IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 5, December 2025
Impact Factor: 7.67

A Study on Effectiveness of Enterprise Resource Planning in the Supply Chain Management System with Special Reference to BEVCO outlets

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Abstract: *The growing complexity of supply chain operations and the need for efficiency, transparency, and timely decision-making have increased the importance of Enterprise Resource Planning (ERP) systems in modern organizations. This study examines the effectiveness of ERP implementation in enhancing Supply Chain Management (SCM) with special reference to BEVCO outlets operated by the Kerala State Beverages (M&M) Corporation Limited (KSBC). The primary objective of the study is to analyze the impact of ERP adoption on supply chain performance, organizational efficiency, and competitive advantage.*

Using a descriptive research design, the study relies on both primary and secondary data collected from 120 respondents, including BEVCO employees, customers, and professionals from other SCM organizations. The findings indicate that ERP implementation has significantly improved operational efficiency through automation of procurement, inventory control, warehousing, sales, and financial accounting. ERP-enabled real-time data visibility and centralized systems have reduced stock-outs, minimized manual errors, enhanced compliance, and improved coordination across departments.

Operational process integration emerged as the most significant benefit of ERP, while challenges such as employee resistance, limited training, and restricted system access constrained the full realization of benefits. The study concludes that ERP functions as a strategic enabler rather than merely a technological tool. Effective training, management support, and continuous system improvement are essential to fully leverage ERP for achieving supply chain excellence and sustainable competitive advantage in BEVCO and similar organizations.

Keywords: Enterprise Resource Planning; Supply Chain Management; Operational Efficiency; Organizational Performance

I. INTRODUCTION

A competitive advantage is based on capabilities that provide the necessary grounds of an Organisation to differentiate itself from its competitors. It is widely recognized that IT (Information Technology) is the most important building block for most Organisations to survive and compete with other Organisations. When a product is not available in the market, the customers can easily replace their choices with another product; so, the lack of availability of the products can leads to loss of sales or customer. The availability of the product in the market can only be supplied by producing and shipping the right product at the right quantity at the right time. These equations are of critical importance for effective business performance and can only ensure with a right supply chain management that is supported by Information Technology. New technologies and increased customer demands are forcing Organisations to reconsider how they can take advantage of Information Technology (IT) capabilities to better manage their Supply Chains.

Enterprise Resource Planning is also considered as an extension of the Market Requirement Planning (MRP) which is being launched during the 1970s and also the Manufacturing Resource Planning (MRP II) which was introduced in the next decades of 1980s. Recent research in ERP system aims at understanding the key drivers of ERP phenomenon, the determination of cost and anticipated benefits, the principal challenges during the deployment of project, and the

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maintenance of the software once it is fixed in place. Such an understanding would provide valuable guidance to managers or shareholders who are currently undertaking such far-reaching project.

This study aims to introduce the impact of Enterprise Resource Planning (ERP) in enhancing supply chain performance, also to establish conditions under which ERP can be a critical enabler or a severe handicap for superior supply chain performance. Supply Chain Management is the term used managing this accurate information's in and out and ERP is the technology used for achieving the same. Lots of efforts pay a high attention for improving and excelling the Enterprise Resource Planning performance because it is one of the main Organisational indicators for success. From here the study decided to figure out the impact of the Enterprise Resource Planning in enhancing supply chain performance among Logistics Industry, that would help the Organisations to draw the road map for applying and practicing the best information technologies in order to get the best supply chain performance.

The project work entitled "**A Study on Effectiveness of Enterprise Resource Planning in the Supply Chain Management System with special reference to BEVCO outlets**" mainly conducted to identify the effectiveness of ERP in most of the Organisations and particularly the influence of ERP implementation in the SCM sector of BEVCO outlets.

