"The role of human resource-related quality management practices in new product development: A dynamic capability perspective"

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The role of human resource-related quality management practices in new product development

A dynamic capability perspective

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Abstract

Purpose – The purpose of this paper is to adopt the dynamic capability (DC) view as a theoretical framework to empirically investigate the relationships among human resource (HR)-related quality management (QM) practices: new product development (NPD) as a specific DC, learning orientation, knowledge integration, and strategic flexibility. Learning orientation and knowledge integration represent two antecedents of strategic flexibility, and strategic flexibility is the developed ability that facilitates NPD.

Design/methodology/approach – To empirically test the relationships, the authors used data from 236 European firms and performed structural equation modeling.

Findings – Results indicate that HR-related QM practices contribute to creating a learning-oriented company, integrating knowledge, and supporting successful NPD. Furthermore, knowledge integration is positively related to NPD through strategic flexibility.

Practical implications – This study is relevant for practitioners because it identifies key points in QM implementation that enable firms to be more strategically flexible and thus better able to regularly develop new products.

Originality/value – When organizations must sustain their competitive positions by continuously adapting to environmental changes, it is important to study not only how QM implementation is positively related to the firm performance on which a significant portion of the QM literature has focused but also to study whether QM implementation is related to strategic variables and can make a contribution to strategic processes. To fill the void in the HR and QM literature, this study offers an integrated framework with empirical support that identifies the role of HR-related QM practices in learning orientation, knowledge integration, strategic flexibility, and NPD.

Keywords New product development, Strategic flexibility, Quality management, Dynamic capabilities, Competitive advantage, Environmental adaptation

Paper type Research paper

Introduction

In recent decades, the importance of quality management (QM) as a key competitive variable has been widely recognized by scholars and practitioners who generally agree that QM practices have a positive effect on firms' performance (e.g. Powell, 1995; Nair, 2006; Kaynak and Hartley, 2008). However, current business environments are characterized by high levels of dynamism and complexity (Teece, 2007), but even companies with excellent quality levels in a particular period cannot be certain that they will sustain their position. Toyota, Sony, and Mercedes-Benz are examples of companies that have challenges sustaining such long-term performance (Su *et al.*, 2014; Su and Linderman, 2016).

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Outline

1. Introduction
2. Theoretical background
3. Research methodology
4. Results
5. Discussion and conclusions

1. Introduction

An approach to management, characterized by three principles: customer focus, continuous improvement and teamwork (Dean and Bowen, 1994), that pursues the obtaining of **sustainable competitive advantages** (Flynn et al., 1995; Powell, 1995).

Positive effects on firms' performance (Powell, 1995; Kaynak, 2003; Nair, 2006)

1. Introduction

TOYOTA

SONY

Mercedes-Benz

Although few would deny Toyota's and Mercedes-Benz's competitive advantage in quality over the past few decades, even the best have **trouble sustaining it** (Su et al., 2014, p.2)

1. Introduction

Positive relationship QM-performance

Environmental adaptation

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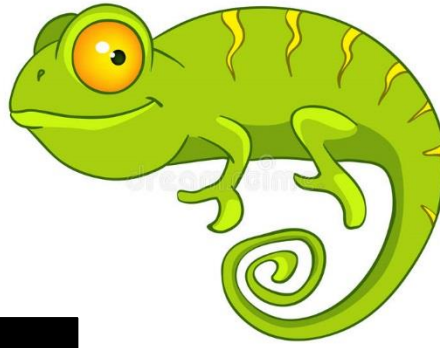
1. Introduction

