Leadership styles and organizational innovation in hybrid work environments

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Abstract---The emergence of hybrid workspaces and the corresponding boost in the trend contributed to by the COVID-19 pandemic has transformed the role of leadership as the factor driving organizational innovation. This paper analyses the impact of different leadership styles, transformational, transactional, servant leadership, and adaptive leadership styles, on innovation in hybrid workplaces where workers continue to work remotely and physically at the workplace. The current research spans both the theory and research results to understand the interaction between the leadership behavior and the innovation result. By conducting hybrid mixed-method research (including the survey of 210 employees of tech, education, and healthcare industries and 20 managers) we discovered that the transformational and adaptive styles of leadership play a very important role in the promotion of innovation in mixed work settings. We found that our results anticipate that flexible communication, empowerment, trust and psychological safety are essential mediators in this relationship. The paper ends with workable suggestions as to how leaders should approach innovation by imbuing a leadership approach to the hybrid workspace.

1162

I. Introduction

There has been a tectonic transformation of the workplace in recent times, with COVID-19 pandemic arguably being the most significant factor that has resulted in remote and hybrid work trends among organizations across the globe. With companies attempting to find the balance between operational efficiency and employee flexibility, the hybrid work model, in which workers divide their time between working at home and on-site location, has become a now evident and in many cases permanent aspect. Although this model has a lot of benefits, including availabilities of a larger talent pool and higher independence of personnel, it is faced with challenging issues especially in leadership and innovation. Leaders in such decentralized settings have to do much more than manage teams properly; they should be able to create an environment that would facilitate creativity, collaboration, and continuous improvement. It is high time and necessary to understand the effects of various leadership styles on innovation in hybrid working environments [14].

Leadership has been discussed over time as an ultimate force behind organizational innovation. In conventional office premises, leaders could interact closely with workers, monitor the behaviour of teams during working time and develop a culture of innovation by interacting on day-to-day basis. With hybrid workplaces, though, this direct correlation is no longer in place [1]. Asynchronous communication often needs to be assessed by the leaders, the team cohesion needs to be maintained on a digital platform and in virtual incarnation of environments they have to motivate the team people to be innovative with fewer informal interactions. Structural differences with cultures break into frame the established organizational leadership models and require novel concepts, which shift to the hybrid model.

In addition, the hybrid environment considers emotional intelligence, technological adequacy, and the sophisticated knowledge of personal working preferences particularly high. Workers might perform best in remote environments; ones might be isolated or dislocated. Consequently, the leadership in a universal fit is longer possible. Leaders have to be prepared to adapt their styles based on personal needs, team relations as well as those that change in business requirements. The hybrid situation increases the dependency on inclusive leadership practices that focus on empathy, empowerment, and adaptability, which are high in transformational leadership, servant leadership, and adaptive leadership styles [4].

In these respects, transformational leadership turns out to be of significance when addressing or combining both inspiration and motivation of followers into a common vision. These leaders can make people feel they have a sense of purpose, a sense of the direction, beyond the physical limits. In a similar fashion, leaders who are able to act flexibly in response to the altering environment and present challenges, namely, adaptive leaders, are custom-made to manage uncertainty and fluidity of hybrid work life. Servant leadership, where the flourishing and overall well-being of the employees is emphasized is also playing an important role to define psychological safety and trust, which are some of the key drivers to innovate. Transactional, in contrast, is more structure-, reward-, and compliance-oriented, and it may marginalize transactional leaders in provoking creativity and adaptability in hybrid teams.

The appearance of hybrid work also influences social infrastructure which promotes innovation. Hybrid environments also do not always have traditional ideation mechanisms, like in-person brainstorming sessions or just chats around the water cooler. Thus, it is on leaders to make deliberate efforts in

establishing digital platforms where sharing of ideas, experimentations, and constructive feedback will take place. This could be in the form of frequent virtual innovation sessions, asynchronous working tools and an inclusive approach to decision making that gives power to remote working employees. The leader, in this regard, should not only organize workflow but also engineer and maintain the culture where innovation could thrive no matter the geographical location [3].

