Open Access
International Research Journal of Management and Social Sciences
ISSN (ONLINE): 2710-0308
ISSN (PRINT): 2710-0316

IRJMSS, Vol: Vol: 2, Issue: 2,
July to September 2021
DOI: **10.5281/zenodo.10340041**
www.irjmss.com

Determinants of Innovative Work Behavior – A Model of Innovative Work Behavior for IT Sector Professionals Through the Application of Jd-R Theory

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Abstract
This research study is concerned with determinants of innovative work behavior under the application of Job demands-resources (JD-R) theory. The study examined pluralistic impact of job demands, job resources and personal resources on innovative work behavior through the sequential mediation role of employee eustress (positive stress) and engagement. Data was collected from 398 knowledge workers of IT sector of Pakistan using a well-structured survey questionnaire. PLS-SEM data analysis technique was opted using Smart-PLS software. Job demands (creativity role expectations and workload), job resources (autonomy, intellectual stimulation) and personal resources (creative self-efficacy, resiliency) were confirmed as determinants of innovative work behavior directly and through the mediating mechanism of employee eustress and engagement. This research study contributes to innovation and JD-R theories with novel empirical knowledge by evaluating the role of job demands, job resources and personal resources on employee innovative work behavior. The study's specific contribution pertains to delaminating a sequential mediating role of eustress (positive stress) and employee engagement between job demands, job resources, personal resources and innovative work behavior which is new addition to relevant theories because this perspective has not been studied so far. The study equally contributes to the relevant practices as well. The findings of this study enlighten the decision makers of IT sector with valuable knowledge about innovative work behavior of employees that can be stimulated to optimal extent by increasing eustress and employee engagement by setting rational and challenge demands for employees, hiring workers with self-enriched innovation specific personal resources and provisioning of job resources that are supportive to innovative work behavior of employees.
Keywords: autonomy, creative self-efficacy, creativity role expectations, eustress, innovative work behavior, intellectual stimulation, job demands-resources, resiliency, work engagement, workload.

1. INTRODUCTION

In the current competitive environment, profitability, growth, and market sustainability have become more exigent due to rapid changing business landscape. Earlier, business assets and cutting costs paradigms were considered significant for business success. Now financial performance and long-term success of a business firm is tied with sustainable innovative potential. Firms due to short product life cycle and globalization cannot think of profitability and growth without advancement in innovation (Anser et al; 2020). Furthermore, extensive rise of knowledge economy has created significance for knowledge workers to play role in organizational innovation (O'Donovan, 2020). Earlier innovation was concerned with efficacy of R & D department and pursuit of technology. Now employees are viewed as major

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source of creativity and innovation in organizational perspective (Lenka and Gupta, 2019). Firm's performance can be uplifted through their knowledge workers when they come up with new and productive ideas and implement them successfully in work roles (Shafique et al., 2019). Contemporary research studies also demonstrated the role of all employees in promoting organizational creativity and innovation (Coad et.al; 2016). While exhibiting innovative work behavior extra cognitive and physical efforts are made by the employee through demonstrating discretionary behavior (Ramamoorthy, Flood, Slattery, &Sardessai, 2005) to create, promote and implement novel ideas in work roles. In this way employee innovative work behavior (IWB) (Janssen, 2000) helps organizations meet new challenges in volatile environment (Khan et al; 2020, Javed et al 2017). The emerging dominance of employees in promoting creativity and innovation have steered organizations to pay more attention towards their employees to succeed ahead (Khan et al., 2020).

Researchers conducted distinct studies to explore new ways to promote employee innovative work behavior (Coad et al; 2016). Individual differences, personal traits, knowledge base, communication, leadership, expectations, motivation, and supervisory support were concluded as determinants of promoting innovative work behavior. However, these studies witnessed mixed support for successful harnessing of IWB that calls for further research studies to promote innovative work behavior. One of the dimensions for research is search for determinants that promote IWB under job demands-resources paradigm. While exhibiting innovative work behavior an employee must follow a complicated roadmap and his/ her additive personal resources are consumed to achieve desired outcomes (Janssen, 2000). Strong commitment, competence and organizational support are extremely important for exhibiting IWB. Researchers view three key stages of employee innovative work behavior. First stage starts with new useful ideas generation. Second is concerned with promoting new ideas by getting support from coworkers, juniors, peers, and superiors. In the final stage supported ideas are practiced by employee in work role to benefit the organization (Reis, et al; 2015, Janssen, 2000). Application ofJob demands-resources theory is significant in promoting IWB as it portrays combined effect of individual and contextual factors on employee performance. According to JD-R theory relevant job resources, personal resources and job demands are concerned with employee engagement, eustress (positive stress) and in role & extra role performance if managed in effective way (Bakker and Demerouti; 2014), (Demerouti, et al; 2015).

Today's knowledge workers are different from traditional mechanical workers. Since, they have moved from status quo job performance to epoch of innovation. The dominance of knowledge workers in promoting organizational innovativeness demands fundamental changes in job demands, job resources and personal resources to pursue the IWB (Watts et al., 2020; Aliet al., 2020). According to JD-R theory each organizational demand relates to employee state of motivation and job stress in organizational perspective (Van Wingerden et al; 2016). Productivity specific hallmark advocates significance of strict supervision and control for employee performance. In contrast through facilitation and freedom new ways of productivity and innovative performance can be attained in the contemporary era (Bos-Nehles et al; 2017a). IWB, generation and implementation of an idea (Devloo et al., 2015), is being sought as it is found to be related to performance (Shanker et al., 2017) and growth (Coad et al., 2016).This study extends existing scholarly knowledge manifold. First, it

examines the role of job demands, job resources and personal in promoting innovative work behavior directly. Secondly, it examines role of job demands, job resources and personal resources on innovative work behavior through the sequential mediation ofeustress and employee engagement. Thirdly, role of employee engagement (motivation) and eustress has been studied simultaneously for promoting employee IWB which is new dimension and extension of empirical knowledge. In summary the study contributes to innovation and JD-R literature substantially.

