



AALBORG UNIVERSITY
DENMARK

Aalborg Universitet

Shaping client-driven business management concepts for modern construction markets

Huovinen, Pekka; Haugbølle, Kim; Oostra, Mieke

Published in:
CIB Proceedings

Creative Commons License
Other

Publication date:
2017

Document Version
Accepted author manuscript, peer reviewed version

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Huovinen, P., Haugbølle, K., & Oostra, M. (2017). Shaping client-driven business management concepts for modern construction markets. *CIB Proceedings*, 1-13.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

SHAPING CLIENT-DRIVEN BUSINESS MANAGEMENT CONCEPTS FOR MODERN CONSTRUCTION MARKETS

P. Huovinen¹, K. Haugbølle² and M. Oostra³

¹ *Business Management in Construction, Civil Engineering, Tampere University of Technology, P.O. Box 600, FI-3310 Tampere, Finland*

² *Research Group on Construction Management and Innovation, Danish Building Research Institute (and Aalborg University), A.C. Meyers Vaenge 15, DK-2450 Copenhagen SV, Denmark*

³ *Research Centre for Built Environment NoorderRuimte, Hanze University of Applied Sciences, P.O. Box 3037, 9701 DA Groningen, The Netherlands*

Email: pekka.huovinen@tut.fi

Abstract: The pioneering review has revealed that various authors have designed and published 77 construction-related business management (BM) concepts during the years 1990-2016 (Huovinen, 2017). In turn, the two-fold aim of our paper is to explore the degrees to which these BM concepts have been designed along the client-driven dimension and to suggest the ways to shape future BM concepts to better accommodate client views in modern construction markets. Our focused review found that 49 (57%) authors have designed their BM concepts along the client-driven sub-dimensions, i.e., 7 to high degrees, 14 to medium degrees, and 28 to low degrees. A further scrutiny of the seven highly client-driven BM concepts revealed that the six sub-dimensions may be of particular importance to take into account when shaping future BM concepts to accommodate client perspectives. These sub-dimensions include (i) client needs, (ii) client base, (iii) buyer-seller collaboration, (iv) sellers' strategies, (v) buyers' strategies, and (vi) services' use, professional, and exchange values. It is envisioned that this focus on client-driven BM will trigger a flow of collaborative R&D&I programs.

Keywords: Business management, clients, construction markets, literature review, marketing.

1. INTRODUCTION

Research into clients and users in construction provides economic, social, and environmental benefits to society, business, government, and academia. The goal of client-focused research is to advance professional behavior among all kinds of clients on the construction demand side. Root clients like investors and owners are playing key roles under complex contractual settings (aligning with Haugbølle and Boyd, 2016). Herein, we are approaching clients traditionally via the supply side, i.e., sellers managing businesses and nurturing buyer relationships. In contractual chains, many parties assume dual roles of sellers and buyers.

The *nature* of our paper is that of reporting on the conduct and findings of a *focused review* of construction-related business management (BM) concepts designed along the client-driven dimension. The *main aim* is to shape the design and content of future BM concepts along the client-driven dimension vis-à-vis firms competing in modern construction markets. We have approached this aim via the answering to the *three research questions* as follows:

- What are the schools of thought on generic BM that guide the design of generic and applied BM concepts, including those with contexts in modern construction markets?
- What are the degrees up to which the authors have designed 77 construction-related BM concepts (published during the years 1990-2016) along the client-driven dimension?
- How to shape the design and content of client-driven, construction-related BM concepts?

The eight schools of thought on generic BM are introduced in Section 2. The review method is reported upon in Section 3. The findings are overviewed in Section 4. The seven highly client-driven BM concepts are briefed and the shaping of BM concepts along the six client-driven sub-dimensions is discussed in Section 5. The conclusions are put forth in Section 6.

2. EIGHT SCHOOLS OF THOUGHT ON GENERIC BUSINESS MANAGEMENT

Since the early 1980s, many distinguished authors have replied to the fundamental question “What is a principal way of managing a business that will enable managers to set challenging business goals and attain them?” One of the co-authors of this paper has been identifying an abundance of replies as assumptions, arguments, definitions, concepts, frameworks, models, explanations, predictions, prescriptions, and even some claimed theories. Consequently, he has arranged the converging and diverging replies into a typology of the *eight schools of thought on generic BM* as follows (Huovinen, 2003a and 2008):

1. Focused, (from markets) outside-in (firms) school of Porterian BM proposes that managers can achieve superior business performance by integrating a chain of causalities, including differentiation and cost leadership strategies (e.g., Porter, 1994).
2. Focused, (from a firm’s) inside-out (to markets) school of resource-based BM proposes that managers can sustain high performance in businesses by developing and exploiting valuable, rare, and inimitable resources (e.g., Barney, 2002).
3. Focused, inside-out school of competence-based BM proposes that managers can attain their business goals and sustain above normal rents by building and leveraging organizational competences (e.g., Sanchez and Heene, 2004).
4. Broad, inside-out school of knowledge-based BM proposes that managers can develop competitive advantages by creating and managing knowledge, nurturing intellectual capital, and enhancing learning (e.g., Nonaka and Takeuchi, 1995).
5. Broad, inside-out school of organization-based BM proposes that managers can achieve high performance by relying on organizational solutions in focal spheres of make/buy decisions, inter-/externalization, globalization, multiple markets, and multiple, networked stakeholders (e.g., Bartlett and Ghoshal, 1989/1998).
6. Broad, inside-out school of process-based BM proposes that managers can achieve high performance by running businesses as sequenced, deliberate, and/or emergent processes, such as incremental building, growth, change, and internationalization (e.g., Johansson and Vahlne, 2009).
7. Broad, inside-out and outside-in school of dynamism-based BM proposes that managers can achieve high performance by perceiving businesses as fast strategy games in unstable markets, nurturing core competences, innovating business models and disruptive technologies, and renewing edges (e.g., Hamel and Prahalad, 1994).
8. Focused, outside-in school of evolutionary BM proposes that managers can achieve high performance even in chaotic external environments by enacting internal and external forces that affect destinies of firms and businesses (e.g., Burgelman, 2002).

