

IT Governance to Create Value

**—Based on the Results of NRI Survey on the
Status of IT Use 2013—**

Yuki ARIGA

Nomura Research Institute

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Currently, companies have been shifting their primary objectives of information technology (IT) investment from improving the efficiency of back office functions to achieving change such as company-wide business process standardization/integration and product/service innovation.

Every year, Nomura Research Institute (NRI) conducts the “Survey on the Status of IT Use in User Companies.” The results of the 2013 survey revealed that Japanese companies mostly rely on a bottom-up approach to build consensus and are unable to make sufficient investments for achieving change.

In companies striving to achieve change by IT, top executives are involved in making decisions regarding IT. In addition, they are attempting to visualize IT investments in an effort to allocate a greater portion of the budget on achieving change.

However, themes such as “company-wide data/process standardization” and “creating new business models by IT” are highly likely to cause friction with each business division. These themes present high hurdles for Japanese companies that have grown by strong “*genba-ryoku* (on-site competency)” as a weapon. Under the leadership of top management, business and IT must be integrated.

Top executives should consider themselves responsible for IT governance and demand to view the status of IT investments and their value, and should make decisions for assigning personnel and setting up organizations so that IT-enabled change can take place without difficulty.

I Change in Expectation of the Value Created by IT

In the past, many arguments about the value created by investment in information technology (IT) have occurred among various experts such as researchers, consultants, pundits, writers, IT executives, etc. Since the 1960s, many companies have introduced computers to improve business efficiency. Without a doubt, such investment has enabled various types of automatic data processing such as data entry, transcription and aggregation. However, they have always raised the question of whether such spending has actually led to real business value. ^{Note 1}

For example, Paul A. Strassmann, a former Xerox chief information officer (CIO), stated in his 1990 book that there was no correlation between expenditures for IT and any known measure of profitability, but then he went on to say that IT can improve the productivity of management practices. He also pointed out the need to reduce swollen administrative work as a requisite for improving productivity.

In 2002, Erik Brynjolfsson of the Massachusetts Institute of Technology (MIT) found through quantitative analysis that investment in IT is related to the market value of companies when it is combined with investment in intangible assets such as human resources, organizational practices and corporate culture.

However, Nicholas Carr published an article entitled “IT Doesn’t Matter” in the May 2003 edition of the Harvard Business Review. In this article, Carr argued that IT has already become a commodity that anyone can access, and it is no longer a source of competitive

advantage. His argument ignited fierce disputes. While it would be paradoxical, it is reasonable to assume that the focus of today’s debates has shifted to whether IT can achieve business innovation and help it gain competitive advantage.

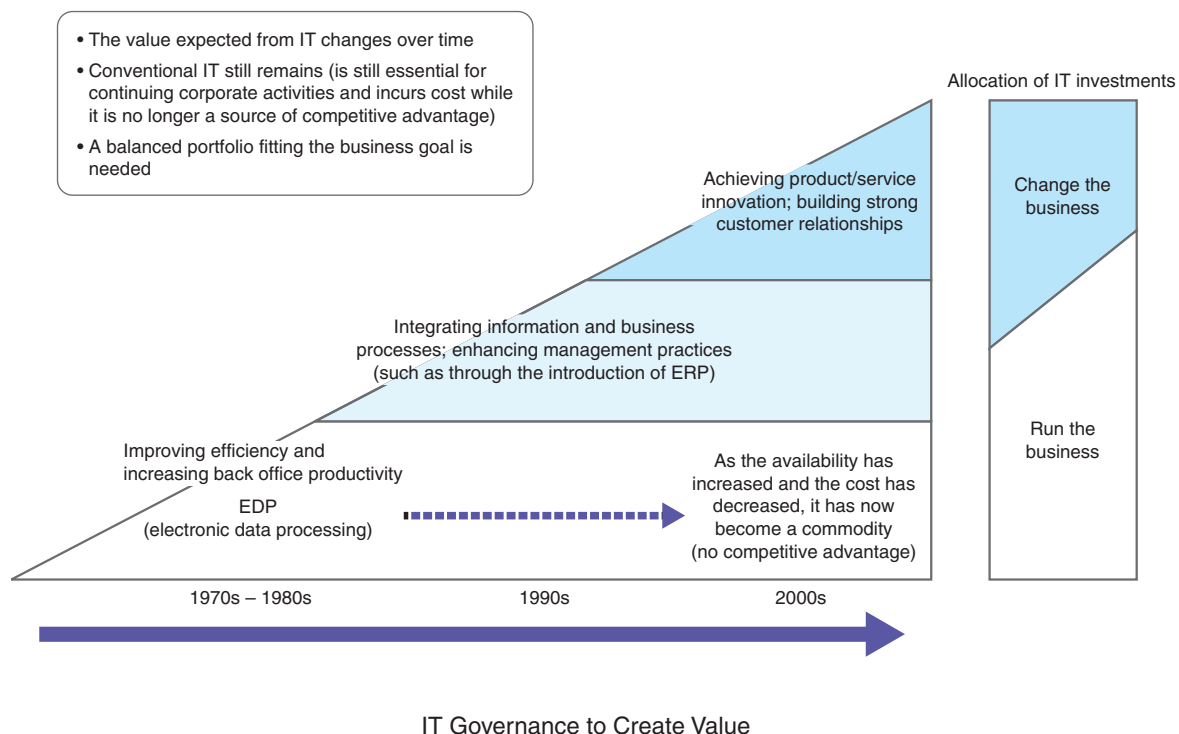
From the perspective of technological evolution, during the initial period when computers were introduced, informatization at the time simply involved electronic data processing (EDP) whereby paper-based slips and ledgers were computerized. However, in the 1990s, business process re-engineering and integration of management information have come to the fore. At the same time, an enterprise resource planning (ERP) package has become common, which comprehensively manages an entire company’s management resources.

