



A Study on Impact of ERP Implementation on Production Planning, Control and Operational Efficiency.

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Abstract

The implementation of Enterprise Resource Planning (ERP) systems has become an essential strategy for organizations aiming to improve productivity, coordination, and operational performance. ERP integrates various business functions such as production planning, inventory management, finance, procurement, and human resources into a single unified system. This study focuses on analysing the impact of ERP implementation on production planning, production control, and operational efficiency within organizations. The research examines how ERP systems help in improving decision-making, reducing production delays, enhancing coordination among departments, and increasing overall organizational efficiency. The study is based on primary data collected from employees and professionals working in organizations using ERP systems. A structured questionnaire was used to gather responses regarding ERP effectiveness in production-related activities. Statistical tools such as , Reliability Test, Correlation Analysis, Chi-Square Test, ANOVA Test and Regression Analysis were used to analyse the collected data. The findings of the study indicate that ERP implementation has a positive impact on production planning and control by improving data accuracy, reducing operational errors, and enhancing workflow efficiency. The study concludes that effective ERP implementation significantly contributes to operational efficiency and organizational performance.

Keywords: Enterprise Resource Planning (ERP), Production Planning, Production Control, Operational Efficiency, Organizational Performance, Workflow Efficiency, Inventory Management, Decision-Making, Business Integration, Productivity Improvement.



INTRODUCTION

Enterprise Resource Planning (ERP) is an integrated software system that helps organizations manage and automate core business activities through a centralized database and real-time information sharing. ERP systems combine various functional areas such as production, inventory, finance, human resources, sales, and procurement into a single platform, enabling better communication and coordination across departments.

In the modern business environment, manufacturing organizations face challenges such as production delays, inventory mismanagement, poor coordination, and inefficient resource utilization. To overcome these challenges, many organizations adopt ERP systems to streamline operations and improve productivity. ERP plays a major role in production planning by helping organizations forecast demand, allocate resources effectively, schedule production activities, and maintain inventory control. Similarly, ERP improves production control by monitoring production processes, tracking performance, and reducing operational errors.

Operational efficiency refers to the ability of an organization to utilize its resources effectively while minimizing wastage, delays, and costs. ERP systems contribute to operational efficiency by providing accurate and real-time information for decision-making, improving workflow management, and enhancing overall organizational coordination. Therefore, this study aims to examine the impact of ERP implementation on production planning, production control, and operational efficiency in organizations.

PROBLEM STATEMENT

Many organizations face operational challenges such as inefficient production planning, poor production control, communication gaps between departments, inventory-related issues, and delays in decision-making. Traditional management systems often fail to provide accurate and real-time information required for effective production management. As a result, organizations may experience reduced productivity, increased operational costs, and lower efficiency.

Although ERP systems are implemented to overcome these challenges, some organizations still face difficulties in achieving the expected benefits due to improper implementation, lack of employee training, resistance to change, and system integration issues. Therefore, it is important to analyze whether ERP implementation effectively improves production planning, production control, and operational efficiency. This study attempts to identify the impact of ERP systems on organizational performance and evaluate their effectiveness in enhancing operational activities.

RESEARCH OBJECTIVES

- To Study on the impact of ERP implementation on production planning, production control, and operational efficiency.
- To assess the role of ERP in improving production scheduling accuracy and demand forecasting.
- To evaluate the effectiveness of ERP in Material Requirement Planning (MRP) and capacity planning.
- To understand the effectiveness of ERP in inventory control and stock accuracy.
- To analyse how ERP contributes to reducing production downtime, bottlenecks, and errors.
- To assess the overall improvement in organizational performance due to ERP implementation.



LITERATURE REVIEW

Syamsuddin and Bahrul Ulum Ilham (2023) explained that ERP systems improve production planning and inventory control in manufacturing firms. Their study found that ERP provides accurate information about material availability, production schedules, and customer demand. The authors concluded that ERP reduces delays and improves coordination between departments.

Hyeon Jo and Do-Hyung Park (2023) stated that ERP success depends on user satisfaction, system quality, and employee training. Their study found that organizations with effective ERP training programs experience higher productivity and better operational efficiency.

Mohamed Rafik Noor Mohamed Qureshi and Zainab Nadhim Jawad (2024) explained that ERP systems improve supply chain management and production forecasting. Their study highlighted that ERP helps firms optimize inventory levels and improve demand planning.

Wolfgang Seiringer and Balwin Bokor (2024) stated that ERP-based production planning systems perform better than traditional methods. Their study found that ERP improves material requirement planning, production scheduling, and inventory control.

Kedem-Yemini and Hustad (2023) found that ERP systems improve operational efficiency through process automation and data integration. Their study reported that ERP helps managers make faster decisions by providing real-time information.

CONCEPTUAL FRAMEWORK

The conceptual framework of this study is based on the relationship between ERP implementation and organizational operational performance.

