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DESIGN ANALYSIS ACHIEVEMENT TARGET DATABASE INFORMATION SYSTEM AT SEAMEO RECFON

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ABSTRACT

SEAMEO Regional Center for Food and Nutrition (RECFON), is an organization of Southeast Asian Ministers of Education in the field of food and nutrition. The activities carried out by SEAMEO RECFON already have a fairly good system, but there are several problems SEAMEO RECFON actively conducts education, research, training, and community empowerment activities so the need for up-to-date information on food and nutrition topics and services and facilities support all these activities is very important. This important task must be supported by adequate facilities, including the procurement of data processing and communication devices capable of supporting RECFON's activities. For this reason, the author takes the title "Analysis and Design of the Target Achievement Database Information System System at SEAMEO RECFON " This SI / IT strategic planning is made using the Ward and Peppard framework with several analysis methods, namely value chain analysis, by mapping what are the main and supporter activities at SEAMEO RECFON and analyzing the problems of each activity. To see the strengths, weaknesses, opportunities, and threats, a SWOT (Strength, Weakness, Opportunity, Thread) analysis is used. Factors that are successful and can solve problems and needs are used in CSFs (Critical Success Factors) analysis. McFarlan Strategic Grid analysis is used to map existing applications in DPPKA Kampar based on categories, namely support, Key Operational, Strategic, and High Potential. The results achieved through this analysis method are recommendations in the form of 19 information systems, 10 information technologies, and 4 SI and IT management. The information system and information technology are made in the form of a roadmap that will be implemented over the next 3 years by SEAMEO RECFON

Keywords: *design analysis, RECFON, information system, achievement target,*

INTRODUCTION

SEAMEO RECFON has the mandate to play a role in improving the nutrition knowledge and practices of communities in Southeast Asia to realize a community with good nutritional status. SEAMEO RECFON actively conducts education, research, training, and community empowerment activities so the need for up-to-date information on food and nutrition topics and services and facilities that support all these activities is very important (Ministers, 2019; Ward & Peppard, 2016). These important tasks must be supported by adequate facilities, including the procurement of data processing and communication devices capable of supporting RECFON's daily activities, including the dissemination of information and knowledge derived from research results(Andry et al., 2022; Nofyat et al., 2018).

The SEAMEO RECFON Data Base System has implemented an information technology infrastructure without using an enterprise architecture framework (Abdurahman, 2018; Andry et al., 2022). Without an enterprise architecture, several problems occur in its technological infrastructure, including hardware that has decreased performance, software that requires the latest version upgrade so that it can be used optimally, and networks that often experience problems in intranet and internet connections (Puspitasari & Kamisutara, 2022; Suswandi et al., 2022).

SEAMEO RECFON's database system needs to plan a new technology architecture using a suitable system, namely Web-based. upgrading all data owned by SEAMEO RECFON which is useful for supporting information dissemination and storage activities (Irmayanti & Permana, 2018). This is expected to increase engagement with the general public and optimize the database function owned by SEAMEO RECFON in storing information in the field of food and nutrition at both the national and regional levels (Dodi Suswandi et al., 2023; Minoli, 2008; Prawira et al., 2023).

Information technology has been widely applied to various types of data storage systems including the database storage system at SEAMEO RECFON which has the main task of providing scientific information needs for research and stakeholders to support SEAMEO RECFON activities that have not yet implemented Information Technology, hereinafter referred to as IT is the SEAMEO RECFON Data Base System (Hermawan & Sumitra, 2019; Kurniawan et al., 2017).

At this time the SEAMEO RECFON Data Base System has not implemented an information technology infrastructure. Over time, the management of the SEAMEO RECFON Data Base System continues to strive to meet the needs of information technology (Carter et al., 1991). Progress and success in the field of information technology in the SEAMEO RECFON Database System do not escape the obstacles and problems in various aspects. The lack of effectiveness in managing the current Data Base, the Data Base is still not integrated into one system for the needs of each unit so each unit still has a different database, the software used still uses Microsoft Excel and Microsoft Access which are still manual and not integrated, thus making the need for information technology quite large and complex.

