

Original Research

Digital Customer Journey Mapping for Business Scale-Up and Loyalty Optimization: A Case Study of Aroma Coffee Bland

Winda Azhara ^a, Septiana Dewi Andriana ^{b*}

^{a,b} Department of Information Systems, Faculty of Engineering and Computer Science, Universitas Harapan Medan, Medan, Indonesia

*Corresponding Author: septianad89@gmail.com

ABSTRACT

Digital transformation requires micro, small, and medium enterprises to manage customer experience as a structured source of business insight rather than relying solely on informal observation. Aroma Coffee Bland, a beverage MSME that has operated for approximately six years, had not yet implemented an integrated mechanism for recording customer interactions, transaction histories, feedback, and the stages of the customer journey. This study designed and implemented a Laravel-based Customer Journey Mapping prototype to support customer-loyalty optimization and the scale-up process of Aroma Coffee Bland. Data were collected through interviews, direct observation, and literature study. System development followed the Prototype method through requirements collection, prototype construction, user evaluation, and iterative refinement. The application was implemented using Laravel 13, MySQL, Laragon, Visual Studio Code, Figma, and Draw.io. The resulting system supports Admin and Operator roles and provides customer, product, transaction, feedback, customer-journey, segmentation, and reporting functions. Customer interactions are visualized across six stages: Awareness, Consideration, Purchase, Experience, Retention, and Loyalty, while customer segmentation is grouped into New, Active, Potentially Loyal, Loyal, and Inactive categories. Black-box testing covered 13 principal scenarios, and all scenarios produced the expected outputs. The prototype provides a structured basis for monitoring customer interactions and supporting data-informed service improvement at Aroma Coffee Bland.

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1 INTRODUCTION

The scale-up stage represents a period in which a startup must move beyond initial business validation and strengthen its ability to serve a growing market. In Indonesia, the expansion of digital economic activity has increased the strategic importance of technology adoption for startup development and business continuity [1]. For micro, small, and medium enterprises, digitalization also changes customer expectations regarding service accessibility, speed, information quality, and consistency. Customer loyalty becomes particularly important in a competitive beverage market because repeat purchases and recommendations can support long-term business sustainability. Digital customer relationship management and service quality therefore form an important foundation for retaining customers [2].

Aroma Coffee Bland is a beverage MSME that has operated for approximately six years and offers coffee-blend drinks together with other beverage variants. Although the business has been able to maintain operations, the source study identified a structural limitation: customer relationships, transaction histories, and customer feedback were not recorded in an integrated system. This condition made it difficult to evaluate customer needs, recurring problems, and the progression from initial awareness to loyalty. Customer experience is closely related to loyalty, making a structured representation of customer interactions valuable for service improvement [3].

Customer Journey Mapping (CJM) provides a framework for representing the stages through which customers interact with a business and for identifying touchpoints and pain points that influence their experience. For Aroma Coffee Bland, the research model organizes the journey into Awareness, Consideration, Purchase, Experience, Retention, and Loyalty. Mapping these stages allows feedback to be interpreted according to where the customer is located in the service journey rather than as an isolated comment [4].

The proposed digital solution was implemented as a web-based prototype using the Laravel framework. Laravel supports structured web development and provides application components that are appropriate for routing, authentication, data management, and modular implementation. A web-based architecture was selected so that Admin and Operator users can access customer-management functions through a unified interface [5, 6].

The novelty of this research lies in the operationalization of Customer Journey Mapping (CJM) specifically tailored for the scale-up phase of a beverage MSME, bridging the gap between theoretical customer experience frameworks and practical, lightweight digital implementation. Unlike previous studies that often apply CJM in large enterprises or treat it as a standalone analytical exercise, this prototype uniquely integrates a structured six-stage journey model directly with real-time transaction records and dynamic customer segmentation (New, Active, Potentially Loyal, Loyal, and Inactive). By automatically categorizing feedback according to the specific journey stage, the system transforms informal, fragmented MSME customer observations into a unified, data-driven dashboard. This provides a highly contextualized, actionable tool for MSME owners to pinpoint exact pain points and deploy targeted retention strategies, an approach rarely documented in the context of localized, resource-constrained coffee MSMEs.

