

## **FACILITIES MANAGEMENT IN CONSTRUCTION PLANNING: MALAYSIAN SCENARIO**

**Sharif Yusuf<sup>1</sup>, Linariza Harun & Omar Osman**  
School Of Housing, Building & Planning  
Universiti Sains Malaysia 11800 Pulau Pinang, Malaysia  
<sup>1</sup>sharifsom@hotmail.com

### **ABSTRACT**

A good construction plan is the basis for developing the budget and the schedule for work. Developing the plan is a critical task in the management of construction and is generally concerned with completing a contract in the shortest possible time compatible with the budget. On the other hand facilities management provides project participants with good coordination, communication and encourages the employees to have personal responsibility in the design and planning process. The objectives of this paper is to explore the role of facilities management in construction planning, to examine the general perception of the local construction industry regarding facilities management principles and practices, and to study how facilities management supports the organizational development, management process and management of the resources, within the two knowledge areas defined by RIBA plan of work (pre-production and production).

A questionnaire survey was conducted on those who are involved in construction planning, viz architects, engineers, quantity surveys and client/developers. One hundred fifty sets of questionnaires were posted to a selected sample of those professional in four areas: Kuala Lumpur (40), Selangor (40), Penang (35), Johor (35), 41 of them are replied; mean importance rating was analyzed on the data.

The results of the survey showed that facilities management in the planning process gives all parties that are involved in the project the ability to measure their capability in order to complete the project on time, budget and quality, while keeping the customer and stakeholders satisfied. Proper planning at the outset makes it easy for design, workplace enhancement and renovation time of the project be carried out successfully, while reducing all costs, especially at the operational level. Hence, the general perception of facilities management in local the industry differs from person to person.

**Keyword:** Construction Planning, Facilities Management, Malaysian Scenario

### **1. BACKGROUND**

Construction planning is a fundamental and challenging activity in the management and execution of construction projects. It involves the choice of technology, the definition of work tasks, the estimation of the required resources, the duration for individual tasks, and the identification of any interactions among the different tasks. Project planning involves detailed consideration of all the activities needed to complete the project, realistic estimates of how long each activity will take, and relationships between activities. The relationships between the established activities affect how the project proceeds and how quickly it can be completed. A significant number of projects exceed their original budgets, run late or fail to meet their objectives. Various studies suggest that the overall success rate is not more than 40%, whereas for Information Technology projects the rate of success is even lower. Approximately 50% of construction projects and 63% of all information systems overrun their budget by between 40% and 200%. (Morris, 1994. ) Evidence increasingly suggests that the performance of the project management profession in

delivering new building assets which satisfy clients' requirements in terms of time, cost and quality parameters is lacking. "Recent work has highlighted the problem of 900 surveyed projects an average cost overrun of 40 percent over the contract sum was reported and an average time overrun of 60 per cent over the contract period was evident" (World Bank, 1996) (Brown et al., 2001)

With this mentioned above construction industry has been using facilities management in different places but the most common usage of facilities management was building maintenances, property management, although (Regterschot, 1990) defined in early 90s "the integral planning, realization and management of buildings and accommodation, services and resources which contribute towards the effective, efficient and flexible attainment of organizational goals in a changing environment"(Igal M. Shohet and Lavy, 2004). While (Akhlaghi, 1994) describe that "facilities management is inseparable and essential function which were required to ensure successful, execution of the organization core activity". Other reasons for the core competencies in facilities management in construction planning include; a focus on the management, delivery of the business, seldom aware of overall corporate strategy, keeping accommodation standards of space and environmental safeguard Nourse (1990), Then (1999), Hinks & Nancy (1999), Varcoe (2000). Facilities management in construction planning optimizes the use of resources and support organizational goals and customer requirements at the operational and strategic levels. The definition of facilities management shows the involvement in different stages of RIBA plan of work from inception to Operation on sites. (Becker, 1990, Nourse, 1990, NHS, 1996, Alexander, 1996, Then, 1999, John Hinks, 1999, Nutt, 2000, Varcoe, 2000, Linda Tay, 2001, Pro-FM, 2006, Alexander May, 2003, Associates, 1999)

