

**IMPACT OF WISDOM MECHANISM ON TEAM CREATIVITY
WITH MEDIATING ROLE OF TEAM VIRTUE
AND MODERATING ROLE OF TEAM CLIMATE**

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ABSTRACT

Idea of wisdom, which refers to how individuals make right use of their knowledge through their common-sense activities, decisions, and moral choices, overall draws in analyst interest in an assortment of disciplines, like philosophy, psychology and management studies, little is thought concerning how wisdom is conceptualized and afterward operationalized in the software development project team setting. In view of the systems for philosophical, bunch and hierarchical wisdom, this paper recognizes software development project, team wisdom as a process for how team members best utilize the stock. Also, stream of their knowledge through aggregate judgment, righteousness morals, feelings/sentiments, and powerful dynamic during their project-related endeavors. Adapting the endeavors and utilitarian similarities of both gathering and hierarchical wisdom rehearses, this work establishes that wisdom-related mechanisms e.g., team variety, organizing with different teams and individuals, and. their previous encounters, team ethicalness and team climate become the various essences of the software development team wisdom process. We then, at that point, propose how these various faces interconnect and how they additionally identify with project process effectiveness, for example, team learning, team creativity and speed-to-clients, both of which have been not really tended to experimentally with regards to software development project teamwork. By insightful 170 in-house software development project teams in a field concentrate on utilizing on the web study: (a) software development wisdom-related mechanisms decidedly identify with team creativity (b) software development team excellence are emphatically connected with software development team creativity, and further (d) Team righteousness intercedes between wisdom mechanism process and team creativity. We close by talking about our discoveries as they identify with the wisdom structure of software development project teams and propose the vital administrative ramifications for various kinds of software development projects.

KEYWORDS

Wisdom, team creativity, team virtue, team climate.

1. INTRODUCTION

Software development is a complicated process and involves various procedures, individuals, teams, and departments to perform (Akgün, 2020). Along with different departments and teams involved in the process of developing a software, the respective knowledge and expertise also play an integral role in software development. Effectively managing and handling the knowledge and processes in software development is imperative to the success of software built and developed and to complete a project on time (Ralph, 2018). Researchers also analyze that along with the cognitive knowledge, practices, and the existing guidelines to complete a successful software project, the collective attributes of the team are also integral to the project success (Nielsen, 2006). The team attributes cope with the realities of project-related issues, decisions, and how the knowledge is applied critically, practically, aesthetically, and ethically (Ghobadi & Mathiassen, 2017). A software development project team, thus, must be able to gather and utilize their collective wisdom to collect and implement the knowledge and critical judgment, aesthetic capacity, and prudence of the team members to become a successful project team during the process of software development (Coakes, Coakes & Rosenberg 2008). Team wisdom is highly attributed with success and enhanced performance of teams in organizations and business corporations (Wang, Keil, Oh & Shen, 2017). The success of Software projects is not only impacted by the existing knowledge and skill set of Software development team members possess, but also by the wisdom about the certain knowledge and practices that are to be used in order to develop a successful software product (Dalal & Pauleen, 2019). Software development team wisdom provides a principal framework, a great insight, to emphasize information processing by elevating knowledge management view of software development teams but that only offers an incomplete picture of knowledge management methodologies (Ghobadi & Mathiassen, 2017). Software development teams are heavily influenced by Human factor, Organizational Project and Knowledge aspects.

Project teams represent an ethical and logical approach to completing tasks in a business environment (Akgün, 2020). Creativity refers to the ability of the project teams to solve problems and to leverage opportunities by using innovation, cognitive ability, and out of box thinking. Team creativity is an integral part of team attributes (Wang, Kim & Lee, 2016). Understanding and analyzing team creativity is becoming important considering its ubiquity in today's organizations. From executive managements to customer service, research and production teams, quality teams, and development teams in software setups, team creativity is becoming a recognizable area of interest because of its impact on the outcome and success of software project management (Barczak, Lask, & Mulki, 2010; Pirola-Merlo & Mann, 2004).

Team wisdom within in software development are a part of many studies. Certain team wisdom dimensions like intuition, (Ralph, 2018), judgment and reasoning (Clarke, 2012; Ralph, 2018), team prudence (Dalal & Pauleen, 2019), as well as the virtue ethics of the project team are explored and analyzed (Wang, Keil, Oh & Shen, 2017) Several studies have also combined these team attributes with the project success and outcome of software development (Akgün, Dayan & Di Benedetto, 2008). However, the phenomena of project team wisdom in software industry is still implicit and not directly addressed. There is a need to analyze the relationship between team wisdom and team creativity (Ali E. Akgün,

2019). From a managerial implications of knowledge management, there is a lack of research on the impact of project team wisdom on the collective creative abilities of the project teams in software development (Neves et al., 2014). This paper discusses how team wisdom process can impact and influence Project Team's collective creativity in Software development and understanding of how this wisdom can be applied for the effective and successful production of software by boasting team's potential and creativity. The study uses the structural equation modeling (SEM) technique to test verify, and validate various wisdom-related mechanisms associated with the team wisdom process (Akgün, 2020). Furthermore, it analyzes the impact of team wisdom on team creativity.

1.1 Problem statement

Many companies and organizations practice team wisdom process to assess competency, capabilities and performance of their Project Teams. Yet there are some elements that are impacted by the whole process (Dalal & Pauleen, 2019). One of the most important that is faced by in-house software development teams and organization is the attribute and behavior of team towards the project. Attribute like Team Creativity can change the outcome of each Project (Egan, 2005). Hence, it is a dire need to recognize and investigate the association between team creativity and team wisdom process (Egan, 2005). Team wisdom's impact on team attributes plays a crucial role in completing project successfully and desired outcome.

1.2 Research gap

Studies have been done previously on discrete and scant aspects of team wisdom some of which were intuition (Ralph, 2018), reason and judgement (Ralph, 2018; Clarke, 2012), prudence and combining Project Team Wisdom to team intelligence (Akgün, 2008). Furthermore, there are studies that analyzed association of team wisdom and success delivery of Project. However, there are no studies that suggested any correlation between team wisdom and team creativity. This paper discusses how team wisdom process can influence Project Team's collective and individual creativity in Software development and understanding of how this wisdom can be applied for the effective and successful production of software by boasting team's potential and creativity.