This study therefore aimed to design and implement a Laravel-based Customer Journey Mapping prototype for Aroma Coffee Bland, analyze how the system structures customer interactions, and evaluate the principal application functions through black-box testing. The research focuses on customer-data management, transactions, feedback, journey visualization, segmentation, and reporting as operational components that can support customer-loyalty optimization and business scale-up [7].

2 RESEARCH METHODS

2.1 Research Design and Data Collection

The research used an applied system-development approach. Primary information was collected through interviews with the owner of Aroma Coffee Bland and direct observation of the existing service process. The interviews were used to identify operational constraints, customer-service needs, product information, transaction practices, feedback handling, and expectations for the proposed system. Literature study was used to support the theoretical discussion of Customer Journey Mapping, customer loyalty, Laravel, web development, and digital MSME development [8].

2.2 Prototype Development Procedure

System development followed four principal Prototype stages. First, requirements were collected by identifying the operational workflow and the functional needs of Admin and Operator users. Second, an initial prototype was built from the identified requirements, including interface designs and the principal functional modules. Third, the prototype was evaluated with the business owner to assess feature suitability and ease of use. Fourth, the prototype was refined iteratively until the implemented functions corresponded with the agreed operational requirements.

The Prototype approach was appropriate because user feedback could be incorporated before the system was considered complete. The system interface was designed with Figma, system models were prepared with Draw.io, and the functional application was implemented after the prototype had been reviewed. This user-centered and iterative design process is consistent with approaches that emphasize problem understanding, rapid solution representation, and repeated evaluation [9].

2.3 System Scope and Customer Journey Model

The system defines two internal user roles. Admin users can authenticate, view the dashboard, manage customers, products, transactions, and feedback, access Customer Journey Mapping, examine customer segmentation, review reports, and log out. Operator users can authenticate, view an operational dashboard, record transactions, manage customer data, record feedback, and log out. The application therefore separates strategic monitoring functions from day-to-day operational data entry.

The journey model classifies customer feedback into six stages: Awareness, Consideration, Purchase, Experience, Retention, and Loyalty. In parallel, customer segmentation is organized into New, Active, Potentially Loyal, Loyal, and Inactive groups by considering transaction and feedback activity. This structure provides a basis for interpreting customer experience and selecting service actions according to customer behavior [10,11].

2.4 Development Technology and System Modelling

The implementation environment consisted of Windows, Visual Studio Code, Laragon, Laravel 13, MySQL, Google Chrome, Figma, and Draw.io. Laravel was used as the principal web framework and MySQL was used for application data storage. The source research used HTML, CSS, JavaScript, and PHP-based web technologies to support interface presentation and system interaction [12,13].

Unified Modeling Language diagrams were used to describe system actors, activities, interaction sequences, and structural relationships before implementation. The modelling process supported consistency between functional requirements and the application modules developed for Admin and Operator users [14,15].

2.5 Functional Testing

Functional testing was conducted using a black-box testing approach to evaluate the operational capabilities of the prototype. In this method, the system's inputs and observable outputs are evaluated without examining the internal program code or logic structure. This approach is highly appropriate for validating user-facing functionalities and ensuring that the system strictly meets the operational requirements defined during the prototype phase. The test scenarios comprehensively covered all core modules, including authentication, dashboard presentation, customer-data operations, product management, transaction input, feedback recording, Customer Journey Mapping visualization, customer segmentation, and reporting [16–18].

A test scenario was considered successful ("Passed") when the observed system output perfectly matched the expected behavior defined in the test plan. Conversely, if the output deviated from the expectation, the scenario was marked as "Failed" and the prototype required iterative refinement. To quantitatively measure the overall success rate of the functional testing, the following mathematical formula was applied:

$$P = \left(\frac{S}{N} \right) \times 100\% \quad (1)$$

Where P is the percentage of successful test scenarios (Success Rate), S is the number of successful scenarios (Passed), and N is the total number of test scenarios executed.

By applying this formula, the researchers could objectively determine the functional readiness of the system before final deployment. A high success rate indicates that the application logic, data processing, and user interface interactions operate cohesively according to the specified requirements, thereby validating the prototype's reliability for its intended operational environment at Aroma Coffee Bland.

