

# Outsourcing vs. Carrying In-House of Biomedical Waste Management

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## I. INTRODUCTION

Outsourcing is defined as any job, task, activity or function contracted to a third-party vendor for a significant period of time instead of carrying it out in-house within the company. In this highly competitive world, outsourcing of activities has become the talk of the town. For example, Nike, a well-established company in sports shoes category outsources its complete manufacturing process and advertisement component to multiple countries including China, Indonesia, Taiwan, Vietnam and South Korea in order to bring about quality production and to focus on its core processes like branding and designing of shoes. Nike has grown into a multimillion dollar company by taking advantage of outsourcing activity.

Many of the firms outsource their activities to the third-parties because of the significant advantages it brings about in terms of:

- **Economies of Scale:** Third party outsourced vendor aggregate the orders received and thus can achieve economies of scale.
- **Reduces the Risk:** Outsourcing certain activities to the third party reduces the risk borne by the parent company.
- **Focus on Core Processes:** Firms can thus focus on core processes which they consider to be more important for the growth of the company.

At the same time outsourcing has got certain limitations as well - when the outsourcing firm loses control and command over the entire end-to-end process.

Disposing the hazardous waste is a crucial decision taken by the company as it involves safety, regulatory and financial risk:

- Companies need to take the important decision of whether to outsource such activities or do it in-house judiciously.

- Outsourcing the waste management activity to a third party is **non-risky as the outsourced third party will have expertise in it**. Non-compliance to legal regulations in disposing the waste bring in heavy fine for the company if they carry it out in-house. Moreover, it may lead to spreading of fire or emission of toxic chemicals in the environment if not handled properly.
- Outsourcing is cost effective as well, as the outsourced third party brings in operational efficiency and thus reduces the cost involved in it.

**So, a cost-benefit analysis has to be carried out to take a decision whether to go in for outsourcing or to carry out the task in-house within the company.**

## II. REVIEW OF LITERATURE

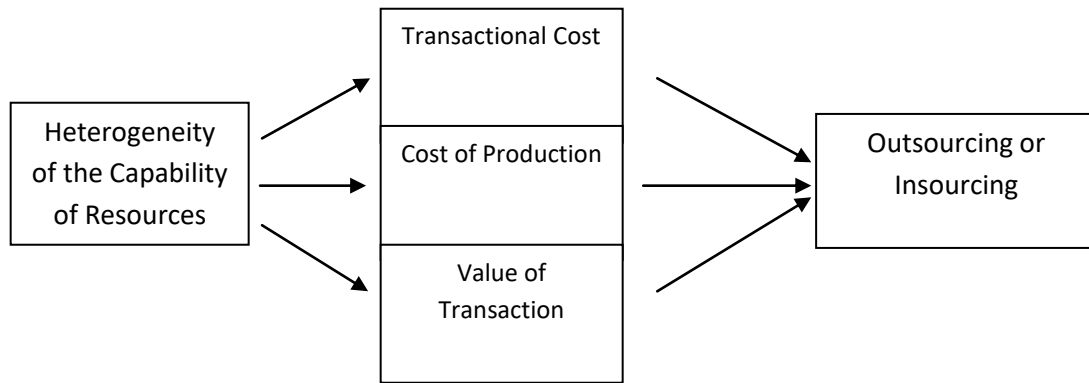
The study mainly takes into consideration the benefits of outsourcing and how the company arrives at a decision of 'Make or Buy', i.e. whether to conduct the activity in-house or outsource it.

### 1. **Title: Antecedents and Consequences of Logistics Outsourcing: An Empirical Investigation in China. Author: Zhuang Bocaho**

Resource based view offers explanation for outsourcing on theoretical basis while Transaction Cost economics interprets the decision of Outsourcing.

It was emphasized that heterogeneity in term of resources and capabilities provides the basic framework of Outsourcing. Hamel & Prahalad (1990) mention that organizations focus on their core-competence and outsource the non-core activities to the third party.

Linking Resources and Capabilities with Outsourcing Decision:



As per Transaction Cost Economics, firms go for outsourcing due to some cost-saving motivation whereas Resource-based Value approach lays emphasis on Value Creation by focusing on Core-competences.

