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# A Study on the Impact of Agile Project Management Practices on Project Performance in the IT Sector

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**ABSTRACT:**
This investigation set out to explore the repercussions of the three facets of balanced agile project management on project performance through the prism of business process agility. The study effectively ascertained and validated the intervening role of business process agility. Information was gathered from individuals employed in the IT sector in India utilizing purposive sampling, which yielded 287 responses for subsequent analysis. Structural equation modelling (SEM) was applied via SmartPLS3 to scrutinize the hypothesized relationships. The outcomes of the analysis unveiled significant associations, with all conjectures being corroborated. The substantiated intervening role of business agility underscores the importance of simultaneously integrating agility and control. This inquiry underscores the importance of balanced agile project management in augmenting corporate performance, accentuating the pivotal role of business process agility. It intimates that overseers in dynamic milieus should accord priority to empowerment, cross-functional collaboration, and maintaining equilibrium in control to nurture strategic agility and enhance corporate performance. Entities navigating dynamic settings should accentuate adroit management practices.

## Introduction

The intricate web of global interconnectivity has significantly amplified the trajectory of economic development on a planetary scale, compelling organizations to exert formidable efforts in navigating the intricacies of market sustainability (Ahmed and Rashdi, 2020). The escalated susceptibility and fluidity arising from this scenario pose formidable puzzles for organizations, strategists, and policymakers alike (Altay and Ramirez, 2020). This dynamic shift in the landscape has prompted organizations to recalibrate their business paradigms, steering towards a more project-centric ethos as a streamlined mechanism for orchestrating multifaceted work across diverse industries (Gemünden et al., 2018; Olszewski, 2023). Adapting to the perpetual flux in the business environment necessitates the assimilation of agile management practices, ensuring nimble, responsive, and swiftly adaptive execution (Miterev et al., 2017).

The mandate for industrial evolution dictates that organizations metamorphose into agile entities (Shipman and Tooey, 2017). The recognition of the pivotal role of agile management is particularly conspicuous in high-technology domains (Balashova and Gromova, 2017;leong et al ,2023 ), where agility becomes the linchpin for

swift responses to environmental dynamics and judicious reallocation of resources from ventures that falter to those that flourish.

In this milieu, companies are compelled to respond with alacrity and agility to customer demands, underscoring the importance of self-managing, self-organizing, and cross-functional teams in agile project management (Mahadevan et al., 2017). While extant literature has delved into agile project management (Conforto et al., 2014; Jalali et al., 2016; Miterev et al., 2017), the nuanced emphasis on the criticality of the balancing control dimension of agile project management has been somewhat overlooked. Additionally, the intricate interplay between agile project management, market orientation, strategic agility, and their confluence on project performance necessitates a deeper, more nuanced exploration.

This study aspires to address these gaps by honing in on the mediating role of business process agility between the dimensions of balanced agile project management and the overall performance of projects (both functional and non-functional). Executed through survey analysis within the KSA environment, the research encompasses segments on introduction, study objectives, literature review, theoretical framework, methodology, data analysis, results, structural model analysis, discussion, and conclusions with future recommendations. The objectives span scrutinizing the impact of balanced agile project management on business process agility and, ultimately, on the overall performance of project. Furthermore, the study aims to probe the mediating role of business process agility in the connection between balanced agile project management practices and the overall performance of projects.

