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## **Store Information Processing in Retail Merchandising**

Key Words: Retail, Store Information Processing, Merchandise, Coordination

### **ABSTRACT**

Many studies that argue about retailers' buying behavior treat retailers as hierarchical organization structure, in which merchandising (MD) plan is determined by only merchandisers at the beginning of period based on predicted demands, without cooperating with stores. However the store information is critically important to fit such uncertain environment. Although recent computerization in retailers would bring about information coordination between stores and buying department, this coordination requires stores to process information about facing environment such as actual customer behaviors. This research aims to investigate and classify store information processing and estimate the effect on business outcome.

### **1. Introduction and Objectives**

Many researches in marketing focus on the importance of retailers staying close to their customers. Traditional studies argue about retailers' buying behavior, treated retailers that had hierarchical organization structure and merchandising (MD) plan is determined by

only merchandisers at the beginning of period based on predicted demands, without cooperating with stores(e.g. Hansen and Skyette, 1998; Nilson and Host, 1987). On these traditional studies about MD, there is no assumption to utilize information accumulated in stores. Or there is assumption that merchandisers can set the MD plan based on the demand forecasts constructed by sales information that they can get without utilizing information accumulated in stores. Based on these assumptions, types of product or merchandise and personal factors of buyer influencing on buying behavior and its process (e.g.Sheth, 1981; Fairhurst and Fiorito, 1990; Davis, 1994; Johansson, 2001; Silva et al., 2002), MD requirements (e.g. Fiorito, 1990; McLaughlin, 1995; Hansen and Slytte, 1998), technical factors effect on buying process (Knight, 1984; Dale, 1994; Hansen and Skytte, 1998; Johansson, 2001), are the main topics in prior studies.

But in such unstable and diverse environment, gaps between MD plan and actual consumer buying behaviors have occurred. This is because, as prior studies' assumptions, merchandisers would set MD plan without utilizing regional information accumulated in each store. So it has critically important to cooperate with stores to share and combine store information, especially regional information on each store, into MD plan.

By the research on organizational architectures (e.g. Aoki, 2001; Chabaud and Codron, 2005), the structure of information processing of traditional retailers were explained by “hierarchical decompositions”, whereas the structure of sharing and combining store information were “information assimilation”. Advanced information technology (IT) is essential for retailers to construct each structure (e.g. Brews and Ticci, 2004; Takashima,

2010). In the case of hierarchical decompositions, IT is necessary to set MD plan based on demand forecast precisely as possible with accumulating and analyzing sales data of prior period. Whereas in the case of information assimilation, it is necessary to modify the MD plan to fit the environmental changes as the gap between the MD plan and actual customer behaviors. In other words, IT enables retailers to construct either hierarchical decompositions or information assimilation.

But some researches pointed out that IT would provide information assimilation (Takashima, 2010). One reason is that stores and merchandisers conduct each specialized information processing separately (e.g. Dale, 1994), hierarchical decompositions would inhibit each specialized information processing. Another reason is that environments addressed by each department are so unstable. Even though the MD plan is set based on precise demand forecast, gaps between MD plan and actual consumer behavior were occurred.

To minimize these gaps, it is necessary to coordinate store information (such as POS, actual customer responses, changes by climate) with MD plan. In other words, store information processing is critically important to treat and feedback such short-term factors into MD plan. This research aims to classify the store information processing, and to investigate the effects of each information processing.

## **2. Literature Review:**

## **Retailer Buying Behavior**

Several studies on retailers buying behavior focus on MD. For instance, Sheth (1981) construct the model of MD buying behavior that contains MD requirements, intra-organizational factors, inter-organizational factors, choice calculus, supplier accessibility, competitive structure, and corporate image. Ettenson and Wagner (1986) define the retailer buying behavior as “the decision-making process through which the retail buyer identifies, evaluates, and selects merchandise for resale to the customer”. As this definition, sheth (1981)’s model divided into two parts, one is the process to decision which product to buy and assort, another is actual product choices. Some studies investigate the factors influencing on these two parts of retail buying behavior, which is types of product or merchandise (Sheth, 1981; Fairhurst and Fiorito, 1990; Johansson, 2001) and personal factors of buyer influencing on buying behavior and its process (Martin, 1973; Ettenson and Wagner, 1986; Fairhurst and Fiorito, 1990; Davis, 1994; Kline and Wagner, 1994; Johansson, 2001; Silva et al., 2002), MD requirements (e.g. Nilsson and Host, 1987; Fiorito, 1990; McLaughlin, 1995), technological factors effect on the buying process (Knight, 1984; Dale, 1994; Hansen and Skytte, 1998; Johansson, 2001).