3. METHOD OF THIS FOCUSED, CLIENT-DRIVEN REVIEW

The conduct of the *17-year, total reviewing process* has been reported in Huovinen (2003a, 2008, and 2017). So far, the pioneering reviewing has resulted in the identification of 74 references that contain 77 construction-related BM concepts, published during the years 1990-2016. In this paper, *client-driven BM* involves firms that are preferring clients as a dimension, outside-in founding blocks, or simply elements in managing of their construction-related businesses, respectively. This client-driven review was conducted as 77 concept-

specific assessments. The *four degrees* of the design of client-driven BM concepts were pre-defined as follows:

- *High degree*: an author has designed a BM concept by choosing a client-driven dimension as one of the primary dimensions and by defining many key elements, such as client-driven goals, business ideas, offerings, strategies, processes, or contracting.
- *Medium degree*: an author has designed one or more client-driven key elements as part of a BM concept.
- *Low degree*: an author has only named client-driven issues in a reference, such as client orientation, client needs, or client requirements. No client-driven elements are included.
- *No degree*: an author is silent vis-à-vis clients as part of construction-related BM. Not even one explicit client-driven ‘phrase’ is included into a reference.

Overall, the assessment revealed that 49 (64%) construction-related BM concepts include the client-driven dimensions, elements, or issues. The assessment validity was protected against the three biases as follows. (B1) A *concept inclusion bias* is related to a fact that one of the three reviewers has (co-)designed 9 (12%) BM concepts along the client-driven dimension. This bias was minimized by assessing each reference in the same way and quoting exactly the minimum relevant parts. Future reviewers can test the inter-concept consistency, repeat the assessments, compare the degrees as well as possibly detect differences and therein reveal reasons for them. (B2) A *concept exclusion bias* is related to 28 no-degree assessments. Again, future reviewers may test these exclusions through the analytical reading of the same 74 references (see a list) containing 77 BM concepts. (B3) A *degree assessment bias* is related to the reliance on the four degrees (high, medium, low, and no) instead of one of more rigorous, quantitative scales. This 4-degree lens was selected to correspond to the explorative nature of this client-driven review. We could assign each BM concept to one degree, by using the pre-definitions. Future reviewers may specify degrees differently, like by dividing each degree into sub-degrees and differentiating among the current same-degree BM concepts.

4. SEVEN HIGHLY CLIENT-DRIVEN BUSINESS MANAGEMENT CONCEPTS

Ex ante, it was hypothesized that only some authors have incorporated client-driven elements to high degrees into their BM concepts. Indeed, *there are only 7 (14%) high-degree concepts, 14 (29%) medium-degree concepts, and 28 (57%) low-degree concepts* (Table 1). The 77 *concept-specific assessments* and quoted terms are compiled in Tables 2-8, school by school, except that no evolutionary BM concepts related to construction have been identified.

Table 1: Three-degree assessment of the design of 49 construction-related BM concepts (published during the years 1990-2016) along the client-driven dimension, by school of thought on BM.

School of thought on BM	High-degree BM concepts		Medium-degree BM concepts		Low-degree BM concepts		BM concepts with client-driven elements	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
1 Porterian school	3	(6%)	5	(10%)	5	(10%)	13	(27%)
2 Resource-based school	1	(2%)	0	(0%)	0	(0%)	1	(2%)
3 Competence-based school	1	(2%)	1	(2%)	1	(2%)	3	(6%)
4 Knowledge-based school	0	(0%)	2	(4%)	3	(6%)	5	(10%)
5 Organization-based school	1	(2%)	0	(0%)	8	(16%)	9	(18%)
6 Process-based school	0	(0%)	1	(2%)	3	(6%)	4	(8%)
7 Dynamism-based school	1	(2%)	5	(10%)	8	(16%)	14	(29%)

8 Evolutionary school	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Sum	7 (14%)	14 (29%)	28 (57%)	49 (100%)

Table 2: Client-driven degrees of 17 construction-related Porterian BM concepts, published during the years 1990-2016 (1st school).

Author (Year)	BM concept and focal context	Assessed client-driven degree based on key quotations (page no.)
Winch, Schneider (1993)	2x2 matrix: Four strategies: strong delivery, experience, ideas, and ambition for UK architectural practices	<u>HIGH</u> : The primary dimensions are (i) clients' preference for quality (client review or peer review) and (ii) project type (complex or simple) (471)
Jennings, Betts (1996)	Model and 4 strategies: execution, expertise, efficiency, and experience for UK quantity surveying practices	<u>HIGH</u> : Primary dimensions: (i) regular, faithful client base (specific, varied) and (ii) level of service to meet clients' requests (simple, complex) (178-9)
Pinto et al. (2000)	Subcontractor's and clients' value chains, customer-based project success	<u>HIGH</u> : Subcontractor as a partner enhances clients' competitive advantages and operations (108)
Roulac (2001)	8 strategies and 7 contributions of superior corporate strategy to competitive advantages in US real estate	<u>Medium</u> : Places and spaces can enhance or frustrate access by customers (143). Creating and retaining customers as 1 (out of 7) contributions (145).
Huovinen (2001)	4-area framework for technology-intensive contractors to design strategies, to offer/tailor solutions	<u>Medium</u> : 3 dimensions include (i) foreign investors with business scope, procurement, need, contract, (ii) focal contractor, and (iii) competitors (69, 73)
Langford, Male (2001)	Adapted 5 forces shape the UK industry structure	<u>Medium</u> : Bargaining power of owners (clients) as 1 (out of) 5 competitive forces
Rapp (2001)	Adapted 5 forces (incl. speedy response) and a client value chain in the US construction	<u>Medium</u> : Bargaining power of clients as 1 (out of) 5 competitive forces (39). Client service follow-up as 1 (out of) 5 elements in value chains (40).
Singer et al. (2007)	Real estate and competitive strategies model in Dutch companies	<u>Medium</u> : Creating customer loyalty by selling unique product/service with a differentiation strategy. Serving customers with a focus strategy (29).
Veshosky (1994)	Analytical, applied framework for the design segment of the A/E/C industry in the USA	<u>Low</u> : Focus/niche strategies with differentiation involve responsiveness to clients' needs as 1 (out of 5) opportunity areas (43)
Roulac (1999)	Real estate (RE) value chains for supporting US firms' businesses	<u>Low</u> : RE supports a firm to deliver goods, services to customers and their customers (389). Buyers are attracted to a retail distribution system (398-389).
Kale, Arditi (2002)	Mode (cost, quality, time, innovation), scope (geography, delivery, clients)	<u>Low</u> : Improving communications with US clients and consultants, meeting needs effectively (240)
Huovinen (2011a)	4 sustainable businesses in 8 arenas in construction markets	<u>Low</u> : Each incumbent occupies 2 roles of a procurer and a seller (3)
Tansey et al. (2014)	Taxonomy of 60 response strategies of Irish and UK construction firms to recession	<u>Low</u> : 2 client-driven strategies: (i) service a specific client group to enhance reputation and relations (712); (ii) target less vulnerable clients (715)
Betts, Ofori (1992)	Use of Porterian concepts in construction firms in the UK	No degree
Milosevic, Srivannaboon (2006)	Framework for aligning PM and a firm's business strategy in US engineering, industrial firms	No degree
Chiang et al. (2008)	Volume building strategy of contractors in Hong Kong	No degree
Heywood, Kenley (2008)	Competitive advantage model for corporate RE in Australia	No degree

