

# Enablers of Business Process Transformation Success in Japan: How Super-ordinate Groups Achieve Effectiveness?

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**Abstract**— The aim of this paper is to present the analysis result of research that focuses on the enablers of business process transformation in Japan. It has been said for some decades that the overall quality and efficiency of production lines in Japan are superior to many other countries. However, the overall business processes, including work of back offices throughout all industries, are not always efficient. According to the Organisation for Economic Co-operation and Development (OECD), labor productivity in Japan ranks 22nd out of 34 countries. Ministry of Economy, Trade and Industry (METI) mentions that the scope of information system integration is rather narrow in Japan, compare to many other countries. In addition, about 70% of firms have aimed at drastic process change but only 30% have attained it. Dealing with these issues, the authors conducted a survey and identified the enablers of Business Process Transformation (BPT) focusing on “super-ordinate” firms.

*Keywords*-business process transformation; success factor; IT utilization stage.

## I. INTRODUCTION

It has been said for some decades that the overall quality and efficiency of production lines in Japan are superior to other countries. The word “KAIZEN (continuous improvement)” has become a word that is used not only in Japan. However, the overall business processes including the work of back offices throughout all industries are not always efficient [1][2], and labor productivity in Japan ranks 22nd out of 34 countries according to the Organization for Economic Co-operation and Development (OECD) [3]. Long working hours are a serious issue in Japan. Firms in Japan are trying to make their business processes more efficient by using Information Technology (IT). The objective of IT investment may differ in each firm; however, there are various tendencies according to region, industry and so on. As for the regions, Higano mentioned that Japanese firms tend to spend much more, in percentage terms, on improving the operational efficiency of their business compared to firms in Western countries, but the results do not seem to be satisfactory because the contribution of IT capital services to value added growth in Japan is lower than in Western countries [4]. There are many methodologies for business process orientation including business process re-engineering (BPR) or business process integration (BPI) [5]. However, it is difficult to achieve

effectiveness by conforming to an ideal or to picture-perfect models. Data from the survey conducted by the authors show that 72.9% of the respondents (managers of information systems, business planning, or internal audit divisions) stated that the policy of their BPR was “drastic BPR,” but only 28.4% had attained it [6].

In this paper, we present the analysis result of research that focused on the enablers of business process transformation (BPT), focusing on what the “super-ordinate” firms do to achieve effectiveness considering the unique situation in Japan. In the subsequent section, we review related studies with the category of business process orientation and the unique situation of firms in Japan considered for BPT success. Section 3 describes our research model of BPT success and the analysis results of the survey. The differences seen between “super-ordinate” firms and other firms are discussed in Section 4. Finally, Section 5 concludes this work and mentions about our future work.

## II. RELATED STUDIES

In this section, we will look through the related studies about business process orientation, and the unique situation of firms in Japan should be considered for BPT success.

### A. Studies about business process orientation

Studies related to business process orientation can be roughly classified into several groups: methodologies [7][8], tools [9][10], the effectiveness of business process integration including critical success factors (CSF) [11][12][13], etc. As for CSF, some researchers mention that culture is also one of them [14][15]. Takei et al. mentioned that some CSF of Enterprise Resource Planning (ERP) vary in different regions or countries, while some CSF are common to many countries [16]. For instance, BPR is not so important in developing countries because they are making new business processes and do not need re-engineering. The CSF of business process orientation including BPT can be considered to vary in different countries.

### B. The unique situation of firms in Japan should be considered for BPT success

· **Scope of the information system.** One of the reasons why business process transformation is not efficient in Japan may be the scope of information system integration [17]. Figure 1 shows the result of a survey about the IT implementation

stage conducted by the Ministry of Economy, Trade and Industry (METI) in Japan. The “IT utilization stage” is defined as follows [17]:

- Stage 1: The information system is implemented.
- Stage 2: The information system is optimally utilized within a department or section within a firm.
- Stage 3: The information system is optimally utilized within an enterprise (expanded beyond departments or sections).
- Stage 4: The information system is optimally utilized among enterprises (including suppliers or customers).