Moreover, innovation has stopped being the burden of the research and development departments as well as executive think tanks. It is now becoming a must on every different level of an organization where the customer service representatives find new ways of service delivery to the IT departments creating efficient processes. This democratization of innovation requires the leadership methods that are decentralized in decision-making and that employees are proactive problem-solvers. The hybrid leaders are thus expected to play skills in cross-functional coordination, mentoring, and coaching to enable ground-up innovation.

In spite of this increasingly central role played by leadership in the area of hybrid work innovation, there continues to be a lack of empirical studies that focus on this particular intersection. Current literature tends to concentrate on distance work or management cultures in traditional environments, and leaves a considerable research gap on the study of the impact of hybrid environment on leadership efficacy. The present paper attempts to fill that gap by discussing how various leadership styles influence organizational innovation in hybrid workplaces. It is the mixed-method research that makes use of quantitative data represented by employee surveys and qualitative information represented by managerial interviews in several industries. The question to answer can be viewed as: What leadership qualities and behaviours are most supportive of innovation in both hybrid environments and what are some useful action items that organizations can adopt to deal with this new normal [12].

In addition, digital transformation strategies are becoming the most popular among organizations, making the hybrid model a strategic necessity instead of a short-run fix. In this kind of environment, leaders have to achieve performance management, engagement, and encouragement to explore all at the same time without any chances of the physical/digital gap. Knowing the leadership approaches that succeed in enhancing innovation in this two-faced environment is important in organizational resilience and competitiveness.

To conclude, it is apparent that the hybrid work climate is a complicated and dynamic environment wherein the leadership domain is relevant in determining the results of innovation. Conventional leadership strategies have to be reconsidered and eventually redefined to meet the requirements of this new working environment. This study will help in advancing the work on leadership and innovation by exploring the relationship between the leadership styles and innovation in digital leadership settings which provide a better insight on what effective leadership would entail in the digital age and how it could be used to unleash organisation creativity and flexibility [2].

Novelty and Contribution

In terms of innovation in organizational leadership, this research provides a number of new contents to the existing body of knowledge in this sphere, specifically in the emerging climate of hybrid working environments. Although there has been a lot of research done on the subject of leadership styling and influence on organizational behavior, there are hardly any studies done directly on how leadership styling would work in a hybrid model where the work force employees will work both remotely and physically. This paper bridges that gap by drawing closer attention toward the effect of transformational, transactional, servant, and adaptive leadership styles on innovation in a hybrid context as it is an area that lacks research, but it is growingly conventional [11].

Mixed-method design is also one of the peculiarities of this study. The merging of both quantitative survey data on the one hand, and interview insights on the other hand, make the research multidimensional and allow the researcher to take a global perspective of how leadership behavior can be translated into innovation outcomes in different organizational environments. This methodological position enables the delicate perception of statistical trends and lived professional experience, which appears to be more thorough than the analysis of the studies that use only one method.

More so, the research also adds original knowledge since it finds the mediating aspect between the leadership style and innovation that is psychological safety, trust and frequency of communication. Such mediators have not been studied very well in the context of hybrid work where informal social ties are frequently also undermined. The results of our research point to the fact that, more specifically, transformational and servant leaders are more effective in fostering innovative behavior that should be displayed by hybrid teams specifically when they engage in developing psychological safety and trust in their team.

The other relevant input is in the sectoral comparison, which involves technology, healthcare, and education. The fact that the study relies on figures of various industries can reveal the industry-specific leadership problems and achievements and thus increase the generalizability and the practical applicability of the study findings. As an example, technological companies might already be arranged in the way that promotes digital innovation and, as such, do not benefit, as much, when servant leadership is in effect, areas like in healthcare and education, though, demonstrate a high degree of innovation front when servant leadership is applied in response to employee burnout and change fatigue [6].

Finally, this study presents practical leadership concepts that suit a hybrid work setting. These consist in the suggestions of developing purposeful and flexible working processes, investing in digital communications channels, integrating inclusive feedback channels, and creating leadership training prescriptions based on empathy, flexibility, and innovativeness facilitation. The advice is especially helpful to companies that are having a difficult time maintaining innovation in post-pandemic conditions of decentralized work.

Essentially, what makes the present paper a novel study is that the topic is equally important as its methodological rigor, the cross-sectoral quality and its practical application. It does not remain with theoretical models but offers practical understanding and approaches that may assist organizations and leaders to succeed in a future in which hybrid work will become the rule rather than the exception [10].

