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The central role of a company's technological reputation in enhancing customer performance in the B2B context of SMEs

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ABSTRACT

Within the B2B context, this paper examines whether technological reputation mediates the relationship between employee skills for innovation, internal social capital (i.e. knowledge sharing among employees) and brand orientation (i.e., the extent to which the brand has a dominant role throughout the firm), and customer performance (i.e., customer satisfaction and loyalty). SEM is employed to analyze primary data from a survey of 150 SMEs. Results show a complementary mediation of technological reputation in the relationship between employee skills for innovation and customer performance, instead an indirect-only mediation between brand orientation and customer performance. This paper makes an important contribution to the literature concerning the determinants of customer performance and the importance of technological reputation for B2B SMEs, an under-investigated area. Indeed, on the one hand, this article proposes an integrated perspective on the different antecedents of customer satisfaction, based on a robust methodology providing academics with a solid foundation upon which to build future studies. On the other hand, managers find evidence that an integrated approach, which encompasses the development of employee capabilities and the spread of a brand culture, seems to be key to enhance technological reputation and, in turn, customer performance.
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1. Introduction

Technological innovation is vital for the success of organisations (Singh et al., 2015). Highly technological industries are characterised by complex products, with short life cycles, which require constant innovations to meet changes in market conditions and fulfil customer expectations. Successful innovations require an adequate understanding of the market's behaviour and potential customer response (O'Cass and Ngo, 2007), as customers ultimately determine whether even a highly innovative product is accepted (Grant, 2010). Within this context, the skills that employees possess and their ability to transfer and share knowledge (i.e. ensure the 'right' knowledge is in the 'right' place at the 'right' time) (Tsoukas, 1996) are critical to guarantee the delivery of superior value to customers (Ambrosini et al., 2007; Cantarello et al., 2012). According to the literature, in the business-to-business (B2B) context, for SMEs to perform well, it is vital to have highly skilled employees who are able to transfer and share knowledge, as well as generate successful innovations (St-Pierre and Audet, 2011). Research has also suggested that strongly orienting employees' activities to the brand plays a fundamental role in SMEs' performance (Glynn, 2012). According to some research, employees may be the principal means of communicating the brand

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value and conveying the brand message (Simoes and Dibb, 2001; Reid et al., 2005; Morokane et al., 2016) as they facilitate the interface between the organisation and the market (Harris and Ogbonna, 2000).

To the best of our knowledge, there is a lack of research providing an overarching perspective on these aspects within the SME B2B context, where there is an increasing need to strengthen the relationship between the firm and the customer (Kumar, 2010). According to Wu and Wang (2007), how the aforementioned factors influence the various dimensions of the performance of SMEs is a promising area of investigation. Thus, the first aim of this study is to investigate the relationship between the following three variables and customer performance in the SME B2B context: (1) the skills for innovation that employees possess, (2) their ability to transfer and share knowledge (internal social capital) and (3) the extent to which their activities are brand oriented.

Customer performance refers to a firm's ability to effectively satisfy customers and develop a loyal customer base (Hooley et al., 2005; Santos-Vijande et al., 2012). According to the literature, it is likely to be related to the perceived quality of products (Wang and Chang, 2005), with the latter helping to determine a company's reputation. In recent years, some authors (e.g. Zahra et al., 2003) have highlighted the importance of the technological reputation of innovative firms in customer performance. According to some research, a firm's technological reputation is determined by the ability of the firm to adopt an 'always be innovative' perspective (Lawless and Anderson, 1996), and its technological reputation can influence consumer behaviour and decision making (Alwi and Da Silva, 2007). Technological achievements and innovativeness depend on the abilities of employees to work, alone and together, to pursue innovation, to be creative, to learn from each other and to transmit their attachment to the brand (Hall, 1993). Positive consumer feedback to technological advancements enhances the technological reputation of the company, in turn, resulting in consumers having a positive predisposition towards the innovative firm (Henard and Dacin, 2010), thus enhancing customer performance. Consequently, the second aim of this paper is to investigate whether a firm's technological reputation mediated the relationships between three variables (employees' skills for innovation, internal social capital and brand orientation) and customer performance within the SME B2B context.

With these aims in mind, we conducted a survey of medium high-tech manufacturing industries in the B2B context, resulting in the collection of data from 150 Italian SMEs. The data obtained were then examined using structural equation modelling (SEM).

The remainder of this paper is organised as follows. Section 2 presents the literature review and research hypotheses. Then, the research methodology and analysis of the results are presented in Sections 3 and 4 respectively, followed by a discussion of the findings and implications of the study in Section 5.

2. Theoretical background and research hypotheses

2.1. Employees' skills for innovation, internal social capital, brand orientation and customer performance

Human resources play a fundamental role in dynamic environments: not only do they form the basis for organisational adaptation and are potentially the most flexible resources available to the firm, they also embed the organisational culture and organisational learning and are the means by which organisations innovate (Mavondo et al., 2005). In this context, firms that possess a high-quality human capital pool (i.e. individuals with high levels of cognitive ability) should possess an advantage relative to their competitors with a less capable workforce, as they can quickly learn, apply new skills, implement new technologies and reorganise the way work gets done (Wright et al., 1994). It is widely acknowledged that employees' skills and abilities untimely determine the quality of an innovative product (Bowen and Ford, 2002) and that developing employees' skills is important in enhancing new product development performance (Cantarello et al., 2012).

Within the service context, Li et al. (2008) argued that employees who were better skilled offered a better service than those who were less well skilled, leading to greater customer satisfaction. In the present study, we argue that in the innovative domain of medium high-tech manufacturing firms, expert, skilled and creative employees can improve existing technologies and implement new ones, thus enhancing customer satisfaction. The aforementioned assumes even greater relevance in the SME domain, where the development of the company essentially depends on the quality of its employees (St-Pierre and Audet, 2011). In the B2B context, employees are more likely than employees in large firms to have direct contact with clients because of co-development or R&D projects where the firm shares basic R&D knowledge with its business customers (e.g. Boyd and Spekman, 2004). This reasoning leads to the first hypothesis.