Focusing on the personal factors of buyers, Martin (1973) mentions that a retail store’s success is in part due to whether or not the organization realizes the importance of having older and more experienced buyers. Similar to this mention, Etterson and Wagner (1986) find that buying experiences affect the judgment strategies of buyers, assistant buyers, and

students when evaluating the salability of merchandise. Fairhurst and Fiorito (1990) investigate more personal factors of buyers, which is experience, degree, gender, and training. They conclude that experiences and training influence significantly on GMROI. This result show strongly supported Martin (1973) and Etterson and Wagner (1986). On the other hand, they found that the extent of training required for the buyer's job negatively influence on GMROI. As opposed to experiences, the buyer's perception of the amount of training needed negatively affected the financial performance of the department.

Different from these personal factors, the criteria buyer using are also investigated. Some studies investigate this criteria such as MD requirement, which is defined as the buying motives and criteria used by the retailer to evaluate different product offerings (Nilsson and Host, 1987; Hansen and Skette, 1998). Although many researches investigate and identify MD requirements separately on new products presented to retailer or on decisions for the assortment (e.g. Gordon, 1961; Grashof, 1970; Nilsson, 1977; Etterson and Wagner, 1986), Nilsson and Host (1987) systematize and conclude that many criteria can be reduced to a framework of ten categories and twenty five sub-categories as can be seen in table 1. As McLaughlin (1995)'s study implies, types of MD drive a number of specific product characteristics to be used in the MD requirements. In other words, through this MD requirements the product characteristics account for the difference between accept and not accept products within the same product lines.

### **Table 1. Merchandise Requirement**

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<p><b>A. Profitability and Sales</b>  A1 Overall profitability  A2 Rate of turnover  A3 Sales potential</p> <p><b>B. Economic Conditions</b>  B1 Supplier's price  B2 Gross margin  B3 Allowances and rebates  B4 Support to cooperative advertising  B5 Credit terms  B6 Other economic conditions</p> <p><b>C. Assortment considerations</b>  C1 Existence of private brands  C2 Relations to other products</p> <p><b>D. Consumer evaluation</b>  D1 Overall consumer value  D2 Retail price  D3 Product's physical characteristics  D4 Product's psychological characteristics  D5 Packaging</p>	<p><b>E. Supplier marketing</b>  E1 Introductory marketing campaign  E2 Continual marketing</p> <p><b>F. Supplier characteristics</b>  F1 Supplier representatives  F2 Reputation and reliability  F3 Sales force organization  F4 Services and functions  F5 Other characteristics</p> <p><b>G. Competitive considerations</b></p> <p><b>H. Distributive factors</b>  H1 Transportation adaptation  H2 Store adaptation</p> <p><b>I. Tactical considerations</b></p> <p><b>J. Salesman presentation</b></p>
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Source: Nilsson and Host (1987)

The relationship between buyer's experience and MD requirement was studied. For instance, Davis (1994) found that inexperienced buyers are more inclined to use objective criteria such as net margin and price for delisting products, whereas more experienced buyers use less objective measures. However, Ettenson and Wagner (1986) found the opposite result that the more experienced buyer use mark-up and sales data as buying criteria. As Hansen and Skytte (1998) mention, the results of the influences experience on MD requirement are mixed.

