

A COMPREHENSIVE REVIEW OF BUSINESS PROCESS TOOLS AND TECHNIQUES IN E-COMMERCE BUSINESS MODELS

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ABSTRACT

Business process management (BPM) is crucial in enhancing operational efficiency and collaboration across various business functions in e-commerce. This study aims to systematically review existing literature to investigate the nexus between BPM and e-commerce. A comprehensive literature review was conducted according to the PRISMA guidelines for conducting systematic reviews. Through a systematic search of the Scopus database, 22 peer-reviewed articles were identified and included in the analysis. The findings reveal a significant body of research exploring BPM within e-commerce, encompassing quantitative analyses, studies on business processes, and examinations of e-commerce business models. This review suggests avenues for further research, including investigations into BPM in e-commerce utilizing approaches that analyze e-commerce business models such as C2C, C2B, and B2G interactions.

INTRODUCTION

Advancements in the digital landscape are evolving rapidly, with smartphones becoming indispensable for fulfilling everyday needs such as shopping for clothing and groceries [1], [2]. E-commerce platforms offer unparalleled convenience and efficiency, enabling customers to shop flexibly anytime, anywhere [3]. Mobile shopping, in particular, stands out for its effectiveness and efficiency, driven by innovative business strategies [4], [5]. The seamless accessibility of e-commerce solutions promptly addresses consumer needs, fostering comfort, ingenuity, and modernity [6]. As the digital transition unfolds, customers exhibit heightened interest, demanding sustained engagement facilitated by contemporary technology [7], [8].

The digital transformation of e-commerce profoundly impacts industries and societies [9]. Leveraging e-commerce platforms for shopping yields numerous advantages, including the ability to make purchases conveniently via smartphones, access to a diverse range of products, dissemination of product knowledge through marketing content, availability of promotions and discounts, including cashback offers, personalized shopping experiences, and streamlined

payment systems [10], [11]. Effective implementation of e-commerce involves robust business process management (BPM).

When executed through e-commerce, BPM harnesses digital innovations to address contemporary challenges faced by customers and emerging businesses [12], [13]. Human errors and system inefficiencies may occur despite the benefits, potentially impacting sales performance [14]. Consequently, digital technologies empower business-to-business (B2B) and business-to-consumer (B2C) interactions, mitigating losses attributable to human error. Business processes evolve to foster greater collaboration [15], highlighting the intrinsic relationship between BPM and e-commerce [3], [16].

However, limited scholarly attention has been devoted to examining BPM in e-commerce using a systematic literature review (SLR) approach.

A systematic literature review (SLR) constitutes a rigorous academic inquiry into the body of research on a specific topic or field. It entails comprehensive identification, evaluation, and synthesis of relevant studies using a transparent, reproducible methodology. SLRs aim to compile the most current, evidence-based research pertinent to the subject matter, irrespective of its origin, thereby generating robust evidence reviews with reduced bias and inaccuracies [17]. This study seeks to investigate the current literature and research concerning the relationship between BPM and e-commerce through a systematic literature review, thereby contributing to a comprehensive understanding of this critical nexus.

RESEARCH METHODS

This study adhered to the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) criteria for conducting a systematic literature review [18]. A comprehensive database search utilised appropriate keywords related to business process management and e-commerce research. The Scopus global database was chosen as the primary source of information due to its reputation as a reliable repository of scholarly papers.

The search strategy used the keywords "business process management" and "e-commerce" in the title, abstract, and author keywords fields to identify relevant literature in the Scopus database, as illustrated in Figure 1. Data extraction was limited to yearly publications to ensure the inclusion of fully published data for each year. The search query employed for data mining was as follows: ((TITLE-ABS-KEY ("business process management") AND TITLE-ABS-KEY ("electronic commerce" OR e-commerce)) AND PUBYEAR < 2022 AND (LIMIT-TO (SUBJAREA, "BUSI"))) AND (LIMIT-TO (SRCTYPE, "j")) as of August 2022. This search yielded a total of 22 documents.