## **2. FACILITIES MANAGEMENT IN CONSTRUCTION PLANNING**

Facilities management in construction planning is to assist planning for the designing and managing for all cycles of the new construction, as well as cost estimating, time management and preliminary planning determines how an activity's tangible fixed assets best supports achieving the desired goals of the project. There are different activities in the planning stage while all project team members will not participate in early phases. In current view of RIBAs' plan of work, the project manager is the leader of all activities from inception to handover, but all the team members have different responsibilities. (Brown et al., 2001) are stated facilities manager is well involved for leading the early stage in construction planning, while (Nutt, 1998) stressed the Life cycle design has two objectives. The first is to make the process of design more strategic, providing a more intelligent, reliable and

accountable design service. The second objective is to make the product of design more strategic, improving the viability of facilities in relation to their use over time (Nutt, 2000).

Many authors have discussed the factors of facilities management in practice. Based on their views the key factors in facilities management practice can be categorized two groups.

1. Internal factors including organizational characteristics, facility features, and business sector
2. An external factor including economic, social, environment, legislation and regulation, facilities management market context and local culture and context. (Chotipanich, 2004)

However, no one has specified the important of facilities management in early stages of the project planning, (Nutt, 1998, Nutt, 2000, Hinks, 2004, Mohamed A El-Haram 2002, Mohamed. A El-Haram. and Andrew, 2002), different authors are mentioned the relationship between in organizational goals and business objective. (Alexander, 1996, Then, 1999, Amaratunga. D. & Baldry, 200a)

Various perspectives are offered that help capture the scope and complexity of the decision process associated with facilities management in construction planning. When facilities management in construction planning is undertaken for the right reason, it may prove to be a feasible economically and client requirements for both strategic and operational level. The most commonly cited reason for undertaken facilities management in construction planning is client satisfaction, organizational development, management enhancement in all services from inception to site.

(Lnnda.Tay. and Joseph, 2001) argue the real facility management is to be found in facility planning this is where strategies relate building to corporate objectives are generated. When facility planning does not exist in organization facilities management is marginalizing in the eye of senior management.

(Barrett, 1995) considers the facilities management discipline as one which encompasses both the strategic and the operational. However, it is the strategic area that gives the facilities manager credence to act in the role of lead manager in the management of new project delivery. It is the strategic aspect, which offers the opportunity(Brown et al., 2001)

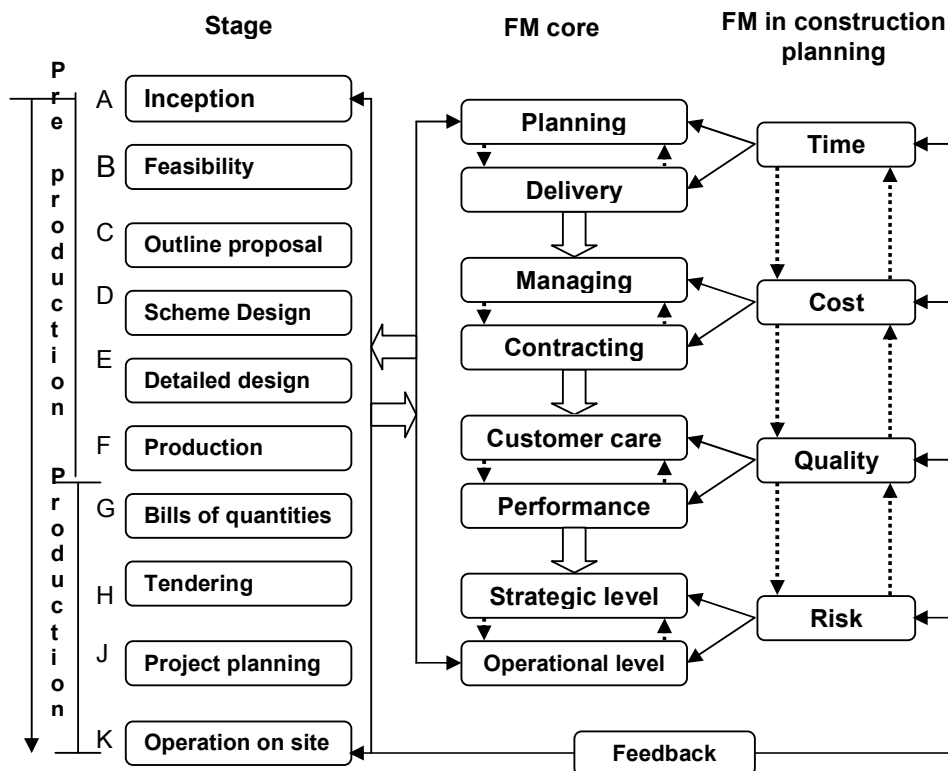
(John Hinks, 1999) has described that a detailed understanding of the client's business process perspective which is required for their successful achievement is already established in the facilities management. It provides the appropriate business specific feedback into early stages of subsequent design and construction process, thereby completing the circle of planning, acting, reviewing and re-

