

Systems-building alternatives

There are several options available to Megasteel in the system development, these options include :

1. System life-cycle
2. Prototyping
3. Application software packages
4. End-user development
5. Outsourcing

These options will be evaluated base on several criteria which is unique to Megasteel. These criteria include :

- a) Human Resource / skill of internal staff
- b) Cost & Time Required
- c) Implementation
- d) support

The options and the evaluations will be discussed in the following section.

1. System life cycle

There are six stages in the system life cycle, each stage consists of basic activities that must be performed before the next stage can begin.

	<u>Stages</u>	<u>End Products</u>
1	Project definition	Project proposal report
2	System study	System proposal report
3	Design	Design specifications
4	Programming	Program specification - code
5	Installation	System performance tests
6	Post Implementation	Post implementation audit

In this methodology, there is a distinct division of labour between end-users and information system specialists. The technical specialist are responsible for the system analysis, design, and implementation work where as the end-users are limited to providing information requirements and reviewing the work of the technical staff.

Stage 1

Project definition

In this stage, the general objectives is identified, the scopes of the project specified and the project plan is developed for further management's evaluation.

Stage 2

Systems study

In this stage, the problems of existing system are being studied and the objectives are identified. The alternative solutions are proposed in order to achieve the objectives. The systems study stage evaluates the feasibility of each solution alternative for the review by Management.

Stage 3

Design

The logical and physical design specifications are produced in this stage for the solution. The involvement of the end - user is important in this stage.

Stage 4

Programming

In programming stage, it translates the design specification into software programme code. The programmers write customised program code using a conventional third-generation programming language or a high-productivity fourth-generation language.

Stage 5

Installation

This will be the stage to put the new or modified system into operation :- testing, training, and conversion. Test is carried out on the software to make sure it performs to the required task both technically and the business function application.

Stage 6

Post Implementation

Evaluation is to be carried out on the system after it had been installed and put into production. Improvement is then carried if the system does not perform to the expectation stipulated in the objectives. After the system is fine tuned and put into production, constant maintenance will be required to improve processing efficiency and corrects error if necessary.

When the demand of end-user change and too much of maintenance is required to keep-up to the demand change, this signals the end of the system useful life span. A completely new system may be required.

(Laudon & Laudon, 1996, pp.439~442)

Evaluation

Taking into consideration of the pre-requisite of Megasteel internal environment . The result of evaluation is as follows :-

a) Human Resource

Megasteel does not have its own team of information system specialists to carry out this system development project. The main technical support will come from the sister company, Amsteel that is also suffering from the economic downturn, Amsteel had scaled down its information system support team to cut cost. Therefore, Megasteel will not be able to undertake any system development on its own due to the lack of human resource.

b) Cost & Time Required

Megasteel project is now entirely relying on the bank borrowing and only expected to start operation by early 1999. This means expenses shall be cut to the minimum due to lack of revenue. It may take more than a year to develop the information system required and cost a huge amount of money to implement. Hence, it is unlikely for Megasteel to adopt this strategy. Bare in mind that the main objective for Megasteel for the moment is to quickly get into production and generate much needed revenue to survive.

c) Implementation

Megasteel will face tremendous challenge in trying to develop its own system. Mainly because of its tight budget and lack of information system specialists. Even if Megasteel can be successful in designing its own system, Megasteel will still need to maintain a pool of specialists to improve and oversee the operation of the system. Expenses will be very high compare to other alternatives.

d) Support

Megasteel will always need to have the information system staff to be around to support the end-user. This may not be possible if Megasteel only want to maintain minimum possible labour force in the information system department.

Conclusion

Megasteel is unlikely to develop its own system using the life-cycle methodology mainly due to its financial constraint and time constraint.

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2. Prototyping

Unlike the life-cycle model, prototyping is less structured and let the end-users change the requirement on the prototype during the development. The idea of prototype is to let end-user interact with the prototype and help end-users to get a better idea of their information requirement.

Just like a model in car making, the prototype visualised the information system but in the preliminary stage. Refining and features addition or reduction is carried out on to the prototype until a final version is achieved in which it reflects the end-users requirements. Since the changes are carried out during the early stage of development, it can be more economical and easier to be carried out. In this manner, we found that system analysis, design, and implementation all takes place at the same time.

Steps in prototyping

- step 1. Identify the user's basic requirements
- step 2. Develop a working prototype
- step 3. Use the prototype
- step 4. Revise and enhance the prototype

Prototyping method can be more successful than the system life-cycle methodology for its flexibility and intensive end-user's involvement through real life experience with the system under development. This is because the user's behaviour and needs are not entirely predictable therefore flexibility in altering the specification help solve the problem in early stage.

