

Empirical analysis of factors affecting industrial maintenance services selection

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Abstract

The process of selecting industrial maintenance services needs careful consideration of various factors to ensure that the chosen provider can effectively meet the specific needs of the organization/facility. This research paper examines the key factors that play a significant role in the decision-making process for selecting industrial maintenance services. These factors encompass the nature of services required, the expertise and experience of the service provider, cost and budget constraints, availability and responsiveness, establishment of service level agreements, evaluation of reputation and references, compliance with safety regulations, assessment of technological capabilities, flexibility and scalability of services, and sustainability practices. Through a thorough examination of these factors, industrial facilities can make well-informed decisions that align with their unique requirements and priorities.

Keywords: Industrial Maintenance Services, Throughput, Material Cost, Selection Process, Factors, Service Provider, Facility Requirements.

1. Introduction

Organizations are facing stiff competition from the industry players. Due to globalization, organizations in the manufacturing sector especially need to compete with local and global organizations. This leads organizations to find ways to gain competitive advantages through cost, service, quality, and timely deliveries. In organizations' overall functioning and productivity, effective maintenance management plays a crucial role. Maintenance can be considered in the context of industrial systems like production facilities, buildings, equipment, etc. Nowadays maintenance management is integrated with the corporate strategy to ensure equipment availability, quality products, on-time deliveries, and competitive pricing.

Organizations need maintenance services to improve equipment effectiveness, increase machine availability, uptime, and throughput, reduce maintenance labor and material costs, and minimize the total cost of ownership. This paper studies the factors affecting the selection of industrial maintenance services.

Different measures can be considered to check the effectiveness of the maintenance as Costs involved, the ratio of total maintenance cost to total production cost or total capital cost, the total number of maintenance personnel or percentage of maintenance personnel to total number of production personnel, consequences for lack of maintenance, etc.

The selection process for industrial maintenance services is a critical decision-making process that significantly impacts the overall performance and efficiency of industrial facilities. The selection process for industrial maintenance services can be influenced by a range of factors. This paper aims to explore the various factors that influence the selection process for industrial maintenance services. By examining these studies, we can gain valuable insights into the key considerations for selecting maintenance service providers and identify the factors that play a pivotal role in this decision-making process.

As stated by Waeyenbergh & Pintelon (2009), organizations are striving towards world-class competitiveness which necessitates maintenance improvement through availability and reliability of production facilities, cost reduction, and minimal wastage. They came up with the CIBOCOF (Centre for Industrial Management Maintenance Concept Development) Framework.

2. Key Factors

Here are some key factors that can impact the decision-making process:

1. **Nature of Services:** Assessing the specific maintenance needs of the industrial facility is crucial. Sub-factors like the size of the facility, complexity, equipment or machinery types involved, and the specific maintenance services required viz. preventive, corrective, predictive, etc. should be considered.
2. **Expertise:** Evaluating the expertise and experience of the maintenance service provider is essential for the organizations. This involves examining their track record in delivering similar services, the qualifications and certifications of their staff involved, and their industry knowledge to ensure they can effectively meet the facility's maintenance needs.
3. **Technological Capabilities:** Considering the provider's technological capabilities is important as technology keeps evolving. It should be evaluated whether the agency incorporates modern tools, software, and technologies into its maintenance practices as these can improve efficiency, accuracy, and overall performance.
4. **Cost and Budget:** The cost of maintenance services and the available budget play a significant role in the selection process. It is important to evaluate the pricing structure of the service provider, including any additional costs like spare parts, equipment, or emergency call-outs. Balancing the cost considerations with the service quality and reliability is crucial.
5. **Availability with Response Time:** Availability and responsiveness are vital, particularly for industries requiring uninterrupted operations or having strict uptime requirements. Assessing a provider's ability to promptly respond to maintenance requests, along with their emergency response capabilities, and operating hours is important to ensure they align with the facility's needs.
6. **Service Level Agreements:** Establishing clear service level agreements (SLAs) with the maintenance service provider is always recommended to ensure smooth execution of it. Such agreements define expected performance standards, response times, and other service-specific expectations. They also help to monitor the provider's performance and ensure that the delivered services meet the required standards.
7. **References:** Assessing the reputation of the maintenance service provider is crucial before engaging their services. Gathering references from the industry, reading their client testimonials, and researching their industry reputation can help determine their reliability, professionalism, and customer satisfaction track record.
8. **Compliance with Safety:** It is essential to ensure that the maintenance service provider complies with relevant and contemporary regulations and safety standards. Facilities should evaluate if the provider follows mandated regulations and has appropriate safety protocols in place to protect the facility, equipment, and workforce.
9. **Flexibility and Scalability:** The provider's ability to adapt to changing maintenance needs and scale their services based on the facility's requirements is significant. Flexibility in service offerings, contract terms, and the provider's capacity to accommodate future growth or changes in operations is advantageous. This helps to ensure engaging single service provider encompassing all allied requirements.
10. **Sustainability Practices:** Some organizations prioritize sustainability. It should be assessed whether the maintenance service provider has initiatives planned to reduce environmental impact, improve energy efficiency, and promote sustainability within their maintenance services.