These 2 focuses (buyers' personal factors and MD requirement) are aim to investigate the characteristics of the buyers or factors affecting on the relationship between buyers and suppliers, whereas some studies argue the technological factors effect on the buying process (Hansen and Skytte, 1998; Johansson, 2001). Johansson (2001) emphasize that

information availability creates more transparency, making it easier to make choices throughout the buying processes. Information for managing the interfaces with the consumer and suppliers on steady-state operations can be managed through information from internal systems (EPOS, EDI, ERP-systems, etc.). These information technologies (IT) influences on buyers' criteria which to buy through the type of information the buyer needs, the sources of information, and the way of processing throughout the buying process (Johansson, 2001).

These previous studies on retail buying behavior are conducted based on the premise that the decision which to buy or not are made by the buyers and all information are gathered and used by the buyers. This means that previous studies have the premise of the structure of retailers as centralization, in other words, the MD plan is set by buyer or buying department and each store only conduct in accordance with that plan.

These studies on buyers' characteristics or criteria assume using the information that is accumulated in each store such as sales data, whereas these studies are not assume the coordination between buyers and stores to share the information that only stores can observe like actual customer buying behaviors. As Swindley (1992) mentions buyers' judgments do not always reflect marketing activities and bring the company's success, it would be difficult to fit the changeable environments as long as it is assumed that only buyers make the decisions which to buy and formulate MD plan based on the information they can get their own. In this regard, because each store and buying department are specialized to process different information such as "selling" and "buying" respectively,



centralization would inhibit these two specialized information processing (Knight, 1984; Dale, 1994).

Traditionally in Japanese retailers, stores and buyers (or buying department) formulate the MD plan with coordinating and sharing the information each other. In the case of the gaps between MD plan and actual customer behaviors occurring, re-coordination and modifying that MD plan are conducted even during the period. The Japanese retail market would be rapidly changing and consumers regard product quality and assortment as important comparatively in the world. Even if the traditional Japanese retailers become large scale and centralize its organizational structure, many of these retailers regard the regional information that only accumulating on each store as important to fit these regional customer demands.

For example, Japanese top retailer AEON adopts the IT system “ODBMS (Open Database Merchandise System)” in order to control each store’s assortment and stocks. The aim of this IT system adaptation is to transfer the ordering authority from each store to the buying department. This enables to optimize the demand forecast and stocks on each store accurately. In other words, it is assumed that the overstock and loss of the sales opportunities can be prevented and the gaps of ordering accuracy on each store also can be reduced by this centralization. However, this centralization brings it difficult to fit each regional characteristic. To make matter worse, it become difficult to reflect customer needs because of this regarding efficiency as priority on layout of the floors. So, AEON modifies this system, which enables each store and buying department to share the data of actual

customer behaviors. In other words, this modifying makes buying department correspond to each regional characteristic flexibly and succeed accomplishing improving the order prevision.

As this case, each store have important role on retail buying behavior. Concretely, it is important for buying department to get accurately data of regional customer behaviors, which depends on each store's capability to perceive and analyze the gaps between MD plan and actual customer buying behaviors.

Hansen and Skytte (1998) mention some retailers has central buying unit through which all buying takes place, whereas other retailers have different concepts and individual store has some degree of autonomy to decide their assortment. However there are almost no investigates focusing on the stores in previous retail studies because of the difficulty to access data and its series of unqualified tasks performed by plain executants (Chabaud and Codron, 2005).

This research focus on retail stores and aim to investigate what capability is needed for stores to analyze the gaps and to improve the business outcome. In order to argue the relationships between stores behaviors and buying department behaviors, I review the organizational architecture based on the informational view.

### **Organizational Architecture and the Structure of Retail Information Processing**

Aoki (2000) emphasizes that the important point is explicitly treating the organization

