

Human Resources in it and Firm Performance in Sustainable Development: The Perspective of Organizational Identity Orientation

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Abstract. This study examines the relationship between human resource management (HRM) in IT and firm performance in sustainable development. Adopting the perspective of organizational identity orientation, we predict that a collectivistic orientation should moderate the relationship between HRM in IT and sustainable development, and it may also have a direct and positive effect on sustainable development. Focusing on firm performance in environmental protection, we test our predictions with empirical data from China's manufacturing industry. The results show a significant direct effect of HRM and a significant moderating effect of identity orientation on the dependent variable, i.e., performance in sustainable development. Other factors, such as firm size and a firm's information intensity, are also found to have significant effects. We conclude with a discussion on the implications of the findings for future academic research and managerial practice.

Keywords: human resource, information system, technology, performance and sustainability

1. Introduction

Research has shown that a firm's human resources with respect to information technology (IT) resources may play an important role in developing and implementing a successful organizational strategy (e.g., Grant, 1991; Bharadwaj, 2000). But it remains unclear whether the same human resources also have a positive effect on firm performance in sustainable development, which is also considered an important firm strategy (e.g., Dyllick & Hockerts, 2002). In this paper, we test the effects of human resource management (HRM) in IT on such performance. To better understand the effect of HRM in IT, we also test the effects of variables related to a firm's resources and internal environmental factors.

One such internal environmental factor is a firm's organizational identity orientation, which we argue should have a moderating effect on the relationship between HRM and performance in sustainable development. In the rest of this paper we provide a brief review of the relevant theoretical perspectives and then proposes models integrating these perspectives, which is followed by a discussion on our tests of the predictions suggested in the models. After that, we report the findings of the current study and consider their implications.

2. Theoretical Background and Hypotheses

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2.1 Relationship between HRM in IT and Performance in Sustainable Development

Corporate sustainable development (CSD) can be considered a business strategy that tries to meet the needs of organizational stakeholders without compromising the resources and interests of the local community (Dyllick & Hockerts, 2002). This strategy is considered an ethical business practice with the objective of “going green” by striking a balance between social, economic, and environmental development interests (Sharma, 2002). Theoretically, this strategy could be defined as “the adoption of business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future” (IISD, 1992: 116). The path to CSD should be understood as a continual process of change, or even a process of evolution (Newman, 2007). Researchers so far have taken somewhat different views of the goals of CSD: some have presented an integrated view of CSD, holding that organizations should consider the interrelations between various dimensions of CSD, such as individual, organizational, social, and political (Baumgartner, 2009; Linnenluecke, Russell, & Griffiths, 2007); others have concentrated on the issues of eco-equity, eco-efficiency, and eco-effectiveness, maintaining that organizations should be working towards efficiency and equity for the natural environment (Chen, Boudreau, & Watson, 2008; Bansal & Roth, 2000). In this paper, we adopt the latter approach, focusing on firm performance in environmental protection.

According to this approach, firm performance in environmental protection can be defined as an organization’s efforts to manage its operations in such a way that its final products do little harm to the environment, including land, air, and water. The core of this performance is to operate within the carrying capacity of the ecosystem by minimizing resource consumption and one’s ecological footprint (Hart, 1995). Firms should reform, redesign, and restructure existing procedures to achieve a positive environmental impact (Gladwin, 1992). Performance can be accomplished through innovation, with changes such as error- and waste-reduction, pollution prevention, and the use of clean technologies (Berry & Rondinelli, 1998). There are two approaches to improving performance: strategic and operational. The strategic approach focuses on cost reductions; for example, pollution prevention may be expensive and cause companies to lose money (Hart, 1995; Porter & van der Linde, 1995). A firm can improve its performance if it can identify an effective way to reduce the costs of production (Aragón-Correa, 1998). On the other hand, the operational approach involves changes made at the production level that reduce harm to the environment (e.g., Gilley, Worrell, Davidson, & El-Jelly, 2000). Firms may adopt many methods to protect the environment. For instance, they could adopt the approach of product-related development, such as packaging and eco-labeling, or that of process-related development, such as recycling waste and redesigning products in ways that will reduce waste (Gilley, Worrel, Davidson & El-Jelly., 2000).