3 RESULTS AND DISCUSSION

The research produced a web-based Customer Journey Mapping prototype for Aroma Coffee Bland. The implementation integrates customer records, products, transactions, feedback, journey visualization, customer segmentation, and reports in one operational workflow. The following subsections present every implementation interface documented in Chapter IV of the source thesis and explain the function of each interface.

3.1 Login Interface for Admin and Operator

The login interface serves as the primary authentication gateway for the Customer Journey Mapping system. This interface is designed to accommodate two distinct user roles: Administrator and Operator. Each role has different access levels and functional permissions within the system. The Administrator role has full access to all system features including dashboard analytics, customer management, product management, transaction records, feedback analysis, journey mapping visualization, customer segmentation, and reporting functions. The

Operator role is limited to operational functions such as transaction recording, basic customer data management, and feedback input. The implementation of role-based access control ensures data security and maintains clear separation between strategic monitoring functions and day-to-day operational activities.

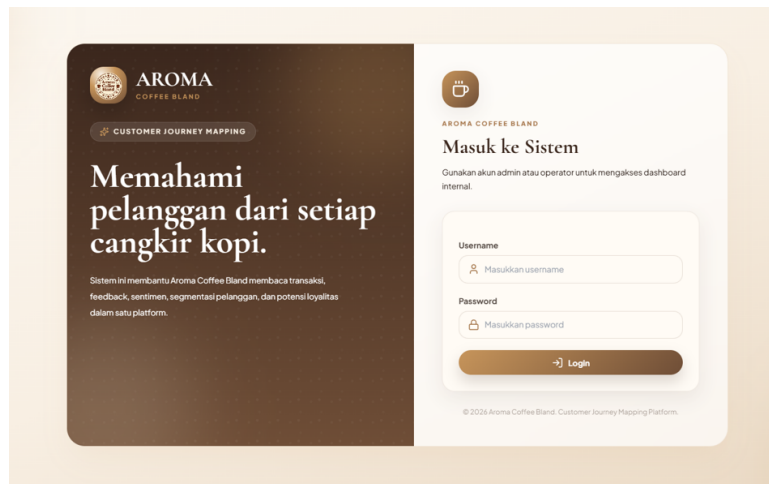


Figure 1. Login page for Admin and Operator

The login page, as shown in Figure 1, presents a clean and professional interface consistent with the brand identity of Aroma Coffee Bland. The left panel features the company logo, system title “Customer Journey Mapping,” and a tagline “Memahami pelanggan dari setiap cangkir kopi” (Understanding customers from every cup of coffee), which emphasizes the system’s core purpose of transforming customer interactions into actionable insights. The descriptive text below explains that the system helps Aroma Coffee Bland track transactions, feedback, sentiment, customer segmentation, and loyalty potential in a single integrated platform.

The right panel contains the authentication form with fields for username and password, accompanied by a login button. The design employs a warm brown color palette that reflects the coffee business theme while maintaining professional aesthetics. Upon successful authentication, users are redirected to their respective dashboards based on their assigned roles. This role-based routing mechanism ensures that administrators can access comprehensive analytics and management tools, while operators are directed to a simplified interface focused on transaction processing and customer data entry. The login interface represents the first layer of system security and establishes the foundation for personalized user experiences throughout the application.

3.2 Administrator Dashboard

The administrator dashboard serves as the central command center for monitoring and managing all aspects of the Customer Journey Mapping system. Upon successful login, administrators are presented with a comprehensive overview of key performance indicators (KPIs) that reflect the current state of customer relationships and business operations. The dashboard integrates multiple data sources including customer profiles, transaction records, feedback submissions, and loyalty metrics into a unified visual interface. This real-time overview enables data-driven decision-making and allows administrators to quickly identify trends, anomalies, and areas requiring immediate attention. The dashboard design follows principles of information hierarchy, presenting the most critical metrics prominently while providing quick access to detailed analytical tools and management functions.

