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Article *in* International Journal of Engineering and Technology · June 2017

DOI: 10.21817/ijet/2017/v9i3/170903134

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Information System Strategic Planning Using IT Balanced Scorecard In Ward & Peppard Framework Model

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Abstract - Not many organizations that utilize information systems and technology in the field of business. Based on the evaluation of the organization's business processes with information systems/technology that running, still perceived to be ineffective and inefficient, due to the lack of strategic planning of information systems to improve productivity, performance, control, and competitiveness of the organization. The method used in this paper is using a model of Ward and Peppard strategic planning with approaches of strategic alignment and competitive impact. The stages implemented are systematically arranged to start from internal and external business environment analysis and information systems/technology environment analysis that processed into a business information system strategy recommendations, information systems/technology management strategy, and information technology strategy for the preparation of strategic plan and road map of information systems/technology at an organization. The additional solution proposed in this research is a tool of IT Balanced Scorecard as a measure forward in evaluating the results of implementing the information systems strategic plan with it's contribution to an organization, increased performance and productivity, and application users feedback. Results of this research are knowledge-based IS Master Plan and Road Map for the next five years that inline with the organization's business strategy plan.

Keywords: Strategic Alignment, Competitive Impact, Ward & Peppard Framework, SWOT Analysis, Critical Success Factors, IT Balance Scorecard, IS/IT Master Plan.

1. INTRODUCTION

The main role of the information system for a business organization is to provide effective support to the company's business strategy so it can provide a competitive advantage. Implementation of information systems in an organization requires strategic planning of information systems that are aligned with the business strategy of the company in order to achieve organizational goals [1, 7]. For example, technology that using cloud computing based on Service Oriented Architecture (SOA) has some competitive advantage such as convert initial investment cost from CAPEX (Capital Expenditure) into OPEX (Operational Expenditure), reduce development time and immediately focus on core business, has high scalability for service upgrade/downgrade, operational control, and safer data repository [1].

In the face of market challenges and consumers needs, it is not enough to have only a business strategy planning, but it must be equipped with information systems strategic planning that is aligned with the vision, mission, and organization's business strategic planning. Information system strategic planning is an identification process of application portfolio that will support organization to implement to the business plan and realize the business goal through innovative technology [2, 5].

To improve the company's internal performance and answer the challenges of the market and consumers, it is necessary to do a research which could answer the problem above by using the Ward & Peppard framework combined with IT Balanced Scorecard [9]. IT-enabled business strategy to get competitive advantages, process innovation, operational excellence, and new market. Business strategy must drive the decision for IT investment [4]. IT Balanced Scorecard produce list of critical success factors to decide application portfolio which will use in the organization [8].

2. WARD & PEPPARD FRAMEWORK

Focus on technology or business aspects are not enough to bring success to overall strategic plan. The right way to achieve strategic advantage from information systems/technology is concentrating or rethinking business processes by analyzing current business issues, analyzing the environment changing and make information technology as a solution [2].

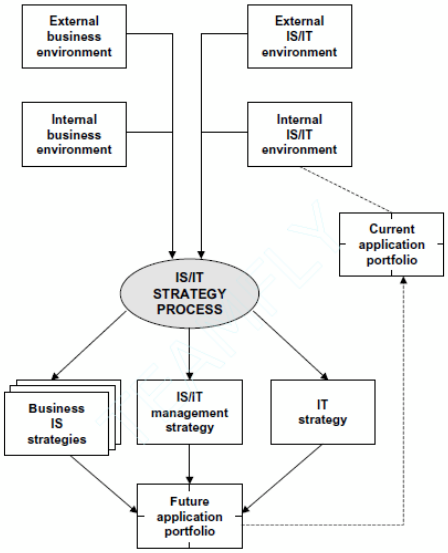

Figure 1: Ward and Peppard Framework

Ward and Peppard Framework for IS/IT strategy formulation and planning process on Figure 1 covers several phases as follows:

a. Internal Business Environment: mapping the current business strategy, the purpose (objective), resources, processes, and culture of the organization. Analysis of internal business environment used to determine the organization's business strategy, vision, mission and the goals of the organization, activities and business processes of the organization, its resources, and information needed by the organization.