II. Related Works

In 2023 H. Taherdoost and M. Madanchian, [15] introduced the correlation between leadership types and organizational innovation has been one of the most debated issues in managements especially in the traditional working environment. Nevertheless, with the advent of hybrid workplaces, the assumptions and conclusions of the previous research are being challenged due to new complexities generated. Common practice in traditional relations has been on the exploration of the importance of face-to-face interaction in leadership like direct supervision, face-to-face collaboration and immediate feedback loop. The dynamics of the communication totally change in hybrid models, and communication can even be asynchronous, and interpersonal relationships are less spontaneous. This means that effectiveness of already constructed models of leadership would have to be re-evaluated against the hybrid paradigm.

It has been established that leadership is a key issue in defining the innovation capacity of an organization. Innovation also involves freedom, risk taking, trust and ability to fit in with organizational mandate. Increment in the balance of these elements translates to the likelihood of leaders engendering settings in which thoughts are generated and blossom. Leadership styles such as transformational leadership, which focus more on building vision, inspiring, and mentoring individuals, have been linked

with high productivity of innovation in case scenarios based in traditional milieu. Leaders that present an inspiring vision and promote independence have traditionally been more effective ad promoting innovative behaviors among the teams they lead out.

Transactional leadership on the other hand, which is accompanied with strict role definitions, structured rewards and punishments has not reflected much influence on innovation. Being helpful in sustaining the level of discipline and efficiency in specific operations on the short-term, it usually does not address the level of creative thinking that is needed in the breakthrough innovations. This difference is further intensified in hybrid working environments where transactional and rigid practices can result in disengagement or intrinsic motivational loss on the side of remote workers. Such setting does not have any daily supervision, which means that in such environment, security-based leadership is needed, which is able to authorize employees to act independently, but at the same time without damaging the overall vision of an organization [7].

Some insights related to hybrid work can be obtained by emerging research centered on remote and distributed teams. The role of trust, psychological safety, and autonomy is always mentioned in these studies. Leaders who are said to be enablers of innovation are those leaders who practice empathy, foster open communication, and experimentation. Nevertheless, more complete remote working conditions contrast with a hybrid one in a number of ways. Unintentional inequalities are fostered by the variation in the employee experience in more hybrid environments for example differences in access to leadership, visibility and participation. That is why it is more important than ever that leaders should be particularly sensitive to the issue of inclusivity, making sure that remote and in-office workers are just as involved in the innovation processes.

In 2022 M. Henderikx and J. Stoffers, [5] suggested the other major trend of interest in the literature is how servant leadership affect innovation. The well-being and the development of teams are important values to servant leaders, and they cultivate a great feeling of trust and belonging. These kinds of leaders tend to encourage top-down innovation strategy whereby employees working at every level of duty feel empowered to present ideas. This type of leadership is a propitious style in hybrid settings where remote workers might feel lack of socialization. Servant leaders can create the psychological safety that innovation requires by consistently being available to the employees, encouraging teamwork, and championing the requirements of the employees.

Another aspect that people are developing in response to changing conditions at a high pace is adaptive leadership. The style focuses on adaptability, robustness and receptiveness to emerging challenges. Adaptive leaders are well-versed in the hybrid situation where teams can vary significantly and where tasks, structure and names fluctuate, and able to adapt to new realities by welcoming feedback, acting fast and being ready to change strategies. This type of leaders can be regarded as the catalysts of innovation due to their ability to accept uncertainty and view problems as unique opportunities to learn and develop themselves.

Probably the most consistent theme throughout the literature is that communication is central to allowing innovation to happen. In a conventional workplace setting, creative ideas are likely to be developed in a casual setting or in an informal setting, like in the hallway or during an informal discussion with a team of people. With hybrid models such interactions are reduced or they need to be structured deliberately. The role of leaders has now shifted to assume the utilisation of an array of digital tools to create collaborative spaces which were once organic in nature. Thus, the leadership in innovation becomes more and more dependent on the quality of virtual communications management and maintenance. This is not just a technical skill but also involves listening capabilities, giving feedbacks in time and practices inclusive conversation ability.