Currently, as exemplified by the Industrial Internet initiative of General Electric (GE), cases have become noticeable in which IT is used to develop new products and services, leading to business innovation (Figure 1).

Given this trend, the concept of IT management has also changed. The improvement of the efficiency of back office functions was the major objective of the use of IT in the past and it can be addressed at the department level. On the other hand, the involvement of top executives is essential for company-wide optimization and change of business model.

In addition, consideration must be given to the priority of each objective in allocating IT investments. The cost to maintain a conventional information system, which is necessary to continue corporate activities but no longer essential for strategic advantage, must be distinguished from investment to change the management scheme and/or to build a new business model. Based on such a distinction, an optimal portfolio must be created.

Figure 1. Change in value expected from IT



II Status of IT Investments in Japanese Companies

1 Objectives and allocation of IT investments

Every year, Nomura Research Institute (NRI) conducts the “Survey on the Status of IT Use in User Companies,” which targets chief information officers (CIOs) or heads of IT departments of leading companies. This survey asks about the allocation of IT investments and the way to make decisions on IT investments.

The question about how to allocate IT investments gives four choices in terms of usage purposes: “infrastructure-related cost,” “application-related cost for improving business efficiency,” “application-related cost for utilizing information” and “application-related cost for strategic purposes.” The results of the 2013 survey ^{Note 2} showed that the average percentage of each purpose was 50.2 percent, 27.4 percent, 12.8 percent and 9.6 percent, respectively (the number of valid responses (*N*) was 523). Among application-related costs, spending for the purpose of improving business efficiency accounted for more than half (Figure 2).

While the average percentage of responding companies that spent for strategic purposes was 9.6 percent, the overall distribution leaned toward lower percentages, with companies that spent 4 percent or less accounting for about one-third. ^{Note 3}

When consideration is given to the purpose of investment, even the infrastructure such as servers and networks would have been made with the aim of gaining competitive advantage and/or transforming business structures. Based on this assumption, starting in 2013, in addition to the conventional classification, a new classification was adopted, which divided investment objectives into two groups: “change the business” and “run the business.”

In the new classification, the average proportion of “change the business” investment was 28.7 percent, thus “run the business” was 71.3 percent (*N* = 500). A look at the distribution reveals that nearly half of the responding companies apportioned 20 to 40 percent of their total

investments for the purpose of “change the business.”

The proportion of spending for the purpose of “change the business” has a low correlation with the proportion of “application-related cost for strategic purposes.” ^{Note 4} Such a low correlation can be interpreted as that these two objectives have somewhat similar meanings. The reason why the percentage of “change the business” is higher than that of “application-related cost for strategic purposes” is that “change the business” responses include some of “infrastructure-related cost” and “application-related cost for utilizing information” spent for the purpose of business transformation.

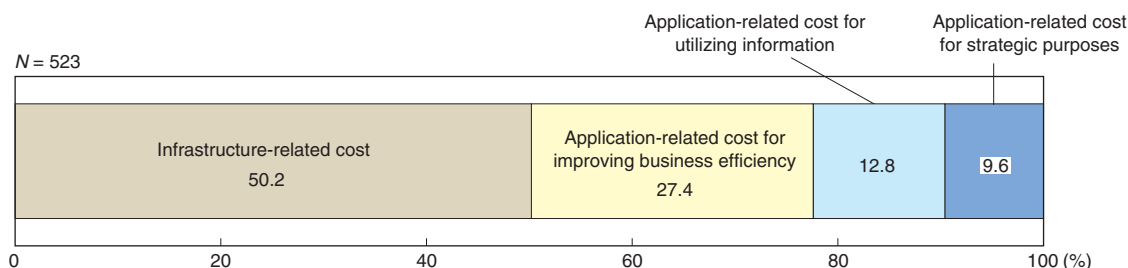
2 Top management’s interest and involvement

If companies use information technology to optimize company-wide business processes and to change business schemes, top management must be actively involved in determining the policy for IT use. According to the 2013 survey results, 46.0 percent of responding companies selected “top executives and board members” to the question of “who decides the policy for IT use.” To the question of “who decides IT investments,” more responding companies (60.5 percent) selected “top executives and board members” (*N* = 598). ^{Note 5}

While it is difficult to infer a general decision-making style in Japanese companies based on these results, it is reasonable to assume that fewer companies have a top-down scheme in which senior executives determine policy and more have a bottom-up scheme in which each investment is judged without a fixed policy and IT use ends up a patchwork.