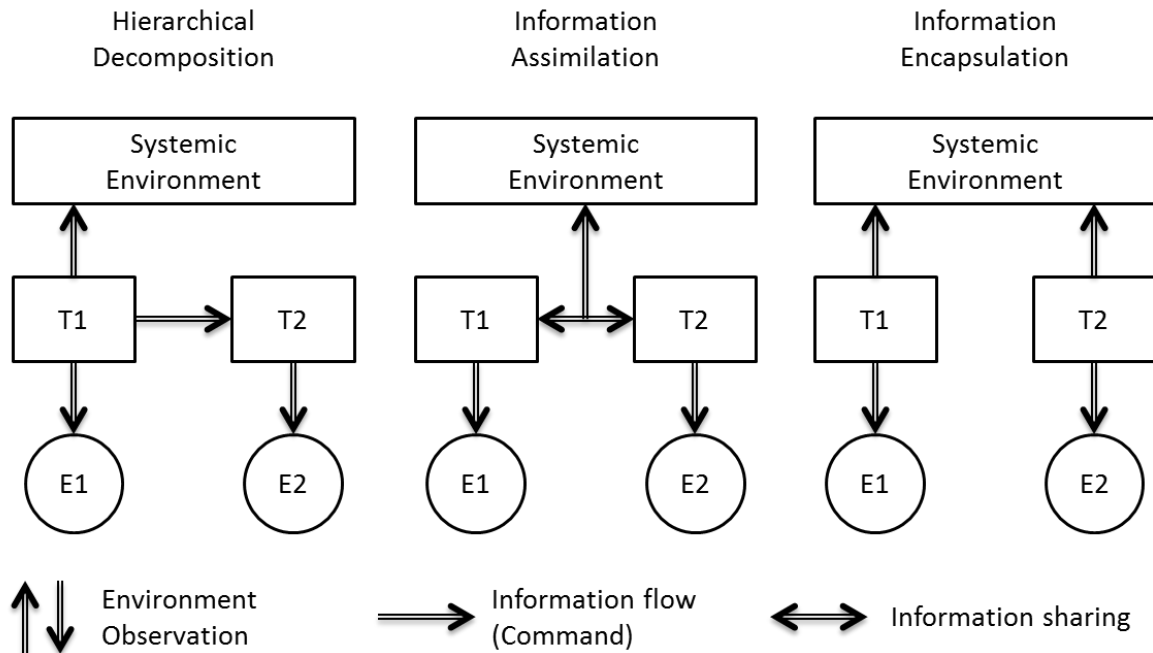
of the firm as an information system. Moreover, in order for firm to be internally integrative and organizationally effective, either coordination or incentive mode needs to be constructed into hierarchical, but not both of them (Aoki, 1990). He distinguishes two economical models; the American model which combines centralized (vertical) coordination and decentralized (horizontal) incentives and Japanese model which combines decentralized (horizontal) coordination and centralized (vertical) incentives.

This Aoki (2000)'s study offers new perspective which gives insights on retail firm organization. He emphasizes the diversity of informational relations with ascending and descending information flows between hierarchically distinct units and horizontal flows between the operational units. Based on this perspective, Aoki (2001) introduces a third generic mode of informational structure, the encapsulation one which focuses on the activities with weak stochastic correlation of environmental uncertainties. Aoki (2001) use the case of the organization which has two units, T1 and T2. These units have to make activity decisions that determine the organizational results in the faced environmental uncertainty. This study describes that one can estimate the environmental parameters in the first time, deriving from past experience or formal knowledge. Such knowledge helps to define the preliminary plan as an optimal decision choice. When firms' activities start, environmental parameters can be observed. If firms can identify appearing events, it will be able to improve ex-ante plan and to bring cost-minimizing immediately. Because it is assumed that observations remain imperfect, the significant question is in the way of sharing information processing tasks between two operational units of the organization and

in the ex-post decision rules that should be implemented at each level. Aoki (2001) defines differentiating two types of environment with corresponding uncertainty; the systemic environment and idiosyncratic environment. The systemic environment can affect the activity of both operational units, whereas idiosyncratic environments, E1 and E2, affect each unit respectively and are proper to each. The idiosyncratic environment can only be observed by each unit and cannot be communicated their observations to the other during the time period.

Based on these assumptions, Aoki (2001) distinguishes three economic models according to how processing tasks of information about systemic environment events are shared between two units (Figure 1).

**Figure 1. Diversity of Information Connectedness.**



Source: Aoki (2001)

*Hierarchical decomposition (HD).* T1 monitors the environment common to both units, and makes a decision regarding its action in response to the state of whole environment and idiosyncratic environment (E1). T2 is informed of the choice of T1 and adjust on this basis its decision. T1 is hierarchically superior to T2.

