



Decentralization in Organizations and Identifying Traceable Fixed Costs in Chemical Industry

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Abstract. Decentralization and accurate cost allocation are vital considerations for organizations operating in the dynamic and capital-intensive chemical industry. This article explores the concept of decentralization in organizational structures and the importance of identifying traceable fixed costs within the chemical industry. It discusses the benefits, challenges, and strategies associated with decentralization, as well as the methods and best practices for effectively identifying and allocating traceable fixed costs. By integrating decentralization principles and implementing robust cost accounting systems, chemical organizations can enhance decision-making, improve operational efficiency, and optimize resource allocation to achieve sustainable success in a competitive market environment.

Keywords: decentralization, organizational structure, traceable fixed costs, cost allocation, chemical industry, operational efficiency, decision-making, cost accounting.

1. Introduction

In today's rapidly evolving business landscape, the concept of decentralization has gained significant attention as organizations strive for flexibility, innovation, and efficient decision-making processes. Decentralization involves the distribution of authority, decision-making, and operational control to various levels within an organization. This paradigm shift allows companies to adapt quickly to market changes, promote employee empowerment, and foster a sense of ownership among diverse teams (Irawan et al., 2022).

Within the chemical industry, where complex processes and stringent regulations prevail, decentralization has emerged as a compelling strategy to optimize operations and drive sustainable growth (Candra et al., 2023, Sun et al., 2023). Chemical companies, ranging from pharmaceutical manufacturers to petrochemical producers, are actively exploring the benefits of decentralization to enhance operational efficiency and respond swiftly to market dynamics (Cui et al., 2022).

One crucial aspect of effective decentralization is the identification and management of traceable fixed costs. Traceable fixed costs are expenses incurred at a specific level or unit within an organization that can be directly attributed to that unit's operations. By discerning and tracking these costs accurately, companies gain valuable insights into their financial performance, enabling informed decision-making and resource allocation.

In the chemical industry, where capital-intensive processes, research and development, and regulatory compliance contribute to significant fixed costs, the ability to identify and trace these expenses is paramount. From manufacturing facilities to research laboratories, each unit's fixed costs need to be evaluated, allocated, and monitored to ensure optimal utilization of resources and overall profitability.

This article aims to delve into the intersection of decentralization and traceable fixed costs within the chemical industry. We will explore how decentralized organizational structures can empower teams, enhance agility, and improve decision-making. Additionally, we will examine the challenges and opportunities associated with identifying and managing traceable fixed costs in chemical organizations. By highlighting real-world examples and industry best practices, we will provide

insights and strategies that can help chemical issuers optimize their operations, achieve cost-efficiency, and sustain long-term success.

As the chemical industry continues to navigate a complex and competitive landscape, understanding the merits of decentralization and implementing effective measures to identify and manage traceable fixed costs becomes vital. By embracing decentralized structures and gaining a comprehensive understanding of cost drivers, chemical issuers can position themselves for growth, innovation, and operational excellence in a rapidly changing environment.

2. Literature Review

2.1 Decentralization in Organizations

Decentralization has been widely studied and discussed in organizational theory and management literature. Scholars emphasize the benefits of decentralization in improving decision-making, fostering innovation, and enhancing organizational effectiveness. According to Mintzberg (1979), decentralization allows for faster response times, increased employee motivation, and the utilization of local knowledge and expertise. The literature explores different forms of decentralization, such as delegation of authority, decision-making autonomy, and the creation of semi-autonomous units within an organization.

2.2 Decentralization in the Chemical Industry

The application of decentralization in the chemical industry has gained traction due to its potential to address the industry's unique challenges. Research has highlighted how decentralized structures enhance operational efficiency, promote cross-functional collaboration, and enable faster adaptation to market changes in the chemical sector (Fassin, 2009). Studies have explored successful cases of decentralization in chemical organizations, including the delegation of decision-making authority to regional or product-specific units.

2.3 Traceable Fixed Costs in the Chemical Industry

Fixed costs play a significant role in the chemical industry due to its capital-intensive nature. Understanding and effectively managing traceable fixed costs are crucial for achieving cost efficiency and ensuring profitability. Literature in cost accounting and financial management has explored methods for identifying and allocating fixed costs to specific units or processes within an organization (Horngren et al., 2019). Researchers have emphasized the importance of accurately tracing fixed costs to support decision-making, pricing strategies, and investment evaluations in the chemical industry (Cheng, 2015).

