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Collaborating Across Time Zones – Digital Platforms, Asynchronous Practices, and Performance in Global Virtual Teams

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Abstract

Global virtual teams in multinational enterprises increasingly operate with minimal time-zone overlap, which often creates structural constraints for communication and coordination. This study examines how the perceived effectiveness of digital collaboration platforms is associated with collaborative performance in remote-first, tech-enabled HR professional service firms operating under high temporal dispersion and limited time-zone overlap, and explores the asynchronous practices that support collaboration in culturally diverse global virtual teams. A mixed-methods design was used, combining cross-sectional survey data from 167 remote-working employees across 45 countries with thematic analysis of open-ended responses. Quantitative results show a strong positive association between perceived platform effectiveness and collaborative performance. Qualitative findings identify recurring practices that enable collaboration under limited overlap, including structured documentation, threaded discussions, lightweight recorded updates, interoperability across communication and task systems, and visibility into colleagues' time zones. The findings suggest that, in low time-zone overlap settings, effective collaboration depends less on default reliance on synchronous rich media and more on the flexible use of written, audio, and visual channels matched to task and temporal constraints. The study contributes to understanding how collaboration technologies support performance under conditions of limited time-zone overlap in remote-first global work and offers practical guidance for designing digital tool ecosystems, documentation standards, and time-zone-aware coordination routines.

Keywords: Global virtual teams, Digital transformation, Behavioural implications of technology,

Asynchronous work, Cross-cultural collaboration

Introduction

Remote-first work has moved beyond a temporary response to disruption and is increasingly adopted as a deliberate organisational design in multinational corporations. Some firms now operate without a central office, coordinating work across countries, cultures, and time zones while drawing on globally distributed talent. Although research on virtual teams is extensive, it has focused largely on software development contexts or on hybrid and co-located multicultural teams (Stray & Moe, 2020; Davidavičienė et al., 2020; Garro-Abarca et al., 2021). Less is currently known about how remote-first, knowledge-intensive professional service firms sustain effective collaboration when time-zone overlap is structurally limited.

This study focuses on remote-first, tech-enabled HR professional service firms as a theoretically and practically relevant setting for examining digital collaboration under high temporal dispersion. This context matters for four reasons. First, these firms are knowledge-intensive: their core outputs are not standardised products, but more specialised advisory, compliance, operational, and coordination services that depend on the reliable sharing of both explicit and tacit knowledge across locations (Empson et al., 2015; Gardner, 2015). Second, they operate through a strongly customer-facing service model, in which internal collaboration is closely tied to service quality and customer satisfaction. Cross-functional coordination among legal, payroll, operations, customer success, and country-specific specialists is therefore central to performance. Third, their work is highly dependent on documentation, coordination, and handoffs. In remote-first environments, documentation is not merely supportive; it becomes a core coordination mechanism that preserves continuity, reduces ambiguity, and enables knowledge access across dispersed teams. Finally, in these firms, time-zone management is a substantive operational challenge rather than a background condition. Work is often organised across continents to maintain service continuity, making collaboration inseparable from the management of overlap, handoffs, and the balance between synchronous and asynchronous communication (O'Leary & Cummings, 2007; Kroll et al., 2018).

A highly dispersed work context also complicates conventional prescriptions derived from media selection theories. Media Richness Theory (MRT) argues that richer communication channels, such as face-to-face interaction or video conferencing, are better suited to ambiguous or complex tasks because they enable immediate feedback and multiple social cues (Daft et al., 1987). However, teams separated by distant time zones often cannot rely heavily on synchronous, high-richness exchanges without generating delays, increasing meeting load, or contributing to fatigue (Bailenson, 2021; Shoshan & Wehrt, 2021). In such environments, Behavioural Complexity Theory (BCT) offers a more flexible account of media use, suggesting that effective

collaboration depends on teams' ability to combine and adapt communication media in response to task demands and contextual constraints, including limited overlap and variation in language proficiency (Shachaf & Hara, 2007). Related research suggests that workflow technologies can reduce communication lag and coordination costs in multi-time-zone environments.

Accordingly, this study examines the association between the perceived effectiveness of digital collaboration platforms and collaborative performance in global virtual teams operating under high temporal dispersion and limited time-zone overlap. It also investigates whether the observed communication patterns in this setting are more consistent with MRT or with BCT and identifies the platform features and team practices that appear most useful in mitigating coordination challenges associated with geographic dispersion and low overlap in culturally diverse teams. Rather than assuming that richer synchronous media are always preferable, the study explores whether collaboration in low-overlap remote-first settings depends more on adaptive media repertoires, asynchronous-first routines, and tool configurations that support continuity across time and place.

