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Strategies, Forces and Tactics of Farm Management Information Systems in Competitive Markets

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Abstract: *The agriculture based nations of the world, the Myanmar among them, are at present in the formative stages of the information society that is emerging from what was formerly an agriculture society. To complete in this environment, people need to understand what it demands from their organization. Accurate and easy to use Farm Management Information Systems (FMIS) are of fundamental importance for a successful operational farm management. This paper aims the agriculture business challenges of the information society and strategies, forces and tactics of (FMIS) in competitive markets that support farmers in managing their farms and markets both effective and efficiently. The farmer has to be empowered to allocate the scarce resources of the farm. Therefore, we picked a farm from the Loikaw, Kayah State, Myanmar as a case-study to apply a system analysis. The case study farm helps to identify and to analyze relevant material and information flows, production processes, and marketplaces.*

Keywords: *Strategies; forces; tactics; farm management information system; competitive.*

I. INTRODUCTION

The main purpose of marketing information system is to support in marketing decision making and marketing efforts of entrepreneurs and farmers. Nevertheless, the information is also useful for various types of organizations, such as government, development organizations, academicians, and researchers. The availability of timely and accurate information to all interested parties is therefore essential, whether it be provided by the government itself or by the private sector.(Gauravjeet Dagar, 2015)

Kayah is a mountainous state bordered by Thailand (Mae Hong Son Province), Shan state and Kayin State. It comprises an area of 11,733 square kilometres and is less than 2% of the total area of Myanmar. Kayah has very low population density, and according to a recent study on state and region governments in Myanmar, Kayah has a population density of 27, making it the third least dense state in Myanmar (only slightly more densely populated than Chin and Kachin). Many communities are very remote and can be reached only by foot. This study found that 43% of surveyed villages are more than two hours from the closest market town. The most farmers continue to rely on traditional farming methods, and have limited access to, and interest in, new technologies and finance that could improve their yields. Only 25% of surveyed villages indicated borrowing to invest in agriculture, while 57% of villages borrow to buy food. In conflict-affected communities that have been relocated and generally constrained for decades, lack of innovation and aversion to taking risks is an understandable outcome and reflects farmers' interest in prioritizing household food security.

Agriculture—and notably growing paddy—is the primary source of livelihoods for the majority of households in Kayah, and 87% of the surveyed villages. However, it is important to understand the varying livelihood patterns in Kayah state and how land type, access to market and access to other income sources influences these. The largest distinction in farming practices is between highland and lowland agriculture and the extent to which households actively pursue cash crops in addition to paddy. Within farming

communities there is also a practice of farmers both selling and buying labour from neighbours to complement family labour. (SOCIO-ECONOMIC ANALYSIS, 2013)

Farm management information system (FMIS) is concerned with all activities and resources necessary for acquisition, storage, updating, and making agricultural information and data of all kinds and formats—scientific research reports, growers' testimonies, market information, details of practical crop production technologies, machinery, weather forecasts, sources of credit, production, education and training and other instructional manuals. FMIS considers not only information resources and technologies, but also development of the human resources needed for efficient use of these technologies.

FMISs have also started to become ''coupled'' mainly with some farming equipment (e.g., actuators) to allow the automatic execution of decisions if this is desirable from the farmers. Currently, FMISs are providing significant services but their capabilities can be greatly improved. Wide-spread adaptation and exploitation of all potentials of existing information management systems for farms are hindered by certain issues. Existing systems are proprietary solutions that mostly have their own specifications about the functionality they provide and the means to interwork with external services. For this reason, there is no clarity and full transparency in technology and communication within the agricultural food supply chain.(Alexandros, 2012)

II. LITERATURE REVIEW

In today's dynamic world everything is changing very radically; and as the 21st century dawns, revolutionary changes are also beginning to challenge the business and marketing world. To cope with the increasing competition and uncertainty, companies need to take advantage of the information technology (IT) and information systems (IS). IS offer firms new ways of improving efficiency? Thus, the need for management of information is becoming the heart of marketing for the firms in order to survive in highly competitive markets. As the significance of management information systems (MIS) has been increasing, marketing and business environments have been revolutionizing through the applications of IT. Hence, the role of MIS in business and marketing has been also changing continuously due to rapid advancements in technology (Nasir, 2005).