*Information assimilation (IA).* Both T1 and T2 observe the systemic environment. In this sense, this model assumed the perfect correlation of these observations, T1 and T2 pooling their observations in order to form an assimilated cognitive representation, enabling to have the same probability distribution over the environment. These units share the samples of not codified information that they separately generate from their activities and collectively construct a joint distribution of the probability of environment state, as

Aoki (2001) use the term of “contextual information sharing”.

*Information encapsulation (IE)*. Systemic and idiosyncratic environments are independently observed by each unit, observation errors are supposed uncorrelated which result in differentiated cognitive perceptions of environment.

These three architectures are determined for what is the informationally efficient organizational architecture by three variables, 1) task complementarity or substitutability, 2) correlation level between idiosyncratic environments, 3) communication costs. He provides 5 propositions offering the benchmarks for three way comparisons of information efficiency. As mentioned in these propositions, the information processing capacity also critical variables influencing on communication cost and information efficiency. Proposition 4 says whenever the use of digital communications technology can reduce the disparity of information processing capacity across task units, the relative informational efficiency of hierarchical decomposition mode vis-à-vis the network-induce information assimilation mode diminishes when two tasks are complementary (Aoki, 2001; p.105). This proposition suggests that installing information systems would provide both hierarchical decomposition and information assimilation. Similar to this, some studies also mentioned the computerization improves the interdepartmental communications because it is easy to share the information as the data of selling and buying separately based on their specialized information processing (Bourlakis and Bourlakis, 2006; Takashima, 2010a). However, as Brews and Tucci (2004) insist, information systems improve each manager’s capability of

information processing, which enables managers to increase the number they can manage. So computerization tends to reduce the hierarchy of the organization. If the computerization enables manager of headquarter (or buying department in the retail context) to gather the store information and to direct the stores directory, centralization (hierarchical decomposition) will be chosen. On the contrary, if the computerization improves the capability of store information processing and enables stores to make decisions and to share and coordinate themselves, decentralization (information assimilation) will be chosen.

But as mentioned above, stores and buying department are specialized to process different information such as “selling” and “buying” respectively (Knight, 1984; Dale, 1994). Centralization would inhibit these two specialized information processing. Moreover, because each selling and buying environment become to be more and more uncertain, it is difficult to modify and fit each environment quickly by hierarchical architecture. For these reason, it is considered that computerization provide retailers the information assimilation (Takashima, 2010a). Assuming high uncertainty, it is necessary for retailers to construct the postponement distribution system in order to fit the regional needs and to minimize stocks on each store, based on information assimilation. Functioning this postponement distribution system, Takashima (2010b) emphasis that it is essentially important to coordinate the data accumulated on each store such as POS and regional customer needs with MD plan. In other words, the information processing capability about regional characteristics of each store and the factors of short-term demand fluctuations in

each market area is the key factor. Especially, there are many staffs (not the manager) and part-time-workers in retailers today. Because of the high ratio of these employees, information processing capability of these employees is critically important for retailers to improve the efficiency of the information assimilation and postponement distribution system. This research aim to investigate what information should be processed in each stores and how each information processing influence on the business outcomes.

### **3. Methodology**

As already mentioned, prior researches do not investigate store information processing. However, by computerization, store information processing is critical to construct information assimilation and the postponement distribution system .Because there is no empirical study focusing on store information processing, it is necessary to investigate what information should be processed in retail stores, firstly in this research. Based on this investigation, I will examine the effect of information processing on store business outcome.

As step1, in order to investigate and classify store information processing, semi-structured interview was conducted on a Japanese Retailer Maxvalu, headquarters in Kobe, Japan. This retailer has 127 stores in western Japan and adopts two different information systems. One is for categories of fresh food, another is for other categories. The reasons of this choice are a) the developing stores in several regions which have



different culture of consumption and b) there exist high performing stores and low performing stores. I conducted 32 semi-structured interviews (1 manager of sales department, 3 store managers, 2 vice-store managers, 9 store staffs, 6 part-time staffs, 4 buying department managers, 3 buying department supervisors, 2 training staffs, 2 management staffs), each is in about one hour. In these interviewees, the manager of high performing store, middle, and low are included because this research aim to investigate the effect of store information processing on business outcome. From these semi-structured interviews, 11 information are described as table 2.