(Laudon & Laudon, 1996, pp.442~446)

Evaluation

a) Human Resource

Same as the earlier option, Megasteel needs dedicated team of information system specialists for such project. This is not possible when Megasteel intends to keep low labour cost for at least the first two years of operation.

b) Time and cost required

An expected time frame of six to twelve months will be required to complete the entire project, therefore it is too long for Megasteel to wait till then. The conversion on historical data into new system will be also big question mark, therefore the loss of historical data should be minimised by cutting down the development time.

c) Implementation

In order to be in time for Megasteel to have the information system to be up and running, this prototyping project should had started much earlier. With much of the attention being focused on the production, it will be unlikely to have the prototyping implemented.

d) Support

A fully committed system support team is required to support and maintain the system. This option requires a similar size of technical support team as the earlier option. (system life-cycle) This will be difficult when human resource is the constraint.

Conclusion

Since time is the essence, Megasteel cannot afford to wait for the system to be up in the next twelve months. This methodology is not suitable for Megasteel.

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3. *Application software packages*

An application software package is a set of pre written, pre coded application software programs that are commercially available for sale or lease. The advantage of a software package is that it eliminates the need for writing software programs when an information system is developed and reduces the amount of design, testing, installation, and maintenance work as well.

Reasons for adopting the application software package can be as follows :-

1. A common function in many companies. Examples are payroll systems, human resource management and accounting package.
2. Insufficient information system resources for in-house development. Particularly for an organisation where budget and specialist are very tight for an expensive in-house development
3. For microcomputer application. Word processor and statistics software packages are readily available and easy to use for desktop computing.

Customisation features allow a software package to be modified to meet an organisation's unique requirement. However, it will defeat the purpose of a software package if extensive modification needs to be done and implementation cost escalated several times the original purchase cost.

The evaluation criteria on a package should be as follows :-

1. Functions Included
2. Flexibility
3. User-Friendliness
4. Hardware and Software Resources
5. Database / File Characteristics
6. Installation Effort
7. Maintenance
8. Documentation

9. Vendor Quality
10. Costs

The issue involved in this strategy of application package is that the organisation may need to change its practise to meet the system. The company policy may be reviewed due to the inflexibility of system. This makes application package a great disadvantage.

(Laudon & Laudon, 1996, pp. 446~455)

Evaluation

a) Human Resource

Megasteel does not need to have a team of specialist for the design and programming of the intended information system. Megasteel will only require a project team, which comprises the end-users and member of the information system department for the evaluation of the various software application packages available in the market.

b) Time and cost required

The price of an application package and its subsequent modification cost must be carefully evaluated. The total cost incurred varied from one supplier to another supplier. Nevertheless, it is expected to be cheaper than Megasteel's own development.

Time is required to study the information requirement, evaluation of proposals and modifications. Therefore much shorter time is required as compared to the other alternatives.

c) Implementations

The questions on implementation will largely depending on the type of software package chosen and suitability of the software package to Megasteel's environment.

d) Support

The support from the supplier is vital and the training to both the end-users and technical staffs must be properly planned. The internal support team should be well equipped with technical knowledge about the software and not just only about its application

Since Megasteel's staffs do not develop the system as compare to system-life-cycle and prototyping, there is tendency of relying heavily on the supplier for system support

Conclusion

This option had met the priority of Megasteel in terms of human resource, financial resource and time constraint. This will be the suggested solution for Megasteel in its need on the information system for purchasing and inventory control.

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4. *End-User development*

End-users develop the information system with or without the assistance of the technical specialists. The special fourth-generation software tools help made possible the end-user development.

End-users can access data, create reports, and develop entire information systems on their own. On the other hand, end-users may rely on information systems specialists for technical support but carry out the system development activities that normally to be undertaken by the information systems department.

There are limitations to these fourth-generation tools therefore it cannot replace conventional tools for some business applications. The limitation is that they were designed for simple systems, manipulating small files. The processing of individual transaction is too slow for most of the fourth-generation languages. It will be too costly to make these systems suitable for large transaction processing systems. When files are large, the response time will be very slow. (Laudon & Laudon 1996, p.458)

Evaluation

a) Human Resource

The end-user, purchasing and inventory control staffs, in Megasteel do not have the necessary skill and capability to do such a system development on its own.

b) . Time and cost constraint

This issue will not be relevant since end-users do not have the relevant skill and know-how.

c) Implementation

The end-user shall need the full support from the technical staffs on the implementation of system. This will be a problem on who shall be responsible for the budget and manpower.

d) Support

The end-users will need the technical staff to support on the system as the end-users are not competent to carry out such job.

