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Implementation Of Information Technology Balanced Scorecard in An Agriculture Organisation

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Abstract. "Sentra Pelayanan Agribisnis (SAPA)" is an agricultural organization owned and operated by a farmer community in Sukabumi, West Java, Indonesia. SAPA adopts information technology (IT) to improve the effectivity of its internal communication. SAPA started IT adoption by a careful planning. The step includes organizing the map of IT strategy and formulating the key performance indicators. The purpose of this research is to arrange a strategy map of SAPA IT division, to formulate the key performance indicators using Balanced Scorecard approach, and to implement as a mobile web application. Results of this research include a strategy map of SAPA IT division, key performance indicators, and a prototype of mobile web application. It can be concluded that IT adoption supported by a strong leadership improves effectivity of the information flows within the researched agriculture organisation.

Keywords: *balanced scorecard, agriculture, it division strategy map, kpi, it strategy*

Abstrak. *Sentra Pelayanan Agribisnis (SAPA) adalah sebuah organisasi pertanian yang dimiliki dan dioperasikan oleh kumpulan petani di Sukabumi, Jawa Barat, Indonesia. SAPA mengadopsi teknologi informasi (TI) untuk meningkatkan efektifitas komunikasi internal. SAPA mulai mengadopsi TI dengan perencanaan matang. Langkah ini termasuk mengorganisir peta strategi TI dan merumuskan indikator kinerja utama. Penelitian ini bertujuan untuk menyusun peta strategi SAPA divisi TI, untuk merumuskan indikator kinerja utama menggunakan pendekatan Balanced Scorecard, dan untuk mengimplementasikan sebagai aplikasi web mobile. Dapat disimpulkan jika adopsi TI didukung dengan kepemimpinan yang kuat akan meningkatkan efektivitas arus informasi di dalam organisasi pertanian yang diteliti.*

Kata Kunci : *balanced scorecard, pertanian, peta strategi divisi ti, kpi, strategi ti*

INTRODUCTION

As an agricultural country, agriculture sector plays a very important role in the national economic development. At present, around half of Indonesia's population rely on the agricultural sector. In addition, agricultural sector is noted as one of sector which most resistant to the economic crisis that has engulfed Indonesia recently. Therefore, working on the agricultural sector is a wise step in overcoming the economic crisis in Indonesia (Daryanto, 2009).

The advancement of information technology (IT) today can be used to help minimize the problems faced in the agriculture sector. The use of IT in agriculture has been implemented for many years in developed countries, such as Japan, Korea, and United States. Our government has started implementing the IT for agriculture, but is still limited to information collection in a website form, such as epetani.deptan.go.id. On the other hand, some innovative non-government agriculture organisations such as SAPA have gone further by implementing Java mobile application combined with mobile information

system, such as SAPA Mobile application. This integrated mobile and web application has been implemented in several places of Indonesia, including West Java and Papua.

The successful implementation of IT in agriculture sector requires accurate vision and strategy, particularly on handling the changes of the way people work. In particular, IT eases and improves effectivity of communication flows between the technical assistants and farmers in the fields (the farthest is over 6 hours motorcycle ride) and the SAPA officers at headquarter. Vision describes the direction of the organization, whereas the strategy guides the organization on how to achieve the vision.

Sentra Pelayanan Agribisnis (SAPA) is an agricultural community organization located in Sukabumi, West Java. The vision of SAPA is "achieving prosperity and sovereignty of farmers towards Indonesia Food Secure 2020". To achieve this vision, a clear strategy map is needed. SAPA decided to adopt the BSC approach in organizing the strategy map. As a result, the stages to achieve the vision can be more clearly described.

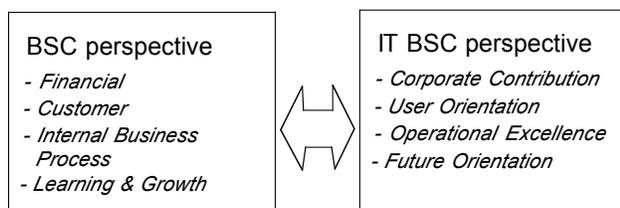Learning from Japanese experience (Ninomiya, 2004),

Figure 1. Adjustment Perspective of IT BSC to the BSC Perspective
Source : Grembergen (1997)

one of the chosen strategies is the implementation of IT. SAPA has implemented a mobile information system (www.mobitani.com) in managing the technical assistants in the field, who can report progress, inform various issues, and execute solutions at any time to the staff at the headquarter. This paper focuses on organizing the IT strategy map for IT division of SAPA, formulating the key performance indicators (KPIs), and implementing a prototype of mobile web application for SAPA BSC dashboard.

