

TOWARD AN UNDERSTANDING OF THE IMPACT OF ORGANIZATIONAL CLIMATE AND ORGANIZATIONAL JUSTICE ON THE IMPLEMENTATION OF ENTERPRISE RESOURCE PLANNING SYSTEMS

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Abstract

This research examines the relationship between the organizational factors (such as justice and organizational climate) and behaviors regarding the implementation of enterprise resource planning (ERP) system. Business Process Reengineering (BPR) is emphasized due to its essentiality to ERP success and the symbiotic relationship. There has been much research that has focused on the relationship between justice and business process reengineering, as well as the relationship between BPR and ERP success in separate manners. However, few studies have explored the interrelationships among these constructs. This research helps explain how the organizational climate and organizational justice impacts the likelihood of success of an ERP implementation. While organizational behaviors under involvement are significantly and positively correlated with the success of ERP, justice plays an important mediating role in affecting individual's attitudes towards organizational changes induced by BPR and ERP implementation.

Keywords: ERP Implementation, Organizational Climate, Organizational Justice, Partial Least Squares

1 INTRODUCTION

Investments in Enterprise resource planning (ERP) systems have increased significantly over the past two decades. Although many ERPs were originally marketed and sold as tools to improve productivity by redesigning and integrating existing business processes across functional areas, the benefits of ERPs can be potentially far more than just productivity improvements. Unfortunately, early research on ERPs generally found no association between investment in ERPs and either improved productivity or improved organizational financial performance.

In order to enhance comparative advantages and leverage the increasingly vast amount of data that is routinely collected by many companies in developing countries, many companies have been adopting Enterprise Resource Planning systems (ERPs) and has become a buzz word (Maditinos et al. 2011). In spite of the potential advantages provided by ERPs, full implementation of ERP software is (and continues to be) difficult and many firms have yet to realize the potential benefits and financial returns.

The current literature on ERP can gain important insights from critical theory from the Frankfurt School and Habermas (Habermas 1990, 1987) in particular. While some authors (Reed 2002, 1999) tend to conflate ideas from critical theory in a liberal idea with the context of international business and responsibilities of companies, there is still a theoretical gap on how concepts for critical theory can enrich organizational studies. In the context of ERP implementation, justice should be of significant importance.

While organizational justice refers to individual's perception and reactions to the level of fairness in an organization, the development of the organizational justice climate is impacted by the organizational climate that has been developed and fostered in an organization. Organizational climate is associated with the social environment of a company, and is more closely and more proximate to employee behavior (Dennison 1996). A significant relationship between organizational climate and organizational justice dimensions has been demonstrated (Kyrillidou et al. 2009). Zhang and Begley (2011) adapted a framework and included extrinsic rewards, empowerment and team participation.

2 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Many ERPs were designed, developed and marketed as organizational productivity improvement investments, which would in turn lead to improved financial performance. Empirical research focusing on ERP investments has found only limited support for the lack of documented, consistent improvements in organizational financial performance (Hayes et al. 2001, Hunton et al. 2003, Hunton et al. 2002, Poston and Grabski 2001).

A number of researchers have offered a number of plausible explanations for these mixed results, most of which follow one of Brynjolfsson's (1993) explanations for the productivity paradox¹. For instance, Poston and Grabsky (2001) suggested that companies might have become more efficient, and therefore

¹ Brynjolfsson (1993) identified five possible explanations of the productivity paradox: (1) Mismeasurement: the financial gains are real, but current measures cannot detect them; (2) Redistribution: there are private gains, but they come at the expense of other firms and individuals, leaving little net gain; (3) Time lags: the gains take a long time to show up; (4) Mismanagement: there are no gains because of the unusual difficulties in managing IT or information itself; and (5) Feedback effects: Lower labor requirements lead to fewer customers, negating any economies of scale achievable with computers.

able to pass cost savings on to customers in the form of lower prices. Therefore, companies would not have experienced significant improvements in financial performance.

2.1.1 The relationships among Organizational Climate and Organizational Justice

Distributive justice concerns the process of allocation of scarce resources (including organizational rewards and punishments). According to Leventhal (1980), distributing organizational rewards (which include items such as payment, promotion and bonus) significantly affects employees' feeling about job satisfaction and organizational efficiency. Organizational rewards is depicted as a representative of extrinsic organizational motivation (Zhang and Begley 2011). Rooted in expectancy theory, a belief that higher performance leads to higher extrinsic rewards for the employees (Parker et al. 2011, Vroom 1964) who argue that if employees deem that the process of organization rewards to the employee is fair (or that there is a high level of distributive justice), the instrumentality of the organization is higher, and will therefore ultimately lead to higher levels of individual performance. Because distributive justice deals with the perception of fairness of allocating outcomes, the higher the level, the more the employees are likely to be sufficiently engaged with decisions made by management. Therefore, we posit:

H1. There is a positive relationship between the organizational climate and organizational justice.

