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DECISION MAKING ON COCS REMEDIATION INFORMATION SYSTEM IN ENVIRONMENT DEPARTMENT PT. HUMAN ENERGY INDONESIA

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OPENING PARAGRAPH

In an organization, an information system plays a significant role. Its presence can support the operations and the development of strategic decision for the organization. Currently as a new department of PT. Human Energy Indonesia, Environment department has not had a sufficient information system that can cover data and information management for a project that is now being a top priority in the company which is COCS Remediation project. The development of a new information system was expected could solve the problem of delays in data and information processing and storage management. This system will support managers or key personnel to make a business decision more efficient and also as a tool for sharing knowledge and data between teams in order to draw the same data so they can operate more accurately and productively. This research will analyse the problem using 5 Whys, Fishbone and Current Reality Tree (CRT) Diagram to gain the root cause of the problem. And the Analytic Hierarchy Process (AHP) model will be developed in decision-making process for determining the development of new information systems.

COMPANY BACKGROUND

PT. Human Energy Indonesia as a subsidiary of Human Energy Corporation operates the Rokan block, that is one of the largest crude oil producers in Indonesia that partnered with government of Indonesia through Production Sharing Contract (PSC) with net daily production averaged 122.000 barrels crude oil and 21 million cubic feet of natural gas in 2017. The company, working as a contractor to the Government of Indonesia, has drilled more than 18,000 wells in Riau province, built more than 150 current and historical gathering stations, laid hundreds of kilometers of pipelines, and pumped billions of barrels of oil. With total area is 6.246 km2 and has seven large area like Minas, Kotabatak, Petapahan in South area and Bekasap, Bangko, Balam, and Libo in North Area, Rokan PSC is the largest PSC area within Indonesia.

The major environmental problem in crude oil exploration activities is soil contamination, which is usually known as “Crude Oil Contaminated Soil (COCS)”. The COCS is most likely to have come from releases from historical operations where PT. Human Energy Indonesia conducted oil and gas operation activities. In line with one of the company’s missions to carry out all operations comply with environmental requirements, PT. Human Energy Indonesia has set up a new department to handle COCS remediation program in Sumatera with fully allocated, dedicated and competent resources.

SPECIFIC PROBLEM

The environment team is currently dealing with massive data and reports as a result of larger organization and project scopes. All remediation data are stored in excel programs in local folder and/or SharePoint and there is no integration between the teams through a centralized application system even though in fact all the data are interdependent. These situations lead to certain delays and limitations in fulfilling the request of internal and external stakeholders in any data and reporting, low reports quality and hard to develop site closure documentation. All of these will also be subject to litigation in the future.

Therefore, the environment team need to develop and deploy an COCS Remediation Information System to cover all data from the activities of Remediation Program. This system is expected to play an important role in providing data and creating reports in the organization to support managers or key personnel to make a business decision more efficient.

The objective of this research is to determine what is the best method to develop a new information system for Environment COCS project based on Analytical Hierarchy Process (AHP) decision making method. The model of decision-making process that was built later is expected can be a template for similar case in the future.

Based on business issues above questions that will be investigated in this final project are:

1. What is the root cause of the problem?
2. Which alternatives is best suited to the Environment team for Remediation Information System?
3. What criteria should be considered in choosing a new information system?
4. How the best alternative can be implemented?

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METHODOLOGY

The research concept: what is the problem, what is the organization's current condition, how to solve the problem, what tools will be used and what is the expected goals, as per Figure 1.

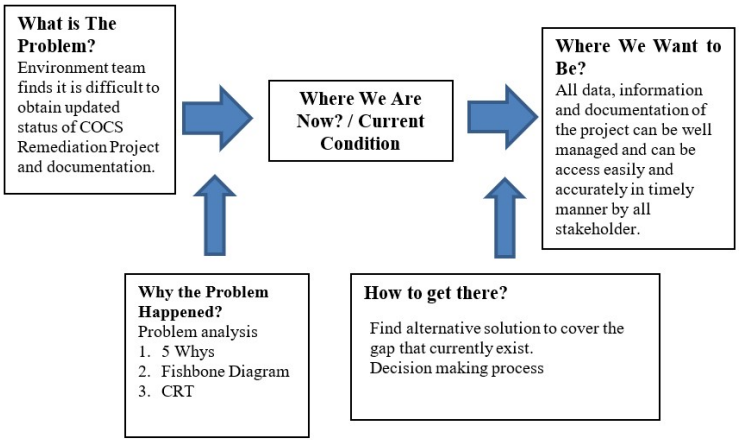

Figure 1. Conceptual Framework

ALTERNATIVES

Problem analysis has been done in the first stage of this research, using the RCA tools which are which are the 5 whys, Fishbone Diagram and Current Reality Tree (CRT).

