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Managers' Inclination towards Open Innovation: Effect of Job Characteristics

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Abstract
This paper examines the role of job characteristics in open innovation proclivity. Building on componential theory of creativity and job characteristics model of work motivation, this article proposes positive causation from job characteristics to open innovation proclivity. Also, the effect of technologically turbulent environment on certain job characteristics is addressed. This is an individual level study focusing on job level factors in technologically less advanced countries by overcoming present gaps. Findings from 363 managers indicate that skill variety has positive effect while task identity has negative effect, and no effect from other characteristics. Technology turbulence is found to have negative influence on skill variety and autonomy. These findings suggest that firms that adapt open innovation should be cautious in job design and environment turbulence.
Keywords: Open innovation proclivity, Job characteristics, Job design, Technology turbulence, Technologically less advanced countries, Intrinsic motivation

1. Introduction

A firm's capacity in innovation has become salient for its survival in present global and competitive markets. Today, innovation is an integral part of any organization seeking for prosperity, growth, and sustainability with higher level of profitability (Elmquist et al. 2009). Technological innovation helps firms go abreast with novel ideas and circumvents entry barriers to other firms (Tseng 2009). Basically, innovation creates and enhances organizational competitiveness resulting success (Edwards et al. 2005; Smith et al. 2008; Essmann & Preez 2009). Also, innovative companies sustain and advance their current businesses and start up new businesses (Chesbrough 2006a), and deliver value to the stakeholders (Kolk & Püümann 2008).

In past, the firms adopted closed, linear model of innovation where extent of formal, internal research and development (R&D) activities of a firm determines the extent of innovation. The closed model of innovation employed internally focused innovation process assuming that firms should have a control over successful innovation (Chesbrough 2006a). It is believed that firms must generate, develop, build, market, distribute, service, finance and support only their own ideas (Chesbrough 2003). However, latter changes in business environment such as increasing number and mobility of knowledge workers, flourishing of the Internet and venture capital market, and broadening scope of possible external suppliers, etc. weaken the sustainability of closed innovation (Chesbrough 2003; Viskari et al. 2007; Lee et al. 2010), and increase the reliance on multiple channel of technology exploration and exploitation. It was the emergence of a new paradigm of management of innovation, which is 'Open Innovation' coined by Henry Chesbrough in 2003 (Lichtenthaler 2008; Elmquist et al. 2009; Enkel et al. 2011; Lichtenthaler 2011; Bigliardi et al. 2012). Since then, Open Innovation (OI) has been a top issue in technology management and innovation literature (Christensen et al. 2005; Gassmann 2006; Bianchi et al. 2011).

The fundamental difference between OI and closed innovation is about the tendency in using external knowledge and external paths to market. OI is "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology" (Chesbrough 2006b, p. 1). Thus, OI requires firms to create and captures value using technologies developed by others, also enabling others to use their own technology.

Accordingly, OI uses valuable ideas generated from interlay and externally. Also, it uses internal and external paths to market. This fundamental change in innovation management requires an attitudinal change within employees and firms. Due to various reasons, managers may develop negative attitude towards OI (Herzog 2011). Mostly discussed two such attitudes are "not-invented-here syndrome" and "not-sold-here syndrome". Discussing attitudes towards external knowledge management, Lichtenthaler & Ernst (2006) present a comprehensive six-syndrome model encompassing both negative and positive attitudes. The attitude of managers that favor OI over its old paradigm is a salient issue. This is assessed by OI proclivity which emphasizes the managers' inclination to integrate external ideas, and enable external parties to use internal know-how. Also, there is an established body of knowledge supporting the fact that job characteristics determine employee

attitudes and behavior (Hackman et al. 1978; Elanain 2009; Slattery et al. 2010). The Job Characteristics Model (JCM) of Hackman & Oldham (1975; 1976) identifies five main job characteristics: skill variety, task identity, task significance, autonomy, and feedback and they are the determinants of three critical psychological states which are experienced meaningfulness, experienced responsibility for the outcome, and knowledge of the results of work activity (Elanain 2009). These critical psychological states reinforce individuals and leads to higher internal work motivation (Hackman & Oldham 1976) that influences creativity (Amabile 1983; Shalley 1991). Therefore, job characteristic may determine managers' inclination towards OI through their effect on motivation. Yet, this has not been received scholars' attention.