H1. (a)Employees skills for innovation impacts positively on customer performance in B2B SMEs.

Highly skilled 'technical' individuals become truly effective only if they also have the ability to transfer and share their skills and knowledge (Ambrosini et al., 2007). In describing firms as distributed knowledge systems, where knowledge is not concentrated in a single mind, Tsoukas (1996) suggested that the coordination of activities, particularly across the organisation and between teams, was a fundamental mechanism for transferring knowledge to ensure that the 'right' knowledge was in the 'right' place at the 'right' time. The value embedded in internal relationships among employees and the quality of such relationships in terms of employees' knowledge-exchange habits, propensity to interact and work in groups constitute *internal social capital* (Nahapiet and Ghosal, 1998; Yang and Lin, 2009). With respect to a firm's customers, internal social capital is valuable because it can effectively satisfy consumers' expressed and latent needs through new products, services and ways of doing business (Slater and Narver, 1998). Internal social capital occurs through "dialogue and joint

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action (which) are crucial to the development of shared understanding" (Crossan et al., 1999). Therefore, in an organisational learning culture that encourages and supports individual mutual learning, the employees can respond quickly and effectively to customers' needs, thus achieving a competitive advantage that is difficult for competitors to emulate and a high recognisability by customers (Pantouvakis and Bouranta, 2013). On such grounds, the second hypothesis is introduced.

H1. (b)Internal social capital impacts positively on customer performance in B2B SMEs.

In addition to recognising the importance of highly skilled employees (i.e. those who can transfer and share knowledge) in generating successful innovations and improving customer performance, the literature has suggested that strongly orienting employees' activities to the brand plays a fundamental role in the success of SMEs (Glynn, 2012). Brand orientation refers to the extent to which a firm recognises the importance of brands as valuable assets and centres its strategy and activities on developing the ability to build strong brands, a concept first addressed by Urde (1999). Brand orientation in this sense is a mind-set, a type of organisational culture that ensures that the brand will have a dominant role throughout the whole firm (Wong and Merrilees, 2007; Baumgarth, 2010). According to some studies, it is essential that employees' activities are brand oriented because they may be the principal means of communicating the brand value (Reid et al., 2005; Morokane et al., 2016). As such, they are the conduit through which marketing strategies are implemented (Hooley et al., 2005). In addition, the brand plays an important role in providing a central focus for all employees (McDonald et al., 2001). Strong brands have a rational, as well as an emotional appeal. The result of brand-building effort is customer attachment or loyalty to the brand (Keller, 2008), as well as prospective new customers (Erdem and Louviere, 2002). Hence, brand orientation and the different dimensions of customer performance are closely linked.

The Interbrand company, which uses research, analytics, and creativity to gain a clear and deep understanding of unmet needs and opportunities related to brands, customers or markets, to create value for businesses, demonstrates the importance of B2B branding. A B2C branding lens is often applied when examining branding from an organisational buying perspective. This type of approach is particularly prevalent among service firms, where the brand's meaning to customers is derived mainly from their experiences with the organisation (Glynn, 2012). The market today is characterised by very similar commercial goods and services, rapid imitation of innovations and intense competition. In this competitive environment, it is more important than ever for firms to build strong relationships with their customers in the B2B sector (Kumar, 2010). B2B branding by a firm benefits consumers by providing information on the company and its products (Glynn, 2012). The latter is particularly important in the case of complex products or services, as branded products reduce the chances of a poor purchase, thereby reducing business risks. The aforementioned is particularly relevant in cases where the buyers initially have little information about a new subcontractor, which also contributes to enhance the experience for the purchaser (Glynn, 2012). Moreover, the brand can be a means of identification of consistent offerings (Goodyear, 1996). In the innovation domain, consistency refers to technological characteristics, with a consequence of becoming a shortcut in decision making in the long-run (Goodyear, 1996). In other words, brands have a rational, as well as an emotional appeal, and the result of brand-building efforts is customer attachment or loyalty to the brand (Glynn, 2012). Therefore, we hypothesize a positive relationship between brand orientation and customer performance in B2B SMEs.

H1. (c)Brand orientation impacts positively on customer performance in B2B SMEs.

2.2. The mediating role of technological reputation

Corporate reputation represents a company's past actions and future prospects and governs the company's appeal to its key constituents (Fombrun, 1996). In an in-depth review of the literature regarding corporate reputation, Chun (2005) argued that based on the aforementioned view of corporate reputation, an organisation does not have a single reputation but rather many reputations. According to this view, the company's 'image' is the outsider's perception, whereas both internal and external stakeholders determine its reputation. A favourable corporate reputation takes time to create and is usually the product of years of demonstrated competence (Henard and Dacin, 2010). Furthermore, it cannot be transferred and has an intangible nature (Henard and Dacin, 2010). In uncertain market conditions, a firm may promote its reputation with the aim of influencing customer behaviour (Henard and Dacin, 2010), as reputation has the potential to attract customers and influence selling-buying processes (Trotta et al., 2011). Reputation is likely to have a positive impact on customer satisfaction, loyalty and profitability (e.g. Hooley et al., 2005), as well as on employees' satisfaction and retention (e.g. Davies et al., 2004).

In addition to a general corporate reputation, which is often referred to in broad or all-encompassing terms, firms can have context-specific reputations (Zahra et al., 2003). Its technological reputation is a subset of the company's overall reputation and refers to the company's technical expertise and capabilities (Zahra et al., 2003). Investment in technological reputation is of the utmost importance in a context where firms are forced to keep pace with rapid technological changes and to pursue the "always be innovative" approach if they wish to remain competitive in the marketplace (Lawless and Anderson, 1996). Indeed, a company's technological reputation is built and shaped on the basis of its ability to adopt this innovation perspective, which influences consumer behaviour and decision making (Alwi and Da Silva, 2007). In contrast to the broad literature on corporate reputation, less attention has been devoted to a company's technological reputation. Studies that have been conducted have focused mostly on the benefits derived from technology licensing, open knowledge exploitation strategies (e.g. Lichtenthaler, 2007; Lichtenthaler and Ernst, 2007) and the positive impact of technological reputation on

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internationalisation (e.g. Zahra et al., 2003). Therefore, there is a need for studies regarding the factors which may foster and affect technological reputation, or, oppositely, the consequences of technological reputation.