planning. Facilities management mission is to improve the quality of the operating environment continually, to add value to the business and to minimize the exposure of an organizational risk (Alexander, 1993).

The facility manager is able to bring greater knowledge and expertise to the process involved in generating a satisfactory project brief whereas clear that the project manager demonstrates reliance on logistic tools and techniques which may not be entirely appropriate to the task (Brown et al., 2001).

The performance of facilities and the quality of services provided by facilities management in an organization are nowadays controlled via the facilities management performance indicators. These performance indicators include: service level agreements, cross-charging, back-to-back agreements, service quality standards, benchmarking, and facilities management audit (Associates, 1999) (Bernard Williams Associates, 1999; (Kornet, 2000); (Whitaker, 1995)

The figure (1) below explains the synthesis literature of facilities management in construction planning, and we translate this relation with empirical data.



**Theoretical frame work :** Adapted the fm definitions Becker (1990), Nourse (1990), NHS Estates (1996), Alexander (1999), Then (1999) Hinks & Mcnay (1999), Varcoe (2000), Nutt (2000), Tay and Ooi (2001), EuroFM (2002), Gefma (2003) Bernard Williams Associates( 1999)

The above figure describes the relationship of facilities management core competencies and RIBA plan of works and we drive this relation how the FM can change the different stages of the construction planning.

### **2.1. Managing and Controlling of the Organization**

All the organizations have similar sets of generic objective. They are concerned with production, which may be either product/ and service orientation. In order to determine the level of importance of the overall and individual position of the project participants we assess how as to the planning process is dependent on the organization structure. The MIR (mean importance rating) is computed and tabulated to extract the rank of each factor. The assessment of the organizational structure factor is done with reference to the types of organization structure is not good or bad organization structure, only appropriate or inappropriate ones. But in project planning process every task needs specialization because of the complexity of the construction process. The research sub question was on how the organizational structure factor minimizes the financial risk while the project participants promote the continual improvement and quality of work, in order to increase the organizations' profitability and at the same time reduce the operational level, by ensuring effective control of the tactical level.

The result shows that project managers identified four most important factors in the planning process are: minimizing risk (4.50), increasing the profitability (4.60), reducing redundancy (4.20) and effective control (4.20) while engineers indicates (4.33) in promoting in continual improvement of the quality of work.

On the one hand, project manager were of the opinion that the organizational goals is profitability (4.6), whilst the client indicated that the quality of work (4.5).was vital On the other hand the engineers (4.33) and quantity surveyors (4.11) highlighted that the most significant factor in the organization is continual improvement in the quality of work and exposure risk.

### **2.2. Planning and coordination**

Successful project planning requires good participation in the management process, co- ordination and controlling of the project resources. In the planning process, the three most important elements in the organization are minimizing the exposure risks, improving the quality of work and increasing the profitability of the firm. Diligence of the project planning and effective process of resource management produced the quality of the participants are looking and encourages the clients. The project participants have different views in this phase but all targets are in accordance with the client's satisfaction. Respondents were asked about the level of resource issues in project planning. Table (1.1) shows the MIR for project participants.