Independent Variable

- ERP Implementation

Dependent Variables

- Production Planning
- Production Control
- Operational Efficiency

Framework Explanation

ERP implementation acts as the central system that integrates various organizational processes and operational activities. It influences production planning by improving forecasting, scheduling, and resource allocation. ERP also strengthens production control through better inventory management, monitoring of production activities, and coordination between departments. In addition, ERP implementation improves operational efficiency by enhancing workflow, communication, decision-making, and effective utilization of organizational resources. Through real-time information and integrated operations, ERP contributes to increased productivity, reduced operational delays, minimized costs, and improved overall organizational performance.

RESEARCH METHODOLOGY

Research methodology refers to the systematic process used for collecting, organizing, analysing, and interpreting data for the study. The present study examines the impact of ERP implementation on production planning, production control, and operational efficiency in the organization. The study is based on primary data collected from employees using a structured questionnaire.



RESEARCH DESIGN

A descriptive research design is adopted for this study. It is suitable as it helps in analysing employees' opinions, perceptions, and experiences regarding ERP implementation without manipulating any variables. The design helps in understanding existing organizational conditions and evaluating the effectiveness of ERP systems.

SAMPLE SIZE AND SAMPLING TECHNIQUE

A total of 200 respondents were selected from Chennai Polypack Pvt Ltd. for the study. Convenience sampling technique was used, where employees were selected based on availability and willingness to participate. Respondents were drawn from departments such as production, finance, HR, logistics, and quality control.

SOURCES OF DATA

Primary Data

Primary data were collected through a structured questionnaire from employees working in ERP-enabled departments. The questionnaire covered ERP usage, production planning, control, and operational efficiency.

Secondary Data

Secondary data were collected from journals, books, articles, websites, and previous research studies related to ERP systems and organizational performance.

STATISTICAL TOOLS AND TECHNIQUES

Data were analysed using SPSS software. The following statistical tools were applied:

- Demographic Profile Analysis
- Descriptive Statistics
- Reliability Analysis (Cronbach's Alpha)
- Correlation Analysis
- Regression Analysis
- ANOVA
- Chi-Square Test

These tools were used to analyse relationships, test hypotheses, and interpret the impact of ERP implementation on operational performance.

QUESTIONNAIRE DESIGN

The questionnaire consisted of 34 close-ended questions using a five-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree". It was divided into two sections: demographic details and ERP-related variables such as production planning, control, coordination, and operational efficiency.



DATA ANALYSIS AND INTERPRETATION

TABLE 1: CORRELATION ANALYSIS

Variables	Planning Score	Control Score	Efficiency Score
Planning Score	1	0.686**	0.725**
Control Score	0.686**	1	0.693**
Efficiency Score	0.725**	0.693**	1

Note: Correlation is significant at the 0.01 level (2-tailed)

Interpretation: The correlation analysis shows a strong positive relationship between production planning, production control, and operational efficiency. Planning Score and Control Score are significantly correlated with Efficiency Score, indicating that better planning and control lead to improved operational efficiency. This suggests that ERP implementation enhances coordination and supports effective production management within the organization.

TABLE 2: REGRESSION ANALYSIS:

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	0.773	0.598	0.594	0.30500

TABLE 3: COEFFICIENTS TABLE

Variable	B	Beta	t	Sig.
Constant	0.628		3.457	0.001
Planning Score	0.468	0.472	7.609	0.000
Control Score	0.366	0.369	5.941	0.000

Interpretation: The regression analysis shows that ERP-based planning and control significantly influence operational efficiency. The model explains 59.8% of the variation in efficiency ($R^2 = 0.598$), indicating a strong explanatory power. Planning has a higher impact than control, showing it is the most influential factor in improving operational efficiency. The results confirm that ERP implementation positively enhances organizational performance.

FINDINGS

- ERP has improved production planning by providing better access to real-time information and aligning plans with resources and demand.
- Demand forecasting accuracy and planning flexibility have improved after ERP implementation.
- ERP has enhanced coordination between production, inventory, procurement, and logistics departments.
- Material Requirement Planning (MRP), production control, and scheduling efficiency have improved.
- ERP has reduced production delays, last-minute schedule changes, and operational uncertainties.
- Inventory management has improved with better stock visibility and reduced holding costs.
- Overall operational efficiency and workflow management have significantly improved after ERP implementation.



SUGGESTIONS

- Regular ERP upgrades should be implemented to improve system performance.
- Continuous employee training is required for effective ERP usage.
- Greater use of ERP modules across departments should be encouraged.
- Data accuracy should be maintained through regular system monitoring.
- Advanced features like AI-based forecasting can be integrated.
- Periodic user feedback should be collected for system improvement.
- Strong technical support should be ensured for smooth operations.
- ERP should be better integrated with supply chain systems.
- Regular performance reviews should be conducted for continuous improvement.

CONCLUSION

The study concludes that ERP implementation has a positive impact on production planning, control, and operational efficiency. Statistical analysis confirms that ERP improves coordination, reduces delays, enhances resource utilization, and supports better decision-making. Planning and control significantly influence operational efficiency, with planning having a stronger effect. Overall, ERP systems play a key role in improving productivity and operational performance in manufacturing organizations.

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