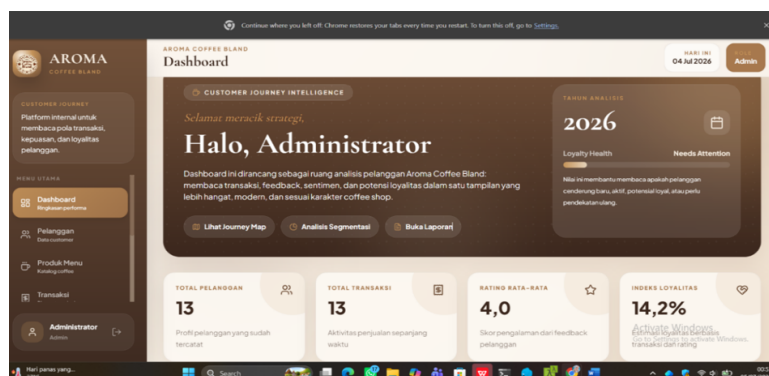


Figure 2. Administrator dashboard

Figure 2 illustrates the administrator dashboard with a warm, coffee-themed design that maintains brand consistency. The interface displays several critical components:

- **Header Section:** The top bar shows the current date (04 Jul 2026), user role indicator (Admin), and provides system-wide navigation. The left sidebar menu offers access to main modules: Dashboard, Pelanggan (Customers), Produk Menu (Products), Transaksi (Transactions), and Administrator settings.
- **Welcome Panel:** The central greeting “Halo, Administrator” is accompanied by a strategic message about customer journey intelligence, emphasizing the dashboard’s role as an analytical workspace for understanding transactions, feedback, sentiment, and loyalty potential.
- **Quick Action Buttons:** Three primary action buttons provide immediate access to core analytical features: “Lihat Journey Map” (View Journey Map), “Analisis Segmentasi” (Segmentation Analysis), and “Buka Laporan” (Open Report).
- **Loyalty Health Indicator:** The right panel displays the analysis year (2026) with a loyalty health status showing “Needs Attention,” alerting administrators to potential customer retention issues that require intervention.
- **Key Performance Metrics:** Four primary KPI cards display Total Pelanggan (13), Total Transaksi (13), Rating Rata-rata (4.0), and Indeks Loyalitas (14.2%).

The dashboard effectively transforms raw operational data into actionable intelligence, enabling administrators to monitor business health at a glance and drill down into specific areas for detailed analysis.

3.3 Customer Data Management

Customer data management forms the foundational identity layer of the Customer Journey Mapping system. This module provides a centralized repository for storing and managing all registered customer information, serving as the primary reference point that connects transactions, feedback, and journey-stage interactions to individual customers. The customer management interface is accessible to both Administrator and Operator roles, though with different permission levels: administrators can perform full CRUD (Create, Read, Update, Delete) operations, while operators are typically limited to viewing and updating customer records during transaction processing.

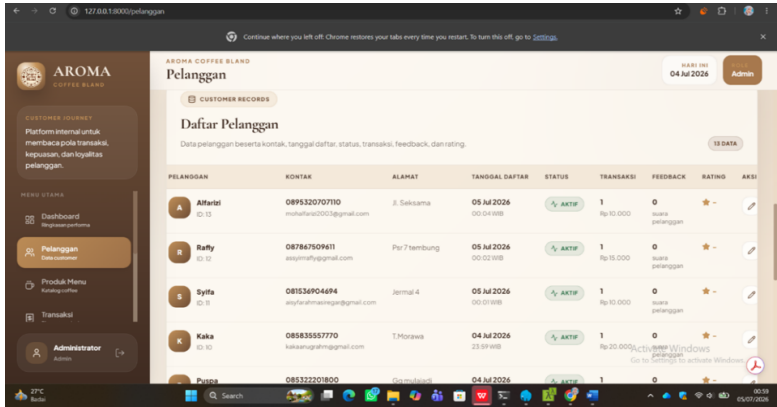


Figure 3. Customer data management page

Figure 3 displays the customer management interface titled “Daftar Pelanggan” (Customer List), which presents a structured tabular view of all registered customers in the system. A data counter in the top-right corner indicates “13 DATA,” confirming the total number of registered customer records currently stored in the database. The customer table is organized into eight key columns: Pelanggan (Customer name and ID), Kontak (Contact info), Alamat (Address), Tanggal Daftar (Registration Date), Status (Active badge), Transaksi (Transactions count and value), Feedback (Feedback count), Rating (Average score), and Aksi (Action buttons). This module plays a critical role by establishing the identity foundation upon which all analytical functions depend.

