CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1   Conclusion

The new information system has been implemented in the company without abandonment. Like most of the IT project, there are some problems remained unsolved and pending for software modification and system enhancement.

Generally, the new information system is quite success since users are satisfied with the up-to-date and timeliness output of the system. The survey results also reflect that most of the respondents agree that the new information system has improved their job efficiency. However, there are various weaknesses have been identified. The effectiveness of the new system can be enhanced further by overcoming the identified weaknesses such as provide sufficient training and guidelines to users to avoid the system being under utilized due to poor users' understanding; provide clear requirement spec. and encourage active user participation in future software modification.

From the survey results of the user satisfaction and the review of the development process and lessons gained from this project, the identified success factors are : systems fits user task and organization business needs, user participation, user training, project management, clear and accurate user requirement specifications, IS members (who are the medium between users and software developer in this case study) understanding of user business needs, top management support and thorough system and facilities test and verification with live run data and environment. The findings show that there are 2 success factors that are not studied in details in the previous research: clear and accurate user requirement; and system and facilities test with live run data and environment.

5.2   Recommendations For Improvement

After analyzing the survey results and reviewing the background and development process of the new information system project, the following recommendations have been made to further enhance the effectiveness of the current system and also as references for the future IT project implementation.

5.2.1   Recommendations To Enhance the Effectiveness Of The Current System

5.2.1.1   Provide Training and Guidelines To Users

A clear instruction manual and guidelines on how to make information inquiry through the system and what are the features and usage of the system shall be prepared. The guidelines will give a clear picture to users on what kind of information can be obtained from the system and how to access to the system and how to manipulate the output information. Education and training regarding the system features and functions shall also be given to the users based on the prepared instruction manual and guidelines. The trainer is recommended to demonstrate to users on how to access the system and make inquiry with actual inquiry screens in PC. With the clear guidelines and proper training, system under-utilization is likely to be overcome.

5.2.1.2   Review Current Requirement Specification

The current requirement specifications are recommended to be reviewed. A detailed specification for clear reference of programmer when modifying the system is necessary. This time, a thorough feasibility study on the process flow and all related production operations (covers main flow and all sub-flows) shall be carried out. The actual production lot movement shall be

confirmed in every junctions so that all the circumstances and conditions are covered in the requirement specification for a complete software modification. Developing a requirement specifications involve production operations in a meeting room without actual production line study is strictly not recommended. A reminder here is all modification of output requirements shall be accompanied with data input screens review. Required output involves raw data that is not captured by the input screen is not feasible.

5.2.1.3   Encourage Active Users Participation In Software Modification

Currently the system is under an enhancement stage where some weaknesses are proposed to be modified. For this modification, users shall be encouraged to participate actively in giving inputs on what is the information, content and format required. The previous experience shows that outcome without consensus and participation of users is likely to have high user resistance when adopting the system. They tend to find errors or weaknesses of the system although the errors may be very minor one. On the other hand, users may try to protect and support the outcome of the system if they have participated in the decision making.

5.2.1.4   Reduce Looping Time During Users Inquiry To Avoid Time-out Error

The problem can be solved by specifying the function screens that face this problem and make clear to all users on the maximum pieces of information can be inquired at a time. Another solution is to split the inquiry screens that face this problem to lesser content and hence the looping time can be reduced and avoid users' PC hang due to time-out error. In long term, the second option is recommended.

5.2.2 Recommendations for Future IT Project

5.2.2.1 System shall Fit User Task and Organization Objectives

Success of an IT project is measured via users satisfaction and its importance to organization. Hence the output of an IT project shall fit user and organization business needs. IT project that improve user job efficiency, process simplification causes reduction of operation cost and improved quality and productivity and etc. are examples of IT project that fit user and organization business needs.

5.2.2.2 Proper Planning and Scheduling

As discussed before, system output requirement shall be established before designing data input screen. A clear picture of the final output or target shall be established before going for overall project planning and scheduling. All the project activities shall be well integrated. Longer period of User Acceptance Test is also recommended especially for IT project of semiconductors based manufacturing lines. The main reason is the manufacturing environment involves high production volume and fast lots moving. Whenever problem arise especially related to data accuracy or error, it takes time to identify the source of error since there are thousand of lots running in production floor.

5.2.2.3 Clear and Accurate User Requirement Specifications

Make a thorough actual process flow and operations study when designing user requirement specifications. All the angles shall be considered and stated clearly in the specifications to avoid misinterpretation of software developer.