OI has been researched in a wide spectrum. The different aspects of OI have been discussed in large number of studies in the context of technologically advanced and developed countries (Karo & Kattel 2010). Also, there are a few OI studies in the context of emerging economies (i.e. Li & Kozhikode 2009; Lee et al. 2010; Kafouros & Forsana 2012). OI studies in technologically less advanced countries are scarce. There is a scant of studies focused on proclivity to OI (except the noteworthy study by Hung & Chinag, 2010). Though there is plethora of OI studies at firm level, there are no studies at individual level. Yet, the influence of job characteristics on proclivity to OI has received no attention. Therefore, this study adds to our understanding of OI paradigm assessing the impact of job characteristics on OI proclivity of managers in technologically less advanced countries. In particular, this paper attempts to assess the impact of five job characteristics (skill variety, task identity, task significance, autonomy and feedback) on managers' proclivity to OI. Further, this paper contributes to the existing knowledge of OI by studying it in a context that was less researched. Also, managers will find the outcome of the paper useful in adopting OI in technologically less advanced countries. The rest of the paper is structured as follows. The next section reviews the relevant literature on OI and job characteristics and develops hypothesis. The third section describes the research methodology adopted in this paper. The fourth section report and discusses the analysis and results of the empirical analysis, whereas final section outlines the discussion, some conclusions, and directions for future studies.

2. Literature Review and Hypotheses

Innovation literature introduces various types of innovation such as product vs. process innovation, radical vs. incremental innovation, technical vs. administrative innovation, technology push vs. market pull innovation, etc. These types of innovation have been recognized based on the technological innovation, except technical vs. administrative innovation. However, technological innovation alone does not bring superior performance to a firm. Firms should be innovative in term of not only technologically, but also organizationally, adapting novel innovation approaches. OI highlights the importance of innovating the process of innovation (Chesbrough 2006a). It claims that the way the firms generate and commercialize new ideas has been subjected to a fundamental change. Innovating innovation insists the necessity of experiment with novel business models (Chesbrough 2006a; Kolk & Püümann 2008). Employees' creative behavior becomes essential in generating novel and useful ideas about novel business models. The employees who are inclined to OI over closed innovation may possess higher tendency towards generating novel and useful business models. OI proclivity can be defined as the inclination of employees to bring novel and useful ideas to innovate existing business model. On the other hand, creativity is the production of novel and useful ideas in any domain (Amabile 1996). Thus, in the domain of OI, OI proclivity represents the creative behavior of employees.

According to the Componential Theory of Creativity, the level of creativity of an employee is a product of the components of creativity operating within and around the person (Amabile 1983; 2013). Within-the-person components are domain-relevant skills, creativity-relevant processes, and task motivation. The component around-the-person includes the surrounding social environment (Amabile 2013). The domain-relevant skills refer to "expertise in the relevant domain or domains", whereas creativity-relevant processes refer to "cognitive and personality processes conducive to novel thinking" (Amabile 2013, p. 3). Task motivation refers to the intrinsic motivation determining the way a person approaches a certain task. Drawing on the intrinsic motivation perspective, the level of intrinsic motivation of a person is influenced by the context that person performs a task, and it affects the level of creative achievement (Amabile 2013). A person who experiences a high level of intrinsic motivation is expected to be more creative since he/ she is excited about a work activity and interested in engaging in it for the sake of the activity itself (Amabile 1983; Shalley 1991). Componential Theory suggests that creative performance is influenced by job characteristics through their effect on intrinsic motivation. Also, there are research based evidence justifying the relationship between job characteristics and creativity using an intrinsic motivation perspective (Coelho & Augusto 2010). Similarly, Interactionist Model of Organizational Creativity suggests that the individual creativity is a function of six factors: antecedent conditions, creative behavior, cognitive styles/ behavior, personality, knowledge, intrinsic motivation, social influences and contextual influences (Woodman *et al.* 1993), justifying that the job characteristics affect creativity through its effect on intrinsic motivation.