The fact that about 70% of the firms in Japan (that is much lower compare to many of Western countries) are in stage 1 or stage 2 can be considered one of the reasons for the difficulty in implementing ERP systems in Japan, and for the low effectiveness of IT investment in Japan. Behind this, there is the culture of “TATEWARI”, which is a kind of vertically-segmented administrative system organization which takes a “silo approach” in Japan. In the TATEWARI type of organization, each section does not interfere with other departments, and everyone works hard only within the organization that they belong to.

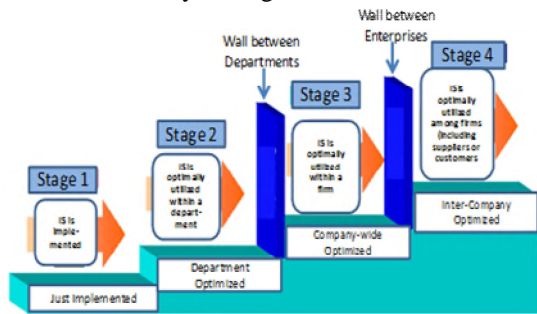


Figure 1. IT utilization four stages (Source: METI 2010)

• **Improvement but not drastic.** Data from the survey conducted by we show that 72.9% of the respondents (managers of information systems, business planning, or internal audit divisions) stated that the policy of their business process transformation was “drastic transformation,” but only 28.4% had attained it [6] (Figure2).

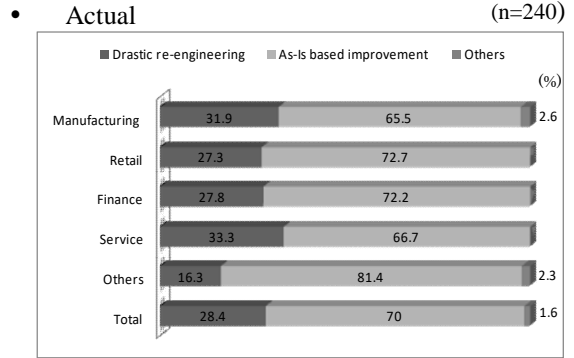
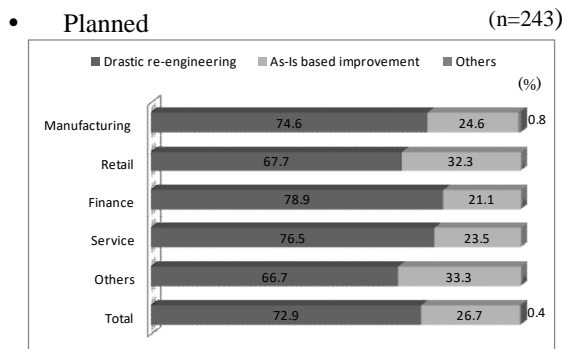


Figure 2. Business process transformation policy (Planned and Actual)

• **Outsource.** Figure 3 shows the ratio of IT investment by software type [18]. Japanese firms rely far more on system engineers of outsourcing services, compared to the United States. Some of the reasons for this situation are related to employment conditions in Japan (Figure 3).

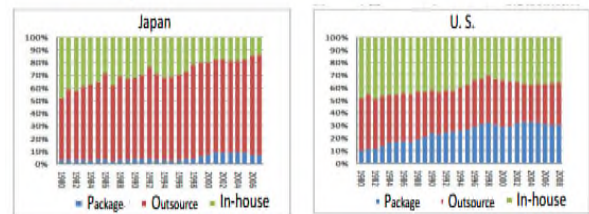


Figure 3. Difference in IT Investment Ratio by Software Type (Source: Motohashi 2010, in Japanese)

As we mentioned above, it seems to be important to seek ways to achieve effectiveness though BPT considering the unique situation in Japan. In the following sections, we describe the analysis result of the survey that we conducted.