In June 2013, the Japan Electronics and Information Technology Industries Association (JEITA) and IDC Japan jointly conducted a survey targeting the chief executive officers (CEOs) and heads of non-IT departments of Japanese and U.S. companies. This survey revealed considerable differences between them in terms of interest in IT. ^{Note 6} While many U.S. managers (75.3 percent) consider IT investment “very important,” the majority of Japanese managers consider it either “important” (52.8%) or neutral (24.1%). Similarly, regarding the expectations of IT (the reason for increasing

Figure 2. Allocation of IT investments



Source: “Survey on the Status of IT Use in User Companies” conducted by Nomura Research Institute in December 2013.

the IT budget), most U.S. managers selected “strengthening the development of products and services” or “changing a business model,” while the largest proportion of their Japanese counterparts selected “improving business efficiency/reducing costs.”

These findings suggest that relatively few companies in Japan drive IT-based change under strong leadership of CEOs who have high interest in IT and who decide on the policy for IT use.

III IT Investments for Creating Value

1 Investment allocation and decision making

IT will be considered the “core technology” that gives rise to competitive advantage if the companies strive for business transformation by using IT. ^{Note 7}

For example, financial institutions are, by nature, unable to operate business without a data processing system. However, the positioning of IT differs from company to company. Some companies might consider IT as mere infrastructure to operate business, while others might use the technology as a “strategic weapon” to gain competitive advantage. The 2013 NRI survey asked the chief information officers (CIOs) or heads of IT departments whether IT is “core technology that enables the company to transform its main business, thereby creating its strengths.” To this question, 54.1 percent of the responding companies answered that they consider IT as such a “core technology” ($N = 593$).

The proportion of IT spending for specific purposes is naturally different between companies achieving competitive advantage by IT and those that do not. Actually, the percentage of spending for the purpose of “change the business” was 32.6 percent on average in companies that consider IT as “core technology,” which is about 8 percentage points higher than companies that do not consider it so. ^{Note 8} Moreover, among companies

that consider IT as “core technology,” the proportion of companies in which top management is involved in determining the policy for IT use was high at 51.4 percent. The proportion was 40.1 percent among companies that do not consider IT as “core technology.” ^{Note 9}

Furthermore, with respect to listed companies that publicly announced their financial data, we compared their financial results from FY 2009 to FY 2012. In this comparison, companies that consider IT as core technology achieved 1.4 percentage points higher profit margin as an average for four years than that of companies that do not consider IT as such technology. ^{Note 10}

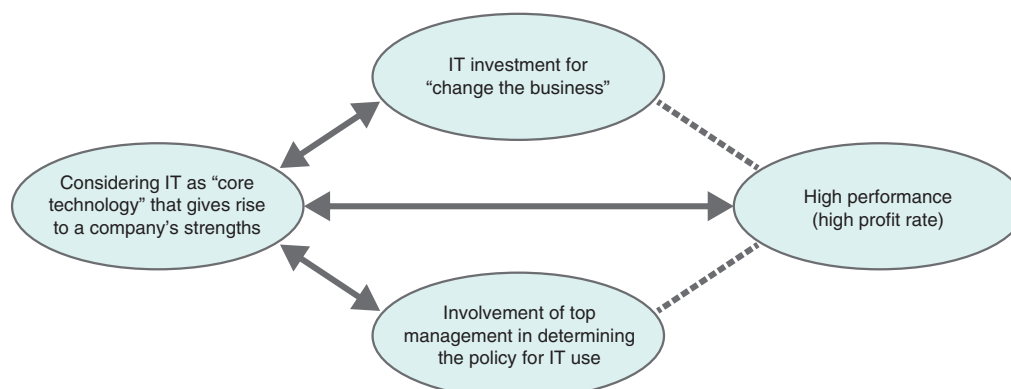
These results do not automatically mean causation but imply some relationship between IT usage and corporate performance in Japanese companies. It is suggested, as well, that there are some “IT savvy” companies ^{Note 11} that have clear purposes for IT use and actively spend on IT-based business innovation, leading to the creation of high value (Figure 3).

2 Case studies of IT investments in “savvy” companies

Looking at actual examples of Japanese “IT-savvy” companies ^{Note 12} would be useful to give shape to the assumptions obtained by the 2013 survey. Among the following examples, this paper describes the cases in which “IT investments to create new value” are clearly distinguished from “IT investments to continue existing business.”

Nissan Motor revised the management method of its IT budget and improved communication between executives, business departments and the IT department with the intent of reducing the costs incurred on complicated systems and of providing adequate explanations of IT investments. Specifically, Nissan changed the conventional classification of IT investments, which consisted of “new development” and “operation and maintenance.” From among investments coming under the “new development” category, the company excluded those to update and reinforce servers and those to respond to regulatory

Figure 3. Strategic positioning and usage of IT



Note: Solid arrows indicate relationships that were verified by the survey results; dotted lines indicate assumptions.

changes. The rest of the investments that are apportioned to the development of applications leading to the creation of business value and to business process reengineering were defined as “value.” Even when new systems are developed, the spending that does not accompany any change in the existing business mechanisms is not included in “value.” The company set goals of reducing total IT spending by 14 percent over the subsequent five years from fiscal 2005 and increasing the ratio of “value” investments to total investments from 28 percent to 40 percent. When compared to the results of the 2013 NRI survey, this 40-percent level can be regarded as an extremely high level.