The Kerala State Beverages (M&M) Corporation Limited (KSBC), commonly known as BEVCO, is a fully owned Kerala government company which was incorporated in the year 1984, it was entrusted by government with the purchase and sale/distribution of Indian made foreign liquor (IMFL), Beer, Wine, foreign made foreign liquor (FMFL) and foreign made wine (FMW) in the state of Kerala. The corporation has also been entrusted with major portion of the Retail Shops in the State. The company is headed by a board consisting of directors nominated by government. The territory along with it's sales and warehousing is divided into six regions by the corporation. Each region is headed by a regional manager. KSBC is having 26 Warehouses (FL-9 Licensed Warehouses) and 289 Retail Outlets (FL-1 Licensed Shops) throughout Kerala. Out of the 289 shops, 208 outlets have self-service/premium Counter facilities. The head office of the corporation is situated in Thiruvananthapuram at Kerala. The corporation is one of the major contributors to the state exchequer.

II. LITERATURE REVIEW

A supply chain is a network that consists of suppliers, manufacturers, warehouses, distributors and retailers who coordinate their plans and activities in order to convert raw materials to finished goods **(Chandra and Grabis, 2007)**. This study focuses on the development of a proposed path model and hypotheses based on the literature. Enterprise Resource Planning (ERP) systems are included as part of the broader SCM software. ERP systems are employed to integrate business processes, by organizing, codifying and standardizing business processes and data **(Norris et al., 2000)**. For this purpose, ERP is expected to have a positive and direct impact on the SCM. The literature on new business models for the Internet age is growing rapidly e.g.Chesborough and Teece 1996, Downes and Mui 1998, Malone and Laubacher 1998, Porter 1998, Tayur et al. 1998, Hagel and Singer 1999).

In traditional supply chain systems, large companies found it beneficial to vertically integrate supplier functions and distribution activities to maximize production and logistical control. Many modern firms, however, rely heavily on outsourced services and suppliers that perform one or more functions of production. Reliance on third parties for important supply chain activities such as raw material procurement and distribution raises concerns related to quality assurance, timely delivery and adherence to responsible business practices. Supply chain management was introduced as a solution to these problems. When companies along a supply chain make a concerted effort to work together in the areas of procurement, production and distribution in an environment of teamwork and transparency, all of the firms involved can experience a greater competitive advantage.

In traditional supply chain systems, operations generally revolve around four main nodes: suppliers, manufacturers, distributors, and customers. In some cases, organizations internalize distribution by creating their own logistics departments, thereby reducing or eliminating the need for independent distributors **(Chopra & Meindl, 2019).** The conventional flow begins with suppliers providing raw materials to manufacturers based on required quality and quantity specifications. Manufacturers then process these materials into finished products, package them, and deliver them to distributors, who manage product availability in the market. The movement of goods typically follows a linear

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path—from supplier to manufacturer, distributor, and ultimately to the end customer—while feedback and information flow in the reverse direction, from customers back through distributors to manufacturers and suppliers **(Christopher, 2016).**

However, studies have highlighted that this traditional sequential structure often results in time delays, inefficiencies, and limited responsiveness to dynamic market conditions **(Ivanov & Dolgui, 2020; Tiwari et al., 2018)**. Because information exchange occurs in stages, decision-making becomes slower, and manufacturers may struggle to respond quickly to changing customer preferences or supply disruptions. To overcome these challenges, contemporary supply chain models emphasize digital integration, real-time data exchange, and collaborative communication platforms that enable all stakeholders—suppliers, manufacturers, and customers—to interact simultaneously **(Queiroz et al., 2022; Brinch, 2018)**. These advancements transform the traditional supply chain into a more connected and agile network, allowing organizations to improve coordination, reduce lead times, and enhance customer satisfaction.

Contemporary research identifies three major flows that constitute the foundation of supply chain management: the material flow, information flow, and financial flow (Ivanov & Dolgui, 2020). The material flow involves the physical movement of raw materials, components, and finished goods, as well as reverse logistics and product returns. The information flow enables the exchange of data related to orders, inventory levels, demand forecasts, and delivery status, ensuring visibility and coordination across supply chain partners. The financial flow covers payments, credit terms, and cost-sharing mechanisms that support the economic viability of the entire network **(Tiwari et al., 2018)**.

