Preliminary Requirement Analysis Of Mushroom Agribusiness Information System In Bandung, Indonesia

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ABSTRACT: This paper describes a model of management information system to facilitate all stakeholders and to support decisions, related to performance improvement and business added value. This study emphasizes the analysis of the needs of each subsystem, starting from the concept that identifies the business benefits and consequences of efforts to be prepared by the stakeholders, more intensive identification of the existence of stakeholders and the need for support of data or information, as well as identifying the needs of the system, both from a functional aspect (processes or procedures of information processing), and non-functional. Agribusiness Systems Oyster Mushrooms have 5 subsystems namely production facilities providers, farm production, agro-industry processing, marketing and supporting institutions. There are 16 stakeholders, from the five subsystems.

Keywords : Management Information System, Mushroom agribusiness development, requirement analysis, Information Technology enabling

1 INTRODUCTION

Indonesia is an agricultural country, where most of people live with agriculture or farming, so that agriculture is a sector that plays an important role in the welfare of the Indonesian population lives. Food crops sub-sector recorded the highest increase in performance compared to other agricultural sub-sector. In the first quarter of 2013, GDP of the food crops sub-sector increased by 68.60 percent against the previous quarter, while GDP plantations and farms fell respectively by 12.76 percent and 3.38 percent [1].Good agricultural development requires systematic and effective plan to make the necessary changes, using innovation and appropriate technology to potential local agro-ecosystem. The effort will increase the income and welfare of farmers and their partners. Successful agricultural development will ensure improved quality, performance and productivity of agriculture. Agribusiness is an agriculture based business or other fields that support it, that has comprehensive series of activities ranging from procurement and production to the industrial processing and marketing activities. Since agribusiness is a system, then there is a lot of factors and related parties which are contribute to the success of its development [4]. Agribusiness development can be conducted by development of seed industry and fertilizer industry support on it, technical and financial support from stakeholders, give regulation to the market to be conducive, and an efficient supply chain Agribusiness system is generally divided into five subsystems [6], i.e subsystem production facilities providers, farm or on-farm activities (primary production), initial processing (secondary production), and late processing services (tertiary production), and the demand side of the market or consumers, neither foreign nor domestic. Communication and coordination between its subsystems is crucial in the success of the develop-ment of agribusiness [4]. The availability of information has very large role in supporting communication and coordination between subsystems accurately and smoothly. To ensure accurate information and good coordination between subsystems often do vertical integration where several subsystems that have the potential cause of the perceived high transaction costs are often ultimately acquired company into a large agribusiness corporations [4]. Bridge of communication between subsystems can be developed in the form of an equal partnership between agribusiness that have different competencies that could eventually form an effective system of vertical coordination and efficient. Vertical integration will encourage the growth of large agribusiness. While vertical coordination will provide more opportunities for agribusiness actors including farmers to remain a role in the overall system of agribusiness. Each subsystem agribusiness requires high quality information and knowledge, which is accurate, complete and up to date, to increase production capacity and improve the ability of human resources in the subsystem. While on the side of the market is essential is that the protection and transparent information, both for producers and consumers so that producers and consumers have many choices of action or transaction with the appropriate quality assurance. Information needed by agribusiness to communicate and coordinate the data is in the form of pricing, product information, location, time, quantity and quality of production.

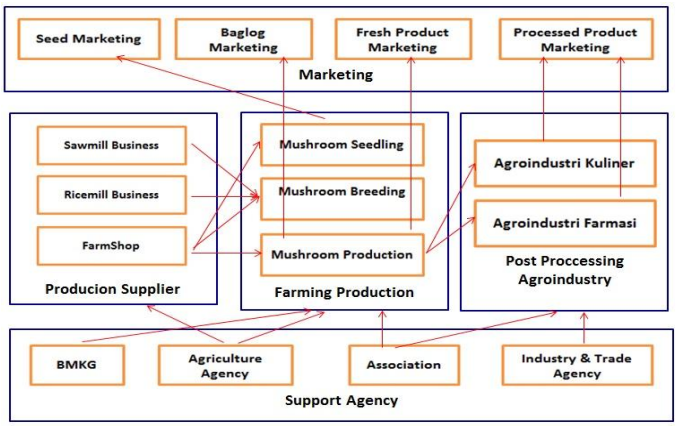

Figure 1: Collaboration and information sharing between Mushroom Agribusness stakeholder