5.2.2.4 Provide Sufficient Users' Training and Guidelines

The effectiveness of a new IT project shall be enhanced with good users' understanding regarding the usage and features of a new system via a proper training and clear guidelines. These promotion measures will stimulate the user interest of accessing and utilizing the system. The impacts of the output of a developed system will only actualized if it is being used. If not, it will remain as treasures buried under the deep sea.

5.2.2.5 Encourage Active User Participation

Active user participation in giving inputs and making decision of the final outcome is likely to yield an outcome that suit the majority of users and accepted by those involve in making the decision. Users are likely to co-operate and give support to a system with their involvement.

5.2.2.6 Full Time CIM Team

IT project involves a long run period from its planning, feasibility study, requirement spec. development, user acceptance test until live run stage. Full concentration and close monitoring is required at all the stages to minimize mistakes or items been overlooked which will result costly modification or system abandonment later. It is recommended to form a full time CIM team consists of members who has production operation and software knowledge especially those has experience of running IT project. The full time CIM team is recommended for full concentration and focus to be given to future IT project and to take care of maintenance and enhancement of existing developed system.

5.2.2.7 Develop A Proper Checklist For Future IT Project

In any IT project implementation, a detailed checklist to confirm the system's functions, infrastructure, validity of requirement specification is recommended. For example in function check, output information such as work in process, achievement, process yield and etc. shall be included in a checklist for verification. As for Infrastructure Check, a checklist that includes network traffic and stress test (check for network congestion), server vulnerability test, speed test, inter servers synchronization test and linkage test, power reliability test and etc. is required. With the well established checklist, the output quality of a project will be verified in a systematic manner and hence minimize errors and mistakes. Thorough checking and verification shall not be skipped. Do not take it for granted and thinking of let the system run first and anything wrong can be modified later. Correction after software has been developed and accepted is costly and sometimes need to be entirely re-designed.

5.2.2.8 System and Facilities Test Shall Be Done In Actual User Environment

Previous experience tells us that effectiveness of an IT project shall be tested and verified with the actual environment. System shall be tested with live run and actual data collected during live run. Dummy data tells the system can be run but does not guarantee its accuracy or whether there are any bugs in actual running. The case study also tells that facilities test shall be carried out in actual user environment to ensure its stability and reliability.

5.2.2.9 Careful Software Developer Selection

Software developer or programmers are the person who translates the users' requirement s into reality via system software. Therefore their precise interpretation of user's requirements are crucial in ensuring the system output matches the requirements. Face to face discussion between users' and software developer is important to avoid mis-interpretation of user requirement

specifications. Therefore, it is recommended to consider local or regional software developer who has no communication limitation and also convenient to conduct face-to-face discussion. Previous studies found many cases of IT project failure are resulted from mis-communication of users and software developer. The two parties are from different disciplinary background. Users are good in technical or engineering knowledge but software developer thinks in software logic rather that technical or manufacturing oriented. In order to minimize the communication gap, face to face discussion is necessary. Hence local or regional capable software developer is recommended.

5.2.2.10   Innovative

The related personnel who involve in developing an IT project such as an information system is recommended to think in innovative manner in order to maximize the advantages of information technology. A new system shall not be developed by referring to the previous out-dated system. When developing a new system, we shall not framed ourselves in just copying whatever the functions of old system to new system. We shall think in innovative manner to maximize the operation automation and simplification, job efficiency, minimize cost and human errors and etc. Take an example of the case study: the new system is able to auto judge whether the process yield is normal or not. The system user will not realize the abnormality until he or she inquires the data by accessing the system. In such case, can we link the system to user pager or prompt the information to user e-mail or activate a linked buzzer? Information technology is very powerful in making our job more effective and efficient. A lot of advantages can be gained if we can think innovatively when developing an IT project

5.3   Suggestion for Additional Research

This study sought to identify the success factors of an information system project implementation through the survey of user satisfaction of the system output quality and review the experience learnt from the project. In future, study to survey the success factors based on all three constraints: system quality, cost and time constraints as a whole is recommended. Research of similar study on other industries or different organization structure for comparison is also recommended.

5.4   Implications

This study provides guidelines and cautions for a manufacturing company that involves high production volume, fast goods movement and heavy process operational activities in order to enhance a successful IT project. The results and recommendations of this study could be used as an important reference for organizations of similar industry when developing and implementing an IT project. Many studies have pointed out the general critical success factors of IT project from data obtained via companies of various of industry. In this case study, conclusion is derived from a specific and in-depth analysis on a manufacturing company's IT project. The findings may be more useful and relevant for the similar industry to refer to.