Table 1.1, MIR for Planning and coordination

Planning and coordination	Architect MIR	Pm MIR	Client MIR	Qs MIR	Eng. MIR
Managing resources (time, budget)	4.08	<b>4.20</b>	4.00	4.00	3.89
HR issues (recruitment, skills shortages)	3.25	3.40	<b>4.00</b>	3.56	3.78
Maintaining in-house knowledge and skills	3.33	3.60	3.67	<b>4.00</b>	3.89
Promoting staff satisfaction	3.58	3.80	<b>4.00</b>	3.89	3.89
Managing information	3.67	4.00	<b>4.17</b>	3.78	4.00
Promoting customer satisfaction	3.58	4.20	4.17	<b>4.22</b>	3.56
Compliance with regulations/ legislation	3.92	3.80	3.83	<b>4.11</b>	3.78

The result of managing resources show that the project manager is the most suitable person for managing the project resource whose MIR indicates (4.20), while the architect is second for this task, The quantity surveyors and clients are next (MIR 4.00) while engineers are least suited to this task (MIR 3.89). Managing information is a vital task for every organization, and to project participant's responses clients shows highest MIR (4.17), while PM and engineers are second (4.00). Architect and quantity surveyors on the other hand, shows the lowest value for managing resource.

Maintaining in-house knowledge and skills of project participant quantity surveyors indicates the highest MIR (4.0) according with other participants, but clients show staff satisfaction in planning process is well needed. (4.0). compliance with legislation and regulations of all concerned part in the project quantity surveyors shows highest according for MIR (4.11).

The highest rated factor of resource issues in project planning process is "managing information" and this indicates the level of importance of team coordination while the participants have different responsibility, but communications and data exchange is well required in the planning process.

### **2.3 Design Responsibility**

The Design teams are often required to certify and take professional design responsibility for a project they designed. In many cases, a modification to the design is required as a project is reviewed. The design team should be expected to have taken into consideration all the applicable code provisions while preparing the design of a project.

The level of project participant in design responsibility, architect is the highest MIR (4.25) in planning preparation, while client is the lowest according MIR value (3.53). In maintenance and controlling, the specification quantity surveyor is considered highest rank (4.17) with other participants.

According, to the results clients was rated (4.03) and quantity surveyors (4.15) are well involved for Service delivery specification, while design review is sharing activities all the team, although quantity surveyors rate is showing lowest rate (3.63)

according with MIR. Quality and variation control during the planning process PM indicates highest MIR (4.17), while architect is lowest (3.75). In traditional organization there are interference for project participators and client especially in architect's job. Accordingly, the above table project manger is acting for the client and he/she is the leader of the team. The figure below describes the relationship of the project participants and design responsibility.

## 2.4 Financial Issue

At the beginning planning in a construction project, a special emphasis should be placed on the difference between construction cost and project costs. The quantity surveyors will be able to provide Information on methods to minimize the costs of project. In the financial issue according the project participant, in procurement and exchanging of information in planning process, PM has the highest MIR (4.40). While the quantity surveyors is a second of above mentioned, but engineers and architect consisted of the lowest among the categories.

Client (4), PM (4.4), and quantity surveyors (4.11) are highlighted for the balancing short cost and long term value in planning phase is important, whereas engineers was rank lowest (3.22).

In procurement selection, there are many factors that effect the selection of the appropriate procurement. However, these entire factors were excluded because of the scope was limited to time. Figure 4-6 indicates the above mean importance rating

## 2.5 Delivery system

As far delivery in planning process, respondent were asked to rate six sub questions that are related cost, time, performance, effective feedback, limitation of internal service and improvement attitude. Table (1.2) shows the MIR rating for above factors.

Table 1.2, MIR in Delivery system

Delivery system	Architect MIR	Pm MIR	Client MIR	Qs MIR	Eng. MIR
Quantify costs to enable full understanding of responsibility	3.75	<b>4.17</b>	4.00	4.13	4.02
Identify consequences of cost reductions	3.50	<b>4.06</b>	<b>4.06</b>	3.50	4.00
Indicate clearly the limitations of internal services	3.67	3.20	4.00	3.75	<b>4.11</b>
Meet agreed targets for performance, time and cost	3.75	<b>4.17</b>	4.11	3.73	3.78
Effective forward planning	4.15	4.05	<b>4.17</b>	4.13	4.13
Effective feedback and evaluation	3.67	4.04	<b>4.15</b>	4.13	4.00

Project manager's response is the highest rate of all service level agreement in planning process, but for the internal services is the lowest. All respondent focuses on effective forward planning, project participants indicate the importance of the

agreement, but every participant had different responsibility. The service agreements in the planning process require for all project participants to produce their ability in order to satisfy clients' at levels this includes detailed design and cost specifications, in order to proceed the preparation of a contract document.