Table 3: Client-driven degrees of 2 construction-related resource-based BM concepts, published during the years 1990-2016 (2nd school).

Author (Year)	BM concept and focal context	Assessed client-driven degree based on key quotations (page no.)
Lowendahl (1997)	3 strategies, 4 resources, 4 dimensions for differentiation, and 3 phases for US professional service firms	<u>HIGH</u> : The three strategies based on (a) client relation, (b) solution or output, and (c) problem solving or creativity (120-130)

Johnsson (2011)	Building system as a strategic asset for industrialized companies in Sweden	No degree [Only the key client types and relations of the case company are reported upon.]
-----------------	---	--

Table 4: Client-driven degrees of 5 construction-related competence-based BM concepts, published during the years 1990-2016 (3rd school).

Author (Year)	BM concept and focal context	Assessed client-driven degree based on key quotations (page no.)
Helander, Möller (2007)	Dynamic model for a complex system supplier's customer strategy and managing supplier-client relations	<u>HIGH</u> : A customer's 3 strategies are a basis for the design and coupling of a supplier's 3 roles, respectively (722-725)
Langford, Male (2001)	Strategies for international construction and the internationalization of UK firms	<u>Medium</u> : 1 (out of 9) sources of competitive advantage includes the identification of user/client needs via market research and partnerships with clients (137)
Davies et al. (2007)	Model of a pure systems seller vs. a pure systems integrator for organizing capital goods into systems, globally	<u>Low</u> : Customer demand for more complex solutions is an important driver behind the emergence of systems integrators offering multi-vendor solutions (188)
Huovinen (1999)	Recursive, competence-based framework for managing a firm in capital investment markets	No degree
Trejo et al. (2002)	Capability assessment for core competency development in US construction & engineering	No degree

Table 5: Client-driven degrees of 11 construction-related knowledge-based BM concepts, published during the years 1990-2016 (4th school).

Author (Year)	BM concept and focal context	Assessed client-driven degree based on key quotations (page no.)
Hawk (2006; 1992)	Continual learning system based on a learning capability in international building	<u>Medium</u> : 2 (out of 10) recommendations are (i) embracing changing consumer ideals and (ii) seeking new business ideas in customer relationships (737-8)
Borner (2004)	Project and success-oriented KM model for design-build contractors in Swiss markets based on the creation and re-activation of knowledge clusters for new projects	<u>Medium</u> : Incorporation of changing needs of the customer/flexibility as 1 (out of 7) cross-section knowledge clusters, coupled with the transparency of a design-build contractor (6). Customer satisfaction and loyalty as part of a strategic target level (8).
Love et al. (2000)	Conceptual model for a learning organization (LO) in construction	<u>Low</u> : Improved customer-supplier relations as 1 (out of 4) reasons for a LO
Love et al. (2002)	Model for a construction alliance founded on TQM and an integrated supply chain, contexts of Hong Kong	<u>Low</u> : Customer is 1 (out of 3) elements in a learning culture (7), satisfying requirements with quality products as 1 (out of 10) rules of an alliance charter (12)
Huovinen (2003b)	System for managing a 5-element, capital investments-based business in KM ways	<u>Low</u> : Value-adding knowledge enables to pre-empt or over-satisfy client needs. A front-line offers best solutions and manages contracts for high satisfaction (377)
Anell (2000)	Matrix for a Nordic firm's project portfolio management	No degree
Davies, Brady (2000)	Organizational learning-cycle model for UK firms offering complex product systems	No degree
Langford, Male (2001)	4 ways of knowledge-based management (use knowledge, learn from the past, develop management, anticipate staff turnover) in the UK construction	No degree
Robinson et al. (2002)	KM framework including knowledge maps for continuous improvement in UK project organizations	No degree
Walker (2005)	Knowledge competitive advantage (K-Adv) concept for Australian construction firms	No degree
Bashouri,	Framework or model for knowledge	No degree [The KM sharing model is only linked to a

Duncan (2014)	sharing within architectural firms with communities of practice (CoPs)	firm's overall business strategy, such as Winch and Schneider's (1993) four generic, Porterian strategies.]
---------------	--	---

Table 6: Client-driven degrees of 15 construction-related organization-based BM concepts, published during the years 1990-2016 (5th school).

