Big Data Innovation and Implementation in Projects Teams: Towards a SEM Approach to Conflict Prevention

Abstract:

Purpose: *Despite an enormous body of literature on conflict management, intra-group conflicts vis-à-vis team performance, there is currently no study investigating conflict prevention approach to handling innovation-induced conflicts that may hinder smooth implementation of big data technology in project teams.*

Design/methodology/ Approach: *This study uses constructs from conflict theory, and team power relations to develop an explanatory framework. The study proceeded to formulate theoretical hypotheses from task-conflict, process-conflict, relationship, and team power conflict. The hypotheses were tested using Partial Least Square Structural Equation Model (PLS-SEM) to understand key preventive measures that can encourage conflict prevention in project teams when implementing big data technology.*

Findings: *Results from the structural model validated six out of seven theoretical hypotheses and identified Relationship Conflict Prevention as the most important factor for promoting smooth implementation of Big Data Analytics technology in project teams. This is followed by Power-Conflict prevention, prevention of relationship disputes and prevention of Process conflicts respectively. Results also show that relationship and power conflict interact on the one hand, while Task and relationship conflict prevention on the other hand, suggesting the prevention of one of the conflicts could minimise the outbreak of the other.*

Research Limitations: *The study has been conducted within the context of big data adoption in a project-based work environment and the need to prevent innovation-induced conflicts in teams. Similarly, the research participants examined are stakeholders within UK projected-based organisations.*

Practical Implications: *The study urges organisations wishing to embrace big data innovation to evolve a multipronged approach for facilitating smooth implementation through prevention of conflicts among project frontlines. We urge organisations to anticipate both subtle and overt frictions that can undermine relationships and team dynamics, effective task performance, derail processes and create unhealthy rivalry that undermines cooperation and collaboration in the team.*

Social Implications: *The study also addresses the uncertainty and disruption that big data technology presents to employees in teams and explore conflict prevention measure which can be used to mitigate such in project teams.*

Originality/Value: *The study proposes a Structural Model for establishing conflict prevention strategies in project teams through a multidimensional framework that combines constructs like team power, process, relationship & task conflicts; to encourage Big Data implementation.*

Keyword: Conflict Management; Innovation Conflicts; Big Data Technology, Organisational Power; Conflict Prevention

1.0 Introduction

Big Data revolution is rapidly transforming every industry as many smart business leaders and institutions leverage data-driven strategies to capture, compete and innovate (Chen et al., 2015). However, as it is common when introducing new technological innovation, one of the significant challenges facing big data adoption in many businesses is cultural impediments within the internal domain of the organisation (Malaka and Brown, 2015; Owolabi et al., 2018). In an Executive Survey conducted by New Vantage in 2017, 52.2% of top executives indicated that cultural factors such as resistance, tension, and conflicts, lack of adoption by frontline teams, less cooperation from middle management, among others, impede big data adoption within their organisations. Regrettably, the literature suggests that if these cultural impediments are not properly managed, they may induce dysfunctional conflicts among employees and ultimately slow-down the full realisation of the value and opportunities in big data adoption (Erl et al., 2016; Greer and Dannals, 2017).

Based on the above premise, this study examines innovation conflicts and strategies for pre-empting or preventing innovation-induced conflicts when implementing technologies in project teams, using Big Data technology as context. This study examines the innovation conflict literature and aligns with the study of Toegel and Barsooux (2016), who argued that unproductive conflicts, if not effectively prevented, can stifle innovation and destroy team confidence in adoption. We argue that despite the inconclusive state of research on the consequences of conflict-types (i.e., task, process, relationship, and team-power conflicts) for innovation in teams; there is yet an alarming paucity of empirical research on a preventive approach (as against the conflict resolution approach) to innovation conflicts in project teams.

Therefore, this study examines 'Innovation Conflict theory' for understanding anticipated incompatibilities and negative tensions in project teams when implementing Big Data technology. We proceeded to develop a Measurement Model based on the above-mentioned innovation conflict types and their preventive measures in order to aid smooth implementation of big data in project teams. We formed four latent constructs from innovation conflict types (i.e., task, relationship, process and power conflicts) as first-order latent constructs and another higher-order construct and measured the constructs through observed variables identified from the literature. From the various latent constructs in the study, we developed first-order and higher-order variables, which were later examined and tested in a structural model using a second generation

Partial Least Square Structural Equation Model (PLS-SEM). Our central hypothesis in this study is:

"Preventing innovation conflicts (i.e., task, process, relationship, and team-power conflicts) can result in the smooth implementation of Big Data technologies in project teams".

1.1 <u>Conceptual Background</u>

For years, many scholars have examined how innovation is adopted within diverse settings- i.e. organisations, teams, customers, etc. (Baskerville and Pries-Heje, 2001; Nylén and Holmström, 2019; Panopoulos et al., 2019). According to Baskerville and Pries-Heje (2001), the successful adoption of innovation suggests the successful diffusion of innovation by people in organizations. Roger's (1962) foundational works on the diffusion of innovation theory (DOI) and a host of other theoretical studies – i.e., Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003); Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975); Technology Acceptance Model (TAM) (Davis et al.,1989); and Theory of Planned Behaviour (TPB) (Ajzen 1991) – have all led debates on how organisations and teams come to embrace innovation. However, despite the ground-breaking contributions from earlier literature, new studies are discarding the foundational narrative of positive outcomes for innovation adoption (Jehn & Mannix, 2001; Webster, 1995; Joachim et al., 2018; Ma and Lee, 2019), on account of being pro-innovation biased and restrictive (Heidenreich and Handrich, 2015; Rosenberg and Vogelman-Natan, 2018). Scholars such as Webster (1995), Jehn & Mannix (2001), Heidenreich and Kraemer (2016), and Nardelli (2017), now consider innovation from a social or dialectical standpoint in which conflicts are an integral part (Joachim et al., 2018).

Vrhovec et al., (2015) describe conflict as incompatible ideas or aspirations or a disagreement over new ways of working or new processes, which creates barriers that ensure the maintenance of status quo. Many studies believe that to promote innovation either at a firm or group-level, a certain amount of conflict and the effective management of such conflict is needed (De Dreu and Weingart, 2003; De Dreu, 2006; Jehn & Mannix, 2001). Hence, conflict management within the innovation process has become a very germane issue for practitioners and researchers alike. Extant body of literature on conflict and innovation have examined diverse conceptualisations of conflict within organisations and working teams, including their associated impact on innovation climate in organisations, innovation conflict among top management teams (TMT), firm innovativeness among others (Jehn, 1997; De Dreu and Weingart, 2003; Jehn et al., 2008; Zhang et al., 2015; Way et al., 2016).

Nevertheless, most of these above studies seem over-concentrated on examining conflict management styles, especially as it affects team outcomes (i.e., innovativeness, performance, employee satisfaction) (Oyedele et al., 2020). For instance, Blake and Mouton (1964, 1970) proposed the popular "Dual-Concern model" which was later refined by the studies of Rahim (1983) and Thomas (1992). These authors including others like Song et al. (2006) and Chen et al., (2012) described five distinct conflict management styles comprising "accommodating", "integrating", "compromising", "forcing" and "avoiding" which emphasized ways of managing conflicts in terms of concern for either personal needs or others (Thomas, 1992; Zhang et al., 2015). Other studies like Deutsch (1949); Charlesworth (1996), Tjosvold et al. (2010, 2014) have explored Theory of "cooperative" and "competitive" conflict management by underlying inter-dependence of goals in teams where one party loses and the other gains. A contingency theory of task conflict which viewed group performance (i.e., effectiveness, innovativeness, etc.) as a function of the type of conflict i.e., task or relationship conflict, was also proposed by De Dreu & Weingart, (2003a,2003b).

However, regardless their immense contributions to the conflict literature, most of these studies on conflict management styles and models are seen as reactive and not widely reflective of the complexity and multi-dimensionality of team conflicts, especially within the innovation context (Shih and Susanto, 2011; Heidenreich and Handrich, 2015; Heidenreich and Kraemer, 2016; Van Knippenberg, 2017) (Please See Table 1 below for Shortcoming of existing models).

Table 1: Shortcomings of Existing Innovation Conflict Frameworks

Authors	Existing Theoretical Models on Conflict and innovation	Assumptions	Shortcomings
Blake and Mouton (1964, 1970)	"Dual-Concern Model"	Individual's preferred approach of dealing with conflict is based on: concern for self and concern for others.	Is based on conflict resolution and not on pre-empting conflict. There is not uniform style for managing

			conflict and outcomes vary and unpredictable
Deutsch (1949); Charlesworth (1996), Tjosvold et al. (2010, 2014)	Theory of "cooperative" and "competitive"	Every party in a conflict comes with either the mindset of cooperation or competition	More suitable for inter-group than intra-group conflict management since excessive competition may harm the team.
De Dreu & Weingart, (2003a,2003b)	Contingency theory of task conflict	Task conflicts may be beneficial to team performance under certain specific conditions	Lack of conceptual foundation. Restricted to task and relationship conflicts. Did not consider dysfunction conflict and the need for prevention
Van De Vliert& Huismans (1995), Van De Vliert (1997)	Conglomerate Conflict Behavioral Model	Component of conflict behaviour should be understood as a configuration of multiple behavioural styles.	Fails to address how to surface innovation conflict and also neglected power-conflict
Anderson, P. (1999). Hendrick, D. (2009).	Complexity theory of Conflict	Suggests that outcomes of conflict is non-linear and pattern flunctions (conflict) are characteristic of systems that cannot truly be managed or eliminated.	It offers no strategy for dealing with conflict within the innovation process of organisations
Van de Ven et al., (1989)	Minnesota Innovation Research Programme (MIRP)	Innovation experience shocks and even setbacks, and as learning occurs, old and new existing together and later become linked	Neglects the role of non-structural dimensions of teams in handling innovation conflict

To effectively address conflict within the innovation process in working teams, recent studies like Bledow et al. (2009), Haufler (2009), Toegel and Barsooux (2016); Bennett and Gadlin (2019), Oyedele et al. (2020), and others have called for examining, among other perspectives, the 'Conflict Prevention' approach. 'Conflict Prevention' is described as acting early (i.e., being proactive) by surfacing differences, negative tensions, and incompatibilities in a team and developing constructive ways to mitigate or contain its full and likely disruptive outbreak. According to Toegel and Barsooux (2016), team conflicts when poorly handled and not pre-empted can stifle innovations and create unpredictable setbacks. Therefore, organisations seeking smooth transition of new technologies within their processes are encouraged to consider proactive and forward-looking measures to detect early warning signs of resistance/tensions and diffuse the threats of innovation-induced conflicts (Bennett and Gadlin, 2019).

Coming from the above, this study aligns with the standpoint of Toegel and Barsooux (2016) and posits that prevention of dysfunctional innovation conflicts in project teams remains a success factor for ensuring smoother implementation of new technological innovation. Based on the above background, this study therefore explores the central research question:

<u>Central Research Question:</u>

<u>*"How can the prevention of innovation conflicts provide a smoother implementation path for new technological innovation in project teams".*</u>

1.2 Big Data Analytics (BDA) Technology as a Context:

As a context for this study, we examine conflict prevention measures within the setting of Big Data Analytics implementation in project teams. The choice of Big data as context for this study is due to its capability to disrupt and revolutionise existing business practices, corporate ecosystems, organisational and team operations (Alaka et al., 2018; Owolabi et al., 2018). Erl et al. (2016) describe Big Data Analytics as the fast processing, analysing, and storage of large datasets that originate from heterogeneous sources, to uncover hidden information. According to Chen et al. (2015), significant innovations (i.e., Big Data) - which are so distinct from current activities, and require new skills, new processing abilities, etc. - are often challenging to implement within organisations and teams. Big Data Analytics falls in the realm of radical innovations and comes with associated technology uncertainty, including technical and business inexperience (Chen et al., 2015). Similarly, the typically long-term nature, substantial investment costs, uncertainty, and risks associated with such radical innovations, suggest possible turnover of existing teams and employees that may be required to protect such investment (Sivarajah et al., 2017). Therefore, given the unpredictability that this type of technological innovation projects brings, vis-à-vis the scale of changes to regular work routine and practices; resistance and conflicts from employees is a possible reality (Schrage, 2016).

