

Importance of the Strategic Utilization of Information Technology in Small and Medium-Sized Food Manufacturers in Japan

Masaru Tezuka, Junko Miyazaki
Research and Development department
Hitachi Solutions East Japan, Ltd.
Sendai City, Japan

Masaki Fujiwara, Miyuki Koriki
Department of Business and Project Planning, School of Project Design
Miyagi University
Taiwa-cho, Kurokawagun, Miyagi Prefecture, Japan

Abstract— The introduction of information technologies (ITs) into small and medium-sized enterprises in Japan is very slow in spite of the various promotional measures such as financial support, education programs, and awards for best practices. We conduct a field study of IT utilization in small and medium-sized food manufacturers in Miyagi prefecture, Japan. In order to show the importance of the strategic utilization of ITs, we carry out a gross profit analysis of their product range. The results of our analysis show that some products have a gross margin below zero (i.e., the more of the product they sell, the lower their profits become). Before the analysis, the managers of the manufacturers thought they did not need to use ITs because their sales were growing (even though their profits were low). However, the results of the analysis suggest that managers could detect this gross margin problem if they utilized IT tools. In order for regional small and medium-sized manufacturers to utilize ITs in a strategic way, their managers must recognize the importance of ITs.

Keywords—small and medium-sized enterprise; IT promotion; gross profit margin; product portfolio

I. INTRODUCTION

The introduction of information technologies (ITs) to small and medium-sized enterprises (SMEs) in Japan is very slow in spite of the various promotional measures [1–3] such as financial support, education programs, and awards for best practices. While software systems for routine tasks such as accounting and salary management are widely used, such systems are not used for strategy planning. However, not only large enterprises but also SMEs are exposed to global competition in the current era of globalization. Hence, to compete in such an environment, the strategic utilization of ITs is essential.

SMEs fail to introduce ITs because of various barriers such as cost and low IT literacy. However, cloud computing [4] and other emerging technologies are reducing the introduction and operation costs of ITs, while the use of personal computers and smartphones is spreading, especially among the younger generation. Nowadays, many people take advantage of online shopping, Internet banking, and information sharing services such as e-mail and social networks to make life more convenient. Therefore, the main barriers to IT utilization are lowering.

In this study, we examine why SME managers do not feel a pressing need to use IT even when profits are not increasing in line with sales. We conduct a field study of IT utilization in small and medium-sized food manufacturers in Miyagi prefecture, Japan to examine whether they could improve this low profitability situation if they utilized business analytics tools or spreadsheet programs at least. We briefly review the status of IT introduction in Japan's small and medium-sized manufacturers in section 2. Then, in section 3, we show the fact many of the manufacturers discount the need for profitability analysis, meaning that some of their products are unprofitable. We discuss the importance of management understanding strategic IT utilization in section 4 and conclude in section 5.

II. IT INTRODUCTION IN SMALL AND MEDIUM-SIZED FOOD MANUFACTURERS IN MIYAGI

Miyagi prefecture is located in the northwest region of Japan and its capital city, Sendai, is the cultural, political, and economic center of the region. Since it has large plains and faces the Pacific Ocean, it is rich in agricultural produce and fishery products. Accordingly, its food processing industry props up the economy of the prefecture. Because the majority of the manufacturers in the industry are small and medium-sized, the reinforcement of their management base, including the promotion of IT introduction, plays an important role in the region's economy.

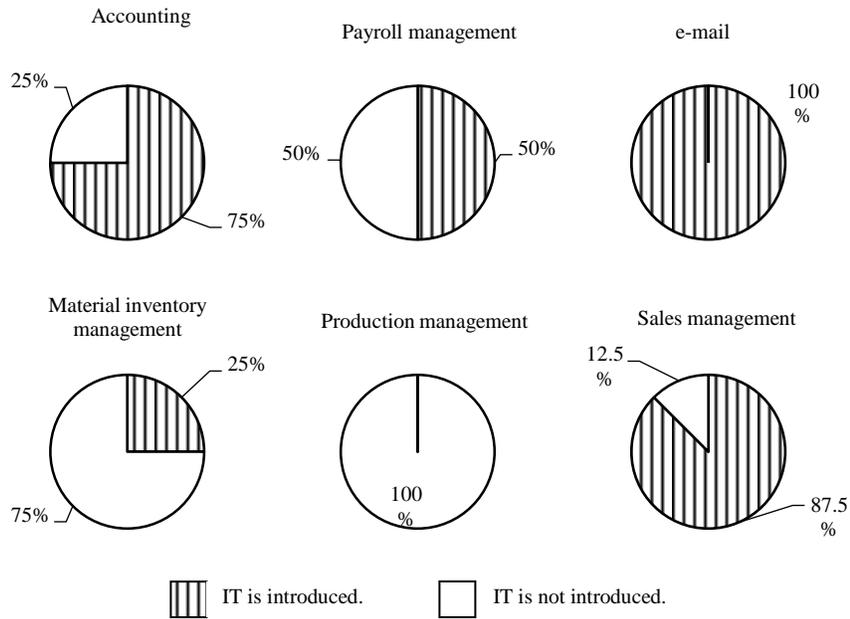


Fig. 1. IT introduction in marine product processing manufacturers in Miyagi by operation area