1. 5 whys

Table 1. 5 Why Question Table

5 Why Question Table	
Problem Statement: Environment team finds it is difficult to obtain updated status of COCS Remediation Project and documentation.	
Recommended Solution: Develop COCS Remediation Database and Application System	
Why Questions	**3W2H Answers**
1. Why is it difficult for the Environment team to obtain COCS Remediation status and documentation?	Because many teams are involved in the COCS remediation project.
2. Why COCS remediation project is involving many teams?	Because this project consists of a lot of process remediation and has significant increase in the number of sites.
3. Why the number site is growing?	Because company need to ensure all area are cleaned and ready to be handed over to GOI after 2021. The increasing number of sites will generate massive data that cannot be manually maintained.
4. Why maintaining massive data and information manually is not enough?	Because excel sheet that is stored in local folder/SharePoint has limitations to run a function as a centralized database. Collecting the data will be difficult.
5. Why the data is stored in local folder / SharePoint?	Because there is no centralized data and information system in place for the organization to support project activities.

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2. Fishbone Diagram

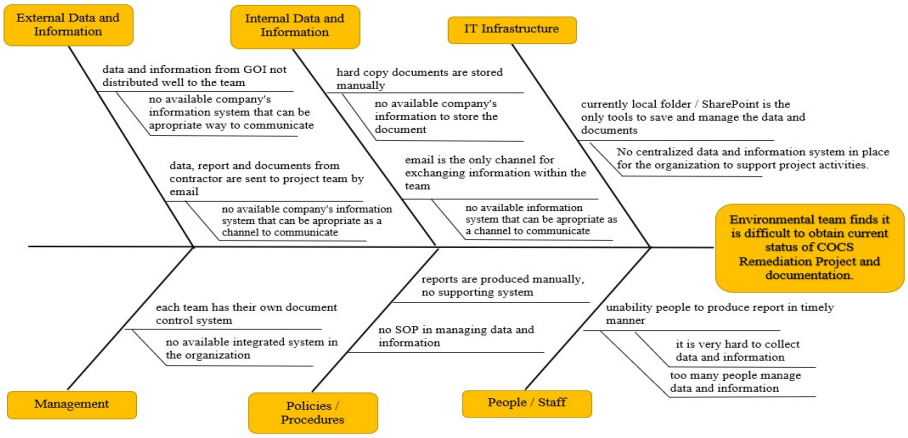

Figure 2. Fishbone Diagram

3. Current Reality Tree

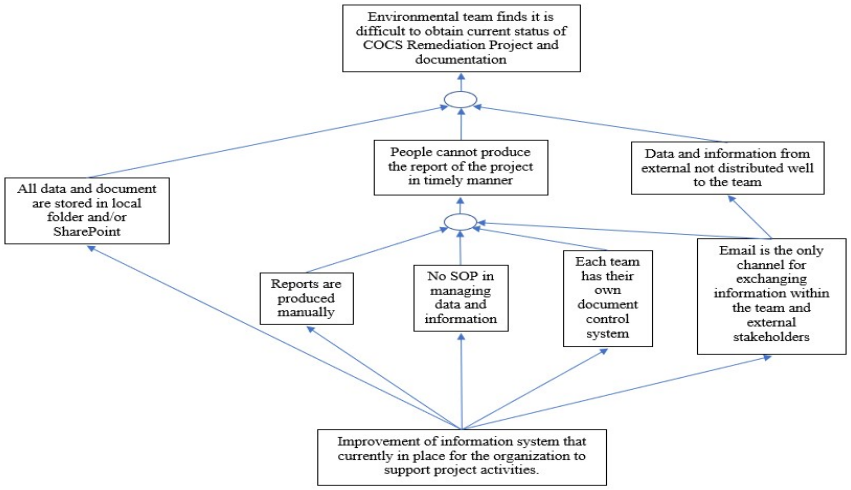

Figure 3. CRT Diagram

The root cause of the problem was currently identified that the organization did not have the appropriate information system to support the activities of the project. So, this project and/or organization need a new information system to help them in managing data, information and reporting. Therefore, this final project will focus on the evaluation of the best alternative recommended for new system developments and the how the implementation plan should be implemented.

DECISION ANALYSIS USING AHP METHOD

This method was started by developing the AHP hierarchy tree. Determination of criteria, sub criteria and decision alternative has been done by doing some interviews. The author did the interview to some internal stakeholders and IT team to capture what they need in an information system. The AHP hierarchy tree can be shown in Figure 3.

