

Critical Factors in Contract Management

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Keywords

Outsourcing, contract management, risk transfer, reliability, competitive edge.

Summary

Contract management in maintenance organizations involves substantial outsourcing, where cost, expertise, response time, reliability, risk transfer, quality, ease of control etc. would be the major concerns of facilities manager and senior management. There seems a dilemma on the extent of outsourcing, direct staffing, and transformation to multi-skilling, or even in-sourcing. All these would have impacts in the overall control of time, cost, quality, and risk management which would pose significant effects to the corporate image and its competitive edge. In this research, the variables, interrelations, barriers, important factors in formulating outsourcing strategies and tactics will be examined; by means of quantitative approach, with primary and secondary data. Statistical analysis will be implemented to verify the correlations and reliability between the crucial factors identified; in order to further enhance better professional contractual and cost management.

Background

Maintenance is the effort in connection with different technical and administrative actions to keep a physical asset in, or restore it to, a condition where it can perform a required function (BSI, 1993). For almost all properties, proper management/maintenance

of the building structure, fabric, components, finishes and engineering services are crucial to satisfy customers' wants/expectations. Senior Management have to manage effectively/efficiently these "infrastructure" like air-conditioning, mechanical ventilation, fire services, lift/escalators, plumbing/drainage, lighting, laundry and catering installations for hotels; to deliver quality services and mitigate any breakdowns. It's worth noting that business availability is a common performance parameter to show the probability that an equipment or system will be available for its as-built functions, calculated from the operating time and downtime (Kelly, 1984).

Through this research, the existing hotel maintenance practices of Hong Kong would be explored, covering the maintenance performances assessment, considerations for outsourcing, and attitude towards multi-skilling. With these data and analysis, it's hoped to formulate some general outsourcing strategies, guidelines and practices. Reference would be made to the set of key performance indicators for facilities/maintenance management as identified by Hinks and McNay (1999).

Literature review

A proper maintenance framework (right mix of in-house resources and outsourcing) provides an effective tool for cost assignment and tracking cost efficiency. Better knowledge about major cost drivers would enable organizations to optimize the utilization of resources in their Planned Maintenance (PM) activities. The workforce is a focus on the product produced by individuals and teams rather than a focus on tasks. In addition, the primary objective of PM is the minimization of total cost of inspection and repair, and equipment downtime (measured in lost production capacity or reduced product quality). Alternatively, corrective maintenance is often dominated by unplanned events, i.e. functional failure, malfunction, or breakdown of equipment (Tsang, 2002); which should be avoided.

Outsourcing is defined as "the relinquishing of business processes or entire functions to external vendors" (Langer, 2004). Outsourcing is a widely researched topic in strategic management, supply chain management, services, manufacturing and operations management (Blumberg, 1998; Campbell, 1995b; Fan, 2000; Fitzsimmons et al., 1998; Zeffane, 1995). From a strategic perspective, a sourcing decision can be made by taking into account both the scope and the purpose of sourcing (Kakabadse and Kakabadse, 2000). Outsourcing allows an organization to expand its capabilities, performances and competitiveness without the need to expand its workforce. It involves procuring "contracts for service" for contractors' time and effort to deliver a specific end product/service without relying on the Client's core resources. These contracts are typically referred to as service contracts.

Back to the hotel industry, there is limited prior research concerned with outsourcing in the hotel sector (Goldman and Eyster, 1992; Hallam and Baum, 1996; Hemmington and King, 2000; Espino-Rodriguez and Padron-Robaina, 2004; Lam and Han, 2005). This lack of research interest in hotel outsourcing is surprising, as outsourcing has become a significant facet of modern hotel management (Sieburgh, 1992; Rowe, 1994; Hottman and Adams, 1996). Understanding hotels' motivation for outsourcing is important, as organisation is as important as technology, cost, and demand in determining success (Milgrom and Roberts, 1992). Hotel operators consider that outsourcing has great potential to improve cost, strategy, and performance; and thus squeeze operating costs in a tough business environment. Some attempt to adopt strategies for sustaining competitive advantages, such as downsizing and laying off employees, partnering external agents with expertise to operate certain functions through franchising, contracting out or easing arrangements.