Armidale: The city of four seasons

1. Introduction

Positive relationship QM-performance



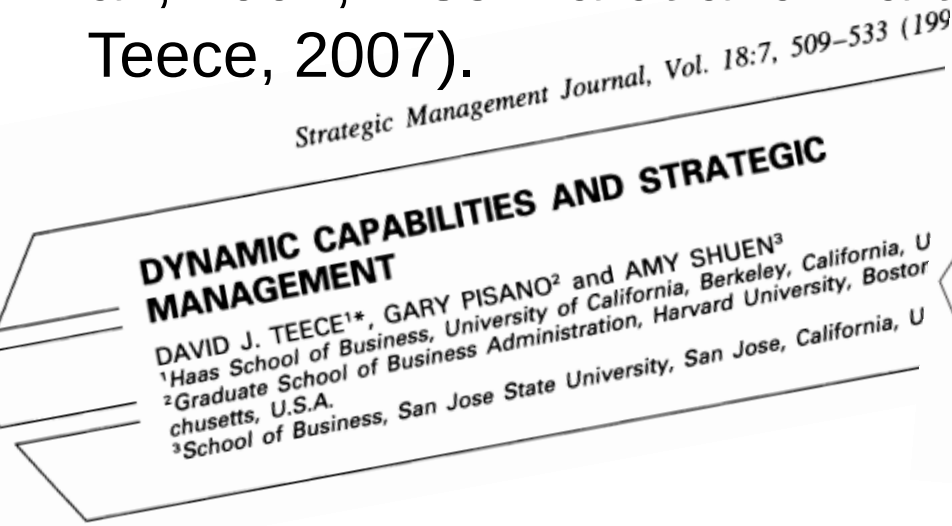
Environmental adaptation

Dynamic capabilities

1. Introduction

Dynamic Capabilities (DCs)

DCs help firms sustain their positions as they formulate an organizational response to environmental changes (Teece et al., 1997; Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Teece, 2007).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DYNAMIC CAPABILITIES AND STRATEGIC MANAGEMENT

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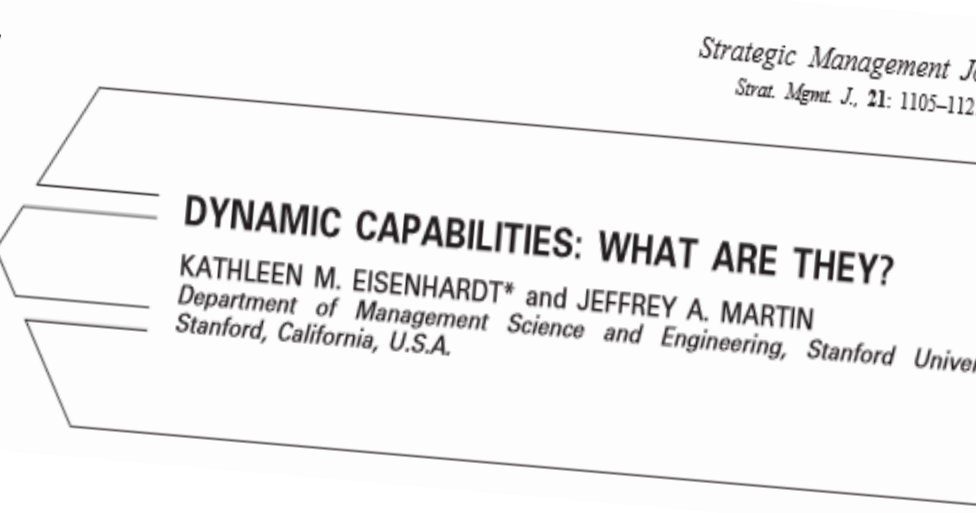
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DYNAMIC CAPABILITIES: WHAT ARE THEY?

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1. Introduction

- ✓ Organizational change literature
- ✓ Human Resource (HR) practices
- ✓ Infrastructure for DCs
- ✓ HR-related QM practices

- Gap literature
- Call for research (Su et al., 2014; Su and Linderman, 2016)

Human Resource (HR) related QM practices

RQ1. How are HR-related QM practices related to strategic flexibility as the developed ability and NPD?

2. Theoretical background

Dynamic Capabilities (DCs)

- ✓ Extension RBV (Barney, 1991)
- ✓ DC is “a firm’s ability to integrate, build and reconfigure internal competencies and thus to address rapidly changing environments” (Teece et al., 1997, p. 516).