H1a. There is a positive relationship between the organizational reward system and distributive justice.

H1b: There is a positive relationship between the organizational reward system and interactive justice.

A positive and significant relationship between empowerment and distributive justice has been demonstrated (as well as the relationship between empowerment and organizational justice) in a multi-cultural context research (Franz 2004). While distributive justice directly affects employees' behavior and attitudes (including job satisfaction and organizational commitment) which could make employee commit more actively to organizational decisions. Enforcement of empowerment should be accompanied with both procedural and distributive justice across the decision making process. Given that distributive justice is a source of individual motivation and that team empowerment reflects motivated status of an organization, it is likely that higher levels of empowerment leads to higher levels of distributive justice (Adams 1965, Kwak 2011). Hence,

H1c: There is a positive relationship between empowerment and distributive justice.

Empowerment is the process of obtaining influence over the outcomes which are important to an individual (Dow et al. 2012, Foster-Fishman and Keys), and an intuitive relationship exists between empowerment and voice (Franz 2004). The organizational justice literature has included empowerment and its role in the decision-making process and has often focused on the subordinate and has suggested a continuum of empowerment, that ranges from no input (nonparticipative), to voice only, where participants can only express an opinion, to voting only, and to voice and voting as the most participative (Greenberg and Folger 1983, Thibaut and Walker 1975). Voice has seen as having low process control, having a vote as higher level of process control, and both voice and vote together as the highest level of process control (Leung and Li 1990, Lind and Tyler 1988). In a BPR context,

the level of empowerment should ultimately impact the ultimate success of the BPR initiative, but only if the process and outcomes are considered to be fair.

H1d: There is a positive relationship between empowerment and interactional justice.

Team participation reflects the behaviors and activities that individuals perform in the course of their duties (Zhang and Begley 2011). This concept of participation is similar to the concept of consultation (Vroom and Yetton) and to voice in the organizational justice literature. In each area, team participation leads to a higher probability of success and to better outcomes. To this end, Hwang and Thorn (Hwang and Thorn 1999) performed a meta-analysis of information systems implementation studies and found that participation has a significant impact on overall system implementation success.

Team participation functions well when team members are willing to interact and exchange information with each other, and interpersonal trust can foster team participation. According to justice theories, interactional justice is a block and essential effort to build and maintain trust atmosphere in a social sector (Farh et al. 1997, Leung et al. 1996). Hence,

H1e: There is a positive relationship between team participation and interactional justice.

H1f: There is a positive relationship between team participation and procedural justice.

Several researches have been conducted and prove that there is a positive correlation between procedural justice and knowledge sharing (Ibragimova 2006). Since procedural justice encourage employees to voice and affect decisions about their work, discretionary service behavior is encouraged. As a result, individual are motivated enforce their duties beyond basic requirements by sharing knowledge and make more contribution to organizations (Kim and Mauborgne 2003, Simons and Roberson 2003). Perceptions about organizational justice, public duty and concern for community motivates people to share knowledge, in spite other tangible or intangible compensation.

H2a: There is a positive relationship between procedural justice and knowledge sharing.

H2b: There is a positive relationship between procedural justice and distributive justice.

H2c: There is a positive relationship between procedural justice and interactional justice

The relationship between interactional justice and knowledge sharing can be explained via perceptions of interpersonal informational justice. Interpersonal justice perception concerns about the quality of treatment among people, especially between the supervisors and employees. It concerns whether people are treated with dignity and politeness (Bies and Moag 1986). When interpersonal justice is perceived, trust within the organizational is fostered and contributes to further exchange relationships. Both of justice and trust are proved to be important for knowledge sharing, as knowledge sharing involving exchange of information within a team or organization based on reciprocal expectations. Because both interpersonal justice and informational justice refer to how employees are treated, we assume that positive justice perception will motivate employees to exchange expertise knowledge. Moreover, it has been demonstrated that negative perceptions of procedural and interactional justice will induce counterproductive consequences (Jones 2009). Hence,

H2b: There is a positive relationship between interactional justice and knowledge

sharing.