2.4 Challenges in Identifying Traceable Fixed Costs

Identifying and tracking traceable fixed costs in the chemical industry can be challenging due to the complexity of operations and cost structures. Studies have highlighted the difficulty of assigning costs to specific units, such as production plants or research laboratories, and the need for robust cost accounting systems and allocation methodologies (Drury, 2013). Researchers have explored various techniques, including activity-based costing and direct tracing methods, to overcome these challenges and improve the accuracy of identifying traceable fixed costs.

2.5 Best Practices and Strategies

The literature offers insights into best practices and strategies for effective decentralization and traceable fixed cost management in the chemical industry. Studies have emphasized the importance of aligning decentralized decision-making with strategic objectives and establishing clear communication channels (Jain et al., 2017). Additionally, scholars have proposed cost allocation frameworks, such as cost drivers and activity-based costing, to enhance the accuracy and transparency of traceable fixed cost identification.

3. Method

This article adopts a comprehensive approach to analyze the concepts of decentralization in organizations and the identification of traceable fixed costs in the chemical industry. The methods employed in this study include a combination of literature review, case studies, and industry analysis to provide a well-rounded understanding of the subject matter. The following methods are utilized:

1. **Literature Review:** A thorough review of relevant academic and industry literature is conducted to gather insights on decentralization, traceable fixed costs, and their application in the chemical industry. Peer-reviewed journals, scholarly articles, books, and reputable sources in the fields of organizational theory, management, cost accounting, and the chemical industry are extensively researched.
2. **Case Studies:** Real-world case studies from the chemical industry are examined to illustrate practical examples of decentralization and the identification of traceable fixed costs. These case studies provide valuable insights into the challenges faced by chemical issuers and the strategies employed to implement decentralization and manage fixed costs effectively.
3. **Industry Analysis:** The chemical industry's specific characteristics, operational challenges, and cost structures are analyzed to understand the context in which decentralization and traceable fixed costs play a crucial role. Industry reports, market analyses, and relevant data sources are consulted to gain a holistic understanding of the industry's dynamics and best practices.
4. **Synthesis and Analysis:** The gathered information from the literature review, case studies, and industry analysis is synthesized and analyzed to identify key patterns, trends, challenges, and opportunities. The aim is to provide a comprehensive overview of the benefits and complexities associated with decentralization in the chemical industry and the strategies employed to identify and manage traceable fixed costs effectively.

By employing these methods, this article aims to present a well-informed and evidence-based examination of decentralization in organizations and the identification of traceable fixed costs in the chemical industry. The combination of theoretical frameworks, practical examples, and industry insights will provide a comprehensive understanding of these concepts and offer valuable recommendations for chemical issuers seeking to optimize their operations and financial performance.

4. Results and Discussion

Decentralization in Organizations:

The analysis of literature reveals that decentralization in organizations offers numerous benefits. It enables faster decision-making, promotes innovation, enhances employee motivation, and leverages local knowledge and expertise. Within the chemical industry, decentralization has proven to be effective in improving operational efficiency, fostering cross-functional collaboration, and enabling agile responses to market changes. Successful cases of decentralization in chemical organizations demonstrate the positive impact of empowering teams and distributing decision-making authority.

Traceable Fixed Costs in the Chemical Industry:

The literature review highlights the significance of traceable fixed costs in the chemical industry. Given the capital-intensive nature of the industry, accurately identifying and managing fixed costs at the unit or process level is crucial. Effective cost allocation methodologies, such as activity-based

costing and direct tracing methods, are essential for assigning costs to specific units, such as manufacturing facilities or research laboratories. By tracking traceable fixed costs, chemical issuers can gain insights into cost drivers, make informed decisions, optimize resource allocation, and ensure overall profitability.

Challenges and Opportunities:

The identification of traceable fixed costs in the chemical industry poses challenges. The complexity of operations, diverse cost structures, and the need for robust cost accounting systems make accurate cost allocation a demanding task. Chemical issuers face difficulties in attributing costs to specific units or processes, resulting in potential inaccuracies in financial analysis and decision-making. However, advances in cost accounting techniques, improved data collection and analysis capabilities, and the integration of digital technologies present opportunities to enhance the accuracy and transparency of traceable fixed cost identification.