Modern supply chains operate through three interdependent pillars—processes, organizational structures, and enabling technologies **(Queiroz et al., 2022)**. Effective processes integrate capabilities in logistics, product design, and knowledge management. Organizational structures determine the level of collaboration and governance between vertically integrated and networked firms. Meanwhile, enabling technologies such as cloud computing, Internet of Things (IoT), and data analytics support real-time visibility and decision-making **(Brinch, 2018; Wang et al., 2021)**. Together, these elements transform supply chain management from a linear, transactional system into a dynamic, technology-driven network that emphasizes resilience, agility, and customer-centric value creation.

In today's competitive market, ERP vendors such as SAP, Oracle, Microsoft Dynamics, and Infor dominate the global landscape, offering both on-premise and cloud-based solutions **(Statista, 2023)**. SAP continues to lead in enterprise-level implementations, while Oracle and Microsoft Dynamics have expanded their presence through hybrid and software-as-a-service (SaaS) ERP platforms **(Gartner, 2023).** The increasing adoption of cloud ERP has provided firms with greater scalability, cost efficiency, and accessibility, enabling real-time data analytics and mobility **(Beheshti et al., 2020).**

Recent studies have also emphasized the growing convergence of ERP systems with emerging digital technologies such as artificial intelligence (AI), big data analytics, and the Internet of Things (IoT) **(Kamble et al., 2020).** These integrations allow organizations to automate routine processes, predict business trends, and optimize supply chain performance with data-driven insights. ERP systems are thus evolving from transactional management tools to strategic enablers of digital transformation and sustainable competitiveness (Ahmad & Pinedo Cuenca, 2021).

Overall, contemporary literature positions ERP as a foundational element of modern enterprise management, integrating business functions and technologies to support agility, innovation, and informed decision-making across global operations.

The objective of this study is to investigate the relationships among SCM practices, ERP systems, firm performance and competitive advantage. In order to increase the flexibility and efficiency of a firm, it needs to implement the SCM strategies. SCM practices have a positive impact on organizational performance and competitive advantage. SCM and ERP system act as an effective tool that enhances firm performance and provide a continuous competitive advantage (Li et al., 2006). ERP systems lead to the improvement in the work conditions and ease the use of information **(Mzoughi et al., 2008).** Enterprise resource planning has been seen as the well renowned business activity thorough out the globe. This system has magnificent fringe benefits associated with it like, it helps in improving customer services, and it helps in improving production capabilities and reduces overhead costs incurred during the production processes. With all these benefits, this enterprise resource planning system has been seen as a complex and risky system (**Keskinocak & Tayur, 2001; Zhang, Lee, Zhang & anerjee, 2003**).

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III. STATEMENT OF THE PROBLEM

Traditional supply chain management at BEVCO and in all same organizations relied heavily on manual inventory tracking, paper-based order processing, and disconnected systems, and these exact problems leading to:

- Inventory mismanagement: frequent stock outs or overstocking.
- Delayed procurement processes: long approval times for supplier orders.
- Lack of transparency: manual errors and compliance risks.
- Inconsistent demand forecasting: leading to revenue fluctuations.
- Non transparent financial accounting systems

To solve the above problems, BEVCO understands to implement a comprehensive ERP oriented computerized system that would facilitate & address its entire gamut of activities without time and cost overruns and with the best contemporary technology and possible quality. With this, KSBC wishes to emerge as an efficient department, providing total transparency in its departmental functioning, and an efficiency of high class in its service to its clients, and consequently acquire their rightful place among premiere IT implementing Government organizations, hence it is proposed to computerize all the business processes of Head Office, Warehouses and Retails shops activities and to make the administration as Real Time, Centralized, Transparent, User Friendly.

Based on the survey and selected literature, here this research concludes that ERP benefits may improve firm competences in SCM, and group those benefits into six constructs. They are Operational benefits, Business process and management benefits, Strategic IT planning benefits, Operational process integration, Planning and control process integration and Customer and relationship integration.

Finally BEVCO achieves this through the implementation of an ERP system, specifically targeting the organization's following needs:

- Automate procurement workflows, supply chain management including stock and sales.
- Improves the financial accounting system
- Enable real-time stock monitoring to prevent shortages.
- Improve supplier collaboration through centralized order processing.
- Enhance compliance with digital tracking and audit logs.