In line with the above reasoning, this study contributes to current body of literature in several ways. For the first time in the innovation conflict literature, this study brings the 'conflict prevention' perspective to the fore and suggests vital pre-emptive strategies that can facilitate seamless acceptance of innovation in project teams. Similarly, the study diverges from earlier studies by operationalising 'power conflict' as a typical conflict type in project teams - which along with other conflict types, i.e., task, relationship and process conflicts; can influence how project teams receive new technological innovation such as Big data. We leveraged this study to demonstrate that, when introducing disruptive technologies like big data in project teams; conflict and tensions can emerge from disputes over tasks to be performed, newly introduced procedures, frosty working relationships, and threats to existing team power balance. We therefore, posit that the prevention of innovation-induced conflicts will enable organisations to achieve project outcomes, especially given the complex nature and typical challenges and constraints associated with projects. Using a Structural Equation Model (SEM) approach, this study pursues the following objectives:

1. To examine conflict within the innovation environment and develop theoretical hypotheses for preventing (1) task conflicts, (2) process conflicts, (3) relationship conflict, and (4) power conflicts in project teams.
2. To apply explanatory framework within the context of Big Data Technology acceptance in project teams.
3. To confirm the validity or otherwise of hypotheses using perspectives of stakeholders within project environments (i.e., Project managers, team members, onsite workers, etc.) via Partial Least Square Structural Equation Models (PLS-SEM).

The next section of this study (section 2) examines extant literature on. The next section of the study explores innovation conflict types and their prevention in project teams and the development of theoretical hypotheses. The section concluded by developing a path model for innovation conflict prevention for smooth innovation implementation in project teams. This section is immediately followed by challenges associated with Big Data technology implementation in project environment/teams. This is then followed by the methodology section the research design and data collection section. Quantitative data analysis (reliability statistics and structural equation model) is also presented was immediately followed by the section on the discussion of the key findings from the study. The last section of the study presents the theoretical implication and conclusion of the study.

2.0 Big Data and Challenges of Implementation in Project Teams

Big Data refers to massively large datasets which can be analysed computationally to uncover hidden patterns, unknown correlations, trends, or preferences (Owolabi et al., 2018). Characteristically, Big Data has five vital attributes, also referred to as the 5Vs, which distinguish it from a traditional dataset. These comprise volume, variety, velocity, veracity & value (Bilal et al., 2016). These 5Vs are apparent in most project data generated in many project-based settings (i.e., IT, Oil & Gas, and Construction and engineering) in recent times. Especially in the construction and engineering (C&E) setting, Bilal et al. (2016), suggested that projects of today now accumulate a vast amount of valuable data sets right from conception till the delivery stage. The majority of these data are electronic and exist in diverse formats including [multidimensional (n-D), computer-aided design (CAD) data, three-dimensional (3-D) geometric encoded data, graphical data, video, audio, text, etc.]and sizes (terabytes, petabytes, etc.). Some of these data can sometimes come in high velocity as real-time data capturing technologies (i.e., sensors, wearable technologies, drones, etc.) are now in use on projects for diverse purposes. This thus makes large-scale and advance processing of project data with Big data technologies a necessity (Alaka et al., 2016).

However, implementing Big Data technologies in project management environment can be quite challenging, according to experts (Alaka et al., 2018; Snyder et al., 2018). Based on the study of Snyder et al. (2018), while about 96% of data in the sector remain unused, 13% of staff working hours is expended on looking for project information, while more than 30% of the firms use applications that are not interoperable. According to Konys (2016) and Koseleva and Ropaite (2017), one of the biggest problems for using big data in construction and engineering projects is access to relevant and quality data. According to Bilal et al. (2016), due to the fragmented nature of the industry, many data sources are heavily siloed and stored in disparate formats; thus, making data integration a significant challenge and hindering smooth task delivery. Although several C&E organisations seem to be trying out the big data approach, Fogelman-Soulié and Lu, (2016) suggested interoperability challenges between traditional tools and big data technologies are hindering seamless coordination at the project level.

According to Snyder et al. (2018), for some C&E firms, existing organisational processes cannot simply accommodate new advancements in data analytics. This difficult mindset thus creates all sort of conflicts and problems for organisation as they struggle with project managers and frontline staff who usually do not comprehend how to execute analytical procedures (Snyder et al., 2018;

Owolabi et al., 2018). Since such scenarios create over-reliance on IT specialists for ad-hoc-analysis, interpretation, and reports; the resultant effects are incompatibilities and conflicts at task and process levels, thus leading to delayed decision making, including loss in team productivity.

Similarly, concern over data privacy and sensitive data sharing is considered another clog in the wheel of Big Data implementation on C&E projects. As suggested by Schrage (2016), lack of willingness to share granular/sensitive information among cross-functional units (to preserve strategic interests) can hinder a broader overview of project activities. This can, in addition to causing inadequate team communication, negatively affect employees' predisposition towards big data adoption. Furthermore, as suggested by Dutta and Bose (2015), given that Big Data Analytics advocates reduction in documentation on projects. This can present a challenge for effective knowledge transfer on projects, especially in the event of departure of any project team member from the organisation. Similarly, William (2014) suggested that historical reliance on a project management environment that is control-oriented can present challenges to workers who have been trained to work under such an approach for years. As such, adjusting to new ways of project documentation, project reporting and resourcing etc., can present unique challenges for project leadership, causing conflicts within processes and task delivery whilst also impacting on team cohesion (Larson and Chang, 2016; Snyder et al., 2018).

As indicated in a recent report by New Vantage (2017), another significant barrier to implementing Big data in project teams is the fear of skill-incompatibilities among existing employees. According to the authors, existing employees may become frightened for fear that their skill-deficiency may be exposed in a new project management environment that thrives on data-driven approaches. This perspective is shared by Frey and Osborne (2017), who suggested that with Big Data, organisations can now move ahead with fewer employees and get rid of old human-centric approaches. With industries like engineering and construction where technology-literacy may not be very high (Kamaruddin et al., 2016), re-training staff can become a difficult challenge and attempts to lay-off staff can lead to resistance/conflicts from employees which may reflect through of task delivery or even relationship conflicts among lower and upper-level staff (Owolabi et al., 2018; Oyedele et al., 2020). In another similar study, Chandarana and Vijayalakshmi (2014) suggested that Big data implementation may result in a decentralised decision-making approach which could in-turn create challenges in project teams by diminishing existing governance structures and leadership. This has vast implications for altering team power balance and has been suggested as one of the reasons why many innovative ideas often get caught up in the web of organisational power-conflicts (Cacciolatti and Lee, 2016). Reports from New Vantage (2017), aligns with this perspective and suggested that middle-management adoption of big data investment is becoming difficult in several large organisations.

Additionally, Larson and Chang (2016) argued that many project-based firms have yet to align their existing organisational and project management processes to be able to work effectively in a big data environment. This presents a massive challenge where you have multiple teams working on a single project, but using different project management practices. Such scenarios create conflicts within processes and can result in unnecessary bureaucracy, delayed decision making, including delayed approval processes etc., thus hindering smooth project delivery (Konys, 2016; Schrage, 2016). Other challenges with implementing Big Data in project teams include the need for a team-based performance evaluation framework to tailor employees' individual and team abilities (Zicari, 2014), aligning autonomous subsidiaries and teams in large project organisations including their control arrangements (Wu et al., 2015; Dutta and Bose, 2015), governance structures and project management practices (Grossman and Siegel, 2014), communication and coordination among differently located teams among others (Greer and Dannals, 2017). Please see Table 2 below for challenges with implementing Big Data Technology in Project environment.

Table 2: Challenges with Implementing Big Data Technology in Project Teams

No	Challenges with Implementing Big Data Technology in Project Teams	Innovation Conflict Type	Sources
1	Fear of the exposure of skill-incompatibilities among existing project teams	*TC&RC*	Greer and Dannals, (2017); Kamaruddin *et al.,* (2016)
2	Difficulty in re-training employees especially those with limited technology-literacy.	*TC&PP*	Frey and Osborne (2017); William (2014), Alaka et al. (2018).
3	Access to relevant and quality data to facilitate frontline teams	*TC/PC*	Konys (2016) and Koseleva and Ropaite (2017)
4	Historical reliance on controlled-oriented project management approaches and practices.	*PC/TC& PP*	Wynen et al. (2017); Chen et al. (2017), Dutta and Bose (2015)
5	Prevalence of unintegrated datasets across siloed project & team sources	*TC*	Bilal et al. (2016), Alaka et al., (2016),

6	Decentralised decision-making approach create challenges in project teams by diminishing existing project governance & leadership	***PC/PP/TC &RC***	Chandarana & Vijayalakshmi (2014), Greer and Dannals, (2017) Cacciolatti and Lee, (2016)
7	Limited analytical skills of frontline managers and teams create over-reliance on IT specialists for adhoc-analysis, interpretation	***TC/PC***	Snyder et al., (2018), Owolabi et al., (2018)
8	Lack of middle-management adoption of big data investment	***PC&PP***	Kamaruddin *et al.* (2016); New Vantage (2017); William (2014)
9	Lack of alignment between organisational strategy and Big data implementation in project operations	***PC &TC***	Larson and Chang (2016); Wu *et al.* (2015), William (2014)
10	Absence of integration between Big Data technology and existing technologies and processes.	***PC/TC***	Raghupathi & Raghupathi (2014) Fogelman-Soulié annd Lu, (2016)
11	Absence of skill-based performance evaluation at individual and project-team level	***TC***	Greer and Dannals (2017); Alaka et al. (2018)
12	Problem of real-time communication among cross functional teams working on autonomous projects	***TC&RC***	Chen and Zhang (2014), Wu *et al.,* (2015)
13	Integrating autonomous subsidiaries and their governance & project management practices and processes	***PP/RC &TC***	Muhwezi et al. (2014); Alaka et al. (2018); Zhang et al., 2015
14	Challenges with prioritising team recruitment strategy either based on technical or technological competencies	***TC&PP***	Wu *et al.,* (2015); Owolabi et al. (2018), Ropaite (2017)
15	Limited supply of workforce with strong and combined competencies in the job market	***TC***	Grossman and Siegel (2014) Ropaite (2017)
16	Absence of information sharing culture	***TC/ RC/&PP***	Lim and Loosemore (2017), Schrage (2016), New Vantage (2017)

Note: *Using the expert opinion, researcher's judgement and logic, the potential conflicts associated with each BDA challenges have been denoted accordingly:* ***TC****=task conflict;* ***RC****=relationship conflict;* ***PP****=power conflict &* ***PC****=process conflicts.*

The above-listed challenges have huge implications for team collaboration and cooperation in a project setting, with enormous potential to result in team conflict when introducing new technology. Project teams are often expected to work together and share information, resources, and tools to execute project tasks and processes. However, this is often not the case in typical settings and smooth cooperation and collaboration cannot be guaranteed at all times. Employees often have conflicting viewpoints on issues, tasks, and processes, many of which sometimes affect mutual interaction and rivalry. There is always competition for project resources including materials and humans, all of which may be aggravated by the high-risk nature of projects and their cross-functional backgrounds. In such a pressurised environment, cooperation over innovation as radical as Big Data can result in conflicts in which managers from different functional divisions disagree over innovation-related decisions. Such disputes over tasks, tools, deadlines, and squabbles over procedures can escalate to personal animosity, thereby leading to bickering, undermining, and ignoring, etc. all of which can affect the implementation of innovation.