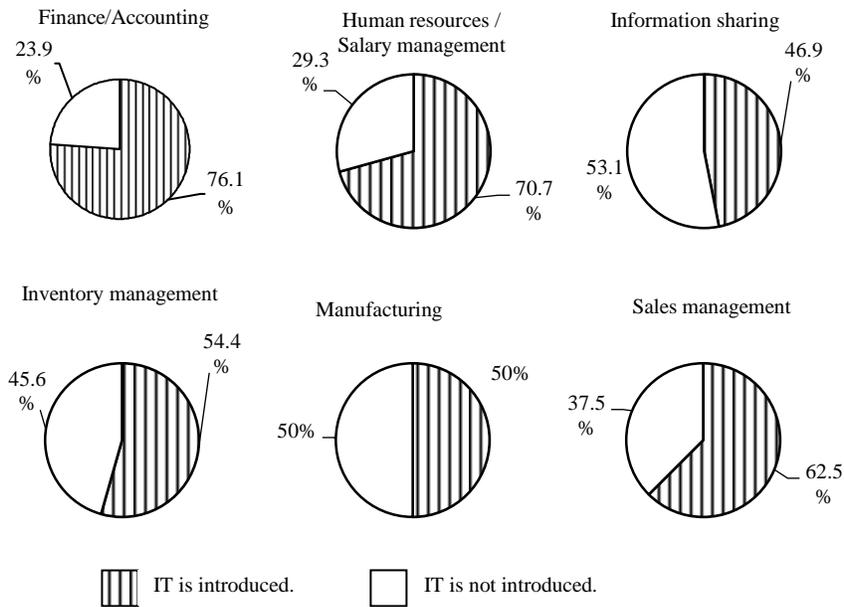


Fig. 2. IT introduction in manufacturers in Japan by operation area

A field study [5] was conducted to assess the extent of IT utilization in eight marine product processing manufacturers in Miyagi. The workforce and sales of the manufacturers varied from 10 to 200 workers and from 100 to 3,500 million yen, respectively. All the manufacturers were capitalized at about 10 million yen. The study showed that while many of the manufacturers used back-office software such as accounting, few used core operation-related software such as production management and material inventory management. Fig. 1 shows IT introduction by operation area.

A similar status can be seen in small and medium-sized manufacturers across Japan. Fig. 2 shows the IT introduction in SMEs in Japan based on data from [6]. In [6], an SME in the manufacturing industry is defined as a company with 300 employees or fewer or whose capital is 300 million yen or less. Again, ITs are highly utilized in back-office functions such as finance, accounting, payroll management, and human resources; however, a low utilization rate is seen in core operations such as production and inventory management.

According to [5], the reasons not to introduce ITs in SMEs include high introduction cost, high operation cost, unclear return on investment, unclear benefits, and managers not feeling the need for ITs. Since there are many measures to promote IT utilization in SMEs [1], we believe that cost is not the real reason. The largest issue to address in order to promote IT utilization is to change the mindsets of SME managers, particularly when their sales are increasing but profits are not. This could be carried out through a profitability analysis.

III. FIELD SURVEY AND FINDINGS

A. Field Survey

Firstly, we conducted a field survey to assess whether SMEs analyze the profitability of each of their products. Altogether, 15 food processing manufacturers in Miyagi prefecture were interviewed. Fig. 3 shows the results of the survey. Surprisingly, 12 manufacturers (80%) do not analyze profitability. Moreover, even among those carrying out such an analysis, only one utilizes IT tools, whereas the others do so by manual calculation.

B. Electronic Data Availability

Although SME managers do not recognize the importance of profitability analysis, the data required for such an analysis are also often lacking. Fig. 4 shows the data availability in four of the manufacturers not carrying out profitability analysis. We find that electronic or paper data are available for some types of information. For example, sales data are available in the form of order slips and receipts. However, manufacturers that do not have inventory quantity data count actual stock every time they need the quantity. Further, no manufacturer has data on manufacturing standard time, but line managers have the figures in their heads.

C. Gross Profit Analysis

In order to show the importance of IT utilization in a strategic way, we analyzed the gross profit of each product of the sample manufacturers. Two of the food processing manufacturers, termed manufacturers A and B herein, provided us with the data required for the analysis. Manufacturer A produces minced and steamed fish products. Its annual sales volume is about 300 million yen. Manufacturer B is a bakery. Its annual sales volume is about 100 million yen. Because some data were lacking, we made assumptions based on interviews with line managers. A spreadsheet software was used for the analysis. Expensive BI tools were not required.

