ABSTRACT

The purpose of this study is to investigate the impact of human resource management system transformation on human resource management system practices. Data is collected via survey of organizations pursuing lean transformation. Results suggest that measurement system transformation will have a positive impact on lean human resource management practices.

KEYWORDS: Lean Manufacturing, Organizational Change

Introduction

Successful lean deployment often requires a cultural shift in the organization, which can lead to stagnant results for those organizations that dismiss the importance of the cultural element (Liker & Hoseus, 2008). Scholars suggest that improper change management techniques and an inability to shift corporate culture can be a significant factor in failures of lean transformation (Liker & Hoseus, 2010; Saurin, Marodin, & Ribeiro, 2011). In fact, recent literature identifying barriers to lean transformation suggests that the largest hurdles faced by organizations pursuing lean transformation are people-related (Hines, Holweg, & Rich, 2004; Ransom, 2008; Shook, 2010). Therefore, the human dimension can essentially be described as the nucleus of successful lean transformation initiatives (Achanga, Shehab, Roy, & Nelder, 2006).

Organizations have turned to strategic human resource management techniques for years to develop organizational culture and drive change management success (Becker & Huselid, 2006; Fombrun, Tichy, & Devanna, 1984; Lengnick-Hall, Lengnick-Hall, Andrade, & Drake, 2009; Wright & McMahan, 1992). The human resource function within an organization is often described from a systems perspective, where the human resource management system is designed to accomplish certain objectives, such as motivating performance, developing employees, establishing culture, implementing business strategies, and many others, that ultimately lead to enhanced performance or competitive advantage for the organization (Becker & Huselid, 1998; Lado & Wilson, 1994; Lawler III, 2003).

To extend lean transformation to the entire enterprise, it has been suggested that not only the operational tools and techniques are modified, but it is also important that all organizational/management policies, procedures, and philosophies, including the human resource performance management system, reflect the lean transformation strategy as well (Koenigsaecker, 2012; Smeds, 1994; Womack & Jones, 1994). The purpose of this study is to assess the extent to which an organization has transformed the human resource performance management system as part of the lean transformation strategy, and to investigate the relationship between HRPM transformational activities, HRPM practices, and HRPM system...
effectiveness. Specifically, we investigate the influence of performance management system transformation (extent to which the HRPM system transformed as part of lean transformation) on the practices (selection, development, evaluation, rewards) employed as part of the performance management system. Subsequently, we test the relationship between the various performance management system practices and the effectiveness of the performance management system.

Theoretical Background and Hypotheses Development

General Systems Theory has been examined in organizational research for over fifty years (see the seminal work of Boulding (1956). Gradous (1989) compiled an extensive collection of research that extends systems theory to human resource development. Swanson (2001) identified general systems theory as the most common and unified theory of human resource development and management. Hence, we examine the constructs utilized in this study from a general systems perspective.

The extant literature suggests that the human resource performance management system should be comprised of the following four primary elements: employee selection and hiring, employee training and development, employee performance evaluation/appraisal, and reward systems (Abu-Suleiman, Boardman, & Priest, 2005; Goldstein, 2003; Lawrie, Cobbold, & Marshall, 2004). Therefore, we define the human resource performance management system as the set of practices, processes, and procedures that are utilized to select, develop, appraise, and reward the organization’s human resources (Bowen & Ostroff, 2004; Ferreira & Otley, 2009; Huselid, 1995; Latham, Almost, Mann, & Moore, 2005; Otley, 1999). We draw from the performance management system framework proposed by Ferreira and Otley (2009) to guide our understanding of the key elements associated with human resource performance management. We define selective hiring as the extent to which the organization engages in selective hiring practices as a means to find and retain employees that fit the organization’s lean transformation strategy. The inspiration for our definition of selective hiring practices stems from Pfeffer’s work (Cohen & Pfeffer, 1986; Pfeffer, 1998) and more recently the work of Ahmad & Schroeder (2003). We define employee development as the extent to which employees are offered formalized training and development opportunities that will enable the employee to support and execute the lean transformation strategy. Our definition is derived from Goldstein (2003), and specifically the element of staff training and development from her employee development construct. Here, we define employee evaluation as the extent to which the organization integrates lean transformation objectives, initiatives, and activities into the performance evaluation process (Bourne, Mills, Wilcox, Neely, & Platts, 2000; Neely, Gregory, & Platts, 1995). Finally, employee rewards refers to the extent to which the organization offers rewards for performance and encourages employees to pursue lean transformation objectives (Ahmad & Schroeder, 2003; Flynn & Saladin, 2001). Rewards are typically designed to reinforce positive actions and behavior that aligns with the strategy of the organization in an effort to increase the likelihood of repeat actions and behavior (Stonich, 1985).