A recent study (Reid and Brentani, 2012) examined the relationship between technological reputation and customers' perceptions. Despite there seems to be evidence of the role that human skills for innovation, internal social capital and brand orientation have in fostering technological reputation which in turn may impact on customer performance, the role of technological reputation in mediating such relationship has not been tested yet, overall in the SME B2B context.

Moreover, having an integrated strategy orientation may be key to customer performance. An integrated strategy orientation is defined as the "guiding principles that influence a firm's marketing and strategy-making activities" (Noble et al., 2002), and it combines an innovation or technology orientation (e.g. Berthon et al., 1999) with a learning orientation (e.g. Baker and Sinkula, 1999) and market orientation (Noble et al., 2002). As noted previously, B2B SMEs need to overcome the production-only orientation that has thus far characterised them (Urde et al., 2013). In this regard, a strategy orientation may be particularly useful and the present study aims to fill the gaps in the literature by shedding more light on this issue.

To maintain customer performance, firms need to continually augment their technological reputation (Henard and Dacin, 2010). Technological reputation is based on investments in R&D, including the R&D skills of its employees (Bell and McNamara, 1991), with the calibre of its researchers having a positive influence on both product innovations and the company's technological reputation (Gabrielsson, 2005). This is especially true in SMEs, where the quality of employees is thought to determine the company's technological development (St-Pierre and Audet, 2011). In particular, in high-tech industries, such as biotechnology, the presence of high-calibre scientists is claimed to be essential for the reputation and credibility of a firm (Coriat et al., 2003). Capable and skilled employees also play a fundamental role in the technological reputation of manufacturing firms. As reported previously, talented individuals with unique competences and expertise are capable of identifying business opportunities and risks (Lepak and Snell, 2002), inspiring new ideas and products and generating technological breakthroughs that can maintain or even improve a firm's technological reputation (James, 2002). Hence, it is expected that firms, especially those in high-technology industries and competitive environments characterised by rapid technological change, place a particular emphasis on improving their human capital (Parikh, 2001). Furthermore, it is expected that consumers will be more motivated to seek out products from a company with a consistent history of product innovations and a solid technological reputation and to have a positive predisposition towards such companies (Henard and Dacin, 2010). In recent years, research has highlighted the importance of technological reputation for customer performance within the context of innovative firms (e.g. Zahra et al., 2003). In an environment where customers want to simplify their buying and consuming tasks, simplify their cognitive-processing tasks and reduce their perceived risks in an attempt to maintain consistency, a solid technological reputation provides an implicit signal of promise of future innovation, which may lead to improved customer performance (Henard and Dacin, 2010). In the SME B2B context, where customers are accustomed to having a close relationship with employees whose skills and abilities are appreciated, a strong technological reputation may be key to improved customer performance. On these bases, the following hypothesis is stated.

H1. (a)Technological reputation mediates the relationship between employee' skills for innovation and customer performance in B2B SMEs.

According to some studies (Lee et al., 2005; Cabello-Medina et al., 2011), the ability of individuals to innovate is partly supported and complemented by interactions with other employees. Close and informal intra-firm interactions can contribute to shared knowledge and information, manage the uncertainty of the R&D process, find solutions to problems and identify potential new applications. Internal social capital, defined as the degree of inter-connectedness, relationships and shared expectations with others (Lee et al., 2005), captures the value embedded in internal relationships among employees (Nahapiet and Ghoshal, 1998). Due to limited resources, SME employees are often involved in many diverse tasks and are called upon to solve problems arising in different functional areas (Theodorakopoulos et al., 2014). Therefore, internal communication and knowledge sharing are likely to be distinctive characteristics of SMEs. The latter have been proven to have positive impacts on the innovation capabilities of firms, upon which technological reputations are built (e.g. Subramaniam and Youndt, 2005; Lin et al., 2011; Chen et al., 2014). Research has demonstrated that the existence of strong internal social capital has a positive influence on customers' perceptions of a company's reputation (Coleman, 1990; Lin et al., 2011) and, ultimately, on customer recruitment and client retention (Škerlavaj et al., 2007). Building on the evidence that a solid technological reputation means more customers, fewer dissatisfied customers and increasing positive word-of-mouth referrals, the following hypothesis is developed.

H1. (b)Technological reputation mediates the relationship between internal social capital and customer performance in B2B SMEs.

Taking H2(b) into consideration, supporting employees' skills and internal social capital with a brand orientation mind-set can greatly advance a firm's technological reputation (Hall, 1993). Brand orientation can guide employees' behaviour by providing a strategic orientation for the firm (Wong and Merrillees, 2005). Obviously, managers play a fundamental role in helping employees to align their behaviour with the brand (King and Grace, 2005). Considering the closeness between employees and customers in the SME B2B industry, employees may be the principal means of communicating the brand value upon which a firm's reputation is built (Reid et al., 2005). Hence, employees need to adopt appropriate behaviours (i.e. aligned with the brand's core values) when interacting with customers (King and Grace, 2005). In technology-driven industries, the brand frequently communicates the innovation ability of a firm, thus enhancing its technological reputation.