At tactical level, once an activity has been identified as non-core, the conventional wisdom is to outsource it to external parties through some contractual arrangements (Fuller, 2002). A major challenge of outsourcing is managing the risk of service agents'

opportunism, where Williamson (1975) defines opportunism as "self-interest seeking with guile. The service activities to be out-tasked are well defined tasks. This mode of sourcing is favoured over in-sourcing in situations where it can lower total costs (Williamson, 1985). When cost efficiency is an issue, the sourcing decision can be guided by application of the transaction cost theory (Williamson, 1985). The sourcing option that will minimize the total cost of transaction (all costs associated with planning, service agreement, work transaction, performance review in the implementation process) should be selected (Bello et. al., 1997). Even when an outsourcing decision is driven by cost saving, the importance of monitoring opportunism should not be overlooked (Wathne and Heide, 2000). During the transactional negotiating process, the business and legal risks would be fairly apportioned between the user and services providers; and supported by good contract management to mitigate risks with decent contract termination. It is quite sure that suppliers/services providers are tempting to deliver the minimum required to generate the maximum profit whilst aiming to safeguard contract retention.

Methodology

To establish an understanding of current maintenance strategies and practices in hotels, a questionnaire is designed to collect information from their FMs. The questionnaire would cover (1) the age, class, number of guestrooms in hotels; (2) maintenance resources allocation; (3) current maintenance practices regarding multi-skilling, in-house and outsourcing labour force; and (4) self-assessed questions to evaluate the strength and weakness in maintenance management in individual hotels. A Likert five point numeric scale has been adopted to help analyse maintenance practices, with "1" for strongly disagree or insignificant and "5" for strongly agree or significant. From the collected data, statistical analysis will be performed to further establish the critical factors in establishing effective maintenance strategies.

1. Findings & analysis of maintenance decisions

In Table 1 below, the average scores indicate the extent of significance of some key factors concerned by the management prior to the development of maintenance strategy and program. According to the findings, health and safety, energy consumption and guest expectation are the main considerations for maintenance decision-making and they are equally significant with an average score ranging from 4.15 to 4.12. Health and safety have become a fundamental requirement for business success; both depend on good maintenance practices to avoid hazards in the buildings or workplaces. There are stringent regulations in the Hotel License imposed by the Hong Kong SAR Government in terms of Fire Regulations, Building Regulations, Environmental Regulations and Standard Requirements of Restaurant Licenses. As the hotel business is an international business where patrons are coming from all over the world, any consequences of mishap in health and safety will ruin a hotel's reputation worldwide.

Description (Variables in statistical analysis)	Response No. for each scale					Average Score
	1	2	3	4	5	
1. Health and safety	0	7	12	39	42	4.15
2. Energy consumption	0	7	12	42	39	4.12
3. Guest expectation	0	10	10	39	41	4.12
4. Degree of influence on business activities	0	12	17	34	37	3.95
5. Environmental Impact	3	5	29	34	29	3.85
6. Hotel policy, objectives and targets	5	3	27	34	31	3.85
7. Maintenance resources	3	7	27	34	29	3.80
8. Legal requirements	5	7	27	34	27	3.71
9. Reliability of system	3	7	29	34	27	3.76

10. Criticality of system	0	17	27	32	24	3.63
11. System life cycle	2	15	27	32	24	3.61
12. Annual budget	5	10	29	32	24	3.61
13. Feedback from other department heads	7	12	29	32	20	3.44
14. manufacturers recommendations	12	10	27	29	22	3.39
15. Equipment history records	7	20	29	27	17	3.27

Table 1 Factors for Maintenance Decision

The statistical analysis of paired-samples all reveals that no significant difference exists between the two variables being considered (as $P > .05$) in the factors for maintenance decision, and therefore the null hypothesis is to be accepted. The paired-samples are listed in ascending order of significance levels, as tabulated below:

Paired-samples	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
VAR00008 - VAR00010	0.08	0.41875	0.04188	-0.00309	0.16309	1.91	99	0.059
VAR00006 - VAR00009	0.08	0.44222	0.04422	-0.00775	0.16775	1.809	99	0.073
VAR00013 - VAR00014	0.07	0.40837	0.04084	-0.01103	0.15103	1.714	99	0.09

VAR00008 - VAR00009	-0.04	0.28141	0.02814	-0.09584	0.01584	-1.421	99	0.158
VAR00010 - VAR00012	0.03	0.26419	0.02642	-0.02242	0.08242	1.136	99	0.259
VAR00002 - VAR00003	0.02	0.24536	0.02454	-0.02868	0.06868	0.815	99	0.417
VAR00005 - VAR00007	0.02	0.31718	0.03172	-0.04294	0.08294	0.631	99	0.53