Farming is a knowledge-intensive industry. Growers need to obtain and process financial, climatic, technical and regulatory - information to manage their farms. Both public and private institutions have emerged to supply farmers with information and analysis. However, inadequacies in this agricultural information system, such as the inability to consistently provide accurate, timely and easily accessible information, present several challenges to farmers. (David Just and David Zilberman)

Market information can be regarded as a public good, particularly where there are numerous small farmers who are unable to pay for information. The availability of timely and accurate information to all interested parties is therefore essential, whether it be provided by the government itself or by the private sector. A large number of countries do operate some type of MIS, the vast majority of services cannot be considered to provide commercially useful information for farmers and traders. (Gauravjeet Dagar, 2015)

Productivity gains in the agricultural industries have historically been driven by the adoption of new technical products and processes. It has been the realm of extension to make sure that farmers hear about these processes and technologies, and usually it has been State governments who have funded the extension effort. With the rapid increase in the complexity of the technology of farming, there is now a recognized need to improve the skills and education of our farmers – the human capital of agriculture. The Internet is changing the way society accesses and processes information. Farmers now have access to a wide range of information about many aspects of their farming systems, but it is often thought by scientists and extension specialists that many lack the skills necessary to use that information to improve their farm profitability and sustainability through technical innovation. (Bell, 2002).

The managerial tasks for arable farming are currently transforming into a new paradigm, requiring more attention on the interaction with the surroundings. Among other things, this managerial change is caused by external entities (government, public) applying increasing pressure on the agricultural sector to change production from a focus on quantity to an alternate focus on quality and sustainability (Halberg, 1999).

Information management plays an important role in how well farms are able to deal with increasing demands. In plant production tasks in the field, agricultural machinery now plays a key role in process acquisition and documentation of data. It is important that field tasks are carried out according to plan, and if sudden changes in plan are needed that these follow

standards and regulations and help to improve the outcome (Pesonen et al., 2008).

Management information systems encompass a broad and complex topic. To make this topic more manageable, boundaries will be defined. First, because of the vast number of activities relating to management information systems, a total review is not possible. Those discussed here is only a partial sampling of activities, reflecting the author's viewpoint of the more common and interesting developments. Likewise where there were multiple effects in a similar area of development, only selected ones will be used to illustrate concepts. This is not to imply one effort is more important than another. Also, the main focus of this paper will be on information systems for use at the farm level and to some lesser extent systems used to support researchers addressing farm level problems (e.g., simulation or optimization models, geographic information systems, etc.) and those used to support agribusiness firms that supply goods and services to agricultural producers and the supply chain beyond the production phase (Harsh, 2004).

III. FARM MANAGEMENT INFORMATION SYSTEM

FMIS is depicted as a planned system of the collecting, processing, storing and disseminating of data in the form of information needed to carry out the operations functions of the farm. The intended of the FMIS has to accurately display all branches of the farm at hand, so that the newly developed FMIS represents a valuable tool for the farmer to successfully manage his farm.

Figure 1shows a sample system architecture as it should be understood by the user of the system. The essential structure that should be understood is the centrality of the FMIS as the system to which all other parties are connected. The arrows, representing communication, are purposely left vague in the sense that they do not specify the protocol or content of the communication. This is because the end user need not know or even care how the communication between the various systems is handled, only that it occurs and that it is possible (Pesonen et al., 2007).