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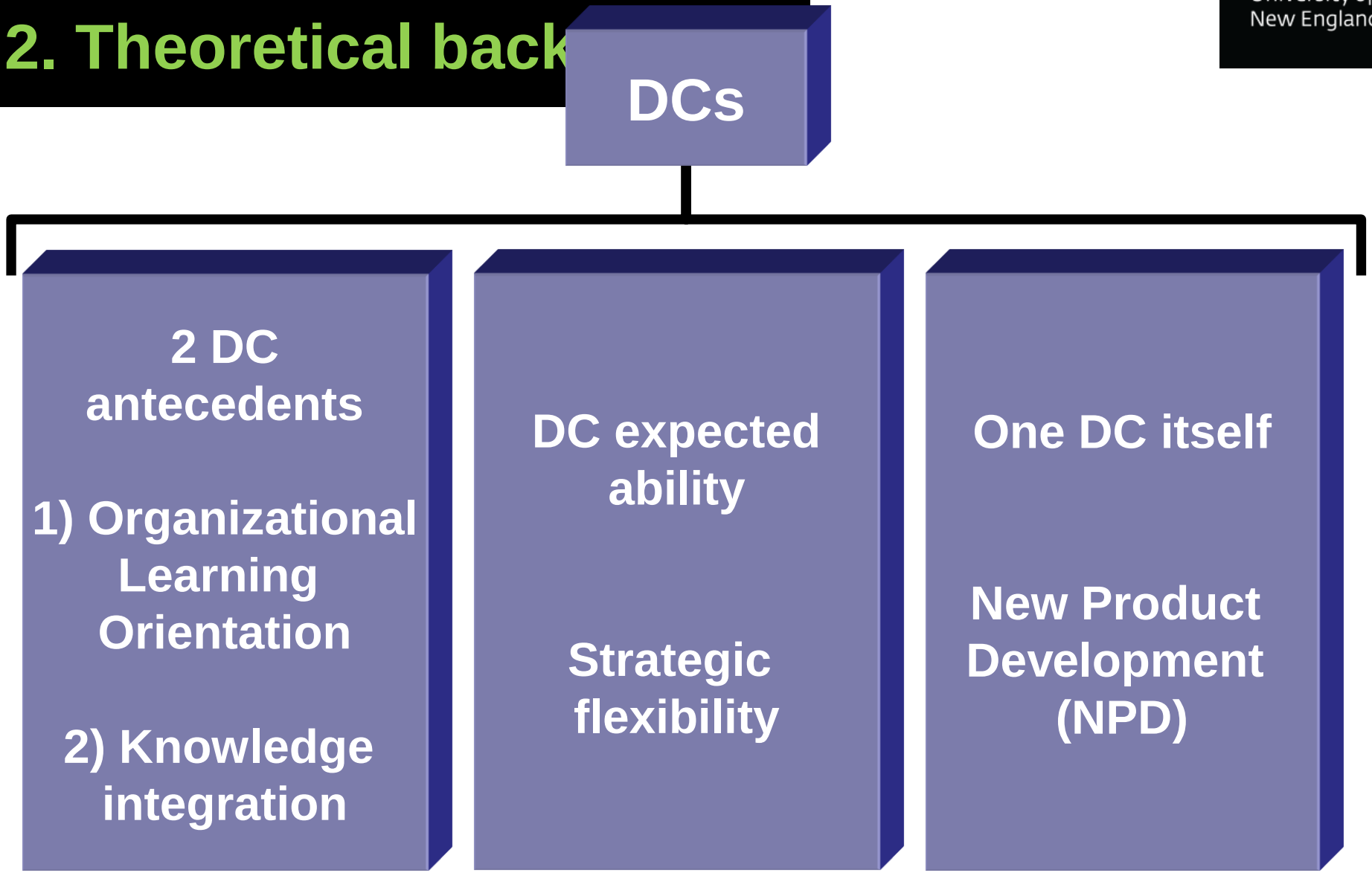
2. Theoretical back