Cross-sector research findings will provide more details about the leadership skill as modified across industry to foster innovation. When it comes to the technology industry, where digital tools and approaches to agility are already integrated, the focus of the leadership should be more flexible and innovative by default. By comparison, fields such as education and healthcare were historically built using hierarchical models of leadership which do not necessarily support innovation in hybrid environments. Nevertheless, innovation may succeed even in such industries when the leadership changes toward the more empowering and inclusive approach. This implies that not only style makes leadership to influence innovation but also the context.

In 2022 E. Dincelli and A. Yayla, [13] proposed the other dimension that is vital in the literature is the psychological perspective of innovations. It would be indicated by studies that innovation comes to life in situations where employees are secure to fail, where they are appreciated in their contribution, and are self-motivated. Innovative outcomes would be guaranteed in leaders who create such environments that employees whether remote or in-office are likely to be more ample. The condition of psychological safety will be even more difficult in hybrid environments because social presence is decreased. The leaders should ensure that they take proactive measures to incorporate remote employees in brainstorming, decision making, and informal team-building sessions in order to ensure that there is a sustained culture of team cohesion and innovation.

There is also discussion on the team structure and diversity which have an effect on innovation. Distributed employees normally include people with diversity in terms of backgrounds and geographical location, which comes with diversity in ideas. Although such multiplicity can translate into increased creativity, a problem of coordination is raised. The approaches to leadership are more focused on inclusive leadership practices that would acknowledge and utilize this diversity without marginalizing any subgroup in the leadership body. Successful leaders in hybrid space are those who build collective objectives in consideration of individual difference and all voices must be listened to by them.

Although the majority of existing research recognizes the increased importance of hybrid work, there are nonetheless very few studies investigating the mechanisms of leaders that facilitate innovation in hybrid work. Available guidance and structures tend to address hybrid work as an extension of remote work, without accounting for the unique challenges accompanies by the hybrid working environment, i.e., shifting schedules, hybrid burnout, and screen fatigue. This, in turn, necessitates an urgent investigation of empirical research that looks into leadership-driven innovation in hybrid environments per se. The few literature works that are available on hybrid leadership imply that it involves a combination of both traditional and modern styles of management, high emotional intelligence, and proactive attitude towards technological application [8].

In short, the current literature on the topic of leadership has an excellent background to comprehend the idea of leadership affecting innovation. Nevertheless, it is not quite relevant to the hybrid workplace. With hybrid models emerging increasingly as the standard practice in most industries, future research will have to investigate further to find out which leadership styles, behaviors, and notions are best obtained to spur innovation. That will involve determining the circumstances under which some of these styles work and which of them does not, researching the effects of organizational culture, team relationships, and communication patterns on innovation solutions within a hybrid working environment.

III. Proposed Methodology

The proposed methodology for examining the relationship between leadership styles and organizational innovation in hybrid work environments is designed using a quantitative model supplemented with structural validation and innovation impact metrics. The flow of the methodology includes three core