1.1 Research Rational

The knowledge incentive economies like IT sector have giant opportunities to grow ahead through advancement in creativity and innovation. Almost all public and private businesses utilize IT and IT enabled services (ITeS). Change and innovation are essential features of IT sector. Without ensuring sustainable innovative potential growth of this sector is merely a daydream (Digital Pakistan Policy Review, 2018). The new business changes in this sector have created challenges for IT firms to burgeon in the competitive market through creativity & innovation. Owing to new and unique ideas differentiation IT firms can pursue to increase their businesses and fulfill customized demands. Now a quick response and first to the market conditions the survival in IT profession. The organizational innovation is driven by employees by promoting innovative work behavior. Innovative work behavior can range from incremental improvements to developing radically novel ideas that affect products, services, and processes of an organization. Employees are important asset as they possess knowledge, skills and such attitudes that can stimulate and implement useful innovative ideas for creation of value for the organization (Bos-Nehles et al., 2017b).

In addition, currently the 4th industrial revolution is taking place that is digital. In 2019 global digital economy was $11.5 trillion which was 15.5% of the global GDP. There are 2000 IT firms in public and private sector in Pakistan which are growing rapidly each coming year. Furthermore, every year 20,000 IT engineers and graduates complete their degrees become part of workforce. Information technology is playing a central enabling role in knowledge economy and contemporary dynamics of a knowledge society (Sector Profile Tech IT Reviw; 2019). IT may be said a central lever of economic growth. IT sector of Pakistanis carving a significant role in freelancing services, software development and BPO. In freelance development Pakistan comes at 4th position in the world. During last three years IT exports have increased to substantial extent i.e.,upto 70% increase has been witnessed (Pakistan Economic Survey 2019-20). IT/ITeSsector of Pakistan contributes almost 1% of GDP i.e 3.5 billion US $ (Pakistan Vision 2025; Review 2020). It is expected that in next 2-3 years IT growth would be doubled.IT/ITeS sector of Pakistan has giant opportunities to further grow ahead (Pakistan's IT Industry Overview, 2020).Knowledge workers of IT sectors have specific significance in achieving desired growth rate through their Innovative practices. Dynamism and change are key features of IT sector which require knowledge workers to be adoptive and creative to achieve innovativeness and growth (Lenka and Gupta, 2019). Considering the importance of employee innovative work behavior in high tech IT/ ITeS sector of Pakistan, this study made focus on pluralistic perspective of various determinants relating to JD-R theory that stimulate innovative work behavior through direct and mediating role of employee eustress and engagement. Previous research studies made focus on positive role of

individual and job resources and negative aspect of job demands for stimulating employee engagement and job performance. To advance the existing scholarly knowledge this study takes into account JD-R perspective in a different dimension and studies role of job demands, job resources and personal resources as positive stimulant of employee innovative work behavior through mediation mechanism of eustress and engagement.

2. Review of Literature

2.1 Innovative Work Behavior

The concept of 'Innovative Work Behavior' was introduced by Scott and Bruce (1994). Innovation has been considered a human behavior since research on innovation spread from administrative science, communications, psychology, and sociology (West and Farr 1990). Innovative work behavior can be defined as intentional generation, promotion, and realization of new ideas within a work role, workgroup, or organization to benefit role performance, group performance or organizational performance (Bos-Nehles et al; 2017a, West and Farr 1990). Employee innovative work behavior implies more than being creative. Innovative work behavior is intended to generate benefit and has a clearer applied component (De Jong and den Hartog 2007). Researchers are agreed that innovative work behavior encompasses employee creativity, i.e., generation of new and useful ideas concerning the products, services, and operational processes (De Jong et al; 2010), and implementation of the useful creative ideas (Anderson et al; 2014). More specifically, innovative work behavior consists of a set of behaviors (Scott and Bruce 1994; De Jong and DenHartog 2010, Janssen 2000). For instant opportunity exploration and idea generation include looking for and recognizing opportunities to innovate and produce ideas and solutions for the opportunities. Next, championing refers to promoting the generated idea for the purpose of finding support and coalition building. Then implementation stage ensures practically utilization of new ideas in work role to benefit the organization. Innovative work behavior of employees is extremely important for maintaining sustainable innovative potential of an organization (Devloo et al;2015).

2.2 JD-R Theory and Innovative Work Behavior

Due to abiding certain rules of exchange, relationships among both parties (employer & employee) evolve over time and result into loyal, trusting, and mutual commitments (Agarwal et al; 2014a). The exchange rules act as guideline for exchange processes. There are various rules of mutual exchange satisfy employer as well as employee and may take several forms. However, reciprocity or repayment rules are most common. These rules set obligations for both parties. When one party abides by the state of interdependence, it generates obligations for the other side. According to the rule of reciprocity one side actions are repaid by the other party. Most commonly socio-emotional and economic resources are exchanged in these processes. For instant in case an employee perceives strong support (provision of organizational resources) from an organization, he/she feels sense of obligation to repay the organization while utilizing his/ her own resources in different ways (Bos et al; 2017b).

Demerouti et al. (2001) was the first who introduced the Job Demands-Resources (JD-R) model. The researcher focused on work engagement and job burnout perspectives.

Demerouti et al. (2014) also highlighted that when the job resources are limited, and job demands are high then employees lack the motivation and become stressed that effects their work engagement and job performance. Moreover, JD-R is based on the job design and job stress theories and states how demands and resources have unique impact on the motivation and stress states (Bakker & Demerouti, 2012). According to Bakker and Demerouti (2012) 'JD-R theory' emerged from Two-Factor Theory, the Demands-Control Model (Karasek, 1979), the Job Characteristics Model (Hackman& Oldham, 1980), and the Effort-Reward Imbalance Model (Siegrist, 1996). According to Bakker and Demerouti (2012) JD-R predicts job burnout, organizational commitment, work enjoyment, connectedness, work engagement, proactive job crafting behavior, in role work performance and specifically is detrimental in extra role performance i.e., individual innovative behavior. Therefore, JD-R theory is significantly relevant in understanding how innovative work behavior is exhibited by the employees while they are performing their work roles.