Figs. 5 and 6 show the gross margin ranges of the products of manufacturers A and B, respectively. Part (a) shows the gross margin by sales amount and (b) shows the gross margin by sales quantity. Both manufacturers have products whose gross margin is below zero. Therefore, the more they sell products with a negative gross margin, the lower their profits become. In addition, it is worth pointing out that gross profit is the profit before the subtraction of selling and general administrative expenses, non-operating expenses, and extraordinary losses. Therefore, low gross margin products also have a negative impact on profit even if the margin is positive.

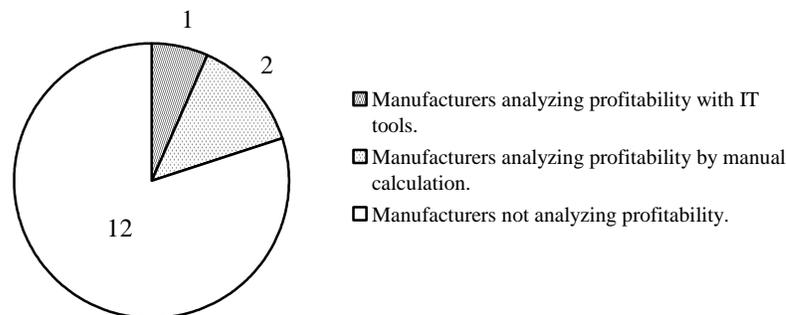


Fig. 3. Adoption of profitability analysis in food processing manufacturers in Miyagi prefecture