System Requirements Analysis is implemen-ted to obtain a thorough and detailed understanding of the business need as defined in information system development and captu-red in the business need, and to break it down into discrete require-ments, which are then clearly defined, reviewed and agreed upon with the stakeholder decision-makers. The purpose of the requirements analysis phase is to transform the needs and high-level requi-rements specified in earlier phases into unam-biguous (measurable and testable), traceable, complete, con-sistent, and stakeholder-approved requirements. The quality of the final product is highly dependent on the effectiveness of the requirements identification process, that creates a com-plete and accurate representation of all requirements that the system must accommodate. The primary goal of this phase is to create a detailed Functional Specification defining the full set of system capabilities to be implemented, along with ac-compa-nying data and process models illustrating the informa-tion to be managed and the processes to be supported by the new system.

2 METHODS

Requirement analysis phase consists of six processes [3], [5] that are (1) preparation, to ensure that the system environment and team developer are adequately prepared to both capture and analyze the system requirements, (2) Determine Business Requirements, to identify of business requirements are and business rules are defined and interfaces to and from the new application are discussed, (3) Process model definition, top down representation of the major business processes that in-teract with the system is diagrammed and decomposed into manageable functions and sub-functions until no further breakdown is feasible; (4) Logical Data Model definition**,** where data that supports the processes and business rules is logical-ly modeled, identifying entities and their relationships to other entities, and defining attributes with their business definitions (5) Business Requirements and Models reconciliation**,** ensur-ing that the Process and Logical Data Models accommodate all requirements and business rules and finally (6) Produce Functional Specification**,** where interfaces, processes and data are merged to describe systematically how the users will oper-ate the application, and how data will be retrieved, processed and stored.

3 RESULTS

The type of information that needs to be conveyed in the communication between systems by agribusiness coordinator is in the form of delivering new know-ledge gained from the results of research and develop-ment, new technology, counseling and education to improve skills, business opportunities, the chance of capital, etc. But agro-industry sector hasn't support it yet. There are many disadvantage conditions, such as too many products that are marketed in the form of fresh agricultural commodities, too dominant role of traditional markets and centralized on marketing and services subsystems (tertiary production). Marketing is still in the form of fresh products through a network of wholesale markets and traditional markets. This dominance led to paralysis of the flow of information, due to perpetuate the dominance of the beneficiaries should control the flow of information [4]. Agribusiness ecosystem requires models that provide all the necessary information sharing in each subsystem agribusiness actors in decisions related to performance improvement and added value. The system needed to be able to integrate the needs of all stakeholders and facilitate the exchange of information, in order to maximize the benefits of collabora-tion. One of the model can be designed for the needs of the information is business hub model. Information business hub or electronic hub is a com-mercial website that provides coordination and synchroniza-tion with electronic commerce of its users or partners. Agribu-siness hub is an internet portal to facilitate the regulator for collaborative work with all of its stakeholder or subsystem par-ticipants. It provides a technological bridge from regulator to businesses and farmers in an order to improve profitability and benefit to the stakeholder. Analysis of the data flow model can be applied by information system context diagram, which presents data and information exchange between stakeholders, which is facilitated by the system [2]. From the field survey, the exchange of data and information between stakeholders are summarized in Table 1 below:

