Examining the Impact of Team Communication Practices in Innovative Research and Development (R&D) Teams: An Early Findings

Mohd Shamsuri Md Saad

Universiti Teknikal Malaysia Melaka
Email: shamsuri@utem.edu.my

Izaidin Abdul Majid

Universiti Teknikal Malaysia Melaka
Email: izaidin@utem.edu.my

Zanariah Jano

Universiti Teknikal Malaysia Melaka
Email: zanariahjano@utem.edu.my

Shahrina Md Nordin

Universiti Teknologi Petronas, Malaysia
Email: shahrina_mnordin@petronas.com.my

Doi:10.5901/jesr.2014.v4n4p177

Abstract

This study was undertaken with the aim of looking at team communication practices amongst innovative research and development (R&D) teams. Innovation in R&D involves the processing and transformation of new knowledge into a commercially viable outcome. Communication is seen as an effective mechanism to translate, share and integrate these new knowledge or information in creating new products or technologies. Therefore, there is an urgent need to understand the role of communication, in this case team communication practices, within innovative R&D teams in explaining its influence on team innovativeness. To achieve the aim, innovative R&D teams from selected public technical universities in Malaysia were identified and selected to participate in this study. Database of these teams was solicited from respective universities' centre for research innovation and management and relevant bodies managing research and innovation activities within the universities. The literature guided the researchers in identifying, selecting and developing appropriate research instruments utilised in this study. For the purpose of this study, team communication practices (boundary spanning, communication safety, team reflexivity and task communication) will be examined in terms of its influence on team innovativeness. The findings in this paper presented an early insight describing the demographics of the innovative R&D teams in Malaysia. Subsequently, this study also provides an understanding on the impact of team communication practices on R&D team which is vital in explaining the dynamics of team communication of innovative R&D teams.

Keywords: *team communication, research and development, innovativeness, Malaysia*

1. Introduction

Innovation is recognised as having a positive impact on the productivity of a country. Crosby (2000) for example found evidence to suggest that a partial decline in Australia‟s productivity in the 1970s could be attributed to declines in innovation in the late 1960s. It is also generally accepted that innovation is an important factor in the growth and prosperity of firms (Janszen, 2000). The level of innovation is also found to be the key for growth and employment creation in SMEs (North & Smallbone, 2000). Thus, the need to innovate successfully is assuming greater importance due to the increasingly rapid technological change and associated market instability as well as increasing demands from customers for new and better products (O‟Regan & Ghobadian, 2006).

Major global changes in various domains are followed by dramatic changes in the goals, values and practices of business organizations. A few important changes have involved the shift to team working and the increased need for innovation (Ajay Goyal and K.B. Akhilesh, 2007). Therefore, for teams to maintain and enhance effectiveness within this rapidly changing and challenging environment, innovation is critical (Jun Liu, 2011). Team's innovativess is defined as "the intentional introduction and application within a team, of ideas, processes, products or procedures new to the team, designed to significantly benefit the individual, the team, the organization, or wider society" (West & Wallace, 1991, p. 303).

In this study, team is being given prominence due to its importance of contributing to the overall organizational innovation by playing a role of organic structure, less restricted with the bureaucratic nature of the parent organization. By adopting this line of argument, it is the intention of this study to seek to understand innovation from team's perspective instead of from organization point of view. This approach is crucial because thus far, innovation research has been investigated and examined through the lenses of top-down approach where organization is deemed to play a significant role of stimulating innovation. As a result, there has been little research on emergent innovation or the introduction of new and improved ways of working introduced by teams at the lower levels of organizations (Agrell & Gustafson, 1996; West & Wallace, 1991).

It is also important to note that for a team to innovate, communication and interaction between members of the team is of crucial importance. This view is supported by the proliferation of studies in team communication with regard to innovation (Marks et. al., 2001). Hirst and Mann (2004) found that team communication predicted innovation, project performance as well as patents and commercialized products citing the works of Ancona and Caldwell (1992), Keller (2001) and Allen (1984). However, the extant literature has thus far shown that communication in teams has been examined according to issues like communication media richness (Oke and Idiagbon-Oke, 2010), communication frequency (Leenders, van Engelen and Kratzer, 2003) and synchronous and asynchronous communication (Berry, 2006) among others.