Author (Year)	BM concept and focal context	Assessed client-driven degree based on key quotations (page no.)
Huovinen, Hawk (2003)	Model for global building product suppliers to manage collaborative customer-supplier relationships	<u>HIGH</u> : 4 (out of 5) elements: (i) select customers, (ii) master customers' procurement methods, (iii) meet preferences, and (iv) learn, master relationships (147).
Leinberger (1993)	Managerial systems change strategy in US process-oriented real estate	<u>Low</u> : 2 (out of 5) marketing characteristics; repeat business, satisfying similar customers (21-27, 63-75)
Flanagan (1994)	Successful UK construction company in the year 2000	<u>Low</u> : Closeness to customers, user markets (312). Customer care programs (318).
Artto (1999)	Organizational model for PM in a project-oriented company	No degree
Bennett (2000)	7 partnering pillars balance competition & cooperation in UK construction	<u>Low</u> : Organizations involve customers in their decisions (83), benchmarked value for customers (92)
Hobday (2000)	Project-based organization (PBO), a single project firm with complex product systems	<u>Low</u> : PBO responds flexibly to changing client needs (871). A customer is directly engaged in innovation and production (875).
Turner, Keegan (2000)	Four operations management models (i-iv) in a project-based organization (PBO), offerings vs. bespoke designs	<u>Low</u> : (i) Large projects for few clients (ii) large projects for many clients, (iii) small projects for few clients, (iv) small projects for many clients (139-144)
Huovinen (2004)	Managing 5-element, capital investments-based business in organization-based ways	<u>Low</u> : Value-adding front-line enables to preempt/over-satisfy needs, offer best solutions, manage contracts for high satisfaction (3-4)
Kiiras, Huovinen (2004)	From building contractors to a virtual CM company model	<u>Low</u> : Company and projects managers are responsible for client relationships (6).
Wikström et al. (2010)	3 models in project business: (i) projects, (ii) project networks, (iii) business networks	<u>Low</u> : Customer involvement is 1 (out of 14) elements. Core competences include customer knowledge and flexibility involves customer-oriented solutions (838).
Davies, Brady (2000)	Capability building and internal interactions, for complex product systems	No degree
Sauer et al. (2001)	PM-centered organization in the Australian construction	No degree
Cheng, Li (2002)	Customized process model of partnering in the construction in Hong Kong	No degree
Kendall (2003)	Support to PMO, project-driven firms	No degree
Thiry, De-guire (2007)	Integration in project-based organizations (PBOs)	No degree

Table 7: Client-driven degrees of 8 construction-related process-based BM concepts, published during the years 1990-2016 (6th school).

Author (Year)	BM concept and focal context	Assessed client-driven degree based on key quotations (page no.)
Salonen et al. (2006)	8-element process model of a global ship power systems integrator	<u>Medium</u> : Fulfilling needs with maximum value and communicating this value to buying centres (742-5)
Kaya et al. (2004)	World-class FM framework for UK-based firms	<u>Low</u> : Customer satisfaction as 1 (out of 3) factors influencing results (74).
Lindholm et al. (2006)	Model for value adding real estate in firms	<u>Low</u> : Model is linked to the customer perspective of balanced scorecards (469).
Then et al. (2014)	Firm's business-real estate/facility management alignment model	<u>Low</u> : To enable customers' success as 1 (out of 7) propositions; services as 1 (out of 4) parameters
Rogers (2004)	High performance FM services in NZ	No degree
Anderson, Merna (2005)	Business development process in PM services in the UK	No degree
Morris, Jamieson (2005)	Linking corporate strategies and project strategies in firms	No degree

Whitla et al. (2006)	Global strategies for contractors based in Hong Kong	No degree
----------------------	--	-----------

Table 8: Client-driven degrees of 19 construction-related dynamism-based BM concepts, published during the years 1990-2016 (7th school).

Author (Year)	BM concept and focal context	Assessed client-driven degree based on key quotations (page no.)
Bos-de Vos et al. (2016)	Applied framework for value capture and delivery by professional service firms (PSFs) and tradeoffs, in the contexts of Dutch architectural firms	<u>HIGH</u> : 3 value dimensions: (i) creating use value as quality or utility for customers, (ii) creating professional value for PSFs, (iii) capturing exchange value as paid prices (24, 32). Trade-offs via PSF-client interactions.
Mitchell-Ketzels (2003)	Workplaces linked to US businesses through innovative workplace strategies and balanced scorecard	<u>Medium</u> : In customer domain, (a) demonstrate new offerings, (b) shift to a partner, (c) design workplace as a showcase, (d) walk the talk, (e) change mindset (270)
Metais, Meschi (2005)	Core competence-based strategy for flexibility of a French (oil & gas) plant contractor via its value chain, architecture	<u>Medium</u> : Client-driven elements: Approaching customers, customers accept proposals (98), customer relationships and customer-specific solutions (99)
Macmillan, Selden (2008)	Incumbent's advantage in order to serve profitable customers' unmet needs with a customer-centric information base	<u>Medium</u> : Client-driven elements: A global building products supplier of Mexico understands and segments customers' needs, analyzes customers' profitability, organizes business units by these segments (111-112)
Girmscheid (2010)	Industrialization in construction based on 3 business models and an ability to adapt products to client requests	<u>Medium</u> : Client-driven elements: Innovations initiated by clients, individualized design, clients' requirements, loyalty, interfaces, clients' influence on design (133-6)
Kujala et al. (2010)	Typology of 5 solution-specific business models with 6 elements for power plant suppliers	<u>Medium</u> : Suppliers' increasing responsibility for customers' businesses (96). Customers and value propositions as 2 elements (100)
Lampel (2001)	EPC contractor's core project processes (modified core competencies) and 3 strategies	<u>Low</u> : Relational competencies for managing client relationships. Relational competencies are 1 of 4 EPC core competencies. (475)
de Haan et al. (2002)	5-element strategies (a fit btw. market, strategy, capabilities, ex-/internal conditions in the Dutch building industry)	<u>Low</u> : Client-driven values: Customers are characterized. Contractor translates customer needs into standard products. Manufacturer approaches directly consumers. (117)
Huovinen (2002)	5-element competitiveness framework for firms in global capital investment markets	<u>Low</u> : Mastering clients' procurement strategies. Frontline offers best solutions to clients and manages contracts for high satisfaction
Osgood Jr. (2004)	5-area strategy alignment map and model for US real estate and businesses	<u>Low</u> : A business organization and corporate real estate are aligned via customers and markets as 1 (out of 5) areas (108)
Huovinen (2005)	Recursive, global, capital investments-based BM as 3 systems	<u>Low</u> : Client-driven values: Targeting, knowing attractive clients (149), caring global and local clients (151)
Huovinen (2011b)	High-sustainability BM concept for construction contexts	<u>Low</u> : Frontline as 1 (out of 5) elements offers best solutions, manages contracts for high satisfaction (11)
Mutka, Aaltonen (2013)	8-element business model framework for a (metallurgical) processing technology supplier	<u>Low</u> : Customers is 1 (out of 8) internal elements.
Brege et al. (2014)	3-part business model construct adapted for industrialized building of multi-storey dwellings	<u>Low</u> : End-user segments is (1 out of 5) business model elements, with a variance in standards and degrees of customer adaptation to fit types of living (214, 216)
Meklin et al. (1999)	Framework of a Finnish firm's project business management	No degree
Barrett (2000)	FM model with linking FM and core businesses in the UK	No degree
Chinowsky with Meredith (2000)	7 areas of strategic management, competency maps in US civil engineering organizations	No degree
Langford, Male (2001)	Contingency model for managing a UK construction company	No degree