In addition, Nissan classified individual applications based on two factors: business value and costs. While the company maintains applications incurring low costs and creating high business value, it has frozen the maintenance of applications incurring low costs but creating low value, which are planned to be discarded in the future. The company conducts improvement plans for applications incurring high costs by analyzing them from the perspectives of functional conditions and technical conditions. Through such management of its application portfolio, Nissan was able to boost the value from overall IT investments, while reducing total IT spending. As a result, the company could achieve its goal of reducing spending three years earlier than initially planned. The company has been implementing a new five-year plan starting in fiscal 2011 with the aim of promoting IT use that more directly leads to the creation of business value such as strengthening the development of products and improving the quality of service.

In a manner similar to that of Nissan, Ricoh has been striving to leverage IT to produce high business value while reducing total IT spending. The company classifies its IT budget into two categories: “infrastructure” and “project.” In an effort to pursue cost reduction, the company has fixed an upper limit of total “infrastructure” investments to 0.75 percent of consolidated sales. For “project” investments, the company has placed an emphasis on return on investment (ROI). These investments are divided into (1) those generating “real effects” such as those directly contributing to personnel reduction and (2) those enabling the company to have “potential value” such as those not directly contributing to personnel reduction but enabling a reduction in work time. For the latter, efforts are made to reap real effects by taking measures such as reshuffling personnel. In addition to pursuing such quantitative effects, the company has developed an assessment method using a balanced scorecard approach to visualize the contribution of IT to business from the qualitative perspective.

It should be noted that while Nissan and Ricoh are both manufacturers, they are very aggressive in promoting IT-based service innovation. Nissan was the first to put an electric car on the market. Concurrently, the company has offered a system whereby data collected from

a vehicle-mounted information system are analyzed on a real-time basis, providing feedback to drivers such as letting them know when to charge their batteries and the location of a nearby charging station. Moreover, Nissan started trials to develop mileage-linked auto insurance products by offering these analytic results to insurance companies with the consent of customers. Ricoh has also been using data collected from copiers used in offices for various purposes. The company uses the data for fault prediction and to determine when to deliver toner cartridges. Furthermore, the data are utilized for determining product specifications as well as for optimizing the inventory of consumable supplies.

At first glance, the management of IT investments and IT-based service innovation appear to belong to different dimensions. Nevertheless, these Nissan and Ricoh cases demonstrate how companies aiming to create value through IT undertake strategic investments and gain the understanding of management without being tripped up by the enormous costs often incurred for the maintenance of conventional systems.

IV Challenges Facing Today's IT Investments

1 Standardization and integration of information and processes

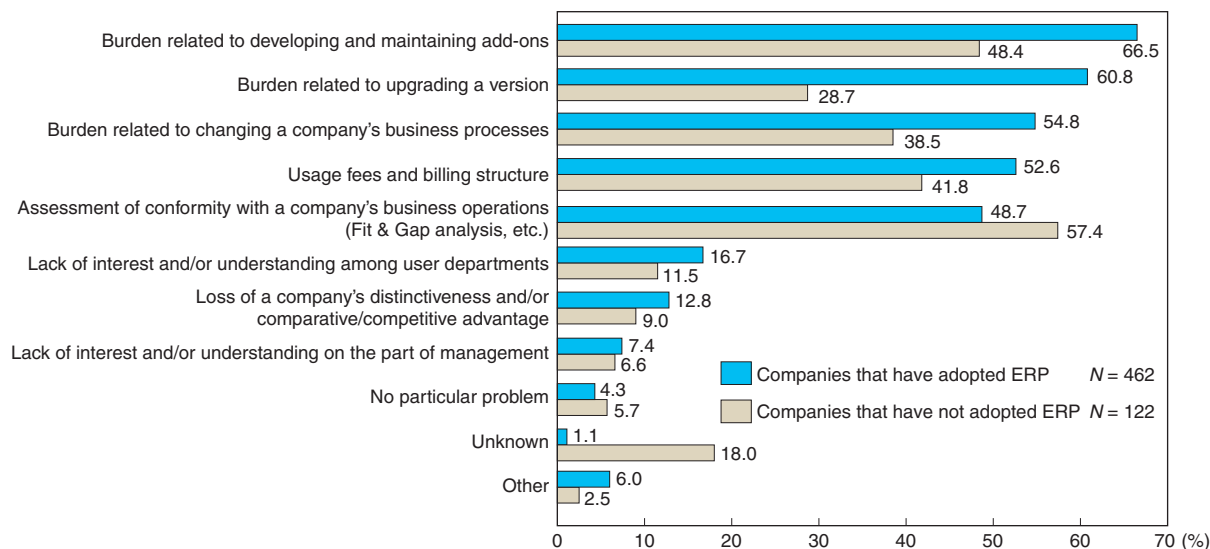
The exhibition of strong leadership by top management is essential to IT investments that contribute to optimization on a company-wide level and to the innovation of core business. The 2013 NRI survey suggests the issues faced by Japanese companies in this regard. One of the issues relates to the standardization and integration of information and processes on a company-wide basis.

The survey asked the companies a multiple-choice question about the problems encountered in implementing and deploying an enterprise resource planning (ERP) package. There have been interesting results in a comparison of companies that have already adopted ERP and those that have not.