As such, Task, Process, Relationship, and Power conflicts are therefore a typical reflection of project management setting and provides suitable context to understand challenges of adoption and mechanisms to prevent such. Besides, with the huge financial investment required to deploy Big Data technologies in most organisations and teams; failure of such innovation as a result of intra-group conflict is an outcome an organisation will be looking to prevent. Hence, conflict prevention as against damage control approach is needed to effectively detect and pre-empt diverse forms of innovation conflicts at every possible level to ensure a conducive climate for innovation implementation.

3.0 Theoretical Framework and Hypotheses Development:

Extensive review of literature in innovation conflicts management in working teams have identified various types of intra-group conflicts vis-à-vis their potential influence on innovation acceptance. Some of these conflict types include task conflict, relationship conflict, and process conflicts, including team power conflicts (Jehn, 1997; Jehn et al., 2008; Zhang et al., 2015; Vollmer, 2015).

2.1 Task Conflict and Prevention in Project teams:

According to De Dreu and Weingart (2003), task conflict refers to differences in opinions and ideas concerning the content of a task to be performed. In the studies by De Dreu (2006), De Dreu & West (2001), Li and Li (2009) results showed that task conflicts are beneficial and promote creative and innovative ideas in groups, thereby positively influencing team innovativeness. As argued by Amason (1996), task conflict improves understanding and decision quality, thus providing opportunities for employees to learn new tasks. However, beyond the above benefits, other studies like Ries et al. (2010), Fairchild and Hunter (2014) could not confirm any positive relationship between task conflict and team innovation. As suggested by Simons and Peterson (2000) and Le and Jarzabkowski (2015), task conflict can result in poorer information processing, and reduce group effectiveness, creativity and decision making. Within the context of project-based teams, preventing or reducing the frequency of task conflicts is a vital step for achieving project outcomes (Simons and Peterson, 2000; Barki and Hartwick, 2004; Medina et al., 2005).

According to He et al. (2014), project management settings are heavily task and team-oriented, and they involve competing deliverables, with immense time and resource constraints. In such contexts, disagreements over task-related issues, can result in volatile exchanges leading to project disruptions and delays including unbudgeted additional costs with contractual implications (Heidenreich and Handrich (2015). As a result, studies like Medina et al., (2005); Grandey et al., (2022), suggest preventing task conflict will enable a project team to harness its' collective energy and intelligence, thus stimulating better collaboration and creativity, in addition to better decision making. According to Lee et al. (2015), when task conflict is kept at barest minimum, employees tend to focus more on getting the job done whilst experimenting creative ideas for better performance.

Earlier literatures have suggested a number of strategies that can help pre-empt or mitigate task-related conflicts on projects when bringing in new technology. According to Zhang and Huo (2015), these include effective team communication on new innovation. Similarly, factors like availability of complete and consistent task information to aid better utilisation of technology on site (Yousefi et al., 2015), constant team motivation towards adopting the new technology for task delivery (König and Neumayr, 2017) have also been considered factor that can help curtail task-related innovation conflicts in teams. In addition, adequate team awareness of how new technology helps to achieve task objectives/project goals (Larson and Chang, 2016) can pre-empt task disputes. Other critical measures for preventing task-related innovation conflicts in teams include clarity and adequate definition of task deliverables within the new technological arrangements (Sivarajah et al., 2017), availability of regular feedbacks from team members on task performance with new technology (Lim and Loosemore, 2017), adoption of a co-operative approach to tasks delivery by all team members (Wu et al., 2017), and re-assign untrainable team-members to less IT-driven roles or move them out of the team completely (Rahim, 2017; Alaka et al., 2018) among others. Based on the above arguments, we hypothesise that:

H1: *Prevention of negative task conflicts will aid the smooth implementation of Big Data technology in Project teams.*

2.2 Relationship Conflict and Prevention in Project Teams:

Relationship conflict –is believed to be person-driven and refers to non-work-related disputes, i.e., personal or social issues (Zhang et al., 2015) – which involves the emotional aspect of interpersonal relations (Way et al., 2016). An overwhelming body of literature including De Dreu (2006), Jehn & Mannix (2001); Gruenfield et al. (1996), Li and Li (2009), Lovelace et al. (2001), Way et al. (2016) - except for Gruenfield et al. (1996) and Lee et al. (2015) – have suggested negative outcomes for relationship conflict and innovation implementation in teams. According to Jehn and Mannix (2001), it is doubtful that relationship conflict is beneficial at any stage in the life of any team, given that personal tensions tend to override the collective sense of purpose and the acceptance of new ideas. The dysfunctional impact of relationship conflict in a project team can be very costly, especially where information needs to be freely shared and innovation needs to be embraced (Bradley et al., 2015).

According to Zhang et al. (2015), relationship conflict is harmful to team performance, reduces task concentration, and suppresses team spirit. Empirical studies on relationship conflict and task conflict have also suggested negative interaction between both conflict types, with scholars arguing that relationship conflict can result in task-related disputes, as team members are more reluctant to accept other members' suggestions, thus resulting in poor decision quality (Lee et al., 2015; Bai et al., 2016). According to Lee et al. (2015), relationship conflict interferes with the process of knowledge co-creation, by making group members focus more on negative emotions towards one another and making task delivery more challenging. Inter-personal conflicts are an important predictor of task conflict and can impede team members from processing complex task information. Relationship conflict also prevent free flow of constructive and creative suggestions among team members. In view of its widely acknowledged negative effects on task conflict and team innovation, studies like Lee et al. (2015) and Way et al. (2016) have suggested preventing relationship conflict will mitigate or reduce the intensity of task conflict, therefore creating positive atmosphere for collaboration, team trust and creative exchanges.

To address the above, review of existing studies in project management literature has identified a number of ways to mitigate or pre-empt relationship conflicts among project team members.

These include the use of collaborative approach to innovation benefit evaluation and incorporation in teams (Mok et al.,2015; Johnson, 2016), open minded discussion about opposing ideas and feelings (Chen et al., 2017), encouraging the adoption of mutually beneficial solutions to innovation problems (Oyedele et al., 2020) and promotion of positive atmosphere within team through positive and honest communication (Osabiya, 2015). Based on the above, this study proposes two hypotheses below:

H2: *Prevention of relationship conflict will aid smooth implementation of big data technology in project teams.*

H3*: Prevention of relationship conflict will minimise task-related conflict against big data technology in project teams.*

2.3: Process Conflict and Prevention in Project Teams:

Process conflict, although not yet robustly explored in the literature (unlike task and relationship conflicts), involves disputes over procedures, processes, or logistical issues; which could unsettle a team and impact its eventual outcomes (Jehn & Mannix, 2001; Vollmer's, 2015Vollmer, 2015; Gundry et al., 2016; Way et al., 2016). Like relationship or emotional conflict, process conflict has also been linked to a number of negative and positive effects in innovating teams (Jehn and Mannix, 2001). Studies like Jehn (1997); Jehn et al. (1999); Arazy et al., (2013) have examined a positive impact of process conflict on groups' acceptance of new ideas. According to Jehn & Mannix (2001), process conflict allows group norms to be agreed upon early on, accepted, and quickly comprehended. However, Gersick, (1989), had a different view and argued that well-performing teams often experience moderately high levels of process conflict in the early stages of group formation which, if not effectively managed or pre-empted, can negatively affect how teams respond to new processes and ideas.

According to Gersick, process conflict can have negative impact on task to be performed, thus triggering task conflicts since managers' disputes and grievances over processes can trickle down causing a lack of agreement over associated tasks. Hence, scholars suggested an interaction effect between process conflict and task conflict in project teams (Mok et al., 2015; Wang et al., 2016). As argued by Greer et al. (2008), process conflict is detrimental to productive work processes as it impedes group performance and team viability, whilst also reducing productivity. As such, authors like De Wit et al., (2012) and Lee et al. (2015), believe preventing process conflict will help reduce role ambiguity among team members, thus providing more clarity to tasks, processes and the use of project resources, while also improving intra-group learning process and collaboration.

Existing conflict studies in project management settings have identified possible measures for mitigating process-related disputes in innovating teams. Wang et al., (2016) and Wamba et al., (2017) both suggested the adoption of more collaborative project management practices, rather than controlled-oriented approaches. Wang et al. (2016), also indicated the availability of up-skilling arrangements to enable employees adapt to new technological changes and remain relevant to the job. Besides, Zicari (2014) in his study, indicated that the existence of pro-innovation champions within project teams can help resolve information asymmetry at the team level. Similarly, Wu et al. (2017) recommended regular team meetings as good practice for identifying early warning signs of innovation rejection in teams. Other very critical measures include effective systems for capturing and disseminating valuable and tacit organisational knowledge in the face of decreasing project documentations (Zicari., 2014), and existence of skill-based performance evaluation at the individual and project-team level to effectively benchmark staff contributions (Mok et al., 2015). In another related study, Raghupathi and Raghupathi, (2014), suggested adequate arrangements for integrating new technology into existing project environment. Similarly, Owolabi et al. (2020) also identified the need to align project governance & delivery practices across cross-functional units with new innovation. Coming from the above perspectives, this study examines two hypotheses below:

H4: *Prevention of process conflicts will aid the smooth implementation of big data technology in project teams.*
H5: *Prevention of Process conflict will minimise task conflict against big data technology in project teams.*

2.4 Team Power Conflict and Prevention in Project Teams:

In recent times, a number of conflict studies have also identified a fourth unique type of conflict in teams, called power conflict (Elzen et al., 2011; Seyfang and Haxeltine, 2012; Bouncken et al., 2016). Power conflict focuses on how the diversity of power structures in teams induces conflicts, which significantly impact on the innovation processes. While some studies on team rivalry have suggested positive performance outcomes due to an increase in competitive motivation (Greer, 2014; Van Bunderen, et al., 2018); scholars believe team-power conflict and rivalry harm innovation implementation. According to Seyfang and Haxeltine, (2012), new innovations most times upset team power-balance and can erode specific traditional roles and expertise in teams, thereby provoking resentment and resistance to change (Bouncken et al., 2016; Wang, 2016; Hai-yang et al., 2018). According to Mørk et al. (2010), since innovation risks and benefits are not evenly distributed in every organisation or team; the more the balance between innovation risks and benefits reflects the team's power structures; the more likely the innovation is to be accepted and vice versa.