However, these studies rarely captured comprehensive team communication practices that can explain its impact on team performance or innovation. In this study, the researchers intent to adopt Hirst and Mann (2004) team communication practices, operationalised as team boundary-spanning, communication safety, team reflexivity and task communication, to argue team communication practices as one of the important elements in influencing team innovativeness. Looking at these constructs, it is safe to say that it covers almost all team communication practices that exist in a team.

The study will examine team communication practices within innovative R&D team dute to its role as an effective mechanism to translate, to share and to integrate new knowledge in order to create new products and technologies. A conceptual model of team communication was developed and tested for empirical validation. Specific focus is given to the context of R&D in Malaysia due to the government's effort to ensure the investment in R&D reaches at least 1% of the country's GDP by 2015. At the same time, commercialisation and innovation development has been assigned as the number one niche under the 10th Malaysian Plan by the Malaysian Ministry of Higher Education (MOHE, 2010), which implies the emphasis and urgency for adequate retrun of investment (ROI). Despite the aim, the number of patents, which is one of the ROI indicators for R&D, is low compared to Taiwan, Korea, China, Hong Kong and Singapore (USTPO,). Therefore, it is crucial that this study explore this issue and provide a better understanding of the interrelation between team communication and innovation performance.

2. Literature Review

This section looks briefly at communication, team communication practices and the hypotheses that lead to the development of the conceptual framework in understanding the dynamic of relationship between team communication and R&D innovation performance.

2.1 Communication

Communication is broadly defined as the exchange of information and the transmission of meaning (Katz and Kahn, 1978). Hirst and Mann (2004) state that communication is an effective mechanism to translate, share and integrate new information into commercial products or processes. Moreover, effective communication has long been known to influence important team processes and outcomes (Leavitt, 1951), and it is an explicit component of many current models of work team performance (Campion, Medsker & Higgs, 1993; Gladstein 1984; Pearce & Ravlin, 1987).

Communication is often assumed to be central to the successful performance team, Hassal (2009). According to prior research, Allen and Cohen (1969) highlighted that communications between R&D team members as a key information source for problem solving. Team communication is also found to be highly correlated with R&D performance (Hung et. al, 2013). It provides an evident that team communication enhances team performance. For the purpose of this study, the researchers adopted team communication as what has been prescribed by Hirst and Mann (2004) in the form of boundary spanning, communication safety, team reflexivity and task communication.

2.2 Boundary Spanning

Schotter (2011) states boundary spanning enables expertise sharing by linking internal and external groups or organizations from different hierarchical or functional levels that would otherwise be more inward looking. Boundary spanning correctly guides the R&D teams to external information sources and thus reduces their sourcing efforts (Allen, 1977). A study by Keller (2001) found that external communication was significant predictors of managers' ratings of technical quality, budget and schedule performance. Earlier longitudinal study by Ancona and Caldwell (1992) on 45 product development teams found that boundary spanning, involving political activities such as negotiating and lobbying resources, was a significant predictor of research managers' ratings of performance. Thus we put forward the following hypothesis:

H1. Team boundary spanning is positively associated with R&D team innovative performance.

2.3 Communication Safety

Communication safety can be defined as a mechanism to exchange information, ideas and different perspectives amongst team members (Hoegl and Gemuenden, 2001). The ability of teams to provide communication safety to their members will ensure that the members are able to contribute positively towards teams' innovativeness due to the absence of threat and expulsion from the group if the ideas are being forwarded and proposed. Mumford and Gustafson (1998) argue that participation leads to a more complete understanding of potential problems due to useful information being shared, resulting cross fertilization of ideas, spawning innovation. This argument was supported by a study undertaken by Kivimaki et al. (2000) who studied about eight different facets of organizational communication. In the study, he found that participative communication was the strongest predictor of innovation effectiveness. Based on the argument we put forward the following hypothesis.

H2.Communication safety is positively associated with R&D team innovative performance.

2.4 Reflexivity

Reflexivity is assumed to help teams know their actual working and develop new understandings and methods that respond to emerging conditions and challenges (Carter and West, 1998; Les Tien-Shang Lee, 2008). Hoegl and Parboteeah (2006), investigated the effect of the team reflexivity on the performance of 145 software development teams, found a positive relationship between team reflexivity and team effectiveness. Furthermore, previous studies indicated that the level of collaboration related with cohesiveness level of team itself. According to Mudrack (1989), the cohesiveness often is accompanied by feelings of solidarity, harmony, and commitment in its members. It can be lubricant "that minimizes the friction due to the human" grit in the system (Mullen and Copper, 1994), and thereby facilitate the pursuit of collective goals (Adler and Kwon, 2002; Hoegl and Parboteeah, 2006). As such, we put forward the following hypothesis:

H3.Reflexivity is positively associated with R&D team innovative performance.