Table 2 Paired-samples analysis - Factors for Maintenance Decision

- VAR00008 - VAR00010 reflects that *legal requirements* closely connect to *criticality of system* in maintenance decision making.
- VAR00006 - VAR00009 reflects that *hotel policies, objectives & targets* closely connect to *reliability of system* in maintenance decision making.
- VAR00013 - VAR00014 reflects that *equipment history records* closely connect to *manufacturer's recommendations* in maintenance decision making.
- VAR00008 - VAR00009 reflects that *legal requirements* closely connect to *reliability of system* in maintenance decision making.
- VAR00010 - VAR00012 reflects that *criticality of system* closely connect to *annual budget* in maintenance decision making.
- VAR00002 - VAR00003 reflects that *energy consumption* closely connect to *guest expectation* in maintenance decision making.
- VAR00005 - VAR00007 reflects that *environmental impact* closely connects to *maintenance resources* in maintenance decision making.

2. Findings & analysis of in-house or outsourcing maintenance

Maintenance could be performed by in-house direct labour force or outsourced contractors, or a combined proportion of both, though there seems no general guideline of such proportion. The survey results of “Factors for considering in-house or outsourcing maintenance” are reflected in Table 3 below.

Description (Variables in statistical analysis)	Response No. for each scale					Average Score
	1	2	3	4	5	
16. Practical skills of in-house maintenance personnel	0	0	20	39	41	4.22
17. Expertise from outsourcing	0	0	20	39	41	4.22
18. Time constraints	0	5	12	42	41	4.20
19. Legal requirements	0	5	15	41	39	4.15
20. Availability of in-house labor force	0	5	29	32	34	3.95
21. Transfer risk via outsourcing	0	5	29	32	34	3.95
22. Use of special tools and testing instruments	0	5	29	32	34	3.95
23. Degree of system complexity	0	5	29	34	32	3.88
24. Financial constrains	0	7	29	32	32	3.88
25. Technical support from manufacturers or suppliers	0	7	32	32	29	3.83
26. Use of proprietary units or parts	3	7	31	32	27	3.73
27. Historical information	5	22	27	27	19	3.34

Table 3 Factors for considering in-house or outsourcing maintenance

The major considerations are Practical skills of in-house maintenance personnel (4.22), Expertise from outsourcing (4.22), Time constraints (4.20), and Legal requirements (4.15). It seems apparent that Senior management has to strike a balance among these crucial factors to achieve the optimal benefits and/or sustainable competitive advantage

for the hotel organization as a whole.

For more expertised maintenance works where in-house staff could not perform, would have to be outsourced (e.g. maintenance for generator, chiller, boiler). For more immediate attention is required in certain maintenance, in-house staff would be prioritized (and/or trained to perform e.g. when downtime happens in food/beverage services/equipments). In some cases like licensing or renewal of license e.g. lift/escalator installations (relevant registered lift contractor & registered lift engineer should be employed to pursue the Form 11 certificate to be issued by EMSD in HKSAR), fire protection systems (relevant registered FSI contractor should be employed to do annual check up as required by FSD in HKSAR); there is no choice but to outsource (a hotel operator could not afford to keep such personnel just for these annual exercises).

Moreover, Senior management has to carefully compare the actual time (including waiting time and operation time) rendered by an outsourced contractor with that of in-house staff. The degree of skillfulness possessed by a specialized contractor is often better (in terms of technical knowledge, skill, equipment, speed, flexible manpower shuffling etc) than in-house staff, even the latter would be trained. The next tier of vital factors are Availability of in-house labor force (3.95), Transfer risk via outsourcing (3.95), Use of special tools and testing instruments, (3.95), Degree of system complexity (3.88), Financial constrains (3.88), and Technical support from manufacturers or suppliers (3.83); which are self-explanatory. The last tier of vital factors is Use of proprietary units or parts (3.73) and Historical information (3.34).