Further, we introduce a new construct, human resource performance measurement system transformation, to capture the extent to which an organization transforms elements of the performance management system as part of the overall lean transformation strategy. Specific items reflect the extent to which the organization adds new measures of performance, the system transforms from an activity/function/results orientation to a process based orientation, the system captures new strategic priorities introduced by lean transformation, and includes new operational expectations for performance as a result of lean transformation.
This study supplements extant literature by examining the relationship between human resource performance management system transformation and practices. As figure 1 illustrates, we propose that the extent of transformation of the system will influence performance management practices utilized by the organization.

**Figure 1 – Theoretical Model**

The change management literature identifies an abundance of strategies for driving organizational transformation. As part of changing organizational strategies, specifically lean transformation, it is important and necessary that the human resource performance management system is transformed along with other operating procedures within the organization (Salminen, 2000). We often hear the adage “what gets measured, gets done”; therefore, it stands to reason that the human resource performance management system plays a large part in employee motivation and performance. Because the human element is a key driver of successful lean transformation, the human resource performance management system should reflect the goals and objectives of lean transformation to motivate employee performance, ensure that employees are properly trained, and reward employees equitably for behaving and displaying values that align with the lean transformation strategy (Liker & Hoseus, 2010).

Fisher et al. (1999) suggested that the human resources function should be linked to organizational strategy. They contend that the human resources function should hold a much more central, strategic position and adapt as needed to align with changing organizational strategies. Mohrman and Lawler (Mohrman & Lawler, 1997) contend that human resources practices of the past no longer fit within rapidly changing organizations, based on technological advances, information availability, and globalization. They argue that human resource management systems should transform to reflect changing organizational strategies and priorities. Human resource management systems require constant innovation and transformation in the face of increased competition, globalization, workplace partnerships, and a design to align human resource practices with organizational strategy (Beer, 1997; Rowley & Bae, 2002). Moreover, Martin and Beaumont (2001) suggest that the human resource management system “is frequently accorded a key role in shaping direction through a program of strategic change involving best practice transfer or culture change (p. 1234)”. Therefore, we offer the following hypothesis:

**H1 – An increased extent of human resource performance management system transformation leads to increased deployment of human resource performance management practices in terms of: (a) selective hiring (b) employee development, (c) performance evaluation, and (d) employee rewards.**

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Methodology

Instrument and Scale Development

In order to evaluate the relationships between constructs in this study, a survey was developed and conducted following Dillman’s Tailored Design Method (Dillman, 2007). The survey instrument was developed and subsequently validated for this study using a multi-step process (Churchill Jr, 1979). Scales are grounded in the extant literature and rely on scale development techniques employed by prior research (DeVellis, 2011; Dunn, Seaker, & Waller, 1994; Stratman & Roth, 2002).

Multi-item reflective measures were utilized for each construct with Likert-based scales anchored at 1 = no extent to 7 = great extent for each item. The human resource performance management system transformation construct reflects the extent to which the organization transformed the human resource performance management system as part of the lean transformation strategic plan. The human resource performance management construct captured the organization’s practices related to personnel selection/hiring, personnel development and training, reward mechanisms, and employee performance evaluations. The human resource performance management system effectiveness construct measured the perceived effectiveness of various human resources practices as part of the overall HR system.