METHOD

The methodology used in this research can be seen in Figure 3 below:

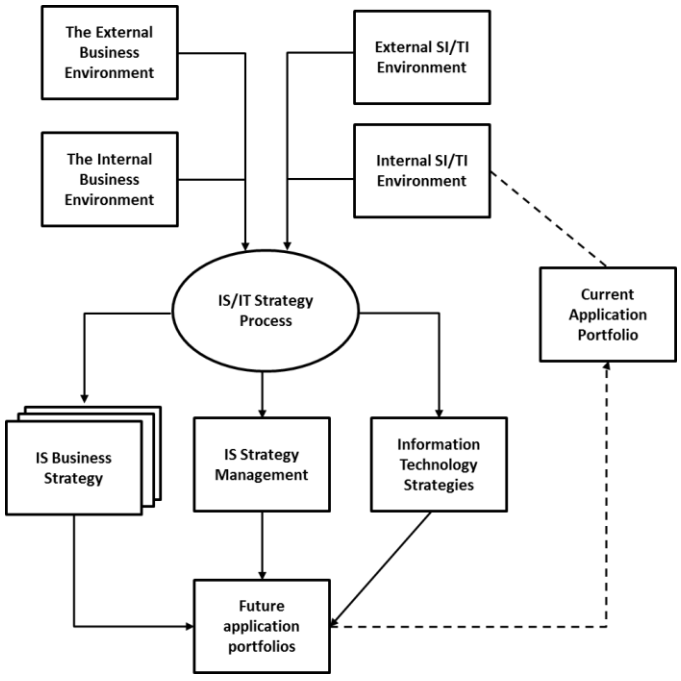

Figure 3. Ward and Peppard Strategic Model

This IT strategy model requires analysis of the following four inputs:

a. The internal business environment includes the current business strategy. The analysis techniques used for the internal business environment are SWOT, Value Chain, and Critical Success Factors.
b. The external business environment includes political, economic, and social conditions, industry technology, and the competitive climate.
c. The internal IS/IT environment includes the information technology currently in use.
d. External IT environment, including technology trends.

The output generated from the strategic planning of this information system produces three outputs, as follows:

a. Information systems business strategy, how each unit within the company can b. implement/utilize SI/IT to achieve the organization's business objectives.
b. Information technology strategy, how policies and strategies to manage technology and human resources.
c. Management strategy, includes common elements that are applied throughout the organization, to ensure consistent application of required SI/ IT policies.

RESULTS AND DISCUSSION

Internal Business Environment Analysis

Value Chain Analysis

Value chain analysis is a mapping of the main and supporting activities at SEAMEO RECFON, from these activities we can find problems from the main activities and supporting activities.

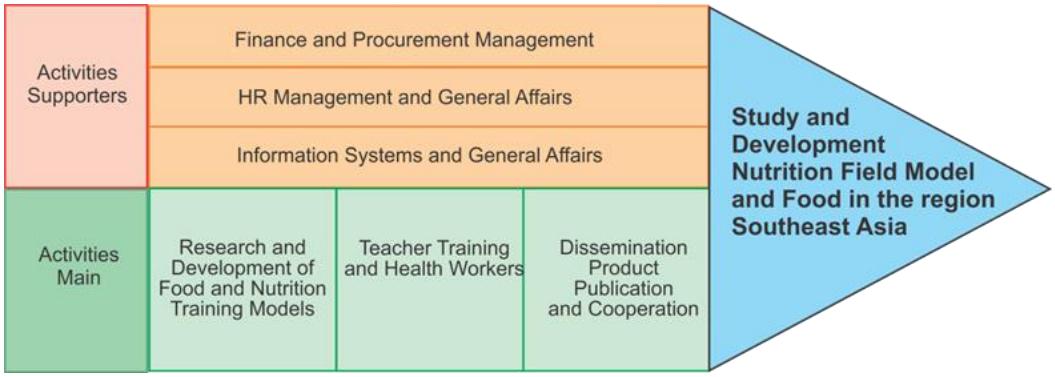

Figure 4. SEAMEO RECFON Value Chain

SWOT Analysis

SWOT analysis is carried out to identify the strategic factors of an organization consisting of Strengths (strengths), Weaknesses (Weaknesses), Opportunities (Opportunities), and Threats (Threats) that exist in SEAMEO RECFON. Knowing the strengths and opportunities of SEAMEO RECFON, it will be able to increase its strategic advantage for SEAMEO RECFON.