2.3 Autonomy, Intellectual Stimulation and IWB

According to Maslow 'the man' may be said as "wanting animal". When resources are provided to satisfy desired needs, a man/ woman becomes motivated and gets engaged in the work roles and behaves proactively and eagerly (Sonmez et al; 2019). According to Ryan & Deci (2000) resources motivate employees toward the work engagement, innovative and extra role behavior and in role performance. Afsar et al; (2015) stated that organizational resources which fulfill needs of employees directly relate to dedication of employees.

Autonomy is a significant variable which steers the employees' innovative work behavior. Autonomy gives additional flexibility and opportunities for adaptability owing to that innovation gets progress (Hackman & Oldham, 1980). It is like empowerment where employee exercises intrinsic motivation and becomes able to accomplish tasks based on meaning, competence, and self-determination (Orth et al; 2017). According to the findings of research study of Hammond et al., (2011) autonomy is an important predictor of employee performance. Having empowerment to do, an employee self-initiate and self-regulate his/ her work and get satisfaction. Consequently, his/ her level of engagement increases adequately. Battistelli (2013) also shared a similar view and stated that empowered employees are more energetic as they feel satisfied and due to fulfilling their basic need of autonomy their level of innovative thinking and engagement is increased. Autonomy is a key resource of employee work engagement in JD-R related theories (Demerouti et al., 2001; Karasek, 1979).

Intellectual stimulation is another variable which motivates employees toward innovative performance in their work roles. According to Northouse (2016) intellectual stimulation is concerned with leadership that steers the employees toward creativity and innovation by changing their status quo. Trang (2016) also reveals intellectual stimulation as key source of promoting employee creativity and innovation. In accordance with Ogola et al; (2017) owing to intellectual stimulation employees become able to exercise newness and creativity when performing their work roles. An organizational leader, for instant, a manager or a supervisor etc. high in intellectual stimulation would motivate individual employee to exhibit innovative work behavior. In lines with creative action theory introduced by Ford's (1996) a leader to be high in intellectual stimulation would adopt innovation process by generating new ideas, championing, and implementation them in work roles. When a leader exhibits intellectual

stimulation effectively in his/ her followers a divergent thinking gets progress that result into creative actions.

2.4 Creative Self-Efficacy, Resiliency and IWB

Distinct research studies view individual characteristics the most substantial predictor of psychological capital. The study of Avey et al. (2011) found that due to individual differences 24% variance extracted in psychological capital. Regression analysis of a study revealed that creative self-efficacy being an individual trait predicted the psychological capital uniquely(Avey et al; 2011). Personal resources related to individual employee, such as education and self-efficacy are essential determinant of innovative thinking and performance. Optimist people always perceive good happenings of things and are confident to execute their work successfully. Personal resources result into positive and hopeful thinking as well as self-regard and employee experience more goal self-concordance (Bass et al; 2016)). Employees blessed with goal self-concordance have strong intrinsic motivation and they pursue more goals which result into higher engagement, innovative and routine performance, and job satisfaction (Luthans et al; 2007).

Creative self-efficacy is considered a significant individual resource and worthy determinant of employee innovativeness. It pertains to extent of an individual's belief regarding undertaking creative endeavors (Richter et al; 2012 and Hammond et al., 2011). Creative self-efficacy is a type of self-efficacy wherein an individual perceives himself/ herself to be capable to achieve creative outcomes (Tierney & Farmer, 2011). According to Bass et al, (2016) employees not open to change experience more distress and do not have control over job events. Employees having greater extent of creative self-efficacy are more creative and innovative. In another research study Bakker et al. (2014) found that employees possessing self-efficacy were coping with the daily demands of the organization in befitting manner. Bakker and Sanz-Vergel (2013) also concluded a positive relationship between creative self-efficacy and innovative performance by employees. Especially when creativity role was more expected, employees with greater creative self-efficacy were better fulfilling desired demands (Hammond et al., 2011; Tierney & Farmer, 2011).

According to King et al, (2015) resilience is people's ability to successfully manipulate the environment while protecting themselves from negative consequences of unfavorable events. Employees being high in resiliency will be capable to move ahead even after experiencing stressful circumstances. In testing situations resiliency proves as strength of individual (Simons &Buitendach, 2013). Resilience is exclusively reactive in nature and brings involvement and engagement of employees (Bakker &Xanthopoulou, 2013). Mitchell et al; (2019) argued that people having resilience trait can cope up with perilous environment conditions, by maintaining equilibrium, true sense and mental as well as physical well-being. Resilience is not only associated with positive act of human in state of adversity, but in rough conditions personal competencies including emotional, cognitive, and social are raised and developed Avey et al., (2011). The literature study revealed that there are three main aspects which relate to resilience. First ability of obtaining positive results in unfavorable situations, secondly the individual ability to act efficiently when stress situations enact and thirdly the individual capacity to recover (Fandino et al; 2019, Mishra et al; 2013 &Mitchell et al; 2019). According to (King et al; 2015) individual with resiliency trait remains persistence on the

course of action even in state of enactment of adversity and influences future through hopeful pathways. The study of Fandino et al; (2019) also concluded that resilience had positive association with positive stress creation among employees that resulted into enriched job performance and more creative and innovative actions by them. Luthans et al; (2007) stated that resilience is an important individual resource which makes a person stable and committed towards the mission of life. The study of Amir, M. T. (2014) also concluded positive and significant relationship between resiliency and individual innovative outcomes. Due to resilient state of mind individual can perform well in both calm and adverse conditions. Employee engagement is positively affected by this worthy personal resource. The view of Avey et al., (2011) regarding resilience is also synonymous. They stated that individual can promote desirable behaviors in the workplace and benefit the concerned organization when possesses the characteristic of resilience. Resilience is positively related to employee eustress and engagement that improves call of duty as well as innovative performance (Moenkemeyer et al; 2012). In accordance with Agarwal et al., 2012 there is positive correlation between resilience and employee engagement as well as innovative and status quo performance. The study of Cavanaugh et al; (2020) ascertained a positive relationship between resiliency and employee engagement as well as job performance.