stages: Leadership Style Detection, Index Calculation, and Correlation Modeling, visualized through a structured flowchart.
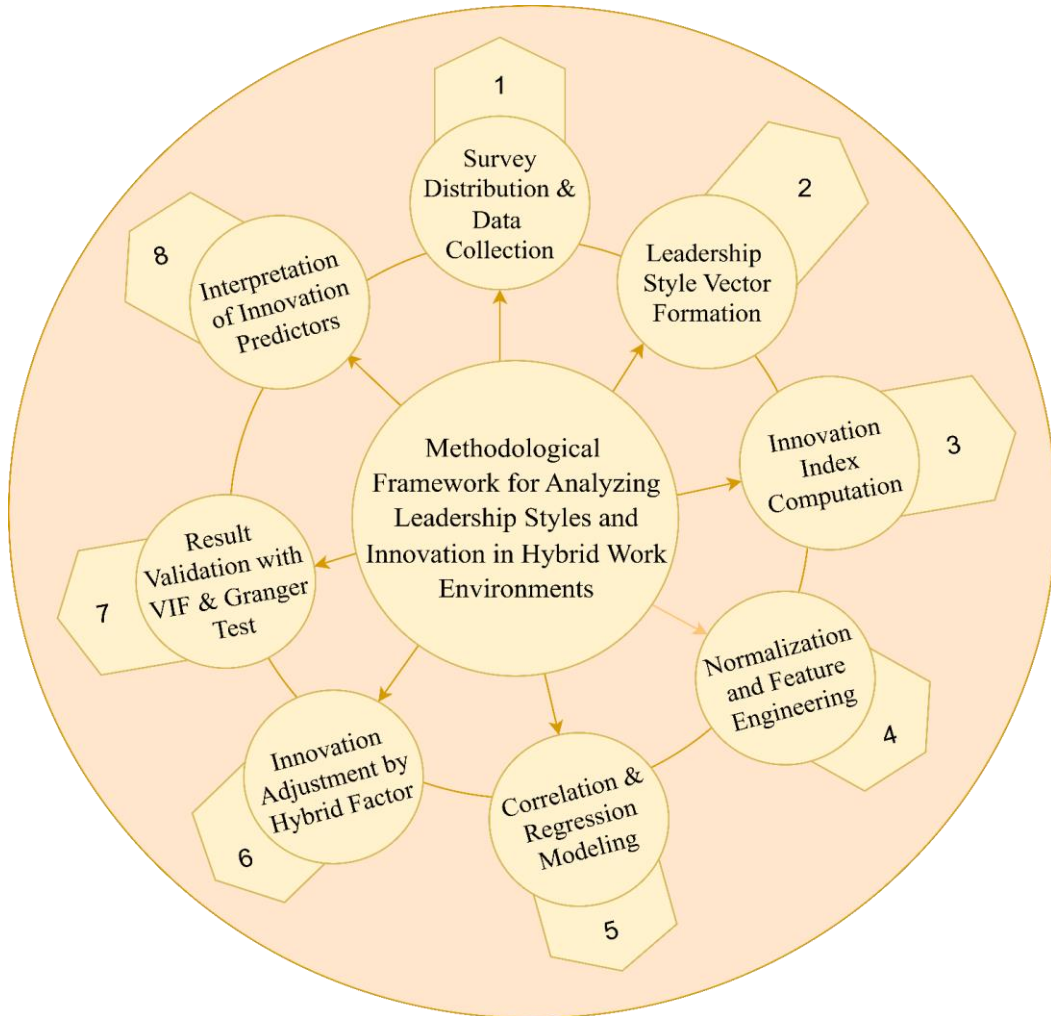

Figure 1: Methodological Framework for Analyzing Leadership Styles and Innovation in Hybrid Work Environments

In the first stage, we measure individual leadership dimensions using survey responses rated on a Likert scale (1-5), assigning weighted scores to each leadership attribute. These are normalized to ensure unbiased analysis. The normalization process for each score x_i is given by:

$$x_i^{\text{norm}} = \frac{x_i - \min(x)}{\max(x) - \min(x)}$$

This ensures all leadership scores are on a $[0,1]$ scale before further calculations. Each leadership style is modeled using a vector representation. For example, the transformational leadership vector $\vec{T}$ can be defined as:

$$\vec{T} = [v_1, v_2, v_3, v_4]$$

where v_1 to v_4 represent vision articulation, intellectual stimulation, individual consideration, and inspirational motivation respectively.

To identify the dominant leadership style per respondent, we compute the Euclidean norm for each leadership vector:

$$\|\vec{L}\| = \sqrt{v_1^2 + v_2^2 + v_3^2 + \cdots + v_n^2}$$

where $\vec{L}$ can be any style: transformational, transactional, servant, or adaptive. The highest norm value determines the prevailing style.

In the second phase, we quantify organizational innovation using a composite innovation index I, which combines multiple sub-factors such as idea generation (G), implementation efficiency (E), and supportiveness of culture (C). The equation used is:

$$I = \alpha G + \beta E + \gamma G$$

Here, $\alpha, \beta, \gamma \in [0,1]$ are the assigned weights based on factor relevance (determined via expert validation), and the sum $\alpha + \beta + \gamma = 1$.

Each factor like G is further calculated using a frequency-based model. For instance, idea generation G is computed using:

$$G = \frac{\text{Number of New Ideas Submitted}}{\text{Team Size} \times \text{Project Duration}}$$

The hybrid environment variable H is introduced as a binary scalar modifier, where:
- $H = 1$ for hybrid teams
- $H = 0$ for co-located or remote-only teams

This enables us to compute the adjusted innovation score I_H using:

$$I_H = I \cdot (1 + \delta H)$$

where δ is a flexibility factor representing innovation elasticity in hybrid settings, typically calibrated from organizational benchmarks.