SEAMEO RECFON SWOT Analysis

a. Strength:

1. SEAMEO RECFON is one of 26 SEAMEO Centres that focus on food and nutrition in the Southeast Asia Region.
2. SEAMEO RECFON is recognized and supported by the Government of Indonesia through the Indonesian Ministry of Education and Culture in terms of policy and operational budget.
3. SEAMEO RECFON Trustee Members are representatives of ASEAN Member States who can provide relevant country perspectives in the planning and implementation of the Centre's programs and activities.
4. Having a Deputy Program Director from outside Indonesia can provide a check and balance at SEAMEO RECFON in terms of operations and can provide a different perspective.
5. SEAMEO RECFON is a collection of professionals, affiliated researchers, and training alumni who are experts in the field of nutrition spread across Southeast Asia and ready to participate in collaborative activities.
6. Obtained ISO 2017 certification for Laboratory management to ensure quality output of measurement results and ensure commitment to continuous improvement of services and operations.
7. Having a network of partners with various levels and sectors both in Indonesia and outside Indonesia that contribute to funding, policy advocacy, knowledge and expertise sharing, and program implementation with other SEAMEO Centres in the Southeast Asia Region.
8. SEAMEO RECFON has staff with commitment, competence, and experience in research, capacity building, community development, information exchange, and administration that can support partnerships and funding arrangements from funders.
9. Quality research results that have been published in reputable international journals and published evidence-based learning modules and guidelines for food and nutrition
10. Appointment of SEAMEO RECFON at the University of Indonesia's Center for Regional Nutrition Studies (PKGR).
11. The SEAMEO RECFON program and experts support the implementation of 4 of SEAMEO's 7 priority areas, namely: Universal Early Childhood Education, Breaking Barriers to Inclusion, Resilience in Emergencies, and Harmonization of Research and Higher Education.

b. Weakness:

1. SEAMEO RECFON's status as a project managed by the Ministry of Education and Culture of the Republic of Indonesia means that it does not have STRONG legality. This legality is very important when making agreements or cooperation with international funders.
2. It lacks expertise in Economics and Food Security, Technology, Policy, Human Resource Management, Legal and Public Relations.
3. The limited number of staff to implement the Center's main tasks effectively and efficiently has resulted in work overload.

4. RECFON has a high degree of staff turnover and lacks a career development pattern.
5. Limited knowledge and skills of staff to maximize ICT implementation in the food and nutrition sector.
6. Non-integrated management system in the planning and evaluation monitoring process of SEAMEO RECFON activities.

c. Opportunities:

1. The issue of nutrition across all age groups is high on the global agenda, particularly the Sustainable Development Goals (SDGs). This provides ample opportunities for SEAMEO RECFON experts to collaborate with various institutions in the Southeast Asia Region or beyond.
2. SEAMEO RECFON's Vision, Mission, and Programs are in line with the ASEAN Vision 2020 program, especially regarding the sustainability of improving the quality of life in the Southeast Asian Region with adequate food and nutrition. This ensures that there is political support from ASEAN member countries.
3. The SEAMEO RECFON program supports the implementation of 4 out of 7 SEAMEO priority areas namely Universal Early Childhood Education, Breaking Barriers to Inclusion, Resiliency in Emergencies, and Harmonization of Research and Higher Education. There is an opportunity for the SEAMEO RECFON program to be adopted by the Ministries of Education of SEAMEO member countries and for collaboration between SEAMEO Centres in Southeast Asia.
4. The accelerated development of science and technology including information technology (e.g. Artificial Intelligence, Cloud Computing, etc.) can provide wider applications for the implementation of nutrition science and nutrition programs by the Industrial Revolution 4.0.
5. The existence of social media is a good opportunity to advocate the importance of food and nutrition and influence changes in people's behavior, it can also be used to promote SEAMEO RECFON's main programs and experts quickly and easily to a wider range of stakeholders.
6. Southeast Asian countries share common nutrition and health problems related to malnutrition, anemia, etc.
7. Society 5.0 can increase the purchasing power of the general public in obtaining adequate, nutritious, and safe (i.e. organic) food for better health.

d. Threats:

1. Opportunities for budget cuts and erratic staff changes have resulted in changes to planned activities and the quality of services provided.
2. Strong competition for program funding review from organizations and similar.
3. Term Improvement of Regional Food and Nutrition Research Centers and Institutes.
4. News of food and nutrition hoaxes spread through social media, but cannot be responded to quickly as evidence-based information takes a relatively long time to create.