2.5 Creativity Role Expectations, Workload and IWB

Job demands play pivotal role in employees' performance. The nature of job demands may be either challengeor hindering demands. On the other hand, demands of employer may be rational or irrational. The irrational demands result into feelings of distress and lack of engagement that decreases employee commitment towards job performance and extra energies consumption for creative actions (Schaufeli et al. 2014). In contrast rational demands create positive stress and motivate employees toward work engagement and enhanced job performance. Creativity role expectations impacts greatly to individual creative actions. Employees get cues from their environment to determine to which extent creative roles make them successful at workplace (Ford, 1996; Oldham & Cummings, 1996). According to Rosenthal & Jacobson (1968) changing performance expectation of employer resulted into compensatory performance changes that made employees to fulfill employer demands. In an organizational setting, usually managers' expectations impact subordinates' performance which may be in role performance and/or beyond the call of duty outputs. The study of Tierney & Farmer (2011) concluded that performance expectations of mangers were positively related to employees' job outputs. Similarly,Carmeli and Schaubroeck (2007) also found that manager's creativity role expectations were positively and significantly related to employee innovative performance. Anderson et al., (2014) also opined that employer expectations from employeeenhanced employee creative actions. The study of Scott and Bruce (1994) revealed that creativity role expectations of leader were positively and significantly related to involvement in creative work activities. Yuan & Woodman (2010) viewed positive relationship between creativity role expectations and employees in role and extra role performance.

Researchers view workloads as challenge demands that generate extra energy in employees to make them more efficient and they become engaged mentally and physically in work roles (Lepine et al., 2005). However, workloads must be rational and supported by desired

individual capabilities and job resources for positive stress building and true motivation of employees. In contrast irrational workloads create distress and result into mentally and physically withdrawal of employees from work roles. Workloads are perceived as work conditions that provide opportunities for learning, personal growth, and goals attainment (Crawford et al., 2010). According to Wu et al, (2014) workloads stimulate positive stress that results into engagement and innovative performance. Binnewies & Wörnlein, (2011) also viewed workload as positive element of employee creativity and innovation. The study of Schuler et al; (2019) also concluded positive and significant relationship between challenge demands and in role &innovative performance. A meta-analysis Pflugner (2021) also proved positive role of workloads in bringing innovation specific performance of employees.

2.6 Employee Eustress and Engagement as Mediators

Distinct researchers concluded that eustress had association with healthy and positive outcomes of employees (Quick, J.C., Quick, J.D., Nelson & Hurrell, 2000). According to Nelson & Cooper (2007) owing to eustress employee are actively involved in job roles and their commitment and engagement is increased to substantial extent. Another research study also suggested a synonymous view and stated that due to eustress an employee becomes engaged and gets easier into the flow of work and likely to savor the challenges that are being faced in work roles (Nelson & Simmons, 2003). Eustress also has association with innovative performance of employees since it provides stimuli for challenge and beyond the call of duty performance. Meyer et al. (2017) investigated that heavy ICT workers i.e., software developers and specific customized software inventors better performed in the presence of eustress. The study of Tams et al; (2018) suggested that eustress has positive and significant effect on employee engagement, creativity, and innovation. According to Andersson et al; (2020) employees were intensively involved in innovative work behavior who experienced the eustress created by job demands and supported by job resources. Tarafdar et al; (2019) also concluded that eustress was associated with employee engagement and innovative performance. According to Maier et al; (2015) positive individual outcomes, including hope and innovation specific involvement were related to sustainable eustress of employees.

The study of extant literature revealed positive association among JD-R, employee work engagement and IWB. In accordance with study outcomes of Agarwal et al; (2012) employee engagement portrays a mediating role between job – individual antecedents and innovative work behavior. It came to know from the study of De Spiegelaereet al; (2014) that relationship between JD-R and IWB was partially mediated by work engagement. According to the opinion of Wang et al. (2015) job resources and personal resources positivelypredict employee involvement in organizational creativity and innovation.

In accordance with meta-analytic research studies job demands and job resources are positively associated with employee job engagement and performance (Lepine et al., 2005 and Crawford et al., 2010). In accordance with Vroom's(1964)expectancy theory human motivation toward any action is outcome of multiple perceptions. This theory explains that desired performance is outcome of efforts which are imparted by employees due to their specific perceptions of rewards.If rewards are attractive these will encourage employees towards further efforts. That is why the behavior of challenge demands is considered positive as it enhances work motivation through increasing the belief of employee that owing to

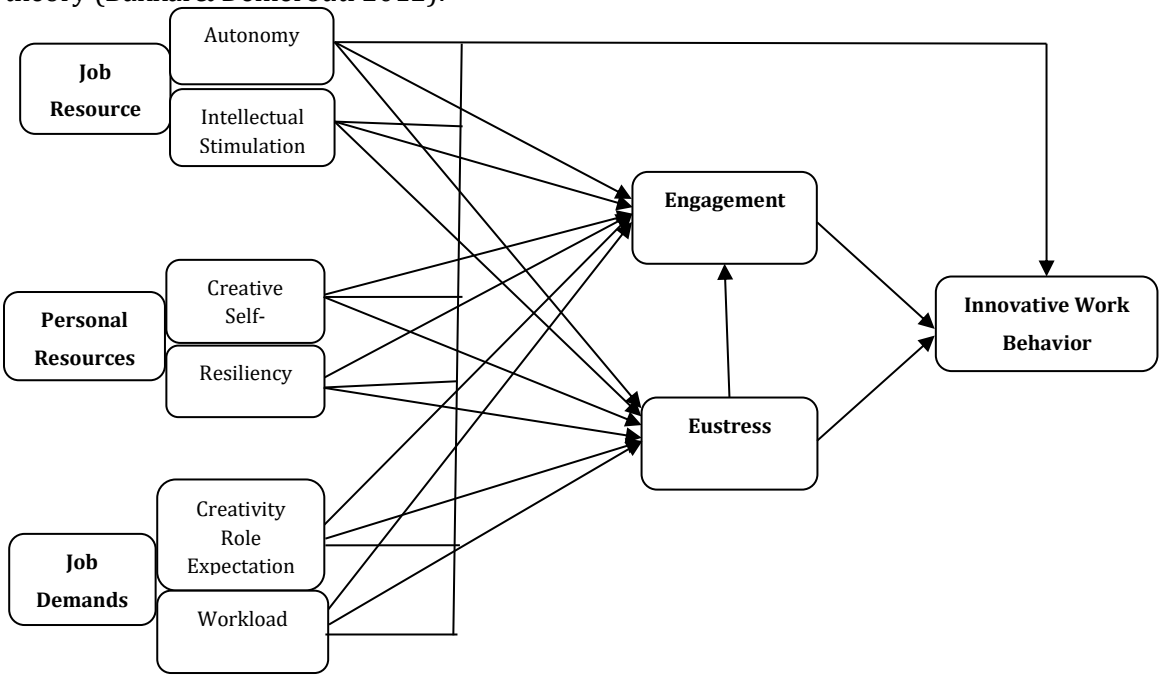
extended efforts desired performance level will be achieved which will result into valuable rewards. In contrast, hindrance demands are said to be negatively associated with work motivation. Since employee believes that due to obstacles task accomplishment and desired performance outcomes cannot be achieved despite imparting extended level of efforts. Therefore, outcome of hindrance demands is withdrawal and disengagement (Lepine et al., 2005).