1.3 Research objectives

Based on problem statement the study has following objectives:

- To study the impact of wisdom mechanism on team creativity.
- To find the relationship between team virtue and team creativity.
- To study the impact of wisdom mechanism on team virtue
- To check whether team virtue mediates the relationship between wisdom mechanism and team creativity.
- To check whether team climate moderates the relationship between team virtue and team creativity.

1.4 Research questions

- What is the impact of team wisdom on team creativity in software project development?
- What is the impact of team virtue on team creativity?

- What is the impact of wisdom mechanism on team virtue?
- Does team virtue mediate the relationship between wisdom mechanism and team creativity?
- Does team climate moderate the relationship between team virtue and team creativity?

1.5 Significance of Study

The factors exploring the association of team attributes for successful project delivery of software products have been studied in past, along with the dispersed studies of their connection to team wisdom. The wisdom- related mechanisms along with team virtue and prudence collectively defines the software development project team's wisdom process. The study holds significance as it mitigates the gap by using the existing knowledge of team wisdom process and defines a formal relationship between team wisdom and team creativity. With the advancement of project teams and a shift of software industry towards the use of better and more efficient approaches, discussing team creativity is important as it directly affects the outcome and results of software projects. Thus, the current study holds significance in the software industry and solves one of the major dilemmas of project failures by analyzing the impact of team wisdom on team creativity.

2. LITERATURE REVIEW

2.1 Theoretical Underpinning

The concept, understanding, and use of the term “wisdom” is as old as the human history itself. For 5000 years ago, wisdom and the concepts behind the term are used and discussed in research, writings, and practical implementation. The earliest use of wisdom is found from the writings of Socrates. Besides, the Platonic dialogues, the “Nicomachean Ethics” by Aristotle, as well as other historic teachings of the earliest scientists, researchers, and philosophers describe the term wisdom. (Bower, 1990). The broad definitions of wisdom were later further redefined resulting in the characterization and classification of wisdom. According to this newer definition, wisdom is defined as a system of knowledge that is used in understanding and solving the practicalities of life. (Baltes, 2000). Wisdom can be referred as a non-deterministic, extrapolative, and non- probabilistic process. It is refined from the basic levels of philosophical aspects of consciousness, data, information, knowledge, and understanding. It is applicable on the moral and ethical codes and programs of human mind (Sternberg, 1998).

However, the previous four levels of consciousness are basic and don't provide the capability to question the existence of any pragmatic of life. Wisdom, on the other hand, asks various questions about the existence of phenomenon, procedures, and practicalities (Bower, 1990). It asks questions that are not easily answerable. Wisdom, hence, is the process that we use to judge the difference between right and wrong, moral and immoral, ethical and unethical (Kekes, 1983). Apart from “individual wisdom” that has been always been a part of psychology literature, the term had also been adopted in the literature of management (Akgün, Keskin, & Kırçovalı, 2019). There are various aspects of wisdom that are discussed in terms of organizational leadership. Besides, organizational leadership is further classified into an array of categories that describe the working of an organization with accordance with the basic notions of wisdom (Lindsjörn et al., 2016).

Software development project team wisdom mechanism clarifies the confusion between the concepts and wisdom by implementing the achieved knowledge in the process of software development. Several past studies have analyzed a hierarchy of data-information-knowledge- wisdom (DIKW) (Rowley, 2006), or have used team wisdom as a guiding principle of project development. Based on the above hierarchy, data, information, knowledge, understanding, and wisdom, the five concepts determine the continuum. These concepts reflect the involvement of human behavior with solving the problem at hand (Tsoukas, & Vladimirov, 2001). The utilization of the continuum in software development methodologies and procedure can be defined as: (1) the programmable code is the most basic concept of the continuum; data, (2) the context-based arrangement and settlement of the program code is the information. (3) Knowledge is the jury of the importance of the program code, (4) understanding is the learning of practical implementation of the program code, and (5) wisdom is the learning of why and how the specific knowledge is used in the software development process (Bellinger, Castro & Mills, 2004). Based on the continuum of five concepts of knowledge management, team wisdom process is the highest level of the management process and offers an interconnecting function for managing the project team's knowledge as well as skills to successfully develop software projects (Bellinger, Castro & Mills, 2004). Moreover, project team wisdom mechanism offers a collective framework for software development practices (i.e., wisdom-related mechanisms, team virtue, and team prudence). This framework enriches the project related practices and skills of the project development team (Bellinger, Castro & Mills, 2004).

2.2 Conceptual Definitions

2.2.1 Wisdom Mechanism

Scientists characterize administrative wisdom as the capacity of chiefs, team pioneers, and tutors, to control, catch, and deal with the significance of feasible knowledge, working process, and comprehensive methodologies of preparation activities (Moberg, 2001). Moreover, administrative wisdom is likewise characterized as the understanding and execution of the above knowledge in an all-encompassing integrative way (Malan and Kriger, 1998). One more order of wisdom that is utilized in administration sciences is team wisdom. Gathering/team wisdom depicts the refined and commonsense utilization of knowledge used or implanted in the activities of the teams working in the association. It likewise incorporates the coherent decisions needed to deal with numerous real factors alongside depicting and utilizing enthusiastic, implementable, and moral contemplations (Bierly, Kessler and Christensen, 2000; Rowley, 2006). Thinking about this, team wisdom is considered as a superior and more powerful way to deal with address the knowledge just as the useful work in the tasks of the associations and endeavors that need more elevated level of scientific, moral, critical, just as different requests to deal with these processes (Küpers, 2007). In experimental examination in the investigation of team wisdom, (Nielsen, 2006) supported that team wisdom is an indispensable piece of any association in compromise the board between the teams. It is needed to deal with the distinction of assessment and interest in the contending team individuals. Besides, it likewise sorts out the needs, requests, and needs of team individuals while successfully dealing with the abilities just as capacities of the whole team (Sternberg, 1998).

A Software development project team is a team that works on the development of the software- based products. Such teams are a specific work group and includes human, team, projects, knowledge factors, and an organization (Jiang et al., 2018; Ralph, 2018). The connection of these knowledge- based factors between the team members can pose challenges for the software development project teams. These challenges involve issues like generating interpretations from the team members working on any specific project as well as the users (Hansen & Rennecker, 2010). The challenges and protocols are escalated by an increased level of complexity in dealing with advanced knowledge during a project of software development (Bano & Zowghi 2015; De Vasconcelos, 2017).

