

ANALYSIS OF FUNCTIONAL NEEDS FOR FARMER GROUP INFORMATION SYSTEMS USING A BALANCED SCORECARD

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Abstract

Farmer groups have an important role as a forum for solving agricultural problems and as a liaison for conveying information from the government and other organizations to the farming community, so there is a need for easier management of farmer groups. To simplify and improve the management of farmer groups, it is necessary to have an information system, but before going further towards development, it is necessary to first determine the functional requirements of the system so that it can produce an information system that suits the needs of its users. To determine more focused functional requirements, a functional requirements analysis framework is needed, namely using the *Balance Scorecard concept*. There are two strategic foundations from the three *Balance Scorecard strategies* used in this research. Namely *Strategic Alignment, Strategic Areas*, these two strategies produce twenty-four farmer group information system functionalities.

Keywords: Farmer Group, Information System, Functional Needs Analysis, Balance Scorecard

A. INTRODUCTION

A farmer group is an entity that aims to facilitate meetings and collaboration between a group of farmers in order to encourage agricultural development (Nainggolan et al, 2023). Formed on the basis of shared desires and interests, farmer groups play an important role in improving social, economic conditions and resource utilization in the agricultural environment (Anantanyu, 2011). With collaboration between farmers' minds, they can support each other and share knowledge and experience, which in turn can increase the overall efficiency of farming (Pramono & Yuliawati, 2020).

The main aim of forming farmer groups is to empower farmers to improve and develop agricultural activities which are managed by group members together (Sabrina, 2021). Through good coordination between group members, they can optimize resource utilization, share risks, and increase access to the latest information and technology in agriculture. This goal is in line with the concept of sustainable agricultural development, which emphasizes the importance of economic, social and environmental sustainability in agricultural practices (Reza et al, 2019). In this way, farmer groups become a vehicle for farmers to work together to overcome challenges and seize opportunities that arise in the world of agriculture.

The formation of farmer groups is not just to receive information from related organizations, but these farmer groups are a forum that can be used to receive information and learn together in the context of solving agricultural problems faced (Amanah & Seminar, 2022). Likewise, extension activities towards farmers will be more effective and efficient if carried out among farmer groups, so that they can reach a wider range of target farmers. This can be

realized because farmer groups are an effective forum for empowering farmers, increasing productivity, income and welfare of farmers with the help of facilities from the government with various agricultural development policy programs (Nuryanti & Swastika, 2011).

To achieve the mission of improving community welfare through agricultural development in Subang Regency, an effective strategy needs to be designed to improve services for farmer groups (Subang, 2022). The government can prioritize a participatory approach by involving farmer groups in the planning and decision-making process regarding agricultural policies. By directly involving farmers, it will be more possible to identify the needs and challenges faced by farmer groups at the local level (Prayitno & Subagiyo, 2018). In addition, providing training and technical assistance to improve farmers' skills in modern agricultural management can be a strategic step. Providing better access to resources such as superior seeds, fertilizer and innovative agricultural technology also needs to be considered (Prawoto, 2012).

Information systems are one of the strategies that need to be prepared to improve services for farmer groups. Information systems have various components that can carry out certain tasks to be able to interact with various actors in the system (Jaja et al, 2020). The information system that is prepared requires a thorough analysis related to functional requirements or system requirements. System requirements analysis is an activity that needs to be carried out to provide an overview of the needs of each user of the system to be built (Setiyani et al., 2020).

Analysis of functional requirements in information system development is a critical step in designing solutions that are effective and relevant to the development of organizational needs. In this context, focusing on information systems can provide a clear picture of the weaknesses or obstacles that may be faced by old systems (Setiyani & Ginting, 2019). By detailing and defining functional requirements, developers can identify areas that need improvement or improvement. This process is not only centered on technology, but also considers aspects such as user needs, data governance, and integration with other systems. By properly understanding functional requirements, developers can design solutions that not only address current problems but also provide responsiveness to changes that may occur in the future (Kasim et al., 2020).