The effect of team-power conflict on other conflict types, though not yet fully explored in the literature, gives room for not much optimism especially as it affects relationship conflict. According to Owolabi et al. (2020), power rivalry in teams focuses on the perception of individual players and their feeling of perceived threats. This perception can often translate to tensions in interrelationship among employees, thus creating dysfunction environment for creativity and innovativeness. Thus, power conflict can have significant influence on relationship conflicts by amplifying differences and biases (i.e., status, role, race, gender etc.) among employees within the teams (Seyfang and Haxeltine, 2012). Existing studies on power rivalry and competition in innovating teams have suggested preventing power conflicts reduces toxic tensions, undercutting behaviours, information hoarding, including overt and covert intra-team squabbles, thus promoting collaboration via harnessing members' productive efforts, improving team dynamics, morale and ideation (Greer et al., 2017; Wee et al., 2017).

As suggested by a number of authors, factors that can help mitigate or pre-empt power conflicts in teams include encouragement of the feeling of involvement and appreciation throughout the team (Cacciolatti and Lee, 2016),familiarity with team culture, structures and dynamics to aid spotting early warning signs and prevent conflict (Johnson, 2016), encouraging team deliberation at innovation development stages (Klerkx and Aarts (2013), timely and responsive resolution of innovation induced issues (Zhang and Huo, 2015), collaborative and data-driven decision making to minimise conflicts (Pelagio et al.,, 2014), and transparent decision making on technology introduction (Bendersky and Hays (2017) among others. Based on the above arguments, we examine these hypotheses:

H6: *Prevention of team power-conflicts will aid the smooth implementation of big data technology in project teams.*

***H7:** Prevention of team power conflicts will minimise relationship disputes against smooth implementation of big data technology in project teams*

Based on the above, scholars believe that these four conflict types can have different consequences for innovation implementation in teams (De Dreu, 2006; Jehn & Mannix, 2001; Lovelace et al., 2001; Way et al., 2016). Unfortunately, existing studies have provided no practical approach nor proactive mechanisms for drastically minimising, if not preventing innovation conflicts and ensure conflicts do stifle innovation implementation in organisations and project teams. Fig.1 below illustrates the focus of the study and path model for examining innovation conflicts prevention and the impact on smooth adoption of Big Data Analytics (BDA) technology in project teams. Also, Table 3 below details the various conflict prevention measures associated with each innovation conflict types examined in the study.

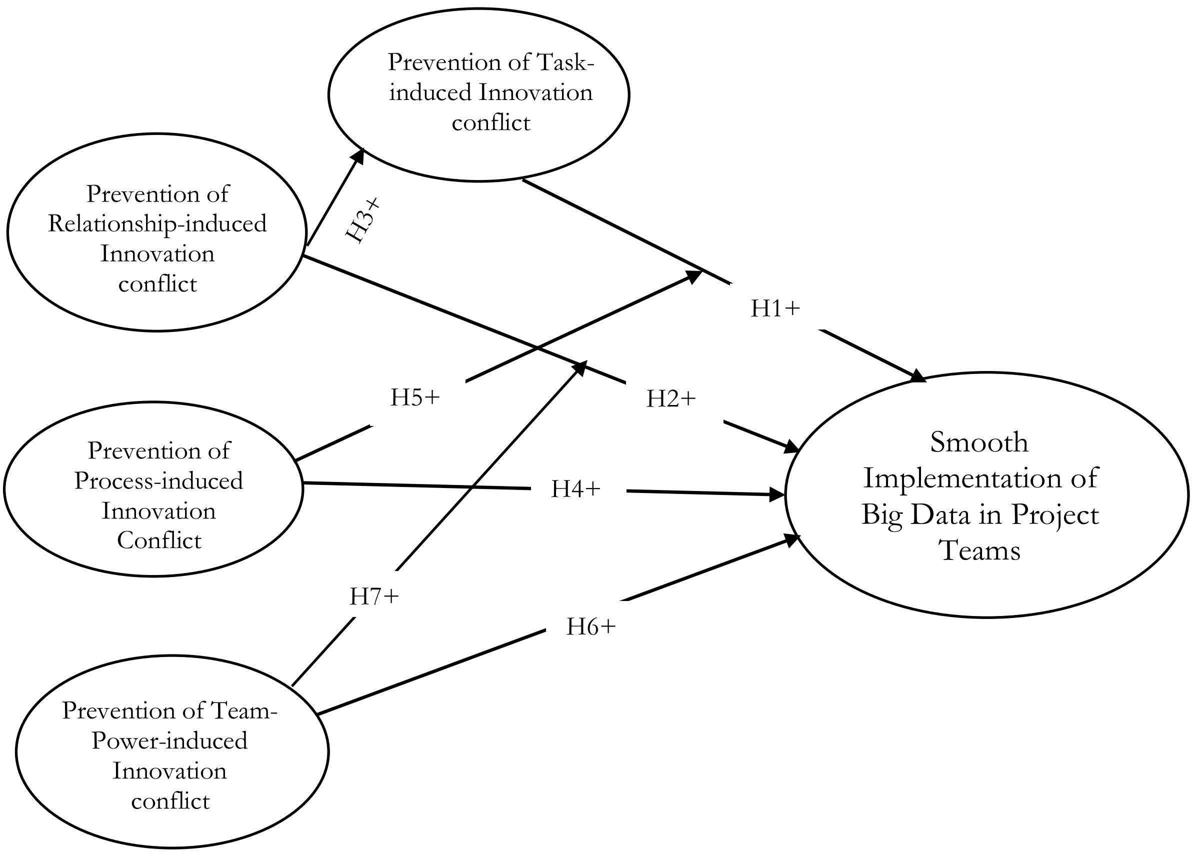

Fig 1. Path Model and Focus of the study

Table 3: Conflict Prevention Measures to Encourage Smooth Implementation of Big Data Technology in Project Teams

		Conflict Prevention Measures to Aid Smooth Implementation of Big Data Technology in Project Teams	**Sources**
PC1	Process-Conflict Prevention Measures in Innovating Project Teams	Adequate arrangements for incorporating big data technologies as routine on projects, processes & operations	Zicari (2014),
PC2		Encouraging more collaborative project management practices rather than controlled-oriented approaches.	Wang et al., (2016) and Wamba et al., (2017)
PC3		Availability of up-skilling arrangements to enable employees to adapt to new technological changes	Wang et al., (2016)
PC4		Regular meetings to identify early warning signs of technology-induced challenges in teams	Wu *et al*., (2017),
PC5		Existence of pro-innovation champions within project teams to resolve information asymmetry at the process/team level	Zicari (2014)
PC6		Aligning project governance & delivery practices across cross-functional units with new innovation	Chen et al., (2017); Owolabi et al., (2020).
PC7		Existence of skill-based performance evaluation at the individual and project-team level to effectively benchmark staff contributions	Mok et al., (2015)
PC8		Effective capturing and transfer of organisational knowledge to supplement decreasing project documentations during staff exits or transitions	De Wit et al., (2012)
TC1	Task-Conflict Measures for in Innovating Project Teams	Effective team communication on new technology & it uses	Wamba et al. (2017);
TC2		Availability of regular and constructive feedbacks from team members on task performance with the new technology	Lim and Loosemore, 2017
TC3		Availability of complete and consistent task information to aid better utilisation of technology on site	Yousefi et al. (2015);König and Neumayr (2017)
TC4		Constant team motivation to achieve success with the new technology	König and Neumayr (2017)
TC5		Adequate team awareness of how new technology helps to achieve project objectives/goals	Larson and Chang, 2016
TC6		Clarity and adequate definition of project roles within the new technological arrangements	Rahim (2017); Alaka et al. (2018)
TC7		Adoption of co-operative approach to tasks delivery by all team members	Wu et al. (2017)
TC8		Re-assign untrainable team-members to less IT-driven roles or move them out of the team completely	Sivarajah et al., 2017
PP1	Team-Power Conflict Prevention Measures in Innovating Teams	Transparent decision making as it affects the introduction of new technology in teams	Cacciolatti and Lee (2016),
PP2		Better awareness of team culture, structures and dynamics to facilitate early identification of conflict warning signs	Johnson, (2016)
PP3		Encouraging team deliberation at the innovation development or adoption stage	Klerkx and Aarts (2013),
PP4		Timely and responsive resolution innovation-induced issues	Zhang and Huo, (2015)
PP5		Collaborative and data-driven decision-making to minimise resistance	Pelagio Rodriguez et al. (2014)
PP6		There must be a feeling of involvement and appreciation throughout the team	Bendersky and Hays (2017)
RC1	Relationship Induced Conflict Prevention Measures	Collaborative approach to innovation benefit evaluation and incorporation in teams	Mok *et al.,* (2015); Johnson, (2016)
RC2		Open minded discussion about opposing ideas and feelings.	Chen et al., (2017)
RC3		Encouraging the adoption of mutually beneficial solutions to innovation problems	Oyedele et al. (2020)
RC4		Promoting positive atmosphere within the team through positive and honest communication	Osabiya, (2015)

4.0 Methodology

The principal focus of this research is to test theoretical hypotheses and confirm/disprove

Phase 1:

This study commenced with a review of the extant theoretical literature. The review examined innovation conflict types in project teams including task conflict, process-conflict, relationship conflict and power conflict/rivalry in teams. Through the theoretical review, we formulated seven hypotheses to investigate how prevention of the various identified conflict types can facilitate smoother adoption of innovation in project teams. Hence, the four conflict types were treated as first order latent constructs/variables, while a second-order construct (Smooth implementation of Big Data in teams) was also formulated at higher level of abstraction. The various constructs were then used to develop a path model as shown in Figure 1 above. Through the extensive review of the literature, we identified twenty-six (26) relevant indicator variables of each first-order latent construct in the study. The identified indicator variables were considered to be very essential for preventing each innovation conflict types in a project team setting. The twenty-six preventive measures were later used to formulate a self-administered questionnaire distributed to IT project teams in the UK's blue-chip and project-based firms.

Phase 2:

The second phase of the study involved quantitative data collection via a self-administered online questionnaire survey. In formulating the questionnaire, respondents were requested to indicate how important they considered the need to prevent "task-related conflicts, process-related conflicts, relationship conflicts and conflicts from power rivalry in teams" when implementing big data technology in teams. Similarly, respondents were also requested to indicate the significance of each 26 associated measures for curtailing the identified innovation-induced conflicts. This was carried out on a five-point Likert scale, where 1 represented "Not Important" and 5, "Most Important". Before distributing the questionnaire, a mini pilot study was conducted by identifying 11 seasoned academics and IT practitioners at a UK R&D laboratory to evaluate the measurement questions and the Likert Rating Scale. The pilot survey was necessary to ensure the questionnaire was measuring what it was designed to measure. Their feedbacks which included the rewording of questions and paraphrasing were used to design the final questionnaire. Using random sampling, a list of 451 respondents with significant project experiences from IT Project settings in the UK including practitioners in construction/engineering projects, including were selected from RIBA database and other industry/expert sources. In all, a total of 313 online questionnaires were mailed-out/distributed over six months between 2018 and 2019, with the survey also posted on Linkedin platform for wider audience/attention. With a return rate of 68%, 212 useable questionnaires were more than the minimum sample threshold of 65% required for Structural Equation Modeling (SEM) based on suggestions from Esfandiar et al. (2019). See Table 4 below for the Characteristics of the questionnaire respondents.

Table 4: Attributes of Questionnaire Respondents

Variables	Sample Size
Total Number of Respondents	206
Type of Organisation	
▪ **Construction & Engineering**	
▪ *Project Manager*	44
▪ *Site Engineers*	36
▪ *Design Engineer*	25
Information & Technology (IT)	
▪ *Software Systems Developer*	39
▪ *Computer Network Architect*	33
▪ *Hardware Engineers*	29
Years of Project delivery Experience	
▪ **<1**	43
▪ **1-5**	75
▪ **6-10**	59
▪ **11-15**	29

Out of the 212 returned questionnaires six (6) questionnaires were identified as largely incomplete and were therefore regarded as unsuitable for statistical analysis. These were immediately deleted, leaving the research team with 206 usable questionnaires from IT engineers, project managers, site engineers, design engineers, system developers, network architects etc. (see Table 4 for Attributes of Questionnaire Respondents).