Software project development process is a perplexing idea and incorporates different components that assume indispensable parts in adding to the plan, development, and accomplishment of the project. To handle these diverse difficulties, scientists advocate that teams that work on software development projects require elaborative and viable methodologies to adapt to unexpected circumstances during the software project development lifecycle and to guarantee the fruitful development of the software-based items (De Vasconcelos, 2017). To provide food this thought, the establishing rules as far as connections and correspondence between the teams and the above noted variables can be overseen all the more productively and adequately by executing the ideas of team wisdom into software development as a binding together system for project the board. This idea is used certainly in the software development belief system and practices, i.e., software designing examination (Ralph, 2018), process spryness Drury-Grogan, Conboy and Acton, 2017), software plan (Venters et al., 2018), knowledge the board (De Vasconcelos, 2017), and open-source software development (Rolandsson, Bergquist and Ljungberg, 2011). The software development project team wisdom process catalyzes the capacity of project teams by characterizing "the thing to do" and "how it ought to be finished" inside the development project teams (Akgün, 2020). Besides, it also describes "what can be done" by utilizing the available knowledge to lead the project to success. (De Vasconcelos, 2017). Using the team wisdom mechanism, team members can learn and enhance their knowledge by renewing their concepts about the challenges and needs and use the required knowledge in order to develop software products. Additionally, where on one hand, team wisdom mechanism increases the knowledge within the project team, on the other hand, it also improves the understanding and learning the aspects of software development project management by offering equilibrium, harmony, and guidelines to improve the development process in order to provide better results and develop robust software projects. However, Venkitachalam and Willmot (2017) advocate that the amount of knowledge utilization in the process of software development must be balanced. Too much emphasis on knowledge management can produce saturation in the team processes. This could lead to flexibility issues within and outside the team, hence impacting the results of projects (Alsayed, 2020).

2.2.2 Team Virtue

Team virtue relates to the ethical tendency of the team members that guides their moral as well as ethical behaviors within a software project team (Akgün, 2019). Team virtue refers to the ethical self-organization of the team instead of only a moral mandate.

2.2.3 Team Climate

Team climate is the worker's common impression of hierarchical occasions, practices, and techniques (Anderson and West, 1998). Estimating climate for work bunch advancement: Development and approval of the team climate stock. West and associates' climate model is, in our mindfulness, the main model zeroing in team level climate (Anderson and West, 1998). In light of a hypothesis of team advancement, the creators fostered a four-factor model including:

- Vision
- Participative safety
- Task orientation
- Support for innovation.

The effects of team level variables on specific creativity does not clearly discuss two important team climate variables in organizational research (Anderson, Potočník & Zhou, 2014): teamwork and struggle. Loch, Galunic and Schneider (2006) narrate in their study that Team members frequently motivated to engage concurrently in both team work and struggle. On other side, Gagné and Deci (2005) tells, inspiration is to satisfy needs for understanding may lead to a cooperative team climate; and also, individual performance base rewards encourage team members to compete, creating a competitive team climate.

2.2.4 Team Creativity

Another important factor that also play an integral role in software project performance is the creativity of the team. Team creativity is defined as the ability of the project development team to develop products and projects using out of the box innovative solutions (Egan, 2005). Team creativity is a new dimension that relates to wisdom related mechanism and is equally important to analyze. Software projects are complex in nature. A lot of projects require different and advanced approach to handle the challenges and solve the problem at hand. Creative teams are capable of thinking and implementing such solutions. Team creativity provides information about the ability of the team to handle stress and pressure related challenges easily (Reiter-Palmon, Wigert, & de Vreede, 2012). Without the learning of creative aspects of the team, the relationship between team wisdom mechanism and knowledge management in software project development cannot be analyzed. Thus, the impact of wisdom related mechanism on the creative aspects of the team must be analyzed and evaluated. Also, the attributes of team wisdom are interconnected to team creativity. Team virtue, ethical values of the team, and team prudence relates to the team creativity (Reiter-Palmon, Wigert, & de Vreede, 2012).

2.3 Hypothesized Relationship

As different attributes of wisdom are considered in analyzing the process-understanding of the software development project as a team, we will use the theory of the process of philosophy (Styhre, 2002) to create our hypothesis. Based on the theory of process philosophy, we have got help from the extended literature to be able to develop the hypothesis of the current research (Styhre, 2002). We are able to discover that the team wisdom process is initiated by establishing and implementing the wisdom mechanism and its domains (Jörg Gottschlich, 2014). It is further extended by additional attributes like team virtue and team prudence (Kupperman, 2009). Finally, the team wisdom process impacts the team creativity, hence changing the results of the software development

projects based on the creative ability and cognitive approach of the software development project team. The following hypothesis is concluded from the study:

H₁: Team wisdom impacts the team creativity of software development project teams.

Team wisdom comprises of three domains, (i) team networking, which is the resource sharing and flow of information within and outside the team. (ii) team diversity, which relates to the diversity and change in the cultural and professional background of the team, and (iii) team experience, which indicates the combined experience of the team in conducting and successfully delivering similar software development projects. These dimensions of team wisdom are based on the agreement of collective group wisdom (Landemore & Elster, 2012; Andler, 2012). At this point, we conclude that team wisdom mechanism impacts the creative ability of the team which in turn impacts the outcome of the software development process. The team networking within and outside of the team will impact its creativity ability to solve challenges. Similarly, the diversity in the group and the collective experience of the team will also impact the creativity of the team, depending on which, the outcome of a software development project will be impacted.

H₂: Team wisdom mechanism relates to team virtue of software development project teams

We argue that team wisdom mechanism has a relationship with team virtue. Software development project involves reasoning and communication within and outside the team. Most of the teams take decisions and reasoning on the base of their intuitions (Ralph, 2018). However, the moral and ethical compass of understanding the right approach to reason for something is required. Hence, we suggest that team wisdom mechanism has a connection with team virtue and the two forms a relationship (Akgün, 2020). During the development of software wisdom mechanism is directly associated with team attributes like team It is the wisdom of the mechanisms that team members have the opportunity to be able to ask questions about how their decisions will affect all the hard work of the other members of the team, and how each and every member of the team will need to conduct themselves in a manner that upholds the common good of the team; (Nielsen et al., 2007) quoted in our study how team members can apply their own professional experience and knowledge to advantage the full team.

H₃: Team virtue relates to team creativity of software development project teams.