3.4 Product Management

Product management is a core operational module within the Customer Journey Mapping system that enables administrators to maintain the catalog of beverages offered by Aroma Coffee Bland. This module serves as the controlled reference list for all transaction inputs, ensuring that every recorded purchase is linked to a standardized product entry rather than free-text descriptions. The product management interface supports full CRUD operations, allowing administrators to add new beverage variants, update pricing, modify availability

status, and remove discontinued items.

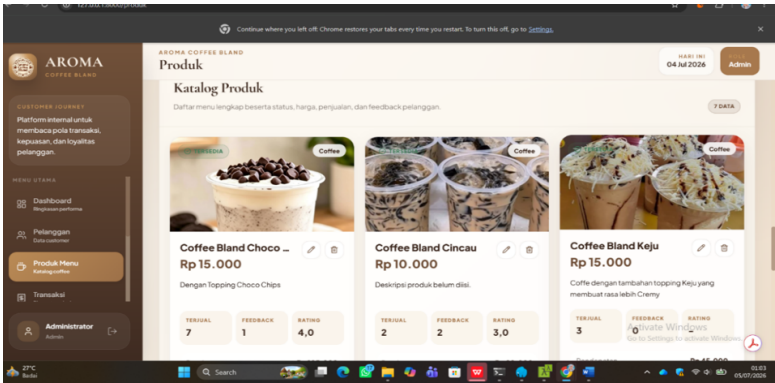


Figure 4. Product management page for the administrator

Figure 4 presents the product management interface titled “Katalog Produk” (Product Catalog), which displays the complete menu of beverages offered by Aroma Coffee Bland in a visually engaging card-based layout. A data counter in the top-right corner indicates “7 DATA.”

Each product card contains structured information: Product Image and Status Badge (Available/Coffee), Product Name and Price, Product Description, Performance Metrics (Units Sold, Feedback Count, Average Rating), and Action Icons (Edit/Delete). From a Customer Journey Mapping perspective, this module links customer feedback to specific products and journey stages, allowing administrators to pinpoint product-level satisfaction drivers.

3.5 Customer Journey Mapping Visualization

The Customer Journey Mapping (CJM) visualization module represents the core analytical component of the system, transforming abstract customer experience concepts into an operational, visual framework. This module implements a six-stage journey model specifically designed for Aroma Coffee Bland: Awareness, Consideration, Purchase, Experience, Retention, and Loyalty. Each stage corresponds to a critical touchpoint where customers interact with the brand, and the system captures feedback classified by sentiment at each juncture.



Figure 5. Customer Journey Mapping visualization

Figure 5 illustrates the Customer Journey Mapping interface titled “Analisis Pengalaman Pelanggan” (Customer Experience Analysis), featuring the “Kurva Emosi Pelanggan” (Customer Emotional Curve) visualization. The interface presents a comprehensive horizontal timeline displaying all six journey stages in sequential order, with each stage represented by a numbered card containing detailed information.

The journey visualization reveals critical insights about customer engagement patterns. The Awareness stage (01) shows a “POSITIF” sentiment classification with “1 SUARA,” while stages 02 through 06 display “NETRAL” sentiment with “0 SUARA.” This visualization immediately alerts administrators to a critical operational issue: the system is not effectively collecting customer feedback beyond the initial awareness phase, providing a strategic diagnostic tool to improve feedback mechanisms across all touchpoints [4, 19].

3.6 Customer Segmentation Visualization

Customer segmentation is a critical analytical function within the Customer Journey Mapping system that enables Aroma Coffee Bland to classify its customer base into meaningful categories based on transaction behavior, feedback activity, and engagement patterns. The segmentation module applies a data-driven classification model that organizes customers into five distinct tiers: New, Active, Potentially Loyal, Loyal, and Inactive.



Figure 6. Customer segmentation page

Figure 6 presents the Customer Segmentation interface titled “Segmentasi Pelanggan” (Customer Segmentation), which provides a comprehensive visual overview of how the customer base is distributed across different relationship tiers. The interface is divided into two main panels: “Komposisi Segmen” (Segment Composition) on the left and “Ringkasan Tiap Segmen” (Segment Summary) on the right. The left panel features a donut chart showing that the “Baru” (New) segment represents 33.3% (1 customer). The right panel displays detailed segment cards, highlighting “SEGMENT TERBESAR: Aktif - 2” (Active segment: 66.7%, 2 customers). This clear, data-driven view enables Aroma Coffee Bland to allocate retention resources effectively and target active customers for loyalty conversion [20].