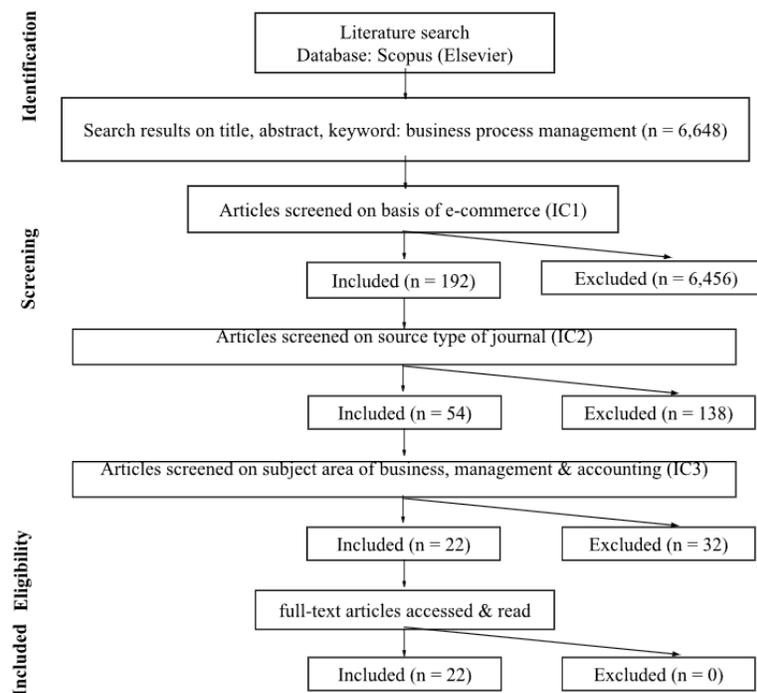


Figure 1 illustrates the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Protocols.

This systematic literature review (SLR) incorporates quantitative, business process, and business model analysis [2, 4, 11]. The quantitative analysis encompasses affiliated publications, yearly publications, and geographical context [2, 4, 11]. Business process analysis includes examining the management, primary, and supporting processes [19]. Meanwhile, the business model analysis delves into various e-commerce models such as business-to-business (B2B), consumer-to-consumer (C2C), business-to-consumer (B2C), consumer-to-business (C2B), and business-to-government (B2G) [20].

RESULTS AND DISCUSSION

This section provides an overview of the literature and research about business process management in e-commerce, employing quantitative analysis, business process analysis, and e-commerce business model analysis.

A. Quantitative Analysis

1) Research Affiliated Publications

Forty-three research institutions were identified as contributors to the field of business process management and e-commerce. Figure 2 illustrates the distribution of research productivity across these affiliated institutions. Notably, George Mason University in the United States emerged as the most prolific institution in this domain, with three published documents. This was closely followed by The University of Manchester, Alliance Manchester Business School, and Nottingham University Business School in the United Kingdom, each with two similar documents.

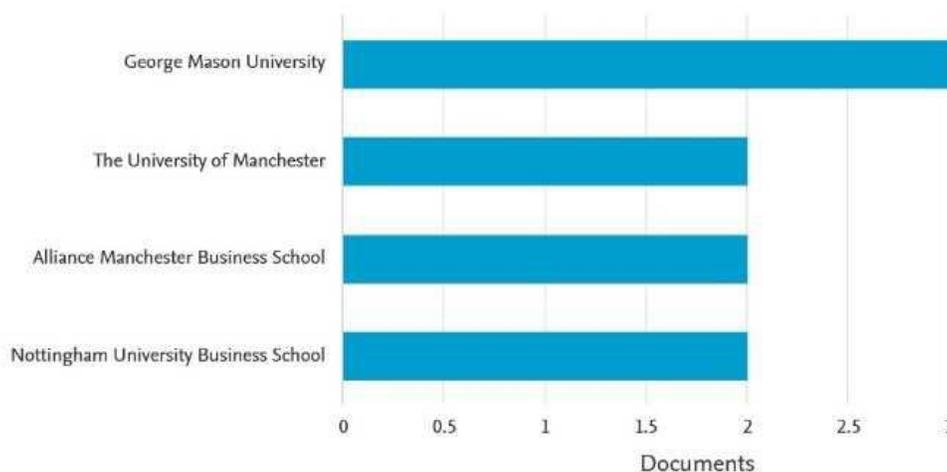


Figure 2 depicts the publications associated with the research.