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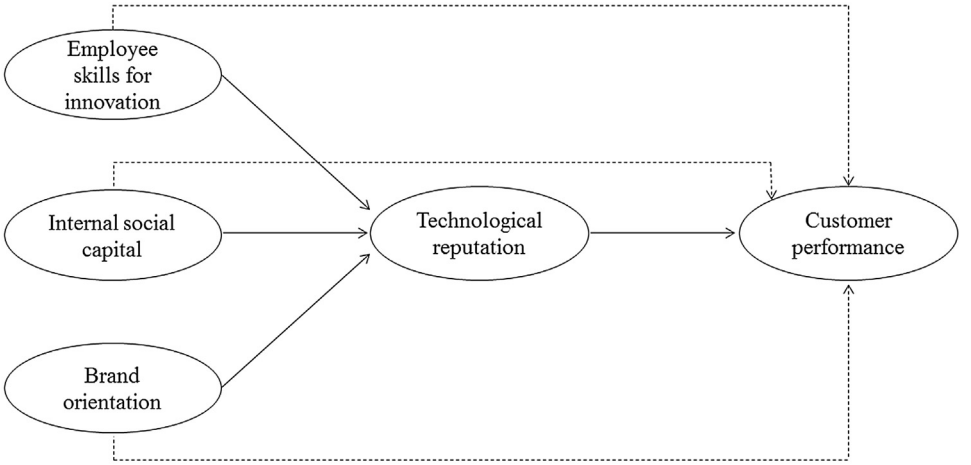

Fig. 1. The research model.

The innovation ability of firms is increasingly important today for enterprises that operate in an environment characterised by rapid change, shortened lead times and exponential innovative activities (Abimbola and Kocak, 2007). In the presence of continual innovation and changing consumer tastes, it is imperative that firms shape firm reputation upon its distinctive technological features (Abimbola and Kocak, 2007).

Within the B2B context, a strong technological reputation can distinguish rival firms and guarantee customer loyalty (Zahra et al., 2003). It can also allay the fears of potential customers in international markets and enable them to operate in a foreign market overcoming the liabilities of newness and foreignness (Zahra et al., 2003). The aforementioned benefits are underpinned by the need for the firm to create value for the business customer (Glynn, 2012), thus increasing customer performance.

Considering that brand, reputation and quality are some of differentiating factors in SMEs (Spence and Hamzaoui Essoussi, 2010), studies have started to investigate the interplay among branding, reputation and innovation (e.g. Merrilees et al., 2011). Such studies found that these factors have a positive impact on customer performance in the SME B2B industry. However, more research is needed to shed light on the role of brand and reputation in enhancing customer performance in B2B SMEs, which is the object of the last hypothesis.

H1. (c)Technological reputation mediates the relationship between brand orientation and customer performance in B2B SMEs.

2.3. The research model

To test our hypotheses, we propose the research model presented in Fig. 1, where both the direct and indirect effects of employees' skills in the areas of innovation, internal social capital and brand orientation on customer performance are tested. This model suggested that technological reputation partially mediated the relationship between the independent variables considered and customer performance.

3. Research method

3.1. Sampling and data collection

The sample of analysis was identified according to some considerations that reflect the aim of our research. We used a "purposive" sampling technique; it allowed us to draw samples according to some specific conditions that need to be satisfied (Short et al., 2002). Considering that this article focuses on SMEs in the B2B sector where technological reputation has to play a role, the research population is represented by firms having a turnover between 1 and 50 million Euros and less than 250 employees and belonging to manufacturing medium-high tech industries. In order to minimize extraneous variation, such studies benefit from industry- and country-specificity; to this purpose, as far as the industry is concerned, we considered firms involved in the production of machinery or instruments,[1] so as to have a homogeneous sample, which follows the tendency of previous authors (e.g., Laursen and Salter, 2006; Lawson et al., 2012) towards discriminating firms on

[1] We selected the following ATECO codes identifying medium-high tech industries (realizing machines and instruments) based on OECD (Organization for Economic Cooperation and Development) classification by technological intensity: 1721, 2222, 2660, 2825, 28293, 2895, 2896, 28993, 3092, 32501, 32503.

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the basis of their technological intensity when investigating issues related to innovation; as far as the country is concerned, we focused on the Northern area of Italy which represents a fertile field of research regarding SMEs, considering that most firms are micro and small. Based on these criteria, a final sample of 975 firms was obtained.

An on line self-administered questionnaire was used as the means for data collection; entrepreneurs or chief executive officers served as respondents because, within the SME context, they are used to have a complete picture of different aspects of their firms encompassing the characteristics of their employees, technological reputation, and customer performance. Firstly, companies were contacted by e-mail in December 2013; the e-mail contained an explanation of the research initiative, and the address to the online survey in Survey Monkey. After two recalls by telephone in February and July 2014, we collected a total of 150 useful questionnaires, resulting in an effective response rate of 15.4%.

3.2. Measures and operationalization

Well validated scales were used for the independent, mediation and dependent variables.

The independent variables "Employee skills for innovation" (ESI) and "Internal social capital" (ISC) were measured using the scale taken from Subramaniam and Youndt (2005). The four-item measure for ESI reflects the overall skill, expertise, and knowledge levels of the employees. Likewise, the three-item scale for ISC captures an organization's overall ability to share and leverage knowledge among and between networks of employees. Even though the factor loading on one item is lower than the others, it is still above the threshold of 0.5 recommended by the literature with a sample size of 150 firms (Hair et al., 2006); the tests for validity and reliability, which are shown below, demonstrate acceptable values.

The independent variable "Brand orientation" (BO) was measured using three items adapted from Wong and Merrilees (2008), and refers to the extent to which the firm recognizes the importance of brands as valuable assets and centers its strategy and activities on developing the ability to build strong brands.

As far as the mediation variable is concerned, the concept of reputation entails both how the company is perceived by the outside and how the company sees itself by the inside and these external and internal views are linked (e.g. Davies and Miles, 1998). Since a company's external image is claimed to commence with a company's internal stakeholders (Chun, 2005), following different authors (e.g., Abimbola and Kocak, 2007) who measure reputation by adopting an inward perspective, "Technological reputation" (TR) was measured using the scale taken from Zahra et al. (2003). The three-item scale makes reference to a subset of a company's overall reputation, indicating how the company perceives its technical expertise, capabilities, innovation and brand efforts are recognized by the external world.