### III. ANALYSIS OF BPT SUCCESS

To address the issues mentioned in the previous section, we conducted a new survey. In this section, we describe the analysis result concerning enablers of BPT success.

#### A. Conceptual research framework and hypotheses

Enabler items are considered to consist of BPT management, executing drastic transformation, and wide-scope transformation. Figure 4 is a conceptual model for analysis.

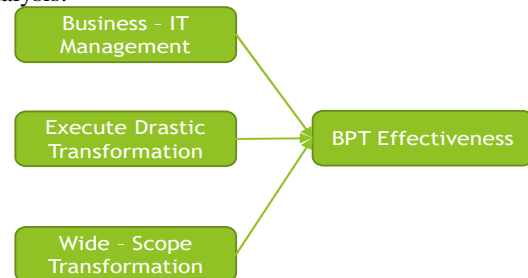


Figure 4. Conceptual model

The major hypotheses for the analysis are as follows:

**Hypothesis 1 (H1): BPT management level has a positive impact on BPT effectiveness.**

It is hardly surprising that BPT management is important for achieving BPT effectiveness. We defined research items for BPT management considering the unique situation of firms in Japan: “business executives’ involvement in IT strategy”, “communication between business and IT section”, “motivation for improvement”, “business - IT alignment function”, “clear rules for cross-department decisions”, “evaluation criteria for external resources”

**Hypothesis 2 (H2): Planning and executing drastic transformation has a positive impact on the BPT effectiveness.**

As mentioned in the previous section, many firms in Japan failed to realize drastic BPT (realized only As-is based improvement finally), and that is considered one of the reasons why such firms have Japan is hardly achieved effectiveness by BPT which focuses on business efficiency.

**Hypothesis 3 (H3): Wide- scope transformation has a positive impact on BPT effectiveness.**

As mentioned in the previous section, many firms in Japan are at a lower stage of IT utilization, and that is considered as one of the reason why firms in Japan is hardly achieve their effectiveness by BPT that focuses on business efficiency.

**B. Overall Research Results**

For the survey, 413 samples were gathered from the internet in March 2015. Table 1 shows the profile of the survey data. In next section, we describe the result of their analysis of BPT success.

TABLE I. PROFILE OF SURVEY DATA

Industry	Frequency	Percentage
Manufacturing	153	37.05%
Distribution	38	9.20%
Finance	18	4.36%
Service	150	36.32%
Others	54	13.08%
Total	413	
Position (※count duplicate for concurrent post)	Frequency	Percentage
Manager of Business Planning Division	95	13.34%
Staff of Business Planning Division	53	7.44%
Manager of IT Division	91	12.78%
Staff of IT Division	103	14.47%
Manager of IT User Division	187	26.26%
Staff of IT User Division	135	18.96%
Chief Executive Officer	25	3.51%
n.a.	23	3.23%
Total	712	
Annual Sales (Yen)	Frequency	Percentage
Above 1000T	29	2.66%
Between 700B - 1T	12	6.54%
Between 400B - 700B	23	14.04%
Between 100B - 400B	11	7.02%
Between 70B - 100B	14	5.57%
Between 40B - 70B	27	6.54%
Between 10B - 40B	58	3.39%
Under 10B	188	45.52%
n.a.	51	12.35%
Total	413	
Number of Employees	Frequency	Percentage
Above 10,000	54	9.93%
Between 7,000 - 10,000	15	10.65%
Between 4,000 - 7,000	19	19.61%
Between 1,000-4,000B	41	13.08%
Between 700 - 1,000	42	4.60%
Between 400 - 700	44	10.65%
Between 100 - 400	81	10.17%
Under 100	115	27.85%
n.a.	2	0.48%
Total	413	

**Business – IT management level and BPT effectiveness.**

The multi regression result of IT management level of super-ordinate firms (target variable: BPT effect) are shown in Table 2. Predictor variables “business executive’s involvement in IT strategy”, “communication between business and IT section”, “motivation for improvement”, “evaluation criteria for external resources” had positive and significant impacts on BPT effect. The item “business - IT alignment function” was not significant, and “clear rules for cross-department decisions” had a negative impact. Clear rules for cross-department decisions may reinforce the “TATEWARI” culture which is considered one of the obstructive factors to wide-ranging BPT.