The paper centres on how teams coordinate under high temporal dispersion and limited time-zone overlap and on the role of digital platforms and asynchronous media repertoires in supporting that coordination. Therefore, the key research questions are:

- **RQ1:** How is the perceived effectiveness of digital collaboration platforms associated with collaborative performance in GVTs operating under high temporal dispersion and limited time-zone overlap?
- **RQ2:** To what extent do media choices and reported outcomes align with predictions from Media Richness Theory versus Behavioural Complexity Theory in minimal-overlap contexts?
- **RQ3:** Which platform features and team practices help mitigate coordination challenges arising from geographic dispersion and limited time-zone overlap in culturally diverse teams?

Contribution and positioning

This study makes three contributions. First, it refines media-choice scholarship by showing that the usefulness of Media Richness Theory is contingent on the practical availability of temporal overlap. Where overlap is structurally limited, Behavioural Complexity Theory offers the stronger explanatory lens. Second, it shifts attention from individual tools to platform affordance configurations, highlighting the importance of documentation capacity, threaded communication, lightweight recorded updates, interoperability, and time-zone visibility in dispersed teamwork. Third, it provides empirical evidence from remote-first, tech-enabled

HR professional service firms, a knowledge-intensive and customer-facing setting that remains under-represented in research on global virtual teams. This focus directly addresses an important gap in the literature: existing studies of global virtual collaboration primarily examine IT/software contexts or temporary project teams, whereas contemporary remote-first organisations operate across functions and on a continuous, organisation-wide basis.

Literature Review and Theoretical Background

Global virtual teams and boundary challenges

Global Virtual Teams (GVTs) are defined as individuals from varied international backgrounds working together towards shared objectives in contexts where team members are geographically separated, requiring communication, coordination, and integration through computer-mediated communication (Batista, 2022).

Such geographic dispersion introduces a range of coordination challenges, including those stemming from spatial distance, temporal misalignment, language barriers, and cultural differences. Among these factors, time-zone dispersion is particularly consequential: teams with substantial overlap can rely more readily on synchronous communication, whereas teams spread across widely separated time zones must depend heavily on asynchronous forms of coordination to avoid delays, interruptions, and extended turnaround times.

In the context of highly dispersed teams relying heavily on computer-mediated communication (CMC) for coordination and interaction, it is beneficial to analyse the digital platforms commonly used in the market to enhance effective collaboration in GVTs. CMC technologies have had a profound impact on organisations, particularly in how members gather, communicate, share, and distribute data. Furthermore, CMC shapes the dynamics of relationships among team members and has been identified as a key factor by several researchers (Abarca et al., 2020; Froese et al., 2025; Obodozie & Nwabufo, 2025).

In this study, digital platforms comprise a variety of technologies designed to facilitate internal communication and collaboration among team members. These include computer-mediated communication (CMC) tools, collaboration platforms, documentation systems, project management software, and CRM applications, as well as mobile and desktop apps integrated within these technologies. The adoption of digital platforms is pivotal in addressing the multifaceted challenges and advancements inherent in GVTs. These technologies serve as crucial enablers, enhancing team cohesion, productivity, and effectiveness within GVTs.

Although cultural differences remain relevant in shaping communication norms and interpretation, the present study does not examine culture as an independent predictor of collaboration. Rather, it considers culturally diverse teamwork as part of the broader context within which media choice

and asynchronous coordination take place.

Definition and Conceptualisation

The common understanding of collaboration is that it involves a collective process where multiple participants work together to address challenges beyond individual capacity. This entails sharing resources, responsibilities, and information to jointly plan, execute, and achieve common goals or produce a shared outcome (Markowitz et al., 2003; Zhong et al., 2015).

