is highly affected by the expertise of the development human resource, which is a lot higher than the case of software(43.9%), and hardware(41.4%). This indicates that the expertise of the operating development human resource is regarded as the major factor.

47.1% of the companies expected that the growth rates of domestic markets would be higher than those of overseas markets, which is 3 times as high as the companies(16.9%) which expected that the growth rates of overseas market would be higher.

Among the responding companies, 52.8% stated that transaction with overseas companies had more added values than that with domestic companies. 54.3% responded that they were interested in entrance into overseas markets in the future, which indicates that various and positive policies conducted for domestic customer satisfaction should be provided for overseas customers as well as early as possible.

In this regard, there may be various strategic plans, but basically the crucial key factor seems to be contents creativity. Especially, contents creativity is correlated to overseas market orientation(.338) more than domestic market orientation(.237), which seems to indicate that to enter overseas markets, contents of the higher level of creativity than that of domestic market should be developed first.

4.5 ANOVA

With business style, development strategy, user class as the independent variables, and all factors drawn up in the factor analysis as dependent variables, ANOVA(one-way) was conducted, and the result showed that according to the business style, customer satisfaction orientation varied, and according to the user class, technology independence and overseas market orientation were different. However, there was no difference among all dependent variables in terms of development strategies.

To clarify the difference of customer satisfaction orientation according to the business style, the test of homogeneity was conducted, and the result showed that Levene statistics accounted for 1.801($p=.170$), and the significant probability was 0.05 higher. Thus, null hypothesis that the dispersion among the three groups according to the business style was adopted, and then ANOVA was conducted. The result of analysis is as in Table 5. ANOVA(business style, customer satisfaction orientation) and the table shows that according to the business style, customer satisfaction orientation showed significant difference.

4.6 Regression

With contents profitability as the dependent variable, Multiple Regression Analysis was conducted and the result is as in Table 6. Multiple Regression Analysis (Contents Profitability).

Table 5. ANOVA (business style, customer satisfaction orientation)

	squaring	df	average squaring	F	Sig.
Inter-group					
(united)	2.901	2	1.450	3.128	.047
lineal					
not added	2.858	1	2.858	6.165	.014
added	2.165	1	2.165	4.670	.033
deviation	.735	1	.735	1.586	.210
Within the group	54.247	117	.464		
Total	57.148	119			

Table 6. Multiple Regression Analysis (Contents Profitability)

	B	Std.B	t	p	VIF	Tolerance
(Constant)	.851	-	2.063	.041	-	-
customer satisfaction orientation	-.129	-.142	-1.641	.104	1.425	.702
team system maturity	.279	.276	3.039	.003	1.556	.643
technology independence	.276	.269	2.994	.003	1.527	.655
hardware excellency	-1.30E-05	.000	.000	1.000	1.316	.760
contents improvement strategy	3.426E-02	.043	.490	.625	1.452	.689
contents creativity	9.451E-02	.113	1.330	.186	1.376	.727
price competitiveness	8.336E-02	.096	1.239	.218	1.141	.876
domestic market orientation	.146	.181	2.121	.036	1.381	.724
overseas market orientation	7.301E-02	.108	1.309	.193	1.287	.777

$R^2 = .407$, $Adj-R = .360$, $F(9, 112) = 8.558$ (Sig. = .000), Durbin-Watson = 2.110

Regarding the independence of the residual, the value of Durbin-Watson is between 0 and 4. Values bigger than 2 mean (-)correlation, while values smaller than 2 mean (+)correlation, but the result of the analysis indicates that the value of Durbin-Watson is close to 2, and thus the assumption concerning the independence of the residual is satisfied.

$$Y = 0.851 + 0.279(\text{team system maturity}) \\ + 0.276(\text{technology independence}) \\ + 0.146(\text{domestic market orientation})$$

This recurrent formula means that as the team system maturity increases as much as 1 unit, the contents profitability increases 0.279 unit, and the modified R^2 value is 0.360, which indicates that the value 36.0%, fluctuation in the dependent variable, contents profitability, can be explained with the recurrent formula. As for the standardized beta values and t of meaningful independent variables, the team system maturity(0.276, 3.039), and technology independence(0.269, 2.994) are the most effective, and the domestic market orientation(0.181, 2.121) is also of great importance. The major factors affecting contents profitability are team system maturity, technology independence, and domestic market orientation. In other words, contents profitability pursues domestic markets realistically rath-

er than overseas markets, and can be secured by consistently accumulating new technology and know-how in the human resource and thus strengthening the technology independence.

5. CONCLUSION

This study focuses on the empirical analysis of new product development process and competitiveness strengthening plans for valuable contents work development through which domestic contents companies can successfully enter markets. As a result, it turned out that contents profitability is correlated to team system maturity, technology independence, and contents creativity, and that team system maturity is correlated to contents improvement strategy and technology independence while technology independence and contents creativity are correlated. However, the only factors that have meaningful effect on the dependent variable, and contents profitability are team system, technology independence, and domestic market orientation.

In conclusion, ideal contents companies equipped with competitiveness and profitability pursue domestic markets first of all, and then accumulate technologies based on the team system, improve these to the point of their own unique source tech-

nologies, which heightens technology independence, and in the end, produce contents creativity, and thus secure contents profitability. In the process, hardware and software do not seem very important, which indicates that every product has no effectiveness unless the animation company has expertise of the human resource in development.

In other words, contents companies are creative and flexible, but the factors that showed effectiveness in traditional manufacturing companies are proved to have the same effect. Especially, concurrent engineering and the embodying team system have positive effects on contents companies in terms of productivity and competitiveness, which indicates that the final dependent variable, contents profitability is a major independent variable with significant causal relationship.

In particular, only when products can satisfy customers' demands in terms of the quality, time, and price, the products can survive in the market, which is more strictly applied to digital contents industry, and thus more study is essential regarding how to strengthen competitiveness verified in the new product development process. Therefore, the following investigation strategies should be pursued: First, regarding factors whose effectiveness in the process of new product development such as concurrent engineering and team system, effectiveness of digital contents other than animation should be also examined. Second, to clarify factors needed to enter overseas markets, specific plans to strengthen competitiveness according to each factor should be investigated.

Contents products ready to enter into markets successfully should reflect customers' demands, be followed by conceptual design(planing) of products, production(manufacturing), and advance into markets through marketing. Each step of this process has the same attributes, and the concurrent engineering and team system, which are the mechanism very useful in the traditional development process, can be effectively taken advantage of in

strengthening competitiveness.

Through this study, empirical clarification and selection of factors that have positive effects on digital contents industry among lots of factors proved to increase the success possibility in the new product development process of traditional manufacturing products will be essential not only for contents industry but also for strengthening competitiveness of digital contents industry in general.

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