Research has suggested that HRM in IT should have a positive effect on firm performance in sustainable development because it results in improved firm resources or skills, which include not only current technical knowledge, but also the ability to deploy, use, and manage those skills (Hulland, Wade, & Antia, 2007). These intangible skills – such as knowledge assets (Bharadwaj, 2000) and technology integration skills (Feeny & Willcocks, 1998) – are quite immobile, so that they are difficult to obtain, trade, imitate, and substitute (Barney, 1991). On the other hand, these intangible skills exist among a firm’s human resources in IT. Without outstanding HRM in IT departments, these intangible skills may disappear.

Hypothesis 1

There will be a positive relationship between a firm’s HRM in IT and its performance in sustainable development.

Some authors have also suggested that the relationship between a firm’s IT effectiveness and CSD may be moderated by certain environmental factors (Aragón-Correa & Sharma, 2003). For example, Stoel and Muhanna (2009) argued that the relationship between IT capabilities and business strategy may be contingent on such factors. In this paper, we focus on a variable in a firm’s internal environment, namely the firm’s organizational identity orientation, and predict the effects of this orientation on the relationship between HRM in IT and performance in sustainable development. Below we first review the research on identity orientation, based on which we then predict its effects on the relationship between HRM and CSD.

2.2 The Perspective of Organizational Identity Orientation

Organizational identity can be defined as the shared perceptions of the members of an organization about its central, distinctive, and enduring qualities (Albert & Whetten, 1985; Dutton & Dukerich, 1991; Pratt & Foreman, 2000). Because organizational identity speaks to the very definition of an organization (Albert, Ashforth & Dutton, 2000), it can help in understanding the organization's coherent actions toward others, including its employees. It can also help others to understand how to interact with the organization (Brickson, 2007). Brickson (2007) developed a model of organizational identity orientation, defined as the perceived nature of the association between an organization and its stakeholders (Brickson, 2005). Following on this definition, Brickson (2007) identified three types of orientation, namely individualistic, relational, and collectivistic. All these orientations address the question, "Who are we as an organization vis-à-vis our stakeholders?" (Brickson, 2007: 866), which has powerful motivational effects for a given organization and its members (Brewer & Gardner, 1996; Cialdini, Brown, Lewis, Luce, & Neuberg, 1997).

In this paper, we focus on the collectivistic orientation, which can be defined as an organizational self-conception of being a member of a larger group with generalized ties to other stakeholders in the group (Brickson, 2007). This orientation is associated with a motivation to benefit this community as a whole. The collectivistic orientation encourages a given organization and its members to view themselves in terms of the collective prototype (e.g., as a member of one's company or department), and to enhance the welfare or relative standing of the organization or community (desire to advance the relative standing of its community). Internally, collectivistic organizations might be described as "fostering an internal sense of community." Organizational evaluations are conducted through an assessment of the contributions to the organization or community (Brickson, 2007: 868). Following this perspective of organizational identity orientation, we predict a positive relationship between a firm's collectivistic identity and its performance in sustainable development.

Hypothesis 2

A collectivistic identity orientation should have a significant and positive effect on a firm's performance in sustainable development.

Moreover, we predict a positive moderating effect of collectivistic orientation on the relationship between HRM and performance in sustainable development. With a high level of this orientation, as discussed above, a firm should be highly committed to such tasks as environmental protection, which should enhance the positive relationship between HRM in IT and performance in sustainable development. Accordingly, we predict as follows:

Hypothesis 3

A firm's collectivistic identity orientation will moderate the relationship between its HRM in IT and its performance in sustainable development. Other conditions being equal, the higher the collectivistic identity orientation, the stronger will be the positive relationship between HRM and performance in sustainable development.

3. Method

3.1 Setting, Sample, and Data

To test our hypotheses, we collected data from manufacturing firms in China. Because manufacturing firms in China consist of several sub-industries, we marked each sub-industry with a number (e.g., car-making being one) so that we could later control the possible effect of industry difference in our data analyses. We discuss this issue further in the next section on data analyses.