According to table (1.2) project manager is the highest MIR (4.17) in quantifying of cost, while clients and quantity surveyors show same MIR in identifying consequence of cost reduction MIR (4.06) and engineers is second.

As far limitation of internal agreement engineers among sample had shows highest MIR (4.11), while clients is second (4.00), but obtaining targets for performance including on time, cost agreed PM indicates (4.17) in MIR and clients is second (4.11), while other participants show lowest.

## 2.6 Contracting Issues

Contracting issues are very critical elements in the planning process. Project participants are concerned with three main elements. These are quality, value, and risk. It is essential to review the planning process at appropriate time to ensure that the all objectives of the customer are being met. Table (1.6) indicates the MIR of the respondent in contracting issues

Table 1.3, MIR in Contracting issues project participants

Contracting issues	Architect MIR	Pm MIR	Client MIR	Qs MIR	Eng. MIR
Quality--contracting to improve service. e.g. by introducing competition and choice	3.84	3.96	3.83	<b>4.01</b>	3.79
Value--contracting as a way of adding value. e.g. by releasing management time	3.67	<b>3.80</b>	3.67	3.78	3.56
<i>Risk--contracting as a way of transferring risk. ; e.g. by allocating responsibility</i>	3.75	3.80	<b>3.94</b>	3.67	3.56

According to table 1.3, Quantity surveyor shows the importance of the quality issue during the planning (4.01). Where as project manager is a second for this issue and other participants show lower rate but all are significant level.

Adding value and managing the time of contracting project manager shows the highest number according with others (3.80), client and architect has indicate same number (3.67) but engineers is lowest number for above mentioned factor. Allocating responsibility and avoiding risk clients indicate the highest MIR (3.94) while PM is second (3.80) and rest of the participants are shows in significant level. The most important contracting factors according to MIR as viewed project participants are improving contracting service.

## 2.7 Performance issues

A useful starting point is to make a distinction between project resource and project participants. In order to obtain a good model project planning, Table show for (1.7), MIR of performance issue.



Table 1.4, MIR in Performance Issues Project Participants

Performance issues	Architect MIR	Pm MIR	Client MIR	Qs MIR	Eng. MIR
Performance measurement (KPIs)	3.83	<b>4.00</b>	3.83	3.78	3.67
Customer satisfaction	4.00	<b>4.40</b>	4.00	4.00	3.89
Profitability	4.00	<b>4.11</b>	3.91	3.83	3.89
Quality of service from suppliers	3.50	<b>3.80</b>	3.50	3.67	3.78

According to table, 1.4 project managers have the highest MIR of (4.00) for performance measurement. Architect and clients are in second place with (3.83) points. Quantity surveyors have a rating 3.78 points while engineers rate the lowest with 3.67 point, through this is significance according to scale.

Project manager obtained the highest MIR rating of 4.40, while architect quantity surveyors had same MIR 4.00. However, engineer had the lowest MIR 3.89.

Yet again, project managers obtained the higher MIR of 4.11 for the organization profitably while architect rank second 4.00 point. Clients' quantity surveyor had lower ratings.

Project manager obtained rating for quality of service at MIR 3.80 while others had significant level for this issue. A well prepared document from inception to tendering is one of KPI requirements in planning phase, performance measurement in this phase PM is the leader of all participants.

Performance measurement in every project is different one to another, because it relates to how the project participants manage, coordinate, and communicate while they doing feasibility study before they submit for the finalized document. All groups were needed to state their attitudes for this stage. In the early stage of planning, good management, to bring about integration of all the production required. Qualified personnel are needed for this stage.

