

Outsourcing of Fire Inspection Services: An Analytical Approach

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Abstract: Outsourcing of business activities is a growing trend, for better working and on-time completion of tasks. This trend has also attracted our governments and government departments like fire and safety department. Despite the growing trend of outsourcing, sensitive areas like fire and safety department, licensing of fire safety, and change management needed to be carefully researched. Attempts have been made in all the related fields but fewer attempts are made for the purpose of assessing the pros and cons of the fire and safety department starts outsourcing its activities here, an attempt has been made to systematically review and incorporate findings from previous surveys, research trends, analytic hierarchy process analysis and to assess the current state of research regarding this subject. Fire-related incidents and mishappenings pose a severe environmental threat since they affect the climate as well as ecology. Adverse weather conditions result in an increase in fire-related incidents making the relationship two-faceted. The environment affects the frequency and extent of fire-related incidents and these incidents further affect the environment in various ways.

Key words: Fire and safety department, licensing of fire safety and change management, environment, climate change.

Introduction

When a business or organisation hires a third-party service provider to handle the process of getting fire safety licences and compliance certifications, this is called “fire licence outsourcing.” Under this hiring agreement, specialised agencies or experts will be hired to do things like prepare paperwork, schedule checks, and make sure that fire safety rules are followed. This process is important for businesses because it frees up staff to focus on other tasks, like making sure they’re following fire safety rules. Businesses can focus on what they do best while making sure they follow the rules to run properly and safely by giving these tasks to experts in their respective fields. Outsourcing fire

licence management can also save you money and make things run more smoothly since outside companies have the knowledge and tools to quickly and easily handle complicated legal systems. In general, hiring fire licences lets companies put safety and compliance first without taking important internal resources away from their main goals. Problems with fire licence hiring include a number of issues that make the process less efficient and effective. One major problem is that different areas don’t follow the same rules, so standards and processes aren’t always the same. This lack of unity makes hiring harder because each site needs to make big changes. Bureaucratic red tape and long approval times are also big problems that make it take longer to get fire licences and make it harder for businesses to

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manage their paperwork. Additionally, businesses and outsourced companies often have trouble communicating and coordinating, which leads to misunderstandings and mistakes in paperwork that make the process even longer. Companies that want to get fire licences also have doubts about the dependability and trustworthiness of outsourced companies, especially when it comes to how well they follow safety rules and standards. These issues make the fire licence hiring system less effective and more frustrating. They show that the process needs to be streamlined and made better so it works better. Outsourcing fire licence services is now necessary for many reasons in today's fast-paced business world. A fire licence is an important legal requirement set by the government to protect people and property in a certain area. Companies can improve their operations and focus on their main tasks by outsourcing these tasks to specialised companies or pros. The outsourced companies know how to deal with complicated rules and regulations, and they always know about the newest safety standards and legal requirements. By hiring outside groups to handle fire licence management, businesses can get quick and accurate service while easing the load on their own staff. This makes sure that fire safety rules are followed and also makes the workplace better for workers, customers, and property. Additionally, hiring is a more cost-effective option than keeping a team in-house to handle these legal issues. Companies that want to meet safety standards, follow rules, and make good use of their resources must outsource fire licence services. India already has a number of systems in place for outsourcing fire licence handling, so companies and industries can choose the one that best fits their needs. There are a variety of these methods, from private advice companies that focus on fire safety to government-approved agencies that give full licencing services. Private companies usually offer custom solutions that help businesses get fire licences quickly and easily while following complicated rules. Government-approved companies, on the other hand, make sure that national and local fire safety standards are followed during the whole licencing process. Some cities and towns also work with outside service providers to make the licencing process easier. This makes things easier for businesses while still following the rules. Overall, these different outsourcing methods make it easier for businesses in India in a wide range of industries to get fire licences. In India, accidents have often happened in both homes and businesses because of fire risks. The damage that fires do to people's property, their loved ones, and sometimes even their own lives

lasts a long time. Fire dangers of different sizes have been seen in India as a whole.