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2. Theoretical background

Organizational Learning Orientation	DC antecedent	Organization-wide activity of creating and using knowledge to enhance competitive advantage (Calantone et al., 2002, p.516)
Knowledge integration	DC antecedent	An ongoing collective process of constructing, articulating and redefining shared beliefs through the social interaction of organizational members' (Huang et al., 2001, p.161)
Strategic Flexibility	DC expected ability	An organization's capability to identify major changes in the external environment (e.g., introduction of disruptive technologies), to quickly commit resources to new courses of action in response to change, and to recognize and act promptly when it is time to halt or reverse such resource commitments (Shimizu and Hitt, 2004, p.45)
New Product Development	DC	The ability to physically and regularly develop new products by identifying customer needs and understanding new technologies and processes (Lloréns et al., 2005; Pisano, 1994; Sethi, 2000; Sethi, Smith and Park, 2001)

2. Theoretical background

Human Resource (HR) related QM practices

- ✓ Not directly related to performance (Flynn et al., 1995; Kaynak and Hartley, 2008)
- ✓ Dissemination of the vision
- ✓ Successful implementation of QM
- ✓ Training, empowerment and teamwork (Strategic value)
  - Firm specific, difficult to imitate or replace
  - “High performance work practices”
  - Contribute to organizational innovation

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2. Theoretical background

Human Resource (HR) related QM practices

Training	Provision of statistical training, trade training, and quality-related training for all employees (Saraph et al., 1989, p.818)
Employee empowerment	Allowing employees to inspect their own work and to stop the production if the process is out of control. Providing supporting framework, such as the necessary resources and technical support, to assist them in such decision making (Ahire et al., 1996, p.31)
Teamwork	Emphasizing the importance of employees' ideas and their continuous growth and development. Usage of teams for problem solving. Supervisors willing to let employees make their own mistakes, in order to learn how to be empowered and manage their own work (Flynn et al., 1995, p.664)

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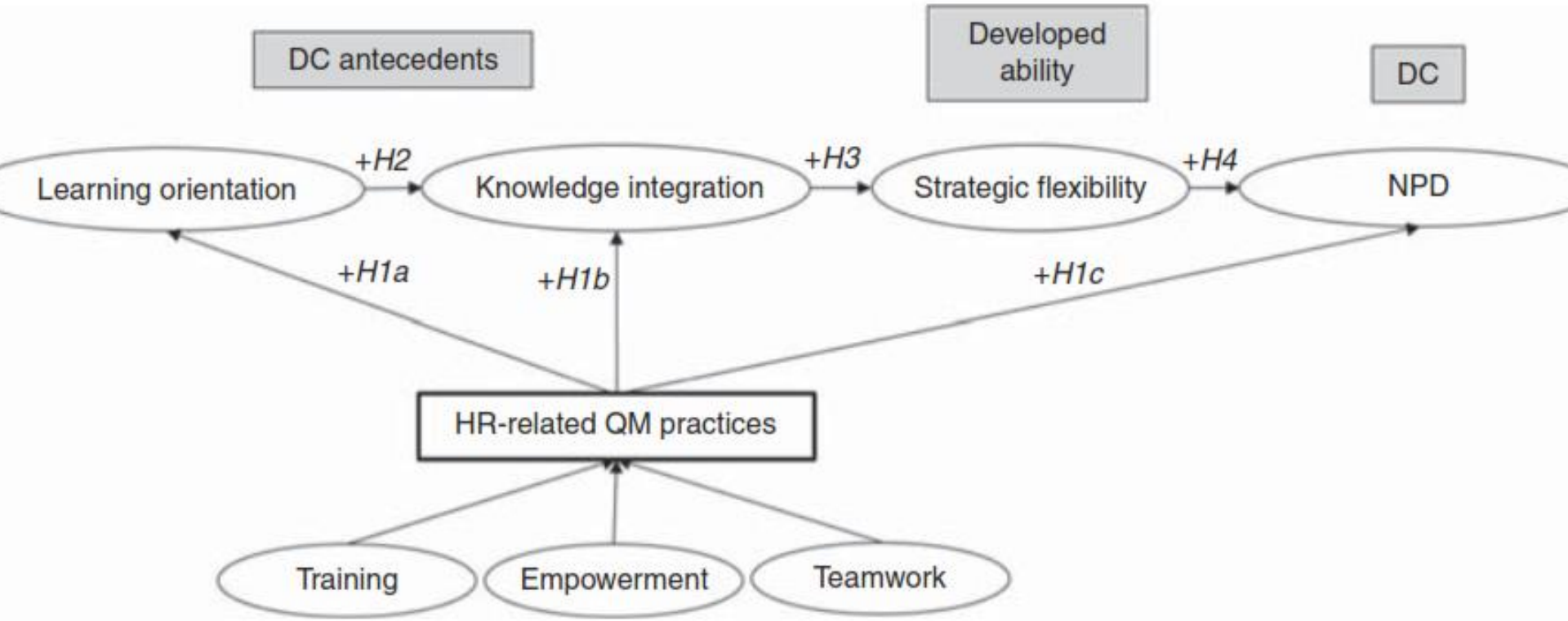
2. Hypotheses and research model