Keenan (2016)	Integration of real estate, business continuum, adaptive capacity	No degree [The focus of the framework is on internal relations, aiming at sustainability.]
---------------	---	--

5. SHAPING OF FUTURE BUSINESS MANAGEMENT CONCEPTS ALONG THE SIX CLIENT-DRIVEN SUB-DIMENSIONS

The seven authors have designed their respective high-degree BM concepts along the *six client-driven sub-dimensions*, i.e., client needs, client base, buyer-seller collaboration, sellers' strategies, buyers' strategies, and services' use, professional, and exchange values. By sub-dimension, we are briefing the high-degree BM concepts as well as suggesting and discussing the shaping of the design and content of future construction-related BM concepts as follows.

(i) The *client needs sub-dimension* is drawn from Winch and Schneider's (1993, pp. 471-472) *four high-degree, Porterian strategies* for architectural practices in the UK that are based on project complexity and client quality preference. Strategy 1 is strong delivery of simple buildings. Strategy 2 is strong experience and value engineering related to complex or unusual buildings. Strategy 3 are strong ideas related to a limited market of prestige buildings. Strategy 4 is strong ambition used by new practices. In turn, we suggest that future BM concepts be shaped to accommodate various investment needs within a spectrum between complex and simple construction objects. Need-driven BM concepts enable firms to productize, servitize, customize, and digitalize their offerings based on both the foreseeing of evolving complex client needs and the recognition of affordable simple client needs in private, public, and third sectors across multiple regions and countries.

(ii) The *client base sub-dimension* is drawn from Jennings and Betts' (1996, pp. 178-179) *four high-degree, Porterian strategies* for quantity surveying practices in the UK that are based on (i) a regular, faithful client base (varied and specific) and (ii) service levels for meeting clients' requests (simple and complex). Strategy A is differentiation-based execution, suited to smaller practices with a varied, repeat client base and simple, tailored services. Strategy B is differentiation-based expertise, suited to larger practices with niche clients, new areas, and complex services. Strategy C is cost focus-based efficiency, suited to fairly new practices with simple, fixed projects. Strategy D is differentiation focus-based experience, suited to larger practices with bonded clients and complex projects. In turn, we suggest that future BM concepts be shaped by client groups, segments, types, investment behavior, or their procurement strategies. Client base-driven BM concepts enable firms to differentiate offerings and strategies to meet complex and simple situations among new and repeat clients.

(iii) The *collaborative buyer-seller sub-dimension* is drawn from the two concepts. Pinto, Rouhiainen, and Trailer's (2000, pp. 107-109) *high-degree, Porterian value chain analysis*, for client-based project success, is based on project supplier-client partnering. A supplier redefines itself as a long-term partner for enhancing each client's operational advantages and eliminating disadvantages. A supplier tailors project bidding, engineering, design, fabrication, and delivery processes for prices that give clients advantages over using competing methods or contractors. Satisfaction is ensured via contract development. A supplier also enters cooperation with other subcontractors in order to offer superior services to clients. Huovinen and Hawk (2003 p. 147, 161) have designed their *high-degree, organization-based model* for the management of collaborative client-supplier relationships in the case of global building products suppliers. Suppliers can deepen collaboration by (a) selecting primary client groups, (b) learning clients' procurement methods and role requirements, (c) meeting clients' preferences, and (d) gradually mastering key states in relationships. In turn, we suggest that future BM concepts be shaped to accommodate the integration of joint value delivery systems

or networks that serve also sellers' buyers' buyers and direct collaboration as part of buyer-seller contractual settings.

(iv) The *sellers' strategies sub-dimension* is drawn from Løwendahl's (2000, pp. 120-130) *three high-degree, resource-based strategies* that she has designed for US professional services firms. (a) Client relation based strategies are enabled by unique abilities to understand and help particular clients. (b) Solution or output based strategies are enabled by superior collective capabilities or organizational competences. (c) Problem solving or creativity based strategies are enabled by innovations in most complex firms. In turn, we suggest that future BM concepts be shaped to enable the concurrent exploitation of buyer relation based strategies by the servicing of buying centers, solution based strategies by integration and co-production, and problem solving based strategies by the joint commercialization of focal innovations.

(v) The *buyers' strategies sub-dimension* is drawn from Helander and Möller's (2007, pp. 722-725) *high-degree, competence-based model for a system supplier's client strategy* that is based on the three strategies of clients: A independence of suppliers, B shared expertise with suppliers, and C reliance on suppliers' expertise. A supplier assumes (a) an equipment/material supplier role with independent clients, (b) a solution provider role with sharing clients, and (c) a performance provider role with dependent clients. In turn, we suggest that future BM concepts be shaped based on the categorization of attractive, potential buyers in terms of each buyer's investment need and strategy, buying strategy, and contract form as well as the coupling and tailoring of a focal system seller's strategies to accommodate each of such buyer categories.

