

# Management of a Virtual Construction Management Services Company

**Wafa Alsakini**

*TKK Helsinki University of Technology, Finland*

**Juhani Kiiras**

*TKK Helsinki University of Technology, Finland*

**Pekka Huovinen**

*TKK Helsinki University of Technology, Finland*

## NETWORKING AND VIRTUAL COMPANIES IN GENERAL

Networking is the organizational form of the information age. Network organizations signify a form of collaboration designed to facilitate economic exchange and to provide an environment for interaction between people (social exchange). Economic actors are likely to sacrifice some of their own preferences in the pursuit of collective goals (Fleisch & Österle, 2000; Franke, 2001). Network organizations are characterized by (1) a purpose and shared goals unifying members, (2) independent members benefiting from being part of a whole, (3) voluntary links between members, (4) multiple leaders providing greater resilience, and (5) many levels integrating organizations, units, and people. From an intra-organizational perspective, networks are the collections of individuals and sub-units within one and the same organizational boundaries. From an inter-organizational perspective, networks are the collections of more or less independent individual economic actors such as, companies, institutions, and research organizations (Franke, 2001). Three network types involve (1) internal networks as the loose associations of autonomous groups and teams, (2) stable networks where focal firms engage in long-term relationships with external suppliers or partners, and (3) dynamic networks as the temporary alliances of independent firms with key skills usually organized around a leading or brokering firm based on the exploitation of market opportunities.

Virtual companies (VC) resemble dynamic networks that facilitate the discovery and configuration of core competencies in value chains that, in theory, result in optimal value creation processes. VCs are considered

purposeful systems that are composed of sets of inter-related elements, that is, actors, resources, and activities (Saabeel et al., 2002). They have the abilities to alter value creation processes (Franke, 2001) through a concept of switching (Mowshowitz, 1999). The essence of VCs is the meta-management of goal-oriented activity. Virtual companies are characterized by four structural dimensions (Bauer & Köszegi, 2003): (1) through differentiation (modularity and heterogeneity), a variety of satisfiers or modules tend to develop a VC's core competence to meet a specific requirement optimally. A flexible and dynamic combination of core competencies into unique value chains gives companies an opportunity to achieve competitive advantages by increasing their resources and know-how virtually; (2) through configuration (temporary and loose coupling), the overall structure and network of a VC is determined to meet changing customer requirements. The main pre-requisite for flexibility involves structural and cultural relations between network partners and the loose integration of collaborators, that is, the market-based mechanisms of integration are required for VCs; (3) through integration (trust as a coordination mechanism) in a trust-based systems, the behavior of a VC is guided by shared norms and values. Control output or behavior is replaced by self-control. Therefore, trust is considered as an efficient mechanism to coordinate exchange relations that are characterized by high uncertainty and interdependence between transaction partners; (4) through technology, the distributed nature of a VC requires integration at the social and technical levels. ICT is considered an enabler to guarantee the efficient coordination of activities along the value adding process in question.

## **MODELS ENABLING CONSTRUCTION MANAGEMENT (CM) SERVICES**

The general construction management (CM) context involves individual practitioners who are needed to perform various CM services for owners (clients) of buildings. A vast range of expertise required for performing all CM services and the demand for timely CM performance on projects preclude the performance of the complete CM services by an individual firm, except on the simplest projects (Haltenhoff, 1999). The organizational make-up of a CM company is unique in the building industry. CM practice has substantiated the fact that CM companies must be multi-discipline organizations. Owners agree with qualified CM companies to provide construction leadership as well as perform management and administration within a defined scope of services. A construction manager works throughout all the phases of a project (programming, building design, procurement, and construction works) and cooperates also with designers in furthering the interests of the owner in question.

In all kinds of economies, the building sector context deals with the design, financing, implementation, services, and life-cycle aspects of investments in both new buildings and the renovation of the existing building stock. Buildings serve public and private sectors. There are residential and non-residential buildings. Further, the latter include commercial, industrial, office, and public buildings.

In the exemplary context of building in Finland, this market witnessed a deep recession in the early 1990s which led to the emergence of both new CM-for-fee consultants and CM-at-risk contractors with their streamlined organizations. Large building investments were increasingly implemented under many forms of CM contracts (Kiiras et al., 2002). Today, major clients are satisfied as the reliance of CM contracts allows them to make decisions in more flexible ways and to avoid change orders as part of the phasing of project processes (Kiiras & Huovinen, 2004).