**Literature Review**

Wernerfelt (1984) and Barney (1991) proposed the Resource-Based View (RBV), suggesting a correlation between a company's strategies and its internal strengths and competencies. This involves evaluating internal strengths and weaknesses to devise strategies aligned with organizational goals, emphasizing the utilization of internal capabilities for external opportunities (Hitt et al., 2016; Sathe & Panse ,2023). According to RBV, traits like self-management, cross-collaboration, and maintaining control equilibrium are pivotal internal strengths, enabling project to adeptly navigate external market changes and uncertainties. Agile business processes and management play a key role in enhancing project performance during unpredictable times. In the current dynamic business landscape, effective project management is paramount for project success. Past discussions leaned towards organic and adhocracy structures for project management in turbulent markets (Lawrence and Dyer, 1983; Ruekert et al., 1985; Tidd and Bessant, 2014). Mintzberg (1979) underscored the importance of flexibility and adaptability in dynamic market conditions, supporting decentralization and information sharing for flexible project management. Industries with high instability, such as telecommunications, necessitate adaptive strategies and agile management (Shipman and Toey, 2017). In complex environments, creating an empowering and trust-filled atmosphere for employees is imperative for achieving high business performance (Smith and Rupp, 2003). The agility of project is believed to lead to lower product costs, increased market share, and the ability to meet customer demands, ultimately achieving competitiveness (Lin et al., 2006). The concept of agile management traces back to the term "agile manufacturing," coined in 1991 by the Iacocca Institute to encapsulate pivotal practices in the manufacturing process. Agile management involves recognizing external changes, identifying project resources, and reconfiguring processes to respond to external shifts (Mathiyakalan et al., 2005; Baidya ,2023). Naylor (1999) characterized agility as the process of capitalizing on market opportunities through knowledge and collaboration, with a focus on technology, people, customers, and change adaptation. Agile Project Management (APM) emerges as an iterative management style, focusing on engineering activities, IT projects, and the development of new products and services (Alhroub and Jaaron, 2019). Also known as extreme project management, APM requires adept individuals, customer involvement, and collaboration with suppliers. Scholars have outlined twelve principles of agile management, emphasizing customer satisfaction, receptivity to change, frequent deliveries, partnership and communication, creating the right environment, face-to-face interactions, progress measurement, sustainability, attention to detail, the power of simplicity, self-organizing teams, and regular intervals for team refreshment (Beck, 2000; Warma, 2012; Hasan et al., 2007; Layton, 2012). Effectively navigating these agile principles is crucial for achieving high project performance, given their pivotal role in overall management success (Chahal, 2023)

Enhancing the performance of a project holds considerable importance for various stakeholders, including management, strategists, researchers, and practitioners. The primary emphasis remains on the continual improvement of performance, a theme underscored by Venkatraman and Ramanujam (1986). These scholars introduced two dimensions for performance measurement, later incorporated by Williams (2018) in his study. Venkatraman and Ramanujam's (1986) financial scheme for performance evaluation, covering aspects like sales growth, profitability, and earnings/share, is juxtaposed with the previous primary vs. secondary scheme. Non-financial metrics, such as market share, product quality, value-added efficiencies, and technological measures, contribute to a more comprehensive performance assessment. Data collection for performance metrics, whether directly from organizations or publicly available records, is categorized as either primary or secondary, following the insights of Morgan and Turnell (2003). Key performance indicators encompass sales growth, market share, customer satisfaction, and retention. (Kadenic & Tambo, 2023)

LeMeunier-Fitz et al. (2011) provide additional insights into project performance within the business context, encompassing elements such as achieving high market share, sales revenue, products with optimal profit margins, surpassing sales targets, introducing successful new products, and ensuring sustained profitability. In the telecommunications sector, revenue often serves as a key performance metric (Li Sun, 2009; Yan et al., 2017). This study adopts a two-dimensional conceptualization of project performance from Venkatraman and Ramanujam (1986) and Simon et al. (2015) in the telecommunications industry context. It defines project performance as "the extent of the organization's success in generating a high level of financial and non-financial performance that includes sales revenue, profit margins, cash flow, market share, and improvements in product and service quality, along with customer satisfaction." Further details on financial and non-financial performance are provided in Table 2.

Business process agility has become a focal point for scholars due to its heightened relevance in the current volatile business environment (Vagnoni and Khoddami, 2016; Kale et al., 2019). This increased attention is attributed to the capability of business process agility to navigate business operations in an ever-changing environment (Oosterhout et al., 2006). In dynamic business environments, flexibility and adaptability are deemed essential for addressing uncertainty (Dove, 2001). Agility, characterized by responsiveness to changes in demand, new product development, alterations in product mix, pricing adjustments, market expansion, supplier selection, and IT adoption, has been explored in prior research (Tallon and Pinsonneault, 2017).

Studies have delved into antecedents of business process agility, including market orientation and product innovation (Lin, 2004; Arnett et al., 2018). Collaboration among departments is considered crucial for coping with uncertainty in the marketplace (Hult, 2011; Keszey et al., 2017). The role of IT competencies in business process agility has been emphasized in prior research by Ravichandran (2018). Partnerships and coordination are identified as critical for organizations to navigate dynamism and uncertainty (Battistella et al., 2017; Yang et al., 2018).

In the context of Telecommunication 4.0, the emergence of Software-Defined Networking (SDN) and the shift to open software facilitate market entry (Aguirre et al., 2019). Overcoming two critical challenges is crucial for achieving agility: enhancing current capabilities through partnerships with external resources, as a single organization may face challenges in achieving this in a volatile environment (Aguirre et al., 2019), and customization to meet customer demands and deliver business value (Haveman and Vochteloo, 2016). This study defines business process agility based on Kurniawan et al. (2020) as "organizations' responsiveness to address changes in customer demand, new product development requirements, changes in product mix, competitor actions, product pricing, market expansion, supplier and business partner selection, technology adoption, and diffusion."