According to Ninomiya (Ninomiya, 2004), the roles of IT in agriculture development and rural area are as follow: IT can: (1) facilitate the activity in rural area. (2) evoke new initiative for agriculture and business in rural area. (3) support the production of policies and evaluation in agriculture production optimally, disaster management, environment-agriculture resource management, and many others. This can be achieved by using geographic information system (GIS). (4) take an important role and become a key factor in industrialization of agriculture. (5) provide system and equipment for investigating the level of security and reliability of food.

According to Kaplan and Norton (Kaplan, 1996), cited by Keyes (Keyes, 2004), Balanced Scorecard (BSC) is a set measure that gives a view of business quickly and comprehensively to the management, including the measure of financial that states the result from actions that have been done. It is used to align business activities to the vision and strategy of the organization, improve internal and external communications, and monitor organization performance against strategic goals. Operational measure is thrust factor from the financial work ability in the future. The following perspectives illustrate the basic concept of the BSC: (1) To succeed financially, how should the organization appear in front of the shareholder? (financial perspective). (2) How the organizations in front of the customer to achieve the vision of the organization? (customer perspective). (3) What kind of business process that can make the shareholder and the client satisfied? (internal business process perspective). (4) How the organization maintain the ability and improvise to achieve the vision of the organization (development and learning perspective)

In each of the four perspectives, the relevant strategies are devised and called Strategic Goals (SS) or a Strategic Objective (Luis, 2008).

In 1997, Van Grembergen and Van Bruggen adapt the BSC framework for more specific purposes in evaluating IT functions. They suggest a different perspective from the BSC perspective. Four perspectives of the IT BSC are user orientation, corporate contribution, operational excellence and future orientation. Figure 1 illustrates the adjustment perspective of IT BSC to the BSC perspective (Grembergen, 1997).

SAPA is an agricultural organization that is focused in the rice industry. The headquarter of SAPA is located at the Tugu street, Pasirhalang Sukaraja, Sukabumi, West Java, Indonesia.

According to (Luwarso, 2010), vision of SAPA is *"Prosperity and sovereignty of farmers towards Indonesia Food Secure 2020"*. Meanwhile, missions of SAPA are to: (1) develop clusters integrated agriculture industry (IPT) in all parts of Indonesia. (2) implement organic farming which is environmentally safe, sustainable, based on farmer self-rule and local wisdom. (3) support for the development of integrated agribusiness industry concept in each district throughout Indonesia, through agribusiness consulting services, training, agricultural information systems, credit union management system, farmer group coaching system, financing system, modern rice mills, and marketing.

Table 1 shows a strategic objective in the four BSC perspectives. Here are the steps of cascading the BSC organization to the level of division: (1) Performing a SWOT Analysis. (2) Vision and Division Mission Analysis. (3) Division Relevance. (4) Division Customer Identification. (5) Division Duty Identification. (6) Customer Expectations Identification. (7) Cascading the objective of organization strategy to division.. (8) Notice the local issues. (9) Develop the strategy map. (10) Formulating and Selecting KPI. (11) Defining Targets and Strategic Initiatives.

SWOT analysis has been performed to identify various factors systematically to formulate a variety of corporate strategies. This analysis is based on the logic that maximizes the strengths and opportunities, but simultaneously minimize the weaknesses and threats.

A result of SWOT analysis mapping on the internal-external matrix diagram is shown in Figure 2 resulting in a coordinate valuation of (2.71; 2,88). This means the management should grow and maintain focus to the integration of stability of internal business strength and

Table 1. Strategic Objective of SAPA in the Four Perspectives of BSC

Perspective	Strategy Objective
Financial	Optimizing the organization's financial health
Customer	Improve prosperity and sovereignty of Indonesian farmers
Internal Business Process	- Improve the effectiveness of learning, building up, training and development - Improve the effectiveness and efficiency of production process - Improve the effectiveness and efficiency of logistic activities and marketing - Good governed credit union - Improve employees' contribution
Learning and development	- Improve IT usage - Improve organization capability