Information management based on object-oriented product models is changing the techniques of design documentation radically when buildings are carried out under CM (and other) contract forms. Readily, the new owner-led types of documentation have been developed. Overall, product model approaches involve (a) product models that are bases containing information about particular individual artifacts (buildings and their parts),

and (b) product data models that are some particular types of conceptual schemas, with their component objects, extending over the whole life-cycles (not only the design or construction stage), expressed in some information modeling languages (Björk, 1995).

In the same vein, process or activity models involve so far the analyses and descriptions of building process functions or activities to discover and to model what controls the execution of functions and what objects or data is consumed and produced by each of interrelated functions (see for example Ojwaka, 1999). Together, these product-modeling approaches enable the exploitation of complete construction information models.

In the mid-2000s, the first two-way linkages between the product (data) models and process models are being designed and piloted across the building globe. The integrated uses of a product model with a process model are yet to be (fore)seen.

## **DYNAMICS OF A VCMSC**

A virtual construction management services company (VCMSC) is herein defined as a dynamic network of collaborating entities that reconfigure around a virtual organizational core whenever a project opportunity arises. A leading member guides a network both on a short- and long-term basis. Members can be geographically dispersed. Each member specializes itself in those parts of the value chain with which it achieves the maximum added value. A VCMSC is a purposeful system composed of a set of interrelated elements, that is, members, resources, and activities. The key members involve special system contractors (SSCs) (Salmikivi, 2005).

An ideal VCMSC has two basic characteristics: (1) a flat and virtual organization and (2) a competitive network of SSCs, designers, and a project staff pool. A VCMSC is capable of adjusting to changes in its environment and renewing itself by designing new CM services for higher customer value, implementing such CM service processes, and managing virtual operations within an IT-enabled, competitive network. The traditional middle management level is removed or to be outsourced. The basic functions (units) are outsourced fully and replaced by the network. Thus, various existing subcontractors, service providers, and building products suppliers can adopt the new enlarged roles of SSCs with incentives for system development,

9 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/management-virtual-construction-management-services/17699](http://www.igi-global.com/chapter/management-virtual-construction-management-services/17699)

## Related Content

---

### Web-Based Business Reporting in Virtual Enterprises

Raif Parlakkaya, Adem Ögütand M. Tahir Demirsel (2008). *Encyclopedia of Networked and Virtual Organizations* (pp. 1864-1870).

[www.irma-international.org/chapter/web-based-business-reporting-virtual/17833](http://www.irma-international.org/chapter/web-based-business-reporting-virtual/17833)

### The Case of Literacy Motivation: Playful 3D Immersive Learning Environments and Problem-Focused Education for Blended Digital Storytelling

Stylianos Mystakidisand Eleni Berki (2019). *Virtual Reality in Education: Breakthroughs in Research and Practice* (pp. 259-274).

[www.irma-international.org/chapter/the-case-of-literacy-motivation/224701](http://www.irma-international.org/chapter/the-case-of-literacy-motivation/224701)

### Smart Classroom-Based Innovative Solution Toward Uninterrupted Education: Perspective

Sudhir K. Routrayand Sasmita Mohanty (2022). *International Journal of Virtual and Augmented Reality* (pp. 1-14).

[www.irma-international.org/article/smart-classroom-based-innovative-solution-toward-uninterrupted-education/306689](http://www.irma-international.org/article/smart-classroom-based-innovative-solution-toward-uninterrupted-education/306689)

### Four Questions You Should Ask Before Using Virtual Reality for Psychological Research

Max Teaford, Feng Guo, William W. Moore, Madison Murray, Hannah C. Daugherty, Connor Callaway, Madalyn Filetti, Maddox Holtz, Tanner Greeneand Shyla S. Khan (2025). *International Journal of Virtual and Augmented Reality* (pp. 1-9).

[www.irma-international.org/article/four-questions-you-should-ask-before-using-virtual-reality-for-psychological-research/374030](http://www.irma-international.org/article/four-questions-you-should-ask-before-using-virtual-reality-for-psychological-research/374030)

### Virtual World Avatar Branding

Thomas J. Mowbray (2014). *Identity and Leadership in Virtual Communities: Establishing Credibility and Influence* (pp. 77-94).

[www.irma-international.org/chapter/virtual-world-avatar-branding/97603](http://www.irma-international.org/chapter/virtual-world-avatar-branding/97603)