Research on business process management and e-commerce has been predominantly conducted by higher education institutions in the United Kingdom. Table 1 highlights the United Kingdom as one of the leading countries in terms of productivity in this field.

2) Business Process Management and E-Commerce Sector's Yearly Research

Figure 3 depicts the distribution of 22 documents published annually in this domain. Analysis of these data reveals fluctuations in the number of publications related to business process management in e-commerce, with peaks observed in 2003, 2005, 2007, and 2019.

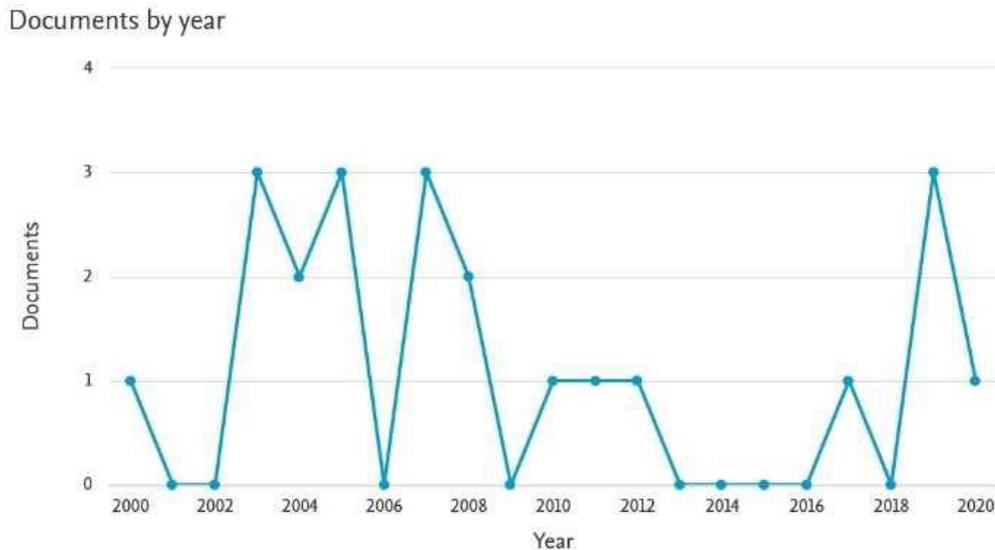


Figure 3 showcases the annual trends of Business Process Management within the E-Commerce sector publications

This surge in growth can be attributed to increased interest in the topic, driven by publications on business process management in e-commerce in reputable scientific journals, including the International Journal of Instruction, the International Journal of Interactive Mobile Technologies, the International Journal of Mobile and Blended Learning, and the Information Resources Management Journal.

3) Geographical Contexts

Research concerning business process management in e-commerce predominantly originated from the United States and the United Kingdom, as indicated in Table 1. To ascertain which countries contributed the most to this research area, we examined the location of the research data (if provided by the researcher) or the location of the authors (in cases involving observations, case studies, or literature reviews).

Alternatively, the location of the authors was considered, especially in articles utilizing empirical analysis or publishing secondary data. Among the 22 documents reviewed, 30 different countries were represented. The United States accounted for ten documents, emerging as the leading contributor. Following closely, the United Kingdom contributed five documents, while Algeria and Hong Kong each had two publications.

The countries contributing a single document were Canada, Chile, China, France, India, Iran, Kyrgyzstan, the Russian Federation, and Taiwan. Additionally, two papers were authored from undefined locations. This diverse geographical representation underscores the increasing significance of business process management in e-commerce research, reflecting sustained interest among professional scholars worldwide.

B. Perspective Analysis

1) The Perspective of Business Process Management and E-Commerce Business Model

The relationship between business process management and e-commerce can be analyzed through business process classification analysis [19] and business model classification analysis [20], as summarized in Table 2. The management process is intricately linked to the e-commerce business model.