There are various degrees of virtuality and levels of dispersion in digital teams, which influence how members collaborate using digital platforms such as the Three-Dimensional Model of Team Virtuality (Kirkman & Mathieu, 2005) as well as the Spatial, Temporal Configurational Characteristics of Geographic Dispersion in Teams (O'Leary & Cummings, 2007). This framework illustrates the physical distances separating team members and the disparities in their time zones and working hours as well as the distribution of team members across various locations, whether they work independently or together. For example, teams in Central Europe enjoy greater time overlap with both American and Asian regions, which allows more frequent synchronous interactions such as calls, video meetings, and instant messaging than teams split between the U.S. and Asia Pacific. This overlap accelerates troubleshooting and decision-making. Conversely, when language barriers exist, asynchronous written communication becomes advantageous, which provides time for translation, reflection, and response. Temporal and spatial dispersion has attracted global software development with the 'follow-the-sun' work approach (Kroll et al., 2018). Similarly, the 'round-the-clock' approach, common in customer service, ensures 24-hour support by scheduling shifts across time zones (Lazarchuk, 2023). Furthermore, evidence from productivity research demonstrates that asynchronous workflows, especially when paired with workflow technologies, significantly decrease communication lags and task-switching costs, which result in improved performance outcomes in multiple time-zone environments (Mosquera-Gende, 2025; Odogwu et al., 2022).

A longitudinal mixed-method case study investigating coordination within global software teams across multiple countries throughout Europe, Asia and the US showed that using collaborative software tools is highly effective for both planned and spontaneous meetings. However, members within digital teams invested more time in meetings (scheduled and unscheduled) with an average of 16 hours per week (Stray & Moe, 2020). The increase in meetings was significantly influenced by the fact that distributed teams are typically 50% larger than collocated teams and demand greater coordination effort. The study also highlighted additional coordination challenges, including limited accessibility of key personnel (managers) due to time zone disparities and minimal overlap in working hours (e.g. between Norway and China). Disparities in participation levels during meetings and in collaboration tools were also noted, mainly due to language barriers, cultural discrepancies, and differing expertise levels. These factors adversely affect

efficient coordination among the teams. As key managers had limited time overlaps with more distant team members, their reduced availability contributed to a decrease in participation as well as in the sharing of knowledge and information. The study highlights the value of creative, trial-and-error problem-solving for addressing unfamiliar issues collaboratively. Agile's daily stand-up meetings, designed for co-located teams, proved to be inefficient for globally distributed teams across Norway, China, and the US. To adapt, the team used an integrated bot for daily status updates and met in person annually, where discussions were deeper and more effective. These findings suggest that simply replicating physical practices online does not guarantee effective collaboration.

A study of employees in a professional service firm during the pandemic found that asynchronous communication methods, such as email and messaging, foster more equitable dialogue by allowing all participants to contribute without dominance by a few. Furthermore, excessive check-in calls prompted a shift from intensive synchronous interactions (video conferencing) to less demanding asynchronous tools (Whillans et al., 2021). Members of GVTs require proficiency in advanced communication technologies to support both individual and collective effectiveness. A central challenge is whether digital tools can adequately replicate the dynamics of face-to-face interaction to achieve core collaborative objectives such as knowledge exchange and team cohesion. Achieving comparable outcomes in distributed digital environments may require re-evaluating existing methodologies to better align with the specific needs of GVTs.

The Five Modes of Communication

Over the past few decades, extensive research has been conducted on communication within virtual teams that emphasises both the benefits and the critical challenges that have the potential to impact productivity and team engagement. Further impact on teamwork might include proficiency in the language (particularly when English is not the native tongue among team members), diverse backgrounds, varying levels of technological proficiency for virtual communication, the multitude of communication platforms, and the complexities arising from synchronous and asynchronous communication due to differences in time zones (Cordova-Buiza et al., 2022; Newman & Ford, 2021).

In face-to-face settings, communication naturally integrates five modes: linguistic (spoken and written language), visual (images, symbols, and charts), aural (tone, pitch, and voice), gestural (body language, facial expressions, and physical interaction), and spatial (arrangement of people and objects) (Fillmore, 2016). In digital environments, however, these modes must be deliberately selected and applied individually to achieve effective interaction.

Media Richness Theory (MRT)

Media Richness Theory (MRT) by Daft et al. (1987) serves as a framework for selecting communication channels, such as video conferencing, email, or chat, based on task requirements. Originally developed alongside the rise of electronic communication, MRT remains widely applied in organisations with an emphasis on technology's capacity to provide immediate feedback and personalised messaging (Sedrine et al., 2020). Nevertheless, it remains primarily a prescriptive best-practice framework used by managers to guide communication and collaboration within teams (Guo, 2022).

According to MRT, uncertainty and ambiguity, often resulting from the absence of nonverbal cues, can be mitigated through media richness, defined by four dimensions: (1) the number of available communication channels, (2) the speed of the feedback, (3) language variety, and (4) personal focus (Ishii et al., 2019). Consequently, face-to-face or video conferencing is considered richer and more effective for complex discussions than email.