According to Macey and Schneider (2008) work engagement made employees more involved in investment of personal resources into work roles that resulted into innovative work performance. Many research studies supported the view that positive relationship existed between availability of resources for employees, work engagement individual employee innovative performance(Demerouti et al; 2015). Another researcher De Spiegelaere et al. (2014) also found that work engagement mediated the relationship between job resources and innovation specific performance of employees. Similarly, the study of Aryee, et al (2012) indicated that due to work engagement relationship between job resources and innovative performance of employees was ascertained. The study of Agarwal et al. (2012) also has a synonymous view that employees exhibited innovative behaviors owing to building strong commitment and engagement towards their job role when supported by desired job resources and rational job demands.

3. Methodology

3.1 Conceptual Framework

This research study focuses on following hypothesized conceptual framework based on JD-R theory (Bakkar& Demerouti 2012):



(Figure 1: Hypothesized Research Model)

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3.2. Research Hypotheses

Following hypotheses have been formulated and tested to establish the study outcomes:

H1: There is significant relationship between job resources (autonomy, intellectual stimulation) and employee eustress.

H2: There is significant relationship between job resources (autonomy, intellectual stimulation) and work engagement.

H3: There is significant relationship between job resources (autonomy, intellectual stimulation) and innovative work behavior.

H4: There is significant relationship between personal resources (creative self-efficacy, resiliency) and employee eustress.

H5: There is significant relationship between personal resources (creative self-efficacy, resiliency) and work engagement.

H6: There is significant relationship between personal resources (creative self-efficacy, resiliency) and innovative work behavior.

H7: There is significant relationship between job demands (creativity role expectations, workload) and employee eustress.

H8: There is significant relationship between job demands (creativity role expectations, workload) and work engagement.

H9: There is significant relationship between job demands (creativity role expectations, workload) and innovative work behavior.

H10: There is significant relationship between employee eustress and work engagement.

H11: There is significant relationship between work engagement and innovative work behavior.

H12: There is significant relationship between employee eustress and innovative work behavior.

H13: Job demands, job resources and personal resources (Autonomy, intellectual stimulation, creative self-efficacy, resiliency, creativity role expectation and workload) have indirect effects on employee innovative work behavior through employee eustress.

H14: Job demands, job resources and personal resources (Autonomy, intellectual stimulation, creative self-efficacy, resiliency, creativity role expectation and workload) have indirect effects on employee innovative work behavior through work engagement.

3.3 Research Design

The nature of this study is non-experimental quantitative. The study has been conducted using deductive approach with cross sectional data collection technique. It examines relationship between the independent variables, dependent variables as well as mediators. Creswell (2003) states that quantitative study approach to an investigation better evaluates relationships among variables under review, reduces to specific questions, hypothesis & variables, uses observations & measurement and tests theories. According to Petty et al. (2012) the quantitative method is ideal for conducting research studies when relevant theory became mature. As, it explains a phenomenon by collecting numerical data and findings can be generalized purposefully.

3.4 Population, Sampling & Data Collection

The population of research study comprises of approximately 15,000 employees of distinct IT companies operating in Pakistan (Pakistan's IT Industry Review; 2020). According to 'Glenn's (1992) Published Table' standard representative sample size for this population is 370. However, considering previous trends of low response rate by respondents, a 450-sample size opted for data collection. A well-structured questionnaire was used as instrument for collection of data from respondents using cross sectional technique. Complete replies received from 398 x respondents.

3.5 Data Analyses Strategy

Data has been analyzed using structural equation modeling methodology. Smart-PLS software developed by Ringle, Wende &Will (2005) opted for data integration and interpretation of results. PLS structural equation modeling is a second-generation data analyses statistical tool suitable for empirical research studies. Using this data analysis technique linear and additive causal model supported by theory can be tested. Moreover, to evaluate theories and rational influence of each individual predictor variable on an outcome variable is calculated rationally which develops better understanding of variables than any other statistical test and successfully models are devised from the theories.

4. Research Findings

4.1 Respondents Profile

Out of 450 x respondents, 398 respondents replied to the questionnaire. 69.45 % were males and 30.55 % were females. Among these respondents 23% were undergraduate, 56% were graduate, 21% had postgraduate& above qualification. The service tenure of respondents in the IT sector is also diversified, 24% respondents service tenure is up to 05 years, 44% respondents has served between 5-10 years, 18% respondents have service experience between 10 to 15 years and 14% respondents have served for more than 15 years in the sector.

4.2 Convergent Validity

Convergent validity analyses are concerned with Cronbach alpha, composite reliability as well as Average variance extracted. The values of composite reliability of variables as illustrated below in table 1 are greater than 0.7 threshold. The value of AVE is also greater than 0.5 i.e., lies within required range (Hair, Ringle, and Sarstedt, 2011). The loadings of variables are also in accordance with desired range. Therefore, reliability and validity of the latent variables have been confirmed for the study.