Business process classification analysis encompasses process management and primary and supporting processes. Ten studies have investigated the aspect of process management in business process management in e-commerce. Notably, blockchain-based technology has been identified as a catalyst for enhancing business processes in e-commerce [21], and the challenges and opportunities posed by implementing business process management and e-commerce in the era of Industry 4.0 have been explored [26].

Eight studies have focused on the primary aspects of business process management in e-commerce. In e-commerce, various process concepts have been adopted, driven by the expanding development of workflow technology as a standard solution for business process management [29]. Furthermore, the utilization of ICT infrastructure for end-user engagement, internal business process management within organizations, and the integration of contemporary ethical principles are highlighted as key features of modern e-business, including e-commerce [30].

Various aspects of supporting processes in business process management in e-commerce have been explored in four studies. These investigations shed light on large-scale business process configuration functions and the elegant yet critical small digital business processes commonly found in e-commerce. Adopting a multifaceted model is proposed to drive the management of digital business workflows and facilitate real-time adaptation to evolving digital business and entrepreneurship requirements [34]. For many businesses, enhancing the efficiency and reliability of e-commerce app development presents a significant challenge, given the complexity and costliness of current business process methodologies. Simplified business process service-oriented designs offer potential solutions, offering the prospect of lower development budgets [37].

The classification of business models in business process management in e-commerce encompasses B2B, B2C, C2C, C2B, and B2G models. Thirteen studies have explored business process management in e-commerce within the B2B model context. As the demand for dynamism, speed, and global interconnectedness of complex business systems grows, e-business, including e-commerce, faces the challenge of transitioning from transaction-oriented to collaborative and optimized business process management [22].

Nine studies have delved into business process management in e-commerce within the B2C model framework. Many businesses have leveraged enterprise resource planning systems-enabled business process management services. However, adapting to new e-commerce models necessitates the ability to manage rapid process changes effectively [1].

Research in business process management in e-commerce has identified specific gaps. Specifically, more studies need to examine business process management from the perspective of business model analysis within the C2C, C2B, and B2G domains.

TABLE I. GEOGRAPHICAL CONTEXTS OF BUSINESS PROCESS MANAGEMENT AND E-COMMERCE STUDIES

<i>Countries</i>	<i>Publication number</i>	<i>Percentage (%)</i>
United States	10	33,3%
United Kingdom	5	16,7%
Algeria	2	6,7%
Hong Kong	2	6,7%
Canada	1	3,3%
Chile	1	3,3%
China	1	3,3%
France	1	3,3%
India	1	3,3%
Iran	1	3,3%
Kyrgyzstan	1	3,3%
Russian Federation	1	3,3%
Taiwan	1	3,3%
Undefined	2	6,7%
Total		100%

TABLE II. THE PERSPECTIVE OF BUSINESS PROCESS CLASSIFICATION AND E-COMMERCE BUSINESS MODEL CLASSIFICATION

Business Process Classification	E-Commerce Business Model Classification	
	B2B	B2C
Management process (strategy & planning, budgeting, and compliance)	[21], [14], [22], [23], [24], [25]	[26], [27], [28], [1]
Main process (design & development, manufacturing, and delivery)	[29], [10], [3], [12]	[30], [31], [32], [33]
Supporting process (Accounting, IT management & recruitment)	[34], [35], [36]	[37]

CONCLUSION

Business process management in e-commerce is pivotal in enhancing operational efficiency and mitigating errors in the digital market and economy. This study has examined the research landscape in business process management and e-commerce, offering quantitative analyses of annual publications, institutional affiliations, and geographical distributions. Notably, Europe emerges as a significant contributor to this field. The volume of annual publications in business process management in e-commerce has exhibited variability over time. The findings underscore the existence of numerous publications addressing business process management in e-commerce, mainly through business process analysis and e-commerce business model analysis.

There remains potential for further research, particularly in exploring business process management in e-commerce from the perspective of business models such as C2C, C2B, and B2G. Additionally, investigating business process management in the metaverse and web 3.0 contexts presents an intriguing avenue for future inquiry. This review will likely stimulate new research endeavours, filling knowledge gaps and fostering more sophisticated analyses in these disciplines.

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