

Improving the competitive advantage through information technology: A case at food and beverage industries in Indonesia

Musran Munizu¹

¹ Hasanuddin University, Perintis Kemerdekaan Street KM 10, Makasar, 90235, South Sulawesi, Indonesia

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ABSTRACT

This study attempts to investigate the effect of Information Technology (IT) on competitive advantage, especially food and beverage industry in South Sulawesi, Indonesia. The research used survey approach and the data were collected by questionnaire. The unit of analysis is big and medium scale companies. The respondents are the managers of companies. There were 126 companies that were surveyed and the total of 100 had completed questionnaires returned as the final sample. Three hypotheses have been developed through literature review and tested using Multiple Regression Analysis. The results show that Information Technology which consists of IT for administration, IT for communication, and IT for production has significant effect on competitive advantage. Competitive advantage is more influenced by IT for production than by both IT for administration and IT for communication.

ABSTRAK

Penelitian ini bertujuan untuk mengetahui pengaruh Teknologi Informasi (TI) pada keunggulan bersaing, khususnya pada industri makanan dan minuman di Sulawesi Selatan, Indonesia. Penelitian ini menggunakan metode survei dan data dikumpulkan melalui instrumen kuesioner. Unit analisis adalah perusahaan makanan dan minuman skala besar dan menengah. Responden penelitian ini adalah manajer perusahaan. Terdapat 126 perusahaan yang disurvei dan hanya 100 kuesioner yang valid sebagai sampel. Hipotesis dikembangkan melalui kajian literatur dan diuji menggunakan Analisis Regresi Berganda. Hasil penelitian menunjukkan bahwa Teknologi Informasi (TI) yang terdiri dari TI untuk administrasi, TI untuk komunikasi, dan TI untuk produksi berpengaruh signifikan terhadap keunggulan bersaing. Keunggulan bersaing lebih dipengaruhi oleh TI untuk produksi daripada TI untuk administrasi dan TI untuk komunikasi.

1. INTRODUCTION

Ramey (2012) stated that a company gains competitive advantage by providing a product or service in a way that customers value is more than the competition's. However, it is not information technology that gives a company a competitive advantage. It is the way they use information technology that makes the difference. Companies need to use information technology in an innovative manner. This is due to the fact that the use of IT can improve business transformation through speed, accuracy and efficiency of information exchange in large numbers. The companies have global competitiveness if they are able to execute business operations reliably, to balance the production systems,

and produce high standards product (UNDP 2007; McLeod 2012).

In this case, Kotler and Armstrong (2009) define competitive advantage as the advantage a firm has over its competitors gained by offering consumers greater value, either through lower prices or by providing more benefits that justify higher prices. In global markets, competitiveness is not just a need, but it has become a necessity for every company in order to be superior in the market. Without high competitiveness, each firm will not be able to survive, as well as winning the competition. Therefore, the implementation of a comprehensive information technology is very important for the company. The use of IT within an enterprise can be

* Corresponding author, email address: ¹ m3.feunhas@gmail.com.

seen from the production, handling management systems, customer service, handling payroll, employee administration and warehousing (Porter 1998; Turban et al. 2001; Mc. Leod 2012).

Turban et al. (2001) state that it is very important to every company in understanding the role of information technology in today's organization, because of it useful to review the major business environmental factors that create pressures on organization. The business environment refers to the social, legal, economic, physical, and political factors that affect business activities. Significant changes in any part of this environment are likely to create pressures on organization.

Chase et al. (2005), and Heizer and Render, (2010) in Munizu (2013) state that every company can improve the capabilities of competitiveness possessed in the organization. Each company's ability to compete refers to the relative position of the company compared to other companies in the local or global market (Kuncoro 2008). Competitive advantage can be obtained if every company has the ability to serve any process in its business operations are better at producing goods and services that have a high quality with competitive prices. So that the resulting product can compete both in terms of quality, price, product delivery, and flexibility than its competitors in the marketplace.