2.5 Task Communication

Finally, task communication relates to clarity of objectives, feedback, transmission and customer requirements which revolve around teams' goal setting (Hirst and Mann, 2004). Having a clear direction of the overall innovation endeavors undertaken by the teams will have a positive impact on teams' innovativeness. This is due to the fact that every member of the teams understands the goals that need to be achieved and will strive hard towards it. Efficient team communication is characterized by higher frequency but shorter duration of dialogues in a systematic and organized manner ather than on an ad-hoc basis near the end of the project (Allen, 1977). Hackman (1990) further strengthen this argument by saying that effective information transmission is crucial in providing teams with sufficient knowledge subsequently enabling informed selection of project strategies, thus enhancing team performance. Based on the rationale, we put forward the following hypothesis.

H4.Task communication is positively associated with R&D team innovative performance.

3. Research Methodology

3.1 Participants

40 research leaders and research group leaders at the Universiti Teknikal Malaysia Melaka (UTeM) were invited to participate in the study. The average research exeperience was 10.18 years ranging from less than five years of research experience to more than 20 years of having research experience. All participants have PhD qualification except 5 of them that have Masters Degree. They indicated that they have the experience of leading research projects and all of them have led or are leading different types of research grants available from internal as well as external local funders. Amongst the research grants are such as the universitiy's short term grant scheme, the ministry's fundamental resesearch grant scheme (FRGS), exploratory research grant schemes (ERGS) and e-science fund.

3.2 Instrument

The survey questionnaire was used in this study due to it being the most common method of collecting survey data (De Vavs, 2001). The team communication practices were adapated from Hirst and Mann (2004) which looks into boundary spanning, communication safety, reflexivity and task communication. They indicated that boundary spanning scale, based upon the work of Ancona and Caldwell (1992) demonstrated sound measurement properties: AGFI=0.92, CFI=0.93. The communication safety factor demonstrated sound measurement properties: AGFI=0.93, CFI=0.96. The reflexivity measure displayed acceptable fit indices: AGFI=0.85, CFI=0.92. Task communication demonstrated adequate fit; AGFI=0.88, CFI= 0.95. Innovation performance measurement were adapted from Hung, Kuo and Dong (2013) as well as Huang and Lin (2013) which looked into the multifaceted indicators of R&D performance rather than single indicator.

The data were initially analyzed using the Statistical Package for the Social Sciences (SPSS Version 19.0 for Windows) in extracting the descriptive understanding of the researchers' profile. Next, the data were analyzed using the SmartPLS which is a software of a second generation of multivariate analyses. Partial least squares (PLS) structural equations modelling technique (Wold, 1975, 1985) is also known as a "soft modelling" technique. As opposed to Latent Variable SEM (LVSEM) or known as "hard modelling", PLS was developed by Wold to address the challenges posed by "hard modelling" technique of LVSEM such as obtaining large enough samples, finding empirical support for nascent theory, and meeting a rigid assumptions of the statistical techniques (Sosik, Kahai, Piovoso, 2009). These kind of challenges if not properly addressed would have a very adverse effect on the development on the research of group and organisation which is known to be constrained by these issues. Recent advances in the advances of statistical software packages like SmartPLS and PLS-Graph and also better understanding among researchers about its functionality as well as advantages has seen this technique increasingly being adopted by group and organisation researchers (e.g., Jung, Wu & Chow, 2008; Jung, Chow and Wu, 2004; Howell & Avolio, 1993).

4. Findings

4.1 The analysis of the measurement model

The assessment of the measurement model composed of the examination three important elements. It started by the examination of the individual item reliability**.** This is done by examining the loadings of items with their associated construct. The rule of thumb is to accept loadings of greater than .60, or above to ensure adequate reliability (Bagozzi & Youjae, 1988). However, if a construct has a significant number of low reliability items, results of analysis should be viewed with caution (Hulland 1999, p.199).

