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Review

Mobile Internet based construction supply chain management: A critical review

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ABSTRACT

Construction supply chain management (CSCM) has gained rapid development in last decades. As a result, the conventional Internet fails to fulfill demands for real-time information sharing and communication derived from various participants of the construction supply chain (CSC).The emerging Mobile Internet (M-Internet) has provided potential for solving this issue. This paper presents a systematic review on M-Internet based CSCM via descriptive and thematic analyses of publications retrieved from four major databases. The theoretical contribution of this paper is the development of an integrated framework in this research domain. This includes five aspects of CSCM, i.e. material flow and supply management, real-time information sharing and communication, coordination and integration in CSC, technology support for M-Internet, and associated safety issues. Finally, gaps in the existing body of knowledge are identified and future research agenda is proposed.

Contents

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1. Introduction

The concept of supply chain management has been introduced from the manufacturing sector into the construction sector two decades ago [20,39,47,58,71]. CSC is a typical make-to-order supply chain in which a single product is assembled from incoming materials [26,51,107,110]. Consisting of various project processes, CSC can be regarded as a network of multiple organizations and relationships of information flow, materials flow, funds flow and services or products between stakeholders [2,35]. CSCM provides a novel solution for problems associated with the construction industry such as fragmentation, reworks, cost and time overruns, and conflicts from a systematic perspective. Meanwhile, the significant challenge of CSCM is to facilitate a multidisciplinary team on achieving common project goals via effective and efficient collaboration and information communication. As a result, information technological advancements have been made such as IT-based system [21,36,78] and web-based technologies [16,28,70,76,77,94]. It is well recognized that information acquisition and information communication are two most crucial aspects of information management in CSCM [75,112,113]. However, there are significant limitations associated with conventional Internet technologies employed in CSCM. For instance, the information exchange among construction sites, site offices, and CSC teams is tedious, time-consuming, and error prone [89,97].

The burgeoning M-Internet provides an effective and efficient way to solve this issue by combining mobile communication technology with Internet technology [52]. Different from the stationary Internet, M-Internet consists of mobile terminal, access networks and application services [14,53]. Indeed, real-time collaboration and information communication between stakeholders within the CSCM are crucial for the project success [75,97,113]. This is crucial for mega projects which are concerned with a large number of organizations and personnel distributed from different geographical locations [66,81,86].

As a result, the application of M-Internet in CSCM has attracted a growing level of attention [9,105]. However, there is shortage of a comprehensive and systematic review of M-Internet CSCM. This study aims to develop an integrative conceptual framework to facilitate the M-Internet's application in CSCM and consequently bridge the gap between research outcomes and practical requirements.

2. Methodology

A systematic review approach is adopted in this study which pays attention to synthesizing research in a systematic, transparent, and

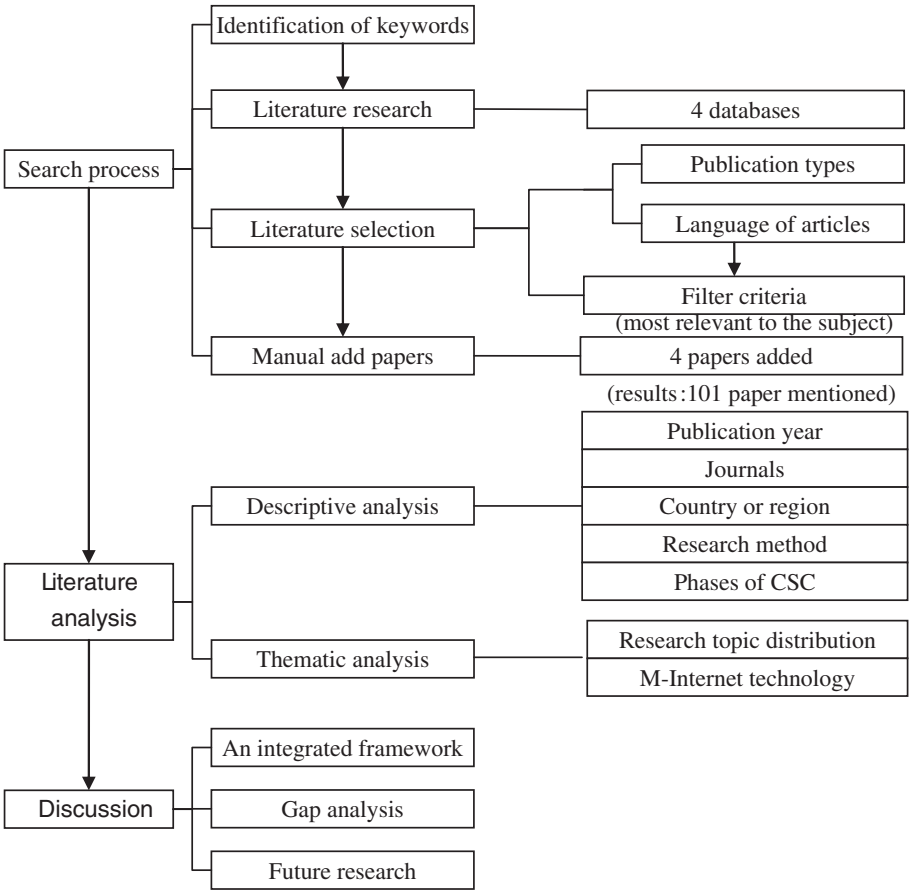

Fig. 1. Main processes of systematic review.