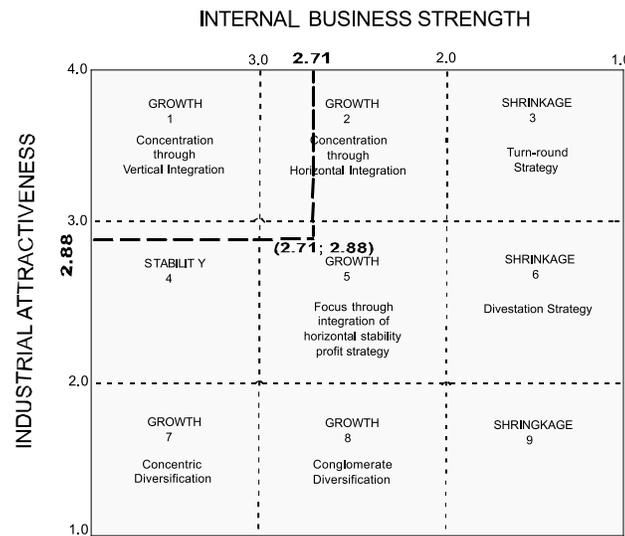Source: Abdullah and Luwarso (2010)

Figure 2. Matrix of Internal-External Diagram of SAPA IT Division.

improving industrial attractiveness.

RESEARCH METHODS

The Vision of IT SAPA division is *"Making the IT as a media for actualizing the prosperity and sovereignty of farmers towards Indonesia Food Secure 2020",* while the missions are to: (1) develop the application for support the SAPA business process. (2) improve the role of SAPA as a modern agriculture organization. (3) develop an inexpensive application and affordable for the farmers. (4) develop the application that is easily accessed and used in the rural areas

Examining the vision of the IT division above, it was explained by the SAPA chairperson that the vision of the IT division has suitability with the SAPA's vision. According to that statement, that vision illustrates the IT division is ready to support the vision of the organization with IT as their foundation.

From the observation of the organization strategy map of SAPA (Abdullah, 2010), there are the strategic objectives (SO) directly supported by the IT division, which is "increasing the usage of IT." The strategic

objectives are on the perspective of development and learning.

Referring to SAPA internal document (Abdullah, 2010) and concluding from direct conversation with the SAPA chairperson, SAPA IT Division has two types of customers, that is: internal customers and external customers.

The main tasks of the SAPA IT Division can be seen in Table 2. Customers of SAPA IT Division include management and other costumers, such as SAPA staff in the field. Table 3 (Abdullah, 2010; Luwarso, 2010) shows their expectations.

Strategic objectives are derived as SO on Learning and Growth perspective on the information capital into the SO IT Division on the user orientation perspective.

When cascading the SO has been done, the next step is completing the strategy map of IT SAPA Division, by adding the strategic objectives of Operational Excellence Perspective and Future Perspectives. Both of them are the supporting perspectives or process perspectives for achieve the outcomes (user orientation and corporate contribution). The process is depicted in Figure 4.

Cause and effect relation diagram has been derived

Table 2. SAPA IT Division Main Tasks

No	Main Task	Output
1	Develop and implement the information systems to support the entire of SAPA business process	SAPA Mobile Agribusiness Information System Modules
2	Maintain SAPA IT facilities	Maintained quality of IT facilities
3	Provide the training about SAPA mobile agribusiness information system and other IT facilities owned by the organization, both on the internal and the external of organization	SAPA members and external parties who have attended the training
4	Manage the financial budget of IT Division	Financial governance

Source: Abdullah and Luwarso (2010)

Table 3. Customer Expectations Identification

No	Output	Customer	Expectations
1	SAPA Mobile Agribusiness Information System Modules	Management of SAPA	Integration of all business processes in SAPA Mobile Information System
2	Maintaining the quality of IT facilities	Management of SAPA All Costumers	The documentation of the usage of IT facilities that are easy to learn
3	SAPA members and external parties who have attended the training	Management of SAPA All Costumers	Increased the knowledge and competency of SAPA members in IT
4	Financial governance	Management of SAPA	No deviation of the budget and the use of financial budgets effectively and efficiently

Source: Abdullah and Luwarso (2010)

and is shown in Figure 5.

The next important step that is very useful for everyday management operation is selecting KPIs. This process is shown on Table 4.

Table 5 shows achievement of KPI Target of SAPA IT Division. We notice that competency gap ratio is low, and this is a driver for the SAPA management to come up with strategic initiatives, such as shown in Table 6.