4.2 Data Screening and Reliability Analysis

For starters, the author screened for missing or incomplete values in the questionnaire data using excel "COUNTBLANK" function. Two values which were missing were immediately addressed using mean-replacement. Thereafter, the author evaluated the dataset for a preliminary Construct Reliability using Cronbach's Alpha reliability test using SPSS software 28. This initial reliability test was needed to ensure that the dataset was reliable, fit and internally consistent. Hence, using Cronbach's Alpha reliability test, all the 26 measures identified from the literature was analysed.

The result produced an overall Cronbach's alpha coefficient of 0.914, indicating a high-reliability coefficient as recommended by Field (2005). In addition, in order to ensure the study is working with set of indicators that truly measure and contribute to their constructs, the study examines another statistical measure named: 'Cronbach's Alpha if item deleted'. According to Field (2005), any variable that is not contributing to the overall construct will have a Cronbach's alpha higher than the overall reliability coefficient and such variable, if deleted will improve the overall reliability of the data. Based on the results, four (4) indicators whose Cronbach's alpha coefficient were higher than the overall reliability was identified and deleted from the dataset, thus, leaving us with 22 valid conflict prevention measures. The more reliable dataset was later taken forward to Structural Equation Modelling (SEM) phase.

The four deleted indicators include:

1. **PC7=***Existence of skill-based performance evaluation at the individual and project-team level to effectively benchmark staff contributions.*
2. **PC8=** *Effective capturing and transfer of organisational knowledge to supplement decreasing project documentations during staff exits or transitions*
3. **PP6=***There must be a feeling of involvement and appreciation throughout the team*
4. **TC8=** *Re-assign untrainable team-members to less IT-driven roles or move them out of the team completely*

Statistical Analytical Approach:

Based on the objective of this study, it was important to confirm or reject the various theoretical assumptions and complex relationships that were hypothesized involving different constructs and indicators innovation conflict studies. To do this, Structural Equation Modelling (SEM) was relied upon to carry out Confirmatory Factor Analysis (CFA). SEM is a multivariate statistical analysis approach that allows simultaneous evaluation of the relationships among exogenous (independent) latent constructs and endogenous (dependent) constructs within a model. There are two popular SEM methods often relied upon by social scientists namely Covariance-based Structural Equation Model (CB-SEM) and Partial Least Square Structural Equation Model (PLS-SEM). However, in this study, the Partial Least Square SEM (PLS-SEM) has been considered because it examines the effects of innovation conflict prevention on smooth adoption of technology in teams. PLS is a structural path estimation approach that is popular in many management studies as a multivariate technique [Hair et al., 2019]. It is suitable for handling complex structural models involving many constructs and model relationships, non-normal data distribution and has strong predictive power

(Rigdon et al., 2017; Shmueli et al., 2019; Hair et al., 2019). The analysis was carried out using *Smart PLS 3* based on the guidelines and recommendations provided by Hair et al. (2017).

Data Analysis:

Data Analysis in PLS SEM involves a combination of the (1) measurement model – also known as the outer model and reflects the relationship between the latent variables and their indicators or measures; and (2) structural model – also known inner model, which indicates the sequence of the constructs and the relationships among the latent variables (Hair et al., 2019).

Measurement Model:

Based on the recommendation of Hair et al., the measurement model is estimated for internal consistency, discriminant validity and convergent validity as demonstrated in Table 5 below:

Table 5: Evaluation of the Measurement Model

Constructs	Item	Loadings	Cronbach's Alpha	Rho	Composite Reliability	AVE
Process Conflict Prevention	PC1	0.537	0.855	0.869	0.895	0.591
	PC2	0.806				
	PC3	0.786				
	PC4	0.833				
	PC5	0.873				
	PC6	0.731				
Power Conflict Prevention	PP1	0.742	0.804	0.808	0.864	0.561
	PP2	0.769				
	PP3	0.735				
	PP4	0.713				
	PP5	0.784				
Relationship Conflict Prevention	RC1	0.87	0.848	0.864	0.898	0.689
	RC2	0.887				
	RC3	0.833				
	RC4	0.72				
Task Conflict Prevention	TC1	0.57	0.842	0.871	0.883	0.53
	TC2	0.4				
	TC3	0.785				
	TC4	0.806				
	TC5	0.832				
	TC6	0.8				
	TC7	0.791				

Being a reflective-formative model, measuring the **internal consistency reliability and validity** of the model was therefore necessary. Reliability and validity measurement which help assess the extent to which each indicator variables for each of the latent variables accurately measures their associated constructs was examined using Cronbach's alpha. Nevertheless, due to the limitations of Cronbach's alpha, other validity and reliability measures such as composite reliability and Dillon-Goldstein's rho were combined (Borriello, A., 2016). Similar to Cronbach's alpha, Dillon-Goldstein's rho value ranges from 0 to 1, with higher values suggesting higher reliability. Particularly, Cronbach's alpha and rho values of 0.6 to 0.7 are generally acceptable as minimum reliability threshold for exploratory research, while the values of 0.90 to 0.95 are undesirable and suggest all indicators are not likely true measures of the construct (Hair et al., 2017). In addition, composite reliability value is believed to range between 0 and 1, while 0.7 is regarded the suitable threshold. Based on the internal consistency results for this study, all the latent variables reported Cronbach's alpha, composite reliability and Dillon-Goldstein's rho values above 0.7 thus indicating strong internal consistency of the model as shown in Table 4 above.

Going further, in order to examine the extent to which each measure of the same latent construct positively correlates with alternative measures of the similar construct, the study examined the model for **Convergent Validity**. Based on theory, the items that are indicators of a specific construct should converge or share a proportion of high variance. To examine convergent validity, this study considered the outer loadings of the model and the Average Variance Extracted (AVE). Higher outer loadings on a construct suggest that the indicator variables have more in common captured by their associated construct. In this study, the outer loadings of all the indicator variables are 0.5 acceptable threshold (Wong, 2013) and the AVE values which reflects the commonality of the latent constructs are well above the acceptable threshold of 0.5 (Fornell and Larcker, 1981). Hence the values of the outer loadings and the AVE therefore suggest a good convergent validity for the indicators and latent constructs in this study.

Finally, the model was examined for **Discriminant Validity** which is a measure of the extent to which a latent construct is truly unique and distinct from other latent constructs by empirical measurement. Two measures of validity are central to discriminant validity, namely **Cross Loadings**, **Fornell Larcker Criterion and** the **Heterotrait-monotrait ratio (HTMT).** (Hair et al., 2019)**.** For cross loadings, it examines whether indicators are measuring other than their supposed associated latent construct. Therefore, their loading under their latent construct should be higher than any other cross loadings as reflected in Table 6 below:

Table 6: Cross Loading Results in the indicator variables in the latent constructs

Indicators	Power Conflict _Prevention	Process Conflict_Prevention	Relation Conflict_Prevention	Task Conflict _Prevention
PC1	0.408	**0.537**	0.293	0.43
PC2	0.439	**0.806**	0.43	0.509
PC3	0.448	**0.786**	0.447	0.519
PC4	0.452	**0.833**	0.484	0.542
PC5	0.508	**0.873**	0.514	0.597
PC6	0.456	**0.731**	0.426	0.559
PP1	**0.742**	0.458	0.431	0.49
PP2	**0.769**	0.472	0.424	0.535
PP3	**0.735**	0.415	0.363	0.48
PP4	**0.713**	0.369	0.384	0.465
PP5	**0.784**	0.48	0.461	0.533
RC1	0.507	0.5	**0.87**	0.596
RC2	0.476	0.489	**0.887**	0.578
RC3	0.454	0.469	**0.833**	0.557
RC4	0.392	0.433	**0.72**	0.516
TC1	0.337	0.405	0.514	0.57
TC2	0.333	0.363	0.227	**0.4**
TC3	0.496	0.574	0.523	**0.785**
TC4	0.538	0.474	0.503	**0.806**
TC5	0.557	0.541	0.543	**0.832**
TC6	0.536	0.515	0.477	**0.8**
TC7	0.565	0.611	0.587	**0.791**

The Fornell Larcker Criterion compares the AVE (square root) and the construct correlations. Based on the rule of thumb (Fornell Larcker, 1981), the square root of the AVE should be higher than its correlations with other latent constructs. Table 7 below showed that all the diagonal values are higher than all the off-diagonal values for each construct, which indicated that discriminant validity has been established.

Table 7: Discriminant Validity Results of the indicators in various latent construct

Constructs	Power Conflict _Prevention	Process Conflict_Prevention	Relation Conflict_Prevention	Task Conflict _Prevention
Power Conflict _Prevention	0.749			
Process Conflict_Prevention	0.589	0.769		
Relation Conflict_Prevention	0.554	0.57	0.83	
Task Conflict _Prevention	0.67	0.689	0.677	0.86

Finally, the **Heterotrait-monotrait ratio (HTMT)** was examined in order to fully clear the model for internal consistency reliability as reflected in Table 7 below. According to Hair et al., (2017), HTMT estimates the mean of all correlations of indicators across the constructs. HTMT estimates what the true correlation should be among constructs, when accurately measured. According to Henseler (2014), HTMT value of 0.9 and above indicates a lack of discriminant validity, while a lower or more conservative threshold of 0.85 is acceptable to demonstrate discriminant validity. Based on the results of the study as shown in Table 9 below, all HTMT values are lower than the conservative threshold and thus suggest discriminant validity is achieved (Hair et al., 2019).

Table 8: Heterotrait-monotrait ratio (HTMT) results of the variables in various constructs

Constructs	Power Conflict _Prevention	Process Conflict_Prevention	Relation Conflict_Prevention	Task Conflict _Prevention
Power Conflict _Prevention	-			
Process Conflict_Prevention	0.712			
Relation Conflict_Prevention	0.665	0.667		
Task Conflict _Prevention	0.814	0.822	0.798	-

2nd Order Construct – Analysis of Convergent Validity

Since this study operationalised all the first-order latent constructs at higher level of abstraction (higher order or second order construct), the theorised 2nd order construct (*Smooth Adoption of BDA in Project Teams*) was therefore examined for convergent validity. In PLS-SEM, two popular approaches are often suggested to estimate the second-order latent variable namely (1) the repeated indicator approach and (2) the two-stage approach (Henseler et al., 2012; Hair et al., 2019). In this study, the repeated indicator approach was adopted based on its simplicity and its ability to estimate all constructs simultaneously. In this regard, all the indicator variables of the first-order constructs were reflected on the 2nd Order latent construct. Using Average Variance Extracted (AVE) and Composite Reliability as measures of validity and reliability, the rule of thumb as per Henseler (2012; 2014), indicated that composite reliability of 0.7 and above is suitable for 2nd order constructs and AVE of 0.5 and above is considered acceptable as well. Hence, going by the results shown in Table 9 below, convergent validity was established for the higher-order construct.