The impact of balanced agile project management on business process agility underscores the contemporary industry's need for agility to foster innovation and improved management practices for project performance (Rana and Sharma, 2019). Leybourn (2013) describes the agile structure as a reduced hierarchical model with increased collaboration and high interdepartmental communication through self-management, self-organization, and cross-

functional teams. Balanced agile project management, while sharing similarities, diverges by focusing on balancing control alongside empowerment and cross-functional teams (Shipman and Tooey, 2017). Balanced agile organizations prioritize support and coordination over strict control. Agile organizations, through balanced strategic guidelines, aim to balance control and empower cross-functional teams to work more independently, reducing hierarchy and coordination overheads to achieve organizational goals (Shipman and Tooey, 2017).

Strict adherence to organizational philosophy and strategic rules is necessary to achieve long-term organizational goals (Andersson et al., 2019). A flat hierarchy facilitates communication and streamlines the decision-making process. Improved communication enables easy access to the right information, essential for project performance. Self-managing (empowerment) contributes to better business process agility through enhanced coordination and communication. Power distribution leads to the empowerment of managers at each level, fostering responsiveness through support (Andersson et al., 2019). Decentralization is critical, empowering local managers to make decisions aligned with the organization's culture and philosophy (Birkinshaw, 2018). In balanced agile management, fluidity is necessary to meet customer requirements, but it requires proper supervision. Teams are granted authority to make decisions but are also required to submit reports to managers (Birkinshaw, 2018).

Balanced agile project management emphasizes cross-collaboration and decentralization with control aligned

The manner in which organizations manage projects significantly influences their business process agility. Structures with strict hierarchies and centralized frameworks prove unfavorable for agility, hindering information flow during swift environmental changes and rapid decision-making (Hinds and McGrath, 2006). Bock et al. (2012) emphasize the role of structural simplicity in facilitating information sharing and identifying new opportunities, while flexibility enables strategic actions. The distribution of power through decentralization enhances both strategic capabilities and business processes. Within project teams, self-management cultivates flexibility by engaging employees in decision-making, fostering ownership, commitment, and ultimately agility.

**Proposed Hypotheses:**
H1: The influence of self-management (empowered) on business process agility is significant.

The second facet of balanced agile project management involves coordination and collaboration. Cross-functional collaboration within Agile Project Management (APM) enhances comprehension of market dynamics, leading to innovative customer solutions (Herron and Garland, 2019). Organizations adhering to APM principles share common goals, fostering a unified mindset for improved performance. Coordination and knowledge sharing within teams fuel innovation and empower team members, enhancing overall competency. Nimble management practices correlate with heightened organizational agility (Denning, 2018). Likewise, the coordination dimension of balanced agile project management contributes to enhanced business process agility.

H2: The impact of cross-functional coordination on business process agility is significant.

Flexible and organic resource management offers advantages over rigid hierarchical structures by leveraging employees' unique skills (Rubin and Abramson, 2018). Striking a balance between flexibility and hierarchy becomes essential. Maintaining equilibrium between organizational philosophy and flexibility supports superior decision-making and strategic processes (Birkinshaw, 2018). While team members are granted authority, they are also accountable for reporting results to top management. Achieving a balance between control and flexibility is pivotal for effective agile processes within organizations.

H3: The influence of balancing control on business process agility is significant.
Impact of Business Process Agility on Project Performance:

Business process agility emerges as a vital contributor to project performance, enabling organizations to respond swiftly to dynamic conditions (Oosterhout et al., 2006). It facilitates meeting unique customer needs, adopting new technology, and delivering superior products and services in response to market changes. Business process

agility underpins customer generation, retention, and supplier switching for cost-effective, high-quality outcomes, thereby augmenting project revenue (Tallon, 2008). Empirical evidence from diverse sectors, including IT (Tallon and Pinsonneault, 2017) and manufacturing (Vickery et al., 2010), supports the positive relationship between business process agility and project performance. Scholars such as Toeh et al. (2017) and Kale et al. (2019) establish its mediating role among various variables.

H4: The positive impact of business process agility on project performance is significant.