We finally suggest that team virtue has a relationship with team creativity in software project development procedures. The teams use their intuitions to provide a solution to tackle the problem at hand. However, no matter how creative the solution is, it needs to be ethically and morally correct. Team virtue is important in understanding and depicting the role of team creativity in solving problems and efficiently provide solutions (Egan, 2005). Hence, we suggest arguing that team virtue has a relationship with team creativity. During development of software projects or products team virtue plays a vital role. Virtue of team during development of software projects, it is collective epistemic actions. Of course, because virtuous teams shed light on ethical decisions. Precisely, as virtue teams highlights the ethical judgments, focusing on team collective benefits, team Each member should be a part of conversation and they should respond honestly and go beyond their own interests Team virtue, reduces preconception and inflexibility of the social arrangements of the

members of the team. During this time, the team members can easily check their understanding of the relationship with the other members of the team, and the users due to the presentation of the items/concepts/ideas based on the perceptions of other. This process of predictions includes experiencing the aesthetic & rendering emotional comfort rather than only rational understanding (Isen, 1987).

H₄: Team virtue mediates between wisdom mechanism and team creativity

Team virtue is a team attribute that contributes in creating team wisdom mechanism (Ralph, 2018). Also, team virtue alone cannot interpret or control the impact or action of wisdom mechanism. However, with the presence of this attribute, the team wisdom mechanism can be impacted. Thus, we argue that team virtue mediates the relationship between team wisdom mechanism and team creativity. The relationship is shown in Figure 1. Through empirical observations it suggests that virtue of team is the core of team wisdom process and this process highlights virtue-ethical characteristics of the wisdom and of the compliance with the legal role to play in the promotion of the members of the team, to build a network. Akgün et al. (2019) narrate in study that, apart from wisdom- related mechanisms, another path Philosophy of wisdom is virtue, this mostly ignored in software project team analysis. Team morality inspires and help other team members to improve their individual moral behaviors within development project team.

H₅: Team climate moderates the relationship between team virtue and team creativity

Most people in the company's work in teams, which results in individual creativity that is often enacted in this context (Shalley, Zhou & Oldham, 2004). In such company's team, this climate creates more effect than companies' climate. This work helps to engage team members in creative behavior and with cooperation, they produce innovative output

2.4 Conceptual Framework

Figure 1 shows the interconnection of wisdom mechanism, team virtue, and team creativity. Team virtue creates a bridge between the wisdom mechanism and team creativity and work together. The impact of wisdom mechanism on team creativity will either increase or decrease the efficiency and performance of the software development project team.

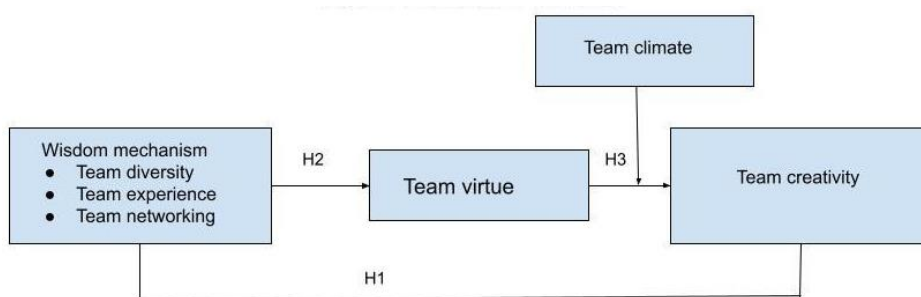


Figure 1: Conceptual Frame

3. RESEARCH METHODOLOGY

Research methods define population, sampling technique, sample, data collection instrument, data collection method, unit of analysis, time horizon and data analysis technique. The instruments are well defined that will be used for data collection. Also discusses the methods which is used to analyze data.

3.1 Population and Sampling

To conduct the current study, we have chosen the software houses registered with PSEB. We have selected 100 software houses that offer software development project services. As the population of this study, in this regard all such software houses which are registered with PSEB and working in vicinity of Rawalpindi and Islamabad will be our sample. We will be selected 300 respondents to conduct the study. Convenient sampling was followed to distribute questionnaire among individuals from target industry because it is easy to collect data from random population. When your population is known and we use sampling probabilistic technique as we know that our research target software houses under registration of Pakistan software export board. Non-sampling technique is used when your population is unknown. To conduct the current study, we used SRS (Simple Random Selection) sampling technique as the sampling technique. 300 respondents were contacted and asked to voluntarily participate in the study. We collected the data from team members and managers in middle, and upper management of organizations. The technique is consistent with the previous studies. We argue that the respondents selected for the current study are the representatives of our target population.

3.2 Data Collection Instrument

We have used questionnaire-based survey for data collection method. The survey was distributed to the respondents and each response was evaluated and added in SPSS. Using the software, the responses were validated and evaluated. The questionnaire will be adapted with changes implemented according to the requirement. Moreover, the adapted changes are tested for validity and the instruments items were selected only after the they will be validated. Study undertaken by Hannah, Uhl-Bien, Avolio and Cavarretta (2009) study help to measure networking by asking five questions. Study undertaken by Akgun and Lynn (2002) study help to measure experience of team by the five question items. Study undertaken from Dayan, Ozer, and Almazrouei (2017) and help diversity of team by asking three questions. Similarly, questionnaire of team creativity was adopted from self-audit questionnaire. Study undertaken by Akgun and Lynn (2002) and Rooney and McKenna (2008). And helps to measured team virtue by using five questions, also questionnaire for team climate was adapted from Amabile et al. (1996); the Team climate for innovations TCI (Anderson & West, 1998; West & Farr, 1989). To measure the 5 hypotheses of the study, we have used multi-item scales that we adopted from the previous literature. We have applied the Likert 5-point scale from (1) “strongly disagree”, to (5) “strongly agree”.

This study is a cross-sectional study and has been conducted only once. The unit of analysis used for the current study is individual. As the survey questionnaire was designed and provided to everyone, the unit is individual.

4. ANALYSIS AND RESULTS

4.1 Descriptive Statistics

Table 1 shows descriptive statistics of different variables. It shows minimum and maximum values, mean and standard derivation of the data we gathered using questionnaire from respondents. All mean values are between 1 and 5 which shows that our data values have no issue or any type of error.