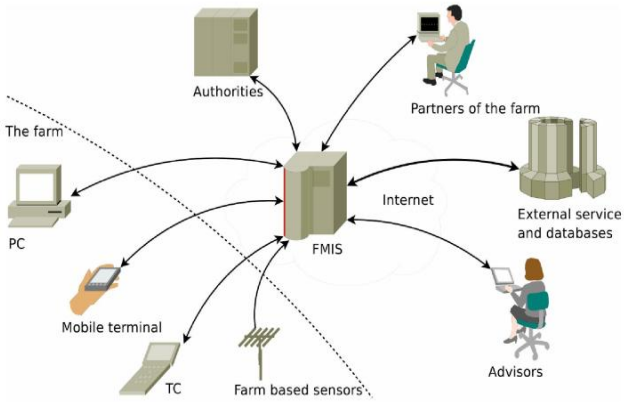

Figure 1: FMIS architecture from the viewpoint of the user

IV. COMPETITIVE MARKETS

Today's organizations compete in an information society. The environment of an information society presents several serious challenges, and the role of organizational information systems has evolved over time as competing organizations attempt to meet these challenges. By analyzing the forces acting in the marketplace and the chains of activities through which it delivers products or services to that marketplace, a company can identify opportunities for deploying strategic information systems that will help it compete.
All successful organizations compete. This is obvious in the case of business corporations. Moreover, in the information society, business competes globally. A competitive environment is less obvious, but nevertheless present, in the operation of not-for-profit organizations, such as most hospitals or colleges and universities.

A. Competitive Strategies

To compete in the marketplace, a firm may adopt one of the four competitive strategies. The first two strategies can be pursued by companies with a broad scope of products, which they market across a number of customer segments. The other two strategies apply to firms that focus on a narrow customer segment. The competitive strategies are differentiation, cost leadership, focused differentiation and cost focus. Four fundamental competitive strategies can be employed. These strategies are mustered to combat the competitive forces operating in the marketplace. This section discusses the strategies, forces and tactics of the competitive marketplace, based on the Farm business company from Myanmar.

1) Differentiation

When a company aims to distinguish its product or service from that offered by the competition, it is pursuing the differentiation strategy.

2) Cost Leadership

If a company is able to offer its product or service at a cost significantly lower than its competitors, it is exercising cost leadership. This is usually the effecet of highly efficient internal operations.

3) Focused Differentiation

When a company is able to identify a segment of the market which it can serve in a superior fashion, it is engaging in focused differentiation.

4) Cost Focus

If a company serves a narrow market segment with a product or service that it offers at a significantly lower cost than its competitors, that company is employin the cost focus strategy.

B. Competitive Forces

Competitive strategies are pressed into service to combat five competitive forces active in the marketplace. The stronger any of these forces acts against your firm, the less power your firm has in the marketplace. Information systems may be used to enact or counteract these forces with respect to customers, existing and potential competitors, or suppliers. These actions are summarized in Figure 2.

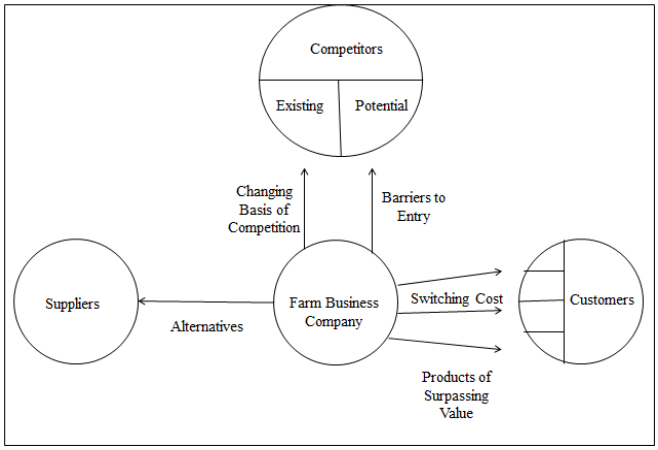

Figure 2: Competitive forces in the marketplace

The following facts are the advantages of competitive forces. They are:

Threat of New Competitors: Erect Barriers to Entry.

Intensifying Rivalry among Existing Competitors: Change the Basis of Competition.

Pressures from Potential Substitute Products: Deliver Products of Surpassing Value.

Bargaining Power of Customers: Introduce Switching Costs.

Bargaining Power of Suppliers: Develop Alternatives.

C. Competitive Tactics

In competitive markets the competitive tactics is necessary for business processes. Depending on its current capabilities and long-term plans, an organization may employ any of several tactics to change its products or processes through the use of strategic information systems.