Next internal consistency was investigated where Fornell and Larcker's (1981) measure which is argued in causal modelling to be a more refined version of Cronbach's α (Barclay, Higgins & Thompson 1995, p.297) is used to determined the constructs internal consistency. A level of .70 was adapted as a modest level of reliability due to the exploratory nature of this research (Hulland 1999, p.199; Nunally 1978). The Average Variance Extracted (AVE) measure (Fornell & Larcker 1981) is recommended to be above .50, implying that 50 per cent or more variance of the indicators is accounted for (Chin 1998b, p.321).

Finally, the discriminant validity which refers to the level of differentiation of supposedly different constructs was determined. An appropriate level of discrimination can be assumed if a construct shares more variance with its own measures than with other constructs in a model (Barclay, Higgins & Thompson 1995, p.297). Two level of testing can be employed to indicate the constructs' discriminant validity. The first testing involved demonstrating that the square root of

Average Variance Extracted (AVE) measure (Fornell & Larcker 1981 is greater than the correlations between constructs in a correlation matrix (Chin 1998b; Hulland 1999, p.200). Meanwhile, the second testing involved examining the component structure matrix to ensure that all item loads substantially more highly into its own construct than other constructs (Barclay, Higgins & Thompson 1995, p.298).

Table 1 presents the factor loadings, the composite scale reliabilities and average variance extracted (AVE) for indicators of the lower-order constructs that contained two or more items. The ability of PLS to estimate the measurement and structural model simultaneously has enabled the researcher to ran a full scale model which includes all team communication practices (boundary spanning, communication safety, reflexivity and task communication) and innovation performance.

Table 1. Initial Assessment: Factor loadings, weights, composite scale reliability, and average variance extracted for assessing construct validity

Construct	Item	Factor Loading	Weight	ICR	AVE
1. Team Communication	**Practices**				
Boundary Spanning	BS1	0.7289	0.1407	0.8910	0.5778
	BS2	0.8087	0.2853		
	BS3	0.7038	0.2052		
	BS4	0.7885	0.1851		
	BS5	0.7247	0.2303		
	BS6	0.7985	0.2623		
Communication Safety	CS1	0.8689	0.4978	0.8358	0.6786
	CS2	0.9080	0.4745		
	CS3	0.6756	0.2023		
Reflexivity	RFX1	0.8391	0.2992	0.9288	0.7654
	RFX2	0.8643	0.2871		
	RFX3	0.9060	0.2975		
	RFX4	0.8887	0.2602		
Task Communication	TC1	0.9162	0.4074	0.9294	0.8145
	TC2	0.9082	0.3298		
	TC3	0.8827	0.3708		
2. Innovation Performance	INPERF1	0.8408	0.1728	0.9419	0.6989
	INPERF2	0.8492	0.1823		
	INPERF3	0.8600	0.1823		
	INPERF4	0.8451	0.1647		
	INPERF5	0.8638	0.1887		
	INPERF6	0.8410	0.1401		
	INPERF7	0.7463	0.1661		

All items fulfilled the requirement of the three important elements mentioned earlier in this section. However, it is important to examine the internal consistency and the discriminant validity of the constructs before making any decision to retain or omit constructs or indicators. The analysis was primarily done using the first level of testing where it involved demonstrating that the square root of Average Variance Extracted (AVE) measure (Fornell & Larcker 1981 is greater than the correlations between constructs in a correlation matrix (Chin 1998b; Hulland 1999, p.200). Table 2 demonstrates that each constructs' square root measure is greater than the correlation between them.

Table 2. Discriminant Validity for Theoretical Model

Item	**BS**	**CS**	**RFX**	**TS**	**INPERF**
BS	0.7601				
CS	0.7091	0.8477			
RFX	0.5707	0.5456	0.8237		
TS	0.2591	0.0554	0.2438	0.625	
INPERF	-0.1771	-0.1345	-0.1489	-0.0779	0.7867

Diagonal elements (boxed) are the square root of the variance shared between the constructs and their measures (AVE). Off-diagonal elements are constructs correlations. For discriminant validity, diagonal elements should be larger than off-diagonals.

4.2 The assessment of the structural model

After confirming the confidence in the measurement model, the structural model was then assessed. Three important elements were usually looked into when undertaking this process. They are the size and statistical significance of the loadings and of the path coefficients, and the measure of the predictive power of the model.