Table 1
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
WM	170	1.60	5.00	3.9541	.69078
TV	170	2.00	5.00	3.3671	.65586
TC	170	2.00	5.00	3.9165	.70322
TCI	170	1.00	5.00	3.8447	.66733
Valid N (listwise)	170				

4.2 Role in Organization

Following table 2 shows the participant's role in specific organization. Different organization has different working environment and their benefits. The below table indicates frequency distribution of the respondents by the industry they each represented. Of the total 170 respondents, 32 or 18.8% represented upper management, 54 or 31.8% represented middle management, and 84 or 49.4% represented team member. This shows a relatively fair balance between the respondents of either category.

Table 2
Role in Organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Upper Management		32	18.8	18.8	18.8
Valid	Middle Management	54	31.8	31.8	50.6
	Team Member	84	49.4	49.4	100.0
	Total	170	100.0	100.0	

4.3 Team Size

Following table 3 shows the Team size in specific organization. The below table indicates frequency distribution of the team by the industry they each represented. Of the total 170 respondents, 74 or 43.5% represented team size <10, 50 or 29.4% represented team size 11-20, and 13 or 7.6% represented team size 21-30, and 8 or 4.7% represented team size 31-40, and 8 or 4.7% represented team size 41-50, and 17 or 10% represented team size 50>. This shows a fair balance between the samples representing each team size could not be achieving.

Table 3
Team size

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 10	74	43.5	43.5	43.5
	11-20	50	29.4	29.4	72.9
	21-30	13	7.6	7.6	80.6
	31-40	8	4.7	4.7	85.3
	41-50	8	4.7	4.7	90.0
	50 >	17	10.0	10.0	100.0
	Total	170	100.0	100.0	

4.4 Normality of Data

Skewness and kurtosis are the measures shown in table 4 which are used to gauge the normality of the data collected. The values for asymmetry and kurtosis between -3 and +3 are considered acceptable in order to prove normal univariate distribution (George, 2011). In the table below, the values of kurtosis and skewness calculated for the data collected are shown, all of which are in the acceptable range, hence proving the normality of the data.

Table 4
Skewness & Kurtosis

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
WM	170	-.524	.186	.181	.370
TV	170	.433	.186	.161	.370
TC	170	-.425	.186	-.081	.370
TCI	170	-1.077	.186	2.430	.370
Valid N (list wise)	170				

4.5 Reliability Analysis

Nunnally & Bernstein (1994) explains the standard of Cronbach alpha value range of value is .70 or more considered good reliable. Table 5 shows the Cronbach's α value for the variables. Cronbach alpha's value needs to range between 0 and 1. Value of Cronbach's α should be lies between 0.75 to 0.95. Wisdom mechanism is 0.773 which shows that there is a steadiness between the items of wisdom mechanism. Team virtue has a Cronbach's α value of 0.558 which is also consistent between the items of this variable. Team climate has a Cronbach's α value .647 which is also consistent between the items of this variable, Cronbach's α value for dependent variable i.e., team creativity has a value of Cronbach's α 0.824 which depicts that there is steadiness between the items of Team creativity

Table 5
Reliability Analysis

Variables	Number of items	Cronbach Alpha Coefficient
Wisdom mechanism	5	0.773
Team virtue	5	0.558
Team climate	5	0.647
Team creativity	5	0.824

4.6 Factor Analysis

Kaiser-Meyer-Ollkin (KMO) Test is a measure of how suited your data is for Factor Analysis. The test measures sampling adequacy for each variable in the model and for the complete model. The adequacy of sampling is 0.858 which meets the criterion of adequacy >0.85 . The below table 5 shows the validity of variables.

Table 6
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.858
Bartlett's Test of Sphericity	Approx. Chi-Square	1430.332
	df	190
	Sig.	.000

4.7 Correlation

The Pearson's correlation analysis was run to ascertain the direction and strength of the relationship between the variables. The relationship between the variables may either be positive or negative (direction) with significant or moderate or poor correlation attributes or strength of the relationship. In 1885, Sir Francis Galton introduced the empirical and theoretical developments that identified regression & correlation as statistical topic. If values of correlation lie between 0.1 -0.4 than we can say it has weak relation, if values lie between 0.4-0.6 than it has good relation and if values lie between 0.6-0.8 than relation is strong. Our analysis of correlation (Table 7) shows that the value of Pearson correlation is 1 which shows there is a strong positive relationship between same variables. The below table shows that there is a significant positive relationship between wisdom mechanism and team virtue with $r=.412$ and $p=.000$, but relationship between them is good. Also, there is a significant positive Relationship between wisdom mechanism and team creativity with $r=.484$ and $p=.000$, where r shows there is good relationship between them. Also, there is a positive relationship between team virtue and team creativity with $r=.660$ and $p=.000$ where value of r shows there is a good relationship between them. Similarly, there is positive relationship between team virtue and team creativity with $r=.384$ and $p=.000$ where value of r shows there is weak relationship exists, also there is a significant positive good relation between team creativity and team climate with $r=.587$ and $p=.000$, also there is a positive relation between team climate and team creativity with value $r=.587$ with significant value $p=.000$.

Table 7
Correlations

		WM	TV	TC	TCI
WM	Pearson Correlation	1			*
	Sig. (2-tailed)				
	N	170			
TV	Pearson Correlation	.412**	1		
	Sig. (2-tailed)	.000			
	N	170	170		
TC	Pearson Correlation	.660**	.389**	1	
	Sig. (2-tailed)	.000	.000		
	N	170	170	170	
TCI	Pearson Correlation	.484**	.418**	.587**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	170	170	170	170

** . Correlation is significant at the 0.01 level (2-tailed).

4.8 Regression Analysis

Coefficient of determination R^2 measures the level of prediction of outcomes by model, defines the relationship between variables and shows variation in data. “Adjusted R^2 ” explains how powerful the model is adjusted for the given population. In linear regression model verify the direct path between all variables. 1925 publication of Ronald Fisher's classic textbook, Statistical Methods for Research Workers. The experiment can be summarized as: Reject the assumption that if and only if the absolute value of t is less than 1.96. Table 8 (path 1) shows the relationship between variables. WM-TC R^2 is .435 which means wisdom Mechanism is bringing 43% change in Team creativity. And Beta value shows that wisdom mechanism will bring .671- unit changes in Team creativity. Another path WM-TV R^2 is .170 which means wisdom mechanism is bringing 17% change in team virtue and B value is .392 which means wisdom mechanism bring .392-unit change in team virtue, another direct path TV-TC R^2 is .151 which means team virtue will bring 15% change in Team creativity and its Beta value shows team virtue will bring .389-unit change in team creativity. Model fitness is checked by T test. Hypotheses are made on the basis of T test if its value is > 2 then we can say our hypothesis is accepted. For the value $p < 0.05$, the alternate hypothesis is accepted and for the value $p > 0.05$ it shows the acceptance of null hypothesis. So, in our case accepted all hypotheses.