TABLE II. MULTI REGRESSION RESULT (TARGET VARIABLE: BPT EFFECT)

Predictor Variable	Coefficients	F-value	p-value
Involvement of business management in the IT strategy decision process	0.2017	20.7115	**
Communication between Business and IT section	0.1147	5.4192	*
Motivation for Innovation /Improvement	0.1849	12.8373	**
Business - IT alignment function	0.0900	3.0136	-
Clear rules for cross-department decisions	-0.0978	3.8994	*
Evaluation criteria for external resources	0.1930	25.9699	**
Constant	1.0737	62.7238	**
Overall model		53.3488	**

\*: P<0.05, \*\*: P<0.01

**Drastic BPT level and effectiveness.** The multi regression result of drastic BPT level and BPT effectiveness is shown in Table 3. The drastic BPT level is as follows:

- Level 4: Planned and able to execute drastic BPT.
- Level 3: Planned drastic BPT but could not execute it (could execute As-is based improvement).
- Level 2: Planned as-is based improvement and executed drastic transformation.
- Level 1: Planned and executed as-is based improvement.

TABLE III. REGRESSION RESULT (TARGET VARIABLE: BPT EFFECT)

Predictor Variable	Coefficients	F-value	p-value
BPT Drastic Level	0.2050	16.3841	**
Constant	2.7773	382.5463	**
Overall model		16.3841	**

\*: P<0.05, \*\*: P<0.01

As we had expected, the BPT drastic level has a positive significant relationship with BPT effect. Figure 5 shows the cross-tabulation result displayed as a bar chart. High level firms tend to achieve effectiveness.

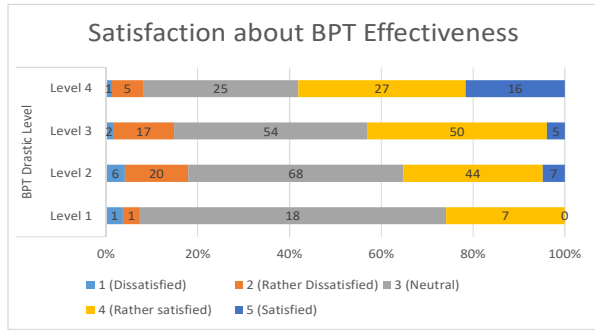


Figure 5. Drastic BPT level and BPT effectiveness

**Wide-scope and BPT effectiveness.** The regression result of IT utilization stage (target variable: BPT effect) are shown in Table 4, and Figure 6 shows the cross-tabulation result displayed as a bar chart.

TABLE IV. REGRESSION RESULT (TARGET VARIABLE: BPT EFFECT)

Predictor Variable	Coefficients	F-value	p-value
IT Utilization stage	- 0.0797	2.5379	0.1120
Constant	3.5359	670.3786	**
Overall model		2.5379	**

\*: P<0.05, \*\*: P<0.01

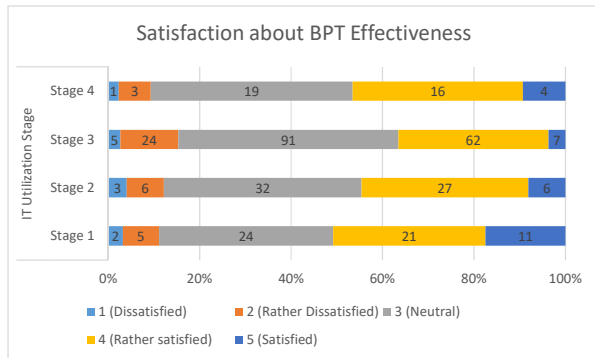


Figure 6. IT Utilization stage and BPT effectiveness

The p-value was 0.112 and this was not smaller than 0.05. In that sense, we can say we cannot find a significant relationship between “IT utilization stage” and BPT effect. However the p-value is 0.112, it is nearly at the 10% level of significance. (It is sometimes considered that <10% is significant, rather than <5% is significant). The coefficient value of this item is negative. That means wide-ranging BPT projects seldom achieve their goal. Figure 7 shows the IT utilization stage ratio. There are about 50% of stage 4 and 3 firms, but this is still far less than in Western countries.