The significance of the loadings and path coefficients is confirmed through a resampling procedure, generally either jackknifing or bootstrapping. The creation of new sub-samples allows the estimation of parameters, which can then in turn be used to calculate a Student t-statistic with *n*-1 degrees of freedom, where *n* is the number of sub-samples produced (Barclay, Higgins & Thompson 1995, p.299). While both resampling techniques have its own advantages, in general "both the jackknife and bootstrap standard errors should converge" (Chin 1998b, p.320). In this case of study, the researcher decided to employ a bootstrap resamples of 200 which tends to provide a reasonable standard error estimates (Chin 2001, p.14). Irrespective of statistical significance, standardised paths should be subjected to a kind of 'reality check': they "should be at least 0.20 and ideally above 0.30 in order to be considered meaningful" (Chin 1998a, p.209).

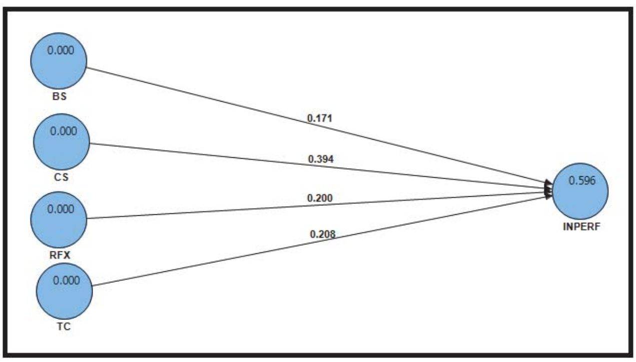
The model's predictive power can be estimated by the magnitude of the *R2* value of the endogenous constructs. It indicates the amount of variance in the construct which is explained by the model (Barclay, Higgins & Thompson 1995, p.299; Hulland 1999, p.202). Note that it is inappropriate to report Goodness of Fit Indices for PLS SEMs, since these are predicated upon covariance-based approaches such as LISREL, rather than the error-minimisation approach of PLS (Barclay, Higgins & Thompson 1995, p.302; Chin 1998b; Hulland 1999, p.202).

The final part could involve substantive revisions to the model where further testing can still be considered. This could include removal of non-significant paths thus resulting reconsideration of the model, or suggestion of additional paths of the correlations amongst the constructs, presuming there is theoretical justification for such a change (Fornell & Larcker 1981, p.299).

Results of the PLS analysis are shown in Fig. 2. The team communication model explained 59.6% of the variance in ratings of R&D team performance. Considering the small sample size of 58 research leaders, we used a relatively lenient criterion of 10% for statistical significance in the current study. Consistent with Hypothesis 1, boundary spanning (BS) was significantly and positively related to R&D innovation performance ($b = 0.171$, $p < .10$). Communication safety (CS) also was significantly and positively related to R&D innovation performance ($b = 0.394$, $p < .001$) thus supporting Hypotheses 2. Hypothesis 3 was also supported where reflexivity (RFX) was significant and positively related to R&D innovation performance ($b = 0.200$, $p < .001$). Finally, task communication (TC) was also significant and positively related to R&D innovation performance which supports Hypothesis 4 ($b = 0.208$, $p < .001$).

Based on the PLS analyses, all predicted team communication practices were found to be significant and positively related to R&D innovation performance thus indicating its importance in developing a suitable team communication strategy when executing R&D project (Hirst and Mann, 2004).

Figure 2. Results of PLS analysis.



5. Concluding Remarks

The results of the analyses and discussions indicated that there existed significant and positive relationships between team communication practices in this case boundary spanning, communication safety, reflexivity and task communication on R&D team innovation performance.

Communication safety is perceived to be the most important element in enhancing R&D team innovation performance due to the opportunity it provides to team members to express ideas and opinion which is crucial in the process of exchanging as well as expanding innovative ideas ideas within the team. This will then be able to be translated into new ways of solving problems identified by the research. Next, task communication is also viewed as vital in ensuring every member of the R&D teams understand their roles when undertaking research projects. The ability to manage and organize individual members' role within the R&D team will also enhance the process of meeting datelines and milestones as promised to the funders. Clear directive and instructions in multi-directions within the R&D teams could also enable the team to be prescriptive in demanding commitment from every team members whilst at the same time avoiding confusions.

Subsequently, reflexivity allows the R&D teams to pause and ponder the progress of the R&D projects. The opportunity for the team to be able to reflect provides the platform to assess and ask questions internally amongst team members on how has their team progress with regard to their R&D projects. Finally, the ability to communicate with external experts and people from the industry through boundary spanning activity enables the R&D teams to understand and predict new technology requirements as well patterns. By having this understanding, it will allow the team to react faster and more importantly aligning their R&D goals towards more practical and commerciable ventures.