**2. Title: Cost-benefit Analysis / Containment in Biomedical Waste Management – Model for Implementation. Authors: Dr. Hemchandra, K Jamaluddin, Leela Masih, Kasturi Agnihotri**

This model carried out the analysis of cost incurred by the firm in carrying out Biomedical Waste Management (BWM) by the outsourced third party and benefits derived out of safe disposal of biomedical waste which would have otherwise been hazardous for the health of the society. It was concluded that benefits derived are much higher than the cost incurred.

**3. Title: Medical Waste Management: a case study in a small size hospital of Central Italy**

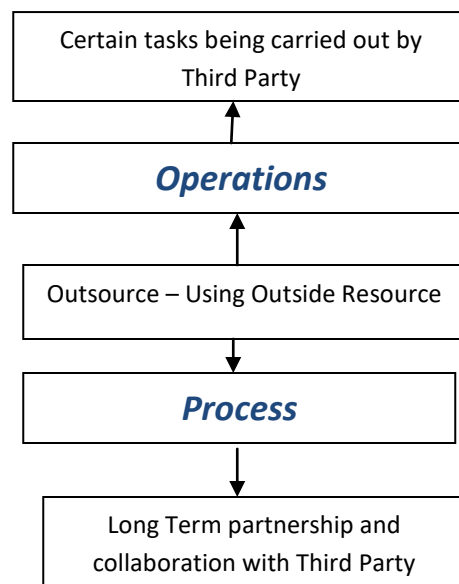
**Authors: Giancarlo Giacchetta, Barbara Marcheth**  
 This paper analyzed the outsourcing of biomedical waste management practice and mentioned that firms go in for

outsourcing because of cost containment and improved efficiency. It concluded that outsourcing process can be improved by the involvement of outsourced party in the waste management optimization plan which would lead to significant reduction in waste and traceability of waste by implementing barcode system.

**4. Title: Outsourcing in Managing a Modern Enterprise. Authors: Oksana Seroka – Stolka and Dagmara Bubel**

Firms should go for outsourcing as their employees are not capable enough to carry out certain activities in a way to protect the environment and firms do not want to invest in training their employees to make them capable enough to carry out the activities in eco-friendly way.

As per the research (Brzezinski.et.al.2012), Outsourcing is a complex process which involves two elements: first one is the form of operation in which certain activity is transferred to external party and second one is a process of building long term collaborative relationship with external third party.



*Comparison Study between 2 Hospitals:***(a) Sanjay Gandhi Post-Graduate Institute of Medical Sciences Hospital, India, and****(b) Shalimar Hospital, Lucknow, India**

Analysis is carried out on two hospitals namely – (a) Sanjay Gandhi Post Graduate Institute of Medical Sciences Hospital which has outsourced Biomedical Waste Management (BWM) process to third-party and (b) Shalimar Hospital, in Lucknow, India, which carries out the activity in-house.

It is not possible to perform cost-benefit analysis as Bio-Medical Waste cannot be recycled due to health hazards it poses to the hospital staff. However, it leads to cost reduction or cost containment by adopting Outsourcing for Bio-Medical Waste Management than carrying it out in-house.

Biomedical Waste Management is a very crucial activity undertaken by the hospitals. If it is not treated and managed properly, it would be hazardous to the environment, public and the hospital staff. Few of the hospitals carry it in-house as they are not convinced enough to rely on the practices carried out by third party, whereas the other firms outsource BWM process to the third party.

BWM is carried out by Incineration technology, Chemical Methods, Autoclaving, Microwave Irradiation Methods. Whether in-house or outsource, it has to be carried out in close supervision of the staff and following the legal guidelines set by Ministry of Forest and Environment, Government of India.

Cost-Benefit / Containment analysis will be carried out on both Sanjay Gandhi Hospitals as well as Shalimar Hospital, Lucknow to find out the effectiveness of Outsourcing.

The basic requirements of BMW facilities are labor, materials and machinery.

The total cost incurred in purchasing the equipment such as Autoclave, Chemicals, Microwave, Incinerator etc. is measured and the cost to be carried out by hospital employees is measured for Shalimar Hospital. This is then compared with the outsourcing cost incurred by Sanjay Gandhi Hospital for a 600-bed hospital and cost of treatment per bed per day is calculated. Please refer table on next page.