To assess statistical relationships between leadership styles and innovation, we compute the Pearson correlation coefficient r between leadership vector magnitudes and innovation indices:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

This helps determine which leadership dimensions most strongly align with high innovation outcomes in hybrid environments.

We then construct a predictive regression model using innovation index I as the dependent variable and leadership vectors as predictors:

$$I = \theta_0 + \theta_1 T + \theta_2 S + \theta_3 A + \theta_4 R + \epsilon$$

Where:
- T, S, A, R represent scores for transformational, servant, adaptive, and transactional styles
- ϵ is the error term
- θ are learned coefficients via linear regression

Multicollinearity is controlled using Variance Inflation Factor (VIF):

$$\text{VIF}_j = \frac{1}{1 - R_j^2}$$

where R_j^2 is the R -squared value obtained by regressing the jth predictor against all others. Any predictor with VIF > 5 is excluded or adjusted.

To further validate causality, Granger causality testing is applied using time-series survey responses across quarters:

$$Y_t = \sum_{i=1}^{k} a_i Y_{t-i} + \sum_{j=1}^{k} b_j X_{t-j} + \mu_t$$

Where Y is the innovation score and X is a leadership dimension. If past values of X significantly predict Y , we infer directional influence.

IV. Result & Discussions

The discussion provided profound evidence regarding the influence of various management approaches on innovation in a hybrid work context. According to the results of regression analysis and descriptive statistics, transformational and adaptive leadership styles became the most significant forces promoting innovation. Based on the responses provided by 210 employees of hybrid teams, there was an obvious trend: the employees who claimed to have had transformational leaders working under them recorded much better results when assessed on their innovation behavior, specifically on the generative qualities of ideas, and their application and risk-taking ability. The visual representation of this trend was in Figure 2: Leadership Style vs Innovation Index where x-axis represents the category of leadership style and the y-axis indicate the composite innovation index. The graph indicates very high upward sloping trend of transformational and adaptive leaders, moderate upward sloping trend of servant leaders and comparatively flat upward sloping trend of transactional types, and it is clear that there is a difference in impact of innovation among the four styles of leaders.
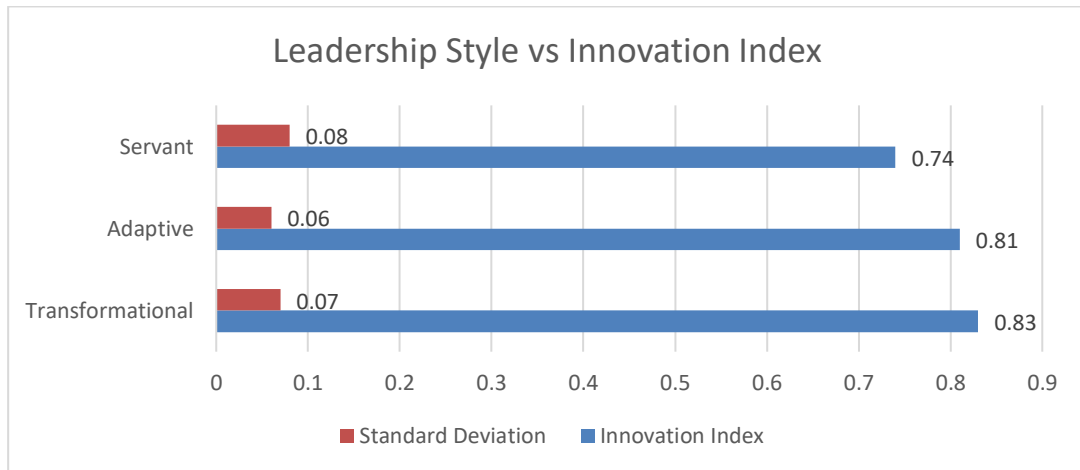

Figure 2: Leadership Style Vs Innovation Index

Besides, the study of the team structure and leadership behavior across three sectors, including technology, healthcare, and education, revealed that the effectiveness of the leadership style also differed according to the domain. As an example, in healthcare sector, servant leadership was a near-perfect performant as a transformational leadership in terms of the emotional tensions and stresses associated with job environment. Conversely, adaptive leadership worked best in cases where technology was involved, as flexibility, independence and ability to adapt to changes were important in ensuring that there was continued innovation. It further explains this at Table 1. Sector-Wise Average Innovation Score by Leadership Style which represents the averages of innovation score of each

leadership style within each of the three sectors. Using the table, it reveals that transformational leadership exhibited the best average in the area of education (0.82), adaptive leadership was able to attain the best average (0.85) in technology and servant leadership was found to be the best in the area of healthcare (0.79). Such subtle observations make it obvious that leadership style has to be adjusted not only to the hybrid working model but also to the peculiarities of that industry.