2. Hypotheses and research model

H1a. HR-related QM practices are positively related to learning orientation.

H1b. HR-related QM practices are positively related to knowledge integration.

H1c. HR-related QM practices are positively related to NPD.

H2. Learning orientation is positively related to knowledge integration.

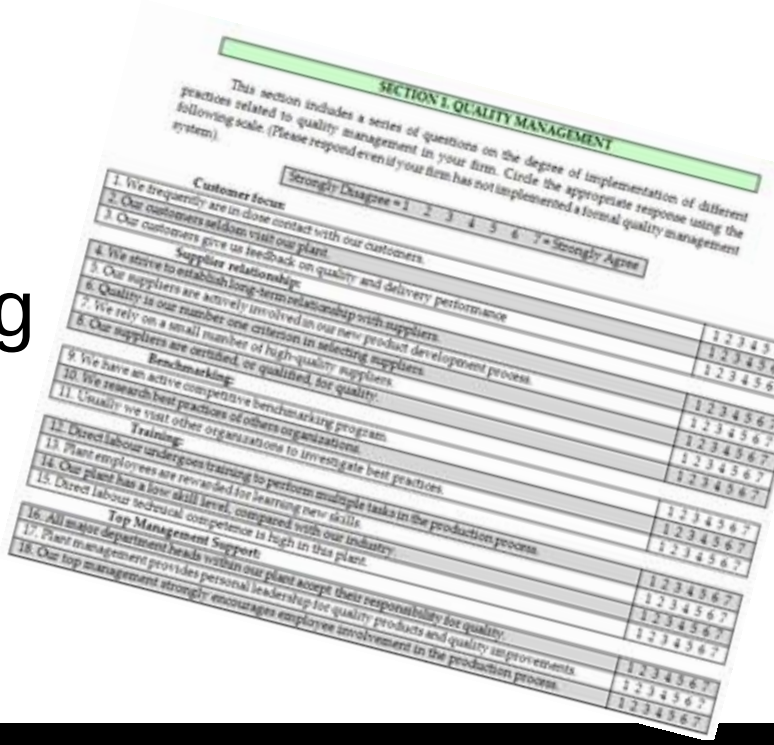
H3. Knowledge integration is positively related to strategic flexibility.

H4. Strategic flexibility is positively related to NPD.

3. Research methodology

Construction of the measurement instrument

- Literature review
- Pretest
- Validation process
- Structural Equation Modelling



SECTION I: QUALITY MANAGEMENT

This section includes a series of questions on the degree of implementation of different practices related to quality management in your firm. Circle the appropriate response using the following scale. (Please respond even if your firm has not implemented a formal quality management system).

1 = Strongly Disagree ... 7 = Strongly Agree

Customer focus:
1. We frequently are in close contact with our customers.
2. Our customers seldom visit our plant.
3. Our customers give us feedback on quality and delivery performance.