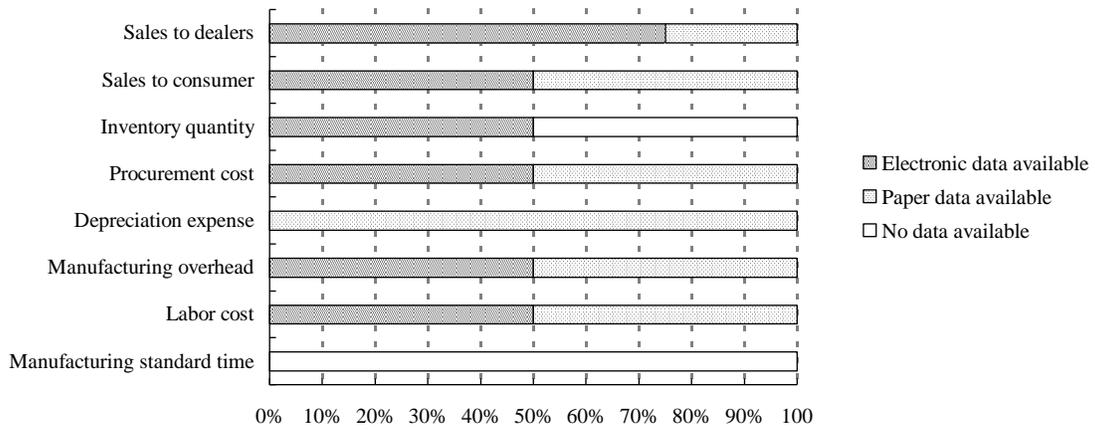


Fig. 4. Electronic data availability

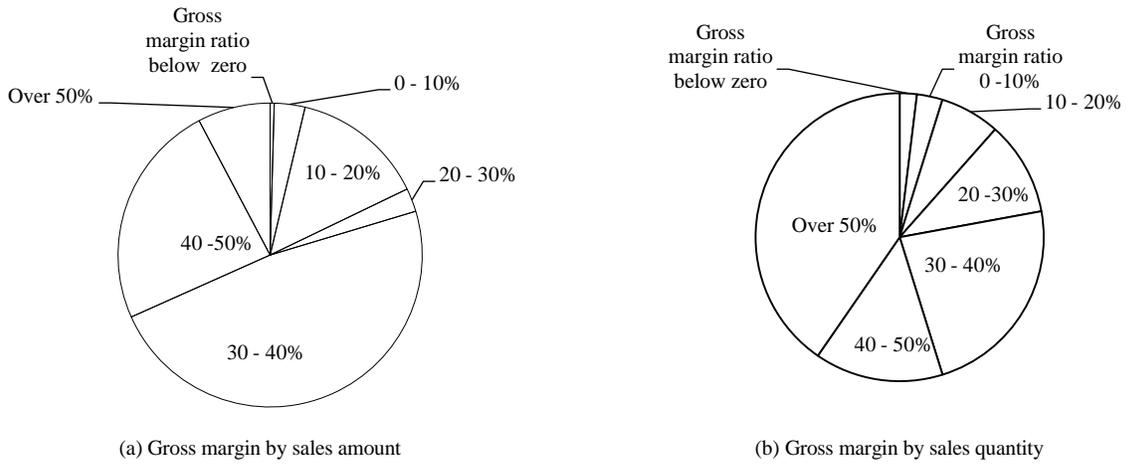


Fig. 5 Gross margin range of manufacturer A

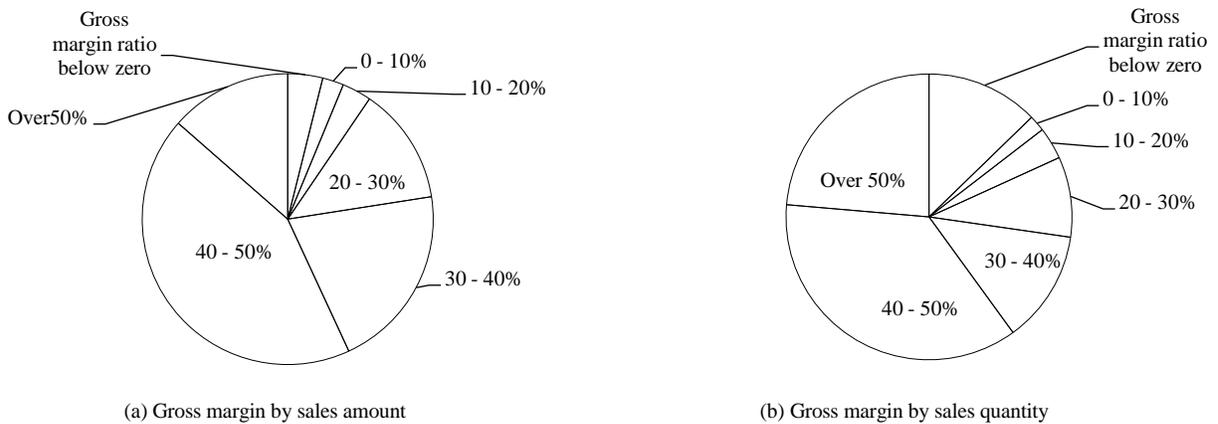


Fig. 6 Gross margin range of manufacturer B

IV. DISCUSSION

Before the gross profit analysis, the managers of the sampled manufacturers thought they did not need to use ITs strategically because their sales were growing. Although profits were low, they were not negative; therefore, they thought they were running their businesses well. However, as shown by the profitability analysis, the gross margin of some products is below zero (i.e., the products are unprofitable). By changing the product portfolio and sales strategy, they could thus increase profit. Discontinuing unprofitable products and focusing on the promotion of high margin products are representative strategies in this regard. Indeed, in order for regional small and medium-sized manufacturers to be more competitive and to continue their businesses in the increasingly globalized market, it is necessary to utilize ITs in a strategic way. For this to occur, managers must begin to recognize the importance of ITs.

V. CONCLUSION

In this study, we reviewed the status of IT introduction in 15 small and medium-sized food manufacturers in Miyagi prefecture, Japan. We found that many of these manufacturers used back-office software such as accounting; however, few used core operation-related software such as production management and material inventory management. In order to highlight the importance of the strategic utilization of ITs, we conducted a profitability analysis of each of their products. The results of the field survey showed that only a small proportion of the manufacturers conducted such an analysis. Further, based on the data provided by two manufacturers, we found that some of their products had a gross margin below zero, meaning that the more of the product they sell, the lower their profits become. This important finding showed the importance of the strategic utilization of ITs in SMEs in Japan.

REFERENCES

- [1] Small and Medium Enterprise Agency, Ministry of Economy, Trade and Industry Japan, "Promotion of the Adoption of IT" in 2014 White Paper on Small and Medium Enterprises in Japan, English version, p. 586, July 2014.
- [2] Organization for Small & Medium Enterprises and Regional Innovation, Japan, "SME Support Activities," <http://www.smrj.go.jp/english/activities/index.html>, Accessed September 25, 2015.
- [3] Ministry of Economy, Trade and Industry Japan, "Small and Medium Enterprises IT Management Power Award," http://www.meti.go.jp/policy/it_policy/it-keiei/award/, Accessed September 25, 2015 (in Japanese).
- [4] NIST, "The NIST Definition of Cloud Computing," NIST Special Publication 800-145, September 2011, Accessed September 25, 2015
- [5] J. Miyazaki, H. Sakurai, M. Fujiwara, M. Koriki, and M. Tezuka, "IT Promotion in Marine Product Processing Industry in Miyagi", Proc. Annual Conference of Japan Society for Management Information 2014 Spring, D2-2, 2014.
- [6] Small and Medium Enterprise Agency, Ministry of Economy, Trade and Industry Japan, "Utilization of information technology" in 2013 White Paper on Small and Medium Enterprises in Japan, English version, pp. 172- 211, September 2013.