The reason why the item “IT utilization stage” shows a negative impact on BPT effect may be that many firms in Japan achieve only a small effect by targeting small scope of the organization.

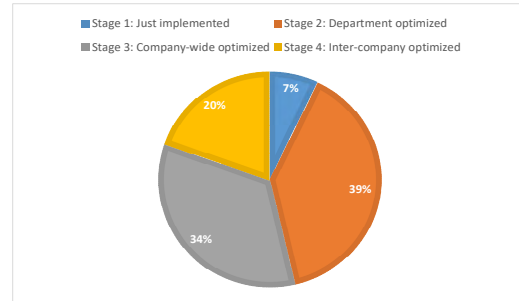


Figure 7. IT Utilization stage ratio

**Summary of overall analysis.** Figure 8 is the summary of overall analysis. Most of the BPT items have a positive impact on BPT effectiveness. Executing drastic BPT has a positive impact on BPT effectiveness, but only 18 % of the firms have been able to execute the drastic BPT that they had planned. Wide – scope BPT has a positive impact on BPT effectiveness, but many of the firms that have wide-scope transformation have not achieved effectiveness.

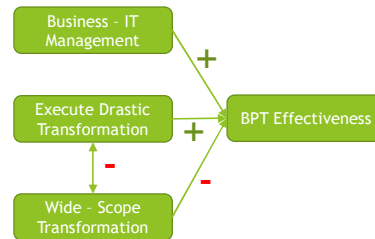


Figure 8. Summary of overall analysis

In addition to the result mentioned in 3.2.3, there some issues are founded from the survey as follows:

- The firms where the IT utilization stage is high do not tend to achieve BPT effectiveness.
  - METI mentioned that most firms in Japan are at a lower stage, and that is one of the reasons EISs in Japan are not efficient. However, even firms at higher stages do not always achieve BPT effectiveness.
- The firms whose IT utilization stage is at a high level do not always achieve a BPT effect which is IT contribution on business efficiency.
- Although about 50% of the firms have planned drastic transformation, only 37% of the firms above have been able to implement such transformation (2015).
  - It has progressed from the survey conducted in 2008 (30% of the firms could implement drastic transformation), but the percentage (37%) is still behind other countries.

C. How do “super-ordinate firms” achieve their effectiveness?

Addressing the issues that relationship between drastic BPT and wide-scope BPT is negative but this negative relationship can be thought the one of the reason of low efficiency of business processes in Japan, we tried to

analyze that how do “super-ordinate firms” achieve their BPT effectiveness.

**Definition of “super-ordinate firms”.** We defined “super-ordinate firms” as follows:

- Drastic BPT Level: Level 4 (Planned drastic BPT and could execute it)
- IT utilization Stage: Stage 4 (IS is optimally utilized among firms) or 3 (IS is optimally utilized within a firm.)

The reason why we defined “super-ordinate firms” as above is that “super-ordinate firms” are overcoming their drawbacks and achieving the BPT effectiveness.

**IT management level of “super-ordinate firms”.** The multi regression result of IT management level of super-ordinate firms (target variable: BPT effect) are shown in Table 5.