(vi) The *services' value sub-dimension* is drawn from Bos-de Vos, Wamelink, and Volker's (2016, p. 24, 27, 29, 32) *dynamism-based framework that they have designed for value creation and capture as well as handling tradeoffs in the case of Dutch architectural firms*. Value creation includes (a) use value as quality or utility for clients and (b) professional value for firms. Value capture involves (1) use value captured by clients, (2) professional value appropriated by firms, and (3) exchange value as prices paid by clients to firms. Firms use service offer strategies for creating potential use and professional values and for maximizing exchange value. Firms use service delivery strategies for safeguarding or maximizing the capture of professional value. In turn, we suggest that future BM concepts be shaped to enable professional service sellers to balance their value-driven strategies in terms of value types, contract parties, value creation processes, and value capture processes.

6. CONCLUSIONS

We are herein concluding that the theoretical advancement of each of these seven highly client-driven BM concepts is only moderate. The authors have adopted the school-specific generic bases (e.g., Porter's competitive strategies) and designed their applied BM concepts with many well-known context-based elements (e.g., architects as peers). In turn, we assess that the practical usefulness of these high-degree BM concepts could have been high in the case of the original case firm(s). By now, this case-based evidence has been outdated and no new, recent case studies that would have tested the same concepts have been reported upon.

The same critique concerns our suggestions for the theoretical shaping of future, client-driven BM concepts along those six sub-dimensions that we have drawn from the seven highly client-driven BM concepts, respectively.

Nevertheless, it is our intent that this client-driven review would trigger a flow of *collaborative research, development, and innovation programs (R&D&I)*, i.e., (a) CIB-related and generic stakeholder-oriented researchers jointly produce highly client-driven BM knowledge, concepts, and models. Contextual contributions resemble many lines of client account thinking such as client grouping and segmentation, life-cycle management, Internet of Clients, and collaborative contracting. (b) Research entities and firms jointly carry out R&D&I programs focused on owners, investors, developers, and other root client groups vis-a-vis (inter)national business types embedded within construction markets. (c) CIB-related researchers advance management concepts that benefit public and private clients alike.

7. REFERENCES

- Anderson, D. K. and Merna, A., 2005, Project management is a capital investment process. *Journal of Management in Engineering*, 21(4), 173-178.
- Anell, B., 2000, Managing project portfolios. In Lundin, R. A. and Hartman, F. (eds.) *Projects as business constituents and guiding motives* (pp. 77-88). Kluwer.
- Arto, K. A., 1999, Management across the organisation. Editorial. *Project Management*, 5(1), 4-9.
- Barney, J. B., 2002, *Gaining and sustaining competitive advantage*. 2nd edition. Prentice Hall.
- Barrett, P., 2000, Achieving strategic facilities management through strong relationships. *Facilities*, 18(10/11/12), 421-426.
- Bartlett, C. A. and Ghoshal, S., 1989/1998, *Managing across borders – the transnational solution*. 1st/2nd edn. Harvard Business School Press.
- Bashouri, J. and Duncan, G. W., 2014, A model for sharing knowledge in architectural firms. *Construction Innovation*, 14(2), 168-185.
- Bennett, J., 2000, *Construction – the third way*. Butterworth-Heinemann.
- Betts, M. and Ofori, G., 1992, Strategic planning for competitive advantage in construction. *Construction Management and Economics*, 10, 511-532.
- Borner, R., 2004. Success factors in construction processes as a key for a benefit oriented knowledge management model. In *Proceedings of CIB World Building Congress on Building for the Future*. CIB, NRC. 1-7 May 2004, Toronto.
- Bos-de Vos, M., Wamelink, J. W. F. H. and Volker, L., 2016, Trade-offs in the value capture of architectural firms: The significance of professional value. *Construction Management and Economics*, 34(1), 21-34.
- Brege, S., Stehn, L. and Nord, T., 2014, Business models in industrialized building of multi-storey houses. *Construction Management and Economics*, 32(1-2), 208-226.
- Burgelman, R. A., 2002, *Strategy is destiny*. Free Press.
- Cheng, E. W. L. and Li, H., 2002, Construction partnering process and associated critical success factors. *Journal of Management in Engineering*, 18(4), 194-202.
- Chiang, Y.-H., Tang, B.-S. and Wong, F. K. W., 2008, Volume building as competitive strategy. *Construction Management and Economics*, 26(1), 161-176.
- Chinowsky, P. S. with Meredith, J. E., 2000, *Strategic corporate management for engineering*. OUP.
- Davies, A., Brady, T., 2000, Organizational capabilities and learning in complex product systems. *Research Policy*, 29, 931-953.
- Davies, A., Brady, T. and Hobday, M., 2007, Organizing for solutions: Systems seller vs. systems integrator. *Industrial Marketing Management*, 36, 183-193.
- Flanagan, R., 1994, The features of successful construction companies in the international construction market. In Warszawski, A. (ed.) *Etkin International Seminar* (pp. 304-318). CIB W65, NBRI, Tecnion. 8-9 June, Haifa.
- Girmscheid, G., 2010, Paradigm shift and client focus on industrialization. In Girmscheid, G. and Scheublin, F. (eds.) *New Perspective in Industrialisation in Construction. A State-of-the-Art Report* (pp. 131-137). CIB Task Group 57 Industrialisation in Construction. CIB Publication No. 329. Eigenverlag des IBB an der ETH, Zurich.
- De Haan, J., Voordijk, H. and Joosten, G.-J., 2002, Market strategies and core capabilities in the building industry. *Construction Management and Economics*, 20, 109-118.
- Hamel, G. and Prahalad, C. K., 1994, *Competition for the future*. Harvard Business School Press.
- Haugbølle, K. and Boyd, D., 2016, *Clients and users in construction. Research roadmap summary*. Publ. 408. CIB.