Table 8
Regression analysis

Sr.No.	IV-DV (path)	B Value(Units)	P Value	R2 (%)	T Value
1	WM-TC	.671	.000	.435	11.474
2	WM-TV	.392	.000	.170	5.869
3	TV-TC	.417	.000	.151	5.467

4.9 Mediation Analysis

A mediation analysis was conducted using Preacher & Hayes (2008). For mediation test three assumptions should be fulfilled. First, is direct link between IV-DV must be

significant. Second, is link IV- Mediator must be significant and third, is link between mediator-DV must be significant.

Table 9
Mediation Analysis

Relations	Co-eff	t	p	LLCI	ULCI
WM-TC	.6125	9.5627	.0000	.4860	.7389
WM-TV	.3916	5.8691	.0000	.2599	.5234
TV-TC	.1560	2.2325	.0000	.0174	.2838

Table 9 shows the Direct effect of independent variable (WM) on dependent variable (TC) is 0.6125, which shows there is partial mediation because P value is significant. Team Virtue have a partial mediation with significance value of 0.0000 and Team creativity have partial mediation with sig value of .0000.

4.10 Moderation Analysis

The results of the moderation analysis shown in table 9 that describes the F value is .2336 ($F < 4$), which tells that fitness value is not in the acceptable range as it should be above 4 ($F > 4$). The lower and upper limits values are also not falling within the acceptable range. The value of t is less than 2 ($t = -.4833$), below the given threshold value. Also, the p value is .6295 ($p > .05$), indicating that the results are insignificant. The signs of both these values should be same but the results show LLCI = -.1747 and ULCI = .1060. Furthermore, the interaction term is negative i.e., -.0344 thus, our fourth hypothesis H5 stands rejected. It means that team climate does not moderate the relationship between Team virtue and team creativity.

Table 10
Moderation Analysis

	co-eff	Se	t	p	LLCI	ULCI	R²	F
Int_1	-.0344	.0711	-.4833	.6295	-.1747	.1060	.0007	.2336

Table 11
Hypotheses Acceptance/Rejections

H	Statement	Results
H1	There is significant positive relation between wisdom mechanism and team creativity.	Accepted
H2	There is significant positive relation between wisdom mechanism and team virtue	Accepted
H3	There is significant positive relation between team virtue and team creativity	Accepted
H4	Team virtue mediates between wisdom mechanism and team creativity.	Accepted
H5	Team climate moderates between team virtue and team creativity	Rejected

5. DISCUSSION

This review showed the primary system, wisdom-related mechanisms foster the utilization of Diversity, team organizing, and experience and executes on software development project. Exactly teams show their outcome in team righteousness, team climate developments and creativity. Exactly, wisdom-related mechanisms increment the comprehension of the social components of organizations, that are: affectability and the uprightness of software engineers, both inside and among software development project teams. In reality, (Peng, Wan, and Woodlock, 2013; Zahedi, Shahin, and Babar, 2016) tells in our review that numerous previous investigations have underlined the knowledge sharing perspective on having network joins in software development projects. It is cited by Ribes et al. (2013) that in software development projects many issues we are confronting, such a techno-driven conceptualization of systems administration which chiefly center around issues that is knowledge stream and trade and it gives a deficient comprehension of the social components of clarification, association, and reality structure between software engineers. It is additionally clarified that in our review that the social component of systems administration helps team members to deliver mutual perspective and implications from the equivalent or various occasions, issues. Distinctive reasonable models of team individuals) clarifies that the perceptual contrasts and assumptions that are available in teams and can accentuate correspondence related hardships, abnormalities, and various activities, and diminish the common perspective among team individuals (Ghobadi & Mathiassen, 2016). For compelling knowledge-sharing practices creators propose that the partners should find the distinctions in perception and come to concession to the snags. Systems administration and wisdom mechanism fundamentally center around creating trust, correspondence framework, and trust that is associated with software development projects. Under software development project teams' wisdom mechanism help them to fosters the job of Boundary Crossing which is considered as a piece of Sy conization system. Some suggestion of analysts, team assortment might act through another activity. creator contended that variety could deliver typical results when team individuals job in an organized manner in software development project teams Faraj and Sproull (2000).

Schindler and Eppler (2003) addresses that in software development projects, Wisdom mechanisms raised the role of experience of past team member. Experience of the final member of the team is the right fit for the continuation of the project by means of the shared contact, and systematic communication between the members of the team. In this way, the team members will help you to better understand what would work and what doesn't, and to make a comprehensive decision regarding the relationships between the processes, a project of the variables and their effects. Berente, Gal & Hansen (2011) states that team virtue is at the very center of team wisdom process and plays an important role in wisdom mechanism. Also, team virtue mediates the relationship between team wisdom process and team creativity (Ralph, 2016). The mediation is partial with significance level i.e., p valued at .0000. Previous study from (Ralph, 2004) points out towards the mediating nature of team virtue by advocating the fact that ethical knowledge and virtues of software development team help the team to achieve better and more creative solutions for project success Hence, the H4 of our study is accepted. This mediation makes a significant impact on the relationship between wisdom mechanism and creative abilities of the software development team. This is proven in evidence in studies from (Nonaka & Toyama, 2007)

who demonstrated that software developers are more creative in problem solving when they take inspiration from their past individual or evolutionary experiences. In addition, with the implementation of team prudence, software development teams can use wisdom mechanisms in a more effective and efficient way to get creative solutions and lead the project towards success. Similarly, being an integral part of wisdom mechanism, our study has proved that team climate doesn't moderate the relationship between team wisdom mechanism and team creativity because interaction value is insignificant i.e. -0.0344 .

5.1 Conclusion and Recommendations

This study analyzed the impact of team wisdom process on team creativity which is an underdeveloped and under researched area. We tested the impact of team wisdom mechanism on the team creativity and innovative approach of the teams in software development approaches. We used team virtue as the mediators of the study and tried to evaluate their mediating effect on the relationship of wisdom mechanism and team creativity. However, the current study doesn't complete the research area and just opens up a new dimension for future researchers to evaluate the area further. The results of the study showed that a positive relationship exists between team wisdom mechanism and team creativity. Future research on the topic can develop more information on this domain of software development approaches.