Establishing well-thought-out functional requirements also opens up opportunities to optimize user experience and increase productivity. Involving stakeholders and end users in this analysis process ensures that the information system developed can accommodate real needs and support business objectives optimally (Gunawan et al, 2023). Alignment between system functionality and user needs will create an information system that is easier to implement and accepted by end users, which in turn can increase the operational efficiency and effectiveness of the organization (Efran et al, 2023).

In the context of information system development, functional and non-functional requirements are two crucial aspects that complement each other. Functional requirements provide an overview of the main features expected by each stakeholder, explaining the functionality of the system that will be built by the development team (Ramadhan et al, 2017). This includes aspects such as data search capabilities, automated business processes, or

integration with external systems. On the other hand, non-functional requirements set parameters and constraints in terms of performance, security, or scalability that are desired from the product. By detailing these two types of requirements, the development team can ensure that the system design and implementation reflects stakeholder expectations and meets the desired quality standards (Setiyani & Ginting, 2019).

These functional requirements can be analyzed well if you first look at a picture of the running business process and measure performance using the Balance Scorecard concept (Usman et al, 2022). The Balance Scorecard is a concept that can be used to measure organizational performance so that it can provide a quick but comprehensive view for the management level (Handayani, 2021). Apart from that, the Balance Scorecard is used to translate the vision and mission as well as the strategy of an organization with an integrated set of performance measures, organized into four perspectives, namely: financial, customer, internal business processes, and learning and growth (Danto et al, 2011).

From the existing introduction, to improve services to farmer groups, it is necessary to analyze the Functional Needs of Farmer Group Information Systems using a balanced scorecard, as a first step in developing information systems in the future.

B. METHOD

The Balance Scorecard framework, apart from measuring organizational performance, can also be used to analyze the functional needs of information systems, developing a strategy is very important for building a Balance Scorecard, namely by focusing on building strategic foundations including: Strategic Alignment, Strategic Areas, and Strategic Grids (Evans, 2002). To determine functional needs, you can use two existing strategies, below is a picture of a research framework for analyzing the functional needs of farmer group systems using the Balance Scorecard (Danto et al, 2011).



Figure 1. Functional Requirements Analysis Framework for Farmer Group Information Systems Using a *Balanced Scorecard*

C. RESULTS AND DISCUSSION

Strategic Alignment

As stated in the introduction, one of the missions of Subang Regency is to increase community welfare through development in the fields of agriculture, community economy, creative industries, fisheries and maritime affairs, as well as exploring potential based on culture and local wisdom. Based on this mission, six Strategic Alignments were obtained which focus on development in the agricultural sector. The following is the result of the explanation of this mission.

Table 1. Strategic alignment of agricultural development through farmer groups.

No	Alignment strategy	Actor
1	There is an increase in crop yields	Farmer Group
2	Provide more intensive counseling	PPL, Farmers Group
3	More excellent service related to solving agricultural activity problems	PPL, Farmers Group
4	Monitoring of farmer group activities in an integrated manner	Farmer groups, PPL, Extension Section
5	Ease of obtaining information related to agricultural equipment needs and the selling power of agricultural products	Farmer groups, kiosks, PPL
6	Easier to report agricultural developments	Farmer groups, PPL, Extension Section

The Strategic Alignment for agricultural development through farmer groups in Subang Regency includes six focus points which are overall aimed at improving community welfare through developing the agricultural sector, in accordance with the district's mission. First, the strategy to increase crop yields (No. 1) is designed to empower farmer groups to optimize agricultural production. This includes implementing efficient and innovative farming practices to significantly increase crop yields. Farmer groups are the main actors in this strategy, and good collaboration between them is expected to achieve increased desired results.

The next strategy (No. 2) emphasizes more intensive extension, involving the active role of Field Extension Farmers (PPL) and farmer groups. It is hoped that more in-depth and targeted counseling can increase farmers' knowledge and skills in carrying out agricultural activities. Better service related to solving agricultural activity problems (No. 3) is also the focus of the strategy, where PPL and farmer groups work together to provide effective solutions to the obstacles faced by farmers in their agricultural process.