IV. OBJECTIVES OF THE STUDY

Supply Chain Management (SCM) and Enterprise Resource Planning systems (ERP) are effective ways to achieve competitive advantage and improve organizational performance.

The major primary objective of this study is to investigate the effectiveness of Enterprise Resource Planning (ERP) adoption in the Supply Chain organisations and tests their relationships with the competitive advantage and organizational performance, and to study its impact like service management performance, financial performance and influencing organisational activity after implementing ERP in BEVCO outlets in Kerala.

However, the following are the secondary objectives of the study for preparation of the project report as follows:

- **To analyze the relationship** between **information technology adoption** and **organizational supply chain performance** in ERP-integrated environments.
- **To examine the role of ERP** in the **enhancement of operations** within supply chain organizations, focusing on process integration and efficiency improvement.
- **To evaluate the contribution of ERP systems** towards the **optimization and coordination of Supply Chain Management (SCM) operations.**
- **To identify the key challenges and success factors** influencing ERP implementation and post-implementation performance in BEVCO and similar organizations.
- **To assess how ERP tools and modules** support **decision-making, real-time data visibility, and resource utilization** within the SCM framework.

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V. SCOPE OF THE STUDY

This study is to analyse the effectiveness of ERP implementation in supply chain sector of Organisations, and the impact of the same in BEVCO outlets. Most of the organizations of same type improve the working of its supply chain management sector with the help of technology. Like the way, BEVCO emerged as an efficient company, achieved total transparency in its functioning, and an efficiency of high class in its service to its clients etc, and improved the financial position by managing the sales activities well in outlets.

VI. RESEARCH METHODOLOGY

RESEARCH DESIGN

In this research study, Descriptive research design has been used because it helps to describe a particular situation of ERP technology implementation prevailing within a company.

Descriptive Research Design is most suitable for understanding the existing structure, functionalities, and effectiveness of ERP systems as implemented within the supply chain management (SCM) environment of the Kerala State Beverages Corporation (BEVCO). Descriptive research is used to systematically describe a situation, problem, phenomenon, or behavior. It allows for detailed analysis without influencing or altering the environment under observation.

In the context of this study, descriptive design helps to explore how ERP systems are integrated across various SCM functions such as inventory management, procurement, distribution, and logistics. It provides insights into the operational effectiveness and benefits of ERP in supporting real-time data visibility, resource planning, and service delivery. The use of this design enables a deep understanding of ERP-enabled SCM systems, measuring their performance from both managerial and user perspectives within BEVCO and other SCM organizations in Kerala.

SAMPLE SIZE

A total of 120 respondents participated in the study, including 75 employees from various BEVCO units (retail outlets, warehouses, and head office staff), 25 BEVCO customers, and 20 respondents from other general SCM organizations.

METHODS OF DATA COLLECTION

The study uses a combination of Primary and Secondary Data Collection methods to ensure comprehensive and reliable findings.

Primary Data Collection:

- **Questionnaires**: Distributed to employees working in ERP-integrated departments like outlets, warehousing, inventory, logistics, and finance.
- **Interviews & Interactions**: Conducted with customers and key personnel involved in ERP implementation and system maintenance.
- **On-site Observations**: Visits to selected retail outlets, warehouses and office locations provided real-time insights into ERP-enabled processes.

Secondary Data Collection:

- Information from BEVCO's official website and ERP vendor documentation
- Review of academic journals, case studies and books covering ERP and SCM best practices.
- Previous project reports and statistics published on ERP adoption and benefits in retail sectors.