Moreover, World Economic Forum Report in 2010-2011 shows the Indonesia's competitiveness in 2010 was ranked 44th, but in 2011 Indonesia's competitiveness ranking dropped to rank 46. Among the ASEAN countries, after Singapore, Malaysia topped the rankings to 21, followed by Thailand 39th. It indicates that in the micro view the competitiveness of manufacturing firms in Indonesia has decreased. The same condition happens at manufacturing industries in South Sulawesi. The growth of the manufacturing industry in South Sulawesi influenced various important factors. Factor of raw materials, human resources, production technology, quality control, marketing, are internal factors, whereas availability of infrastructure, investment climate and the government's pro-business policies are external factors that drive the growth performance of the manufacturing industry (Munizu 2010).

Competitive advantage can support each organization has one or more of the following capabilities when compared to its competitors: lower prices, higher quality, higher dependability, and shorter delivery time. These capabilities will, in turn, enhance the organization's overall perform-

ance (Mentzer et al. 2000). An organization offering high-quality products can charge premium prices and thus increase its profit margin on sales and return on investment (ROI). An organization having a short time-to-market and rapid product innovation can be the first in the market thus enjoying a higher market share and sales volume (Li et al. 2006; Han et al. 2007).

Studies on the relationship between information technology and competitiveness and performance have been done and can be found in the literature. There were some research, for example, Smith (1999) conducted a study on 150 small businesses in the UK, and found that the use of information technology (IT) can improve over all performance. Then, Rodriguez et al. (2006) conducted a study on 234 Manufacturing Industry in Spain. The study found that the use of IT to support the initiatives of quality management. IT has influence on performance quality and operational performance. Further, Sanders (2007) founds that e-business technologies have influence on performance and competitiveness.

Despite the fact that more money is spent annually on information technology, very few firms have found competitive advantage through the use of information technology. Information technology is seen as a back office function that is used for administrative functions and not as a key business enabler. Information technology will not only aid the business in surviving, but can be a strategic component to providing competitive advantage to the business, provided that the information technology function in the business is aligned to the business strategy. The critical factor in achieving competitive advantage through the use on information technology is not what technology is used, but how the technology is implemented and how the technology is aligned to the business (Pieterse 2002).

In general, the benefits induced by IT solutions are often associated with the competitive advantage in various studies, but the concept of competitive advantage is applied usually as a self-evident. Though the approaches of competitive advantage does not provide with the clear definition of the concept, they are useful in developing the indicators for the competitive advantage.

This study, therefore, seeks to discuss how such information technology can help an organization achieve a competitive advantage. Therefore, the purpose of this study is to empirically test the effect of Information Technology (IT), which consists of IT for administration, IT for communication,

and IT for production to competitive advantage both simultaneously and partially at food and beverage industry in South Sulawesi, Indonesia.

2. THEORETICAL FRAMEWORK, AND HYPOTHESIS

Information Technology

Turban et al. (2001) emphasizes that information technology is a technology that used to process the data, including process, obtain, compile, store, manipulate data in different ways to produce quality information, i.e. information that is relevant, accurate and timely, used for personal, business, and government and information for strategic decision-making. This technology uses a computer to data processing, network system for connect one computer to another computer in accordance with the requirements (Mc. Leod 2012).

In this case, information technology is not only just limited to computer technology (hardware and software) that is used to process and store information, but also includes communication technology to transmit information both internal and external organization. IT affects the firm at all levels from primary activities, including the likes of automated warehouses, flexible manufacturing, automated order processing, telemarketing and computer scheduling and routing of repair trucks; to support activities, such as planning models, automated personnel scheduling, computer aided design and online procurement of parts. The coordination of all of the activities that constitute a successful business requires linkages between these activities, and also to external bodies of, for example, buyers and suppliers. IT can enable the firm to coordinate these linkages (Porter and Millar 1991; Smith 1999).

Information technology encompasses the transfer, storage and processing of information. Electronic mailing systems and networks are growing at a rapid pace, and any companies can take advantage of new opportunities on offer. Industries in which there is little or no technical change offer few opportunities for industries to break into the market, but changes in the form of deregulation, new technology, organizational and management innovations, and changing customer preferences create opportunities for new firms (Cooper et al. 1996).

Competitive Advantage

Mooney in Pilinkiene et al. (2013), advocate that the concept of competitive advantage is used very often in economic literature without clear definition what does the author mean by applying this con-

cept in his or her research thus leading to the situation that the meaning of competitive advantage is "taken for granted but not fully understood."