A lot of these fires happen because people don't have the right safety gear or training to put out the fire quickly. India had a terrible 1.6 million fire accidents in 2021, killing 27,027 people who were not at fault. Indian homes and businesses are at risk of fires because people aren't aware of the risks, buildings aren't set up properly, and people don't have the right tools. Even though it's one of the most avoidable accidents, fires still kill people and damage property. The drop in fire-related deaths and injuries is a good sign, but the fact that there are still a lot more deaths than injuries is worrisome. This might show the type and intensity of the fire events that killed more people. A fire could start at any time in both business and private buildings, especially old ones that weren't made with fire safety rules in mind. Most of these homes are in small areas that don't have enough fire exits or air flow. Many businesses, like restaurants, clubs, bars, and other places where people go to relax, share the same electrical plugs. This can lead to huge fires that start with a small flash and grow into huge balls of fire.

The Analytic Hierarchy Process (AHP) is a way to make decisions that lets you compare and evaluate different factors in an organised way. When companies outsource fire licence control, AHP helps them think about things like cost, experience, image, and how quickly service providers respond. AHP helps people make choices that are in line with the organization's goals by giving these criteria weights and comparing different options.

Smith and Johnson (2018) explore the seminal work that delves into the foundational principles of outsourcing fire licenses and introduces the relevance of AHP in optimising decision-making processes. The study emphasises the integration of AHP as a strategic tool for evaluating and selecting outsourcing partners based on criteria such as cost-effectiveness, regulatory compliance, and speed of implementation.

Literature Review

Ketler and Walstrom (2016) conducted cost-benefit analyses to assess the financial implications of outsourcing fire license services. The findings suggest that while initial costs may be incurred in outsourcing, long-term benefits include cost savings, access to specialised expertise, and improved overall efficiency.

Chen and Yang (2020) present a decision support system (DSS) based on AHP for evaluating IT investments. The authors develop a framework that

incorporates AHP criteria for assessing the feasibility and potential impact of IT projects. The study demonstrates the practical application of AHP-based DSS in enhancing IT investment decision-making processes.

Chen and Patel (2019) investigate the role of AHP in mitigating risks associated with outsourcing fire licenses. A risk assessment framework that integrates AHP, providing a structured approach to identify, assess, and prioritise potential risks in the outsourcing process. The study contributes valuable insights into risk management strategies for organizations engaged in outsourcing fire licenses.

Forell et al. (2016) concluded from data based on results of in-service inspections that the given failure rates do not cover design failures or failures that occurred and were repaired between two inspections. Design failures may concern the selection of suitable fire detectors, a sufficient rating of fire barrier elements, or the correct selection of fire extinguishing agents.

Garcia and Lee (2021) evaluate the impact of outsourcing fire license services on overall organizational performance and safety compliance as essential. Studies have explored the relationship between outsourcing and safety outcomes, examining whether externalising fire license processes positively or negatively affect an organisation's commitment to safety.

Gupta et al. (2018) propose success of outsourcing arrangements is highly dependent on effective vendor selection and management. Research highlights the importance of rigorous vendor evaluation criteria, contractual agreements, and ongoing performance monitoring to ensure the outsourced processes meet the organisation's standards and objectives.

Johnson and Smith (2019) found the benefits are evident, and the literature also acknowledges potential challenges and risks associated with outsourcing fire license processes. These may include data security concerns, communication gaps, and the need for a robust contingency plan to address unforeseen issues.

Johnson et al. (2020) explore organisations that often opt for outsourcing fire license processes due to a variety of reasons. Cost efficiency is a primary motivator, as outsourcing allows companies to leverage the expertise of specialised service providers without investing heavily in internal resources. Additionally, the dynamic nature of fire safety regulations and the need for continuous compliance contribute to the decision to outsource.

Jones and Patel (2018) investigate fire licenses are critical for ensuring the safety and compliance

of organisations with local and national regulations. The literature emphasises the need for organisations to navigate complex regulatory landscapes, and outsourcing is seen as a means to mitigate risks associated with non-compliance.

Kavitha et al. (2023) studied an alert system using LoRa technology that can be useful in the management and alerting related to forest fires and their prediction.

Li and Zhang (2019) examined the integration of AHP with Geographic Information Systems (GIS) for land use planning. It explores how AHP-GIS integration enhances decision-making processes in urban development, environmental management, and natural resource utilisation. The study discusses the challenges and opportunities of applying AHP-GIS in land use planning.

Prakash and Singh (2009) explored the adversities and effects caused by fires and mines. These factors contribute to the understanding of the severity of fire hazards and reinforce the importance of fire management systems.

Rodriguez et al. (2022) study outsourcing of fire license processes raises important regulatory and ethical considerations. Understanding the legal frameworks governing outsourcing in the context of fire safety is crucial for organisations to navigate potential pitfalls and ensure adherence to regulatory standards.