5.2 Limitations and Future Recommendations

There are some limitations of this study, as we used a cross-sectional study, so we are not able to grasp the causality between the variables & also the changings in those variables during the software development project. So use of longitudinal research can be helpful in future studies. The limitation of current study is that the data was collected only from software houses based in vicinity of Rawalpindi and Islamabad. The same framework can be tested on data collected from software houses and IT companies outside of Pakistan. Besides, the hypothesis can be tested on software industry domain. Also, the data was assembled only from the team members. Upper management and middle management responsible for the development of software projects and the sample size of 170 was small. Hence the element of bias was there. To reduce the bias to minimum and to get more accurate readings, the data can be collected from project sponsors, project owners, and leaders. A bigger sample size can reduce the bias. During software development process one major factor which is Team memory and for good advantage it can be investigated in detail. To measure team wisdom process what characteristic features of memory required and how different kinds of memory can affect the software development project. This would be further emphasized as well that when a team becomes too large the advantage of team reasoning can be gone. For future research in this area a much larger sample and a broad scope of firms such as software companies which are outside Pakistan are recommended to be taken into considerations. An area of research can be analyzing the other variables of team performance and team wisdom mechanism such as team strength or shared efficiency, team elasticity, team conflict resolution effectiveness, and project development cost in software development project context. Another dimension of research is to use moderators such as project complexity. We have used linear regression method for the analysis of data. More advanced techniques such as Structural Equation Modelling (SEM) can be used on the same framework. The current study can be expanded into a new

domain of research for project managers, software companies, software project development teams, academicians, and researchers. However, more variables and advanced research techniques must be included to make the research fruitful.

REFERENCES

1. Akgün, A.E. (2020). Team wisdom in software development projects and its impact on project performance. *International Journal of Information Management*, 50, 228-243.
2. Akgün, A.E. and Lynn, G.S. (2002). Antecedents and consequences of team stability on new product development performance. *Journal of Engineering and Technology Management*, 19(3-4), 263-286.
3. Akgün, A.E., Dayan, M. and Di Benedetto, A. (2008). New product development team intelligence: Antecedents and consequences. *Information & Management*, 45(4), 221-226.
4. Akgün, A.E., Keskin, H. and Kırçovalı, S.Y. (2019). Organizational wisdom practices and firm product innovation. *Review of Managerial Science*, 13(1), 57-91.
5. Alsayyed, N.M., Suifan, T.S., Sweis, R.J. and Kilani, B.A. (2020). The impact of transformational leadership on organisational performance case study: the University of Jordan. *International Journal of Business Excellence*, 20(2), 169-190.
6. Amabile, T.M., Conti, R., Coon, H., Lazenby, J. and Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39(5), 1154-1184.
7. Anderson, N.R. and West, M.A. (1998). Measuring climate for work group innovation: development and validation of the team climate inventory. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 19(3), 235-258.
8. Anderson, N., Potočnik, K. and Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40(5), 1297-1333.
9. Andler, D. (2012). What has collective wisdom to do with wisdom? In Landemore, H. and Elster, J (Eds.) *Collective Wisdom: Principles and Mechanisms*, (pp 72-84), Cambridge University Press.
10. Baltes, P.B. and Staudinger, U.M. (2000). Wisdom: A metaheuristic (pragmatic) to orchestrate mind and virtue toward excellence. *American Psychologist*, 55(1), 122-136.
11. Bano, M. and Zowghi, D. (2015). A systematic review on the relationship between user involvement and system success. *Information and Software Technology*, 58, 148-169.
12. Barczak, G., Lassk, F. and Mulki, J. (2010). Antecedents of team creativity: An examination of team emotional intelligence, team trust and collaborative culture. *Creativity and Innovation Management*, 19(4), 332-345.
13. Bellinger, G., Castro, D. and Mills, A. (2004). *Data, information, knowledge, and wisdom*. <http://www.Systems-thinking.org/dikw/dikw.htm>
14. Berente, N., Gal, U. and Hansen, S. (2011). Ethical implications of social stratification in information systems research. *Information Systems Journal*, 21(4), 357-382.
15. Bierly, P.E., Kessler, E.H. and Christensen, E.W. (2000). Organizational learning, knowledge and wisdom. *Journal of Organizational Change Management*, 13(6), 595-618.
16. Bower, M. (1990). *Wisdom: Its nature, origins, and development*. Cambridge University Press.

17. Clarke, P. and O'Connor, R.V. (2012). The influence of SPI on business success in software SMEs: An empirical study. *Journal of Systems and Software*, 85(10), 2356-2367.
18. Coakes, E.W., Coakes, J.M. and Rosenberg, D. (2008). Co-operative work practices and knowledge sharing issues: A comparison of viewpoints. *International Journal of Information Management*, 28(1), 12-25.
19. Dalal, N. and Pauleen, D. J. (2019). The wisdom nexus: Guiding information systems research, practice, and education. *Information Systems Journal*, 29(1), 224-244.
20. De Vasconcelos, J.B., Kimble, C., Carreteiro, P. and Rocha, Á. (2017). The application of knowledge management to software evolution. *International Journal of Information Management*, 37(1), 1499-1506.
21. Drury-Grogan, M.L., Conboy, K. and Acton, T. (2017). Examining decision characteristics & challenges for agile software development. *Journal of Systems and Software*, 131, 248-265.
22. Egan, T.M. (2005). Creativity in the context of team diversity: Team leader perspectives. *Advances in Developing Human Resources*, 7(2), 207-225.
23. Faraj, S. and Sproull, L. (2000). Coordinating expertise in software development teams. *Management Science*, 46(12), 1554-1568.
24. Gagné, M. and Deci, E.L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331-362.
25. George, D. (2011). *SPSS for windows step by step: A simple study guide and reference, 17.0 update, 10/e*. Pearson Education India.
26. Ghobadi, S. and Mathiassen, L. (2017). Risks to effective knowledge sharing in agile software teams: A model for assessing and mitigating risks. *Information Systems Journal*, 27(6), 699-731.
27. Hannah, S.T., Uhl-Bien, M., Avolio, B.J. and Cavarretta, F.L. (2009). A framework for examining leadership in extreme contexts. *The Leadership Quarterly*, 20(6), 897-919.
28. Hansen, S. and Rennecker, J. (2010). Getting on the same page: Collective hermeneutics in a systems development team. *Information and Organization*, 20(1), 44-63.
29. Isen, A.M. (1987). Positive affect, cognitive processes, and social behavior. *Advances in Experimental Social Psychology*, 20, 203-253.
30. Jiang, J.J., Klein, G., Tsai, J.C.A. and Li, Y. (2018). Managing multiple-supplier project teams in new software development. *International Journal of Project Management*, 36(7), 925-939.
31. Jörg Gottschlich, O.H. (2014). A decision support system for stock investment recommendations using collective wisdom. *Decision Support Systems*, 59, 52-62.
32. Küpers, W.M. (2007). Phenomenology and Integral Pheno-Practice of Wisdom in Leadership and Organization. *Social Epistemology*, 21(2), 169-193.
33. Kupperman, J.J. (2009). Virtue in Virtue Ethics. *The Journal of Ethics*, 243-255.
34. Landemore, H. and Elster, J. (2012). *Collective wisdom: Principles and mechanisms*. Cambridge University Press.
35. Lindsjörn, Y., Sjøberg, D.I., Dingsøyr, T., Bergersen, G.R. and Dybå, T. (2016). Teamwork quality and project success in software development: A survey of agile development teams. *Journal of Systems and Software*, 122, 274-286.