b. External Business Environment: mapping the economic conditions, industry environment, and competitive environment where the organization operates. External business environment can boost the organization to go ahead and compete, also can provide barriers and even a threat to organization survival.

c. Internal IS/IT Environment: the perspective of the IS/IT at the business process, it's maturity, the scope and contributions of business, skills, resources and technology infrastructure, current portfolio application and the system that is being developed or already budgeted but not yet completed are also part of the internally IS/IT environment.

d. The external IS/IT Environment: technology trends and opportunities usability/utilization generated by the IS/IT of other parties, especially customers, competitors, and suppliers. This analysis is used to gain an understanding of the development of the IS/IT outside the organization that may have an impact on the organization's survival.

e. Current Application Portfolio: an information system applications that have been or are being used by the organization. Identify the advantages and strength given by the application to confront the competition climate faced by organizations.

The process output of Ward and Peppard Framework describe as follow:

a. Business IS Strategic: the mechanics of each unit or function that will develop IS/IT in achieving a business objective, application portfolio, and overview of information architecture.

b. Information Technology Strategy: policies and strategies for technology management and human resources experts.

c. IS/IT Management Strategy: include that common elements of the strategy that used by organization overall to ensure consistency of IS/IT policy required.

Final output of Ward and Peppard framework is Future Application Portfolio, an application proposals that will be developed by the organization in the future with the aim to integrate each organizational unit and adjust the rhythm of technological development with organizations business development.

3. IT BALANCED SCORECARD

Balance Scorecard was first published by Robert S. Kaplan and David P. Norton in 1992 in an article entitled "The Balanced Scorecard - Measures That Drive Performance". In the article, Balance Scorecard is defined as a set of measure that's gives top manager a fast but comprehensive view of the business, includes financial measures that tell the results of actions already taken, complements the financial measures with operational measures on customer satisfaction, internal process, the organization's innovation and improvements operational activities measures that are the drivers of future financial performance [3,6].

In 1997, Van Grembergen and Van Bruggen adopted the Balanced Scorecard (BSC) for use at the Department of Information Technology. They proposed IT BSC as a method of measuring the performance of the Information Technology Department within an organization to do an evaluation that provides a comprehensive view of core business as in Figure 2. IT BSC provides executive management a comprehensive framework where the vision and strategy of IS/IT adapted from the vision, mission, and strategy of the organization business [4,6].

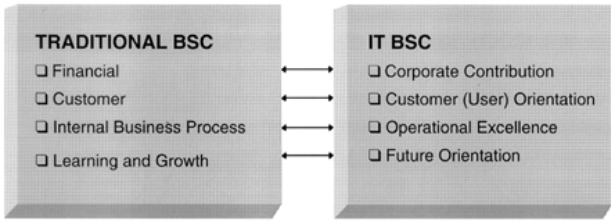

Figure 2: IT Balance Scorecard

Some perspective in evaluating the performance of information systems/technology based IT Balance Scorecard:

1. Corporate contribution a perspective, perspective that evaluates the performance of IS/IT based on the views of executive management, directors, and shareholders.
2. User orientation perspective, the perspective that evaluates the performance of the IS/IT based on business users/customers. The organization can identify customer and market segments which entered so it can harmonize various measurements of the important customer such as satisfaction, loyalty, retention, and profitability with customer acquisition and target market segments.
3. Operational excellence perspective, a perspective that assesses the performance of IS/IT based on IS/IT management itself and furthermore is a party related to the audit and the policy maker.
4. Future orientation perspective, a perspective that assesses the performance of the IS/IT based on a view of the implementer staffs, practitioners, and professionals inside the organization. In this perspective must be prepared organization infrastructure that enables the objectives of three other perspectives can be achieved.

4. RESEARCH METHOD

A. Conducting data collection by literature review, interviews and field observations

1. Observations carried out to get an overview of how business processes are running at the moment and what is information technology/systems is used.
2. Interviews, conducted to ensure the information got was truth and make a formal statement directly from the source. Interview material includes Standard Operating Procedure, the technology used, as well as the business needs toward of information systems development.
3. Literature Studies, understanding the concept of Ward and Peppard as an innovative solutions for the business world environment.