## 2.8 Customers' Service

In planning production all service must be in agreement with the customers' demand. In table (1.10), fulfillment of customer's satisfaction indicates the acceptance of the shareholders, employees, community, and suppliers in project the planning phase.

According to Customers service to MIR, PM shows high score (4.2) for maintaining shareholders assets, while quantity surveyors are second. Project manager are of the opinion that the morale of employees is important (4.2) while clients and architects are in total agreement with MIR (3.83) and quantity surveyors are second with (4.11). Most of project participants show same MIR (4.0) while Qs is different (3.78) for Maintaining and reinforcing the image of the company.

### 3. DISCUSSION

The findings from the study of facilities management in construction planning show us the role of facilities management in early stages of this process and it provides information for all levels. However, several factors indicate that we are able to improve the situation of construction planning process using facilities management core competencies. The requirements from the public sector and partly private investors regarding lifecycle planning, the changes in the old fashioned building process towards more integrated solutions, coordination information and communication solutions, different elements that we were analyze in Planning and coordination factors had indicated the role in facilities management in pre-production and production stages.

Facilities management in the planning process develops team integrations during the pre-design phase which outlines each team member's role and responsibilities. It sets protocols for communication and reviews, it specifies procedures for documenting commissioning activities and resolving issues, and sets the initial schedule for commissioning activities during the design phase of the project. Facilities manager provider attends selected design team meetings and formally reviews and comments on the design at various stages of development.

Facilities management makes possible for all project participants to share information of each stage of the planning process. In the planning stage, the design team develops the building's design, including documents, plans, and specifications, that meets owner's expectations for the building.(Duffy, 2000), recently referred to the RIBA Strategic Study which identifies the particular skills of the architectural profession and reinforced the primacy of design contribution. He described the close relationship of values between architects and facilities managers, especially the concern for users. Whilst, (Keith, 1993) summarized that the role of facilities management in design responsibilities should include:

1. Planning, preparation, maintenance and control of the service specification and the service delivery specification;
2. Specifying products and services to be produced for the service delivery process;
3. Designing quality control as an integral part of the overall service operation;
4. Implementing design reviews for each stage of the service design;
5. Validating that the service delivery process will meet the service specification requirements; and

Accurate design and construction documents, in turn, result in lower project construction costs. Areas of savings include less rework on the part of the

construction contractor, fewer change orders to the owner for correction of design errors or omissions and the cost of belatedly adding project upgrade features that should have been addressed in the original design.

Indirect cost savings can be realized by avoiding costs associated with loss of productivity during construction-delayed facility start-up, effective review of designs maximizes the probability that a business requirement will be successfully supported by a facility that was conceived and designed.

Results indicates the involvement of facilities management with cost reduction and reducing all costs during the planning process while it balances short term with costs with long term value is very important.

In every project planning activity, a vast number of data are generated and distributed to the involved parties. However, this process does not always take into account the three most important attributes of data, i.e., quality, value, and risk.

The integration of project planning process and contract has become one considerable in optimal approach to successfully reducing project failures and eliminating some of the major problems in the construct stage.

(Alexander, 1992) states that 'the facilities management team must assess how contracting out can contribute to the core tasks of managing quality, value and risk'.

The facilities management in construction planning gives all parts that involve this stage for good confirmation for their skills, resources and clients required objectives.

(Hinks and McNay, 1999) stressed that " the process management of design and construction within the existing interface between core and non-core processes could facilitate improved fit and reduced disruption by the design, production, delivery and commissioning of the new built asset". Facilities management in early phase of project planning and design is important because the highest percentage of the production can be specified in this phase. Nevertheless, the limited information obtained so far is useful in considering the difference between the facility manager led case and the project manager led case. Clearly, the facility manger is able to bring greater knowledge and expertise to the process involved in generating a satisfactory project brief whereas it is clear that the project manager demonstrates reliance on logistical tools and techniques which may not be entirely appropriate to the task.(Brown et al., 2001 ).

Organizational objectives have become more specific in terms of maintaining the resource while keeping a logical balance between the resource, time, and quality of the project deliverables. In the past, the focus has been on assigning properly competent project teams to projects to ensure the success of the project. Although

this approach is a necessary one, current thinking is that more formalized procedures, policies, and tools are necessary for planning and managing projects, facilities management in planning process solves the barriers of resource management and reduces all redundant works.