The statistical analysis of paired-samples all reveals that no significant difference exists between the two variables being considered (as $P > .05$) in judging for in-house or outsourcing, and therefore the null hypothesis is to be accepted. The paired-samples are listed in ascending order of significance levels, as tabulated below:

Paired-samples	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
VAR00020 - VAR00023	0.02	0.14071	0.01407	-0.00792	0.04792	1.421	99	0.158
VAR00022 - VAR00023	0.02	0.14071	0.01407	-0.00792	0.04792	1.421	99	0.158
VAR00017 - VAR00018	0.01	0.30134	0.03013	-0.04979	0.06979	0.332	99	0.741

Table 4 Paired-samples analysis – Factors for considering in-house or outsourcing

- VAR00020 - VAR00023 reflects that *availability of in-house labour force* closely connect to *degree of system complexity* in consideration for in-house or outsourcing.
- VAR00022 - VAR00023 reflects that *use of special tools & testing instruments* closely connect to *degree of system complexity* in consideration for in-house or outsourcing.
- VAR00017 - VAR00018 reflects that *expertise from outsourcing* closely connect to *time constraints* in consideration for in-house or outsourcing.

3. Findings & analysis of multi-skilling

Multi-skilling is a form of working arrangement to enhance engineering staff's competency through proper training. Multi-skilled training offers staff the ability to individually undertake a wider range of tasks, and increase the flexibility of allocating

day-to-day maintenance duties. This would better escalate staff's ability, enhance the overall quality and reduce staffing costs ultimately.

Mono-skilled staff/technicians are normally less capable of achieving multi tasks owing to inadequate knowledge/skill. To convert them to multi-skilled technicians would require both internal and external trainings. They are not eager to accept changes, as they have to pay more effort to learn, and subsequently increase their workload.

As shown in Table 5 below, front-line maintenance technicians' dissatisfaction at doing more tasks (3.49), time constraint on providing adequate internal training (3.46), and shortage of manpower to promote and monitor multi-skilling (3.29) are crucial factors to implement such scheme; while financial constraints on supporting the plan of multi-skilling (2.73) appears not very significant.

Description (Variables in statistical analysis)	Response No. for each scale					Average Score
	1	2	3	4	5	
27. Front-line maintenance technicians' dissatisfaction at doing more tasks	5	20	22	29	24	3.49
28. Time constraint on providing adequate internal training	10	10	27	31	22	3.46
29. Shortage of manpower to promote and monitor multi-skilling	7	12	39	27	15	3.29
30. Financial constraints on supporting the plan of multi-skilling	12	29	39	12	8	2.73

Table 5 Barriers to deployment of multi-skilling

The statistical analysis of paired-samples all reveals that no significant difference exists between the two variables being considered (as $P > .05$) in judging the barriers to deployment of multi-skilling for in-house staff, and therefore the null hypothesis is to be

accepted. The paired-samples are listed in ascending order of significance levels, as tabulated below:

Paired-samples	Paired Differences				t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
VAR00028 - VAR00029	0.02	0.56818	0.05682	-0.09274 0.13274	0.352	99	0.726

Table 6 Paired-samples analysis – Barriers to deployment of multi-skilling

- VAR00028 - VAR00029 reflects that frontline maintenance technicians' dissatisfaction at doing more tasks closely connect to time constraints on providing adequate internal training in judging the barriers to deployment of multi-skilling for in-house staff.

4. Findings & analysis of maintenance decision vs. in-house or outsourcing

Senior management has to consider appropriate optimization of maintenance costs and resources allocation among in-house, in-house plus multi-skilling training, and outsourcing. More knowledge about maintenance cost distributions (routine, corrective, preventive, emergency) would enable hotel operators to optimize resources. Preventive Maintenance would be more emphasized than Corrective Maintenance, to project a better control and reduce system failures, and thus have a better control over maintenance expenditure.

In some cases, hiring few more-qualified/productive/multi-skilled labour on part-time

basis would help reduce maintenance costs and improve effectiveness/efficiencies; instead of purely relying upon long established in-house full-time employees. Outsourcing some maintenance works that demand higher expertise, updated knowledge and advanced equipments could be considered. It is anticipated that further influence regarding incentive, momentum, and pressure may be imposed to in-house staff for improvement.