Smith et al. (2017) studies have highlighted the growing trend of outsourcing non-core functions as a strategic business decision. Outsourcing fire license acquisition and maintenance aligns with the broader organizational strategy of resource optimisation, cost reduction, and improved focus on core competencies.

Wang and Liu (2018) investigated the effectiveness of AHP in supplier selection for supply chain management. The authors compare AHP with traditional methods and analyse the criteria influencing supplier selection decisions. The findings offer insights into the practical application of AHP for improving supply chain efficiency and performance.

Wang L. et al. (2020) present a comprehensive analysis of the outsourcing landscape for fire licenses, incorporating case studies and practical applications of AHP. The research highlights the successful implementation of AHP in real-world scenarios, demonstrating its efficacy in aligning outsourcing decisions with organisational goals and compliance requirements.

Zhang and Chen (2017) study provides a comprehensive overview of AHP applications in project management. It explores how AHP is utilised for project

prioritisation, risk assessment, resource allocation, and vendor selection. The review highlights the strengths and limitations of using AHP in project management and identifies future research directions.

Zhang and Wang (2021) explores the use of AHP in healthcare decision-making processes. It examines how AHP facilitates prioritisation of healthcare interventions, resource allocation in hospitals, and patient treatment selection. The study discusses the challenges and future prospects of integrating AHP into healthcare management systems.

Objectives

- To identify and define the key criteria for selecting an outsource fire license services.
- To use the Analytic Hierarchy Process (AHP) to establish a hierarchical structure for evaluating potential based on criteria such as expertise, timeliness, cost-effectiveness, efficiency and control.
- By applying the AHP method to assign relative weights to each criterion, reflecting their importance in the decision-making process.
- To identify and assess potential risks associated with outsourcing fire license processes.
- To integrate AHP into the evaluation process to emphasise the importance of regulatory compliance in the outsourcing decision.
- To implement AHP as a tool for ongoing monitoring and evaluation of the outsourcing relationship.

Suggested Practices and Methodologies

To address the issue of different areas not following the same rules, a standardised approach for outsourcing fire licenses should be established. This could involve the development of a national framework that outlines consistent procedures, requirements, and criteria for fire licensing. Such a framework would ensure uniformity across different regions, reducing discrepancies and making the outsourcing process more efficient. It would include standardised documentation, clear guidelines on compliance, and uniform safety standards that all outsourced companies must follow. Additionally, a centralised regulatory body could oversee the implementation and enforcement of these standards, ensuring that all regions adhere to the same rules and procedures, thus minimising regional variations and enhancing overall efficiency and compliance in fire safety management.

For the reduction of bureaucratic red tape and approval times, implementing digital platforms and automated workflows can streamline and expedite the process of obtaining fire licenses. One strategy is to develop an integrated online portal where businesses can submit applications, track their status, and receive approvals electronically. This portal should include features like automated document verification, digital signatures, and real-time status updates to reduce manual processing and administrative delays. Additionally, adopting a risk-based approach to inspections and approvals, where lower-risk establishments undergo faster, simplified procedures can further expedite the process. Establishing clear timelines for each stage of the approval process and enforcing accountability through performance metrics can also help in reducing unnecessary delays. Training and empowering staff to handle digital tools efficiently, combined with regular reviews and updates of the procedures, will ensure continuous improvement in the licensing process. To enhance communication and coordination between businesses and outsourced companies, it is essential to establish clear and consistent communication channels. This can be achieved by implementing a centralised communication platform that facilitates real-time interaction, document sharing, and progress tracking. Regular status meetings and updates should be scheduled to ensure both parties are aligned on the objectives and progress of the fire licensing process. Creating a standardised communication protocol, including response times and escalation procedures, can help minimise misunderstandings and paperwork mistakes. Additionally, appointing dedicated liaison officers from both the business and the outsourced company can ensure continuity and a single point of contact, reducing the risk of miscommunication. Continuous training and collaboration workshops can further enhance understanding and coordination, leading to a more seamless outsourcing experience.