The Job Characteristics Model (JCM) of Hackman & Oldham (1975) has been widely used to investigate the effect of job design and characteristics on various work attitudes and behaviors such as absenteeism, motivation, performance, satisfaction and turnover (Ferris & Gilmore 1984; Griffin *et al.* 1987). Also, several studies have investigated the effect of job characteristics on creativity (i.e. Tierney & Farmer 2002; Coelho & Augusto 2010). Job design elicits employees' intrinsic rewards from work efforts (Elanain 2009) that lead to higher inclination to OI. Accordingly, a causal relationship from job characteristics to OI proclivity can be postulated. JCM presents five core job characteristics: skill variety, task identity, task significance, autonomy, and feedback. This study focuses on all of them and the effect of technology turbulence.

Skill variety: Skill variety is "the degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the person" (Hackman & Oldham 1976, p. 257). Jobs with higher variety provide employees with a feeling that their jobs are meaningful and worthwhile, and this feeling increases intrinsic motivation (Hackman & Oldham 1976; Coelho & Augusto, 2010). Both Componential Theory and Interactionist Model suggest that intrinsic motivation increases creativity. Thus, skill variety influences to OI proclivity. This argument proposes following hypothesis.

Hypothesis 1: Skill variety is positively related to OI proclivity.

Task identity: Task identity is "the degree to which the job requires completion of a 'whole' and identifiable piece of work; that is, doing a job from beginning to end with a viable outcome" (Hackman & Oldham 1976, p. 257). Employees experiencing higher level of task identity in their jobs find that the work is more meaningful and worthwhile and this leads to higher intrinsic motivation (Hackman & Oldham 1976; Coelho & Augusto, 2010). Higher intrinsic motivation affects higher level of OI proclivity. Thus, the following hypothesis is proposed.

Hypothesis 2: Task identity is positively related to OI proclivity.

Task significance: Task Significance refers to "the degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organization or in the external environment" (Hackman & Oldham 1976, p. 257). Understanding of employees the effect of their work on well-being of others increases meaningfulness of the work thereby, enhances the intrinsic motivation. This enhances intrinsic motivation that positively influences OI proclivity. Therefore, the following hypothesis is suggested.

Hypothesis 3: Task significance is positively related to OI proclivity.

Autonomy: Autonomy refers to "the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out" (Hackman & Oldham 1976, p. 258). Autonomy makes the job more exciting due to the sense of freedom, responsibility and control of work outcome (Tyagi 1985; Amabile *et al.* 1990; Coelho & Augusto 2010). Also, employees' own efforts, initiatives and decisions affect the work outcome (Hackman & Oldham 1976). Thus, Autonomy promotes a feeling that the job is responsible for work outcome, and it increases intrinsic motivation. This enhances managers' inclination to OI. Thus, the following hypothesis is derived.

Hypothesis 4: Autonomy is positively related to OI proclivity.

Feedback: Feedback is "the degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his or her performance" (Hackman & Oldham 1976, p. 258). Feedback enhances the knowledge of the actual performance of the work activities, and it increases the intrinsic motivation (Hackman & Oldham, 1976; Coelho & Augusto 2010), and it positively influences the managers' inclination to OI. Also, the opportunity to evaluate work efforts with the feedback information encourages employees to attempt different methods to achieve better outcome (Earley *et al.* 1990), and it has a positive effect on OI proclivity. Therefore, the following hypothesis is proposed.

Hypothesis 5: Feedback is positively related to OI proclivity.