In conclusion, the study re-iterates the importance of communication in driving innovation and project performance. Thus there is an urgent research and practical need to understand how does R&D teams execute their communication strategy and how these practices impact their iinovation performance. Further research should look into transdisciplinary research collaboration due to its hetereogenity and complexity in understanding whether similar communication practices can be employed and executed.

6. Acknowledgement

This study was supported by a Fundemental Research Grant Scheme F00144-FRGS/2012/PBPI/SS09 from the Ministry of Education Malaysia. The authors would also like to thank Universiti Teknikal Malaysia Melaka for the support in undertaking this research.

References

Agrell, A. &. (1996). *Innovation and creativity in work groups.* Chichester: In. M.A. West (ed).

Ajay Goyal, K. A. (2007). Interplay among innovativeness, cognitive intelligence, emotional intelligence and social capital of work teams. *Team Performance Management*, 206-226.

Albert G. Zeufack, L. K. (2011). Knowledge, Innovation and Long-Run Growth. *Unpublished Raw data*.

Ancona, D. G. (1992). Bridging the boundary: external activity in performance in organizational teams. *Administrative Science Quaterly*, 634-665.

Andrea Goncher, S. K. (2010). Team Communication and Innovative Design Practices: The Effect of Team Adoption and Implementation of the Tablet PC. *Human Factors and Ergonomic Society 2010*. San Francisco: German National Library of Science and Technology.

Campion, M. J. (1994). The Knowledge, Skill, and Ability Requirements for Teamwork: Implications for HUman Resource Management. *Journal of Management*, 503-530.

Copper, B. M. (1994). The relationship between group cohesiveness and performance: An intergration. *Psychological Buletin*, 210-227.

C.W. (Ed), *Handbook on Knowledge Management*, Springer, Vol. 1 Ch. 5 pp. 73-87.

Daniel Levi, C. S. (1995). Team work in research and development organizations: The characteristic of successful teams. *International Journal of Industrial Ergonomics*, 29-42.

David Lepak, M. G. (2010). *Human resource Management.* New Jersey: Pearson.

Day, Natalie and Amran bin Muhammad (2011), "Malaysia, The Atlas of Islamic-World Science and Innovation country, case Study No. 1.

Dr. Albert G. Zeufack, L. K. (2006). Knowledge, Innovation and Long-Run Growth. *(Unpublished Dissertation)*.

Education, M. o. (2011, December 21). *Researcher: Department of High Education*. Retrieved from Department: http://jpt.mohe.gov.my/eng/menupenyelidik.php?page=PENYELIDIK/penyelidik.php

Gemuenden, M. H. (2001). Teamwork quality and the success of innovative projects: a theoretical concept and empirical evidence.