The dependent variable, "Customer performance" (CP) was measured through a three-item scale taken from Hooley et al. (2005) who assume the perspective that superior customer performance can be obtained through satisfied and loyal customers who are relatively efficient to serve.

All items referring to the constructs used in the present study were assessed asking the respondents to indicate the extent to which they agree or disagree with some statements on a Likert scale ranging from 1 (completely disagree) to 7 (completely agree).

We also controlled for firm age, measures in terms of the number of years since foundation, and firm size, measured in terms of the logarithm of turnover (e.g., Wei and Morgan, 2004).

Appendix A presents a detailed description of all items.

3.3. Statistical procedure

Our methodology consisted of a confirmatory factor analysis (CFA) and a structural equation modelling (SEM) to test our research model using AMOS. The SEM methodology was preferred to regression because SEM performs better than regressions when conducting tests for mediations and it will never be outperformed by regressions (Iacobucci and Deng, 2007). Moreover, SEM allows a powerful generalization of earlier statistical approaches with the key advantage of associate a measurement error to each explanatory and dependent variable, differently from ordinary least squares regression (Bollen, 1989). In addition, SEM allows for multiple indicators of latent variables, which gives a more realistic representation of the variables under study. The advantages of this technique are also related to the fact that it makes it possible to best capture the theoretical inter-variables dependencies and it is particularly effective when testing models with mediating variables since all of the relevant paths are directly tested (Edelman et al., 2005; Wu et al., 2008).

4. Results of the measurement model

We first assessed the reliability and validity of the measurement model in order to ensure that constructs' measures are valid and reliable before attempting to draw conclusions regarding relationships among constructs (Barclay et al., 1995). Next paragraphs deal with these issues in deep details, in order to ensure that all constructs have the desirable characteristics of dimensionality, convergent and discriminant validity and reliability.

4.1. Convergent and discriminant validity

Confirmatory factor analysis (CFA) was run on all the items and it clearly replicated the intended factor structure, with each item loading on its intended factor. Thus, all items were significantly related to their underlying

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Table 1
CFA and scale validation.

Item	ESI	ISC	OB	TR	CP	p-value
ESI_1	.774					No p-value[†]
ESI_2	.697					***
ESI_3	.867					***
ESI_4	.538					***
ISC_5		.912				No p-value
ISC_6		.924				***
ISC_7		.783				***
OB_1			.933			No p-value
OB_2			.897			***
OB_3			.925			***
TR_2				.685		No p-value
TR_3				.846		***
TR_4				.853		***
CP_1					.832	No p-value
CP_2					.967	***
CP_3					.896	***
Cronbach's alpha	.803	.903	.945	.858	.897	
Composite reliability	.815	.907	.941	.839	.927	
AVE	.531	.766	.843	.637	.810	

$\chi 2 = 183.891$; DF = 94; $\chi 2/DF = 1.956$; CFI = 0.947; IFI = 0.948; RMSEA = 0.08.
[†] No p-value means that the parameter has been fixed at 1.

constructs, providing support for convergent validity; all standardized parameter loadings were significant (p-value < 0.01) and ranged from 0.538 to 0.967, with most of the items greater that 0.8 (see Table 1). Furthermore reliability was assessed by checking whether the composite reliabilities exceeded 0.6 (Fornell and Larcker, 1981): as shown in Table 1, the requirement is satisfied by all the constructs thus indicating that items related well within each latent variable. We further assessed discriminant validity by examining Cronbach's alpha, which showed alphas definitely higher than the acceptable threshold of 0.6 (Nunally, 1978). Discriminant validity was also checked by means of the AVE (Average Variance Extracted) analysis. The values of AVE, which measures the explained variance of the construct, for each construct has to be at least 0.5 (Fornell and Larcker, 1981); all the constructs exceed this threshold value. Moreover, we also checked that every AVE value belonging to each latent construct is higher than any squared correlation among any pair of latent constructs (Fornell and Larcker, 1981), which further confirms discriminant validity is not a problem in our data (see Table 2).

Finally, unidimensionality was assessed by the overall model fit that can be tested using the comparative fit index (CFI), incremental fit index (IFI), root mean square error of approximation (RMSEA), and normed chi square (i.e. $\chi 2$ per degree of freedom) (Byrne, 1998; Hair et al., 2006). All the indexes indicated that the data acceptably fit the model. In conclusion, results provided strong evidence that the measures are of good quality.

Table 1 presents the correlations of the studied variables.

The data were collected from a single respondent per firm, so common method bias may be a problem (Podsakoff et al., 2003). Analysis of Harmon's one-factor test of common method bias (Podsakoff et al., 2003; Flynn et al., 2010) revealed 5 factors, explaining 80.29% of total variance. The first factor explained 35.9% of the variance, which is not the majority of the total variance. As a second test of common method bias, CFA was applied to Harman's single-factor model (Sanchez and Brock, 1996; Flynn et al., 2010). The model's fit indices of $\chi 2/df = 11.365$, NFI = 0.347, CFI = 0.362, IFI = 0.368 and RMSEA = 0.264 were significantly worse than those of the measurement model. This suggests that a single factor is not acceptable, thus the common method bias is unlikely to be a concern in our data.

Table 2
Correlations (above the diagonal) and AVE analysis (diagonal and below).

	ESI	ISC	BO	TR	CP
Employee skills for innovation	**.531**	.715	.278	.383	.390
Internal social capital	.511	**.766**	.168	.267	.284
Brand orientation	.077	.028	**0.843**	.419	.130
Technological reputation	.147	.071	.176	**.637**	.426
Customer performance	.152	.081	.017	.181	**.810**

Note: AVE values of each construct are in the diagonal (in bold), to be compared with squared inter-construct correlations (values below the AVE).