Empirical evidence on Media Richness Theory (MRT) remains mixed, with studies reporting partly conflicting findings. Rapid technological advancements further complicate its application, as individuals now build relationships through text-based channels supplemented by audio, video, and asynchronous options. Organisations also engage effectively with consumers via social media, while nonverbal cues absent in text can be conveyed through visual elements such as emojis, GIFs and images, though this requires deliberate message construction. Critics argue that MRT oversimplifies the complexities of contemporary digital communication, where factors such as organisational culture, established practices and individual preferences, significantly shape media choice (Ishii et al., 2019).

Behavioural Complexity Theory (BCT) of Media Selection

Behavioural Complexity Theory (BCT) tackles the challenges related to modes of communication, channels, and cultural factors (Shachaf and Hara, 2007). The theory examines how individuals select communication media according to the complexity of the task at hand (ranging from simple and routine to complex and non-routine tasks) as well as various situational factors, including time constraints, the nature of relationships, and diverse backgrounds, including language proficiency. For example, it suggests employing email communication for complex tasks, especially when team members face difficulties communicating in English or the language used by the company. Written communication will provide them time to read, understand, process, and answer. The authors also propose that leaders and teams may flexibly combine the various information and communication media to efficiently collaborate.

Furthermore, Gaan (2019) identified that written communication using emails, instant messaging, and collaboration tools can mitigate differences and bias. This is because such mediums eliminate

visual cues, accents, language errors, and misunderstandings often associated with non-native speakers.

While excessive video conferences can lead to nonverbal overload, over-reliance on written communication may result in information overload. Recent studies focusing on digital work and the effects of video conferences on individuals have identified that virtual meetings are perceived by participants as exhausting. This exhaustion is related to the number of participants, perceived duration, technical challenges, and compensating for the lack of nonverbal cues, contributing to 'Zoom fatigue', known as nonverbal overload. Interestingly, a significant number of individuals prefer less visually stimulating media, such as written communication and phone calls (Shoshan & Wehrt, 2021). This overload arises from exaggerated facial expressions and gestures intended to be more noticeable on the screen during a video conference (Bailenson, 2021). Additionally, the study highlighted a noticeable gender discrepancy, indicating that women might be more vulnerable to nonverbal overload due to social conditioning factors (Fauville et al., 2023). These findings contradict the established media richness theory, which suggests that richer media, such as video conferences, are more effective in communication than less rich media.

BCT aligns with contemporary observations that teams may substitute lengthy meetings with documented workflows, recorded updates, and collaborative workspaces, particularly under low-overlap conditions and when participants vary in language proficiency.

Digital collaboration platforms as coordination infrastructure

Collaboration and knowledge sharing in GVTs depend heavily on the digital technologies teams employ. In virtual environments, where members cannot directly observe one another's work, teams often rely on assumptions that may be biased or negatively distorted (Morrison-Smith & Ruiz, 2020). To counter this, many project-management platforms provide real-time visualisations of tasks and progress, including Kanban boards, dashboards, charts, and activity streams, to support coordination across distributed teams.

Because tech companies increasingly aim to offer all-in-one collaboration ecosystems, communication and task-management functionalities frequently overlap. Organisations also combine multiple tools to meet specialised needs.

Their effectiveness for GVTs depends on how flexibly teams configure integrations and workflows. Collaboration platforms often support language localisation and translation through native or third-party apps, although real-time captioning typically requires external conferencing tools. Extensive customisation is available across platforms, but excessive notifications, bots, and multiple channels can cause cognitive overload, and highly structured task environments may reduce opportunities for informal interaction.

Across providers, 'collaboration' is largely conceptualised as task coordination rather than relationship building, despite the importance of interpersonal ties for effective teamwork. Visual cues such as emojis, stickers, GIFs, and avatars help clarify messages and foster positive social interaction (Li & Yang, 2018), although usage is culturally variable (Bai et al., 2019).

Informal exchanges, such as water-cooler conversations, play a significant role in strengthening relationships and can occupy up to 75 minutes per workday (Herbsleb & Mockus, 2003). More broadly, digital tools can recreate spontaneity but not the serendipity of in-person encounters, which often occur without intent. As Brummel observes, 'The beauty of the water cooler is that it brings together people who otherwise wouldn't have a reason to talk' (Lauria & Cohen, 2022). This raises questions about how the relational benefits of informal office interactions can be meaningfully supported in virtual contexts. Emerging VR solutions aim to create more immersive collaboration spaces, yet research on asynchronous collaboration in VR/AR remains limited due to high costs and early-stage adoption (Pidel & Ackermann, 2020).