We selected firms in this sample if they had an IT manager leading human resources in an IT division, department, or unit. Among these firms, 215 were from North China, and 103 from South China. The largest firm employed 11,638 people, and the smallest 102.

3.2 Measurements

Dependent variables

We measured firm performance in sustainable development using an instrument developed by Chan (2005) and Bansal (2005). This instrument consists of the following items: (1) reducing impact on animal species and natural habitats; (2) undertaking voluntary actions (i.e., actions not required by regulations) for

environmental restoration; (3) reducing waste and emissions from operations; (4) reducing purchases of non-renewable materials, chemicals, and components; (5) reducing energy consumption; (6) reducing the environmental impact of its products; (7) reducing the likelihood of environmental accidents through process improvement; (8) disposing waste responsibly; (9) using waste as inputs for its own processes; and (10) handling or storing toxic waste responsibly. The highest score for good performance measured by each item is seven, and the lowest is one. Our pre-test showed that this instrument had a reliability alpha of .83.

Independent variables

We measured HRM in IT using an instrument developed by Tallon (2008). This instrument has four items: (1) “Our IT personnel are encouraged to improve their technical skills,” (2) “Our IT personnel can quickly develop technical solutions to business problems,” (3) “Our IT personnel are adept at multi-tasking,” and (4) “Our IT personnel are trained in a variety of programming methodologies and tools.” Again, the highest score for good performance measured by each item is seven, and the lowest is one. Our pre-test showed that this instrument had a reliability alpha of 0.90.

Control variables

We controlled for the effects of other variables that may influence the relationship between HRM and performance in sustainable development. These included 1) the proportion of employees using IT resources in a given firm, 2) how many years the firm had been using IT, 3) firm size, 4) information intensity in a given firm, and 5) a firm’s sub-industries. The first variable was actually an estimation from the firm managers, which shows the involvement of a firm’s employees in IT technology. The second variable, namely how many years a given firm had been using IT, reflects the firm’s experience in using IT. The third variable, namely the firm size, was the logged number of the firm’s total number of employees. Finally, we measured the fourth control variable, information intensity, using four items adopted from Karimi, Somers, and Bhattacharjee (2007): (1) “Our production/service operations require a significant amount of information processing,” (2) “There are many steps in our value chain that require frequent use of information,” (3) “Information used in our production/services operations needs frequent updating,” and (4) “Information constitutes a large component of our product/service to customers.” Here the highest score for good performance measured by each item is seven, and the lowest is one. Our pre-test showed that this instrument had a reliability alpha of 0.87. Finally, we used the number of sub-industries to control for the possible effect of industry differences.

4. Results

Table 1 presents four models testing the proposed hypotheses. Model 1 is the basic model that includes the effects of all control variables. Model 2 is concerned with the effect of HRM in IT. Model 3 deals with the effect of a collectivistic identity orientation. Finally, Model 4 focuses upon the interaction effects between HRM in IT and the collectivistic orientation. Following past research (e.g., Aiken & West, 1991), we first standardized the data before conducting regression analyses.

Table 1 shows the results of the analyses. The results from Model 1 indicate that both firm size and information intensity have significant and positive effects on firm performance in sustainable development. Larger firms may be more likely than smaller ones to perform better ($\beta = 0.20, p < 0.05$). On the other hand, the higher its level of information intensity, the more likely a firm will perform better ($\beta = 0.46, p < 0.01$). We will provide our explanations for these findings in the next section.