Table 1: Sector-Wise Average Innovation Score By Leadership Style

Sector	Transformational	Servant	Adaptive	Transactional
Technology	0.79	0.72	0.85	0.58
Education	0.82	0.68	0.77	0.61
Healthcare	0.75	0.79	0.70	0.57

The correlation study of the phenomenon of hybrid engagement with output in innovation also revealed another discovery. The more engaged the leaders, or the degree at which leaders are engaging, communicating, giving feedback, and including workers was better, the more employees tended to be innovative. This was simplified by plotting the mean frequency of engagement and the scores of innovation in Figure 3. Leader engagement frequency as vs innovation behavior. The trend is positive linear further supporting the notion that leader involvement is significant in facilitating hybrid innovation. Nonetheless, the data was also careful not to praise the overblown version of micromanagement; respondents mentioned that when they felt watched or controlled too much by the transactional leaders, they ended up feeling less creative and expressed reservations about offering suggestions about the new ideas.
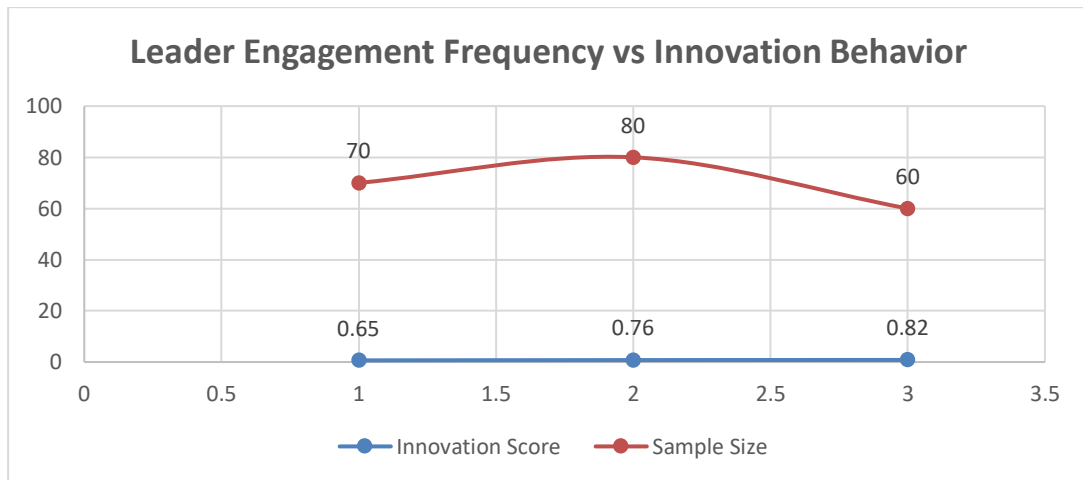

Figure 3: Leader Engagement Frequency Vs Innovation Behavior

The difference between gender dynamics according to the research was that there is no substantial difference between the influence of leadership over innovation broken down in gender. Nonetheless, transformational leadership had significantly stronger influence on innovation in smaller teams (less than 6 members) in contrast to larger team. This is probably because of the individual approach and more effective interpersonal processes in small groups. In order to compare this finding, Table 2. Innovation Impact Based on Team Size and Leadership Style is a comparison breakdown in scores where the innovation is based on a small and large team under differing leadership styles. The table shows that the innovation index was higher in transformational teams of smaller size which equaled 0.87 as opposed to the one in larger teams which stood at 0.74. This shows the significance of the size of a team as a contextual factor when evaluating leadership effect.