2.2 Organizational Climate and Business Process Reengineering Hypotheses

The organizational climate can provide us with a critical lens to observe the relationship between organizational behavior and business process reengineering. A proper and sufficient organizational system is also important to success of BPR efforts, including extrinsic rewards such as promotion opportunities and increased wages (Ahmad et al. 2007).

A rewards system is a critical part in the promotion of the success of reengineering efforts and reducing discrepancies in workplace as the straightest way to obtain the desires of employees' hearts is "through their wallets" (Hammer and Champy 2009). While monetary incentives are essential to enhance employee's job satisfaction, solely payment system might not be adequate to motivate staff, other instruments such as job security, development opportunities and degree of job challenges are needed (Debela and Hagos 2011).

Since BPR introduces fundamental changes regarding different jobs and work environment, current reward system existing in the system might not be appropriate for new work structures. Hence, it is also noticed that revision of rewarding system is a critical success factor to business process reengineering process (Hammer and Champy 2009). Hence,

H2c: There is a positive relationship between distributive justice and effective BPR.

H2d: There is a positive relationship between procedural justice and distributive justice.

2.3 ERP Implementation and Business Reengineering Practices

Many companies have experienced significant pressure to adopt ERPs and therefore find themselves in a position to reengineer their existing business processes – mainly due to the fact that many firms do not have the organization structure and processes in place that support the processes embedded in the ERPs (Hammer and Champy 2009). While, some companies could simply adapt the ERP software through customization to the firm's specific needs (or the organization could change its business processes to match the system) the underlying reality is that most companies must fundamentally change their business processes in order to successfully implement the ERP system (Fui-Hoon Nah et al.).

BPR is a necessary but insufficient condition for successful ERP implementation, since an ERP system is not designed for an isolated function but to integrate processes across the organization. BPR is a necessary, but insufficient condition for success, as ERP implementation will definitely induce changes to the normal modes of operation (Hammer and Champy 2009, Yusuf et al. 2004). Therefore, our hypothesis is:

H3a: BPR is positively associated with an effective ERP implementation.

A theoretical framework that outlines the proposed relationships among organizational climate, organizational justice, effectiveness of BPR, and ERP success is depicted in the figure 1.

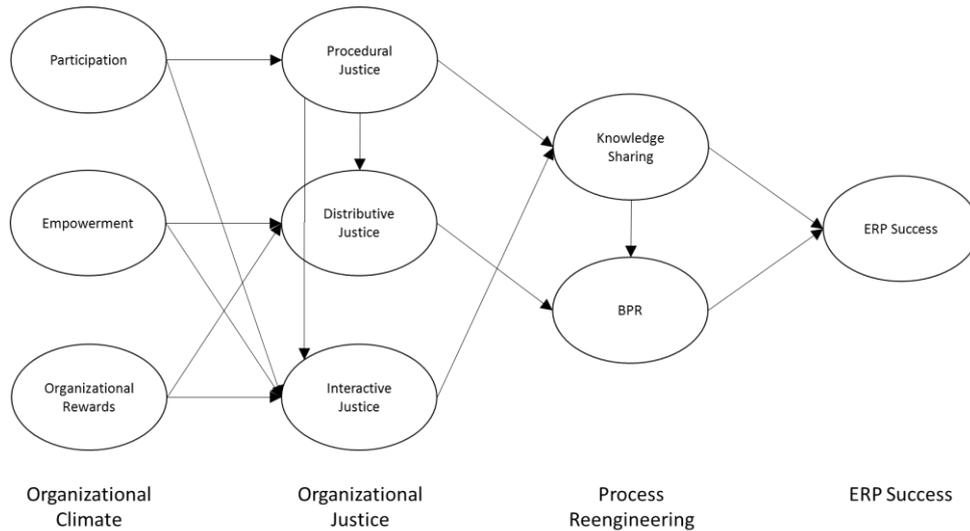


Figure 1: Theoretical Model

BPR is a rational process to redesign organizational processes and involve a reallocation of expertise and skills. Effective knowledge sharing and transfer mechanism can facilitate the adoption of best business practices of the industry and transfer experiences into actions effectively. This study demonstrates the importance for the company to possess the knowledge of change induced by BPR in a precise and deep manner. Since the primary purpose of BPR is to identify value-added activities and reorganize firm's value chain, knowledge sharing can facilitate managers to understand how to deliver value by documenting sharing and collaborating activities. Hence,

H3b: There is a positive relationship between knowledge sharing and BPR.