- Hawk, D., 1992, *Forming a new industry – International building production*. D11. Swedish Council for Building Research.
- Hawk, D., 2006, Conditions of success. *Construction Management and Economics*, 24, 735-742.
- Helander, A. and Möller, K., 2007, System supplier's customer strategy. *Industrial Marketing Management*, 36, 719-730.
- Heywood, C. and Kenley, R., 2008, The sustainable competitive advantage model for corporate real estate. *Journal of Corporate Real Estate*, 10(2), 85-109.
- Hobday, M., 2000, The project-based organization. *Research Policy*, 29, 871-893.
- Huovinen, P., 1999, A recursive competence-based approach for managing a firm in capital investment markets. In Hannus, M., Salonen, M. and Kazi, A. S. (eds.) *Procs of 2nd International Conference on Concurrent Engineering in Construction* (pp. 167-176). CIB TG33, VTT. 25-27 August 1999, Espoo.
- Huovinen, P., 2001, A framework for designing an international competitive strategy in the case of technology-intensive contractors. In Preece, C. N. (ed.) *Procs of 2nd Int'l Construction Marketing Conf.* (pp. 68-75). Univ. of Leeds. Watford.
- Huovinen, P., 2002, Managing a firm's competitiveness in global capital investment markets. In Uwakweh, B. and Minkarah, I. A. (eds.) *Procs of 10th Symposium of CIB W65&W55 on Construction Innovation and Global Competitiveness* (pp. 330-344). University of Cincinnati, CIB. 9-13 Sep 2002, Cincinnati. CRC Press, Boca Raton.
- Huovinen, P., 2003a, Firm competences in managing a firm's dynamic business in particular in construction markets. Unpublished Licentiate Thesis in Construction Economics and Management. Helsinki University of Technology.
- Huovinen, P., 2003b, Knowledge-based management of a firm's business in capital investment markets. In Ofori, G. and Ling, F. Y. Y. (eds.) *Procs of CIB W55 et al. Symposium on Knowledge Construction* (pp. 367-381). Vol. 1. National University of Singapore, CIB. 22-24 Oct 2003, Singapore.
- Huovinen, P., 2004, Organization-based management of a project business in capital-investment markets. In *Procs of NORDNET 2004 Conference on Successful PM*. PM Association in Finland. 29 Sep – 2 Oct 2004. Helsinki.
- Huovinen, P., 2005, Recursive management of a dynamic business in global capital-investment markets. In Kähkönen, K. and Porkka, J. (eds.) *Procs of 11th CIB W55, W65 et al. Symposium on Global Perspectives on Management and Economics in the AEC Sector* (pp. 142-153). Vol. 2. VTT, RIL, CIB. 13-16 June 2005, Helsinki.
- Huovinen, P., 2008, Platform for advancing research in competence-based business management: A population of 84 concepts published between the years 1990-2002. In Sanchez, R. and Heene, A., eds., *A Focused Issue on Fundamental Issues in Competence Theory Development. Research in Competence-Based Management* (Vol. 4, pp. 175-218). Emerald Group.
- Huovinen, P., 2011a, Advancement of sustainable development, contracting, design, and supply businesses vis-a-vis construction markets. In Wamelink, H., Geraedts, R., and Volker, L. (eds.) *Procs of MISBE2011 Int'l Conference on Management and Innovation for a Sustainable Built Environment*. CIB, Delft University of Technology. 20-23 June 2011. Amsterdam.
- Huovinen, P., 2011b, Managing of construction-related businesses in environmentally sustainable ways - a focused review of 62 concepts. In Wamelink, H., Geraedts, R., and Volker, L. (eds.) *Procs of MISBE2011 Int'l Conference on Management and Innovation for a Sustainable Built Environment*. CIB, Delft University of Technology, 20-23 June 2011. Amsterdam.
- Huovinen, P., 2017, Shaping future construction-related business management: A review of 77 concepts. *Procs of International Research Conference on Shaping Tomorrow's Built Environment, Construction and Design for the Modern World*. School of Built Environment, University of Salford, CIB. 11-12 Sep 2017, Salford.
- Huovinen, P. and Hawk, D. L., 2003, Towards collaborative customer-supplier relationships in global building product businesses. In Reponen, T. (ed.) *Information technology-enabled global customer service* (pp. 143-162). Idea Group.
- Jennings, M. J. and Betts, M., 1996, Competitive strategy for quantity surveying practices: The importance of information technology. *Engineering, Construction and Architectural Management*, 3(3), 163-186.
- Johansson, J. and Vahlne, J.-E., 2009, The Uppsala internationalization process model revisited. *Journal of International Business Studies*, 40(9), 1411-1431.
- Johnsson, H., 2011, The building system as a strategic asset in industrialized construction. In Haugbølle, K., Gottlieb, S. C., Kähkönen, K. E., Klakegg, O. J., Lindahl, G. A. and Widén, K. (eds.) *Procs of 6th Nordic Conference on CEO*. Vol. 3 (pp. 541-552). DBRI, Aalborg University. 13-15 April 2011, Copenhagen.
- Kale, S. and Arditi, D., 2002, Competitive positioning in US construction industry. *Journal of Construction Engineering and Management*, 128(3), 238-247.
- Kaya, S., Heywood, C. A., Arge, K., Brawn, G. and Alexander, K., 2004, Raising facilities management's profile in organizations: Developing a world-class framework. *Journal of Facilities Management*, 3(1), 65-82.
- Keenan, J. M., 2016, From sustainability to adaptation: Goldman Sachs' corporate real estate strategy. *Building Research & Information*, 44(4), 407-422.
- Kendall, G. J., 2003, Profit-driven portfolios. *PM Network*, 17(5), 48-53.
- Kiiras, J. and Huovinen, P., 2004, The virtual project management (PM) services company – in the case of construction markets in Finland. In *Procs of CIB World Building Congress 2004*. NRC. 1-7 May 2004, Toronto.
- Kujala, S., Artto, K., Aaltonen, P. and Turkulainen, V., 2010, Business models in project-based firms - Towards a typology of solution-specific business models. *International Journal of Project Management*, 28, 96-106.