B. Analyze internal and external environment of the business side and IS/IT side

1. Internal Environment Analysis, identify strengths and weaknesses that exist in the organization. Information that can be discovered such as organization's business processes and activities, organizational structure, the application portfolio, and information technology infrastructure towards the vision, mission and organization IS/IT strategy.
2. External Environment Analysis, identify opportunities and threats such as determine the condition of the political, economic, social, cultural, technological, industrial environment, and the IS/IT organization competitive climate such as information systems/technology trends used by competitors.

C. Mapping Critical Success Factors using IT Balance Scorecard

Based on the analysis above, created the internal and external environment mapping into an identification of future application needs based on strategic alignment and competitive impact, then deliver Critical Success Factors by mapping the four perspectives of IT Balanced Scorecard that have targets with measurement adapted to the vision and mission of the organization.

D. Formulate suggestion of business information systems strategy, information technology strategy, and IS/IT Management strategy based on CSF

After the critical success factors mapping is done, then proposed IS/IT strategic plan both from business information system strategy, IS/IT management strategy, and information technology strategy for the organization. The results that can be produced are the guide of initial preparation of information systems development, information technology infrastructure, IS/IT organizational structure, and policy/procedure that should be prepared.

E. Creating a future application portfolio proposal

Future application portfolio proposed based on all the results of internal and external environment analysis using strategic alignment, competitive impact, and also critical success factors as well as the formulation of the IS/IT strategic plan based on organization vision and mission.

F. Creating a Roadmap and IS/IT Master Plan

IS/IT Master Plan will be made for the medium-term planning of information system/technology development in the organization with the way translate the desire of management (system owner), the user (system user) as well as changes occurring inside or outside the organization.

5. RESEARCH RESULT

A. SWOT Analysis

In SWOT analysis we can identify the internal and external factors of the common organization. Analysis of internal factors used to determine briefly and evaluate the strengths and weaknesses of the organization. External factors analysis used to determine briefly and evaluate opportunities and threats from the environment around the organization.

Internal and external environment strategic factors identified by making Internal Factors Evaluation and External Factor Evaluation Matrix. IFE-EFE coordinate position on the matrix shows the ability of organization to face internal and external factors. The total weighting of each question should not exceed a total score of 1.00 divided by the number of items on the internal factors (strengths and weakness) and external factors (opportunities and threats) as shown in Table 1.

Table 1: Internal and External Factors Evaluation Result

Strategic Factors		Weight	Rating	Weight x Rating
1.	Strength	0,573	3,45	1,98
2.	Weakness	0,427	3,02	1,29
Internal Factors Evaluation		**1**		**3,27**
3.	Opportunity	0,549	3,22	1,77
4.	Threat	0,451	2,90	1,31
External Factors Evaluation		**1**		**3,08**

From the results of the internal and external matrix on table 3 above can be seen that total scores of internal factors are 3.27 and the total scores of external factors are 3,08. Based on the calculation above, we can create IFE-EFE matrix that describes on figure 3 below.

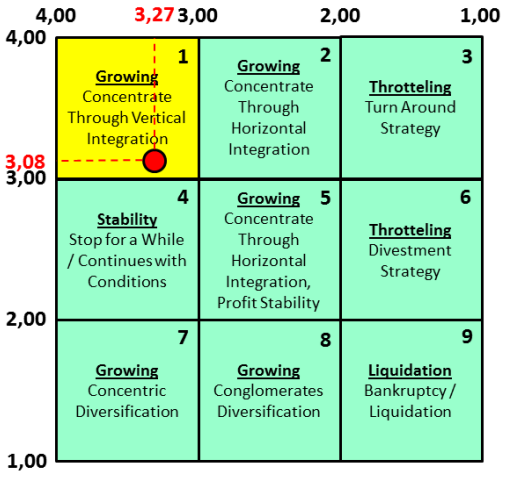

Figure 3: IFE-EFE Matrix

Figure 3 shows that the condition of organization line in the first box (first quadrant) with IFE-EFE matrix coordinates (3.27; 3.08), with the following explanation:

1. The organization has an ability to deal with internal and external factors is pretty good
2. Organization can still grow up with high concentration through vertical integration. That's mean the organization may take over some of the work that used by the supplier, so in the future, the organization can eliminate dependence on the supplier.
3. It is a very favorable position because the organization has more value of the power and opportunity than the value of weaknesses and threats, so it can compete with some advantages such as work experience, the uniqueness of the product, total assets, support of many parties, and reliability of information systems/technology owned.
4. The strategy used is aggressive growth policy, for example, the expansion of business process, marketing expansion, and system/technology development to support business processes.