Technology turbulence: It is apparent that the technological environment is subject to a rapid change, and it refers to the technological turbulence which is defined as the speed of change and unpredictability of technology in a given industry (Jaworski & Kohli 1993). The changing technological environment creates a number of opportunities and challenges to firms such as introduction of new products, upgrade products, enhance customer bases, etc. Firms that fail to utilize opportunities and face challenges will be squeezed out of the market (Li & Calantone 1998). Therefore, technological turbulence forces firms to obtain new technologies and skills to introduce new products quickly. Jobs in a non-turbulent environment have narrow scope due to less opportunities and challenges. In contrast to this, the rapidly changing technological environment demands diverse skills and talents from employees to cope up with the change. Jobs with higher skill variety make a person who is capable of facing challenges and utilizing opportunities. The turbulent environment creates more challenges, resulting jobs with stretched skills and abilities. Thus, employees perceive jobs as meaningful and interesting. That leads to higher intrinsic motivation, thereby higher OI proclivity with compared to non-turbulent environment. On the other hand, employee autonomy creates a context which encourages employees to grab opportunities, and come up with novel ideas to grasp them and face challenges. Comparatively, jobs in non-

turbulent environment will have fewer opportunities and challenges. Due to the so diverse opportunities and challenges in a turbulent environment, employees enjoy substantial freedom, independence and discretion than those who are in a non-turbulent environment. This results in higher level of intrinsic motivation that leads to OI proclivity. Therefore, technological turbulence may positively moderate the relationships of skill variety and autonomy with OI proclivity. Thus, the following two hypotheses are proposed.

Hypothesis 6: Technological turbulence positively moderates the relationship between skill variety and OI proclivity.

Hypothesis 7: Technological turbulence positively moderates the relationship between autonomy and OI proclivity.

3. Methodology

3.1 Sample and Data Collection

This study investigates the impact of job characteristics on managers' proclivity to OI. The empirical research for testing hypothesis adopted a questionnaire based survey approach and conducted in a technologically less advanced country[1] by using an email database of a university. Consistent with previous studies (Oldham & Cummings 1996; Farmer *et al.* 2003; Shalley *et al.* 2004; Coelho & Augusto 2010), managers in different hierarchical levels were considered as unit of analysis since employees reaction is determined by their perception (Coelho & Augusto 2010). The self-administrated questionnaire with a cover letter was distributed to 1,100 managers, and 378 responses were received (34.4 per cent response rate). Due to incompletion, 15 responses were eliminated and 363 were used for the analysis (33 per cent net response rate). The majority of the sample, 63.9 per cent was middle level managers, and 32.2 per cent was lower level managers. Higher number of respondents (72 per cent) possesses postgraduate qualifications and 22 per cent possesses bachelor level qualification. 64.7 per cent of the sample is male, and 84 per cent is above 30 years of age. Majority of respondents (50.4 per cent) possesses more than 10 years of work experience while 77.4 percent work for firms with more than 150 employees.

3.2 Variables and Measures

The questionnaire was developed in English and tested with 12 respondents out of which 6 were from manufacturing sector, 7 were males from private sector. Also, 4 respondents were below graduate level and 5 and 4 respondents represented lower and middle level in management hierarchy, respectively. Based on the responses, some of questionnaire items were revised slightly for the clarity.

The items for measuring dependent variable, proclivity to OI, were adapted from Hung & Chiang (2010). The constructs were devised based on six OI principles of Chesbrough (2003 p. 17; 2006b p. xxvi). This scale assesses the managers' inclination towards the new business model that utilizes external ideas to complement their firms' technology and to sell their firms' intellectual property to outsiders to profit from them. Items for measuring independent variables (five job characteristics) were adopted from Coelho & Augusto (2010) who adopted the scales from Job Diagnostic Survey of Hackman & Oldham (1975) and Hackman & Greg (1980). The four items concerning moderating variable, technology turbulence were adopted from Jaworski & Kohli (1993), and it measures the rate at which the technology in an industry is getting change. All items were measured by five-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (5).