Conclusion

This methodology can be useful only when there is an existing system that the end-user is familiar with. In this case, Megasteel can only implement this method in the future provided the end-users are properly trained.

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5. Outsourcing

The process in which the organisation hires the external information system specialists to build and operate the information system. The main objective of outsourcing is to save cost on the information system development because the external specialist could be more efficient than the firm's own information system staff. The service provider can benefit from economies of scale therefore the cost incurred in outsourcing can be cheaper than the in-house development.

Reasons for outsourcing

1. The organisation may choose to outsource the entire information system operation or part of the business function. If the particular application in business function does not bring any competitive advantage, it will be more likely that the application be outsource for lower cost. There will be trade off between outsourcing and internal control. The organisation shall consider the issue of security, impact on information system staff and etc.
2. The service provider may not be able to attend to the problem as quickly as the internal staff, therefore interruption for longer period may occur. If the interruption shall cause serious damage to the organisation perhaps its more sensible to keep the internal control over information system.
3. The technical know-how of the internal information system staff shall always be kept up-to-date. This is important for future development of the information system. Training for the in-house staff must not be neglected.
4. If the organisation is unable to keep up to the latest technology in information architecture, it will be wise to let the specialists do their best in meeting the organisation's changing demand. The new global networking allows firm to send and retrieve information at every corner

of the world. Therefore the firm shall have the convenience of latest technology without having to worry about maintaining the hardware and software.

Partnership in outsourcing

The outsourcing vendor is an important business partner. Choosing the right partner is not an easy task. The initial evaluation may overlook issues that will bring to the unpleasant break-up with the service provider. The terms and conditions in the contract may also be disadvantage to the organisation should the organisation wanted to terminate the contract earlier. This may end-up more costly than it was supposed to be.

(Laudon & Laudon, 1996, pp.462~465)

Evaluation

a) Human Resource

This option will help Megasteel to avoid using its own internal staff for this development. The external specialists will be more capable to carry out the development in meeting Megasteel's requirement.

b) Time and cost constraint

The price of a service provider it to be determined by comparing among the various suppliers available in the market however the cost could run into million of Ringgit which is beyond the financial capability of Megasteel for the time being.

Similar to the earlier alternative, outsourcing will also take more than twelve months to accomplish the whole project and put the system into production. Therefore, Megasteel may not be able to adopt this option.

c) Implementation

The service provider must get access to all the relevant information for the development. This poses a question of confidentiality of information and will this information go into the competitor's hand? Megasteel may not want to take such a risk.

d) . Support

The service provider will need to give support to the firm's ever changing requirement, the external staff may not understand the end-user's requirement or may take long time to comprehend. It may turn out the end-user has to accommodate the system which is inflexible.

Conclusion

If time is available, Megasteel should evaluate thoroughly on this option. By outsourcing, Megasteel will be able to minimise labour force, lower maintenance cost and adopt to latest system architecture. Unfortunately, Megasteel will have to forego this option for the constraint in terms of time and financial constraint.

Summary of evaluation

<div>High</div> <div>↓</div> <div>Low</div>	Ranking	Human Resource	Time and Cost	Implementation	Support
	1	ASP	ASP	ASP	ASP
	2	OS	OS	OS	OS
	3	EUD	EUD	P / SLC	P / SLC
	4	P	P	P / SLC	P / SLC
	5	SLC	SLC	EUD	EUD

System building alternatives :
SLC = System Life Cycle
P = Prototyping
ASP = Application Software Package
EUD = End User Development
OS = Outsourcing

The result of evaluation of all the options available to Megasteel basing on the pre-set criteria are tabulated as above. The higher in the ranking shows the more preferable the option is to Megasteel in each criterion. For example, application software package is ranked higher in the Human Resource because it needs less manpower than other options. The involvement of end-users and other relevant department is less intense in application software package as compare to other alternatives therefore it is ranked highest in terms of *Implementation*. Application software package is also ranked higher in the system support because the system supplier shall render the support and lesser number of internal staff will be required.

It was found that the Application Software Package is most preferable option to Megasteel and therefore it is recommended as the solution to Megasteel's purchasing and inventory control information system. This solution is recommended based on the current environment of Megasteel. We may find from the above table that the second most preferable option is the

outsourcing and this option may become suitable when the environment change. Further study should be carried out before implementing this recommended solution. We shall conduct a S.W.O.T. analysis in the following section.