Tabel 1 List of Data and Information flow of the system

No	Stakeholder	Data Input to the System	Information (output of the System)
1	Sawmill Busi-ness Unit	I-1: Profile, Produc-tion Capacity, Price,	O-1: order-Qty, Regula-tion, Wood Production Predic-tion & Distribution
2	Ricemill Busi-ness Unit	I-2: Profile, Produc-tion Capacity, Price,	O-2: order-Qty, Regula-tion, Wood Produc-tion Predic-tion & Distribution
3	FarmShop	I-3: Product Profile, Price , Stock status, Order status Credit Oppor-tunity	O-3: order-qty, Regulation, Know-Hows,, Investation Opportunity
4	Seedling Busi-ness Unit	I-4: Profile, Produc-tion Capacity, Price, Stock position, Spec of Seed	O-4: Know-Hows, Market Price, De-mand-qty, Seed Certifi-cation
5	Breeding (Bag-log) Business Unit	I-5: Profile, Produc-tion Capacity, Price, Stock position, Spec of baglog	O-5: Know-Hows, Market Price, De-mand-qty, Gas-Fuels Supply capa-city, weather report
6	Mushroom Pro-duction (Main) Busi-ness Unit	I-6: Profile, Produc-tion Capacity, Price, Stock position, Spec of product	O-6: Know-Hows, Market Price, De-mand-qty, raw mate-rial Supply capacity, wea-ther report
7	Cullinary Agroin-dus-try Unit Busi-ness	I-7: Profile, Produc-tion Capacity, Price, Stock position, Spec of product	O-7: Know-Hows of Food Tech, Market Price, Demand-qty, raw mate-rial Supply capacity, inves-tation Oppor-tunity
8	Pharmaceu-tical Agro-industry	I-8: Profile, Produc-tion Capacity, Price, Stock position, Spec of product	O-8: Know-Hows of Phar-maceutical Tech, Market Price, Demand-qty, raw mate-rial Supply capacity, inves-tation Oppor-tunity
9	Seed Marke-ting	I-9: Product Profile, Seed Price	O-9: Seed Demand Qty
10	Baglog Market-ing	I-10: Product Profile, Baglog Price	O-10: Baglog De-mand Qty
11	Fresh Product Marketing	I-11: Product Profile, Fresh Product Price	O-11: Fresh prod-uct Demand Qty
12	Processed Prod-uct Marketing	I-12: Product Profile, Pro-cessed Price	O-12: Proces-sed product Demand

			Qty
13	BMKG	I-13: Weather report	O-13: Feed-back Info
14	Agriculture Agency	I-14: KnowHows, Standards, Regula-tions	O-14: Feed-back Info on the agency ser-vices
15	Asosiasi	I-15: Standard price info, association re-gulations	O-15: agricul-ture, Industry & Trade agen-cy regulation, Market demand Production-qty, weather repport
16	Industry & Trade Agency	I-16: Industry & Trade regu-lation, produc-tion target, export quota, standard	O-16: Feed-back Info on the agency ser-vices

Functional requirements of the system is presented in a context diagram, which describes the interaction of information exchange among stakeholders, that is facilitated by the system. Based on the information needs analysis has been conducted in table 1, the context diagram for Information Systems Agribusiness Mushrooms, shows in Figure 2.

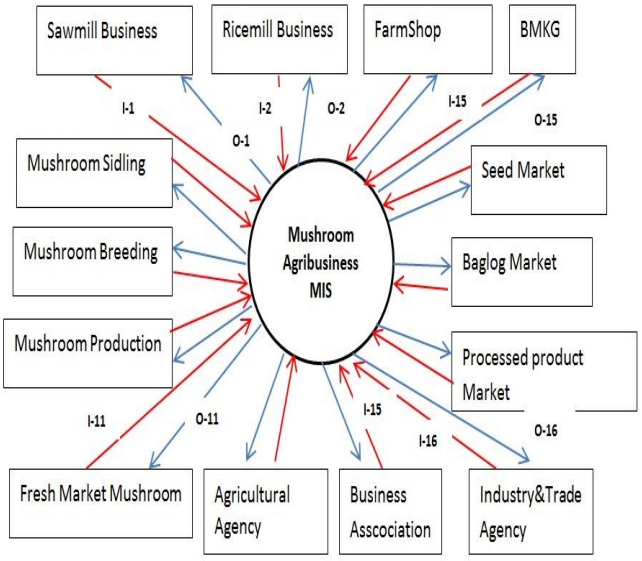

Figure 2: Context diagram of the system (dataand information flow are coded refer to table 1)

Futher more the exploration of the functional system in more detail, with a top-down approach can be applied functional decomposition, which is used to describe the detailed processes contained in the system, use the Data Flow Diagram. Based on field investigation, the type of system functional requirements concerning the processes that can be presented in the form of functional decomposition diagram as shown in figure 3.