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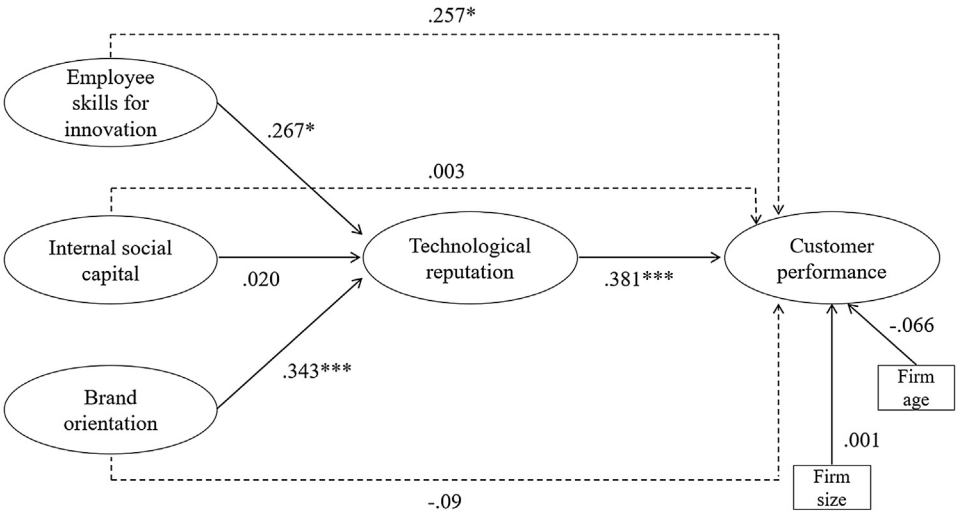

Fig. 2. Standardised estimates of the structural model (Model 1).
* Significance at $p < 0.10$ level; *** Significance at $p < 0.01$ level

5. Results

To verify our hypotheses, we used the decomposition of effects results, in which the total effect of an independent variable on a dependent variable was disaggregated into its direct and indirect effects (Tabachnick and Fidell, 1996). Fig. 2 shows both the direct and indirect paths and the standardised parameter estimates.

With regard to the direct effects, employees' skills for innovation were significantly positively related to customer performance ($p < 0.10$), in accordance with H1a, whereas internal social capital and brand orientation were not significantly related to customer performance. Therefore, H1b and H1c were rejected.

With regard to indirect effects, a significant indirect effect indicated that a relevant quantity of the independent variable's total effect on the dependent variable happened via the hypothesised mediator. Consistent with H2(a), technological reputation mediated the relationship between employees' skills for innovation and customer performance, although the level of significance of the coefficient relating ESI to TR was 10%. In this case, as that the direct effect of ESI to CP was also significant, a *complementary mediation*[2] occurred (Zhao et al., 2010). H2(c) was also supported, with technological reputation mediating the relationship between brand orientation and customer performance. However, the direct effect between the independent variable BO and the dependent one CP is not significant. Hence, for brand orientation, only *indirect mediation* occurred (Zhao et al., 2010). Finally, H2(b) was not supported because technological reputation did not mediate the relationship between ISC and CP. Thus, overall, ISC did not influence the dependent variable.

Overall, the model had acceptable fit indexes: $\chi 2 = 230.488$, DF = 118, $\chi 2/DF = 1.953$, CFI = 0.936, IFI = 0.937 and RMSEA = 0.08.

The variance inflation factor (VIF) was calculated to check for multicollinearity. The VIF of all the independent variables (ranging from 1.05 to 1.80) was much lower than 3, showing that multicollinearity was not a concern in the data (Hair et al., 2006).

To further test for the significance of mediation, the bootstrap method was employed. Although Baron and Kenney's (1986) four-step approach and the Sobel test were used in the past to test for the significance of the mediation effect, recent studies showed that the bootstrapping technique was more appropriate and powerful (see Hayes, 2009; Preacher and Hayes, 2008; Zhao et al., 2010). In particular, Cheung and Lau (2008) recommended bootstrapping over the approach of Baron and Kenney (1986) on the basis that the former had a higher level of power and reasonable control over type 1 error rates.

Table 3 shows the standardised direct, indirect and total effects of employees' skills for innovation, internal social capital and brand orientation on customer performance and the mediating effect of technological reputation.

The results demonstrated that the effect of BO on CP was indirectly mediated by TR, and the relationship between ESI and CP showed a complementary mediation effect, providing support for H1(a), H2(a) and H2(c), whereas rejecting H1(c). There

[2] The classifications of the different types of mediation by Zhao et al. (2010) differ from those of Baron and Kenney (1986). Zhao et al. identified three patterns consistent with mediation and two patterns consistent with non-mediation: (1) Complementary mediation: Both mediated effects and direct effects existed and pointed in the same direction. (2) Competitive mediation: Both mediated effects and direct effects existed and pointed in opposite directions. (3) Indirect-only mediation: Mediated effects existed but not direct effects. (4) Direct-only non-mediation: Direct effects existed but not indirect effects. (5) No-effect non-mediation: Neither direct nor indirect effects existed.

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Table 3
Standardized direct, indirect and total effects of ESI, ISC, OB and TR on customer performance (2000 bootstrap samples).

	Direct effect		Indirect effect		Total effect	
	Technological reputation	Customer performance	Technological reputation	Customer performance	Technological reputation	Customer performance
Employees skills for innovation	0.267*	0.257*		0.102*	0.267*	0.359*
Internal social capital	0.02	0.003		0.007	0.02	0.011
Brand orientation	0.343***	−0.090		0.131***	0.343***	0.041
Technological reputation		0.381***				0.381***

Significant levels based on bootstrapped, bias-corrected confidence intervals.
* Significance at $p < 0.10$ level.
*** Significance at $p < 0.01$ level.

was no significant effect of internal social capital either on customer performance or on technological reputation. Thus, H1 (b) and H2(b) were not supported.