B. Critical Success Factor Based On IT Balanced Scorecard

Critical Success Factors analysis is the key component that influences the success or failure of the organization vision and mission. The purpose of Critical Success Factors is to interpreting the objective/target more clearly to determine strategy alignment that should be done and information needed so it could be the link between organization's business strategy with IS/IT strategy.

Critical Success Factors determined after identification of the vision and mission of the organization is done. All candidates of Critical Success Factors above should be evaluated and identified so the selection of the CSF can be monitored and measured. The next step is mapping the critical success factors candidates based on IT Balanced Score Card, as showed on Table 2:

Table 2: Determined Critical Success Factor based on IT Balanced Scorecard

Corporate Contribution Perspective			
No	**Objective**	**Measures**	**Critical Success Factors**
1	Have cost and benefit analysis about the development of knowledge-based total solution IS/IT with reliable infrastructure and human resources.	IS/IT Development Budget	Investment funds management for IS/IT development both internally, externally, and software purchase
2	Have strategic information system to help create decisions and establish the phases of organization business strategy	Requested Database Query	Create Digital Dashboard System to enhance business value of IS/IT
User Orientation Perspective			
3	Increase the number of new customers and old customer loyalty	Number of Visitors/Users	Had IS/IT that provide updated information and free facilities to customers
4	Carries information services to	Number of	Having informative,

	consumers regularly so it can increase the business value of the product/service	Information Delivery Services	interactive and communicative IS/IT
5	Evaluate the results of user responses to organization IS/IT	User Satisfaction Survey Results	Provide IS/IT support and maintenance
Operational Excellence Perspective			
6	Streamline business process performance and operational costs	Business Process Speed	Increase automation and eliminates routine work dependence using manual activity
7	Have human resource with competencies and technical skills in the field of information systems/technology	Number of Human Resources That Has IS/IT Competency	Putting human resource with appropriate job description in accordance with their competence
8	Improving the ability of information systems in accordance with company policy changes and trends development of information systems/technology	Full Parameterized	Developing parameterized based information system to accommodate changes
Future Orientation Perspective			
No	**Objective**	**Measures**	**Critical Success Factors**
9	Increase human resource competencies to become a professional IT within organization	Total Training of IS/IT	Providing education and training of IS/IT to employees so they can improve the quality and competitiveness
10	Having competitive and innovative products and services that trusted by consumers	IS/IT Features	Create IS/IT to inform the development of products and services in real time

C. Strategic Recommendation

Ward & Peppard framework will generate three outputs, namely Business Information Systems Strategic, Information Technology Strategy and IS/IT Management Strategy. All of the strategies above is arranged based on internal and external environment analysis that mapped into critical success factors.

Business Information Systems Strategic

Implementation of information systems utilization to support the activities and business processes of organization requires the right strategy because when we choose wrong information system strategy, it can lead to problems in organization operational which has been running. Business information systems strategy proposed based on the results of critical success factors above can be summarized into several categories, business strategic alignment with IS/IT, competitive advantage, integration, development phases, data warehouse, business intelligence, licenced software, single sign on, software security, maintenance & support, and software migration.

Information Technology Strategy

Based on external and internal environment analysis that has been packed in Critical Success Factor, IT architecture strategy design proposals can be made into six categories. There are hardware design and network architecture, the operational strategy of local communication networks, interruption recovery/disaster prevention strategy, internet network strategy, and hardware & network security strategy.

Recommended information technology architecture strategy design can be seen in Figure 4.