Most collaboration platforms originate from the global North, which may neglect international differences in communication practices. Even with multilingual features, interface design and usage norms often fail to accommodate preferences found in collectivist or high-power-distance cultures, such as varying comfort levels with public knowledge sharing or direct transparency.

Effective collaboration depends not only on technology, but also on shared understanding of tool use, goals, metrics, and data interpretation. Misalignment or unclear collaboration purposes can lead to inefficiencies, especially when local needs are overlooked. Ethical concerns arise when transparency features are perceived as monitoring or surveillance, potentially undermining trust.

Although digital tools support knowledge sharing, research shows that social norms, motivation, conflict, trust, technology, and leadership strongly influence willingness to share information (Davidavičienė et al., 2020). Studies in professional service firms similarly emphasise that collaboration depends on perceived benefits, organisational culture, and leadership that rewards collective rather than competitive efforts (Gardner, 2015). Meanwhile, information overload and the continual need for digital proficiency may overwhelm team members and reduce collaborative effectiveness.

In this study, the usefulness of digital collaboration platforms was interpreted not simply as general user satisfaction, but in relation to the extent to which platforms offered affordances suited to highly dispersed teamwork. By drawing on the categorisation logic used in the broader study, platform usefulness was considered in light of: (a) the variety of communication modes supported (e.g., written, audio, and visual), (b) the availability of both synchronous and asynchronous options, (c) task-management and workflow coordination features, (d) affordances that support relationship-building and informal interaction, (e) time-zone visibility and scheduling support,

and (f) multilingual or cross-cultural support features. This approach reflects the premise that, in remote-first teams operating across multiple time zones, platform value depends less on any single communication channel and more on whether tools can be configured to support coordination, continuity, and interaction when time-zone overlap is limited.

In summary, the reviewed literature suggests that the central issue in highly dispersed teams is not simply whether collaboration platforms are available but whether they enable a usable repertoire of media and work practices under conditions of minimal temporal overlap. For this reason, the present study treats MRT as a conditional rather than universal guide and uses BCT as the primary lens for examining how teams combine written, audio, visual, synchronous, and asynchronous channels in context.

Conceptual Framework and Analytical Expectations

Building on the preceding literature review, this paper conceptualises platform effectiveness as the main independent variable and collaborative performance as the outcome. The relationship between the two is not purely technological. Instead, platform effectiveness matters because it supports asynchronous coordination through practices such as documentation, delayed discussion, recorded explanations, and structured handovers. The paper therefore treats asynchronous coordination capability as the key explanatory mechanism. Time-zone overlap and cultural–linguistic diversity are considered boundary conditions, as they influence when synchronous communication is still useful and when more flexible combinations of communication media are more effective.

The model in Figure 1 suggests that perceived platform effectiveness is positively related to collaborative performance, as it enhances teams' ability to coordinate work asynchronously. The relative value of synchronous, media-rich communication compared to flexible combinations of communication tools depends on the degree of time-zone overlap among team members. When temporal dispersion is high and overlap is low, the explanatory power of Media Richness Theory becomes more limited, while the broader perspective of adaptive media use, as proposed by Behavioural Complexity Theory, provides a more suitable framework.

Methodology

Research design

The study employs a mixed-methods design that combines a cross-sectional survey with a thematic analysis of open-ended responses. This design allows for a quantitative assessment of the relationship between perceived platform effectiveness and collaborative performance, while also providing qualitative insight into how teams describe the practices and digital features that enable collaboration under high temporal dispersion and limited time-zone overlap in culturally