Construct Validity: The measures were refined and assessed for construct validity as per the two-step approach recommended by Anderson & Gerbing (1988). First, exploratory factor analysis was run for multi-item scales (skill variety, task identity, task significance, task autonomy, task feedback, technology turbulence and OI proclivity). Theoretically expected factor loading for all items was achieved (over 0.7 except two item bearing 0.688 and 0.654. One item was dropped). Secondly, Confirmatory Factor Analysis was run for all focal variables. After dropping one item due to low factor loading, the confirmatory model achieved a satisfactory fit to the data (absolute index: goodness-of-fit index [GFI] = 0.926, root mean square error of approximation [RMSEA] = 0.07, root mean square residual [RMR] = 0.035; incremental index: incremental fit index [IFI] = 0.923, normed fit index [NFI] = 0.884, comparative fit index [CFI] = 0.922). All factor loadings were highly significance ($p<.001$), and all composite reliabilities of construct (0.700 – 0.991) exceed the minimum threshold point of 0.6 (Bagozzi & Yi 1988). Also, average variance extracted (AVE) of all constructs (0.518 – 0.698) exceeded the cut-off-point of 0.50 (Hair et.al., 1998). These values confirm adequate convergent validity and reliability (Fornell & Larcker 1981). The discriminant validity of the measures was tested by calculating the shared variance between all possible pairs of construct to determine whether they were lower than the AVE of the individual constructs (Fornell & Larcker 1981). Results show that all AVE values (0.518 – 0.698) are substantially higher compared to shared variance with the other construct (0.0001 – 0.2601), in support of discriminant validity. Thus, results

[1] Technologically less advanced countries are the Scientifically Lagging Nations as of "RAND's Science and Technology Capacity Index".

show that the measures of the study possess adequate reliability and validity.

Also, the study considered several control variables focusing personal characteristics (such as management hierarchy, level of education, gender, age, experience of respondents) with the firm specific characteristic (size of the firm which managers work for). Management hierarchy was measured in three-point scale (top, middle and lower level). Five-point scale was adapted to measure level of education (below bachelor, bachelor, postgraduate diploma, master and doctoral level). Experience of managers was measured on a six-point scale from 1-4 years to over 25 years of experience. Size of the firm was measured by number of employees on a six-point scale. Also, the study adopts component-wise analysis of job characteristics rather than composite analysis. The creativity is influenced by each job characteristic through different mechanisms since each job characteristic has its own locus of interest and involves different cognitive activities (Coelho & Augusto 2010). Thus, this study tests the effect of each job characteristic on OI proclivity.

4. Analysis and Results

The Table 1 summarizes basic descriptive statistics and correlations of the measures. Managers' proclivity to OI is at higher level (M = 3.34, SD = .638). The correlations are computed for all dependent, independent and control variables. Results show that 37 out of 78 correlations are statistically significant. Skill variety, task significance, feedback and technology turbulence have significant positive association with OI proclivity supporting the postulated relationships. The issue of multicollinearity was examined by variance inflation factor (VIF) for each construct in each regression equation. The maximum VIF value, 2.427 within the models is far below the cut off value of 10 (Neter *et al.* 1990), alleviating the concern of multicollinearity.

Table 1. Basic descriptive statistics and correlations

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1	3.34	0.638	1											
2	4.03	0.673	.250**	1										
3	3.60	0.771	-.071	.227**	1									
4	3.96	0.837	.116*	.414**	.216**	1								
5	3.80	0.624	-.081	.029	.178**	.016	1							
6	3.83	0.722	.133*	.409**	.348**	.361**	.248**	1						
7	3.46	0.773	.116*	.386**	.441**	.286**	.048	.451*	1					
8	1.72	0.530	-.007	.193**	.026	.181**	.009	.058	.072	1				
9	3.06	0.954	.001	-.063	-.136**	.058	.235**	.068	-.059	.071	1			
10	1.35	0.478	-.152**	.076	.166**	-.024	-.143**	.043	.076	.036	-.136**	1		
11	2.26	0.838	-.049	.078	-.023	.097	.216**	.079	.113*	.255**	.271**	-.162**	1	
12	2.70	1.313	-.063	.093	-.063	.064	.230**	.102	.043	.103*	.342**	-.139**	.734**	1
13	4.58	1.793	.045	-.048	.007	.033	.056	.058	.035	.096	.285**	.020	.122*	.145**

Notes: *N = 363;* ***p* < 0.01, * *p*< 0.05

1=OI proclivity, 2=Skill variety, 3=Task variety, 4=task significance, 5=Autonomy, 6=Feedback, 7=Technology turbulence, 8=Hierarchy, 9=Education, 10=Gender, 11=Age, 12=Experience, 13=Firm size

The Hierarchical Regression method was applied to test hypothesis and assessed the explanatory power of each set of variables (Aiken & West 1991). Also, this method helps explain whether or not interaction term has a significant effect over and above the direct effect of the independent variables, and thereby the existence of interaction effect (Wiklund & Shepherd 2003). The results are presented in the Table 2.