The concept of competitiveness and competitive advantage in the implementation are always interchangeable. For example, the competitiveness or competitive advantage has diverse interpretations or in the literature. None of the authors who claim the concept above as the "standard definition" are acceptable to all parties. It is expressly presented by Michael Porter that there is no accepted definition of competitiveness. Whichever definition of competitiveness is adopted, an even more serious problem has been there is no generally accepted theory to explain it.

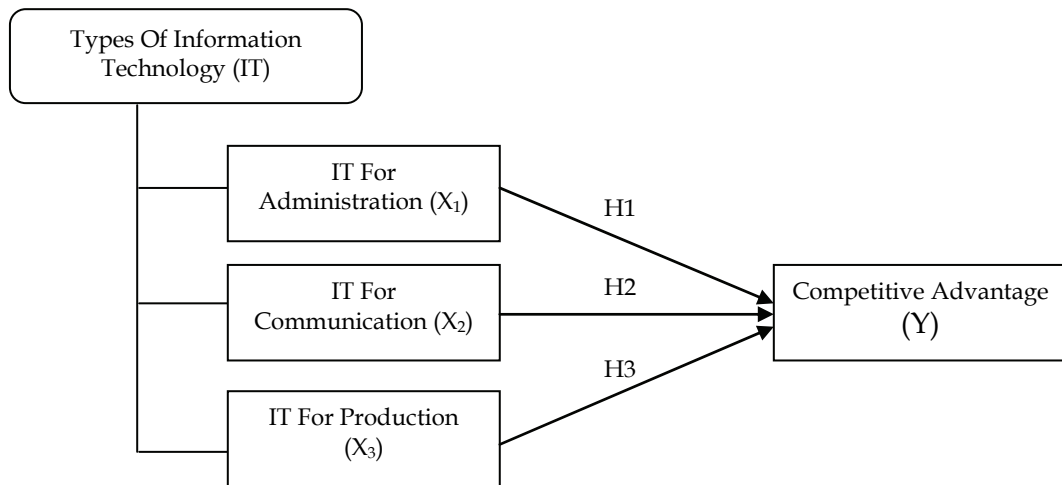
Thus, competitiveness remains a concept that is not well understood, despite widespread acceptance of its importance (Porter 1998). According to Reed et al. (2000), there are two models of competitive advantage. The first model is the market-based model, focuses on cost and differentiation and contends that the environment selects out firms that are inefficient or that do not offer products for which consumers are prepared to pay a premium price. The second model focuses on the firm's resources and is driven by factors that are internal to the firm.

Conceptually, competitive advantage is the extent to which an organization is able to create a defensible position over its competitors (Porter 1998; Kotler and Armstrong 2009). It comprises capabilities that allow an organization to differentiate itself from its competitors and is an outcome of critical management decisions. The empirical literature has been quite consistent in identifying price/cost, quality, delivery, and flexibility as important competitive capabilities (Han et al. 2007).

The organizations can also follow one of five basic competitive strategies, which are based on Porter's three generic strategies of broad cost leadership, broad differentiation, and focused strategy. The five competitive strategies are cost leadership, differentiation, innovation, growth, and alliance. Meanwhile, information systems could be a critical enabler of these five competitive strategies (O'Brien and Marakas 2011).

Based on previous literatures, Koufteros et al. (Li et al. 2006) describe a research framework for competitive capabilities and define the following five dimensions: competitive pricing, premium pricing, and value to customer quality, dependable delivery, and production innovation. Li et al. (2006) also describe these dimensions. Based on the above, the dimensions of the competitive advantage con-

Figure 1
Conceptual Model



structs used in this study are price or cost, delivery dependability, product innovation, and time to market.

Conceptual Model and Hypotheses

Conceptual model is developed by author based on review of literature on information technology, and competitive advantage. Based on this review, the constructs of the framework is defined and the theoretical evidence supporting the relationships contained in this framework is described. In this conceptual model, there are two types of variables i.e. the independent variable and the dependent variable. The conceptual model could be shown in Figure 1.

Based on the literature review and previously study, the hypotheses can be formulated as follows:

H1: IT for administration has significant effect on competitive advantage.