For example, the highest percentage (66.5 percent) of answers from responding companies that are using ERP was the “burden related to the development and maintenance of add-ons” as a problem. The second highest percentage (60.8 percent) of answers from such companies was the “burden related to upgrading a version” as a problem, followed by 54.8 percent of such companies selecting the “burden related to changing a company’s business processes” (Figure 4). On the other hand, relatively lower percentages of responding companies that are not using ERP perceive these three matters as problems.

To implement an ERP package, a company’s business processes must be changed so that they conform to ERP functions. In fact, many companies stumble at this stage.

Figure 4. Problems in deploying an ERP package (comparison of companies that have adopted ERP and those that have not)



Source: "Survey on the Status of IT Use in User Companies" conducted by Nomura Research Institute in December 2013.

Specifically, because many companies fail to change their business processes to conform to ERP standards, they often develop add-on functions on an ERP platform. Such failure creates a need to also upgrade add-ons when upgrading a version of the ERP package, requiring additional time and labor for development. In particular, in a case lacking clear leadership, an IT department is unable to handle the objections raised by user departments that actually use the ERP package, and tends to develop a large amount of add-ons in response to their requests. As a result, major benefits that should be accrued from an ERP system are most likely to be lost. This case represents an ironic example because "genba-ryoku (on-site competency)," which has driven the growth of Japanese companies, has a negative effect on the deployment of a standardized global ERP system.

Enterprise resource planning (ERP) is significant in that it manages a company's data by integrating all facets of business operations including production, logistics, sales and accounting, and optimizes management resources. The primary objective of implementing ERP is to facilitate a PDCA (plan, do, check, act) cycle based on accurate and reliable data through the standardization of data and processes. However, on the part of user departments, implementation encounters their resistance in conforming to ERP's global standards. The users refuse to throw away familiar business processes and to discard conventional systems that "do everything they want."

Therefore, to successfully introduce an ERP system, it must be made clear that the adoption of ERP is incapable to achieve a higher level of business sophistication. In addition, it is imperative for the departments that actually use the system in their daily activities to recognize the need for such adoption. To address the problems that are likely to occur in daily

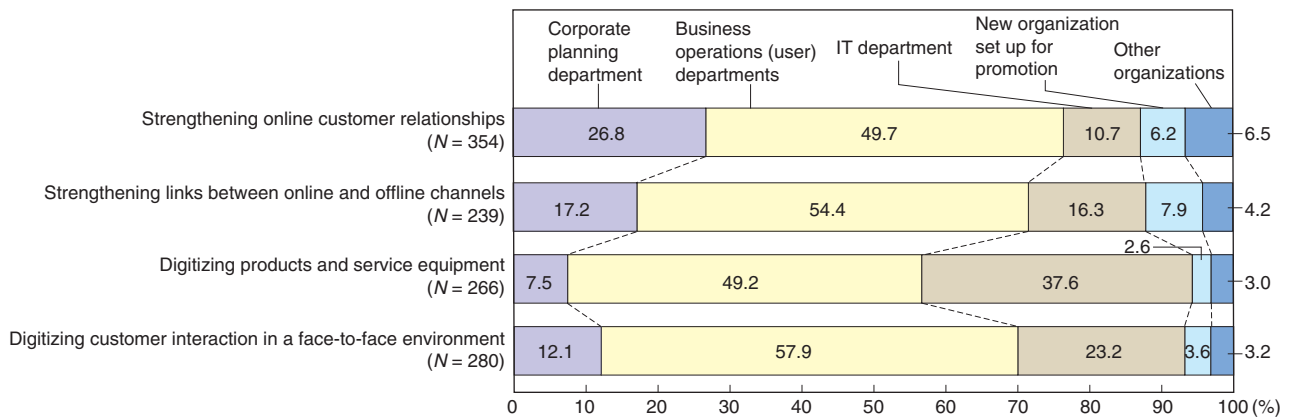
business operations as a result of the adoption of ERP, user departments that have a good knowledge of their work should autonomously predict such problems as their own responsibility. Based on such predictions, the anticipated problems must be solved by appropriately changing existing processes. Placing the responsibility on user departments and setting up a system to enable the resolution of predicted problems can only be done with strong leadership on the part of top management. In this regard as well, top management must have a deep understanding of IT and exhibit its leadership.

2 Approach to "digitization"

Another challenge requiring the exhibition of management-level leadership is to respond to "digitization" that has become inevitable throughout today's society. The specific themes related to this issue include the development of new IT-enabled services such as those described in the Nissan Motor and Ricoh cases, marketing assuming the popularization of smartphones and social media, and providing higher value in a customer service touchpoint.