Furthermore, monitoring farmer group activities in an integrated manner (No. 4) is an important strategy to ensure efficiency and effectiveness in implementing farmer group activities. With the involvement of farmer groups, PPL, and the Extension Section, comprehensive monitoring can provide an accurate picture of agricultural developments at the group level. Ease of access to information related to agricultural equipment and marketability of agricultural products (No. 5) is the focus of the next strategy. Involving farmer groups, kiosks and PPL, this strategy aims to increase farmers' access to the latest information about

agricultural equipment and markets. Easier reporting on agricultural developments (No. 6) is the final strategy aimed at simplifying the reporting process for farmer groups, which involves collaboration between farmer groups, PPL, and the Extension Section.

These six strategies complement each other and are expected to create an environment that supports the growth and welfare of farmers in Subang Regency, in line with the established vision and mission of agricultural development.

Strategic Areas

From the strategies that have been obtained at the *strategic alignment stage* , generalization will be carried out into 4 perspectives in accordance with the *Balanced Scorecard concept* , namely: financial, customer, internal business processes, and learning and growth so that this generalization will produce *strategic areas* .

In these *strategic areas* , two examples of perspectives will be created, namely for customers and internal business processes. From this stage it will then become a reference in determining or analyzing the functional needs of farmer group information systems in accordance with the existing mission. The following are *strategic areas* for agricultural development through farmer groups.

Table 2. *strategic areas* for agricultural development through farmer groups

Perspective	Strategic Areas	Strategy
Customer	Increasing the image and trust of the farming community	There is an increase in crop yields
		Ease of obtaining information related to agricultural equipment needs and the selling power of agricultural products
		More excellent service related to solving agricultural activity problems
Internal business processes	Improved Farmer Group Services	Provide more intensive counseling
		Monitoring of farmer group activities in an integrated manner
		Easier to report agricultural developments

Strategic Areas for agricultural development through farmer groups illustrate the Balanced Scorecard concept by generalizing strategy into four main perspectives: financial, customer, internal business processes, and learning and growth. From table 2, two examples of perspectives have been identified, namely Customers and Internal Business Processes. From a customer perspective, the main focus is improving the image and trust of the farming community. This includes strategies such as increasing crop yields to have a positive impact on the public's image and trust in farmers. Ease of obtaining information related to agricultural equipment and marketing of agricultural products is also a strategy that supports improving this

image. Better service related to solving problems in agricultural activities is an integral part of efforts to increase public trust in farmer groups.

On the other hand, from an Internal Business Process perspective, there is a focus on Improving Farmer Group Services. Strategies such as providing more intensive counseling aim to improve the quality of services provided to farmer groups. Monitoring farmer group activities in an integrated manner and making it easier to report agricultural developments is another strategy that supports improving services and efficiency of farmer group internal business processes. By identifying and generalizing strategies into strategic areas, Subang Regency can more easily set priorities and allocate resources to achieve the desired agricultural development goals. This is an important reference in analyzing the functional needs of information systems for farmer groups, where the system is expected to support the implementation of strategies that have been formulated in these strategic areas.

Functional Requirements Analysis

After determining *the Strategic Areas*, the next step is to determine the functional needs analysis of the farmer group information system in accordance with the needs or desires of each actor or stakeholder with the first step determining the expected value of the strategy in the *Strategic Areas*, secondly describing the functional needs of each existing strategy, thirdly ensure the actors involved in each functional requirement, fourthly determine the functional code. The following are the results of an analysis of the functional needs of farmer group information systems.

Table 3. Results of Analysis of Functional Requirements for Farmer Group Information Systems.