The statistical analysis of paired-samples all reveals that no significant exists difference between the two variables being considered (as $P > .05$) in maintenance decision making and judging for in-house or outsourcing, and therefore the null hypothesis is to be accepted. The paired-samples are listed in ascending order of significance levels, as tabulated below:

Paired-samples	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
VAR00006 - VAR00024	-0.06	0.31205	0.0312	-0.12192	0.00192	-1.923	99	0.057
VAR00001 - VAR00016	-0.05	0.29729	0.02973	-0.10899	0.00899	-1.682	99	0.096
VAR00001 - VAR00018	-0.04	0.24288	0.02429	-0.08819	0.00819	-1.647	99	0.103
VAR00003 - VAR00019	-0.03	0.26419	0.02642	-0.08242	0.02242	-1.136	99	0.259

VAR00014 - VAR00027	0.06	0.63277	0.06328	-0.06556	0.18556	0.948	99	0.345
VAR00004 - VAR00023	0.03	0.41329	0.04133	-0.05201	0.11201	0.726	99	0.47
VAR00002 - VAR00019	-0.01	0.17379	0.01738	-0.04448	0.02448	-0.575	99	0.566
VAR00004 - VAR00021	0.01	0.38912	0.03891	-0.06721	0.08721	0.257	99	0.798

Table 7 Paired-samples analysis – Maintenance decision vs. in-house or outsourcing

- VAR00006 - VAR00024 reflects that *hotel policies, objectives & targets* in maintenance decision making closely connects to *financial constraints* in considering in-house or outsourcing.
- VAR00001 - VAR00016 reflects that *health & safety* in maintenance decision making closely connects to *practical skills of in-house maintenance personnel* in considering in-house or outsourcing.
- VAR00001 - VAR00018 reflects that *health & safety* in maintenance decision making closely connects to *time constraints* in considering in-house or outsourcing.
- VAR00003 - VAR00019 reflects that *guest expectation* in maintenance decision making closely connects to *legal requirements* in considering in-house or outsourcing.
- VAR00014 - VAR00027 reflects that *manufacturer's recommendations* in maintenance decision making closely connects to *historical information* in considering in-house or outsourcing.
- VAR00001 - VAR00019 reflects that *health & safety* in maintenance decision making closely connects to *legal requirements* in considering in-house or outsourcing.

- VAR00005 - VAR00025 reflects that *environmental impact* in maintenance decision making closely connects to *technical support from manufacturers/suppliers* in considering in-house or outsourcing.
- VAR00004 - VAR00020 reflects that *degree of influence on business activities* in maintenance decision making closely connects to *availability of in-house labour force* in considering in-house or outsourcing.
- VAR00004 - VAR00022 reflects that *degree of influence on business activities* in maintenance decision making closely connects to *use of special tools & testing instruments* in considering in-house or outsourcing.

5. Findings & analysis of maintenance decision vs. multi-skilling

The statistical analysis of paired-samples all reveals that no significant difference exists between the two variables being considered (as $P > .05$) in maintenance decision making and judging the barriers to deployment of multi-skilling for in-house staff, and therefore the null hypothesis is to be accepted. The paired-samples are listed in ascending order of significance levels, as tabulated below:

Paired-samples	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
VAR00014 - VAR00029	-0.06	0.31205	0.0312	-0.12192	0.00192	-1.923	99	0.057
VAR00015 - VAR00030	-0.04	0.63437	0.06344	-0.16587	0.08587	-0.631	99	0.53

VAR00013 - VAR00028	-0.01	0.57726	0.05773	-0.12454	0.10454	-0.173	99	0.863
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Table 8
Paired-samples analysis – Maintenance decision vs. deployment of multi-skilling

- VAR00014 - VAR00029 reflects that *manufacturers recommendations* in maintenance decision making closely connects to *time constraints on providing adequate internal training* in judging the barriers to deployment of multi-skilling for in-house staff.
- VAR00015 - VAR00030 reflects that *equipment history records* in maintenance decision making closely connects to *shortage of manpower to promote & monitor multi-skilling* in judging the barriers to deployment of multi-skilling for in-house staff.
- VAR00013 - VAR00028 reflects that *feedback from other department heads* in maintenance decision making closely connects to *frontline maintenance technicians' dissatisfaction at doing more tasks* in judging the barriers to deployment of multi-skilling for in-house staff.

Conclusion

The success of a hotel relies principally on satisfying customers' wants and expectation through quality of services (such as hospitality, guestroom, food/beverage, leisure facilities if any) and also cost control; which subsequently hooks upon proper hotel management and maintenance. In this research, there are 7 significantly correlated paired-samples in maintenance decision, 3 in in-house or outsourcing, 1 in multi-skilling; whilst 8 significantly correlated paired-samples in maintenance decision vs. in-house or outsourcing, and 3 in maintenance decision vs. multi-skilling. It is expected that these crucial factors would help aid better strategies for hotel maintenance decision,

consideration of in-house or outsource and deploying multi-skilling.

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