TABLE V. REGRESSION RESULT (TARGET VARIABLE: BPT EFFECT)

Predictor Variable	Super-ordinate firms (n=30)			Other firms (n=378)		
	Co-efficients	F-value	p-value	Co-efficients	F-value	p-value
Involvement of business management in the IT strategy decision process				0.2075	19.0905	**
Managements' will to change business process according to business environmental change	0.5796	16.8674	**			
Communication between Business and IT section				0.1162	5.1579	*
Motivation for Improvement				0.1737	10.6313	**
Business - IT alignment function	0.2185	2.3347	0.1391	0.0888	2.6973	0.1015
Clear rules for cross-department decisions				-0.1027	3.8186	0.0515
Evaluation criteria for external resources	0.2528	5.1090	*			
Provision for IT Risk	-0.1996	2.8360	0.1046			
Constant	0.4745	1.0711	-	1.1368	65.4518	**
Overall model			**			**

\*, P<0.05, \*\*: P<0.01

There is a significant, positive relationship between the following items and BPT effect; “Managements' will to change business process according to business environmental change” and “Evaluation criteria for external resources”. There is a positive relationship between “Business - IT alignment function” and BPT effect, its p-value is about 0.13, which can be said to be rather significant (because sometimes up to around 0.1 is considered as significant). This multi regression result of

“super-ordinate firms” is quite different from that of other countries. For the group of other firms, the items which have a positive significant relationship with BPT effect are “Involvement of business management in the IT strategy decision process”, “Communication between Business and IT section” and “Motivation for Improvement”.

**Meeting style of “super-ordinate firms”.** The multi regression result of IT management level of super-ordinate firms (target variable: BPT effect) are shown in Table 6. The following items have a positive impact on BPT effect: “System users' division leads the meeting” and “Meeting is held at IT division's office”. For the meeting style, we could not find any difference between super-ordinate firms and other firms by item, but the coefficient values were different.

TABLE VI. REGRESSION RESULT (TARGET VARIABLE: BPT EFFECT)

Predictor Variable	Super-ordinate firms (n=26)			Other firms (n=274)		
	Coefficients	F-value	p-value	Coefficients	F-value	p-value
System users' division has the key role at the meeting.	0.2731	3.6525	0.0685	0.1868	12.7846	0.0000
Meeting is held at IT division's office.	0.4882	13.2862	0.0014	0.0981	4.0598	0.0449
Informal meeting about BPT is held in coffee lounge etc.				0.0970	2.2612	0.0245
Constant	0.5756	0.5997	0.4466	2.0858	10.8761	0.0000
Overall model			**			**

\*, P<0.05, \*\*: P<0.01

**What is difficult about BPT?** The multi regression results as regards what is difficult about BPT of super-ordinate firms and other firms (target variable: BPT effect) are shown in Table 7. As for the super-ordinate firms, the answer of the question “It is difficult to estimate the BPT effectiveness of each division” has a positive impact on BPT effectiveness. That means the “super-ordinate” firms are good at estimating the BPT effectiveness of each division (5: No (=Do not feel difficulty), 4: Rather no, 3: Neutral, 2: Rather no, 1: No) . It seems this makes sense, because the adjustment of each division's requirements can be considered as one of the critical issues of wide-scope transformation.

TABLE VII. REGRESSION RESULT (TARGET VARIABLE: BPT EFFECT)

Predictor Variable	Super-ordinate firms (n=26)			Other firms (n=274)		
	Coefficients	F-value	p-value	Coefficients	F-value	p-value
It is difficult to estimate the BPT effectiveness of each division.	0.2909	3.2105	0.0844			
It is difficult to determine the business process standardization scope of the BPT project.				0.1061	2.6425	0.1050
It is difficult to adjust system users' requirements and IT feasibility.				-0.0955	2.2245	0.1368
Constant	2.6670	38.1676	0.0000	3.2901	572.541	0.0000
			**			**
Overall model		3.2105	0.0844			0.2343
			-			

5: No (=Do not feel difficulty), 4: Rather no, 3: Neutral, 2: Rather no, 1:No  
 \*: P<0.05, \*\*: P<0.01

On the other hand, as for the other firms, the answer of the question “It is difficult to adjust system users’ requirements and IT feasibility” has negative impact on BPT effectiveness (5:No (=Do not feel difficulty), 4:Rather no, 3: Neutral, 2:Rather no, 1:No) . That means, for the other firms, difficulty of adjusting system users’ requirement and IT feasibility is lowering BPT effectiveness.