Supplier relationships:
4. We strive to establish long-term relationships with suppliers.
5. Our suppliers are actively involved in our new product development process.
6. Quality is our number one criterion in selecting suppliers.
7. We rely on a small number of high-quality suppliers.
8. Our suppliers are certified, or qualified, for quality.

Benchmarking:
9. We have an active competitive benchmarking program.
10. We research best practices of others organizations.
11. Usually we visit other organizations to investigate best practices.

Training:
12. Direct labour undergoes training to perform multiple tasks in the production process.
13. Plant employees are rewarded for learning new skills.
14. Our plant has a high skill level, compared with our industry.
15. Direct labour technical competence is high in this plant.

Top Management Support:
16. All major department heads within our plant accept their responsibility for quality.
17. Plant management provides personal leadership for quality products and quality improvements.
18. Our top management strongly encourages employee involvement in the production process.

3. Research methodology

- 3,204 European firms
- CEO
- On-line
- Total sample:

  236 valid responses

  (7,8% response rate)

3. Research methodology

European country	Percentage
Spain	62.71
Italy	17.8
UK, Switzerland, Romania, Czech Republic, Denmark, Austria, Belgium, Sweden, Germany	19.49
Number of employees	Percentage
Less than 50	12.29
From 51 to 250	46.19
From 251 to 1,000	27.12
More than 1,000	12.29
Annual sales	Percentage
1 million Euros or less	2.12
1-7 million Euros	7.63
7-40 million Euros	51.27
more than 40 million Euros	38.98

Activity sector	Percentage
Service sector	20.76
Machinery and components	17.80
Construction	13.14
Food industry	11.86
Metal industry	9.32
Chemistry	8.47
Electricity and electronics	7.63
Miscellaneous	11.02

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3. Research methodology

- Non-response bias
- Common method variance
- Content validity: Literature review
- Scales reliability: Cronbach´s α
- Unidimensionality: EFA and CFA
- Convergent validity: CFA
- Discriminant validity: Confidence intervals, AVE

Variable	Sources	Cronbach's α	Items	Factor loadings and t-values
Training	Original from Flynn *et al.* (1995)	0.780	1. Direct labor undergoes training to perform multiple tasks in the production process	$\lambda = 0.75$, t-value = 16.75
			2. Plant employees are rewarded for learning new skills	Removed
			3. Our plant has a low skill level, compared with our industry (reverse coded)	Removed
			4. Direct labor technical competence is high in this plant	$\lambda = 0.86$, t-value = 23.04
Empowerment	Original from Ahire *et al.* (1996)	0.872	1. Our line workers inspect the quality of their own work; inspection is not the responsibility of an inspector	$\lambda = 0.80$, t-value = 23.78
			2. Line workers are encouraged to fix problems they find	$\lambda = 0.94$, t-value = 42.54
			3. Line workers are given the resources necessary to correct quality problems they find	$\lambda = 0.92$, t-value = 41.33
			4. Line workers have technical assistance available to them to help them solve quality problems	$\lambda = 0.83$, t-value = 17.29
			5. A problem-solving network is available to line workers in solving quality-related problems	$\lambda = 0.84$, t-value = 32.93
Teamwork	Original from Flynn *et al.* (1995)	0.907	1. Our plant is organized into permanent production teams	Removed
			2. Our plant forms teams to solve problems	Removed
			3. In the past three years, many problems have been solved through small group sessions	Removed
			4. Supervisors encourage the persons who work for them to exchange opinions and ideas	$\lambda = 0.96$, t-value = 57.47
			5. Supervisors encourage the people who work for them to work as a team	$\lambda = 0.96$, t-value = 63.92
			6. Supervisors frequently hold groups meetings where the people who work for them can really discuss things together	$\lambda = 0.87$, t-value = 38.71
Learning Orientation	Elaborated from Baker and Sinkula (1999) and Sinkula *et al.* (1997)	0.929	1. Our organization is a learning organization.	$\lambda = 0.95$, t-value = 54.89
			2. The sense around here is that employee learning is an investment not an expense	$\lambda = 0.95$, t-value = 57.46
			3. Once we quit learning, we endanger our future	$\lambda = 0.90$, t-value = 27.99
			4. The basic values of this organization include learning as a key to improvement	$\lambda = 0.97$, t-value = 81.19
			5. Our ability to learn is the key to improvement	$\lambda = 0.93$, t-value = 53.93