5.1. Robustness check

A nested-models approach, adopted from Anderson and Gerbing (1988), was used to examine the mediation models and determine which model best fitted the data. The partial mediation model was compared with the two most likely competing models to determine which model best fitted the data. As Model 1 revealed an indirect-only mediation of BO on CP, the following two models were assessed: Model 2, in which the direct paths from the independent variables to the mediator were constrained to zero, and technological reputation was considered an independent variable (direct model); Model 3 in which the direct link between BO and the dependent variable was constrained to zero (Table 4).

A chi-squared analysis of Model 1 and 2 revealed that Model 1 was statistically better than Model 2 ($\Delta\chi2 = 13.913$; $\Delta DF = 2$; significant at $p < 0.01$ level). Hence, Model 2 was discarded. Then, A comparison of Model 1 and Model 3 revealed no statistically significant differences between the two models ($\Delta\chi2 = 0.964$; $\Delta DF = 1$; not significant). Hence, the fit indices were compared to determine which model best fitted the data, following the approach of previous authors (e.g. Zacharia et al., 2011). The following were included in the comparison of the model fit: statistically significant parameters, squared multiple correlations (better closer to 1), parsimony, Akaike's information criterion (AIC) and the Browne–Cudeck criterion (BCC). As shown in Table 3, the significant parameters did not differ in the two models, other than a slightly higher level of Parsimony Normed Fit Index (PNFI) (better close to 1) in Model 3. In addition, the values of AIC and BCC were lower in Model 3.

Taken together, the comparison of the models showed that Model 3, depicted in Fig. 3, best fitted the data. Thus, we can conclude that the data supported the existence of complementary mediation of employees' skills for innovation and indirect mediation of brand orientation.

Table 4
Comparison of different models.

	Model 1	Model 2	Model 3
ESI to TR	0.267*	–	0.272*
ISC to TR	0.020	–	0.018
BO to TR	0.343***	–	0.338***
TR to CP	0.381***	0.387***	0.344***
ESI to CP	0.257*	0.255*	0.240*
ISC to CP	0.003	0.003	0.007
BO to CP	−0.090	−0.091	–
AGE to CP	0.001	−0.011	0.022
SIZE to CP	−0.066	−0.075	−0.084
$\chi2$	230.488	216.575	231.452
DF	118	116	119
$\chi2$/DF	1.953	1.867	1.945
CFI	0.936	0.942	0.936
IFI	0.937	0.944	0.937
RMSEA	0.080	0.076	0.080
PNFI	0.678	0.672	0.683
AIC	372.488	362.575	371.452
BCC	393.242	383.914	391.914

**Significance at $p < 0.05$ level.
* Significance at $p < 0.10$ level.
*** Significance at $p < 0.01$ level.

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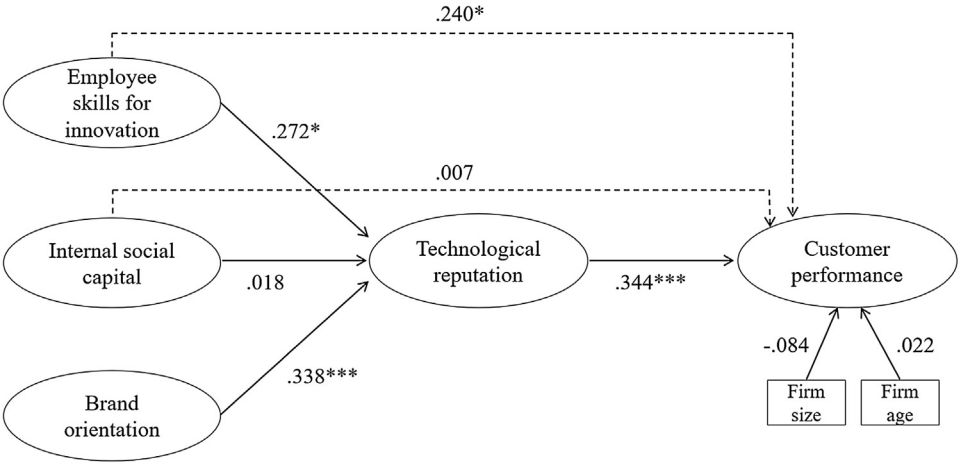

Fig. 3. Standardised structural estimates of Model 3.

It is important to highlight that although the direct effect between the independent variable (i.e. BO) and CP was not significant, mediation is anyway observed, but it was 'indirect-only mediation (Zhao et al., 2010).

6. Discussion and implications

The present study aimed to investigate the mediating role of technological reputation in the relationship between employees' skills for innovation, internal social capital and brand orientation and customer performance. It focused on the SME B2B context because there is a lack of research in this area, and there is an increasing need to strengthen the relationship between the firm and the customer. The findings should help managers better understand the key roles of employees' skills and their ability to transfer and share knowledge, in addition to brand orientation, in improving a firm's technological reputation and achieving customer satisfaction. The major findings and implications of the study are discussed below.

With regard to employees' skills for innovation, the results provided support for the existence of complementary mediation. Indeed, both the direct effect of employees' skills for innovation and customer performance and the mediated effect via technological reputation existed (Zhao et al., 2010). In the case of brand orientation, an indirect-only mediation was observed, as the mediating role of a firm's technological reputation was significant, whereas the direct relationship between the brand orientation and customer performance was not.

The key point finding of the present study was that technological reputation played a central role in determining customer performance. Although the direct effect of employees' skills for innovation on customer performance was positive and significant, it decreased in the presence of the mediator. The case of brand orientation was even more noteworthy, with its relationship with customer performance becoming significant only in the presence of the mediator.

The evidence, some of which was unexpected, may be explained by the different context in which the study was carried out, with respect to that in the previous literature. With regard to the size of firms, there are several differences between SMEs and their larger counterparts. For example, Raju et al. (2011) highlighted that SMEs tended to be intrinsically more innovative, especially in the early stages of the industry lifecycle, and that smaller firms were also likely to have more contacts with customers, more flexibility than larger firms and simpler organisational structures. In terms of the types of industry, the dynamics in the B2B context may be different from those in the B2C setting and different in manufacturing and service sectors. For example, the communication channels that firms in the B2C sector use to enhance their reputations differ from those used in the B2B environment (Swani et al., 2014), with the latter relying more on the technical aspects of their product to build their technological reputations. These differences should be taken into account when considering the results of the present study.