Critical Success Factors (CSFs) Analysis

Critical Success Factors analysis is to analyze the success factors of the problems that exist in the value chain analysis and their needs. From the CSF analysis, the success factors of the problems and needs described in each field and subfield are obtained.

Table 1. CSFs Analysis

Research / Research field unit		
Problems	**Needs**	**CSFs**
Research data storage that is still not well accommodated every year	A system to be able to store research results in data that can be accessed easily so that the monitoring and evaluation process in each research can be carried out simply and effectively.	Identify the needs in coordinating research data and what systems or tools are currently used, and identify what kind of integration is needed from the data system owned by the research unit.
The research monitoring and evaluation process is still manual with quite a lot of reporting data		
There is no electronic data storage that meets the needs of each research grant and research program at SEAMEO RECFON.		
Training Unit		
Problems	**Needs**	**CSFs**
There is no integrated data storage system for training, workshop, and seminar participants.	Procurement of online participant data storage system, training and M&E platform	Collect current information and data, identify the types of training and workshops, and media tools used to collect data and store certificates.
No self-managed online training platform yet		
There is no platform for monitoring and evaluating the achievements of training programs and workshops that can be accessed easily.		
Membership certificate data storage		
Science Management and Policy Support Unit		
Problems	**Needs**	**CSFs**
Lack of information system to manage integrated database	Information system to manage integrated database	Create an information system to manage an integrated database
There are still not enough human resources who are experts in the IT field, especially programmers.	Human resources who are IT graduates and masters in the field of IT programmers	Recruiting employees who are IT graduates and have mastered the IT field, especially programmers.
Development and Partnership Unit		
Problems	**Needs**	**CSFs**
Storage of data on the results of the NGTS and ECCNE program schools that are still not well accommodated every year	A system to be able to store data on school results that can be accessed easily by each locus so that it is easy to monitor and evaluate.	Identify the need to coordinate data from schools and what systems or tools are currently used, identify what kind of integration is needed from the data system owned by the Development and Partnership unit.
The process of monitoring and evaluating schools assisted by each Lokus is still manual with a lot of reporting data		
There is no electronic data storage		

that suits the needs of each participant for schools, teachers, and students.		
There are no storage and partner institutions and MOU data as well as monitoring of MOU time is in progress and will be completed as well as monitoring and evaluation results.		
Lab and Consultancy Unit		
Problems	**Needs**	**CSFs**
Integrated and easily accessible data storage of colleagues who analyze samples in the laboratory	System to be able to store data of colleagues who analyze samples and information to manage independent Laboratory assets	Create an information system to manage an integrated database of colleagues and laboratory asset information.
Information system to manage Laboratory assets independently		
HRGA Unit		
Problems	**Needs**	**CSFs**
Employee performance system data has not been well managed in SUBAG GENERAL	Employee data performance system management Computerized	Conduct a current employee data collection system and computerize performance data and systems.
Accounting, Finance, and Administration Unit		
Problems	**Needs**	**CSFs**
Preparation of financial statements adjusted to the specified time	Time to prepare financial statements	Perform financial report preparation using the
In terms of preparing the Budget Work Plan (RKA) takes a long time	Time to create a Budget Work Plan (RKA)	Conduct the preparation of the Budget Work Plan (RKA) using the information system

External Business Environment Analysis

Overview of the External Business Environment SEAMEO RECFON is one of seven government organization centers of the Southeast Asian Ministry of Education located in the DKI Jakarta Province,

Internal SI/TI Analysis

SI Mapping Based on McFarlan Strategic Grid Analysis

Strategic:	**High Potential:**
- SIMAK BMN - SIMPLE	
Key Operational:	**Support:**
- SAS	

External SI/TI Analysis

To obtain an overview of the current SI/TI development, the external SI/TI environment is analyzed, which includes trends in hardware technology, computer networks, and information systems (Prawira et al., 2023). Current technology trends are 3G&4G technology, WiFi, Cloud Computing, Mobile Applications, and Rich Internet Applications (RIA).