Table 1 - Convergent Validity

Construct	Item	Loading	AVE	Composite Reliability	Cronbach's Alpha
AUT	Aut1 Aut2 Aut3	0.87 0.84 0.86	0.734	0.88	0.83
ITL	Itl1 Itl2 Itl3 Itl4	0.82 0.83 0.84 0.81	0.680	0.86	0.88
RAR	Rar1 Rar2 Rar3 Rar4 Rar5	0.83 0.88 0.85 0.87 0.86	0.736	0.89	0.84
CSE	Cse1 Cse2 Cse3	0.84 0.86 0.85	0.722	0.87	0.82
RES	Res1 Res2 Res3 Res4 Res5	0.87 0.83 0.90 0.86 0.84	0.740	0.91	0.84
CRE	Cre1 Cre2 Cre3	0.88 0.85 0.83	0.729	0.89	0.85
WLD	Qwl1 Qwl 2 Qwl3 Qwl4 Qwl5	0.81 0.84 0.83 0.80 0.82	0.673	0.85	0.86

WE	We1 We2 We3 We4 We5 We6 We7 We8 We9	0.83 0.87 0.84 0.82 0.91 0.90 0.86 0.85 0.89	0.746	0.92	0.89
EUS	Eus1 Eus 2 Eus 3 Eus 4 Eus 5 Eus 6 Eus 7	0.83 0.78 0.84 0.80 0.81 0.82 0.79	0.656	0.84	0.80
IWB	Iwb1 Iwb2 Iwb3 Iwb4 Iwb5 Iwb6 Iwb7 Iwb8 Iwb9	0.88 0.85 0.90 0.89 0.80 0.86 0.87 0.83 0.84	0.737	0.90	0.81

4.3 Discriminant Validity

Discriminant validity analyses have been conducted as per Fornell–Larcker (1981) which suggests that AVE value of latent variable must be greater than correlation among the constructs. Table 2 below clearly indicates that values of all variables of study fulfill the desired criteria. Therefore, discriminant validity has also been confirmed for variables involved in the study.

Table 2 – Discriminant Validity

	AUT	ITL	RAR	CSE	RES	CRE	WLD	WE	EUS	IWB
AUT	**0.734**									
ITL	0.461	**0.680**								
RAR	0.331	0.367	**0.736**							
CSE	0.352	0.447	0.604	**0.722**						
RES	0.444	0.521	0.593	0.479	**0.740**					

CRE	0.369	0.457	0.491	0.210	0.313	**0.729**				
WLD	0.313	0.339	0.471	0.338	0.389	0.401	**0.673**			
WE	0.497	0.496	0.537	0.356	0.497	0.356	0.296	**0.746**		
EUS	0.151	0.445	0.336	0.311	0.302	0.403	0.441	0.565	**0.656**	
IWB	0.449	0.443	0.525	0.642	0.603	0.566	0.531	0.607	0.290	**0.737**

Item wise Cross Loading

	AUT	**ITL**	**RAR**	**CSE**	**RES**	**CRE**	**WLD**	**WE**	**EUS**	**IWB**
Aut1	**0.711**	0.427	0.352	0.128	0.238	0.414	0.318	0.321	0.535	0.541
Aut2	**0.782**	0.238	0.221	0.276	0.126	0.247	0.233	0.418	0.334	0.472
Aut3	**0.806**	0.254	0.319	0.115	0.243	0.149	0.322	0.379	0.193	0.437
Itl1	0.522	**0.786**	0.455	0.655	0.590	0.273	0.454	0.459	0.353	0.439
Itl2	0.493	**0.807**	0.566	0.543	0.469	0.352	0.363	0.517	0.382	0.516
Itl3	0.541	**0.745**	0.672	0.472	0.416	0.401	0.412	0.475	0.417	0.473
Itl4	0.474	**0.773**	0.661	0.361	0.515	0.326	0.471	0.394	0.291	0.384
Rar1	0.453	0.235	**0.791**	0.419	0.393	0.291	0.513	0.511	0.516	0.461
Rar2	0.417	0.416	**0.712**	0.476	0.331	0.312	0.476	0.494	0.498	0.462
Rar3	0.395	0.466	**0.743**	0.514	0.384	0.371	0.603	0.461	0.523	0.442
Rar4	0.421	0.514	**0.776**	0.522	0.414	0.392	0.534	0.385	0.442	0.371
Rar5	0.503	0.573	**0.809**	0.390	0.476	0.402	0.493	0.415	0.392	0.514
Cse1	0.512	0.414	0.475	**0.739**	0.541	0.433	0.222	0.412	0.355	0.515
Cse2	0.531	0.384	0.516	**0.696**	0.473	0.414	0.271	0.471	0.414	0.533
Cse3	0.498	0.438	0.445	**0.715**	0.416	0.373	0.319	0.39	0.439	0.461
Res1	0.514	0.324	0.291	0.281	**0.751**	0.512	0.471	0.381	0.415	0.329
Res2	0.438	0.377	0.316	0.331	**0.763**	0.412	0.591	0.351	0.395	0.368
Res3	0.473	0.282	0.351	0.422	**0.723**	0.373	0.413	0.319	0.477	0.417
Res4	0.461	0.423	0.416	0.471	**0.794**	0.337	0.462	0.309	0.514	0.382
Res5	0.393	0.362	0.289	0.382	**0.734**	0.289	0.443	0.295	0.504	0.297
Cre1	0.613	0.413	0.539	0.533	0.611	**0.691**	0.472	0.642	0.440	0.452
Cre2	0.581	0.512	0.561	0.411	0.532	**0.743**	0.512	0.581	0.238	0.521
Cre3	0.470	0.497	0.495	0.563	0.463	**0.761**	0.393	0.637	0.266	0.449
Wld1	0.561	0.335	0.567	0.413	0.294	0.236	**0.813**	0.545	0.436	0.195
Wld2	0.442	0.441	0.446	0.322	0.273	0.344	**0.835**	0.445	0.479	0.227
Wld3	0.535	0.411	0.469	0.293	0.222	0.332	**0.835**	0.487	0.569	0.169
Wld4	0.495	0.512	0.509	0.287	0.208	0.298	**0.746**	0.412	0.347	0.213
Wld5	0.471	0.351	0.536	0.408	0.199	0.254	**0.768**	0.389	0.336	0.157