Variable	Sources	Cronbach's α	Items	Factor loadings and t-values
Knowledge integration	Elaborated from Grant (1996)	0.778	1. The rules and/or policies in the firm enable the co-ordination of activities and information flows	Removed
			2. Our firm has production activities divided into independent phases and organized sequentially	Removed
			3. There are generally accepted behavior patterns that govern actions when rules and procedures do not	Removed
			4. To resolve complex situations and uncertainty, we organize conflict resolution and decision-making groups	$\lambda = 0.97$, t-value = 23.02
			5. The rules, sequences, behavior patterns, and groups enable sharing of useful knowledge among members of the firm and avoid unnecessary transfers	$\lambda = 0.77$, t-value = 21.23
Strategic flexibility	Adapted from Volberda (1999)	0.837	1. In our firm, we re-formulate dismantle current strategies quickly when market conditions or competence require it	$\lambda = 0.89$, t-value = 30.82
			2. In our firm, we have a variety of alternative strategies that let us to change easily when environmental conditions vary.	$\lambda = 0.93$, t-value = 35.39
			3. In our firm, we use production machinery or providing of services technologies that allow a large amount of operations quickly and without large costs of task change	Removed
NPD performance	Elaborated from Kusunoki, Nonaka and Nagata (1998)	0.869	1. The firm has introduced a very high number of new products and services	$\lambda = 0.89$, t-value = 29.65
			2. The firm has entered a very high number of new markets	$\lambda = 0.83$, t-value = 24.16
			3. We have initiated a very high number of new production processes or services offered	$\lambda = 0.94$, t-value = 49.13

Goodness-of-fit statistics	Measurement model for QM (first-order model)[e]	Measurement model for QM (second-order model)[e]	Measurement model for NPD antecedents and strategic flexibility[e]	Structural model	Recommended values for satisfactory fit of a model to data
χ^2/df	1.571	1.561	2.053	2.003	< 3.0[a]
Root mean square error of approximation (RMSEA)	0.049	0.046	0.067	0.0634	< 0.08[b]
Akaike's information critetion (CAIC)	198.94	201.31	292.50	731.274	< saturated model and independence model[c]
CAIC for saturated model	355.51	355.51	504.18	1,635.349	
CAIC for independent model	3,526.73	2,827.18	4,673.89	7,547.717	
Parsimony goodness-of-fit index (PGFI)	0.58	0.54	0.61	0.687	> 0.50[d]
Parsimony normed fit index (PNFI)	0.70	0.68	0.71	0.819	> 0.50[d]
Comparative fit index (CFI)	0.99	0.99	0.99	0.972	> 0.90[b]

Notes: [a]Bollen (1989), Hair *et al.* (1995); [b]Byrne (1998), Jöreskog and Sörbom (1993); [c]Byrne (1998), Jöreskog and Sörbom (1993); [d]Byrne (1998), Mulaik *et al.* (1989); [e]additional fit indexes: QM first-order model (GFI = 0.99; AGFI = 0.99; NFI = 0.99; NNFI = 0.99); QM second-order model (GFI = 0.96; AGFI = 0.93; NFI = 0.98; NNFI = 0.99); NPD model (GFI = 0.99; AGFI = 0.98; NFI = 0.98; NNFI = 0.98)