36. Loch, C.H., Galunic, D.C. and Schneider, S. (2006). Balancing cooperation and competition in human groups: The role of emotional algorithms and evolution. *Managerial and Decision Economics*, 27(2-3), 217-233.
37. Malan, L.C. and Kriger, M.P. (1998). Making sense of managerial wisdom. *Journal of Management Inquiry*, 7(3), 242-251.
38. Moberg, D.J. (2001). Managerial wisdom. In J. Dienhart, D. Moberg, & R. Duska (Eds.), *The next phase of business ethics: Integrating psychology and ethics* (pp. 377-396). Elsevier Science/JAI Press. [https://doi.org/10.1016/S1529-2096\(01\)03021-8](https://doi.org/10.1016/S1529-2096(01)03021-8)
39. Nielsen, T.M., Edmondson, A.C. and Sundstrom, E. (2006). Team wisdom: Definition, dynamics, and applications. *Dynamics, and Applications* (June 2006). <http://dx.doi.org/10.2139/ssrn.910332>
40. Nonaka, I. and Toyama, R. (2007). Strategic management as distributed practical wisdom (phronesis). *Industrial and Corporate Change*, 16(3), 371-394.
41. Peng, G., Wan, Y. and Woodlock, P. (2013). Network ties and the success of open source software development. *The Journal of Strategic Information Systems*, 22(4), 269-281.
42. Pirola-Merlo, A. and Mann, L. (2004). The relationship between individual creativity and team creativity: Aggregating across people and time. *Journal of Organizational Behavior*, 25(2), 235-257.
43. Preacher, K.J. and Hayes, A.F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891.
44. Ralph, P. (2018). The two paradigms of software development research. *Science of Computer Programming*, 156, 68-89.
45. Reiter-Palmon, R., Wigert, B. and de Vreede, T. (2012). Team creativity and innovation: The effect of group composition, social processes, and cognition. In *Handbook of organizational creativity* (pp. 295-326). Academic Press.
46. Ribes, D., Jackson, S., Geiger, S., Burton, M. and Finholt, T. (2013). Artifacts that organize: Delegation in the distributed organization. *Information and Organization*, 23(1), 1-14.
47. Rolandsson, B., Bergquist, M. and Ljungberg, J. (2011). Open source in the firm: Opening up professional practices of software development. *Research Policy*, 40(4), 576-587.
48. Rooney, D. and McKenna, B. (2008). Wisdom in public administration: Looking for a sociology of wise practice. *Public Administration Review*, 68(4), 709-721.
49. Rowley, J. (2006). Where is the wisdom that we have lost in knowledge? *Journal of Documentation*, 62(2), 251-270.
50. Neves, S.M., Da Silva, C.E.S., Salomon, V.A.P., Da Silva, A.F. and Sotomonte, B.E. P. (2014). Risk management in software projects through knowledge management techniques: Cases in Brazilian incubated technology-based firms. *International Journal of Project Management*, 32(1), 125-138.
51. Schindler, M. and Eppler, M.J. (2003). Harvesting project knowledge: a review of project learning methods and success factors. *International Journal of Project Management*, 21(3), 219-228.

52. Shalley, C.E., Zhou, J. and Oldham, G.R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, 30(6), 933-958.
53. Sternberg, R.J. (1998). A balance theory of wisdom. *Review of General Psychology*, 2(4), 347-365.
54. Styhre, A. (2002). How process philosophy can contribute to strategic management. *Systems Research and Behavioral Science*, 19(6), 577-587.
55. Tsoukas, H. and Vladimirou, E. (2001). What is organizational knowledge? *Journal of Management Studies*, 38(7), 973-993.
56. Venkitachalam, K. and Willmott, H. (2017). Strategic knowledge management—Insights and Pitfalls. *International Journal of Information Management*, 37(4), 313-316.
57. Venters, C.C., Capilla, R., Betz, S., Penzenstadler, B., Crick, T., Crouch, S., Nakagawa, E.Y., Becker, C. and Carrillo, C. (2018). Software sustainability: Research and practice from a software architecture viewpoint. *Journal of Systems and Software*, 138, 174-188.
58. Wang, J., Keil, M., Oh, L. B. and Shen, Y. (2017). Impacts of organizational commitment, interpersonal closeness, and Confucian ethics on willingness to report bad news in software projects. *Journal of Systems and Software*, 125, 220-233.
59. Wang, X.H.F., Kim, T.Y. and Lee, D.R. (2016). Cognitive diversity and team creativity: Effects of team intrinsic motivation and transformational leadership. *Journal of Business Research*, 69(9), 3231-3239.
60. West, M.A. and Farr, J.L. (1989). Innovation at work: Psychological perspectives. *Social Behaviour*, 4(1), 15-30.
61. Zahedi, M., Shahin, M. and Babar, M.A. (2016). A systematic review of knowledge sharing challenges and practices in global software development. *International Journal of Information Management*, 36(6), 995-1019.