- Lampel, J., 2001, The core competencies of effective project execution. *Int'l J. of Project Management*, 19, 471-483.
- Langford, D. and Male, S., 2001, *Strategic management in construction*. 2nd ed. Blackwell.
- Leinberger, C. B., 1993, *Strategy for real estate companies*. Urban Land Institute and ACRE, Washington.
- Lindholm, A.-L., Gibler, K. M. and Leväinen, K. I., 2006, Modeling the value-adding attributes of real estate to the wealth maximization of the firm. *Journal of Real Estate Research*, 28(4), 445-475.
- Love, P. E. D., Li, H., Irani, Z. and Faniran, O., 2000, Total quality management and the learning organization: A dialogue for change in construction. *Construction Management and Economics*, 18, 321-331.
- Love, P. E. D., Irani, Z., Cheng, E. and Li, H., 2002, A model for supporting inter-organizational relations in the supply chain. *Engineering, Construction and Architectural Management*, 9(1), 2-15.
- Løwendahl, B., 1997, *Strategic management of professional service firms*. 1st ed. Copenhagen Business School.
- Macmillan, I. C. and Selden, L., 2008, The incumbent's advantage. *Harvard Business Review*, 86(10), 111-121.
- Meklin, J., Lahti, M., Kovanen, V., Arenius, M. and Arto, K. A., 1999, *FITPRO - A product-oriented approach to industrial project management*. PM Association in Finland, Helsinki.
- Metais, E. and Meschi, P.-X., 2005, Competence-based management and strategic flexibility: The case of Air Liquide. *Advances in Applied Business Strategy. Competence Perspectives on Managing Internal Processes*, 7, 91-107.
- Milosevic, D. Z. and Srivannaboon, S., 2006, A theoretical framework for aligning project management with business strategy. *Project Management Journal*, 37(3), 98-110.
- Mitchell-Ketzes, S., 2003, Optimising business performance through innovative workplace strategies. *Journal of Facilities Management*, 2(3), 258-275.
- Morris, P. W. G. and Jamieson, A., 2005, Moving from corporate strategy to project strategy. *Project Management Journal*, 36(4), 5-18.
- Mutka, S. and Aaltonen, P., 2013, The impact of a delivery project's business model in a project-based firm. *International Journal of Project Management*, 31, 166-176.
- Nonaka, I. and Takeuchi, H., 1995, *The knowledge-creating company*. OUP.
- Osgood Jr., R. T., 2004, Translating organizational strategy into real estate action. *Journal of Corporate Real Estate*, 6(2), 106-117.
- Pinto, J. K., Rouhiainen, P. and Trailer, J. W., 2000, Project success and customer satisfaction. In Lundin, R. A. and Hartman, F. (eds.) *Projects as business constituents and guiding motives* (pp. 103-115). Kluwer.
- Porter, M. E., 1994, Toward a dynamic theory of strategy. In Rumelt, R. P., Schendel, D. E. and Teece, D. J., eds., *Fundamental Issues in Strategy* (pp. 423-461). Harvard Business School Press.
- Rapp, R. R., 2001, Business strategy. *Leadership and Management in Engineering*, 1(April), 37-42.
- Robinson, H. S., Carillo, P., Anumba, C. J. and Al-Ghassan, A. M., 2002, Knowledge management for continuous improvement in project organizations. In Uwakweh, B. and Minkarah, I. A. (eds.) *Procs of 10th Symposium of CIB W65&W55 on Construction Innovation and Global Competitiveness* (pp. 680-697). University of Cincinnati, CIB. 9-13 Sep 2002, Cincinnati. CRC Press, Boca Raton.
- Rogers, P. A., 2004, Performance matters: How the high performance business unit leverages facilities management effectiveness. *Journal of Facilities Management*, 3, 371-381.
- Roulac, S. E., 1999, Real estate value chain connections. *Journal of Real Estate Research*, 17(3), 387-404.
- Roulac, S. E., 2001, Corporate property strategy is integral to corporate business strategy. *Journal of Real Estate Research*, 22(1-2), 129-152.
- Salonen, A., Gabriellson, M. and Al-Obaidi, Z., 2006, Systems sales as a competitive response to the Asian challenge: Case of a global ship power supplier. *Industrial Marketing Management*, 35, 740-750.
- Sanchez, R. and Heene, A., 2004, *The new strategic management. Organization, competition, and competence*. Wiley.
- Sauer, C., Liu, L. and Johnston, K., 2001, Where project managers are kings. *Project Management J.*, 32(4), 39-49.
- Singer, B. P., Bossink, B. A. G. and Vande Putte, H. J. M., 2007, Corporate real estate and competitive strategy. *Journal of Corporate Real Estate*, 9(1), 25-38.
- Tansey, P., Spillane, J. P. and Meng, X., 2014, Linking response strategies adopted by construction firms during the 2007 economic recession to Porter's generic strategies. *Construction Management and Economics*, 32, 705-724.
- Then, D. S. S., Tan, T. H., Santovito, R. and Jensen, P. A., 2014, Attributes of alignment of real estate and facilities management to business needs. *Journal of Corporate Real Estate*, 16(2), 80-96.
- Thiry, M. and Deguire, M., 2007, Recent developments in project-based organizations. *International Journal of Project Management*, 25, 649-658.
- Trejo, D., Shekhar, P., Anderson, S. and Cervantes, E., 2002, Framework for competency and capability assessment for resource allocation. *Journal of Management in Engineering*, 18(1), 44-49.
- Turner, R. and Keegan, A., 2000, The management of operations in the project-based organization. *Journal of Change Management*, 1(2), 131-148.
- Veshosky, D., 1994, Portfolio approach to strategic management of A/E firms. *Journal of Management in Engineering*, 10(5), 41-47.
- Walker, D. H. T., 2005, Having a knowledge competitive advantage (K-Adv): A social capital perspective. In Ribeiro, F. L., Love, P. D. E., Davidson, C. H., Egbu, C. O. and Dimitrijevic, B. (eds.) *Procs of Conference on Information and KM in A Global Economy* (pp. 13-31). CIB, IST. 19-20 May, Lisbon.
- Whitla, P., Walters, P. and Davies, H., 2006, The use of global strategies by British construction firms. *Construction Management and Economics*, 24, 945-954.

- Wikström, K., Artto, K., Kujala, J. and Söderlund, J., 2010, Business models in project business. *International Journal of Project Management*, 28, 832-841.
- Winch, G. and Schneider, E., 1993, The strategic management of architectural practice. *Construction Management and Economics*, 11, 467-473.