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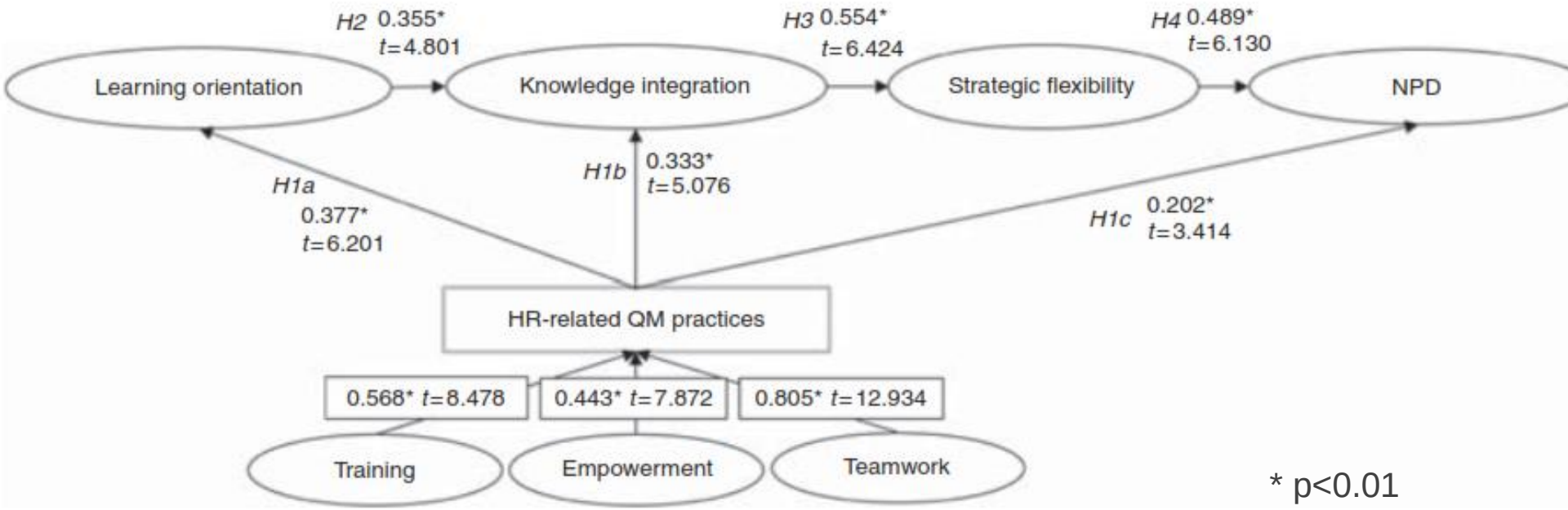
4. Results



* p<0.01

5. Discussion

Human Resource (HR) related QM practices

- ✓ QM-performance literature
- ✓ Innovation literature
- ✓ Learning organization literature: training and empowertment (Sitkin et al. 1994; Zhang et al., 2012), teamwork (Linderman et al., 2004)
- ✓ Theoretical contibutions (Zollo and Winter, 2002, Teece, 2007) about teams -knowledge integration-NPD
- ✓ Strategic flexibility in QM firms (Gómez-Gras and Verdú-Jover, 2005).

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5. Discussion

Dynamic Capabilities (DCs)

- ✓ Knowledge management for strategic flexibility: learning orientation and knowledge integration
- ✓ Strategic flexibility and NPD -> Response to environment
- ✓ Call for connecting DC view with other related fields (Vogel and Guttel, 2013).
- ✓ Microfoundation of DCs

5. Discussion

Managerial implications

- ✓ QM implementation for DC development
  - ✓ HR-related QM practices
  - ✓ Integrating QM-NPD for environmental responding
  - ✓ Specific HR-related QM practices: training, empowerment, teamwork
- ✓ Importance of knowledge management
- ✓ Importance of NPD as DC (strategic flexibility)
- ✓ Roadmap for organizations (Europe; Spain and Italy)

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5. Discussion

Limitations

- ✓ Strategic focus of the study: Cross-sectional study
- ✓ Additional HR-related QM practices: performance apprasial, retribution…
- ✓ Low response rate
- ✓ Single respondent and self-reported

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5. Discussion

Future lines of research

- ✓ Objective measures of organizational performance or competitive advantage
- ✓ HR-related QM practices implementation is not uniform (Gutierrez et al., 2010)
- ✓ The role of the environment

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