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PROCESS GRAPHS AND REENGINEERING IN ECOMMERCE: MODELING FOR DIGITAL EFFICIENCY IN 2024

Summary. *This paper reinterprets classical IT business modeling principles through the lens of eCommerce, outlining how tools such as process graphs, reengineering strategies, and optimization techniques traditionally used in information systems can enable marketplace efficiency, automation, and growth. It presents a structured methodology for translating real- world seller operations into actionable workflows and optimization scenarios. The article aims to demonstrate the relevance of systematic modeling in transforming traditional commerce into robust digital ecosystems.*

Key words: *eCommerce modeling, business process reengineering, optimization, BPMN, process graph, marketplace automation, system analysis.*

Actuality / Relevance As eCommerce platforms scale rapidly, business owners are challenged to move beyond intuitive decisions and adopt structured, data-driven workflows. Applying IT- derived modeling practices—such as BPMN, IDEF, and UML diagrams—helps sellers automate procurement, customer service, and

inventory cycles. More importantly, visual modeling enables stakeholders to reveal inefficiencies, prioritize development areas, and implement scalable automation.

Discourse

1. **Business Process Modeling in eCommerce**

Digital sellers face growing process complexity, from multi-platform listings to logistics and returns. To map these operations, a systematic modeling framework is essential.

Techniques such as BPMN and IDEF0 allow eCommerce entrepreneurs to along with analysis (Table 1) [4]:

◦ Document "as-is" processes (e.g., current fulfillment workflows)

◦ Identify bottlenecks (e.g., redundant order verification steps)

◦ Propose "to-be" states optimized for software automation

Table 1

Sample eCommerce Business Process Gap Analysis on personal instance

Process Stage	As-Is (Symptoms)	To-Be (Goal)
Order Processing	Manual verification via email	Auto-synced API-based validation
Customer Returns	Disconnected email/chat handling	Unified ticketing system
Vendor Onboarding	Google Forms, manual entry	Automated intake + database sync

2. Notations and Graph Standards for Modeling

Among the most widely applied modeling notations:

- **BPMN (Business Process Model and Notation)** is ideal for marketplace workflows [3].

• **IDEF0** captures inputs, controls, mechanisms, and outputs, essential in supplier-side coordination[3].

• **UML Sequence Diagrams** illustrate dynamic interactions, such as refund negotiations or bundle creation logic [3].

Each tool provides a unique lens on the system. In eCommerce, diagrams are not ornamental—they serve as logic engines that inform automation.

3. **Optimization and Reengineering for Market Efficiency**

Optimization begins with identifying criteria—efficiency, timeliness, cost—and establishing boundaries (resource constraints, vendor policies) [1].

Reengineering then proposes new workflows balancing [2]:

◦ Speed vs control

◦ Cost vs coverage

◦ Automation depth vs exception flexibility

This approach resonates with the Pareto Principle: meaningful change happens when small, targeted process shifts bring disproportionate gains.

Optimization rout looks endless and actually can be up to the brilliance and in non constant environment because it's defined by the triangular connections (Fig. 1)

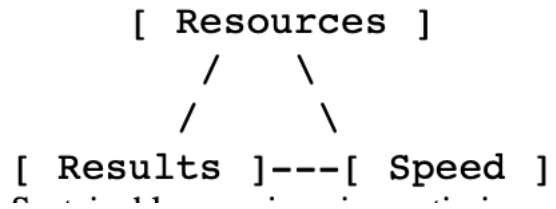

Fig. 1. Optimization Triangle
Curtis, B., Kellner, M. I., & Over, J. (1992). "Process Modeling."

4. Process Complexity Test for Reengineering Readiness [3]

Use this checklist to evaluate eCommerce workflows:

- 3 stakeholders per task?
- 2 conditional branches per process?
- 3 exit states in refund flow?
- No role-based alerts on workflow updates?

If "yes" to 3+ questions, reengineering is advised. [3]

Conclusion. Business modeling offers more than visualization—it transforms perception into systematized logic. When eCommerce entrepreneurs adopt modeling frameworks from IT, they gain clarity, efficiency, and control over their operations. These methods—rooted in engineering but applied to commerce—highlight extraordinary ability in digital transformation.

Literature

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