H3c: Knowledge sharing is positively associated with an effective ERP implementation

3 METHODS

Subjects for this study were project managers of a large-scale ERP implementation in a single Chinese state-owned company. Additional non-managerial employees were included in the sample frame as representative of the overall organizational environment. Questionnaires were distributed to the managers identified above, and in turn were distributed non-managerial employees for completion. To ensure as complete a dataset as possible, telephone calls and emails were made to the key respondents emphasizing the importance of the participation. This process resulted in a total of 101 usable questionnaires. Table 1 presents basic demographic data of the respondents. Only general demographic data was collected from subjects and every subject had at least some college education, and roughly half of the subjects held managerial positions. The mean age of respondents was 36.6 years. The average level of business process experience in organizations was approximately 14 years.

Education Level	Number	Percentage
Some College	37	37%
Undergraduate Degree	49	49%

Master's Degree	15	15%
Gender		
Male	46	46%
Female	55	54%
Position		
Managerial	46	46%
Non-Managerial	55	54%
	Years	SD
Experience	14.7	9.69
Age	36.6	8.96

Table 1: Basic demographic data of respondents

In order to measure the latent constructs that comprise the theoretical model, a questionnaire was developed using previously validated scales (and their corresponding items) using multiple items and appendix A contains the specific items for each latent construct and their respective sources.

All items on the questionnaire were originally written in English; translated to Chinese by a single person and translated back into English by a second person. The English translation was compared to the original English questionnaire to ensure proper translation. Under the guidance of a senior manager (who is familiar with the specific ERP implementation project as well as the company's culture), the Chinese version of questionnaire was then adapted using language that conformed to the real context of the particular ERP implementation and the firm to minimize any potential for discrepancies.

4 RESULTS

PLS is a structural modeling technique that uses a principle component based approach and requires less data than does traditional structural equation modeling techniques, and also has fewer model assumptions regarding the underlying distributional properties of the data (Chin 1998). While PLS does not offer a statistical tests to specifically determine the significance of the path coefficients, bootstrapping can be applied by repeatedly analyzing different subsets (with replacement) of the data to estimate the statistical significance of the path coefficients. The path coefficients for the structural model can simply be interpreted as standardized beta weights as would normally be found in an OLS regression analysis.

The basic model assumptions of PLS were tested through: (1) outlier analysis; (2) multivariate normality assumption testing; and (3) assessing the internal consistency of the previously validated scales. Through these tests, no outliers were found that could potentially distort the results. Examination of the skewness and kurtosis at the individual measure level was conducted with the skewness ranging from -2.687 to 0.294 and the kurtosis ranging from -2.04 to 6.920. It should be noted that absolute values of skewness and kurtosis of less than 3.0 (for skewness) and 10.0 (for kurtosis) are not usually considered to be violations of multivariate normality (Mardia 1970).

While PLS does not offer general goodness-of-fit indices, three indices can be used to assess the fitness of the overall theoretical model. These indices are: (1) average path coefficients (APC); (2) average R-squared (ARS); and the average variance inflation factor (AVIF). The APC is simply the average of all the path coefficients of the inner model; the ARS is found by taking the average of the R² of the inner model. Both the APC and ARS are considered to be significant at 0.05. Finally, the AVIF is the average of variance inflation factor of the paths of the inner model. It has been suggested that the AVIF should be less than 5 (Kock 2012), and since the calculated AVIF is 1.312 (which is below the threshold of 3.3 specified by Kock, suggesting a good fit. These measure, when taken together, provide support that the overall fit of the theoretical model is good. The results of the PLS analysis are presented in Table 2 for each of the hypothesized relationships.

Hypothesis and Path	Path Coefficient	P-Value
Organizational Rewards → Distributive Justice	0.200	0.005
Organizational Rewards → Interactional Justice	0.301	0.001
Empowerment → Distributive Justice	0.281	0.001
Empowerment → Interactional Justice	-0.053	0.242
Participation → Procedural Justice	0.468	0.001
Participation → Interactional Justice	0.129	0.046
Procedural Justice → Distributive Justice	0.247	0.001
Procedural Justice → Interactional Justice	0.343	0.001
Procedural Justice → Knowledge Sharing	0.616	0.001
Interactional Justice → Knowledge Sharing	0.131	0.043
Distributive Justice → Effective BPR	0.304	0.001
Effective BPR → ERP Implementation	0.767	0.001
Knowledge Sharing → Effective BPR	0.487	0.001
Knowledge Sharing → ERP Implementation	0.113	0.069
R ² -- Procedural Justice	0.212	
R ² -- Distributive Justice	0.262	
R ² -- Interactional Justice	0.345	
R ² -- Knowledge Sharing	0.455	
R ² -- Effective BPR	0.421	
R ² -- ERP Implementation	0.705	