**Table 2. Store Information Processing by Semi-Structured Interview**

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- stock turnover of strong seller items
  - monthly actual sales of strong seller items
  - price point (that achieve to have the most sales) of flagship items
  - price range of flagship items
  - gaps between monthly MD plan and actual sales in each categories
  - expectations for services that frequent customers have
  - customer needs for the assortments
  - customer needs for the prices
  - competitors' price of flagship items
  - items on competitors' flyer.
  - prices on competitors' flyer.
- 

As step2, in order to test the classification and its effects on business outcome, of 2153 surveys for 127 stores distributed by interviewee retailer, 818 were returned for response rate of 37.1%. In this research, 452 samples on agricultural, livestock, fisheries,

side dish, and in-store bakery were used, because this research aim to classify information processing in each stores and to investigate the effect on business within the uncertainty environment.

Each items of store information processing on 5 point scales items were measured with 7-point scales anchored at 1 (*not ascertainment or understanding at all*) and 5 (*strongly ascertain or understand*). The aspect of information assimilation is measured by store activities sharing store information such as modifying each items' order of assortment, volume, and price with buyers during the period, with 6-point scales anchored at 1 (*strongly disagree*) and 6 (*strongly agree*). And I measured the business outcome with each store's rate of achievement of the planed business outcome over the same period last year.

I conducted a factor analysis to investigate constructs of store information processing and the activity of information sharing. The result of factor analysis (varimax rotation) for information processing is in table 3. I examined the factor loadings to assess the validity of the measures. Cronbach's  $\alpha$  and AVE (average variance extracted) is indicated to assess the reliability. Firstly, Cronbach's  $\alpha$  is significant high (from .85 to 90.). Secondly, AVE supports the reliability of measures and the criterion for establishing reliability is that the AVE measures should exceed .50 (Bagozzi and Yi, 1988). As in table 3, AVE of MD plan is under this criterion because the factor loadings of "*stock turnover of strong seller items*" and "*gaps between monthly MD plan and actual sales each category*" are comparatively low. However, repeatedly, this research aims to investigate the effect of store information processing on business outcome exploratively. So I contain these two measurement items

because of its significance for retailers. By this factor analysis, there are three factors. I named these factors as information processing of *MD plan*, *customer needs*, and *competitors* (see table 3).

**Table 3. The Result of Factor Analysis and Items Reliabilities**

Construct	Scale Items	Factor loading	$\alpha$	AVE
Information assimilation	sharing store information such as modifying each items' order of assortment with buyers during the period	.902	.907	.834
	sharing store information such as modifying each items' order of volume with buyers during the period	.922		
	sharing store information such as modifying each items' order of price with buyers during the period	.916		
Information processing about MD plan	stock turnover of strong seller items	.586	.856	.472
	monthly actual sales of strong seller items	.703		
	price point (that achieve to have the most sales) of flagship items	.810		
	price range of flagship items	.750		
	gaps between monthly MD plan and actual sales in each categories	.552		
Information processing about Customer needs	expectations for services that frequent customers have	.627	.848	.552
	customer needs for the assortments	.883		
	customer needs for the prices	.696		
Information processing about Competitors	competitors' price of flagship items	.658	.902	.715
	items on competitors' flyer.	.920		
	prices on competitors' flyer.	.931		

In the next step, in order to examine how effect these information processing in stores and activity of information sharing on each business outcome, I construct the hypotheses how each factor effect on store business outcome.

#### **4. Analysis and results**

Based on items obtained from semi-structured interviews, it is cleared that three types of information processing are existing. Firstly, information processing about MD plan would be able to optimize stocks in store. Secondly, information processing about customer needs would improve the fitness of assortments in their markets. However, information processing about competitors would bring the price competition in their market. This competition makes store profitability worse. If profitability becomes worse, the rate of achievement of the planed business outcome goes down. Finally, it is more efficient to choice information assimilation in high uncertain environment. In other words, store business outcome would become high by doing the activities of sharing store information or coordination with buying department.