Internal growth makes it possible to realize economies of scale. Many firms conclude a strategic alliance, a long-term partnership, with another company. Information partnerships, based on sharing of information systems, have become a potent competitive weapon. The advantage of partnership is economy of money and time, and reciprocity of competencies. Strategic alliances are vital to competing in global markets.

D. Strategic Cube

The combination of competitive strategies, the market forces they target, and the tactics used to implement the strategies can be mapped into a framework call the strategic cube. By using the strategic cube, a company may review its options for seeking competitive advantage with information systems.

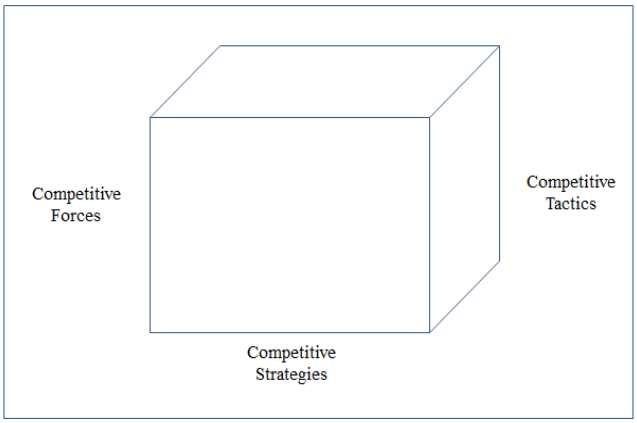

Figure 3: Simple structure of the strategic cube

Figure 3 shows the simple structure of the strategic cube for the system. The strategic cube does not tell the company exactly where it may apply information systems in its activities in order to seek competitive advantage. The competitive forces to contend with customer power, supplier power, present competitors, potential competitors and substitute products. The competitive strategies are basic line in the strategic cube. The competitive tactics have the strategic alliance, merger or acquisition, internal growth and internal innovation process.

V. CONCLUSIONS

The strategies, forces and tactics are very important techniques of farm management information system in competitive markets. The farms environment are involved in has become more and more complex over the past decades. Information systems are also used for innovation in the ways products are manufactured and services are provided, we can call process innovation. Overall, a well-designed FMIS well increase the total profit of a farm and therefore help to survive in today's fast changing and highly competitive environment. In the future, the farm business globalization will be the emergence of global markets as the arena of competition and cooperation among firms. Because of this phenomenon, our new competitor can emerge in any area of the world. We will gain a marketplace or locate a production facility in a foreign country. This research can support farmers in managing their farms and markets both effective and efficiently.

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REFERENCES

[1]. Gauravjeet Dagar, "Study of agriculture marketing information systems models and their implications", AIMA Journal of Management & Research, May 2015, Volume 9 Issue 2/4.

[2]. KAYAH STATE SOCIO-ECONOMIC ANALYSIS (September 2013)

[3]. Halberg, N. Indicators of resource use and environmental impact for use in a decision aid for Danish livestock farmers. Agriculture, Ecosystems & Environment 1999; 76: 17-30.

[4]. Nasir, S. The development, change, and transformation of Management Information Systems (MIS): A content analysis of articles published in business and marketing journals. International Journal of Information Management 2005; 25: 442–457.

[5]. Pesonen, L., Koskinen, H., Rydberg, A. InfoXT - User-centric mobile information management in automated plant production. Nordic Innovation Centre, Stensberggata 25, NO-0170 Oslo, Norway. 2008. Available online at: http://www.nordicinnovation.net/_img/infoxt_finalreport.pdf.

[6]. Pesonen, L., Nikkilä, R., Kaivosoja, J., Olsson, J., Norros, L. Rydberg, A. Technological solutions for the information management system. 2007. Available online at: https://portal.mtt.fi/portal/page/portal/www_en/Projects/InfoXT/Publications/WP2.pdf.

[7]. Alexandros Kaloxylos, Robert Eigenmann, " Farm management systems and the Future Internet era", Computers and Electronics in Agriculture 89 (2012) 130–14, https://www.elsevier.com/locate/compag.

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