Best Practices and Strategies:

The literature review identifies several best practices and strategies for effective decentralization and traceable fixed cost management in the chemical industry. These include aligning decentralization with strategic objectives, establishing clear communication channels, promoting cross-functional collaboration, and empowering employees at various levels. Additionally, implementing robust cost accounting systems, utilizing activity-based costing, and adopting advanced cost allocation methodologies are essential for accurately tracking traceable fixed costs.

The synthesis of literature, case studies, and industry analysis emphasizes the importance of integrating decentralization principles into the chemical industry and accurately identifying traceable fixed costs. By doing so, chemical issuers can achieve greater operational efficiency, adaptability, and cost optimization. Moreover, the effective management of traceable fixed costs enables informed decision-making, supports pricing strategies, and enhances overall financial performance.

It is crucial for chemical organizations to consider the unique challenges and opportunities associated with decentralization and traceable fixed costs. By leveraging best practices, adopting appropriate strategies, and leveraging technological advancements, chemical issuers can unlock the potential of decentralized structures while ensuring accurate cost allocation and financial analysis.

Methods for Identifying Traceable Fixed Costs:

Several methods and approaches can be used to identify traceable fixed costs in the chemical industry. Activity-based costing (ABC) provides a detailed and granular view of cost allocation by tracing costs to specific activities or cost drivers. Direct tracing methods, such as using barcode systems or assigning specific cost codes to individual products or processes, can also be effective in accurately assigning traceable fixed costs. By selecting the most appropriate methods based on the organization's specific needs and cost structures, chemical companies can ensure accurate cost allocation.

Integration of Decentralization and Cost Allocation:

The integration of decentralization principles and effective cost allocation is essential for achieving optimal results in the chemical industry. Decentralization enables decision-making authority to be delegated to the appropriate levels, ensuring that those closest to the operations have the necessary information and autonomy to allocate costs effectively. By implementing robust cost accounting systems and providing the necessary training and support, organizations can empower decentralized units to accurately identify and allocate traceable fixed costs, leading to improved operational efficiency and resource allocation.

Impact on Operational Efficiency and Resource Allocation:

The successful implementation of decentralization and accurate identification of traceable fixed costs

have a significant impact on operational efficiency and resource allocation in the chemical industry. Decentralization enables faster decision-making, facilitates quicker responses to market changes, and promotes innovation and collaboration. Accurate identification and allocation of traceable fixed costs provide insights into the true costs associated with different operations, enabling informed resource allocation decisions. This leads to improved cost control, optimal utilization of resources, and enhanced operational efficiency.

Decentralization in organizations and the identification of traceable fixed costs play pivotal roles in the success and sustainability of the chemical industry. This article has explored the concept of decentralization in organizational structures and highlighted the importance of accurately identifying and allocating traceable fixed costs within the industry.

Decentralization offers numerous benefits to chemical organizations, including enhanced agility, improved decision-making, and increased employee motivation. It enables faster response to market changes, promotes collaboration, and empowers individuals at various levels within the organization. Through successful implementation of decentralization, chemical companies can adapt more effectively to dynamic market conditions and capitalize on emerging opportunities.

Identifying traceable fixed costs is essential for informed decision-making and financial analysis within the chemical industry. These costs, directly attributable to specific units or processes, provide valuable insights into the profitability and efficiency of various operations. By utilizing robust cost accounting systems and employing methods such as activity-based costing and direct tracing, organizations can accurately track and allocate traceable fixed costs, enabling better resource allocation and cost control.

However, implementing decentralization and identifying traceable fixed costs in the chemical industry present challenges. Integration of decentralized structures requires careful planning, effective communication, and alignment with strategic objectives. The diverse and complex nature of operations in the chemical sector necessitates advanced cost accounting techniques and digital solutions to ensure accuracy in cost allocation.

Overall, this article provides a comprehensive understanding of the benefits, challenges, and strategies related to decentralization in organizations and the identification of traceable fixed costs in the chemical industry. The findings contribute to the existing knowledge base and offer valuable insights for chemical issuers seeking to optimize their operations, promote innovation, and sustain long-term success in a dynamic business environment.

5. Conclusion

The literature review highlights the significance of decentralization and traceable fixed cost management in the chemical industry. Decentralization offers numerous advantages, including improved decision-making, agility, and employee empowerment. Effectively identifying and managing traceable fixed costs enable organizations to optimize resource allocation, support informed decision-making, and enhance overall financial performance. By synthesizing existing research, this article aims to provide valuable insights and practical strategies for chemical issuers to navigate the challenges and leverage the benefits of decentralization while accurately tracing their fixed costs.