Regarding organizational structure, the findings show that all participants indicate that they find this factor significant for the organizations ability to satisfy the customers.

All respondents are sought for minimization of the exposure of both clients and organization.

Results has showed that the majority of the project participants were satisfied with using facilities management in early the stage reduces all levels of risk increasing the organizational profitability. In addition, that most of respondents agree that facilities management is well-needed during the early stage in construction planning in order that the future activities of the building are carried out properly..

There is the responsibility to establish an appropriate organizational structure which allows the project to be managed by its objectives with respect to its technology, its contributors and the environment in which it takes place (Bennett, 1991, Walker, 1988, Morris, 1994. )

In organizational changes, respondents show its enhancement and develop the organization's internal environments so that a good climate will be created for client objective, while it provides all involved parties a good consideration and specific responsibility based on with their professional qualification. (Keith, 1992) stated that organizational restructuring provides the opportunity to review options and raises fundamental issues for facilities management --about how facilities management is planned, organized and implemented.

The managing agent approach offers considerable flexibility for the client organization to find and then to hold on to the combination of contracts that suits it best. In this approach, there are no obstacles when some services are part in-house and part outsourced. The managing agent role attracts especial significance since the client organization would be using the agent to contribute expertise and exercise judgment when deciding between in-house and outsourced service provision.(Brian Atkin and Brooks, 2000)

In performance measurement both of internal and external capabilities of the organization to satisfy the client's needs with all the elements whit time, cost and good quality settled in the involving parties are very important. All participants indicated that required standards were important and that improving the workplace and employees was are their goals in order to have good quality of production.

Satisfaction while they indicates improving the work place and employees satisfaction is one their goals, in order to product a detailed production for this stage. Performance measurement in planning process may reduce the costs from overrunning and time expectation for all involved per production and production stage, while every element for these stages is explained in a specific manner.

(Keith,1993 ) indicated, "Performance should become the language of design, specification and contract negotiation. As decisions are reached they can be assimilated in the specification of what service is to be provided and how it is to be delivered. A performance specification will set down the requirements for the service rather than specifying the means of achieving the performance. The organization's ability to set down its needs in a clear specification will be a key determinant of delivering the service to support business needs."

Facilities management enables significant economies in the business operation by reducing redundancy and waste and avoiding duplication of effort and resources and brings benefits of economies of scale.

#### **4. CONCLUSION**

The result of the paper showed that Facilities management in construction planning involves managing and directing comprehensive programs from the design to demolition of the building but in different procedure, organizes and direct resources, and evaluate effectiveness through inspections, and budget controls. Whilst Facilities Management in planning process should, be a central element in business continuity planning, perhaps taking the leading responsibility in the planning preparation. The survey result showed that facility management in planning process identifies all threats that could possibly cause harm and eliminate those does not affect the process and workplace.

Secondly, according the responses provided by the respondents the results shows that there is a general consciousness of the importance of the role facilities management in the Malaysian construction industry, but in different way, despite the very rapidly changing management environment.

The findings also show that there are numerous significant associated factors with the role of facilities management and its usage the industry. While the most of respondents are familiar, they use consultant office and commercial facilities. In practice, most of organizations are outsourcing facilities management non core business activities.

Lastly, the results showed that Facilities management in construction planning reorganizing the organizational administration process by improving management, design, planning, and logistics are applied to all kinds of products, services and

information. An important part has been organizational development focusing on projects participants. Facilities management seeks to realize the objectives of organizations by coordinating the workplace with the people and work of the organization.