By considering these major factors, industrial facilities can make informed decisions when selecting a maintenance service provider that aligns with their specific needs and priorities. Giving due importance to these factors or assigning them suitable weightage as per the organization's need is required before finalizing the service provider.

Faccio et.al. (2014) offered a quantitative framework for industrial maintenance with two decision-making tools, a decision-making abacus, and graphic curves; to choose between failure-based maintenance and use-based maintenance.

3. Conclusion

In summary, this paper highlights the key factors influencing the selection process for industrial maintenance services. The nature of services, expertise, and experience of the provider, cost and budget considerations, availability and response time, and service level agreements are essential factors that guide decision-making towards this. By considering these factors, industrial facilities can make informed decisions that align with their specific requirements and ultimately lead to efficient and reliable maintenance operations.

Acknowledgements

None.

Conflict Of Interest

None.

Data Availability Statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

References

1. Bokrantz, Jon; Skoogh, Anders; Berlin, Cecilia; Wuest, Thorsten; Stahre, Johan (2019). *Smart Maintenance: a research agenda for industrial maintenance management*. *International Journal of Production Economics*, (), 107547–. doi:10.1016/j.ijpe.2019.107547
2. Chinese, D., Ghirardo, G., 2010. Maintenance management in Italian manufacturing firms: matters of size and matters of strategy. *Journal of Quality in Maintenance Engineering* 16 (2), 156–180 2010.
3. Faccio, M.; Persona, A.; Sgarbossa, F.; Zanin, G. (2014). *Industrial maintenance policy development: A quantitative framework*. *International Journal of Production Economics*, 147(), 85–93. doi:10.1016/j.ijpe.2012.08.018
4. Geert Waeyenbergh; Liliane Pintelon (2009). *CIBOCOF: A framework for industrial maintenance concept development*. , 121(2), 633–640. doi:10.1016/j.ijpe.2006.10.012
5. Löfsten, H. (1999), "Management of industrial maintenance – economic evaluation of maintenance policies", *International Journal of Operations & Production Management*, Vol. 19 No. 7, pp. 716-737. <https://doi.org/10.1108/01443579910271683>
6. Kari Komonen (2002). *A cost model of industrial maintenance for profitability analysis and benchmarking*. , 79(1), 15–31. doi:10.1016/s0925-5273(00)00187-0
7. Ruschel, Edson; Santos, Eduardo Alves Portela; Loures, Eduardo de Freitas Rocha (2017). *Industrial maintenance decision-making: A systematic literature review*. *Journal of Manufacturing Systems*, 45(), 180–194. doi:10.1016/j.jmsy.2017.09.003
8. Waeyenbergh, W., Pintelon, L., 2004. Maintenance concept development: a case study. *International Journal of Production Economics* 89, 395–405 2004
9. Wang, L., Chu, J., Wu, J., 2007. Selection of optimum maintenance strategies based on a fuzzy analytic hierarchy process. *International Journal of Production Economics* 107, 151–163 2007.
10. Wireman, T., 1998. *Developing Performance Indicators for Managing Maintenance*. Industrial Press, New York.