

Design and Development of Web-Based Digital Product Marketplace Using Seller-Based Approach

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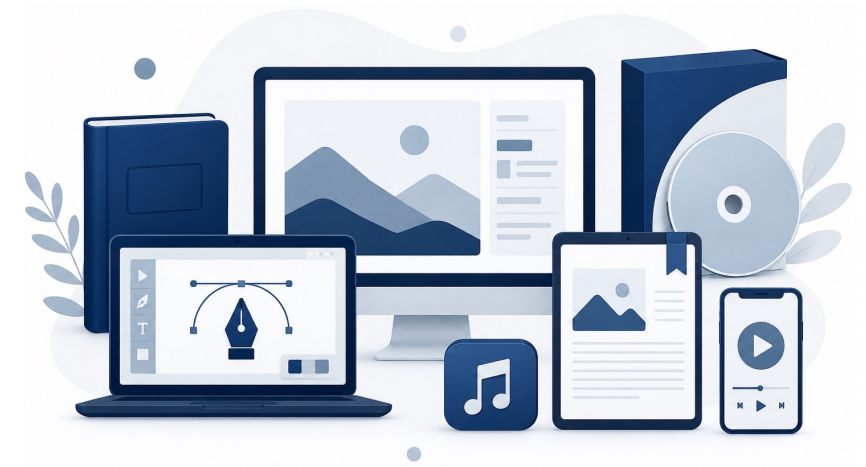
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Introduction

- > **Commodity Shift:** Massive tech adoption fuels the Creator Economy, increasing demand for digital assets (software, e-books, designs).
- > **Infrastructure Gap:** Local marketplaces in Indonesia are designed for physical goods MSMEs (requiring logistics, package weight), which is irrelevant for digital commodities.
- > **Creator Impact:** Creators' brand identities are vulnerable to fading in crowded product catalogs, making their digital products harder to sell.
- > **Solution Requirement:** A dedicated digital product platform centered on the seller entity (Seller-Based Approach) is needed to enhance the visibility and credibility of their work.



Research Question (Problem Formulation)



Focus Problem

How to design and implement a marketplace architecture centered on the seller profile (Seller-Based) to overcome the functional inefficiencies of traditional e-commerce platforms in handling intangible digital commodities?



Development Goal

Develop a marketplace prototype that structurally prioritizes creator storefront identity, profile autonomy, and independent product management to support the local digital economy ecosystem.

Research Methods

This applied research utilizes the **Waterfall Model** to maintain strict architectural integrity, with sequential system development stages:

1. Requirement Analysis

Using the Cause-Effect-Solution (CES) framework to define functional problems.

2. System Design

Visualizing entity interaction workflows using UML standards (Use Case & Sequence Diagrams).

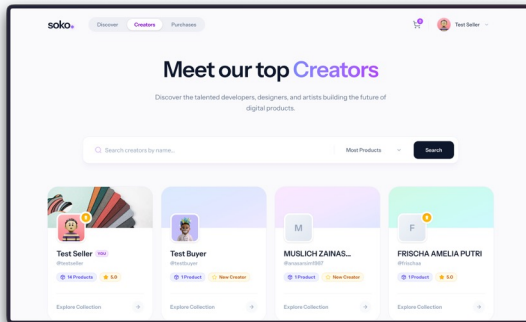
3. Implementation

Backend construction with Laravel (MVC), SPA frontend with React, and Midtrans gateway.

4. Testing & Validation

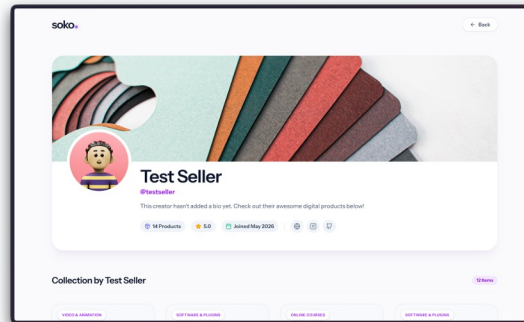
Comprehensive evaluation through Black-Box, User Acceptance Testing (UAT), and Load Testing.

Implementation Results: Seller-Oriented Interface



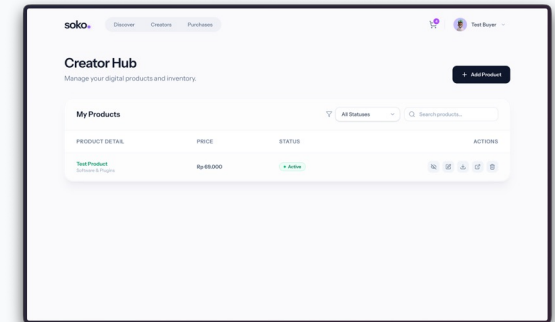
1. Creator Discovery

A dedicated directory that elevates creators above individual products, prioritizing seller visibility.



2. Autonomous Profiles

Customizable public storefronts allowing creators to define their brand identity with bespoke banners and avatars.



3. Private Creator Hub

An isolated management environment giving sellers full autonomy over digital asset pricing and portfolio lifecycle.

System Validation Test Results

Black-Box Testing

100%

Perfect execution success rate with no errors across 10 core operational scenarios (auth & transactions).

User Acceptance Test

86.5%

Achieved the "Highly Feasible" category based on Likert scale evaluation by 20 respondents.

Load Testing Error

0%

Successfully handled a stress simulation of 300 virtual users (140.87 RPS) without failure.



Discussion



Structural Resilience (Backend)

Load testing results prove the system architecture does not suffer performance degradation under high pressure (300 concurrent users), resolving concurrency issues common in early deployments.



User Acceptance & UX

Although buyer functionalities were rated highly satisfying, evaluation scores for the seller profile customization were slightly lower, indicating potential areas for improving interface clarity on the creator's dashboard.



Digital Ecosystem Trust

The platform effectively utilizes visual personalization and a reliable payment gateway (Midtrans) to validate creator credibility, a fundamental aspect in bridging the trust gap for intangible commodities.

Key Research Findings



Visibility Resolution

The seller-based infrastructure effectively resolves the brand visibility deficit experienced by digital creators when using traditional physical-oriented marketplaces.



Storefront Autonomy

The dedicated seller dashboard is proven to return portfolio management autonomy to creators, distancing them from the complexities of shipping logistics parameters.



Implementation Readiness

Comprehensive functional and stress evaluations confirm that this prototype has strong fundamental stability and is ready for a real digital commerce ecosystem.

Research Benefits



For Digital Creators (Practical)

Provides a working environment free from physical logistics, allowing for more professional and autonomous marketing of digital materials.



For Academics (Theoretical)

Offers a foundational framework (blueprint) for information system architectures specifically for intangible digital commodity trading.



For the Economy (Social)

Drives the growth of the local Creator Economy in Indonesia by facilitating independent creators to build sustainable digital businesses.



Main References

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