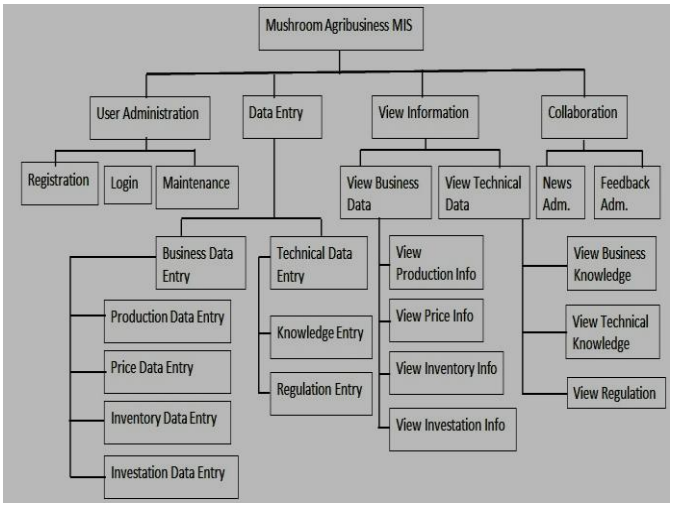

Figure 3: Functional Decomposition Mushroom Agribusiness Management Information Systems

4 DISCUSSION

An effective system can be well developed, if the system specifications, which are being developed, well verified and approved by all of the stakeholders, so that the error can be identified in early phase of development. Since the improvement efforts in the early stages of development is much more efficient than if the improvement in the final stages. The model needs to be followed by the identification information of each data structure or information, accurately and completely, which is commonly presented in the form of a data dictionary. The deliverable of requirement analysis is documentation on the analysis of functional and non-functional requirements should be done carefully, in order to obtain good quality of the analysis results, which are indispensable in the further process of system design. In addition, the development must also plorasi mengeks-supporting infrastructure needs, whether it be hardware, software (system, database, and other), as well as computer networks and telecommunications networks. Associated with the ease of operation of the system will, need to be analyzed the behavior of each user in the use or access information from a computer apikasi, commonly presented in the specification of interaction with the system users.

5 CONCLUSION

Agribusiness Systems Oyster Mushrooms have 5 subsystems namely production facilities providers, farm production, agro-industry processing, marketing and supporting institutions. Of the five subsystems there were 16 stakeholders, which consists of sawmills, rice mills, farm supply stores, farm seed provider, seedling breeding farm (baglog), core farming (cultivation of mushroom), culinary mushroom processing business , pharmaceutical mushroom processing business, seed marketing, marketing baglog, fresh mushrooms marketing, marketing of processed mushrooms, BMKG, Department of agriculture, Department of Industry, and the Association. It had been identified 16 streams of data that shows the collaboration between stakeholders in the exchange of data and information, which is then presented in the context diagram. In general, data or information exchanged includes a data / business information and data / technical information. The information presented can be either

policy or technical knowledge or business. From the context diagram analysis can be continued by applying a top-down technique, to explore the functional needs of agribusiness management information system of oyster mushrooms. To facilitate the analysis of functional requirements, need to be identified the processes required in system procedures. The structure of existing processes in the system have been identified and then presented in a functional decomposition. The system has four main processes, namely user administration, data input, show information and collaboration.

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REFERENCES

[1] Buletin PDB Sektor Pertanian Vol. 13, No. 2, Juni 2014 - See more at: http://epublikasi.setjen.pertanian.go.id/arsip-buletin/52-buletin-pdb/183-vol-13-no-2#sthash.dP5DEdmo.dpuf (Last access July, 30-th, 2014)

[2] Beaumaster, S., 1999, *Information technology implementation issues: an analysis*. Unpublished manuscript, Faculty of the Virginia Polytechnic Institute and State University

[3] Kroenke, D. M., 2007, *Using MIS* (2nd ed.). Upper Saddle River, New Jersey, Pearson Prentice Hall

[4] Natawidjaja, Ronnie. S. 2002. Jaringan Informasi Digital Untuk Menunjang Pengembangan Pertanian Berbasis Agribisnis

[5] O'Brien, J. A., 2004, Management information systems: managing information technology in the business enterprise (6th ed.). New York, McGraw-Hill/Irwin.

[6] Saragih B. 2001. Suara Dari Bogor: Membangun Sistem Agribisnis. Yayasan USESE dan Sucofindo. Bogor.