H1: Information processing about MD plan in stores effects positively on store business outcome.

H2: Information processing about customer needs in stores effects positively on store business outcome.

H3: Information processing about competitors in stores effects negatively on store business outcome.

H4: The activities of information sharing (coordination) on stores effects positively on

store business outcome.

In order to verify these hypotheses, I conducted regression analysis and the results were obtained as table 4. Each dependent variable of MD plan, customer needs, competitors are constructed with combining each scales into factor scores by principal factor method, while the dependent variable of activities of coordination is obtained by principal component analysis. To control the regional characteristics and the characteristics of product categories, each region and category included in this regression model as control variables.

The result is that information processing about competitors is significantly negative ( $p < .05$ ), while coordination with buying department is significantly positive ( $p < .05$ ) relation to the business outcome ( $R^2 = .518$ ). Information Processing about MD plan and customer needs are not significant.

**Table 4. The Result of Analysis of Regression Model**

Dependent variables	Standard error of the estimate	$\beta$	t-value	p-value	VIF
Information assimilation	1.200	.276**	2.397	0.020	1.335
Information processing about MD plan	1.433	-.015	-0.125	0.901	1.485
Information processing about customer needs	1.638	.076	0.607	0.547	1.577
Information processing about competitors	1.496	-.256**	-2.075	0.043	1.538
Control variable (region: middle of Hyogo)	4.531	-.083	-0.606	0.547	1.906
Control variable (region: western Kobe)	5.341	-1.196	-1.196	0.237	1.707
Control variable (region: Eastern Kobe)	4.861	-1.821*	-1.821	0.075	1.820
Control variable (region: Eastern Yamaguchi and Hiroshima)	5.422	-2.084**	-2.084	0.042	1.490
Control variable (region: Yamaguchi)	4.026	-1.426	-1.426	0.160	2.675
Control variable (Fisheries)	4.708	-3.985***	-3.985	0.000	1.520
Control variable (Livestock)	4.065	-4.359***	-4.359	0.000	1.773
Control variable (Side-dish)	3.468	-2.390**	-2.390	0.021	2.016
Control variable (In-store-bakery)	5.972	-4.215***	-4.215	0.000	1.809
Control variable (Part-time-work)	2.596	-.059	-0.059	0.954	1.185
R2=.514					

\*\*\*sig.<.01, \*\*sig.<.05, \*sig.<.1

In this regression analysis, information processing about MD plan and customer needs are not significant. However, these two processing information are essential for information assimilation and postponement distribution system, which theoretically bring about minimizing the stocks and better assortment fitting to regional characteristics. So, this result possibly is supposed to shows that these two variables have the interactive effect