Table 9: Convergent Validity Loading for 2nd-order construct (Smooth Adoption of BDA)

Latent Construct	Standardised loading	STD loading square	Error Variance = 1-loadings squared
Process conflict prevention	0.16	0.0256	0.9744
Power conflict prevention	0.476	0.226576	0.773424
Relationship conflict prevention	0.744	0.553536	0.446464
Task conflict prevention	0.502	0.252004	0.747996
Total Loadings	1.882	1.057716	2.942284
Total Loadings Squared	3.541924		6.484208
	AVE	0.627	
	Composite Reliability	0.716	

Explanatory Power of the Structural Model:

Based on the results, the latent construct measures have been confirmed to be reliable and valid in the earlier section of the measurement model. Therefore, this section tackles the assessment of the structural model so as to determine its explanatory and to test the various theoretical relationships hypothesized in the measurement model. To achieve this, the structural model was first estimated for collinearity using the variance inflation factors (VIF) which are all below the threshold of 5 but not lower than 0.20 (Hair et al., 2019); thus, indicating absence of collinearity problem in the latent construct as per recommendation by Henseler et al. (2014) and Hair et al. (2019). Please see Table 11 below for Outer Values of Variance Inflation Factor (VIF).

Table 10: below for Outer Values of Variance Inflation Factor (VIF)

Collinearity Check using Outer VIF Values	VIF
PC1	1.217

PC2	2.205
PC3	1.903
PC4	2.358
PC5	2.824
PC6	1.592
PP1	1.495
PP2	1.605
PP3	1.54
PP4	1.45
PP5	1.622
RC1	2.621
RC2	2.743
RC3	2.015
RC4	1.571
TC1	1.281
TC2	1.128
TC3	1.973
TC4	2.23
TC5	2.266
TC6	2.159
TC7	1.96

Since the results established absence of collinearity in the model, the structural model was afterwards estimated for its predictive capabilities using important heuristic metrics including coefficient of determination (R^2 Values), significance of the path coefficient, effect size (f^2) and predictive relevance (q^2). According to Henseler (2014), R^2 Values is the estimate of the predictive power of the model and is calculated as the squared correlation between the predicted and actual values of an endogenous variable. Based on the rule of thumb, the general thresholds of R^2 Values for endogenous variables are 0.25 (weak), 0.50 (moderate) and 0.75 (substantial) accordingly (Hair et al., 2019). Going further, the significance of the path coefficient and statistical error was calculated using complete bootstrapping with 3,000 subsamples and the coefficient of determination - which is the measure of the model's predictive power - was estimated. Path coefficient is an equivalent of regression weights and reflects the weight of the paths (Garson, 2013). Hence, the higher the path, the more significant the influence of an independent construct on the dependent construct.

As suggested by Murari (2015), a path coefficient of 0.1 to 3.0 signified weak influence, 0.3 to 0.5 signify moderate influence and 0.5 to 1 suggest strong influence. Going further, the effect size (f^2) - which is the value of R^2 when a specified latent construct is omitted and included from the model - was calculated by estimating 0.02; 0.15 and 0.35 represent small, medium and large effect respectively, while the effect size of less than 0.02 suggests no effect at all. Similarly, the cross validated redundancy, also referred to as the predictive relevance q^2 , which is a measure of the model's 'out-of-sample predictive power' (Henseler., 2014), is calculated through blindfolding with an omission of a part of the data matrix at distance of 7. The lesser the variance between the predicted and original values, the greater the q^2 and therefore the model's predictive accuracy. Particularly, a q^2 value that is larger than zero for a specific endogenous construct, suggest's the path model's predictive relevance to the particular construct. As a comparative measure of predictive relevance, the q^2 values of 0.02, 0.15, and 0.35, suggest that the exogenous variables possess small, medium and large predictive relevance for a particular endogenous construct (Henseler et al., 2009).

In addition, the critical t-values of a two-tailed test include 1.65 (significance level = 10%), 1.96 (significance level= 5%) and 2.57 (significance level=1%) respectively. Figure 2 below presents the structural model and Table 11 below reveals the path significance, computed effect size and predictive relevance. Going by the results, the coefficient of determination (R^2 Values) of the endogenous constructs: *"relationship conflict prevention", "task conflict prevention"*, and *"Smooth adoption of BDA in project teams"* is 0.307 and 0.594 and 0.897 respectively, thus confirming that substantial variance in the constructs is explained by the model. In addition, this also suggests that 30% of variance in *"relationship conflict prevention"* is accounted for by the pressures of *"power conflict prevention"*; 59% variance in *"task conflict prevention"* construct is accounted for by *"process conflict prevention"* and *"relationship conflict prevention"* respectively, while overall, 89% of the variance in the higher-order construct *(Smooth adoption of BDA in project teams)* is accounted for by all the four first-order constructs. This therefore signifies an acceptable predictive accuracy of the structural model.

Going further, a two-tailed t-test was employed to evaluate the paths in the model where each path represents a hypothesis (Please see Figure 2 below). The study made decisions based on statistical standard significance levels of 0.01 and 0.05 as reflected in Table 10. Out of the seven hypothesised relationships, six hypotheses were confirmed significant based on the results. In this regard, the path coefficient between *task conflict prevention* and *smooth adoption of BDA in teams* (H1) and the path coefficient between *relationship conflict prevention* and *smooth adoption of BDA in teams* (H2) were deemed significant at 99% confidence interval (CI). Likewise, the path coefficient between "relationship conflict prevention" and "task conflict prevention" (H3) was confirmed as significant at 99% CI. In a nutshell, all the hypotheses were accepted since their *t-values* are greater than 1.96 and their *P-values* were less than <0.05; except for hypotheses **H4** – (*Prevention of process conflicts to aid smooth implementation of big data technology in project teams)*. This path relationship was rejected at *p-value* of 0.061, *t-statistic* of less than the 1.96 minimum threshold and effect size (f^2) and predictive relevance q^2 that is less than the acceptable threshold of 0.02.

The implication of this result is that, preventing innovation-induced process conflict has no significance in ensuring smooth adoption of BDA in project teams. This result mirrors the perspectives of Jehn (1997) and Isaksen and Ekvall (2010), who both argued that, though some high performing teams experience some high-levels of task conflict in their innovation process; such teams often encounter little or no process conflict. Nevertheless, H5, H6 and H7 were all accepted having surpassed the required statistical thresholds. The result therefore confirms that except for *"process conflict prevention"* variable, other latent constructs like *"task conflict prevention", "relationship conflict prevention"* and *"team power conflict prevention"* all statistically play crucial roles in ensuring a hitch free implementation of big data technology in project teams. In addition, all the latent constructs achieved effect size (f^2) and predictive relevance q^2 higher than the minimum threshold value of 0.00 as recommended by Bag et al., (2021). Also, in terms of indirect relationships, the results in Table 11 below also showed all the hypothesised indirect relationships in the study were significant at 99% CI (using p-value and t-statistic thresholds of <0.05 and >1.96 respectively), thus, signifying their important interaction effects on the higher-order construct and their impact in aiding smooth BDA technology implementation project teams. Detailed discussion of the results of the SEM is presented in the next section.

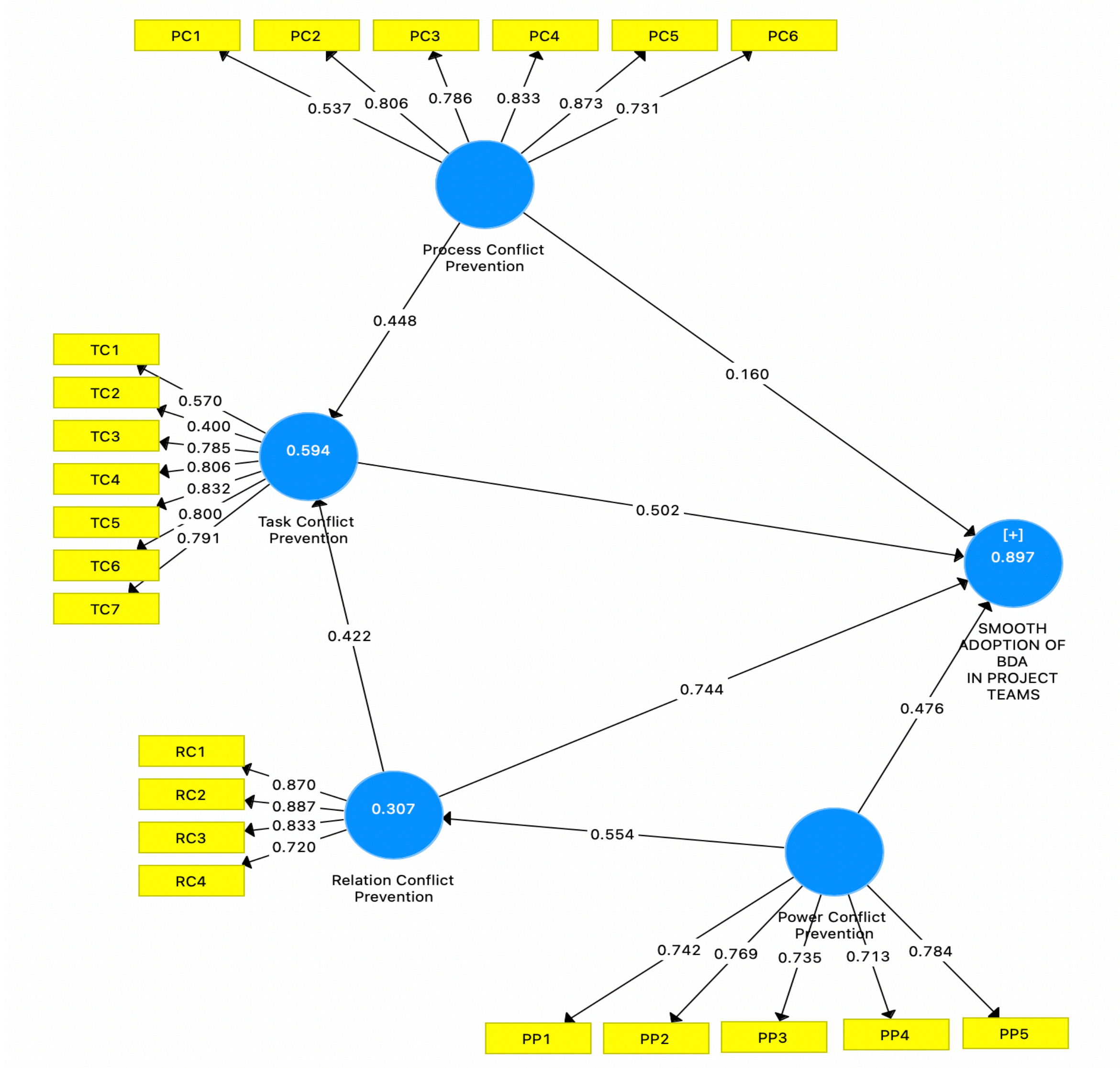

Fig.2: Structural Model indicating the results of all the indicators in the constructs