Organization Science, 435-499.
Hassal, S. L. (2009). The relationship between communication and team performance. *Unpublished Dissertation*.
Hassal, S. L. (2009). The relationship between communication and team performance: Testing moderators and identifying communication profiles in established work teams. *Unpublished Dissertation*.
Idiagbon-Oke, A. O. (2010). Communication channels, innovation tasks and NPD project outcomes in innovation-driven horizontal networks. *Journal of Operations Management*, 442-453.
Jong, J. P. (2007). Individual innovation: the connection between leadership and employees' innovative work behavior. *Unpublished Dissertation*.
Jun Liu, X. L. (2011). Does transactional leadership count for team innovativenness?: The moderating role of emotional labor and the mediating role of team efficacy. *Journal of Organizational Change Management*, 282-298.
K. Thiruchelvam, V. C. (2011). *Country Profile of Innovation: Malaysia.* Chiang Mai: OECD Review of Innovation in Southern Asia.
Kahn, D. K. (1978). *The Social Psychology of Organizations.* HR Folks International.
Keller, K. L. (2001). *Building Customer-Based Brand Equity: A Blueprint for Creating Strong Brands.* Cambridge: Marketing Science Institute.
Kostopoulus, K. (2009). Leading new product development. *Unpublished Raw Data*.
Kwon, P. S.-W. (2002). Social Capital: Prospects for a New Concept. *Academy of Management*, 17-40.
Lee, L. T.-S. (2008). The effects of team reflexivity and innovativeness on new product development performance. *Industrial Management & Data Systems*, 548-569.
Leitner, K.-H. (2011). The effect of intellectual capital on product innovativeness in SMEs, *International Journal of Technology Management 53(1): 1-17.*
Lucas Layman, L. W. (2006). Essential Communication Practices for Extreme Programming in a Global Software Development Team. *Information and Software Technology,* 781-794.
Mann, G. H. (2004). A model of R&D leadership and team communication: the relationship with project performance. *R&D Management*, 147-160.
Michelle A. Marks, J. E. (2001). A temporally based framework and taxonomy of team processes. *Academy of Management* , 356-376.
MIDA. (2012). Investment For Transformation. *Malaysia Investment Performance 2012*.
Mudrack, P. E. (1989). Group cohesiveness and productivity: a closer look. *Human Relations*, 771-785.
Nayir, K. Y. (2010). Procedural justice, participation and power distance: Information sharing in Chinese firms. *Management Research Review*, 66-78.
Osarenkhoe, A. (2008), "What characterises the culture of a market-oriented organisation applying a customer-intimacy philosophy?" *Journal of Database Marketing & Customer Strategy Management, Vol*. 15 N0.3, pp.169-190.
Othman, N. H. (2009). Public-Private Collaboration in Research and Development in Malaysia. *Special Feature: Public-Private R&D Collaboration*, 19-23.
Panneerselvam, R. (2004). *Research Methodology.* New Delhi: Prentice-Hall of India Private Limited.
Parboteeah, M. H. (2006). Autonomy and teamwork in innovative projects. *Human Resource Management*, 67-79.
Paul S. Hempel, Z.-x. Z. (2012). Team empowerment and the organizational context: decentralization and the contrasting effects of formalization. *Journal of Management*, 475-501.
Rahman, Z. A. (2012). AGRICULTURAL RESEARCH AND DEVELOPMENT IN MALAYSIA. *J. ISSAAS*, 22-33.
Robert L. Mathis, J. H. (2008). *Human Resource Management.* Canada: Thomson Nelson.
Roger Th.A.J. Leenders, J. M. (2003). Virtuality, communication, and new product team creativity: a social network perspective. *Journal of Engineering and Technology Management Jet-M*, 69-92.
Romer, P.M (2004), "The Knowledge Economy" (Romer, P.M. interviewed Kurtzman, J.), in Holsapple,
Rudy K. Moenaert, F. C. (2000). Communication Flows in International Product Innovation Teams. *Journal Product Innovation Management*, 360-377.
Ruiz, M. (2013). Human Capabilities and innovation in Young Companies. *2013 EU-SPRI FORUM CONFERENCE MANAGEMENT OF INNOVATION POLICIES.* Madrid: European Forum for Studies of Policies for Research and InnovationSusan G. Cohen, D. E. (1997). What Makes Teams Work: Group Effectiveness Research from the Shop Floor to the Executive Suit. *Journal Management*, 239-290.
Susan G. Cohen, D. E. (1997). What Makes Teams Work: Group Effectiveness Research from the Shop Floor to the Executive Suit. *Journal Management*, 239-290.
Tatiana Andreeva, A. K. (2011). Knowledge Processes, Knowledge-Intensity and Innovation: A Moderated Mediation Analysis. *Journal of Knowledge Management*, 1016-1034.
Trott, P. (2005), Innovation *Management and New Product Development*, 3rd ed., Pearson Education Limited, New York, NY.
Vaus, D. d. (2001). Research Design in Social Research. London: SAGE.
Wallace, M. A. (1991). Innovation in health care teams. *European Journal of Social Psychology*, 303-315.*Wold, H. (1975). Soft modelling by latent variables: The non-linear iterative partial least squares (NIPALS) approach. In J. Gani (Ed.), Perspective in Probability and Statistic, Papers in Honour of M. S. Bartlett*. London: Academic Press, 117-142.
West, M. A. (2000). State of the art: creativity and innovation at work . *Psychologist*, 460-464.
Wold, H. (1975). Soft modelling by latent variables: The non-linear iterative partial least squares (NIPALS) approach. In J. Gani (Ed.), Perspective in Probability and Statistic, Papers in Honour of M. S. Bartlett. London: Academic Press, 117-142.
Wold, H. (1985). *Partial Least Squares. Encyclopedia of Statistical Sciences .* New York: John Wiley & Sons.