According to the results of the 2013 NRI survey, these themes have been pursued by "business operations departments (user departments)," though there are fewer companies in which the "corporate planning department" or "IT department" takes the initiative (Figure 5). Furthermore, the survey also revealed that in addressing these themes, the primary role of the IT department was "building infrastructure and developing/acquiring new technology." The percentage of responding companies in which the IT department is responsible for "managing and coordinating the IT budget" was less than half for each theme (Figure 6). In the areas of these themes, the primary beneficiaries are often marketing personnel,

Figure 5. Key departments in promoting IT use in new areas

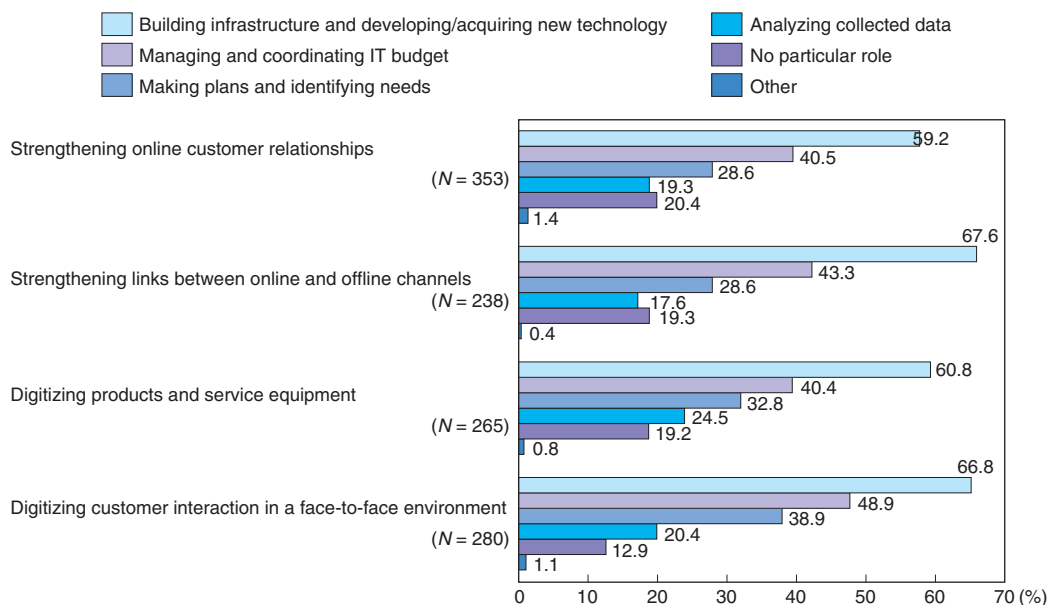


Note: For each area of IT use as listed below, calculations were made only for companies that have been implementing the relevant measures.

- Strengthening online customer relationships: Collecting, analyzing and utilizing customer voice and behavior data on social media, brand sites and so on; promoting online word-of-mouth communication and encouraging online buying behavior; and similar activities.
- Strengthening links between online and offline channels: Using the same loyalty points program on EC sites and brick and mortar stores, sharing transaction history; encouraging online customers to visit brick and mortar stores; and similar activities.
- Digitizing products and service equipment: Collecting, analyzing and utilizing data sent from sensors built into products and service equipment; enhancing product functions by updating programs via networks; and similar activities.
- Digitizing customer interaction in a face-to-face environment: Using tablet PCs to provide simulation services in stores; using video sensors and IC cards to collect and analyze customer behavior data within stores; and similar activities.

Source: "Survey on the Status of IT Use in User Companies" conducted by Nomura Research Institute in December 2013.

Figure 6. Role of IT departments concerning IT use in new areas



Note: For each area of IT use, calculations were made only for companies that have been implementing the relevant measures.

Source: "Survey on the Status of IT Use in User Companies" conducted by Nomura Research Institute in December 2013.

service personnel and/or customers, rather than back office personnel. The survey results suggest that these areas represent those in which it is difficult to get involved for an IT department that has so far handled an enterprise backbone system centering on back office functions.

Moreover, such business innovation with digital technology presents high hurdles for Japanese companies that have thus far grown using improvements made at worksites, rather than in head offices or IT departments. For example, with on-site initiatives, it is difficult to undertake transformations that most likely change a company's profit structure such as shifting from sales at

brick and mortar stores to online sales. On the other hand, the IT department lacks first-hand experience to identify the wants and needs of customers.

To deal with this issue, some companies have established a new organization that is dedicated to promoting "digitization" apart from the IT department that handles infrastructure and back office systems. Employees from both the IT department and user departments were assigned to this new organization. However, according to the 2013 NRI survey, only 6 percent to 8 percent of responding companies have established a new organization with the purpose of "strengthening online customer relationships" or "strengthening links between online and

offline channels,” that is still higher than the percentage with other purposes in response to digitization.

In the United States, an increasing number of companies have been creating a new role of chief digital officer (CDO), who oversees the sphere of digitization. While the chief information officer (CIO) continues to assume responsibility for promoting the use of IT related to improving business efficiency and enhancing business management, the CDO is responsible for innovating business and service by drawing on digital technology.