To further validate and refine the new items and the previously validated items, a group of industry professionals and academics were assembled to conduct a Q-sort exercise (Moore & Benbasat, 1991; Nahm, Solís-Galván, Rao, & Ragu-Nathan, 2002). A pretest and pilot was conducted as the next phase of instrument development. The survey instrument was delivered to a total of fifty academics and industry professionals. Each respondent was asked to thoroughly review the survey and provide feedback on the construction, content, clarity, and quality of the survey. Based on the results of the pretest and pilot study, the survey was revised to improve clarity, reduce content, and minimize ambiguity.

Data Collection

A web-based survey was utilized for the large-scale data collection effort. The sample consisted of executive and managers randomly selected from a database provided by a consulting firm specializing in lean supply chain practices. The respondents targeted as part of this sample frame are those individuals that are typically involved, and often leading, the lean transformation activities within their respective organization. A total of 319 responses to the survey were received, which equates to a 13.2% response rate.

A time-trend extrapolation test was utilized to examine non-response bias, which assumes that non-responses will resemble late responses (Armstrong & Overton, 1977). To test for non-response bias, we conducted a multivariate analysis of variance between the first 25% of responses and the last 25% of responses. The result of the test suggests that non-response bias is not present as no significant differences between groups were detected (Wilks’ Lambda = 0.006, p = 0.38).

Harman’s single-factor test was used to check for common method variance (Malhotra, Kim, & Patil, 2006; Podsakoff & Organ, 1986; Spector, 2006). If common method bias exists in the data, a single factor will be present following exploratory factor analysis of the variables included in the study. The exploratory factor analysis revealed six factors with Eigenvalues greater than 1, with no single factor explaining more than 13% of the variance. Therefore, we can conclude that common method bias is not a concern for this study.
Data Analysis

Partial Least Squares (PLS) path analysis was utilized to analyze the relationships among constructs in this study. Table 1 presents the factor loadings and cross-loadings for the higher-order constructs employed in this study. Please note that three items (select5, reward3, & reward6) from the human resource performance management system practices were dropped due to low factor loadings.

Table 1: Human Resource Performance Management Practices Factor Loadings

<table>
<thead>
<tr>
<th>Items</th>
<th>Factors</th>
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<tbody>
<tr>
<td></td>
<td>Selection</td>
</tr>
<tr>
<td>select1</td>
<td>0.519</td>
</tr>
<tr>
<td>select2</td>
<td>0.809</td>
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<tr>
<td>select3</td>
<td>0.492</td>
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<tr>
<td>dev1</td>
<td>0.322</td>
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<td>dev2</td>
<td>0.788</td>
</tr>
<tr>
<td>eval1</td>
<td>0.762</td>
</tr>
<tr>
<td>eval2</td>
<td>0.587</td>
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<tr>
<td>eval3</td>
<td>0.42</td>
</tr>
<tr>
<td>eval4</td>
<td></td>
</tr>
<tr>
<td>eval5</td>
<td></td>
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<td>eval6</td>
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</table>

The psychometric properties generated by PLS Graph are used to assess convergent validity, discriminant validity, and internal consistency reliability (ICR). Table 2 displays the ICR, square root of the AVE (diagonal terms), and the correlation between constructs. To assess convergent validity, we examined the square root of the average variance extracted (AVE), which should generally be greater than 0.707 or $\text{AVE} > 0.5$ (Fornell & Larcker, 1981). The square roots of the AVE values in this study, which can be equated to an R-square value in simple regression, were all greater than 0.707 with a lowest AVE value of 0.771. To assess discriminant validity, we compared the AVE square root to the correlation with other constructs. The AVE square root should be larger than the correlation with other constructs to confirm discriminant validity (i.e. measures for a specific construct are unrelated to measures of a different construct). From Table 2 below, one can see that the square root of the AVE exceeds all correlations (horizontal rows and vertical columns) for each construct, which supports discriminant validity. The ICR values (similar to Cronbach’s alpha) should all be larger than 0.7 (Fornell & Larcker, 1981). As illustrated
in the table, the lowest ICR value in this study is 0.877, which supports the reliability of the constructs.