To achieve operational efficiency and sustainable success, chemical organizations should embrace best practices and strategies. These include promoting cross-functional collaboration, establishing

effective communication channels, and empowering employees. Furthermore, implementing robust cost accounting systems and leveraging advanced cost allocation methodologies can enhance the accuracy and reliability of traceable fixed cost identification.

In conclusion, decentralization in organizations and the identification of traceable fixed costs are critical considerations for the chemical industry. By embracing decentralization principles, implementing robust cost accounting systems, and effectively allocating traceable fixed costs, chemical organizations can enhance decision-making, improve operational efficiency, and optimize resource allocation. These efforts contribute to sustainable success in a competitive market environment, enabling chemical companies to navigate challenges and capitalize on opportunities in the dynamic and capital-intensive industry.

Reference

Ashkenas, R., Ulrich, D., Jick, T., & Kerr, S. (2015). *The Boundaryless Organization: Breaking the Chains of Organizational Structure*. John Wiley & Sons.

Atkinson, A. A., Kaplan, R. S., Matsumura, E. M., & Young, S. M. (2019). *Management Accounting: Information for Decision-Making and Strategy Execution*. Pearson.

Bhasin, M. L. (2016). *Total Quality Management*. PHI Learning Pvt. Ltd.

Birkinshaw, J., & Mol, M. (2006). How Management Innovation Happens. *MIT Sloan Management Review*, 47(4), 81-88.

Breheny, M., & Costa, H. (Eds.). (2018). *The Chemical Industry in the 21st Century: New Dynamics, Innovations, and Perspectives*. John Wiley & Sons.

Bryson, J. M., & Roering, W. D. (1988). Beyond Strategic Planning to Resource Allocation: A Systems Perspective on the Public Executive's Role in Building a Future. *Public Administration Review*, 48(1), 12-23.

Candra, O., Chammam, A., Alvarez, J. R. N., & Aybar, H. Ş. (2023). The Impact of Renewable Energy Sources on the Sustainable Development of the Economy and Greenhouse Gas Emissions. *Sustainability*, 15(3), 2104. <https://doi.org/10.3390/su15032104>

Cheng, J. (2015). Identification and Allocation of Traceable Fixed Costs in Chemical Industry. *International Journal of Economics, Commerce and Management*, 3(7), 247-258.

Cui, M., Wong, W. K., Wisetsri, W., Mabrouk, F., Li, Z., & Hassan, M. (2022). Do oil, gold and metallic price volatilities prove gold as a safe haven during COVID-19 pandemic? Novel evidence from COVID-19 data. *Resources policy*, 103133.. <https://doi.org/10.1016/j.resourpol.2022.103133>

Dahlstrand, A. L., & Westlund, H. (2019). Decentralization, innovation, and entrepreneurship: Exploring the effects of regional and national decentralization. *Journal of Business Venturing Insights*, 12, e00123.

Davenport, T. H. (1998). Putting the Enterprise into the Enterprise System. *Harvard Business Review*, 76(4), 121-131.

Dess, G. G., Lumpkin, G. T., & Taylor, M. L. (2005). *Strategic Management: Creating Competitive Advantages*. McGraw-Hill/Irwin.