For example, under the leadership of the CDO, Starbucks Coffee Company of the U.S. has integrated web, mobile payments and reward point programs in an effort to increase customer loyalty.^{Note 13} Prior to the creation of the CDO position in 2012, these activities were handled separately by different departments. McDonald’s also created a new position of CDO in October 2013 with the aim of implementing digital strategy focusing on future growth in e-commerce and enhancing the restaurant customer experience.^{Note 14}

MetLife, which is the largest life insurance company in the U.S., is striving to increase its online sales under the leadership of its CDO in order to successfully reach the middle-income demographic, a prime target of life insurance companies, which is less responsive to the traditional sales process that involves going to an agent’s office.^{Note 15}

In the public sector, New York City created the new post of CDO in 2011. The CDO’s responsibilities include ensuring that all residents are able to access the Internet, using IT to facilitate open government, launching digital learning programs to expand educational opportunities and strengthening cooperation with industry.^{Note 16}

A common problem in addressing the issues of “company-wide standardization and integration” and “response to digitization” is the difficulty in creating a management system and/or an organization for a relevant purpose. Even though neither of these issues can be left up to the IT department, on-site leadership in a user department would be unlikely to lead to company-wide transformation. Rather, such leadership would entail risks of developing “IT silos,” which achieve only partial optimization. To solve this problem, IT goals must be aligned with business goals under the leadership of management. That is why the way of making IT decisions must be revised in Japanese companies.

V IT Governance in the Digital Age

1 Rethinking IT governance

The term “IT governance” refers to the mechanisms for making IT-related decisions in the course of conducting

business activities, and there seems to be an analogy to “corporate governance.”

Traditionally, IT governance has often been associated with the term “control” in such meanings as internal controls and risk management. For example, in the past, the “IT management portal” site operated by the Ministry of Economy, Trade and Industry (METI) contained an explanation of IT governance by using the following expression: “appropriately controlling all activities, results and interested parties and guiding them to what they should aim at.” The Japan Audit & Supervisory Board Members Association also defined IT governance in its report as “mechanisms or activities to appropriately promote the use of IT throughout all group companies and effectively deal with the risks associated with the use of IT.”^{Note 17}

There is no denying that these definitions give the nuance of emphasizing the regulating aspect of IT governance in light of the impression created by the term “control” and from the perspective of auditors who strive to minimize risks to put them under control. Nevertheless, as defined by METI, the primary objective of IT governance is to guide IT-related corporate activities to what management aims at. Furthermore, “what management aims at” is nothing else but an attempt to strike the right balance between risk and return and to use IT to facilitate the creation of business value.

2 Proposals: IT governance to create value

“COBIT”^{Note 18} is a globally accepted standard framework published by the Information Systems Audit and Control Association (ISACA), which focuses on the governance and management of enterprise IT.

The primary purpose of the initial versions of COBIT was to control individual processes such as IT cost management and quality management. In particular, COBIT has rapidly been accepted in Japan in an effort to comply with JSOX, the Japanese version of the Sarbanes-Oxley Act, which requires internal controls over financial reporting. However, the latest revision, COBIT 5, released in 2012, largely shifted its emphasis to how to align the direction of IT use with the direction of business. The principal objective of IT governance is “using IT to create value,” and risk management is simply one of the means to achieve this goal.

The difficulty in understanding the concept of IT governance is also attributable to the difference in corporate management styles between the U.S. and Japan. Based on the American management style, COBIT 5 clearly separates governance from management. COBIT 5 defines governance and management as follows: “in most enterprises, overall governance is the responsibility of the board of directors under the leadership of the chairperson” and “in most enterprises, management is the responsibility of the executive management under the leadership of the chief executive officer (CEO).”

In Japan, because of differences in corporate structure, there is less distinction between “governance” and “management.” In addition, competitive strengths have traditionally been developed under on-site leadership as well as by on-site efforts to bring about improvements. However, if the current status is left as is, where top management has no interest in IT and the worksites make substantive decisions for IT use, Japan’s ability to maintain and increase its international competitiveness is questionable. To say the least, management must get actively involved in aligning IT goals with business goals, as typically required by COBIT 5.

IT is one of the factors that affect the achievement of business goals in the same way as production equipment does in the manufacturing industry and human resources do in the service industry. It is unacceptable for any part of management to be apathetic toward such a critical factor. In this paper, based on the findings of the 2013 NRI survey, the author would like to propose the following three measures that management should take.

(1) Defining the entities/persons responsible for IT governance

“An organization or committee that essentially decides the direction of business” as well as top executives who are accountable to shareholders should be defined as the unit responsible for IT governance.

(2) Establishing the assessment methods of IT investments

The value of IT for business should be visualized so that top management is able to comprehend such value. In particular, it should be made possible to distinguish the portion of IT investments for “change the business” from that for “run the business.” Then, different methods of assessment should be established for each field.

(3) Setting up an organizational structure that is suitable for each theme

As it is often said that “the ultimate role of top management is human resource management,” the measures that only top executives can take are those related to assigning personnel and setting up organizations. In an effort to pursue IT-enabled company-wide optimization and/or change in business models, existing organizations often become opponents. To address this issue, management must clarify authority and responsibility so that an organization suitable for each purpose should be formed. For example, an expert group who is familiar with worksite operations should be created, giving this group the responsibility for business process change. Other examples include bringing IT experts and marketers who have first-hand experience in identifying customer needs together as one team, giving this team the responsibility for service innovation.

In the future of Japan when the current generation of new employees, who are called “digital natives,” becomes responsible for corporate management, business goals and IT goals may be considered to be a single goal as a matter of course, and even the term “IT governance” may be no longer necessary.

However, before waiting for the arrival of such a day, traditional Japanese companies are now faced with the need to compete with IT companies led by young CEOs and with global companies in which highly IT-sensitive CEOs take the leadership for digitization on a top-down basis. Given this situation, it is a pressing need for the top management of Japanese companies to achieve high-level governance to create value from IT.