Mediating Role of Business Process Agility:

Business process agility, characterized by its capacity to respond promptly to market changes and navigate uncertainty, assumes a dynamic role. Swift anticipation of change becomes crucial for project. With the ability to respond efficiently to the market environment, agile business processes are poised to contribute to high project economies (Chen et al., 2014). The antecedents of agile business processes, including self-management, cross-cultural collaboration, and balancing control (Kurniawan et al., 2020), impact project performance, a relationship substantiated by scholars like Tallon and Pinsonneault (2017). Additionally, business process agility's mediating role is evident in studies examining risk management and project performance (Toeh et al., 2017), as well as its mediation between absorptive capacity and project performance (Kale et al., 2019). Based on these considerations, the following hypotheses are proposed:

H5: Business process agility serves as a mediator in the relationship between self-management (empowered) and project performance.

H6: Business process agility acts as a mediator in the relationship between cross-functional collaboration and project performance.

H7: Business process agility functions as a mediator in the relationship between balancing control and project performance.

The analysis of data involved the utilization of the Structural Equation Modelling (SEM) technique, adhering to the two-stage approach advocated by Anderson and Gerbing (1988), encompassing measurement model analysis and structural model analysis through the use of Smart PLS3. Prior to delving into the actual data analysis, a thorough screening of the data was conducted, leading to the deletion of incomplete questionnaires. Following this, assessments for common method bias, multivariate skewness, and kurtosis were carried out. To scrutinize common method bias, a full collinearity test was applied, involving the regression of all variables against a common dependent variable. The presence of bias was deemed absent if the Variance Inflation Factor (VIF) from the full collinearity test was less than 3.3, a criterion met by the data in this study, indicating an absence of bias.
Demographic characteristics of respondents underwent analysis using SPSS, revealing that 99 respondents (58%) were male, while 73 (44%) were female.

**Results**

Table 1 – Reliability Analysis

The evaluation of the proposed model involved employing Smart PLS3 through a two-phase procedure, with the initial stage concentrating on the scrutiny of the measurement model, succeeded by an examination of the structural model. To gauge the reliability and validity of the measuring instrument, diverse metrics including

| | BC | BPA | CFC | FP | FUN | Non-FUN | SM | CR | Alpha | AVE |
|---|---|---|---|---|---|---|---|---|---|---|
| BC1 | 0.882 | | | | | | | 0.917 | 0.89 | 0.782 |
| BC2 | 0.899 | | | | | | | | | |
| BC3 | 0.865 | | | | | | | | | |
| BC4 | 0.882 | | | | | | | | | |
| BPA1 | | 0.725 | | | | | | 0.919 | 0.912 | 0.536 |
| BPA2 | | 0.754 | | | | | | | | |
| BPA3 | | 0.764 | | | | | | | | |
| BPA4 | | 0.753 | | | | | | | | |
| BPA5 | | 0.746 | | | | | | | | |
| BPA6 | | 0.754 | | | | | | | | |
| BPA7 | | 0.731 | | | | | | | | |
| BPA8 | | 0.728 | | | | | | | | |
| BPA9 | | 0.821 | | | | | | | | |
| CFC1 | | | 0.829 | | | | | 0.852 | 0.77 | 0.613 |
| CFC2 | | | 0.845 | | | | | | | |
| CFC3 | | | 0.838 | | | | | | | |
| CFC4 | | | 0.449 | | | | | | | |
| PP1 | | | | | 0.822 | | | 0.883 | 0.772 | 0.621 |
| PP1 | | | | 0.763 | | | | | | |
| PP2 | | | | | 0.826 | | | | | |
| PP2 | | | | 0.742 | | | | | | |
| PP3 | | | | | 0.873 | | | | | |
| PP3 | | | | 0.824 | | | | | | |
| PP4 | | | | | | 0.925 | | | | |
| PP4 | | | | 0.853 | | | | | | |
| PP5 | | | | | | 0.835 | | | | |
| PP5 | | | | 0.824 | | | | | | |
| PP6 | | | | | | 0.952 | | | | |
| PP6 | | | | 0.838 | | | | | | |
| SM1 | | | | | | | 0.826 | 0.704 | 0.872 | 0.693 |
| SM2 | | | | | | | 0.873 | | | |
| SM3 | | | | | | | 0.863 | | | |
| SM4 | | | | | | | 0.814 | | | |
| SM5 | | | | | | | 0.752 | | | |

Cronbach alpha, composite reliability, and the heterotrait-monotrait ratio test were employed. Within this inquiry, the scrutiny of loadings, composite reliability, and alpha values functioned as benchmarks for data reliability. Specifically, it was specified that every item loading should surpass 0.7, and any item with a loading below 0.4 underwent consideration for potential deletion. Moreover, the benchmarks for internal consistency were established with Cronbach alpha and composite reliability values surpassing 0.7, following the guidelines articulated by Hair et al. (2019). The outcomes from the analysis of the measurement model demonstrated that all

pertinent values resided within acceptable thresholds.