VII. DATA ANALYSIS AND INTERPRETATION

Distribution of the study sample

As mentioned above, the first section analyzed the biographical data of the respondents. The distribution of the study sample is shown below:

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Table 1:Frequency distribution of category in SCM organizations

Variable	Category	Frequency	Percentage (%)
Gender	Male	21	87.5
	Female	3	12.5
Managerial Category	General Manager	1	4.16
	Deputy Manager	1	4.16
	Logistic Department Managers	14	58.33
	Warehouse Managers	4	16.66
	Functional Department Staff	4	16.66
Age of industrial supply chain company	Less than 5 years	13	54.16
	From 5 to less than 10 years	8	33.33
	10 years and above	3	12.5
The Company's target markets	Local market	5	20.83
	International market	8	33.33
	Local and international market	11	45.83
Size of industrial supply chain company	High	1	4.16
	Medium	15	62.5
	Small	8	33.33
No.of employees	Less than 10	2	8.33
	10 to less than 25	8	33.33
	25 to less than 50	9	37.5
	50 and above	5	20.83

Interpretation:
The majority of respondents (87.5%) were male, with the largest share being logistics managers (58.3%). Most firms were less than five years old (54.16%) and primarily targeted both local and international markets (45.83%). Medium-sized companies dominated the sample (62.5%), reflecting a growing and dynamic SCM sector.

ERP system implementation and access
ERP system implementation and access the study reveals that firms are becoming more aware of IT integration and its benefits for their organisation. In this regard, implementation of ERP and other related systems are becoming a trend especially when companies start expanding their business and turn into larger firms.

Table.2: ERP Implementation in SCM Organizations including BEVCO

Industry	ERP not implemented in Industries	ERP Implemented in Industries	ERP Implementation Percentage (%)
SCM Organizations including BEVCO	7	17	71%

Interpretation:
The analysis shows that 71% percent of the respondents (17 firms) have implemented modules of ERP system, this showcasing a positive trend toward technological adoption in SCM operations. This highlights growing awareness of ERP's potential to streamline supply chain processes.

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ERP Module Implementation

Table 3: ERP Module Implementation

Module Implementation	YES	NO	TOTAL
Accounting	17 (100%)	0 (0%)	17 (100%)
Human Resource Management	14 (83%)	3 (17%)	17 (100%)
Logistics	12 (71%)	5 (29%)	17 (100%)
CRM	10 (59%)	7 (41%)	17 (100%)
Warehouse	10 (59%)	7 (41%)	17 (100%)
Forecasting	6 (35%)	11 (65%)	17 (100%)

Interpretation:

The most important module is Accounting, because all of those firms who have implemented ERP, have also implemented this module. Next is Human Resource Management (HRM) by almost 83 %. Other famous modules which are used in respondent's organisations are: logistics, human resource, forecasting, Warehouse, and customer relationship. The data is also collected that whether supply chain industries provide any online access to their suppliers or customers but findings show that most of the respondents provide online access to their supply chain partners.

ERP benefits contribute to firm competence of SCM

Table 4: ERP benefits contribute to firm competence of SCM

Performance Impact in	Mean	Standard Deviation
Operational benefits	3.29	1.4
Strategic IT planning benefits	3.23	1.56
Operational process integration	4.11	1.21
Customer and relationship integration	3.23	0.9
Business process and management benefits	1.64	0.78
Planning and control process integration	2.88	1.16

Interpretation:

This show how respondents rated different ERP-related benefits in terms of their contribution to supply-chain management (SCM) competence. *Operational process integration* has the highest mean (4.11), indicating respondents perceive the strongest benefit of ERP in integrating operational processes. *Business process and management benefits* scores lowest (1.64), suggesting a perceived shortfall or slower realization of benefits in that area. Standard deviations vary: *Strategic IT planning benefits* shows the largest variability (SD = 1.56), indicating disagreement among respondents about strategic IT planning gains, while *Customer and relationship integration* is more consistently rated (SD = 0.90). Overall, the data suggests ERP implementation is perceived to improve operational integration most noticeably, but organizational-level process/management benefits are seen as weakest and may need targeted attention or further analysis.

VIII. FINDINGS

- ERP implementation in BEVCO and other SCM organizations has significantly improved operational efficiency, transparency, and coordination between departments.
- The Administration, Accounts, Finance, Purchase, Warehouse, Audit, and Sales Departments in BEVCO now perform their operations digitally, ensuring accurate reporting, reduced manual work, and faster information flow.
- ERP has automated crucial processes like supplier empanelment, permit generation, purchase orders, stock transfers, and sales reconciliation, leading to greater control and reduced human error.