RESULT AND DISCUSSION

At this stage, a mobile web application is developed. A mobile web application is selected, as opposed to a native device application, due to simplicity in development (requires only server side programming), uniform user interface, no installation required on any smatphone, and ease of update. The home page of the mobile web application is displayed in Figure 6, and the most useful feature of the application (the dashboard) is displayed in Figure 7.

Some of the important findings and results of the research include: (1) Based on a SWOT analysis using internal-external matrix, then the SAPA IT Division is located in the 5th cell, that is the growth strategy cell with horizontal integration and profit stability. (2) SAPA IT Division has had an IT strategy map, strategic objectives and key performance indicators for each strategic objective in each perspective. The third is the result from cascading

SAPA BSC to the division level with eleven steps. (3) The Strategic Objectives are derived directly from the SAPA BSC to the SAPA IT division is a strategic objective on Learning and Development perspective of the information capital, that is: "Improving the usage of IT", move to be strategic objectives in user orientation perspective in the IT division, with the strategic objective statement as follows: "Improving the utilization and quality of IT services." (4) A prototype mobile web application for the SAPA BSC has been developed. This application is a dashboard for monitoring the level of achievement of each KPI which is operated by the organization. (5) In the prototype application that has been developed, achievement of the performance of KPI is categorized into four categories, that is: *Excellence*, *Good*, *Fair*, and *Poor*. (6) Following a good practice from Kaplan, an achievement is Excellence if its performance is 115% over the target; good, if the performance achievement between 100% and below 115%, fair, if the achievement is between 85% and 100% of the target, while for the poor, if the performance achievement below 70% of the target that set by the management.

CONCLUSION

Upon completion of the SAPA IT BSC mobile web implementation and deployment, it was noticed that the SAPA management was satisfied with the result.
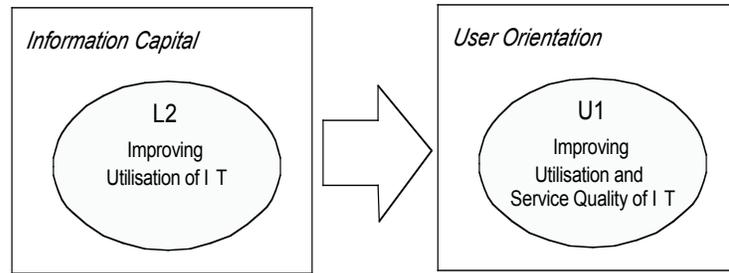
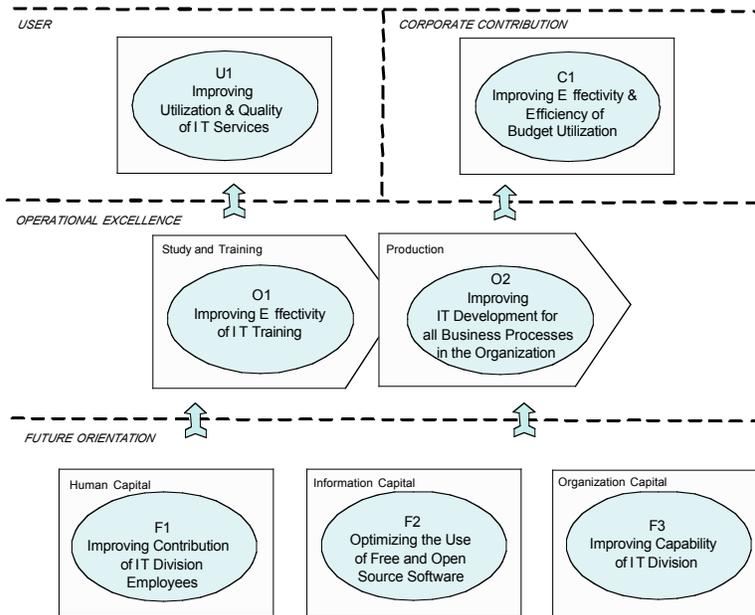**Figure 3. Cascading SAPA BSC with Perspective Displacement**
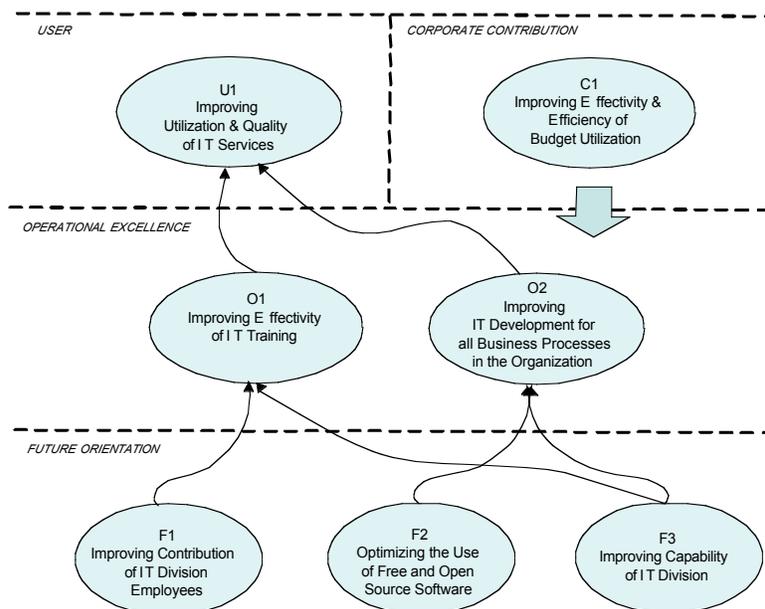