<i>Strategic Areas</i>	Mark Expected	Functionality	Code
There is an increase in crop yields Actor: Farmer Group	Availability of reporting of harvest results for each season	Managing agricultural land ownership	SRS-001
		Manage the area of agricultural land that will be cultivated	SRS-002
		Manage harvests each season	SRS-003
		Manage Recommendations for the types of seeds that should be planted	SRS-004
		Displays a dashboard of increasing crop yields each season and year	SRS-005
Ease of obtaining information related to agricultural equipment needs	Real-time information for agricultural needs	Manage agricultural equipment price information	SRS-006
		Manage information on selling prices of agricultural products	SRS-007

and the selling power of agricultural products Actor: Farmer groups, kiosks, PPL		Displays information on prices of agricultural equipment and selling prices of agricultural products	SRS-008
More excellent service related to solving agricultural activity problems Actor: PPL, Farmers Group	Ease of solving agricultural problems	Managing agricultural problems	SRS-009
		Managing solutions to agricultural problems	SRS-010
		Showing agricultural problems	SRS-011
		Showcasing agricultural solutions	SRS-012
Provide more intensive counseling Actor: PPL, Farmer Group	There is a routine and incidental agenda for outreach activities	Manage the schedule for implementing routine counseling	SRS-013
		Manage the incidental outreach agenda	SRS-014
		Manage the schedule for implementing incidental counseling	SRS-015
		Displays routine counseling schedule information	SRS-016
		Displays incidental counseling information	SRS-017
Monitoring of farmer group activities in an integrated manner Actor: Farmer groups, PPL, Extension Section	There is monitoring of farmer group activities	Manage farmer group data	SRS-018
		Manage the planting agenda, flowering phase and harvest phase of farmer groups	SRS-019
		Manage the distribution of agricultural aid from both the government and other parties	SRS-020
		Manage reporting on the use of agricultural aid	SRS-021
Easier to report agricultural developments	Generate real-time progress reports	Displays agricultural reporting information	SRS-022
		Print agricultural reporting information	SRS-023

Actor: Farmer groups, PPL, Extension Section		Export agricultural reporting according to central reporting requirements	SRS-024
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D. CONCLUSION

The application of the Balanced Scorecard proves its usefulness in analyzing the functional needs of information systems for farmer groups. By summarizing the two main strategic foundations, namely Strategic Alignment and Strategic Areas, it is able to produce twenty-four measurable information system functionalities that suit the needs and expectations of users. Integrating the foundations of this strategy ensures that each element of the information system that will be built appropriately meets the strategic objectives and policies that have been set in the agricultural development mission in Subang Regency. This functional needs analysis, which is the result of implementing the Balanced Scorecard, not only provides clear direction in designing farmer group information systems, but also becomes a strong foundation for building solutions that are able to increase efficiency, effectiveness and farmer welfare in the future. Thus, this analysis becomes a strong basis for guiding the process of developing relevant and effective information systems for farmer groups, making it easier to face future agricultural dynamics.

REFERENCES

1. Amanah, S., & Seminar, A. U. (2022). Sekolah lapang petani sebagai community of practice pengembangan inovasi kelompok di era digital. *Jurnal Penyuluhan*, 18(01), 164-176.
2. Anantanyu, S. (2011). Kelembagaan petani: peran dan strategi pengembangan kapasitasnya. *SEPA: Jurnal Sosial Ekonomi Pertanian dan Agribisnis*, 7(2).
3. Danto, W., Pertiwi, A. P., & Laksitowening, K. A. (2011). Analisis Kebutuhan Fungsional Sistem Informasi IT Telkom Menggunakan Balanced Scorecard. In *Konf. Nas. Sist. Inf.*, no. Februari.
4. Effran, E., Perdana, M. A. C., Maranting, H. S., Prakoso, T., Ratri, W. S., Riwu, Y. F., ... & Saputro, W. A. (2023). *Manajemen Strategi Agribisnis*. Pradina Pustaka.
5. Evans, M. H. (2002). Excellence in Financial Management, Course 11: The Balanced Scorecard, Revised.
6. Gunawan, A., Munir, M., Wibisono, Y., & Furqon, C. (2023). Sistem Informasi Manajemen Terkini: Meningkatkan Efisiensi dengan Kecerdasan Buatan.
7. Handayani, N. (2021). Perkembangan Balance Scorecard di Indonesia. *Jurnal Al-Iqtishad*, 17(2), 289-303.
8. Jaja, J., Alfaritsy, F., & Purwanti, S. (2020). Pengembangan Sistem Informasi Hasil Uji Lab Benih Padi Bersertifikat Menggunakan Metode Rational Unified proses. *Media Bina Ilmiah*, 15(3), 4339-4344.