We1	0.211	0.545	0.617	0.162	0.414	0.561	0.327	**0.831**	0.519	0.491
We2	0.134	0.576	0.553	0.215	0.548	0.524	0.361	**0.873**	0.507	0.471
We3	0.223	0.556	0.542	0.227	0.463	0.490	0.419	**0.84 2**	0.496	0.443
We4	0.276	0.565	0.491	0.299	0.416	0.477	0.393	**0.823**	0.484	0.412
We5	0.298	0.446	0.444	0.161	0.392	0.541	0.374	**0.814**	0.545	0.408
We6	0.345	0.476	0.393	0.113	0.444	0.443	0.334	**0.795**	0.563	0.456
We7	0.398	0.487	0.387	0.337	0.498	0.574	0.404	**0.708**	0.525	0.337
We9	0.412	0.503	.0334	0.259	0.395	0.505	0.446	**0.731**	0.508	0.372
Eus1	0.155	0.238	0.124	0.241	0.162	0.226	0.339	0.352	**0.812**	0.216
Eus2	0.226	0.294	0.113	0.243	0.116	0.218	0.315	0.33	**0.803**	0.223
	0.219	0.351	0.146	0.125	0.103	0.263	0.146	0.306	**0.782**	0.116
Eus4	0.128	0.295	0.192	0.146	0.186	0.302	0.178	0.317	**0.794**	0.172
Eus5	0.192	0.222	0.109	0.163	0.139	0.195	0.194	0.292	**0.765**	0.130
Eus6	0.203	0.305	0.178	0.115	0.198	0.184	0.186	0.408	**0.772**	0.172
Eus7										
Iwb1	0.416	0.512	0.392	0.41	0.243	0.099	0.214	0.415	0.118	**0.832**
Iwb2	0.474	0.471	0.372	0.426	0.353	0.255	0.164	0.474	0.147	**0.804**
Iwb3	0.416	0.495	0.404	0.498	0.195	0.113	0.173	0.568	0.194	**0.814**
Iwb4	0.505	0.543	0.336	0.361	0.272	0.102	0.132	0.507	0.142	**0.826**
Iwb5	0.462	0.562	0.384	0.331	0.363	0.145	0.121	0.596	0.101	**0.782**
Iwb7	0.393	0.447	0.448	0.403	0.222	0.133	0.108	0.463	0.183	**0.741**
Iwb8	0.505	0.482	0.473	0.425	0.373	0.161	0.089	0.474	0.226	**0.756**
Iwb9	0.446	0.538	0.367	0.462	0.403	0.088	0.136	0.522	0.208	**0.762**

4.4 Model Fitness - Blindfolding and Coefficient of Determination

The predictive accuracy of endogenous latent variables is assessed by R^2 and Q^2 values. 0.25, 0.50 and 0.75 values of R^2 indicate weak, moderate, and strong association respectively. Table 3 below shows that innovative work behavior, work engagement and eustress have strong, moderate, and weak association respectively. Q^2 values in table 3 indicate that work engagement and innovative work behavior have large prediction relevancy and eustress has medium prediction relevancy.

Table 3- Blindfolding and Coefficient of Determination

Construct	R^2	Q^2
WE	0.49	0.36
EUS	0.25	0.15
IWB	0.76	0.35

4.5 Evaluation of Structural Model

To confirm multicollinearity bootstrap analyses were carried out. These analyses confirm statistical significance of the path Co-efficient (Hair et al., 2012). Table 4 below shows that all variables are significant and are being defined by all dimensions. The value of all variables lower than 5 clearly indicate that multicollinearity issue does not exist among variables in the study.

Table 4 - Weights for Formative Dimensions

Constructs	T- Statistics	P-Value	VIF
AUT	12.542	0.002	8.850
ITL	7.012	0.000	4.258
CSE	2.890	0.000	2.280
RES	6.124	0.001	1.577
CRE	3.840	0.000	3.248
WLD	16.705	0.004	6.776
WE	5.425	0.002	3.420
EUS	4.458	0.000	2.643
IWB	3.450	0.003	9.725

4.6 Hypotheses Testing

Tables 5, 6 and 7 below indicate that all hypotheses (H1 to H14) have been supported. Direct and inventing effect of all variables ascertained for this study. Intervening effect of eustress and work engagement (between independent variables i.e., job demands, job resources and personal resources and dependent variable innovative work behavior) have also been confirmed.

Table 5- Indirect Effect through Work Engagement on Innovative Work Behavior

	Original Sample (β)	Sample Mean (M)	Standard Deviation	t-value	p-value	Decision
AUT -> IWB	0.21	0.22	0.08	2.26	0.01	Supported
ITL -> IWB	0.18	0.20	0.14	7.99	0.00	Supported
CSE -> IWB	0.35	0.35	0.09	5.36	0.00	Supported
RES -> IWB	0.16	0.18	0.19	2.74	0.00	Supported
CRE -> IWB	0.19	0.20	0.12	3.20	0.01	Supported
WLD -> IWB	0.07	0.09	0.10	4.56	0.01	Supported

Table 6 - Indirect Effect through Eustress on Innovative Work Behavior

	Original Sample (β)	Sample Mean (M)	Standard Deviation	t-value	p-value	Decision
AUT -> IWB	0.19	0.21	0.12	5.46	0.02	Supported
ITL -> IWB	0.09	0.10	0.15	3.38	0.00	Supported
CSE -> IWB	0.14	0.14	0.17	6.90	0.02	Supported
RES -> IWB	0.15	0.18	0.20	2.88	0.01	Supported
CRE -> IWB	0.11	0.13	0.11	3.22	0.04	Supported
WLD -> IWB	0.20	0.22	0.15	4.76	0.00	Supported