Table 2: Results of PLS Analysis

5 DISCUSSION AND CONCLUSION

The findings suggest that the perceptions and development of organizational justice are a critical organizational process that drive human behavior as they relate to ERP implementations. By examining the process of ERP implementation in a single firm, we provide an indication on how organizational justice mediates the relationship between organizational climate and the successful implementation of an ERP system. Our results suggest that dimensions of justice – procedural, distributive and interactive – are affected by these organizational climate factors, and in turn, impact the BPR efforts within an organization and subsequently the success of the ERP implementation.

Perceived injustice primarily means the violation of rights and human dignity (Habermas 1996). Rights are institutionally defined rules that define social interaction as in what people are allowed to do and what not. Therein rights represent relationships between people with a social entity, for

instance a society, organization or family. Social relationships that constrain action or derive action from an ideal path are perceived as unjust. Again, these perceptions of justice depend on the processes of interaction and decision making themselves, not on their outcomes. Our model and findings agree with the Habermasian perspective in that managers should focus on designing processes based on principles that have the universalistic character of law aiming for individual integrity (Habermas 1996).

There is a need to further develop and to test ideas derived from the extant literature. The above research has supported the development of hypotheses relating to concepts of organizational justice. Thus it is encouraging to see that the application of ideas from certain authors come together in a model which takes previously researched concepts and combines them with Habermasian ideas of justice.

REFERENCES

- Adams, J.S. (1965). *Advances in experimental social psychology*. Berkowitz, L. (ed), Academic Press, New York.
- Ahmad, H., Francis, A. and Zairi, M. (2007). Business process reengineering: Critical success factors in higher education. *Business Process Management Journal*, 13(3), 451-469.
- Bies, R.J. and Moag, J.S. (1986). *Research on Negotiation in Organizations*. R. J. Bazerman, B.H.L., and M. H. Sheppard (ed), pp. 43-55, JAI Press, Greenwich, CT.
- Brynjolfsson, E. (1993). The Productivity Paradox of Information Technology. *Communications of the ACM*, 36(12), 67-77.
- Chin, W.W. (1998). *Modern Business Research Methods*. Marcoulides, G.A. (ed), pp. 295-336, Lawrence Erlbaum Associates, Mahwah, NJ.
- Debela, T. and Hagos, A. (2011). The design and implementation of business process reengineering in the Ethiopian public sector: An assessment of four organizations.
- Dennison, D.R. (1996). What is the difference between organizational culture and organizational climate? A native point of view on a decade of paradigm wars. *Academy of Management Review*, 21(3), 619-654.
- Dow, K.E., Watson, M.W., Greenberg, P.S. and Greenberg, R.H. (2012). Understanding Participation: Situational Participation, Intrinsic Involvement, and Influence.
- Farh, J.-L., Earley, P.C. and Lin, S.-C. (1997). Impetus for action: A cultural analysis of justice and organizational citizenship behavior in Chinese society. *Administrative science quarterly*, 421-444.
- Foster-Fishman, P.G. and Keys, C.B. (1997). The person/environment dynamics of employee empowerment: An organizational culture analysis. *American Journal of Community Psychology*, 25(3), 345-369.
- Franz, C. (2004). A cross-cultural study of employee empowerment and organizational justice. ETD Collection for Wayne State University, AAI3130337.
- Fui-Hoon Nah, F., Zuckweiler, K.M. and Lee-Shang Lau, J. (2003). ERP implementation: chief information officers' perceptions of critical success factors. *International Journal of Human-Computer Interaction*, 16(1), 5-22.
- Greenberg, J. and Folger, R. (1983). *Procedural justice, participation, and the fair process effect in groups and organizations*, Springer.
- Habermas, J. (1996). *Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy*, MIT Press, Cambridge, MA.
- Habermas, J. (1990). *Strukturwandel der Öffentlichkeit : Untersuchungen zu einer Kategorie der bürgerlichen Gesellschaft*, Suhrkamp, Frankfurt am Main.
- Habermas, J. (1987). *Theory of Communicative Action Volume 2: Lifeworld and System: A Critique of Functionalist Reason*, Beacon Press, Boston, MA.
- Hammer, M. and Champy, J. (2009). *Reengineering the Corporation: Manifesto for Business Revolution*, A, HarperCollins e-books.
- Hayes, D.C., Hunton, J.E. and Reck, J.L. (2001). Market Reaction to ERP Implementation Announcements. *Journal of Information Systems*, 15(1), 3-18.
- Hunton, J.E., Lippincott, B. and Reck, J.L. (2003). Enterprise Resource Planning: Comparing Firm Performance of Adopters and Nonadopters. *International Journal of Accounting Information Systems*, 4(3), 165-184.