Notes:

- 1 Paul A. Strassmann, *The Business Value of Computers: An Executive’s Guide*, 1990; Erik Brynjolfsson, *Intangible Assets: Computers and Organizational Capital*, 2002; and Nicholas Carr, “IT Doesn’t Matter,” *Harvard Business Review*, 2003.
- 2 The survey was addressed and mailed to the chief information officers or heads of IT departments of about 3,000 companies having their headquarters in Japan with the highest sales. Survey responses were received from 599 companies, a response rate of 20 percent, in December 2013.
- 3 “Infrastructure-related cost” refers to investment in data center facilities, networks, helpdesks and so forth, as well as to the cost of their maintenance. “Application-related cost” refers to the cost for developing, maintaining and enhancing applications. This cost includes expenses to purchase hardware and software as well as personnel expenses for development. The amount is on a disbursement basis and does not include depreciation. However, expenses for internal personnel are included.
- 4 Correlation coefficient $r = .331$, $N = 478$, significance probability $p < .001$.
- 5 The respondents were asked to select all answers that apply from a list, “top executives and board members; company-wide IT executive; head of each business department; IT manager of each business department; other; unknown,” in multiple choice, to the questions of “who decides the policy for IT use – who sets the positioning of IT in your company (example 1: IT is strategically used as a source of competitive advantage, example 2: IT is mainly used to improve business efficiency)” and “who decides IT investments – who prioritizes IT investments and who makes a final decision on investment.”
- 6 “IT wo katsuyo shita keiei ni taisuru nichibei kigyō no soui bunseki (Analysis of differences between Japanese and U.S. firms concerning the use of IT for business management)” released by the Japan Electronics and Information Technology Industries Association (JEITA) and IDC Japan in October 9, 2013.
- 7 Koki Yodokawa, *Jissen IT senryaku-ron – hidaika suru sisutemu wo koete aratana jigyou kachi wo souzou suru*

- (Theory of practical IT strategy – Creating new business value by going beyond ever-expanding systems), Nikkei Business Publications, Inc., 2013.
- 8 Percentage of spending for the purpose of “change the business” by companies that consider IT as “core technology:” 32.6 percent on average, standard deviation (SD) = 19.3, $N = 259$.
Percentage of spending for the purpose of “change the business” by companies that do not consider IT as “core business:” 24.5 percent on average, $SD = 18.2$, $N = 237$.
Test statistic $t = 4.779$, degree of freedom $df = 494$, significance probability $p < .001$.
 - 9 Relationship between whether IT is considered as “core business” and whether management is involved in determining policy for IT use: chi-square statistic $\chi^2 = 7.602$, degree of freedom $df = 1$, $N = 593$, significance probability $p = .006$.
 - 10 Average profit margin during four fiscal years achieved by companies that consider IT as “core technology:” 2.86 percent on average, $SD = 5.93$, $N = 122$.
Average profit margin during four fiscal years achieved by companies that do not consider IT as “core technology:” 1.49 percent on average, $SD = 3.24$, $N = 102$.
Test statistic $t = 2.087$, degree of freedom $df = 222$, significance probability $p = .038$.
 - 11 Companies with the capability to improve business performance by using IT are called “IT savvy” companies. P. D. Weill, J. W. Ross, *IT Savvy: What Top Executives Must Know to Go from Pain to Gain*, 2009, Harvard Business Press.
 - 12 Introduced cases are based on publicly announced information. For Nissan Motor, sources included *Nikkei Computer*, June 26, 2006, September 1, 2008, and May 26, 2010, Nikkei Business Publications, Inc.; speech at the Microsoft Japan Strategic Architect Forum, April 9, 2008; speech at the ITGI Japan Conference 2013, November 13, 2013; and Nissan Motor Company’s news releases, July 2, 2012, May 15, 2013. For Ricoh, sources included *Nikkei Computer*, October 2, 2006, December 10, 2007, Nikkei Business Publications, Inc.; and *Nikkei Monozukuri*, August 2013, Nikkei Business Publications, Inc.
 - 13 “How Starbucks Has Gone Digital,” MIT Sloan Management Review, April 4, 2013, news release by Starbucks Coffee Company, March 8, 2012.
 - 14 Press release by McDonald’s Corporation, October 13, 2013.
 - 15 “MetLife’s Manish Bhatt Sets the Cutting Edge of Life Insurance,” October 25, 2013, Insurance & Technology.
 - 16 “New York City’s Digital Leadership: 2013 Roadmap,” 2013, The City of New York.
 - 17 “Kansayaku ni kitai sareru IT governance no jissen (IT governance practices expected of auditors)” published by Japan Audit & Supervisory Board Members Association on August 25, 2011.
 - 18 COBIT was initially an acronym for “control objectives for information and related technology.” However, the spelled-out version was abandoned in favor of the acronym, which is now used officially.

Yuki ARIGA is researcher at NRI’s IT Strategy & IT Operation Research Department. Her specialties include research and analysis concerning IT strategy, marketing, etc.

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Inquiries to: Corporate Communications Department
Nomura Research Institute, Ltd.
E-mail: nri-papers@nri.co.jp