3.7 Black-Box Testing Results

Functional testing was conducted using a black-box approach to evaluate the system’s operational capabilities based on external behavior and user inputs, without examining the internal code structure. A total of 13 principal test scenarios were executed, covering all core modules accessible to Admin and Operator roles. Table 1 presents a comprehensive summary of all test scenarios.

Table 1. Black-box testing results

No.	Feature	Input / condition	Expected output	Status
1	Admin Login	Valid username and password	Administrator dashboard is displayed.	Passed
2	Operator Login	Valid username and password	Operator dashboard is displayed.	Passed
3	Admin Dashboard	Operational data are available	Statistics and charts are displayed.	Passed
4	Add Customer	Complete customer form	Customer data are stored and displayed.	Passed
5	Edit Customer	Customer data changes	Customer data are updated.	Passed
6	Delete Customer	Selected customer record	Customer data are removed from list.	Passed
7	Add Product	Complete product form	Product data are stored and displayed.	Passed
8	Edit Product	Product data changes	Product data are updated.	Passed
9	Input Transaction	Complete transaction data	Transaction is stored and displayed in history.	Passed
10	Record Feedback	Complete feedback form	Feedback is stored and displayed.	Passed
11	Customer Journey Mapping	Journey-stage feedback available	Customer journey visualization is displayed.	Passed
12	Customer Segmentation	Customer data available	Segmentation chart is displayed.	Passed
13	Admin Report	Transaction data available	Report and export function are displayed.	Passed

As demonstrated in Table 1, all 13 test scenarios achieved a “Passed” status, yielding a 100% success rate ($P = 100\%$). This confirms that the prototype is functionally complete, operationally reliable, and ready for deployment at Aroma Coffee Bland.

3.8 Discussion

The implemented prototype addresses the principal operational problem identified at Aroma Coffee Bland by converting customer interactions from informal observations into structured records. Customer, transaction, and feedback data can be connected within one application, giving the owner a clearer basis for understanding how customers move through the service journey [10]. The six-stage journey visualization provides more analytical value than a simple feedback list because each comment is associated with a specific point in the customer relationship. Problems found during Awareness or Consideration require different actions from issues occurring during Experience, Retention, or Loyalty [4]. Customer segmentation complements the journey view by summarizing the current relationship status of customers. The New, Active, Potentially Loyal, Loyal, and Inactive categories can be used as a practical basis for differentiating follow-up actions [20]. Laravel provides a structured technical foundation for the prototype, while the use of a browser-based interface

reduces dependence on a single workstation and supports a modular separation of operational functions.

4 CONCLUSION

This study successfully designed and implemented a Laravel-based Customer Journey Mapping (CJM) prototype tailored to support the scale-up and customer loyalty optimization of Aroma Coffee Bland, a beverage MSME. By addressing the structural limitation of unrecorded customer interactions, the system integrates customer data management, transaction history, and feedback logging into a unified web-based platform. The prototype effectively operationalizes the CJM framework by visualizing customer interactions across six distinct stages (Awareness, Consideration, Purchase, Experience, Retention, and Loyalty) and categorizing customers into five dynamic segments (New, Active, Potentially Loyal, Loyal, and Inactive). All 13 black-box testing scenarios confirmed that the system functions reliably according to the defined operational requirements. For future development, it is recommended to expand the system by incorporating direct customer-facing interfaces, automated notification systems, advanced predictive analytics, and longitudinal studies to measure long-term impact on customer retention.

DECLARATIONS

Author Contributions:

Winda Azhara: Conceptualization, Methodology, Software, Writing—original draft.

Septiana Dewi Andriana: Supervision, Methodology, Writing—review & editing.

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The authors declare that they have no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability:

The data that support the findings of this study are available from the corresponding author upon reasonable request.

AI Use Statement:

During the preparation of this work, the authors used Qwen AI in order to improve the language and readability of the manuscript. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the final content of the published article.

Additional Information:

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