Laugen et. al (2005) has given a correlation between the outsourcing of the activities and financial performance of the top-level companies. This is because of the transaction cost economies – which is the underlying factor responsible for Make-or Buy decisions.

*Cost-Benefit / Containment Analysis of Hospital Waste Management for 10 yr period (for a 600-bed hospital):*

<b>Shalimar Hospital (In-house operations)</b>	<b>In INR</b>	<b>Sanjay Gandhi Post-Graduate Institute of Medical Science Hospital (Outsourced operations)</b>	<b>In INR</b>
Cost of consumables	<b>748000</b>	Maximum Charge Slab @ INR 17.50 per occupied bed per day  (Calculated based on 80% hospital-bed occupancy rate and for 150 km distance travelled from Hospital to Third-party location or INR 5000 whichever is higher)	<b>17.5*480*150</b>
Cost of Vehicles (annualized having 10 years life in calculation)	<b>60000</b>		
Cost of Autoclaves and other Equipments	<b>408000</b>		
Manpower	<b>13000</b>		
Electricity and Other Expenditure	<b>21000</b>		
Annual Maintenance of Autoclaves and Vehicles @5% of Cost	<b>110000</b>		
Maximum Charge Slab INR 19.50 occupied per day (Calculated 108000 on 80% Bed Occupancy)	<b>108000</b>		
<b>Total Expenditure</b>	<b>1468000</b>		

*Findings:*

Thus, there is a net profit of INR 2080000 over a period of ten years for Sanjay Gandhi Post Graduate Institute of Medical Science Hospitals compared to Shalimar Hospitals, as the Bio Medical Waste Management has been outsourced to the third party compared to Shalimar Hospitals which is carrying out Waste Management in-house. As a result - it is justifiable for the hospitals to go for Outsourcing for Bio-Medical Waste Management.

In addition to outsourcing of Bio-Medical Waste Management, Sanjay Hospital is also laying emphasis on Energy and Water conservation.

- Meeting the energy requirements from Solar Panels.
- Using LED lights for external lighting arrangements.
- Installation of energy efficient air compressors for energy conservation.
- Setting up Sewage Treatment plant for recycling waste water.

By taking these initiatives, there is a drastic reduction in the cost of the company. There is a net saving of 12% in the past two years in the cost incurred by the company.

### III. APPLICATION OF THEORY TO THE CASES

The Cases of Sanjay Gandhi Post Graduate Institute of Medical Science Hospitals and Shalimar Hospitals are reviewed and analyzed based on Transaction Cost Theory and Resource Based View Theory.

Sanjay Gandhi Hospital should focus on its core activities, and non-core activities should be outsourced to the third party. **The Core Activities of the Hospital can be identified through Resource Based Theory which tells us in which all activities the Hospital is good at. On the other hand, decision of which activity to be outsourced is taken by Transaction Cost Theory.**

*Transaction Cost Theory:*

Transaction Cost Theory basically implies the amount of money involved in undergoing any business transaction or exchange of goods. In this case, it is the amount of money involved in Outsourcing by Sanjay Gandhi Post Graduate Institute of Medical Sciences Hospitals.

**It comprises of three cost components:**

- **Search & Information Cost:** Cost involved in searching the right party to carry out Bio-Medical Waste Management for Sanjay Gandhi Hospitals. *Ferris and Graddy* (1991) presented their views that contractors are