Table 2. Results of Hierarchical Regression Analysis

Variables	Model 1		Model 2		Model 3	
	b (s.e)[a]	β	b (s.e)[a]	β	b (s.e)[a]	β
Constant	3.70(0.20)	***	3.10(0.32)	***	-2.44(0.91)	*
Control variables						
Hierarchy	0.01(0.07)	0.01	-0.06(0.06)	-0.05	-0.05(0.06)	-0.04
Education	-0.01(0.04)	-0.01	0.01(0.04)	0.01	0.03(0.04)	0.04
Gender	-0.23(0.07)	-0.17**	-0.25(0.07)	-0.19***	-0.17(0.07)	-0.13*
Age	-0.03(0.06)	-0.03	-0.01(0.06)	-0.02	0.02(0.06)	0.02
Experience	-0.03(0.04)	-0.07	-0.06(0.04)	-0.11	-0.06(0.04)	-0.12
Size	0.02(0.02)	0.06	0.03(0.02)	0.08	0.04(0.02)	0.13*
Direct effects						
Skill variety (SV)			0.25(0.06)	0.27***	0.61(0.14)	0.65***
Task identity			-0.12(0.05)	-0.15**	-0.13(0.05)	-0.15**
Task significance			-0.00(0.04)	-0.00	-0.02(0.04)	-0.03
Autonomy (TA)			-0.09(0.06)	-0.09	1.00(0.27)	0.98***
Feedback			0.08(0.06)	0.09	0.05(0.05)	0.05
Techno. Turbulence (TT)			0.06(0.05)	0.07	1.73(0.33)	2.10***
Moderating effects						
SV x TT					-0.15(0.04)	-0.93***
TA x TT					-0.30(0.07)	-1.78***
R	0.186		0.379		0.451	
R^2	0.035		0.144		0.204	
ΔR^2	-		0.109		0.060	
R^2 *(adj)*	0.018		0.114		0.172	
F	2.128*		4.899***		6.357***	

Note: Dependent variable: Creativity; N = 363; ***p<.001, **p<.01, *p<.05
[a]Unstandardized coefficients with standard errors in the parentheses and standardized coefficients are reported

The base model, Model 1, includes only control variables, and explains statistically significant amount of the variance in OI proclivity ($R^2 = 0.035$, $p < 0.05$). In the Model 2, direct variables were included to assess the main effect, and this set of variables contributes to significant amount of variance in OI proclivity ($R^2 = 0.144$, $\Delta R^2 = 0.109$, $p < 0.001$). In particular, coefficients indicate that both skill variety ($\beta = 0.27$, $p < 0.001$) and task identity ($\beta = –0.15$, $p < 0.01$) significantly influence OI proclivity. Skill variety has significant positive effect, supporting Hypothesis 1; skill variety is positively related to OI proclivity. The effect of task identity is significant. However, contrary to the Hypothesis 2 that postulated positive effect of task identity on OI proclivity, it has negative effect. Hypotheses 3, 4 and 5, which suggested positive effect of task significance ($\beta = –0.002$, $p > 0.10$), autonomy ($\beta = –0.09$, $p > 0.10$) and feedback ($\beta = 0.09$, $p > 0.10$) on OI proclivity, are not supported. Model 3 considers interaction effect of skill variety and task autonomy with technology turbulence on OI proclivity, and this interaction accounts for a significant contribution over and above the main effects ($R^2 = 0.204$, $\Delta R^2 = 0.06$, $p < 0.001$). Both interaction terms (skill variety x technology turbulence: $\beta = –0.93$, $p < 0.01$; task identity x technology turbulence: $\beta = –1.78$, $p < 0.001$) have significant negative moderating effect, contrary to Hypotheses 6 and 7, which proposed positive effect. Also, adjusted R^2 increases gradually from model 1 to 3.