**Table 2: Reliabilities, Convergent Validities, and Discriminant Validities**

| Factors       | ICR  | Correlations and AVE Square Roots |            |            |            |            |
|---------------|------|----------------------------------|------------|------------|------------|
|               |      | Selection Development Evaluation Rewards Transformation |
| Selection     | 0.877 | **0.771** | 0.771 | 0.839 |            |            |
| Development   | 0.923 | 0.640 | **0.839** | 0.799 | 0.853 |            |
| Evaluation    | 0.913 | 0.543 | 0.612 | **0.799** | 0.490 |            |
| Rewards       | 0.914 | 0.575 | 0.610 | 0.680 | **0.853** |            |
| Transformation| 0.943 | 0.557 | 0.495 | 0.532 | 0.490 | **0.897** |

Table 3 presents the path coefficients and t-statistics between the higher-order constructs in this study. There is statistically significant support for a positive relationship between human resource performance management system transformation and each of the first-order human resource performance management system practices. The next section provides some insight on the findings in this study and discusses implications of these findings for researchers and practitioners.

**Table 3: Path Coefficients and T-Statistics**

<table>
<thead>
<tr>
<th>Path</th>
<th>Hyp.</th>
<th>Path Coeff.</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meas. Trans. → Selection</td>
<td>H1a</td>
<td>0.557</td>
<td>9.157*</td>
</tr>
<tr>
<td>Meas. Trans. → Development</td>
<td>H1b</td>
<td>0.202</td>
<td>2.941*</td>
</tr>
<tr>
<td>Meas. Trans. → Evaluation</td>
<td>H1c</td>
<td>0.532</td>
<td>10.281*</td>
</tr>
<tr>
<td>Meas. Trans. → Rewards</td>
<td>H1d</td>
<td>0.490</td>
<td>7.198*</td>
</tr>
</tbody>
</table>

*p<0.01

**Discussion and Conclusion**

Our results indicate that the extent to which organizations transform their human resource performance management systems, as part of the overall lean transformation strategy, will positively impact selective hiring practices utilized by the organization, as well as employee training and development policies. In addition, our results indicate that employee performance evaluations/appraisal and employee reward practices are significantly influenced by performance management system transformation.

To date, we have been unable to find any studies that empirically investigate outcomes of human resource performance management (or measurement) system transformation with respect to the lean transformation journey. This study makes a few important contributions. It supplements the human resource performance management literature by providing empirical evidence to support the position that key performance management practices will lead to performance management system effectiveness. It also demonstrates the relative importance, via a new construct grounded in prior literature, of transforming the performance management system as part of the change management strategy.
This study provides several interesting opportunities and implications for researchers. First, the new construct advanced in this study is just the initial step towards additional performance management system transformation research. While our construct is rooted in lean transformation, the scale could certainly be adapted to other organizational change strategies. Second, there is an abundance of research investigating the impact of human resource practices on organizational outcomes (e.g., performance, competitive advantage). However, there is a limited body of knowledge highlighting the importance of not only practices, but also the effectiveness of the practices. Therefore, we offer additional opportunities to researchers to expand this work, and perhaps address additional/other dimensions of human resource performance management system practices.

We would be remiss if we did not acknowledge a few of the limitations to this study. Our original sample was cleansed substantially to remove excessive missing data, excessive selections at either scale anchor (i.e., selected 7 for every question), excessive neutral responses, respondents not pursuing lean transformation, or respondents indicating that they did not have enough information to answer the questions and/or the questions were not relevant to their organization. Also, our new human resource performance management system construct, while empirically and statistically valid, could incorporate other dimensions, such as technical and strategic performance management system transformation.

References