9. Kasim, A., Hadjaratie, L., & Dai, R. H. (2020). Rancang bangun sistem informasi skripsi dan kerja praktik berbasis web. *Jambura Journal of Informatics*, 2(2), 95-107.
10. Nainggolan, H. L., Sidabalok, F. E. P., Saing, B. R., Bakkara, I. M., Tobing, A. G. L., & Sianturi, S. A. (2023). Analisis Pendapatan Usahatani dan Strategi Peningkatan Pemahaman Petani Atas Biaya Lingkungan Kelapa Sawit Rakyat di Kabupaten Batu Bara, Sumatera Utara, Indonesia. *Agro Bali: Agricultural Journal*, 6(1), 171-187.
11. Nuryanti, S., & Swastika, D. K. S. (2011). Peran kelompok tani dalam penerapan teknologi pertanian. In *Forum penelitian agro ekonomi* (Vol. 29, No. 2, pp. 115-128).
12. Pramono, L. G., & Yuliawati, Y. Y. (2020). Peran Kelompok Tani terhadap Pendapatan Petani Padi Sawah di Kelurahan Kauman Kidul Kecamatan Sidorejo Kota Salatiga. *Agritech: Jurnal Fakultas Pertanian Universitas Muhammadiyah Purwokerto*, 21(2), 129-139.
13. Prawoto, N. (2012). Model pengembangan dan pemberdayaan masyarakat berbasis kemandirian untuk mewujudkan ketahanan ekonomi dan ketahanan pangan (Strategi pemberdayaan ekonomi pada masyarakat Dieng di Propinsi Jawa Tengah). *Jurnal Organisasi dan Manajemen*, 8(2), 121-134.
14. Prayitno, G., & Subagiyo, A. (2018). *Membangun desa: Merencanakan desa dengan pendekatan partisipatif dan berkelanjutan*. Universitas Brawijaya Press.
15. Ramadhan, M. R., Nugroho, L. E., & Sulisty, S. (2017). Evaluasi sistem informasi monitoring skripsi menggunakan prinsip usability. In *Prosiding Seminar Sains Nasional dan Teknologi* (Vol. 1, No. 1).
16. Reza, M., Noer, M., Yonariza, Y., & Asmawi, A. (2019). Hubungan Ikatan Anggota Kelompok Tani dengan Partisipasinya pada Proses Perencanaan Penyuluhan Pertanian Tingkat Nagari di Kabupaten Lima Puluh Kota. *Jurnal Penyuluhan*, 15(1).
17. Sabrina, R. (2021). Pemberdayaan Petani dalam Peningkatan Kinerja Pertanian (Suatu Kajian dengan Pendekatan Teoritis). *JASc (Journal of Agribusiness Sciences)*, 4(2), 100-104.
18. Setiyani, L., & Gintings, A. (2019). Analisis Kebutuhan Fungsional Sistem Informasi Pengelolaan Skripsi. *Simposium Nasional Ilmiah & Call for Paper Unindra (Simponi)*, 1(1).
19. Setiyani, L., Rostiani, Y., & Ratnasari, T. (2020). Analisis Kebutuhan Fungsional Sistem Informasi Persediaan Barang Perusahaan General Trading (Studi Kasus: PT. Amco Multitech). *Owner: Riset dan Jurnal Akuntansi*, 4(1), 288-295.
20. Subang (2022). Visi dan Misi Kabupaten Subang. <https://www.subang.go.id/profil/visi-dan-misi> (accessed Jun. 11, 2022).
21. Usman, A., Mediaty, M., Ansar, A. D. A., Utami, A. P., Nurafifah, I. P., & Nasution, N. (2022). Manfaat Pengimplementasian Balanced Scorecard: Sebuah Literatur. *Economics and Digital Business Review*, 3(2), 432-452.