Table 11: Results of Hypotheses Testing

Mean, STDEV, T-Values & P-Values	Standard Deviation (STDEV)	$t-Value$	*P-Values*	Decision	f^2	q^2	95% LL	95%UL
H1-Task Conflict _Prevention -> SMOOTH ADOPTION OF BDA_IN PROJECT TEAMS	0.024	11.895	0.00**	Supported	**0.592**	**0.023**	0.497	0.501
H2- Relation Conflict_Prevention -> SMOOTH ADOPTION OF BDA_IN PROJECT TEAMS	0.024	6.06	0.00**	Supported	**0.832**	**0.135**	0.016	0.089
H3- Relation Conflict_Prevention -> Task Conflict _Prevention	0.03	9.538	0.00**	Supported	**0.293**	**0.089**	0.218	0.323
H4 - Process Conflict_Prevention -> SMOOTH ADOPTION OF BDA_IN PROJECT TEAMS	0.027	1.118	0.061	Unsupported	**0.019**	**0.001**	0.386	0.102
H5-Process Conflict_Prevention -> Task Conflict _Prevention	0.03	8.26	0.00**	Supported	**0.330**	**0.103**	0.101	0.196
H6-Power Conflict Prevention -> SMOOTH ADOPTION OF BDA_IN PROJECT TEAMS.	0.027	2.14	0.01**	Supported	**0.029**	**0.020**	0.26	0.378
H7- Power Conflict Prevention -> Relation Conflict_Prevention	0.026	7.471	0.00**	Supported	**0.443**	**0.263**	0.08	0.405

Specific Indirect relationships	**Original Sample**	**Sample Mean**	**STDEV**	***t-Statistic***	***P-Values***
(a) Relation Conflict_Prevention -> Task Conflict _Prevention -> SMOOTH ADOPTION OF BDA_IN PROJECT TEAMS	0.241	0.242	0.023	10.456	0
(b) Process Conflict_Prevention -> Task Conflict _Prevention -> SMOOTH ADOPTION OF BDA_IN PROJECT TEAMS	0.413	0.412	0.027	15.102	0
(c) Power Conflict _Prevention -> Relation Conflict_Prevention -> SMOOTH ADOPTION OF BDA_IN PROJECT TEAMS	-0.081	-0.081	0.014	5.715	0

****p< 0.01, *p< 0.05.** Effect size indicators are based recommendation by Cohen (2013), f2 values: 0.35 (large), 0.15(medium) and 0.02(small). Predictive relevance (q2) of predictor exogenous latent variables is according to Henseler et al. (2019), q2 values: 0.35 (large), 0.15(medium), 0.02(small).

5.0 Discussion

The statistical results from the structural equation model as detailed in Table 11 above confirmed three important latent constructs as having significant influence on aiding smooth implementation of big data technology in project teams. These constructs include– *"Relationship Conflict Prevention", "Task conflict prevention"*, and *"Team Power Conflicts prevention"*. These three latent variables (first-order) formatively contribute to ensuring a validly abstracted higher-order construct (*Smooth Adoption of BDA in Project teams)* by returning a strong coefficient of determination (R^2 Value) of 0.897, per Hair et al., (2019). As shown in Fig 2. above, their path coefficients of 0.744, 0.502 and 0.476 respectively are statistically significant as per recommendation by Murari (2015) *(path coefficient of 0.1 to 3.0 signified weak influence, 0.3 to 0.5 signify moderate influence and 0.5 to 1 suggest strong influence*), with all the three contributing to explain 89% variance in the structural model. Further details of the findings from the structural model are comprehensively elaborated in the sub-sections below.

5.1 Relationship-Conflicts Prevention in Projects Teams Implementing Big Data

Going by results from the statistical analysis and SEM-modelling, **hypothesis H2** was fully supported at 99% confidence internal (CI) showing that preventing relationship conflicts when introducing Big Data Analytics (BDA) innovation in project teams is the topmost and most crucial strategy for ensuring smooth implementation. This is accurately evidenced by the significance of the path coefficient which reported a loading of 0.744 indicating the strong strength of the construct in contributing towards the R^2 Value of the higher-order construct *(smooth adoption of BDA in project teams)*. The results of the *p-value (0.00)* and *t-statistic* (6.06) metrics also helped to confirm the marginal significance of hypothesis **(H2)** and were clearly within acceptable threshold of <0.05 and not less than 1.96 respectively. The effect size (f^2) of 0.832 and predictive relevance (q^2) of 0.135 were also higher than the acceptable thresholds of minimum of 0.02, thus indicating a strong effect and predictive relevance. This result has huge significance and strongly mirrors earlier innovation literature who have all confirmed negative outcomes for relationship conflict in teams including De Dreu (2006), Jehn & Mannix (2001); Gruenfield et al. (1996), and Li and Li (2009).

According to Jehn and Mannix (2001), it is doubtful that relationship conflict is beneficial at any stage in the life of any team. From the perspective of Zhang et al. (2015), relationship conflict is harmful to organisational outcomes like innovation. It can reduce task concentration, and suppresses the climate for innovation and creativity and thus, hindering rather than helping individuals or teams in a constructive way (Isaksen and Ekvall, 2010). Bradley et al., (2015) opines that the dysfunctional impact of relationship conflict in teams needs to be anticipated when introducing innovation and should be adequately curtailed or pre-empted. Therefore, a proactive approach to handling such conflicts will help create a climate more receptive to innovation and creativity in teams.

Going further, the results of the SEM also indicated that *"Preventing relationship conflict"* also correlate significantly with other variables such as *"task conflict prevention"* and *"power conflict prevention"*, and therefore confirms hypotheses **H3**. As in expected directions, relationship conflict prevention correlate strongly to task conflict prevention (**H3** =*Relation Conflict_Prevention -> Task Conflict _Prevention)* with a significant path coefficient of 0.422 and contributes to total variance of 0.594 (R^2 Value) in the endogenous construct *(task conflict prevention)*. The *P-value* of 0.00 (@99% CI), *t-statistic* of 9.538, the effect size (f^2) of 0.293 and predictive relevance (q^2) of 0.089 all confirm hypothesis H3 and supports the strong interaction between relationship conflict (RC) and task conflict (TIC). The hypothesized mediation effects here is a partial as the prevention of relationship conflicts still has impact on smooth adoption of big data in teams regardless of its corresponding positive impact on task conflict prevention. This result mirrors the perspectives of studies like Lee et al. (2015), Bai et al. (2016) who have all reported strong interaction effects between relationship conflict and task conflict. It confirms arguments by Isaksen and Ekvall (2010), that relationship disputes in teams can lead to task-related disputes and vice versa, thus making it difficult for managers to separate work-related issues from personal issues.

Therefore, as Owolabi et al. (2020) suggested, minimising the dysfunctional effects and outbreak of relationship conflict will potentially and proportionally reduce the task conflict and vice versa. In this study, relationship conflict was reflectively measured by four indicators including **RC1=** *Collaborative approach to innovation benefit evaluation and incorporation in teams;* **RC2=** *Open minded discussion about opposing ideas and feelings;* **RC3=** *Encouraging the adoption of mutually beneficial solutions to innovation problems* and **RC4=***Promoting positive atmosphere within the team through positive and honest communication.* All the indicators converged strongly and showed loadings of above 0.5, with the highest being 0.887 (RC2) and the lowest being 0.720 (RC4).

5.2 Task Conflicts Prevention in Projects Teams Implementing Big Data

The results from the structural equation modelling above support hypothesis **H1**, indicating that preventing task-related conflicts is essential and 2nd ranked factor for facilitating a conflict-free Big Data Analytics (BDA) implementation in project teams. This is shown by the significance of the path coefficient which showed 0.502 and supported at 99% confidence interval (CI). The effect size (f^2) of 0.592 was also higher than the most minimum recommendations of 0.02 by Hair et al., (2019) and 0.00 by Bag et al. (2021), while the predictive relevance (q^2) of 0.023 indicated a medium predictive capability of the model. In addition, the *t-statistic* and the *P-value* which confirms the strength of the hypothesized relationship are greater than 1.96 per Henseler et al. (2014) and less than <0.05 respectively. This result, therefore identified pre-empting or mitigating task-related conflicts as a crucial strategy for ensuring a rancour-free BDA implementation in project teams. The results also mirror earlier studies like Wamba et al. (2017) and Lim and Loosemore (2017), who both argued that in typical cross-functional teams (i.e., project management teams) where members are often selected from different professional or educational backgrounds, agreeing on tasks is a common challenge that needs better management.

According to Lim and Loosemore (2017), the diverse nature of cross-functional teams engenders differences in values and perspectives, and this sometimes results in members disagreeing on what the team's actual task, purpose, focus, or mission should be. When introducing new technology in project teams, Yousefi et al., 2015 believe such disputes brings more difficulty within the innovation process especially where innovation is radical and strongly challenges existing work-practices that has long become a culture and widely imbibed. From the results, task conflict prevention was reflectively measured by seven relevant indicators including: **TC1=***Adequate arrangements for incorporating big data technologies as routine on projects, processes & operations*; **TC2=***Availability of regular and constructive feedbacks from team members on task performance with the new technology*; **TC3=** *Availability of complete and consistent task information to aid better utilisation of technology on projects locations and sites;* **TC4=***Constant team motivation to achieve success with the new technology*; **TC5=** *Adequate team awareness of how new technology helps to achieve project objectives/goals*; **TC6=** *Clarity and adequate definition of project roles within the new technological arrangements* and **TC7=***Adoption of co-operative approach to tasks delivery by all team members*. All the indicators strongly converged on their first-order latent construct (task conflict prevention) and have loadings above 0.5 except TC2 at 0.40. But the indicator was later retained rather than deleted due to its importance in ensuring better convergence of the model.

5.3 Power Conflicts Prevention in Projects Teams Implementing Big Data

The results in Table 11 above confirms **hypothesis HP6** as a valid relationship and confirms the *"prevention of conflicts relating to team power rivalry"* as the third most crucial factor for ensuring smooth and conflict-free implementing of big data technology in project teams. Going by the significance of its path coefficient which reported a loading of 0.476 (moderate influence as per Murari, 2015) at 99% CI, the *P-value* of 0.01 and *t-statistic* of 2.14 (above recommended 1.96) the result showed that prevention of tension and power rivalry within the innovation process in teams is positively correlated to team adoption of BDA. To further examine the strength of the path relationship, other model quality measures like effect size (f^2) and predictive relevance (q^2) were also examined and both reported satisfactory results at 0.029 (higher than recommended threshold of 0.02 for f^2) and medium predictive capacity of 0.021 (above the minimum recommendation of 0.02 by Hair et al. 2019 and 0.00 by Bag et al. 2021). The result above mirrors opinions in earlier literature and has immense significance for organisations and teams considering new innovation such as big data technology (Bouncken et al., 2016; Wang, 2016; Hai-yang et al., 2018). Studies like Cacciolatti and Lee (2016), Bouncken et al. (2016), Wang (2016), Hai-yang et al. (2018) have earlier highlighted rivalry over the control of a team's valuable resources (i.e. economic opportunity, professional security, etc.) or social resources (i.e. expertise, knowledge, decision-making opportunities, status, social approval or information, etc.) as daily occurrence in most project teams, which in most cases affects team activities and outcomes.

According to Aime et al. (2014), the critical behavioural process involved with power structures in teams is about overt and covert intra-team power struggles. Team members compete for influence and resources, and studies have shown that influential members can wield enormous power over others and can resist influence as well (Greer, 2014). One of the significant impacts of big data innovation within such teams is that its introduction can potentially erode or disrupt existing power or governance arrangements with the team. Such re-organisation may unwittingly position better-skilled staff in a new vantage situation ahead of other team members in terms of power and influence (Greer et al., 2017). As such, affected-influential team members may respond to the innovation by, either becoming a useful-agent for the organisation and the team, thereby positively influencing other members (Cacciolatti and Lee, 2016), or becoming a negative influence on other members and inducing resistance towards the innovation (Greer, 2014).