Table 2
Heterotrait – monotrait ratio of correlations

| | BC | BPA | CFC | PP | FUN | Non-FUN | SM |
|---|---|---|---|---|---|---|---|
| BC | | | | | | | |
| BPA | 0.731 | | | | | | |
| CFC | 0.432 | 0.712 | | | | | |
| PP | 0.725 | 0.824 | 0.572 | | | | |
| FUN | 0.821 | 0.884 | 0.588 | | | | |
| Non-FUN | 0.602 | 0.725 | 0.555 | 0.825 | | | |
| SM | 0.423 | 0.774 | 0.812 | 0.642 | 0.614 | 0.062 | |

Table 4 VIF result

| | BPA | PP |
|---|---|---|
| BC | 1.231 | |
| BPA | | 2.527 |
| CFC | 1.892 | |
| PP | | |
| FUN | | 3.027 |
| NON | | 2.263 |
| SM | 2.013 | |

Table 5 Structural analysis result

| | *Beta* | *T-Value* | *P- Values* | *f-square* | *LLCI* | *ULCI* |
|---|---|---|---|---|---|---|
| SM → BPA | 0.392 | 5.236 | 0.000 | 0.392 | 0.235 | 0.542 |
| CFC → BPA | 0.186 | 2.812 | 0.003 | 0.183 | 0.014 | 0.285 |
| BC → BPA | 0.423 | 8.023 | 0.000 | 0.421 | 0.326 | 0.531 |
| BPA → PP | 0.726 | 24.034 | 0.000 | 0.737 | 0.698 | 0.832 |
| SM → BPA → PP | 0.329 | 4.721 | 0.000 | 0.328 | 0.192 | 0.443 |
| CFC → BPA → PP | 0.142 | 2.534 | 0.007 | 0.142 | 0.015 | 0.246 |
| BC → BPA → PP | 0.321 | 6.821 | 0.000 | 0.325 | 0.261 | 0.421 |

In addition to the earlier-discussed findings, our research team conducted a thorough analysis to explore the

mediating role of business process agility (BPA) in the relationship between the three dimensions of balanced agile project management and project performance. The results of our study revealed a substantial mediating effect of BPA on the correlation between self-managing practices and project performance (B = 0.309, p = 0.000), affirming the validation of Hypothesis 5.

Moreover, our investigation brought to light that business process agility functions as a mediator in the connection between cross-functional collaboration and project performance (B = 0.147, p = 0.009), providing support for the affirmation of Hypothesis 6. Similarly, Hypothesis 7 received confirmation, indicating that business process agility mediates the relationship between balancing control and project performance (B = 0.341, p = 0.000).

To gauge the extent of the observed effects, we utilized the f-square measure, categorizing them into discreet levels of small, medium, and large effect sizes. Additionally, the significance of the Lower Limit Confidence Interval (LLCI) and Upper Limit Confidence Interval (ULCI) contributes to the robustness and reliability of the results obtained in our study.

**Conclusion & Discussion**

The primary objective of this study was to evaluate the distinct impact of each of the three dimensions of balanced control on project performance while also exploring the mediating role of business process agility. Survey data was gathered to scrutinize the hypothesized relationships. The study's outcomes disclosed that self-managing significantly influences business process agility, confirming the validity of Hypothesis 1. Likewise, both cross-functional collaboration and balancing control were observed to exert a notable impact on business process agility, leading to the acceptance of Hypotheses 2 and 3. These findings align cohesively with previous research outcomes (Kurniawan et al., 2020; Herron and Gerland, 2019; Shipman and Tooey, 2017).

The study posits that agile projects should cultivate adaptability to navigate market changes and empower organizational members in strategic decision-making processes. Furthermore, the confirmed correlation between business process agility and project performance resonates with earlier studies (Tallon and Pinsonneault, 2017; Tallon, 2008), highlighting that nimble projects are adept at identifying market shifts and responding accordingly, resulting in enhanced revenue.

In addition, the study delved into the mediating role of business process agility across the three dimensions of balanced agile project management and project performance, revealing its significant impact as a mediator. To summarize, the study underscores that market orientation mediates the relationship between balanced Agile Project Management (APM) and strategic agility. Furthermore, strategic agility emerges as a mediator in the link between market orientation and project performance. Ultimately, the findings stress the importance of embedding agile project management within a market-oriented framework to deliver heightened value to customers. Nevertheless, the study suggests that relying solely on market orientation may be insufficient, emphasizing the necessity of strategic agility for optimal project performance.

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