SI/TI PLANNING

SI Business Strategy Planning

Based on the analysis of the internal business environment using Value Chain analysis with needs and Critical Success Factor (CSF) analysis, the SI or Business needs that are mapped with the McFarlan Strategic Grid can be seen in the table below.

Table 5. McFarlan Strategic Grid

Strategic:	**High Potential:**
a. SIMAK BMN b. SIMPLE c. Web-based Research SI d. SI Training e. SI management Science and policy support f. SI development and partnership data g. SI Laboratory colleagues and assets	An integrated information system for monitoring and evaluating the achievements of the SEAMEO RECFON program.
Key Operational:	**Support:**
a. Financial SAS b. SIP Research grants and non-grants c. SIP training and workshops d. SIP of training and workshop alumni e. SIP Management Science and policy support f. SIP of the locus school g. Partnership SIP h. SIP of Laboratory Partners and Assets	a. Absorption Registration and Reporting b. Training and workshop registration c. Organization database website d. SI Certificate validation e. Features on the website for searching training data and assets

IT Strategy Planning

The following is the information technology that will support information system strategy planning. This information technology solution pattern will be built according to the needs of the information system (Siswanto & Sumitra, 2020). Information Technology Solution Pattern

a. Application Server, Database, Backup and Proxy
b. Server
c. Router
d. Internet Network (Access Point)
e. Mobile Device Data Collection
f. Mobile Device Mapping
g. Personal Computer Desktop core i5
h. Access Switch (server and client)

IS/TI Strategy Management

The SI/TI management strategy at SEAMEO RECFON, Training and school database management is obtained from the results of the analysis of strategic planning of information systems and information technology in the form of organizational policies in implementing the SI/TI strategy. The recommended SI / IT strategy management is:

a. Proposed database structure
b. Each Unit's database
c. Online office system development
d. Management of the administrative database system for each unit

Development Roadmap

Table 6. Development Roadmap

Year	Information System	Information Technology
2021	- SIP Research grants and non-grants - SIP training and workshops - SIP of training and workshop alumni - SIP Management Science and policy support - SIP of the locus school - Partnership SIP - SIP of Laboratory Partners and Assets	- Application Server, - Database, - Backup and - Proxy Server
2022	- Notification System Design - SI Monitoring evaluation of fund absorption. - SI Management of correspondence administration - HR Portal - Employee performance SI	- Application Server, - Database, - Backup and Proxy Server
2023	- Organization e-office website - Features on the website for searching letters, proposals, and report data - Certificate Document Validation - Online and blended training platform application	- Access Switch (server and client) - Internet Network (Access Point)
2024	- Web and Mobile Workshop and School Registration Application - Web-based and Mobile Application for Registration and Reporting of Research Activities - Web-based food and nutrition SI	- Personal Computer - Desktop core i5 - UPS - Router - Mobile Device enrollment and data collection - Mobile Device Database mapping

CONCLUSION

Some things that can be concluded based on the research that has been done in the previous chapters and the objectives of this study are as follows: By analyzing using the value chain, SWOT, CSFs, and McFarlan Strategic Grid methods. Then 19 information system recommendations, 10 information technology recommendations, and 4 SI / IT management for the future of SEAMEO RECFON from the McFarlan Strategic Grid analysis obtained an

overview of support at the managerial level to develop information systems and information technology that has been recommended.

Value chain analysis is carried out to be able to analyze what problems occur in the activities that exist at SEAMEO RECFON. there are several activities, namely the main activity consists of 7 activities which have 18 number of problems. From these problems, the factors that make the problem exist are obtained and can get information system and information technology solutions for the progress of SEAMEO RECFON, database management, monitoring, and SEAMEO RECFON's e-office administration system in the future.

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