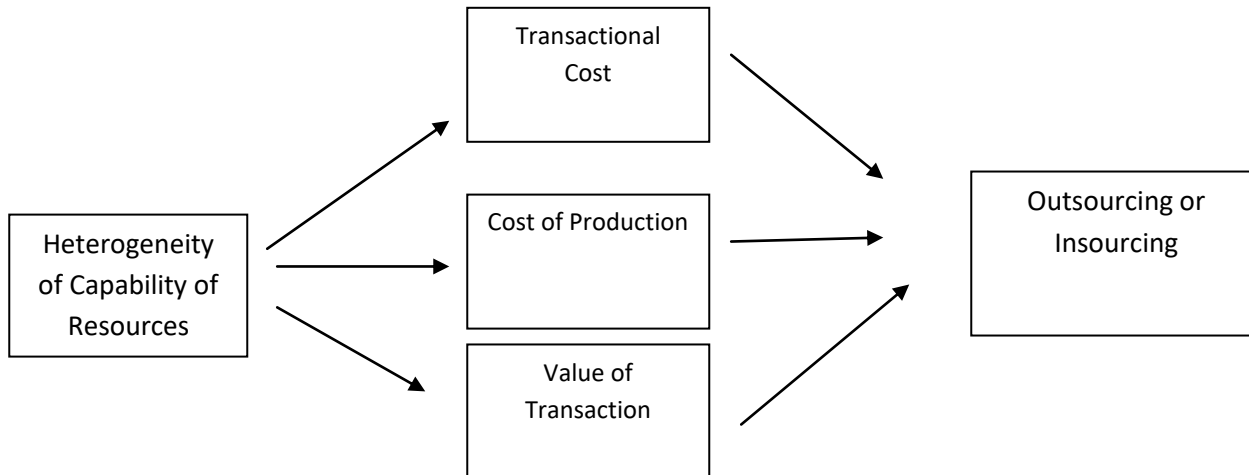
decided by the company based on certain parameters. The first one is Service Delivery Cost which comprises of Production Cost and Transaction Cost. It is the objective that the Transaction Value should always be higher than the Production and Transaction Costs and service delivery cost has to be minimized. Harte and Dale (1995) conducted a survey to shortlist few basic parameters on the basis of which supplier is selected. These five parameters are: **Timeliness** (Timely delivery and meeting the deadline), **Empathy** (to understand each other's point of view), offering **Quality Work** (safe and correct disposal of Biomedical Waste), **Reliability** (trustworthiness) and **Viability** (supplier should be around to fulfill the promises it makes).

- **Bargaining Cost:** Money involved in negotiations between both the parties and finally preparing the contract as per mutual terms and conditions. The Hospitals have relevant qualified staff who prepare the legal contract and then it is submitted for review and approvals / signatures by both the parties.
- **Policing and Enforcement costs:** Policing and enforcement costs are applied as a penalty mechanism if any of the parties do not comply with the norms mentioned in the contract. Sanjay Hospitals has got reward mechanism in order to boost up the morale of the contractor and at the same time punitive measures to penalize the contractor if the work is not carried out as per the contract.

In case of Sanjay Hospitals, transaction cost would be less, because:

- In order to **reduce the Search and Information Cost**, the best solution is maintaining collaborative long term relationships with the contractor. Thus, one time expenditure is being done and thus the best contractor is finalized. Year on Year, Sanjay Hospitals maintain long term collaborative relative relationship with the contractor.
- Based on mutual trust and collaborations with the contractor, the Bargaining cost can be reduced. They don't have to go for Bargaining again and again.
- As the long-term relationship and collaboration is based on mutual trust, so the Policing and Enforcing cost is also reduced as time progresses.

The main objective of Sanjay Hospitals is to bring down Transaction and Production costs so that it should be lower than Transaction Value.



The Production Cost is substantially reduced for Sanjay Hospitals (compared to Shalimar Hospital) as they have gone for Outsourcing of Biomedical Waste Management:

- Economies of Scale:** Contractor can achieve economies of scale as it clubs together the order received from various customers and thus fixed cost investment in purchasing equipment like Incinerator, Autoclaves, Microwave, Chemicals get distributed over more number of customers and thus average fixed cost comes down. On the other hand, Shalimar Hospitals carries the activity in-house. Thus, they cannot achieve economies of scale. **As seen from the above table, Sanjay Hospitals has a net profit of Rs. 2080000 over the next ten years compared to Shalimar Hospitals, as they have outsourced the activity to the third-party contractor.**
- Cost of Training of Employees for Bio Medical Waste Management:** As Bio-Medical Waste Management has to be carried out in compliance with the legal norms laid down by the Government. So, Shalimar Hospital incurs cost in training their employees to carry out the process of Bio-Medical Waste Management in a legal way. Any non-compliance with the legal norms of BWM leads to heavy penalty for Shalimar Hospitals.
- Contractor has expertise in Bio-Medical Waste Management:** The contractor to whom Sanjay Hospital has outsourced the Bio-Medical Waste Management activity has got expertise in it and thus can carry out the process properly. On the other hand, Shalimar Hospital employees don't have the expertise in the field and are thus unable to carry out the process properly.