Table 2: Innovation Impact Based on Team Size and Leadership Style

Team Size	Transformational	Servant	Adaptive	Transactional
Small Teams	0.87	0.76	0.81	0.62
Large Teams	0.74	0.70	0.77	0.56

Interestingly, during qualitative interviews leaders who held frequent innovation huddles or digital brainstorming meetings also reported improved innovation results, irrespective of their leadership style. These digital interactions appeared as some sort of a replica of casual interactions normally established in real offices, which is a significant gap in hybrid work. Figure 4 shows that. Frequency of Innovation Session vs Outcome which is a plot that graphically displays session frequency in the horizontal axis against average scores of innovation and rate of innovation, showed that the occurrence of such sessions with higher frequency also experienced incremental frequencies in the measurement of innovation. This argument implies that deliberate innovation ceremonies, together with favorable leadership approaches, are likely to undo least of the restrictions arising out of the hybrid environments.
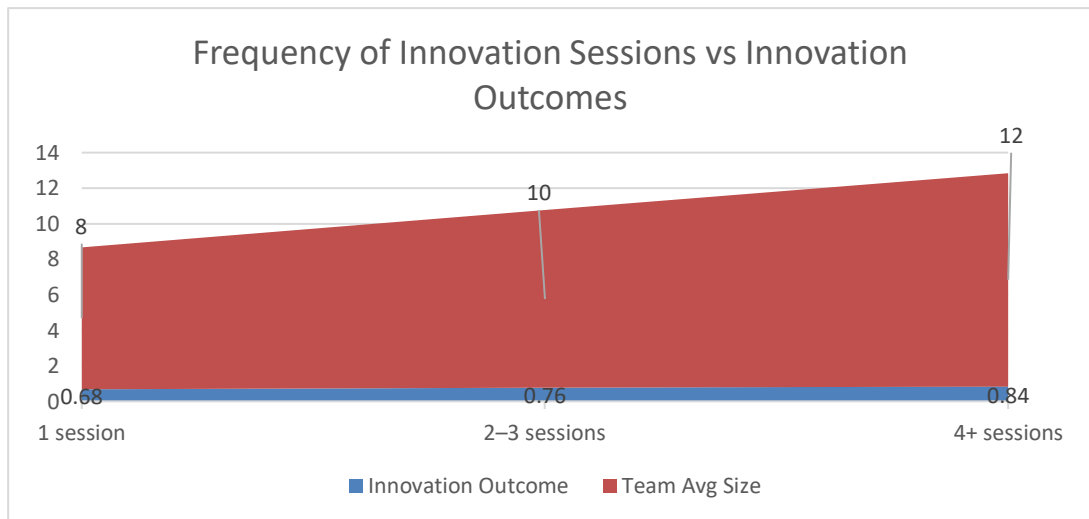

Figure 4: Frequency Of Innovation Sessions VS Innovation Outcomes

There was a consistent trend in the data showing that transactional leadership did not work as well as the rest of them in innovation. Although it aided in achieving goals and being accountable, it did not contain the emotional and risk-taking abilities needed in creating innovative thoughts. Most prominently, work group under transactional leader had a greater chance in characterizing their innovation environment as been restrictive, procedural and uninspired. Conversely, individuals that had transformational and adaptive leadership (included) such terms as empowering, fluid and safe to explore [9].

It was also noted that the main themes that have been repeatedly narrated by employees who gave cutting-edge scores to their teams were trust and autonomy. Sense of ownership among the team members has been cultivated by leaders that focused on trust-building and decentralize decision-making. This observation supports the assertion that in hybrid systems, there is more decentralization of innovation, less command based, and a community based innovation. The evidence correlated with the theory that more empathetic, talkative, and flexible forms of leadership are much more relevant to the innovation process, especially in situations when face-to-face encounters are scarce.

V. Conclusion

With hybrid work becoming a long-term organizational reality, leadership will have a determinant role in defining how innovation takes a shape. The paper has demonstrated that transformational and adaptive leader styles are especially good in innovative enhancement in the hybrid environment. The concept of servant leadership helps in increasing the levels of psychological safety and employee well-being, and transactional leadership despite its utility in terms of structure does not assist much in terms of innovation.

In hybrid settings, leaders should be able to act as flexible communicators, trust developers, and creativeness facilitators. Organizations must look into investing into leadership development regarding emotional intelligence, flexibility, and the ability to handle digital communication. In future studies, longitudinal impacts are necessary to be studied and also cross-cultural situations need to be broadened to generalize results.

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