H2: IT for communication, has significant effect on competitive advantage

H3: IT for production has significant effect on competitive advantage

3. RESEARCH METHOD

This study use quantitative approach in which the respondents are the company's managers, selected based on their best knowledge about operation in organization. The information about the companies was obtained from the Statistical Bureau Center of South Sulawesi Province. There were 126 food and beverage companies in South Sulawesi in 2011. The overall companies were surveyed and total of 100 completed questionnaires were returned as the final sample. The data used in this study were obtained from a questionnaire method. The question-

naires mailed by post in part, and the rest delivered directly by researchers at company sample.

There are two variables such as Information Technology (IT) as independent variable and Competitive Advantage as dependent variable. Information Technology (IT) variable is adopted from Smith (1999) i.e. IT for administration, IT for communication, and IT for production. Competitive Advantage variable consists of four indicators i.e. cost, quality, delivery, and flexibility. It is adopted from Han et al. (2007). Overall indicators in the questionnaire of the study uses five-point Likert scale was employed for scoring responses (1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree). For easier interpretation the results of the study, the scale changed into interval class as follows: (1) 1.00 to 1.80 = Very Low; (2) 1.81 to 2.60 = Low; (3) 2.61 to 3.40 = high enough, (4) 3.41 to 4.20 = High; and (5) 4.21 to 5.00 = Very High (Sugiyono 2013).

Furthermore, the validity tested by Product Moment Correlation. An instrument has high validity if r -value > 0.30 (Sugiyono 2013). Reliability of constructs was tested with Cronbach's α . As suggested by Hair et al. (2006), the cut off point for Cronbach's α was > 0.60 . According to the test, it could be concluded that either value of correlation (r) or Cronbach's α value were in good category, because their value above the criteria standard. So, the instrument that used in this study was both valid and reliable.

Based on research objectives, method of data analysis uses both descriptive statistics and multiple regression analysis. Multiple regression analysis is used to test the effect of independent variables to dependent variable (Hair et al. 2006). Techni-

Table 1
Results for Mean Value

No.	Variables	Mean	Description
1.	IT for Administration (X1)	3.45	High
2.	IT for Communication (X2)	3.15	High Enough
3.	IT for Production (X3)	3.88	High
4.	Competitive Advantage (Y)	4.09	High

Source: Munizu (2013).

Table 2
Summary of Multiple Regression Analysis Results

Variable	Standardize Coefficients (β)	t-values	Sig.	Description
IT for Administration (X1)	0.442*	3.850	0.001	H1, accepted
IT for Communication (X2)	0.263*	2.240	0.022	H2, accepted
IT for Production (X3)	0.540*	4.670	0.000	H3, accepted

Source: Munizu (2013)

Note : * Significant at ($p < 0.05$), (NS) Not significant at $p > 0.05$.

cally, hypotheses are tested use both level of significance at 5% and level of confidence at 95%. Data processing is performed by IBM SPSS 21 for Windows. The effect of variable of IT simultaneously on competitive advantage could be performed by comparing F-value with F-table. Furthermore, the effect of variable of IT partially on competitive advantage can be performed by comparing t-value with t-table.

4. DATA ANALYSIS AND DISCUSSION

Descriptively, the respondents have quite different characteristics. Diversity could be seen from the personal data of respondents that consists of sex, age, position, and educational level in the organization. The majority of respondent who participated in this research was male gender (92%), aged between 30 to 45 years (65%). The most of respondents as production manager and operations (55%), and their level of education are Bachelor degree (80%). Furthermore, the level perception of respondent on variables or constructs could be seen clearly from mean value of items or indicators as presented in Table 1.

Table 1 reveals that average value (mean) use of IT variable at food and beverage companies in South Sulawesi is high category. IT for production is the higher variable (3.88). followed by IT for administration (3.45), and IT for communication (3.15). The use of IT in production activities such as computer-aided design (CAD), computer for controlling the factory floor, flexible manufacturing systems, and computer aided manufacturing (CAM). Most of companies have adopted invoicing systems, payroll systems, and database for company administration.

Every company also use IT for communication both internal and external organization such as electronic mail, EDI with suppliers or customers, and company intranet. Furthermore, competitive advantage variable is high grade (4.09). This condition shows that cost, quality, delivery, and flexibility in good implementation. Thus, the results of research hypotheses testing use multiple regression analysis completely is presented in Table 2.