In addition, the SEM-results also confirmed the validity of **hypothesis H7** *(Power Conflict Prevention --> Relation Conflict_Prevention)* and signified the strong mediation effect between *"power conflict prevention"* and *"relationship conflict prevention"* as they are positively related at *P-value* of 99% confident interval (CI) and *t-statistic* of 7.471 (above 1.96 threshold). At f^2 and q^2 of 0.443 and 0.263 respectively, the strength of the mediated relationship was sufficiently validated. This effect is however partial, as the prevention of power conflict did not nullify nor reduce the impact of relationship conflict prevention Smooth BDA adoption (both had significant path coefficients on the higher order construct. Nevertheless, the result suggests, among other arguments, that relationship conflict and power conflicts are both emotive, subconscious and personal state-of-the-mind, emanating from perceived threats to individual's interests, control, desires or aspiration. Both conflict types can generate deep emotional tensions and operate at a more personal, rather than task-levels in a team. As suggested by Bouncken et al. (2016), relationship conflict may arise due to rivalry and competition over teams' activities, resources, thus leading to tension as parties seek to exert control. Hence, power rivalry will directly influence the individual relationships in teams especially where new innovation is seen as a perceived threat.

Earlier study by Wee at al. (2017) had articulated how power struggles in teams find indirect expressions in how it drives other forms of conflicts in teams (i.e., relationship, task conflicts) and is often undetected within the innovation process. Adequate attention is therefore required from managers in properly understanding and diagnosing the nature of conflicts within the innovation process. In this study, we reflectively measured power conflict using five relevant indicators: **PP1=***Transparent decision making as it affects the introduction of new technology in teams;* **PP2=** *Better awareness of team culture, structures and dynamics to facilitate early identification of conflict warning signs;* **PP3=** *Encouraging team deliberation at the innovation development or adoption stage;* **PP4=** *Timely and responsive resolution innovation-induced issues* and **PP5=** *Collaborative and data-driven decision-making to minimise resistance*. All the indicators are true measures of their construct and converged strongly with loadings above 0.50 (lowest being 0.713 and highest being 0.784).

5.4 Process-Conflict Prevention in Projects Teams Implementing Big Data

Results from the structural equation model rejected hypothesis **H4=**(*Process Conflict_Prevention -> SMOOTH ADOPTION OF BDA_IN PROJECT TEAMS)*, at 0.061 *p-value* (>0.05) and 1.118 *t-statistic* (< 1.96 threshold). The result also showed a weak path relationship with a coefficient of 0.160 as shown in the structural model Fig 2 above. Further examination of the predictive capability of the model using model quality measures; effect size (f^2) and predictive relevance q^2 also returned values 0.019 (effect size lower than 0.02 threshold) and 0.001 (predictive relevance lower than 0.02). The results therefore signify that, the prevention of process-related conflicts is not an important factor for ensuring smooth implementation of BDA in a project team. A valid reason for this may not be unconnected to arguments espoused by Gersick (1989) who suggested collinear effect between process conflict and task conflict. According to Gersick, although project environments are largely process and task driven, the managers are often known to flexibly adapt processes to ensure tasks are successfully delivered to specification, time and budget. The implication of this is that the rigidity of task demands and the flexibility of processes to meet constantly changing client expectations means that managers are more able to dish or adapt processes, thus triggering task-related disputes than entertain disputes on the actual tasks.

In addition, studies have showed that process and task conflict have an intertwined relationship, with one type morphing into or triggering the other. This perhaps explains the reason Hypothesis H4 is not support in addition to their mediated relationship, which has been demonstrated in the results from **hypothesis H5=** (*Process Conflict_Prevention -> Task Conflict _Prevention).* The result strongly supported the mediated relationship between process conflict prevention and task conflict prevention at *p-value* of 0.00 (@99% CI) and *t-statistic* of 8.26 respectively. The effect size (f^2) and predictive relevance q^2 of the hypothesized relationship are also well supported having met the appropriate thresholds of not lower than 0.02 thresholds respectively. Although the study assumed a partial mediated relationship, the results above showed that, despite the weak influence of process conflict on smooth BDA adoption, the mediated relationship between process-conflict and task conflict are significant, and therefore contribute in explaining the 0.594 variance (R^2 Value) in the endogenous construct (prevention of task conflict).

The implication of the above result is clear for most project practitioners. Being a task and process-oriented environment, the project management setting is such that disruptions relating to project implementation processes are easily reflected in the tasks to be delivered, with such indirect and multiplier effects resulting in costly and time-consuming project variations and corrections with significant impact on outcomes. (Larson and Chang, 2016; Wu et al., 2017; Owolabi et al., 2018). As rightly reflected in the study by Folger et al., (2015) preventing and minimising innovation resistance help improve project and team performance and help many project-based organisations innovate and achieve significant productivity saving.

In this study, process conflict has been reflectively measured by six relevant indicators including PC1=Adequate arrangements for incorporating big data technologies as routine on projects, processes & operations; **PC2=** *Encouraging more collaborative project management practices rather than controlled-oriented approaches;* **PC3=***Availability of up-skilling arrangements to enable employees to adapt to new technological changes;* **PC4=***Regular meetings to identify early warning signs of technology-induced challenges in teams;* **PC5=***Existence of pro-innovation champions within project teams to resolve information asymmetry at the process/team level;* and **PC6=** *Aligning project governance & delivery practices across cross-functional units with new innovation.* All the indicators were confirmed as true measures of their construct and converged strongly with loadings above 0.50 (the lowest being 0.537 and highest being 0.833).

Finally, all the hypothesized specific indirect relationships were also returned significant and accepted at p-value of 0.00 @99% confidence interval and *t-statistic* above the minimum threshold of 1.96 as shown in Table 11 above. The implication of this results is that theoretical relationships regarding the significant influences of were accurately reflected in the structural model thus suggesting a valid interaction effects among the first other constructs and the higher order construct.

6.0 Implication of the study and Conclusion

Theoretical Implication

The theoretical contributions of this study emerge from two broad standpoints. Firstly, current framings of innovation conflict in existing literature have been incomplete and fail to address the broad spectrum of issues surrounding conflict within the innovation process. The argument that conflicts behaviours should be managed by adopting a set of conflict management styles, which varies from context-to-context appears too simplistic, especially when dealing with organisational change. As widely known, resistance to change is a real occurrence in most working environments. As is common in most organisations, and especially in project settings, innovation involves huge financial investment and the opportunities it provides can vary among staff in organisations and teams. This in most cases often trigger tension, discontent and conflicts. Nevertheless, while huge contributions have been made in early studies, organisational and team contexts constantly change, thus making conflict outcomes for innovation and conflict behaviour rather unpredictable. This study, therefore, suggests a new turn in the innovation conflict literature towards conflict prevention perspective, by articulating strategies that integrate proactive and forward-looking measures for early detecting of innovation-induced conflicts, in order to arrest the spate of innovation failure in many organisations and teams.

Secondly, the literature has emphasised various positive and negative outcomes for certain conflict types (i.e., task, relationship, process, etc.) and intra-group innovation. However, the results of this study did throw up a couple of interesting results chief of which suggest the following: (1a) as hypothesised, relationship conflict potentially has negative outcomes for innovation and the smooth adoption of a technology like big data in teams. From the participants' point of view, pre-empting such relationship conflicts is crucial for aiding BDA technology acceptability in a project team. (1b) Also, when relationship conflict is prevented, it has a mediating effect on task conflict, thereby reducing disagreements among employees over issues like roles, key performance indicators etc., while improving decision quality: (2a) that high-levels of task conflicts is undesirable in highly performing teams, thus pre-empting preventing high-levels of task conflict will enable employees agree much easily and make much quicker and creative decisions: (3a) that other project settings are heavily process driven, preventing process conflicts has no significant impact in aiding smooth adoption of big data in teams: (3b) however, preventing process conflicts thus have huge effect in preventing task conflicts due to the mediating effect.

Scholars like Wee et al. (2017) believe the intertwined relationship between process and task conflicts makes both conflicts distinguish the effect of process conflicts from task. This study believes such interrelated relationship may have accounted for the non-significant effect of process on conflict on smooth adoption of big data in teams. (4a) In addition, results from the study bring to the fore, the much-neglected focus on power dynamics in teams and how it affects the innovation process. Findings from this study (see Table 11 & Figure 2 above) have showed the real impact of power in teams given its statistical significance on Smooth adoption of big data and its strong mediating effect relationship conflict. Power conflict is believed find expressions in order forms of team conflict, with its most dysfunctional impact on relationship conflict. Studies like De Clercq et al., (2009), Bouncken et al. (2016) and Wee et al. (2017), have highlighted emotive and intense nature of power and relationship conflicts in teams and why their prevention helps to bring calm and creative atmosphere, which helps teams collaborate better and make quality decisions.

Therefore, the role or power conflict in this study provide a new context for understanding the complex nature of innovation conflict within working teams. More importantly, while many studies have either looked at power in teams separately from conflict, most frameworks have not yet examined the role of power and rivalry in team members under the context of an innovation conflict. Thus, this study proposes an expansion of the conflict and conflict type literature and thereby suggests a new focus on power-conflicts as conflict type and the need for vigilance and prompt response.

Practical implication for Companies

This study has enormous implications for project-based companies that are considering investing in big data technology for transforming their project operations. Firstly, project organisations are now under increased pressure to achieve better project outcomes and improve project margin through leveraging data-driven digital technologies. However, the uncertainty that technologies like big data analytics bring to existing project management processes, task performance, and team working can have an enormous impact on project outcomes. Typically, projects often require high financial investment, time, and resource constraints and usually entail a significant degree of risk as well as costly errors/reworks. As a result, implementing state-of-the-art technologies in such working environments is often treated with great caution, as most employees usually prefer tried and tested techniques and approaches. To most practitioners in this domain, tried and tested methods offer less complexity, reliability, low maintenance, and leverages agelong dexterity in task and process performance. Based on the above, the degree of apathy and resistance to new technology is substantial in many project management domains.

However, while big data offers great opportunities and valuable use cases in project management settings, implementing such radical innovation must avoid a tumultuous implementation process. Evidence shows that 50% of failed innovations happen due to employee resistance (Heidenreich and Handrich, 2015). As a result, organisations in this project-based domain have little margin for failed investments in state-of-the-art technology. As such, by embracing a proactive and preventive approach to managing innovation-induced conflicts; organisations can anticipate both subtle and overt frictions that can undermine effective task performance, derail processes and create tension in the team.

Secondly, in most project-based organisations, projects are more or less the lifeblood on which the company survives. Similarly, the bulk of project work is anchored on successful task and process implementation as well as effective coordination and control. Studies believe that effective handling of these key implementation areas will contribute massively to successful project delivery (Owolabi et al., 2018; Oyedele et al., 2020); and holds massive opportunity for leveraging digital technology like big data (Alaka et al., 2018). However, the project management industry is still heavily reliant on human actors in the form of project teams. As such, radical innovations like big data risk being viewed as a way to take over employee jobs. The results of this study, therefore, have huge implications, since organisations can now evolve a multipronged conflict prevention strategy that can pre-empt innovation-induced task and process disputes as well as conflicts that threaten team relations.

This study has been conducted within the context of big data implementation in a project-based work environment and the need to prevent innovation-induced conflicts in teams. As such, the results of the study should be examined in this setting. Similarly, the research participants examined are stakeholders within UK projected-based organisations, and as a result, future studies can consider exploring the results of this study in other geographical contexts. Future studies can also compare stakeholders' attitudes towards big data implementation between the information-technology sector and construction sector - which is historically noted for apathy towards technology adoption.

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