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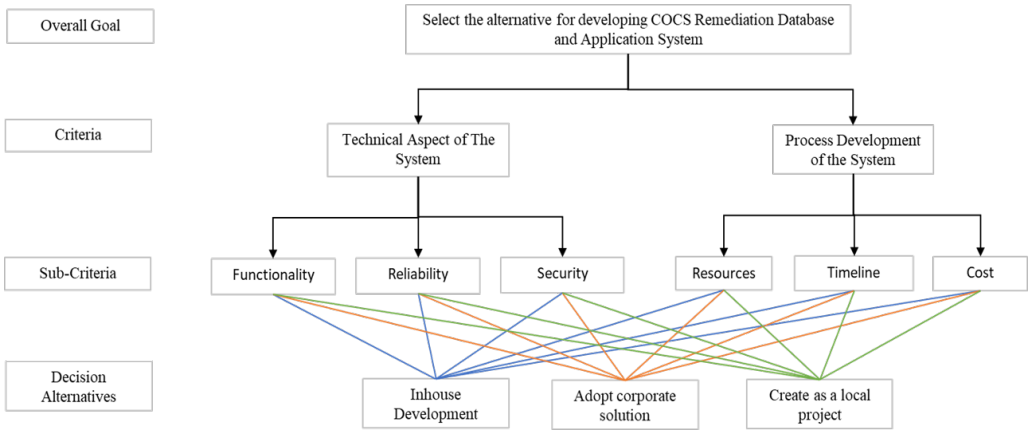

Figure 4. The AHP Hierarchy Tree

The next step is to make comparisons between the criteria and sub-criteria. The scale of preferences used in this research is the Saaty scale and continuing with check the consistency in the Pairwise Comparison. Based on the calculation, all pairwise comparisons are consistent. The data are therefore valid and can be used for the next process of selecting alternatives that will be selected from the highest score of alternatives. Based on the final AHP calculation, the highest score is obtained by the Inhouse Development alternative with score of 0,58 while Adopt Corporate Solution has 0,24 and Create as a Local Project has 0,18.

After getting the best alternative, one important thing to do is Potential Problem Analysis (PPA). Based on Kepner Tregoe (1965), PPA is a tool designed to provide a proactive solution for analysing how it might be wrong. This is done to evaluate risk that might be happened during the development and implementation plan. So, the mitigation plan can be planned as early as possible to avoid negative impact to the project.

CONCLUSIONS

Based on RCA process, the root cause has been identified that no centralized data and information system in place for the Environment department to support COCS Remediation project activities. All data and document manage manually in Local Folder and/or SharePoint and email is the only channel for exchanging the data and information. While the available company's information system is not suitable to be applied in the project. Therefore, it is very important to the organization to have a new information system to support project activities.

Three alternatives have been identified to solve this situation which are: Inhouse Development; Adopt Corporate Solution; and Create as a Local Project. They have been selected after considering their capability to solve the problem and comply with the IT Corporate Policy. The best alternative based on AHP process is to develop a new information system by Inhouse Development. After the PPA analysis session, the implementation plans as well as the detailed schedule is developed to ensure that the identified the risks are covered in the detailed plan.

RECOMMENDATION AND IMPLEMENTATION PLAN

Based on research that have been done, the author recommends some action items to support the development of new information system, such as:

1. Accommodate the preventive action and mitigation plan that is recommended by PPA process result to the implementation plan. One of the items is to assign a task force team to develop this new system. This is a small group of people with specific skill that focus only with this work in certain of time.
2. This development project is supposed to have leadership approval and supports, the progress of the development needs to have updated to them regularly, so if there is a bottleneck during the development phase, they can help to solve the problem. In addition, the team must publish to all the stakeholder at all levels that the new system is currently being developed. Socialize that this new system will facilitate their job easier in the future, so the development team will have full support also from the working level of the project.
3. Environment team is a new team that the business process is still immature, some studies are being conducted to improve the business process. Therefore, to avoid the functional errors in the future, development team need to have close

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coordination to keep updated if there are any changes in business process.

4. Associated with the infrastructure issue, the project team need to approach IT corporate desktop team to provide all the infrastructure that needed in the application from the early phase of development. For resources issue project team need to explore possibility to have additional programmer from them to speed up the project.
5. While waiting for new system implemented, suggest developing SharePoint that can be accessed by all team for temporary file storage. This will help each team in organizing their files and fata, so once the system is implemented, the data migration will be easier.
6. Since this business solution has a tight timeframe, as a benchmark for successful milestone criteria, it is necessary to develop detailed schedule for the implementation plan. Table 5 is high level schedule for implementing the project to develop new information system for COCS project.

The COCS project has some technical application that support the program activities. To synchronize all the application, development team also need to explore possibilities and prepare the application module that can be integrated with other environmental applications. Once the system has been completed and ready for implementation, project team need to develop a Business Process Procedure (BPP) for each team in every module as well as the Role and Responsibility (R&R) for each team related to this new system. BPP and R&R supposed to be socialized and formalized to all personnel in organization.

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