### 5. REFERENCES

- AKHLAGHI, F. (1994) History and Development of Facilities Management from the Definitive IN DOCUMENT OF THE POSTGRADUATE PROGRAMME IN FACILITIES MANAGEMENT (Ed., Sheffield Hallam University).
- ALEXANDER, K. (1992) Facilities Value Management. *Facilities*, 10, 8 - 13.
- ALEXANDER, K. (1993) Identifying and managing facilities needs. *Facilities*, 11, 18-21.
- ALEXANDER, K. (1996) *Facilities Management: Theory and Practice by in Management*, Routledge.
- ALEXANDER MAY, O. B., KUNIBERT LENNERTS (2003) The Latest Developments in Facility Management Research.
- AMARATUNGA. D. & BALDRY, D. (200a) A Conceptual Framework to Measure Facilities Management Performance. *Property Management Journal*, 21, 171 - 189.
- ASSOCIATES, B. W. (1999) *Facilities Economics: Incorporating Premises Audits.*, BEB, Chippenham.
- BARRETT, P. (1995) *Facilities Management: Towards Best Practice*, London., Blackwell Science.,
- BECKER, F. (1990) *The Total Workplace: Facilities Management and the Elastic Organization*, , New York: Van Nostrand Reinhold.
- BENNETT, J. (1991) *International Construction Project Management: General Theory and Practice*, Oxford, Butterworth Hienemann.
- BRIAN ATKIN & BROOKS, A. (2000) *Total Facilities Management*, london, Blackwell Publishing
- BROWN, A., HINKS, J. & SNEDDON, J. (2001 ) The facilities management role in new building procurement *Facilities*, 19, 119-130.
- BROWN, R. B., ROWE, M. B., NGUYEN, H. & SPITTLER., J. R. (2001) Time-constrained project delivery issues *AACE International Transactions.*, p. PM91.
- CHOTIPANICH, S. (2004) Positioning facility management. *Facilities*, 22, 364 - 372.
- DUFFY, F. (2000) Design and facilities management in a time of change. *Facilities*, 18, 371-5.
- HINKS, J. (2004) FM and the Management of the Design and Construction Process. <http://www.caber.org.uk/faculty/people/papers/fmlinkp7.asp>.
- HINKS, J. & MCNAY, P. (1999) The creation of a management-by-variance tool for facilities management performance assessment. *Facilities*, 17, 31 - 53.
- IGAL M. SHOHET & LAVY, S. (2004) Development of an integrated healthcare facilities management model. *Facilities*, 22, 129 - 140.
- JOHN HINKS, P. M. (1999) The creation of a management-by-variance tool for facilities management performance assessment. *Facilities*, 17, 31 - 53.
- KORNET, A. J. (2000) Facilities Management Benchmarking in Europe. IN REPORT, E. F. (Ed. *Dutch Benchmarking System*).
- LNNDATAY. AND JOSEPH, T. L. O. (2001) Facilities management: a "Jack of all trades"? *Facilities*, 19, 357 - 363.
- MOHAMED. A EL-HARAM. AND ANDREW, A. (2002) Role of the facility manager in new procurement routes. *ournal of Quality in Maintenance Engineering*, 8, 124-135.
- MORRIS, P. W. G. ( 1994. ) *The management of projects*, London, Thomas Telford.
- NHS, E. (1996) Re-engineering the facilities management service. *Health Facilities Note 16*.
- NOURSE, H. O. (1990) *Managerial Real Estate: Corporate Real Estate Asset Management*, Prentice-Hall, Englewood Cliffs, NJ.
- NUTT, B. (1998) Linking research and best practice opportunities. *Proceedings of the British Institute of FM Annual Conference*. Queens' College, Cambridge.
- NUTT, B. (2000) Four competing futures for facility management. *Facilities*, 18, 124-32.
- PRO-FM (2006) Pro-FM website. *European FM standard is approved (CEN/TC 348)*.
- REGTERSCHOT, J. (1990) Facility management in changing organizations. *Proceedings of the International Symposium on Property Maintenance Management and*

*Modernization, Vol. 1, CIB International Council for Building Research Studies and Documentation Working Commission 70*,. Singapore.

- THEN, D. S.-S. (1999) An integrated resource management view of facilities management. *Facilities*,, 17, 462-469.
- VARCOE, B. (2000) Implications for facility management of the changing business climate. *Facilities*, 18, 383-91.
- WALKER, A. (1988) *Project Management in Construction*, London, BSP Books.
- WHITAKER, M. J. (1995) Conducting a facility management audit. *Facilities*, 13, 6-12.