- Hunton, J.E., McEwen, R.A. and Wier, B. (2002). The Reaction of Financial Analysts to Enterprise Resource Planning (ERP) Implementation Plans. *Journal of Information Systems*, 16(1), 31-40.
- Hwang, M.I. and Thorn, R.G. (1999). The effect of user engagement on system success: a meta-analytical integration of research findings. *Information & Management*, 35(4), 229-236.
- Ibragimova, B. (2006). Propensity for knowledge sharing: An organizational justice perspective, University of North Texas.
- Jones, D.A. (2009). Getting even with one's supervisor and one's organization: Relationships among types of injustice, desires for revenge, and counterproductive work behaviors. *Journal of Organizational Behavior*, 30(4), 525-542.
- Kim, W.C. and Mauborgne, R. (2003). Fair process: Managing in the knowledge economy. *Harvard Business Review*, 81(1), 127-136.
- Kock, N. (2012). WarpPLS 3.0 User Manual, ScriptWarp Systems, Laredo, TX.
- Kwak, W.J. (2011). Multi-level investigation of empowering leadership, leader-member exchange, and subordinate empowerment.
- Kyrillidou, M., Lowry, C., Hanges, P., Aiken, J. and Justh, K. (2009). ClimateQUAL™: Organizational climate and diversity assessment. *C&RL News*, 70(3), 154.
- Leung, K. and Li, W.-K. (1990). Psychological mechanisms of process-control effects. *Journal of Applied Psychology*, 75(6), 613-620.
- Leung, K., Smith, P.B., Wang, Z. and Sun, H. (1996). Job satisfaction in joint venture hotels in China: An organizational justice analysis. *Journal of International Business Studies*, 947-962.
- Leventhal, G.S. (1980). What should be done with equity theory?, Springer.
- Lind, E.A. and Tyler, T.R. (1988). The social psychology of procedural justice, Plenum Publishing Corporation.
- Maditinos, D., Chatzoudes, D. and Tsairidis, C. (2011). Factors affecting ERP system implementation effectiveness. *Journal of Enterprise Information Management*, 25(1), 60-78.
- Mardia, K.V. (1970). Measures of multivariate skewness and kurtosis with applications. *British Journal of Mathematical and Statistical Psychology*, 28, 205-214.
- Parker, R.J., Nouri, H. and Hayes, A.F. (2011). Distributive Justice, Promotion Instrumentality, and Turnover Intentions in Public Accounting Firms. *Behavioral Research in Accounting*, 23(2), 169-186.
- Poston, R. and Grabski, S. (2001). Financial Impacts of Enterprise Resource Planning Implementations. *International Journal of Accounting Information Systems*, 2(4), 271-294.
- Reed, D. (2002). Employing Normative Stakeholder Theory in Developing Countries: A Critical Theory Perspective. *Business & Society*, 41(2), 166-207.
- Reed, D. (1999). Stakeholder Management Theory: A Critical Theory Perspective. *Business Ethics Quarterly*, 9(3), 453-483.
- Simons, T. and Roberson, Q. (2003). Why managers should care about fairness: The effects of aggregate justice perceptions on organizational outcomes. *Journal of Applied Psychology*, 88(3), 432-443.
- Thibaut, J.W. and Walker, L. (1975). Procedural justice: A psychological analysis, L. Erlbaum Associates Hillsdale.
- Vroom, V.H. (1964). Work and motivation, Wiley New York.

Yusuf, Y., Gunasekaran, A. and Abthorpe, M.S. (2004). Enterprise information systems project implementation:: A case study of ERP in Rolls-Royce. *International Journal of Production Economics*, 87(3), 251-266.

Zhang, Y. and Begley, T.M. (2011). Perceived organisational climate, knowledge transfer and innovation in China-based research and development companies. *The International Journal of Human Resource Management*, 22(01), 34-56.