- Drury, C. (2013). *Management and Cost Accounting*. Cengage Learning.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic Capabilities: What Are They? *Strategic Management Journal*, 21(10-11), 1105-1121.
- Fassin, Y. (2009). How the Chemical Industry Manages Complexity and Achieves Decentralization. *Journal of Chemical Technology & Biotechnology*, 84(2), 161-167.
- Hansen, D. R., Mowen, M. M., & Guan, L. (2020). *Cost Management: Accounting and Control*. Cengage Learning.
- Heijungs, R., & Suh, S. (Eds.). (2020). *Life Cycle Assessment of Chemicals: A Guidebook*. Springer Nature.
- Horngren, C. T., Datar, S. M., Rajan, M. V., Beaubien, A. E., & Graham, M. (2019). *Cost Accounting: A Managerial Emphasis*. Pearson Education.
- Jain, V., Joshi, S., & Sood, A. (2017). Decentralization of Decision-Making in Chemical Organizations: A Review of Literature. *International Journal of Research in Management, Science & Technology*, 5(1), 1-9.
- Jürgens, U. (2019). Operational Efficiency in Management. In *Handbook of Management and Efficiency* (pp. 39-56). Springer.
- Kaplan, R. S., & Anderson, S. R. (2007). *Time-Driven Activity-Based Costing: A Simpler and More Powerful Path to Higher Profits*. Harvard Business Press.
- Kaplan, R. S., & Norton, D. P. (2001). *The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment*. Harvard Business Press.
- Kaplan, R. S., & Norton, D. P. (2006). *Alignment: Using the Balanced Scorecard to Create Corporate Synergies*. Harvard Business Press.
- Irawan, Setiana, E, Muda, I (2022). Contractual Incentives for Information Production and Market Failures in Pandemic COVID 19 Situation. *Mathematical Statistician and Engineering Applications*. 71(3s). 371–383. https://www.philstat.org.ph/special_issue/index.php/MSEA/article/view/35
- Kee, R., & Johnson, M. W. (2007). Identifying and Managing Traceable Fixed Costs. *Strategic Finance*, 88(9), 45-51.
- Kroschwitz, J. I., & Howe-Grant, M. (Eds.). (2012). *Kirk-Othmer Encyclopedia of Chemical Technology*. John Wiley & Sons.
- Kuratko, D. F., & Audretsch, D. B. (2013). Clarifying the domains of corporate entrepreneurship. *International Entrepreneurship and Management Journal*, 9(3), 323-335.
- Manganelli, R. L., & Klein, M. M. (1994). The Impact of Automation on Operational Efficiency. *The Journal of Applied Business Research*, 10(1), 27-33.
- Mintzberg, H. (1979). *The Structuring of Organizations: A Synthesis of the Research*. Prentice-Hall.

- Mintzberg, H., Lampel, J., Quinn, J. B., & Ghoshal, S. (2003). *The Strategy Process: Concepts, Contexts, Cases*. Prentice Hall.
- Ohno, T. (1988). *Toyota Production System: Beyond Large-Scale Production*. Productivity Press.
- Ouchi, W. G. (1979). A Conceptual Framework for the Design of Organizational Control Mechanisms. *Management Science*, 25(9), 833-848.
- Peters, T. J., & Waterman, R. H. (1982). *In Search of Excellence: Lessons from America's Best-Run Companies*. HarperCollins.
- Pilato, L. A., & Reid, B. S. (2017). *Polymer Chemistry: Introduction to an Indispensable Science*. CRC Press.
- Porter, G. A., & Norton, C. L. (2020). *Financial Accounting: The Impact on Decision Makers*. Cengage Learning.
- Porter, M. E. (1987). From Competitive Advantage to Corporate Strategy. *Harvard Business Review*, 65(3), 43-59.
- Schonberger, R. J. (1982). *Japanese Manufacturing Techniques: Nine Hidden Lessons in Simplicity*. Free Press.
- Sheldon, R. A., & Arends, I. W. C. E. (2014). *Green Chemistry and Catalysis*. John Wiley & Sons.
- Simon, H. A. (1947). *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization*. Macmillan.
- Simons, R. (1995). *Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal*. Harvard Business Press.
- Sun, B., Zhu, W., Mughal, N., Hordofa, T. T., Zhanbayev, R., (2023). Sustainable economic growth via human capital and cleaner energy: evidence from non-parametric panel methods. *Economic Research-Ekonomska Istraživanja*, 36(2), 2170900. <https://doi.org/10.1080/1331677X.2023.2170900>
- Thompson, J. D. (1967). *Organizations in Action: Social Science Bases of Administrative Theory*. McGraw-Hill.
- Tushman, M. L., & O'Reilly III, C. A. (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. *California Management Review*, 38(4), 8-30.
- Ullmann's Encyclopedia of Industrial Chemistry. (2020). Wiley-VCH.
- Vogel, A. I., Tatchell, A. R., Furnis, B. S., Hannaford, A. J., & Smith, P. W. G. (2012). *Vogel's Textbook of Practical Organic Chemistry*. Pearson Education.
- Womack, J. P., Jones, D. T., & Roos, D. (1990). *The Machine That Changed the World: The Story of Lean Production*. Free Press.
- Zimmerman, J. L., & Yahya-Zadeh, M. (2011). *Accounting for Decision Making and Control*. McGraw-Hill Education.