TABLE 1 THE EFFECTS OF HRIT AND COLLECTIVISTIC-IDENTITY ON ENVIRONMENTAL DEVELOPMENT

Control Variables	Environmental Development			
	M1	M2	M3	M4
Industry type	0.04	0.04	0.04	0.03
Proportion of Employee using IT	-0.03	-0.03	-0.03	-0.02
Length of Applying IT	0.19*	0.18*	0.17	0.17*
Firm size	0.30**	0.30*	0.30*	0.39*

Information intensity	0.46** *	* 0.35* *	* 0.35* *	0.36* *
Independent Variables				
HRM in IT		0.25* *	0.25* *	0.23*
Collectivistic-identity			0.05	0.05
Interaction				
HRIT*Collectivistic-identity				0.18*
R^2	0.25	0.25	0.26	0.27
ΔR^2	0.25	0.01	0.00	0.18
F	46.16* **	38.62 ***	32.49 ***	28.65 ***
ΔF	46.16* **	6.65* *	1.63	4.39*

Note: * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

Model 2, which tests hypothesis 1 (H1), shows a significant and positive coefficient for HRM in IT ($\beta = .15$, $p < .01$). In other words, this significant coefficient supports H1, which predicts that a firm's HRM in IT should have a positive relationship with its performance in sustainable development.

Model 3, however, shows no significant coefficient for a collectivistic identity orientation ($\beta = .15$, $p < .01$). In other words, the empirical data fail to support H2, which predicts that a firm's collectivistic identity orientation should be positively related to its performance in sustainable development. This model is also not significantly improved after entering the collectivistic orientation. This result is surprising and we will provide our explanation for this finding in the next section.

Finally, Model 4, which tests hypothesis 3 (H3), shows a significant and positive coefficient for the interaction between HRM in IT and the collectivistic orientation ($\beta = .18$, $p < .01$). Specifically, the results suggest that the positive effect of HRM in IT is more likely to be observed given a high level of collectivistic identity orientation.

5. Discussion And Implications

This study has obtained empirical evidence on several issues that previous research has not tested sufficiently. First, it shows that a firm's HRM in IT does positively influence its performance in sustainable development. Assuming that other conditions are equal, the better a firm's HRM in IT, the better its performance is likely to be. The reason seems to be, as discussed above, that better HRM in IT allows a firm to understand the internal and external environments better and to develop and implement better strategies for environmental protection.

Second, larger firms are more likely to do better than smaller firms in sustainable development; this is at least true among manufacturing firms in China. There may be two reasons for this finding. First, because larger firms are monitored more closely by the governments and communities in China, they are forced to show better performance in sustainable development. And second, larger firms may also have more resources, such as financial and technological, to perform better. Therefore, firm size should have a positive relationship with firm performance in sustainable development.

Third, a firm's information intensity also has a significant and positive relationship with its performance in sustainable development. The reason seems to be that firms with high levels of this may be more likely to adopt more advanced technologies, which are often environmentally friendly. In other words, information intensity may actually reflect the advanced technologies being adopted. Conversely, those firms with a low level of information intensity are more likely to have less advanced technologies, which are often less friendly to the environment.

Finally, both a collectivistic identity orientation and relational orientation have some significant direct or moderating effects, although the directions of these effects differ. These findings highlight the importance of

identity orientation in the study of IT management and of firm performance in sustainable development. Past research has found that a firm's IT capability, including its HRM in IT, can have positive effects on many dimensions of firm performance, such as financial, marketing, and environmental protection performance (e.g., Melville, Kraemer & Gurbaxani, 2004). The research, however, has not considered sufficiently the effects of organizational identities on these dimensions of performance. Our study shows that the effects of orientation should be given more consideration. Although the collectivistic orientation showed no direct effect on firm performance in sustainable development in this study (to be explained in the last part of this paper), it did have a significant moderating effect on the relationship between HRM in IT and performance in environmental protection. In other words, a firm's HRM in IT is more likely to have a positive effect on performance in sustainable development if the firm has a collectivistic identity orientation.

5.1 Implications

For academic research, our results show that more comprehensive investigations need to be conducted in the future testing those factors or variables that may influence the relationship between IT and performance in sustainable development. One such variable is organizational identity orientation. Past research has paid insufficient attention to the effect of this variable and its interactions with other variables. Our findings in this study suggest that this variable could have a very important influence on the explanatory power of the regression equations. Without considering the effect of this variable, the effects of many other relevant variables may not be significant. The results of our study also have useful implications for managerial practitioners, especially those with lots of human resources working in the IT area. If a firm wants to adopt a strategy of sustainable development, it must establish a right identity.

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