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- At BEVCO outlets, ERP has enabled automatic indent generation, POS-based billing, real-time stock updates, and integrated warehouse–retail coordination, improving service reliability and daily reconciliation accuracy.
- Among SCM organizations, ERP has generated six major competency improvements: operational benefits, process integration, business management benefits, IT planning, control integration, and customer relationship enhancement.
- Despite these achievements, trust and user resistance emerged as key barriers. Some employees were reluctant to adopt ERP fully, while management restricted system access, limiting the expected transparency.
- A few organizations did not seek vendor consultancy or training, which slowed functionality optimization and reduced confidence among users.
- ERP vendor selection remains a challenge; many firms rely on popular or low-cost options without evaluating deeper functional fit, leading to mismatched systems.
- BEVCO's ERP has enhanced data security, statutory compliance, and inter-departmental coordination, especially in handling Outlet retail sales, Stock Management, Purchasing, and Warehouse activities.
- Overall, the ERP system has delivered measurable improvements in inventory turnover, on-time delivery, order fill rates, and administrative responsiveness, confirming its positive impact on supply chain performance.

Recommendations

Following recommendations are provided to further strengthen ERP efficiency in BEVCO and general SCM organizations.

Enhance User Training and Awareness:

Continuous training programs should be conducted to reduce user resistance and increase confidence in ERP usage. Employees must clearly understand the purpose and benefits of ERP in daily operations.

Build Trust and Broaden Access:

Management should promote transparency by granting appropriate system access to employees. Trust between management and staff is essential for utilizing the full functionality of ERP.

Top-Management Involvement:

Active participation of senior management is required at all stages—from planning to post-implementation review—to ensure strategic alignment and accountability.

Regular Vendor Support and System Upgrades:

BEVCO should maintain close collaboration with ERP vendors or consultants for continuous performance evaluation, software updates, and technical improvements.

Integrate All Departments and Processes:

Ensure seamless connectivity among Purchase, Warehouse, Finance, Administration, and Sales sections to maintain a unified data flow and improve coordination across all outlets.

Automation and Real-Time Monitoring:

Automate core operations such as permit management, stock transfer, and billing to reduce manual errors. Implement dashboards for real-time tracking of sales, inventory, and delivery performance.

Data Security and System Audits:

Regular system and data audits must be conducted to ensure accuracy, prevent misuse, and maintain compliance with Excise and financial regulations.

Adequate Budgeting and Cost–Benefit Review:

Allocate sufficient funds for ERP maintenance, infrastructure, and staff training. Periodic cost–benefit analysis should be used to assess ERP's impact on efficiency and cost reduction.

Phased Implementation and Monitoring:

Introduce ERP modules gradually and conduct periodic evaluations to identify challenges early and ensure smooth adoption.

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Continuous Improvement and Innovation:

Encourage a culture of feedback and improvement, allowing users to suggest refinements. Explore new technologies like cloud and mobile ERP for scalability and accessibility.

IX. CONCLUSION

The study on the '**Effectiveness of ERP in the Supply Chain Management System of General Organizations including BEVCO'** highlights that ERP implementation has brought significant improvements in operational performance, transparency, and decision-making efficiency. ERP systems have modernized traditional supply chain operations by automating key functions like inventory control, order processing, and procurement, leading to cost and time savings.

The integration of ERP has resulted in higher customer satisfaction, better coordination among departments, and improved data visibility across all organizational levels. At BEVCO outlets, ERP adoption has particularly improved accuracy in stock management and ensured timely replenishment, minimizing shortages and excess inventory.

However, the study also notes certain areas requiring improvement, such as the need for regular training, better change management, and continuous system monitoring to fully realize ERP benefits. With proper investment in infrastructure, user competence, and strategic alignment, ERP can serve as a '**transformative enabler for supply chain excellence'** in BEVCO and similar organizations.

In conclusion, ERP is not merely a technological upgrade but a '**strategic tool for operational excellence and competitive advantage'**. Continuous evaluation, user engagement, and innovation in ERP practices will ensure sustained efficiency, cost reduction, and enhanced service performance across BEVCO and other organizations.

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