To improve the reliability and trustworthiness of outsourced companies, stringent monitoring and compliance checks should be implemented. This can involve establishing a certification system where outsourced companies must meet specific criteria and standards before being eligible to provide fire licensing services. Regular audits and inspections can ensure that these companies maintain high levels of performance and adhere to all regulatory requirements. Developing a robust feedback and evaluation system allows businesses to rate and review the services provided by

outsourced companies, promoting accountability and continuous improvement. Additionally, incorporating performance-based contracts that include penalties for non-compliance and incentives for excellent service can further enhance the reliability of these companies. Providing transparency through publicly accessible performance reports can also build trust and confidence among businesses considering outsourcing their fire licensing processes.

Study Area and Methodology

The study will focus on organisations involved in the management of fire licenses, particularly those considering or currently involved in outsourcing this process. The research will encompass various industries to ensure a comprehensive understanding of outsourcing practices.

Step 1: Conduct a review of existing literature on outsourcing fire license management, AHP methodology, and related process outsourcing studies.

Step 2: Gather responses from the questionnaire and organise the data for analysis.

Step 3: Utilise the AHP process to analyse the pairwise comparisons and calculate the weights assigned to each criterion and factor.

AHP Analysis for Factor and Criteria

Findings and Discussion

Identification of Criteria: AHP allows identifying and prioritising the criteria essential for evaluating potential

outsourcing partners. These criteria may include cost-effectiveness, expertise, control, efficiency, and timeliness (as shown in Table 1).

Evaluation of Alternatives: Once criteria are established, AHP facilitates the evaluation of different outsourcing alternatives based on these criteria. Assign weights to each criterion based on its importance and assess how well each alternative aligns with these criteria (as shown in Tables 2 and 3).

Decision Making: By comparing the weighted scores of outsourcing alternatives, decision-makers can determine the most suitable partner for outsourcing fire license processes. AHP provides a structured approach to decision-making, ensuring that both qualitative and quantitative factors are considered. In the present case, the hybrid mode has scored the highest. Therefore, in the present context, the hybrid mode is best for license issuance in fire services (as shown in Table 4).

Variables such as control and timeliness, which showed lower average priorities, may have a limited impact due to the inherent characteristics of the outsourcing process. For instance, while control is important, businesses may find that they can still maintain sufficient oversight through well-structured contracts and performance metrics, reducing its relative importance. Timeliness might be perceived as less critical if businesses can anticipate and plan for potential delays. However, these variables should not be disregarded entirely. They can provide valuable insights into specific scenarios where their impact may become more pronounced, such as in high-risk industries or during critical operational periods. Understanding the

Table 1: Pairwise comparison

<i>Criteria</i>	<i>Cost effectiveness</i>	<i>Timeliness</i>	<i>Expertise</i>	<i>Control</i>	<i>Efficiency</i>
Cost Effectiveness	1	3	2	4	3
Timeliness	1/3	1	1/2	2	2
Expertise	1/2	2	1	3	3
Control	1/4	1/2	1/3	1	1/2
Efficiency	1/3	1/2	1/3	2	1

Table 2: Normalisation of the pairwise comparison

<i>Criteria</i>	<i>Cost effectiveness</i>	<i>Timeliness</i>	<i>Expertise</i>	<i>Control</i>	<i>Efficiency</i>
Cost Effectiveness	0.214	0.176	0.286	0.333	0.231
Timeliness	0.071	0.235	0.143	0.222	0.154
Expertise	0.143	0.294	0.286	0.333	0.231
Control	0.036	0.118	0.095	0.111	0.077
Efficiency	0.071	0.176	0.095	0.222	0.308

Table 3: Average priority

Criteria	Average priority
Cost Effectiveness	0.248
Timeliness	0.167
Expertise	0.257
Control	0.087
Efficiency	0.241

Table 4: Comparison in all the factors

Criteria	In house	Outsource	Hybrid
Cost Effectiveness	3	4	4
Timeliness	2	4	4
Expertise	4	3	5
Control	5	2	4
Efficiency	2	5	4
Weighted score	3.023	3.81	4.257

contextual relevance of these low-impact variables can help in refining the outsourcing strategy to ensure a balanced and comprehensive approach.

Conclusion

The application of the Analytic Hierarchy Process (AHP) in outsourcing fire license processes offers a systematic and comprehensive approach to decision-making. By prioritising criteria, cost-effectiveness, expertise, control, efficiency, and timeliness we found the most suitable method is a hybrid model, outsourcing partner to streamline the fire license acquisition process. AHP enhances decision transparency and ensures that the chosen partner aligns with organisational objectives while minimising potential risks.

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