Table 2 describes that IT for administration, IT for communication, and IT for production has significant effect on competitive advantage. The results of study indicate the IT for administration has significant effect on competitive advantage, IT for communication has significant effect on competitive advantage, and IT for production has significant effect on competitive advantage. Therefore, the hypotheses 1, 2, and 3 are accepted. Competitive advantage is influenced more by IT for production than IT for administration and IT for communication because IT for production has greater of t-values than others.

In that case, the study support Chui and Fleming (2011), that organizations can use information technology (IT) systems to identify and create or assist in creating new products and services or/and to develop new/niche markets or/and to radically change business processes via automation (i.e. using digital modeling and simulation of product design to reduce the time and cost to the market.

Then, the results of the study show the higher of intensity of the use of information technology (IT) in the field of administrative, communication, and production can lead to increased competitive advantage the corporate in dimension of cost/price, quality, delivery, and flexibility. The

results are consistent with the Han et al. (2007) argue that continual improvements in aspects of cost, quality, delivery, and flexibility can generate best performance as well as organization competitiveness. The findings of this study support Smith (1999); Rodriguez et al. (2006); Li et al. (2006), Sanders (2007), and O'Brien and Marakas (2011). They found that e-business technologies have influence on performance and competitiveness. In the SMEs context, these findings strengthen the argument of Rahmana (2009) that The use of IT can increase the transformation business through speed, accuracy and efficiency through exchange large amounts of information. Each small and medium enterprises (SMEs) could be had competitiveness if they are able to compete in global market by provided the reliable, and high quality standard product.

These findings are consistent with Ramey (2012), use Information Technology to bridge the gap between business people and technical people. Business people must understand the use of Information technology to gain competitive advantage. In this case, they work hand on hand with technical people to archive this goal; in this process, technology brings both parties together and bonds their relationship. Designing an information system that gives a competitive advantage requires at least two things. First, it requires an understanding of the business problem you are trying to solve. Second, it requires an understanding of available technologies to know which ones to use in designing a creative solution for the business problem. It's very important for business people to study management information systems (MIS). This will help them analyze technical issues if need arises. Then, these results support Ramanathan's study (2011) there are five major ways through which competitive advantage may be gained: Differentiation, Cost leadership, Innovation, Alliance and Growth.

Relate to the results, Pieterse (2002) suggests that to achieve maximum competitive advantage there should be maximum alignment between the business and IT components. In the stage of perfect alignment IT enables the business to pursue new opportunities and take advantage of any dislocations created in the marketplace. But not only do firms have to align IT to the business to maximize competitive advantage, firms need to improve their use of IT in order to survive The information technology implemented by a firm is not as important as the purpose it is used for, and the purpose is not as important as the utilization of the technology. The importance here is to implement whatever technology is selected to provide the low cost,

speed advantage or product differentiation that the firm requires.

This study also support the argue that each organization is aware of the special effects, benefits and implication of Information technology (IT) in business performance and also its capacity in building sustainable competitive advantages. In business, IT is used through the value chains of activities that help the organization to optimize and control functions of operations for easy decision-making. In addition, the use of IT as a competitive weapon has become a popular instrument to influence on a particular organizational performance and the processes that will allow a smooth coordination of technology and corporate as well as business strategies (Daneshvar and Ramesh 2010).

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATION

In general, it shows that Information Technology (IT) which consists of IT for administration, IT for communication, and IT for production have significant effect on competitive advantage. In addition competitive advantage is influenced more by IT for production than by both IT for administration and IT for communication. This indicates that Information Technology produce competitive advantage to the organization. On the other hand, IT for administration, IT for communication, and IT for production provide a better explanation on competitive advantage criteria such as cost, quality, delivery, and flexibility.

For that reason, the frequency of using of IT can determine company competitiveness, especially food and beverage companies in South Sulawesi of Indonesia. The IT for production is most important factor in improving competitive advantage. Managers of the organization have to drive the use of IT in production field intensively. They have to responsible for determining appropriate organization policies in supporting their competitive advantage. Further, a firm adopting IT can also enjoy innovation, growth, cost reduction, alliance, and differentiation advantages generated by the IT. On the other hand, IT enhances quality, speed of delivery, flexibility, and cost reduction.

The study has some limitations for examples, it was conducted in South Sulawesi, hence the findings have limitations in their ability to generalize in other areas. The Object of research was in food and beverage companies so that further research can be conducted in other sectors for example in manufacturing industries to provide the best results and wider generalization.

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