5. Discussion and Conclusions

Among the plethora of OI literature, OI proclivity and individual level analysis on OI were largely ignored. Also, though the effect of job characteristics on various outcomes have been inquired, its effect on OI proclivity is still unexplored. Thus, this study attempted to explore the effect of job characteristics on OI proclivity. This empirical study assesses the OI proclivity of managers in the context of technologically less developed countries and examines the causal link between core job characteristics of JCM and their proclivity to OI adopting component-wise analysis.

The study contributes to research on OI proclivity and core job characteristics in several ways. The proclivity to OI is above average among managers in technologically less developed countries indicating their readiness to adopt new innovation management paradigm. The present study contributes to scholars understanding as to why certain people are more inclined to OI while others are not. The results of the study reveal that the core job characteristics and interaction effect of unpredictability of technology environment influence managers' inclination to OI in different ways. Overall, this research indicates that job characteristics have mixed influence

on OI proclivity. Skilled variety indicates a positive influence while task identity has a negative influence on OI proclivity. This result reveals that job characteristics differ in their influential capacity on OI proclivity. The results confirm the positive relationship between skill variety and creativity suggested by Coelho & Augusto (2010) but, none of the others. In contrast to Coelho & Augusto (2010) findings, the results of the present study suggest a negative relationship between task identity and OI proclivity. Also, there is no significant relationship found between task significance, autonomy, feedback and OI proclivity. This difference may be due to the contextual difference of this study with previous studies. Also, the findings indicate that technology turbulence moderates the relationship between certain job characteristics (skill variety and task identity) and OI proclivity. Particularly, the technology turbulence has negative influence on the said relationships. Interestingly, results revel that jobs with narrow scope due to less opportunities and challenges in non-turbulent environment have higher effect on OI proclivity while Jobs with stretched skills and abilities in a turbulent environment have a negative effect. One possible explanation for these results is that the managers in a turbulent environment are more defensive in nature thus, tend to avoid possible risks, Also, the managers experiencing less opportunities and challenges in non-turbulent environment strive to create and grab them.

The outcome of this study has several implications to managers. The results of this study indicate that managers in technologically less developed countries have inclination to OI, and this inclination is influenced by job characteristics. Managers' proclivity to OI can be spurred by incorporating variety into job tasks by adding several activities. Limiting the task identity also helps enhance proclivity to OI, thus, designing jobs in such a way that managers can complete an entire piece of work should be avoided. Also, firms operating in technologically less-turbulent environment need to design jobs in such a way that they require a range of skills to perform the job and enjoy higher autonomy than in turbulent environment. Finally, managers should not find that these recommendations are universal since differences such as industry, technology intensity, sector (private vs. public, manufacturing vs. service), need for growth, etc. may have some effect on findings of this research.

This research focuses on new area of study, investigating the effect of job characteristics on proclivity of managers towards OI. Apart from the merits, contributions of this study should be considered with the appropriate understanding of limitations which open opportunities for future studies. This study considered managers from various industries and sectors together. For specific understanding, further narrowed investigation such as industry level, technology intensity level and sectorial analysis may be required. Also, the study considered managers occupying different fields (i.e. marketing, finance etc.) together. However, there is a possibility that managers from different fields may respond differently to job characteristics and OI proclivity. Therefore, it would be interesting to inquire how managers from different fields respond to job characteristics and OI proclivity. Proposed narrow-studies would possibly lead to lower sample variability and thereby reduce the variance of job characteristics resulting more meaningful hypothesis testing. Also, it is interesting to inquire the effect of turbulent environment on the relationship between task verity and identity with OI proclivity. Further, this study concentrated on direct effect of job characteristics on OI proclivity and ignored the interactive effect between job characteristics, creating an opportunity for further investigation. This study assumes a causation mechanism from job characteristics to OI proclivity. Though longitudinal research design is much appropriate for studies in this nature, this study adopted cross sectional approach, opening an opportunity for further investigation.

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