Figure 4. IT SAPA Division Strategy Map

Figure 5. Cause and Effect Relation of IT SAPA Division Strategy Map

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Table 4. KPIs of IT SAPA Division

SS	No	KPI
	1	Rate of user acceptance
	2	Rate of SAPA Mobile usage
U1	3	Level of user satisfaction
	4	Rate of grievances or complaints
	5	Downtime rate
C1	6	Level of deviation budget usage
O1	7	Competency gap ratio
	8	Level of users / customers participation
O2	9	Level of SAPA Mobile Modules development
	10	Level of IT employees Competency
F1	11	IT employee productivity
	12	IT Employee Welfare
F2	13	Rate of FOSS usage
F3	14	Leadership
	15	Work climate

Source: Abdullah and Luwarso (2010)

Table 5. KPI Target

SS	No	*KPI*	Target
	1	Rate of user acceptance	95%
	2	Rate of SAPA Mobile usage	100%
U1	3	Level of user satisfaction	95%
	4	Rate of grievances or complaints	10%
	5	Downtime rate	10%
C1	6	Level of deviation budget usage	1%
O1	7	Competency gap ratio	3%
	8	Level of users / customers participation	55%
O2	9	Level of SAPA Mobile Modules development	100%
	10	Level of IT employees Competency	100%
F1	11	IT employee productivity	100%
	12	IT Employee Welfare	100%
F2	13	Rate of FOSS usage	100%
F3	14	Leadership	100%
	15	Work climate	100%

Source: Abdullah and Luwarso (2010)

Table 6. Strategic Initiatives of IT SAPA Division

|	Strategic Objectives	Strategic Initiatives
U1	Improving the utilization and quality of IT services	Make a complete and comprehensive documentation of IT, including troubleshooting.
C1	Improving the effectiveness and efficiency of budget	
O1	Improving the effectiveness of Training and IT building up	Conduct the training regularly
O2	Improving IT Support to the entire organization business processes	Make a priority scale manufacture of the modules of business processes for SAPA Mobile
F1	Increasing the Contribution of IT Employees	Training dan *knowledge sharing* for the internal IT division
F2	Optimizing the use of FOSS (Free and Open Source Software)	Organizing the FOSS introduction and training
F3	Improving capabilities IT organizations	Developing communication standards to improve the work culture and working climate

Source: Abdullah and Luwarso (2010)
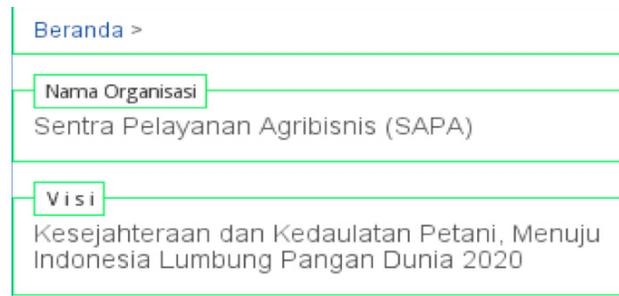
Figure 6. Display Interface of Mobile Web Home Page

Figure 7. Display Interface of Annual Achievement

The SAPA chairperson can focus to view the dashboard everyday, drill down when necessary, and issue some necessary commands and actions to his staff. There remains many other challenges in IT implementation, particularly the competency gap faced by SAPA's human resources. Therefore, IT training is placed as one of important strategic initiatives in the organization.

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