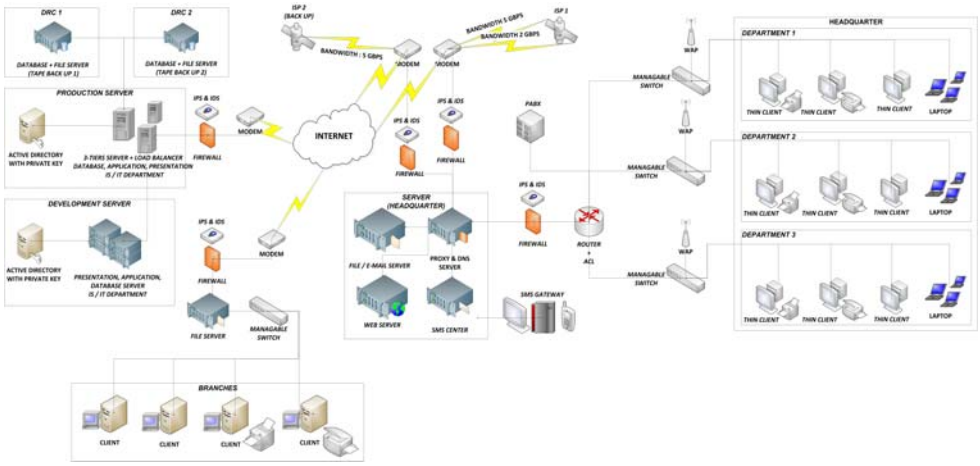

Figure 4: Information Technology Architecture Strategy

Information Systems/Technology Management Strategy

The four perspectives of IT Balanced Scorecard illustrates that the competitive value obtained from the IS/IT lies in the ability and information value gotten and used in business processes both operational and strategic decision making through proper management, not based on the number of applications developed, hardware, network infrastructure, and other IT facilities. This is following proposed information systems/technology management strategy recommended for the organization:

1. Based on Organization Contributions Perspectives: focus on cost allocation plan, IS/IT Master Plan and Roadmap aligned with organization internal business strategy so we can face competitive pressure from outside.
2. Based on User Orientation Perspective: designing policies and procedures of change management for implementing of the new information system/technology, creating a troubleshooting guide/consumer complain in the form of FAQs, technical communication, and SLA commitments for each complaint classification so it can increase the number of new customers and maintain existing customers loyalty, making IS/IT Steering Committee as a form of executive management commitment to implementation of IS/IT strategic plan, and periodically evaluate the results of user responses to the IS/IT through a questionnaire of user satisfaction survey.
3. Based on Operational Excellence Perspective have updated complete and SOPs documentation such as user guides, technical specification, installation manual, and parameter setting, designing procedures and policies for physical and non-physical IT Security & Risk Management for all hardware, software, networks, and peripheral devices, User ID and E-Mail Management based on access rights synchronized with employee absenteeism list, and computing resources using monitoring and control based on capacity planning/sizing that has been agreed with monitoring dashboard as a tools.
4. Based on Future Orientation Perspective: making standard operational procedure about Disaster Recovery Plan, which provides disaster prevention and system recovery strategy for business continuity and develop competency-based education and training programs both technical and nontechnical skills in information technology field to grow the seeds of IT professionals.

D. Future Application Portfolio

This phase meant to map applications to be used as an IS/IT strategic solution classified into application portfolio quadrant matrix based on requirement business process, technical complexity, and impact of risks that arise if the application does not exist. The next step is to map all information system into the McFarlan matrix by grouping applications category as in Table 3.

Table 3: McFarlan's Application Portfolio Mapping

No	Future Application	Questions (Y / N) *)							Position
		1	2	3	4	5	6	7	
1	Management Information System	Y	Y	Y	Y	N	N	N	Strategic
2	Monitoring Information System	N	N	Y	Y	N	N	N	Key Operational
3	Marketing Information System	Y	Y	N	N	N	N	N	Strategic
4	Executive Information System	Y	Y	N	N	N	N	N	Strategic
5	Human Resource Information System	N	N	Y	Y	N	N	N	Key Operational
6	Digital Library	N	N	Y	Y	N	N	N	Key Operational
7	Research & Development Information System	N	N	N	N	N	N	Y	High Potential
8	Asset & Inventory Information System	N	N	Y	Y	N	N	N	Key Operational
9	User Management Information System	N	N	N	N	Y	N	N	Support
10	Finance & Accounting Information System	N	N	Y	Y	N	N	N	Key Operational

The mapping results of information system portfolio into McFarlan application management strategy matrix can be seen in Figure 5.