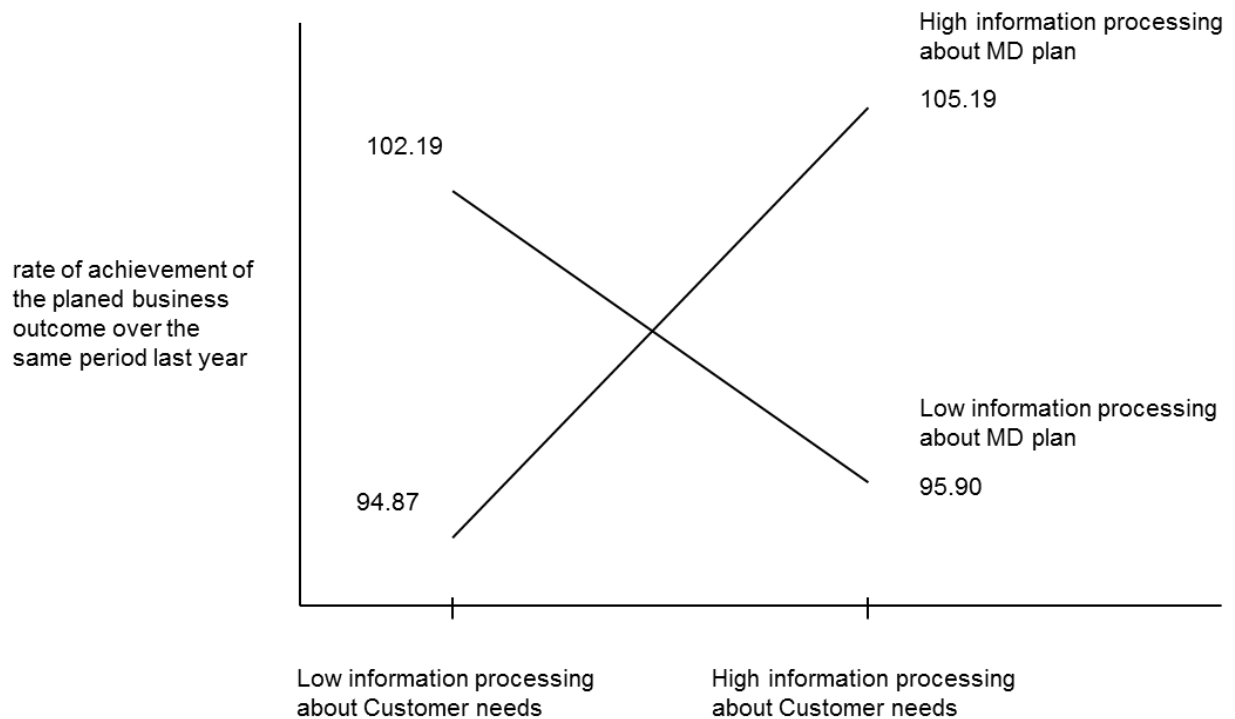
on store business outcome.

It is comparatively easy to process the information about MD plan because this requires observing the gaps between MD plan and actual sales. On the other hand, to process the information about customer needs requires paying more attention to observe customers. This means that processing the information about customer needs requires more advanced information processing, compared to MD plan. Because information about customer needs contains more diversity, this would occur the over adaptations, for example bullwhip effects (e.g. Lee et al., 1994; 2004; Croson and Donohue, 2006). In this sense, it is crucial to process the information about customer needs based on processing information about MD plan. If retailer process only information about customer needs without MD plan, it is assumed to trigger over adaptation to the market, which makes business outcome of stores worse.

H5: There is an interactive effect of information processing about MD plan and customer needs on store business outcome.

To test H5, I conduct ANOVA and the result is in table 5. As the result, there was no significant simple effect to the dependent variable, but there was significant interactive effect of information processing about MD plan and customer needs on the dependent variable ( $F(1,379)=5.175, P<.05$ ).

**Table 5. The Result of ANOVA: Cell Means**



## 5. Discussion

This study investigates the relationships between information assimilation (information coordination), information processing in retail stores and business outcome. Firstly I classified three information processing in retail stores. It is the information processing about “MD plan”, “Customer needs”, and “Competitors”. Secondly, I examined the effect of coordination activity and these information processing on business outcome. I found that coordinating with buyers has positive effect on business outcome and processing competitors information has negative effect to the rate of achievement of MD



plan. I assume that the negative effect of processing competitor information occur unreasonable price competition.

Moreover, I found that there is an interactive effect of information processing about MD plan and customer needs on business outcome. The result of this study suggests that it is critically important to process customer needs information based on MD plan information. If stores processed MD plan and does not customer needs, the rate of achievement of MD plan would remarkably become worse. This is considered that only processing MD plan occur the ignoring customer actual needs because of its standardized assortment. On the other hand, only processing information about customer needs occurs the over adaptation to the market. So, it is important to process MD plan and customer needs with keeping balance.

Finally, the stores of low information processing about MD plan and customer needs are relatively high performance. This is assumed that the managers of these stores have strong leadership high capability to process information and direct their staffs. In these stores, the capability of store managers and its leadership to direct would cover the low information processing of staffs and achieve relatively high business outcome, even if store staffs' and part-time-workers' motivation and capability of information processing are low. This point will be significant factor effect on business outcome of retailer stores. In this sense, it will necessary to construct and investigate the model including this manager's capability and leadership for the future research.

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