In the B2B SME environment, employees also have more personal contact with their customers to understand their requirements and develop customised products. In these circumstances, clients have an opportunity to appreciate first hand the employees' skills for innovation. This advances the technological reputation of the firm and directly affects customer performance. Contrarily, the analyses show that internal social capital does not produce the same effect. A possible explanation for this evidence is that SME employees are often involved in many diverse tasks and are called to solve operative problems arising in different functional areas (Theodorakopoulos et al., 2014). Therefore, the ability to transfer and share knowledge, which helps employees with different skills and experience connect more easily to solve problems, does not seem to represent an order-winner to enhance customer performance, but rather an operative routine in the SME context.

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In terms of brand orientation, the previous literature has almost exclusively considered its importance in large companies in the service sector (e.g. McDonald et al., 2001), where the final consumer may be emotionally attached to a brand, unlike products or services where rationale and logic are more prevalent. In the innovative domain of the B2B industry, buyers have to consider the technical features of the product when selecting a new supplier or ordering a new product from a regular supplier. According to Douglas et al. (2001), if a brand is used to communicate the innovativeness of a product to make the company recognised as a technology leader and, thus, to enhance its reputation for innovative products or technologies, the company may reap benefits in terms of customer recruitment and retention. All these elements contribute to making the company well known, thereby increasing sales of products and services and creating satisfied or loyal customers.

The findings of this study have both theoretical and managerial implications. From a theoretical viewpoint, we propose a model that integrates different antecedents of customer satisfaction in the SME B2B context, which has not been the focus of much research attention. The present study focused not only on employees' skills and internal social capital but also on brand orientation, which, in the past, was investigated mainly through a B2C lens. As reported elsewhere, the importance of brand orientation is increasing substantially the B2B industry (Glynn, 2012). Moreover, our research paid particular attention the mediating role of a firm's technological reputation in the relationships between employees' skills for innovation, brand orientation and customer performance. In addition, the present study employed robust methodology, providing academics with a solid foundation upon which to build future studies. For example, all the scales were tested using rigorous statistical methodologies, including confirmatory factor analysis, reliability and validity analyses. All the scales met the requirements for reliability and validity and thus can be used in future research. The robust methodology used herein could help future empirical research capture the relationships among the constructs studied.

From a managerial viewpoint, the evidence from the present study suggests that managers can expect significant rewards by building a strong technological reputation. If a firm's technological reputation is a significant determinant of customer performance, as suggested in this research, then understanding the factors that play a role in enhancing technological reputation is critical. We suggest that strong human resources (i.e. a pool of skilled employees who are able to create knowledge, as well as convey the brand message while performing their activities) are key to developing a solid technological reputation. Managers play a fundamental role in this process, as they need to align employees' behaviour with the brand by conveying the strategy behind the brand to them. An integrated approach, which encompasses the development of employees' capabilities and the creation of a brand culture, seems to be key to enhancing technological reputation which, in turn, improves customer performance.

Although the present study provides scholars and managers with interesting insights, the findings should be viewed in the light of some limitations that suggest directions for future research. First, the survey technique can only provide a cross-sectional snapshot, and the process of building a strong reputation is long and difficult. Further qualitative investigations would be required to understand the complex dynamics underlying this process. Second, the data were obtained through self-reporting. Data on a firm's technological reputation and customer performance could also be gathered directly from the customer. The latter approach might provide a more realistic picture of customers' perceptions. The results of this study revealed positive relationships between all the predictor variables and technological reputation and between technological reputation and customer performance. However, the results cannot be generalised to other types of industries and settings. The application of the model to organisations other than B2B SMEs and other sectors (e.g. non-manufacturing) could help to generalise the applicability of the findings.

7. Conclusion

The aim of this article was to examine whether technological reputation mediated the relationship between employees' skills for innovation, internal social capital and brand orientation and customer performance of B2B SMEs.

The findings revealed that technological reputation acted as a complementary mediator in the relationship between employees' skills for innovation and customer performance, as both the direct and indirect effects were positive and significant, and that it acted as an indirect-only mediator of the relationship between brand orientation and customer performance, as only the indirect effect occurs.

To sum up, technological reputation played a central role in enhancing customer performance. Hence, managers need to understand the key factors that contribute to build a strong technological reputation, which in turn enhances customer performance. In particular, paying attention to the technical skill development of employees and encouraging a brand orientation mind-set at work are critical to build a strong technological reputation within the SME B2B context.

Appendix A.

See Table A1.

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Table A1
Constructs and items.

Acronym	Item	References
ESI_1	Our employees are highly skilled to develop innovations	Subramaniam and Youndt (2005)
ESI _2	Our employees are widely considered the best in our industry	
ESI _3	Our employees are creative and bright	
ESI _4	Our employees are experts in their particular jobs and functions	
ISC_1	Our employees are skilled at collaborating with each other to diagnose and solve problems	Subramaniam and Youndt (2005)
ISC _2	Our employees share information and learn from one another	
ISC _3	Our employees interact and exchange ideas with people from different areas of the company	
OB_1	Branding is essential to our strategy	Wong and Merrilees (2008)
OB _2	Branding flows through all our marketing activities	
OB _3	Long-term brand planning is critical to our future success	
TR_2	This company has well known products or brands	Zahra et al. (2003)
TR _3	This company has a great reputation for innovative products (technologies)	
TR _4	This company is recognized throughout as a technology leader	
CP_1	We have higher levels of customer loyalty compared to competitors	Hooley et al. (2005)
CP _2	We have registered higher levels of customer satisfaction compared to last year	
CP _3	We have registered higher levels of customer loyalty compared to last year	

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