IV. DISCUSSION

Some differences were seen between “super-ordinate” firms and other firms in some categories.

The items that show positive or negative impact on the BPT effect are listed below.

- Super-ordinate firms
  - (+)Managements' will to change business process according to business environmental change.
  - (+)Business - IT alignment function.
  - (+)Evaluation criteria for external resources.
  - (-)Provision for IT risk.
  - (+)System users’ division has a key role at the meeting.
  - (+)Meeting is held at IT division’s office.

- (+)It is not difficult to estimate the BPT effectiveness of each division.
- Other firms
  - (+)Involvement of business management in the IT strategy decision process
  - (+)System users’ division has a key role at the meeting.

“Managements’ will to change business process according to business environmental change” and “Business - IT alignment function” are the items discussed at CSF of business process orientation (BPR, BPI, BPT). They can be considered the common enablers of BPT success. On the other hand, “Evaluation criteria for external resources”, “It is not difficult to estimate BPT effectiveness of each division” and negative impact of “Provision for IT Risk” can be considered as items fitting the unique situation of firms in Japan.

Having “evaluation criteria for external resources” as an enabler, firms can manage outsourcing resources, which have more weight in Japan. Having “It is not difficult to estimate BPT effectiveness of each division” as an enabler, a firm can adjust the requirement of the divisions and avoid conflict. Not having “provision for IT risk” means taking IT risks (preparing for IT risk) must be an enabler to achieve the effectiveness of new technology.

Figure 9 shows operating income on sales by “super-ordinate” firms and other firms. “Super-ordinate” firms look a little superior to other firms. They will be considered to achieve much greater effectiveness by continuing their transformation using their enablers.

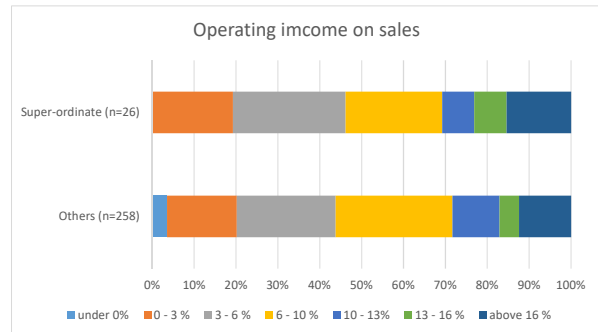


Figure 9. Operating income on sales

V. CONCLUSION AND FUTURE WORK

The aim of this paper was to present the analysis result of research that focuses on the enablers of business process transformation in Japan. At the time we constructed the conceptual research framework and hypotheses, enabler items were considered to consist of BPT management, executing drastic transformation, and wide-scope transformation which helps to achieve BPT effectiveness. However, from the research results, executing drastic transformation and wide-scope transformation seemed to be



conflicting items. Then, we focused on the group that we had defined as “super-ordinate firms”, and a difference was seen between “super-ordinate” firms and other firms in some categories.(e.g., managements' will to change business process according to business environmental change, business - IT alignment function, evaluation criteria for external resources, system users' role.) These items can be considered as the enablers of BPT for Japanese firms. The item “evaluation criteria for the external resources” must be important for many firms, not limited to Japanese firms. However, Japanese firms rely far more on system engineers of outsourcing services, compared to the United States. That means, evaluation criteria for the external resources must be one of the crucially important items for the Japanese firms. The enablers we had mentioned in this paper would help the firms in Japan who are struggling to realize drastic transformations. For the future research, we plan to delve more deeply into these enabler items, by interviews. Trust can be considered one of the key factors of business transformation effect [19]. So, we are planning to focus on the process of developing trust in business process transformation, and will analyze the differences between the super-ordinate firms and other firms.

#### ACKNOWLEDGMENT

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