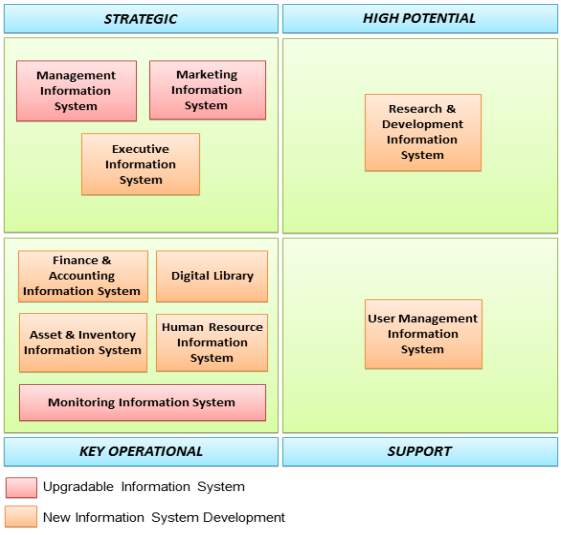

Figure 5: McFarlan Application Management Strategy Matrix

E. Road Map and IS/IT Master Plan

Strategic planning roadmap is created by determining priorities which aim to sort the applications needed by the organization by providing a value on the application proposal based on its contribution to the business processes accordance with organization vision and mission. Application development roadmap can be seen in Figure 6.

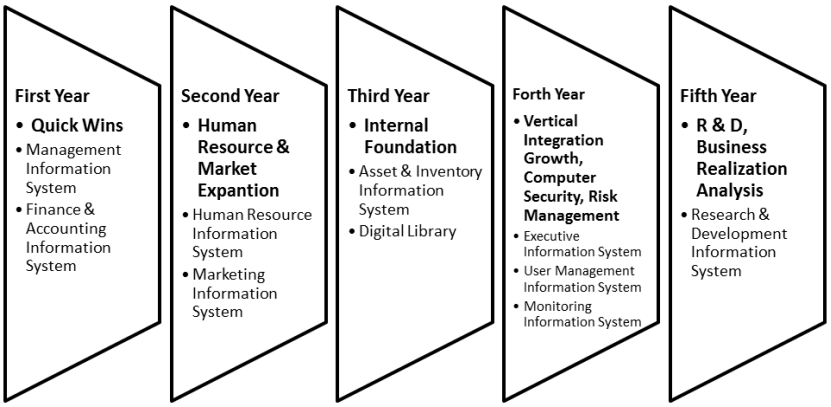

Figure 6: Application Development Roadmap

Roadmap strategy applied to the organization for the next five years described as follows:

1. The first year, quick wins strategic theme, an easy and fast initiative steps to start IS/IT Master Plan program. This year is an implementation of one of the IT Balance Scorecard perspective, Corporate Contribution.
2. Second Year, Human Resource & Market Expansion strategic theme, focusing on competent and high-quality human resources assets as well as the expansion of the national market. This strategy is the implementation of Customer Orientation perspective
3. Third Year, Internal Foundation strategic themes, focusing on the internal foundation such as asset management, equipment, tools, and other infrastructure that is integrated with the organization production process. This strategy is an implementation of Operational Excellence perspective.
4. Fourth Year, Vertical Integration Growth, Computer Security, and Risk Management strategic theme, an implementation of the SWOT analysis where the organization should be able to takeover/acquisition the vendor to eliminate dependency. In addition, executive management can monitor internal performance, create future business strategies projections, and accelerate decision-making. This strategy is the implementation of Future Orientation perspective.
5. Fifth Year, Research & Development, Business Realization Analysis strategic theme, organization's focus on the results of all applications evaluation that are already running in previous years and create an IS/IT strategic plan for the next of five years.

6. CONCLUSION

Based on analysis result and discussion that has been done in previous chapters, the conclusions obtained from this study are as follows:

1. Based on the analysis of internal and external environment obtained ten Critical Success Factors based on IT Balanced Scorecard for first quadrant organization.
2. To support IS/IT Strategic Plan, organization require IS/IT department to be added into an organizational structure with project & change management underneath so the implementation of IS/IT Master Plan can be run well in accordance with the roadmap recommended.
3. IS/IT Master Plan & Roadmap are valid for five years with the evaluation process is carried out every year and at the end of the fifth year, the organization must create Business Realization Analysis (BRA) to restart the process of developing strategic plans, IS/IT for the next five years.
4. The commitment of executive management and the overall understanding of all the staff toward organization vision and mission should be followed up with real activity.

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