#### Resource Based View

According to Resource based view, each company possesses heterogeneous resources and differs in terms of capabilities. Each firm has unique set of resources, endowments and capabilities. The competitiveness of any organization depends on its unique and sustainable capabilities (*Barney, 1986, Hamel & Prahalad 1990*). In order to be unique, the resources should fulfill the below mentioned criteria:

- Resource should be unique and rare.
- Company should have a first mover advantage in terms of capability.
- Resource should offer sustainable competitive advantage to the company over other competitors.
- It should not be easily substituted by the competitors.

Resource Based View says that a firm should focus on its core competence and outsource the activities which are not part of their core competence.

**In case of both Sanjay Hospitals and Shalimar Hospitals, the core competence lies in providing healthcare facilities to the patients. Carrying out Bio-Medical Waste Management is not their core competence and thus employees don't have the required expertise in carrying out the same process effectively and efficiently.**

**As a result - profitability and cost efficiency of Shalimar Hospitals has come down as it is carrying out the BWM in-house.**

On the other hand, the contractor to whom Sanjay Hospitals has outsourced the Bio-Medical Waste Management has core competence in carrying it out and thus can perform it effectively and efficiently.

### Comparative Chart of Sanjay Hospitals and Shalimar Hospitals based on Transaction Cost Theory and Resource Based Theory

Parameters	Sanjay Hospitals (Outsourced the Bio-Medical Waste Management)	Shalimar Hospitals (Carrying Bio-Medical Waste Management In-house)
<b>Transaction Cost : Search and Information Cost</b>	Low due to long term contractual relation with the contractor. One time expenditure.	Not Applicable as carrying it in-house
<b>Bargaining Cost</b>	<b>Low</b> due to collaborative partnership with the contractor	Not Applicable
<b>Policing and Enforcement Cost</b>	Low due to Mutual trust and long term partnership	Not Applicable
<b>Production Cost : Economies of Scale</b>	Net profit of INR 2080000 over ten years as contractor achieves economies of scale 12% Cost Reduction	Additional cost of INR2080000 compared to Sanjay Hospitals as they can't achieve economies of scale.
<b>Cost of Training employees for carrying out Bio-Medical Waste Management</b>	<b>Not Applicable</b> as it is outsourced	High Training cost involved
<b>Skills and Expertise</b>	<b>High</b> skills and expertise of the contractor as they carry it on a regular basis	<b>Low</b> skills and expertise as they don't carry it on a regular basis
<b>Resource Based View: Focus on Core Competence</b>	focus on core competence of providing healthcare facility to the patients as non-core competence of BWM is outsourced.	<b>Have to</b> focus on non core competence of BWM than on the core competence of healthcare facility.

#### IV. DISCUSSION AND CONCLUSION

After doing a careful analysis of Case study of Sanjay Hospitals which has outsourced Bio-Medical Waste Management and Shalimar Hospitals which carries out the activity in-house, it has been found that Outsourcing Bio-Medical Waste Management is a win-win situation for both the client and the contractor.

Company which outsources this activity is benefitted in the following terms:

- Achieves cost efficiency as the production cost reduces due to economies of scale
- Carries out the process with the skilled and expert hands of the contractor who has got expertise in carrying out the activity effectively and efficiently.
- Bio-Medical Waste Management is carried as per the legal norms laid down by the government.
- Can focus on core-competence of providing health care facility and elimination non-core competence to the outsourced party.
- Increase in cost efficiency and profitability.
- Contractor is also benefitted as they can achieve economies of scale by clubbing the orders received from many clients.
- It will be beneficial from the environmental perspective as well as the contractor can carry out Bio-Medical Waste Management effectively because of their skills and expertise. Thus it is not hazardous for the environment, hospital staff and the society.

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