Table 7 - Direct Effect

	Original Sample (β)	Sample Mean (M)	Standard Deviation	t-value	p-value	Decision
AUT ->IWB	0.29	0.31	0.12	3.29	0.00	Supported
ITL ->IWB	0.22	0.23	0.09	2.95	0.01	Supported
CSE ->IWB	0.46	0.49	0.11	5.75	0.04	Supported
RES ->IWB	0.21	0.23	0.17	3.22	0.00	Supported
CRE ->IWB	0.31	0.32	0.16	2.68	0.02	Supported
WLD ->IWB	0.24	0.25	0.15	7.35	0.01	Supported
AUT ->WE	0.45	0.47	0.09	3.52	0.00	Supported
ITL ->WE	0.36	0.39	0.13	3.88	0.01	Supported
CSE ->WE	0.20	0.22	0.19	2.67	0.02	Supported
RES ->WE	0.33	0.36	0.13	2.45	0.00	Supported
CRE ->WE	0.15	0.18	0.22	6.12	0.03	Supported
WLD ->WE	0.10	0.11	0.18	3.14	0.01	Supported
WE ->IWB	0.46	0.47	0.11	4.24	0.00	Supported
AUT ->EUS	0.03	0.05	0.17	17.25	0.02	Supported
ITL -> EUS	0.18	0.19	0.22	8.23	0.01	Supported
CSE ->EUS	0.03	0.04	0.17	7.08	0.04	Supported
RES ->EUS	0.16	0.19	0.10	6.18	0.00	Supported
CRE ->EUS	0.31	0.33	0.18	3.56	0.00	Supported
WLD ->EUS	0.41	0.42	0.14	4.83	0.02	Supported
EUS -> IWB	0.02	0.07	0.20	9.16	0.01	Supported
EUS -> WE	0.43	0.45	0.11	4.10	0.00	Supported

4.7 Explanation of Target Endogenous Variable

The value of R^2 (the coefficient of determination) is 0.76 for IWB latent variable. It indicates that eight latent variables (AUT, ITL, CSE, RES, CRE, WLD, EUS and WE) explain 76% of the variance in IWB. AUT, ITL, CSE, RES, CRE, WLD together explain 49% of the variance in WE and 43% in EUS.

5. Discussion

The purpose of this study was to examine the determinants of innovative work behavior under the application of JD-R theory. Role of job demands job resources and personal resources in stimulating innovative work behavior was empirically examined. Furthermore, role of employee eustress and engagement was also examined being mediating variables for relationship between job demands, job resources, personal resources, and innovative work behavior. The results indicated that job demands (Workload and Creativity Role Expectation) were positively related to IWB. Furthermore, it was also confirmed relationship between job demands and innovative work behavior is mediated by eustress and work engagement. These results are somehow different to previous research studies which concluded that job demands are concerned with employee burnout and are source of diminishing individual

creativity and innovation. Furthermore, it also emerged from the study that challenge demands have positive relationship with employee motivation and innovative work behavior in contrary to hindering demands that have negative relationship with employee motivation and innovative performance. Therefore, job demands may be source of individual engagement in work roles and stimulation of innovative work behavior. This study duly found that workload and creativity role expectations being challenge demands create positive stress (eustress) for employees and enhance employee engagement and innovative work behavior (Jornberg, Nathan H; 2017) and (Kamran et al. 2018). Job resources (Autonomy and Intellectual Stimulation) were also found to be positively and significantly related to employee IWB directly and through the mediated mechanism of employee eustress and engagement. Here findings are in lines with previous research studies that concluded job resources increased employee motivation and work engagement. In addition, this study concluded that availability of desired job resources also increased positive stress (eustress) that contributed toward employee work engagement and innovative performance (Jornberg, Nathan H; 2017) and (Naveed et al. 2019). Personal resources (creative self-efficacy and resiliency) have also been found to be positively and significantly related to innovative work behavior. Moreover, employee eutress and engagement also mediated the relationship between personal resources and innovative work behavior. The findings pertaining to increasing employee's work engagement and innovativeness through personal resources are in lines with previous literature. However, additionally it also emerged that personal resources positively relate to positive job stress (eustress) which becomes source of increasing employee engagement and innovative work behavior. Most of study results are synonymous to previous researchers' studies, however new addition in this study is that job demands if set as challenge demands and to a rational extent, they become source of positive stress and motivation and increase work engagement and innovative performance of employees. Furthermore, in the presence of adequate job resources and personal resources eustress may be sustained to achieve optimal employee engagement and innovation specific performance.

5.1 Conclusion

This research study devised a model comprising of determinants of innovative work behavior by examining the role of selected job demands, job resources and personal resources in stimulating Innovative Work Behavior directly and through the mediating mechanism of employee eustress and engagement. Previous researchers highlighted positive role of job resources and personal resources in stimulating innovative work behavior through employee engagement and studied the role of job demands as having negative association with employee engagement and innovative work behavior and have direct relationship with distress and burnout. In contrast, this study has taken into account a positive role of job demands i.e.,rational and challenge demands are source of creating positive stress (eustress) for employees that increases work engagement and innovative work behavior.

The study found empirical findings and contributed to scholarly literature adequately with addition of new empirical knowledge.This study has practical implications for IT sector professionals. However, the study is equally beneficial for other industries as well. Since, it has provided valuable knowledge pertaining to individual and contextual determinants that

stimulate IWB of employees. Furthermore, due to job demands positive role of stress (eustress) has also been emerged which is a new addition to JD-R and innovation theories.
This study has practical implications for IT sector practitioners. During hiring process IT recruits may be given specific attention for possessing with desired personal resources (traits) for exhibiting innovative work behavior by employees during work roles. The study also concluded that job resources play significant role in engaging the employees into innovative performance. This aspect may be given specific attention by managers and provisioning of desired job resources may be ensured for enhanced innovative performance by the employees.Although the nature of job demands is negative and various studies concluded that they create distress in employees. However, this study concluded that demands may create positive stress to improve innovative performance in organizational setting if kept rational. Therefore, managers may know that rational and challenge demands motivate the employees. Managers may exercise this perspective to improve innovative performance of their employee at workplace. Most of study outcomes are synonymous to previous studies (Bakkar& Demerouti 2012 and Naveed et al. 2019) except inclusion of eustress as mediator between job demands, job resources, personal resources, and innovative work behavior. Furthermore, in this study sequential mediation of eustress and work engagement has been taken into account which in new addition to the relevant literature.

5.2 Future Direction of Research Study

Future studies may use more variables of job demands, job resources and personal resources to further enrich the findings of innovative work behavior. This study did not use any moderating variable, future studies may opt for moderating variables for better understanding of relationships and findings.

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