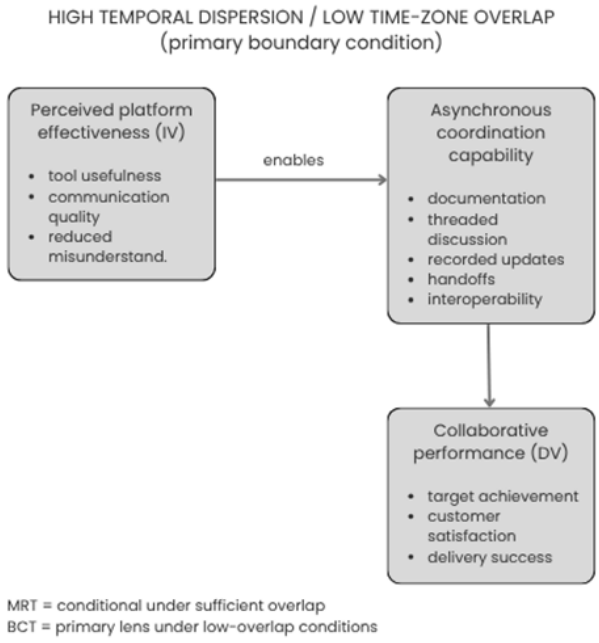


Figure 1: Conceptual model of platform effectiveness, asynchronous coordination, and collaborative performance under low time-zone overlap in culturally diverse GVT settings.

diverse team settings.

Sampling and context

The study focuses on employees working in remote-first multinational enterprises that operate across at least three time zones. Organisations maintaining a dominant physical headquarters, adopting hybrid work models, or relying on temporary remote arrangements were excluded to ensure the sample reflects long-term, structurally remote-first operations. This sampling frame was intended to capture teams for whom limited time-zone overlap was not incidental but a routine feature of everyday coordination.

Eligible firms were identified through a multi-stage screening process and designed to capture organisations structurally oriented toward remote global collaboration. Potential firms were first located through business directories and company databases to verify sector, organisational scale, and international presence. Remote-first or all-remote status was then cross-checked through company websites, career pages, job advertisements, and employee-review platforms. Firms were retained only if they fit the study's focus on tech-enabled HR professional service organisations and operated across multiple countries, continents, and time zones. Hybrid firms

and organisations with a dominant physical headquarters were excluded because the purpose of the study was to examine collaboration in contexts where remote work is a stable organisational design rather than a temporary, mixed, or office-led arrangement. Excluding these firms reduced the influence of legacy co-located practices and pre-existing face-to-face routines that may shape collaboration differently. In total, 176 survey responses were collected. Nine responses were removed because respondents worked in hybrid arrangements, belonged to industries outside the study scope, or had missing/ineligible data, yielding a final sample of 167 respondents.

A purposive, non-probability sampling strategy was employed to capture a diverse range of experiences rather than to achieve population representativeness (Saunders et al., 2012). A multi-stage screening process identified nine eligible remote-first organisations based on three criteria: (a) a formal remote-first policy, (b) a global footprint spanning at least three continents and three time zones, and (c) consistently high customer ratings ($\geq$ 4.5/5) at the time of screening. The final dataset captured experiences from employees across 45 countries and six continents.

Data collection

Data were collected using an online questionnaire suitable for geographically dispersed participants. The instrument comprised Likert-scale items (1–5), categorical questions, and open-ended prompts. A small pilot test was conducted prior to deployment to refine item wording and enhance clarity.

Ethical Considerations

The study used an anonymous, voluntary online survey and did not involve intervention or sensitive personal data. Participants received information about the study purpose, anonymity, and their right to withdraw and provided informed consent before participation. No directly identifying data were collected, responses were analysed in aggregate, and recruitment was conducted through direct individual contact by the researcher rather than via HR or managerial channels in order to minimise organisational pressure and preserve voluntariness. Participants were contacted only once and were not offered incentives.

Formal ethical approval was not required under the applicable institutional guidelines for anonymous, non-interventional survey research.

Data were stored securely on password-protected systems and were accessible only to the researcher. In line with research practice, the study complied with principles of informed consent, privacy protection, and responsible handling of digital data.

For transparency, the author notes that this dataset was previously used in another study with a different analytical focus. While the previous article examined broad organisational drivers of collaboration in remote-first HR firms (Tran, 2025), the present study asks a narrower question:

how do teams collaborate when time-zone overlap is structurally limited? The paper therefore shifts attention away from general predictors of collaboration and toward contingent media choice, asynchronous work routines, and the platform affordances that make low-overlap coordination possible. It addresses a distinct set of research questions and contributes unique theoretical and empirical insights by isolating the role of digital platform effectiveness, asynchronous coordination practices, and media selection under conditions of low time-zone overlap.

Measures

Collaborative performance (DV): This construct combined responses to three survey items: team success in achieving targets, the perceived impact of collaboration practices on customer satisfaction, and overall customer satisfaction with projects delivered by the team. Each item was measured on a 5-point Likert scale and coded so that higher scores reflected stronger collaborative performance. Internal consistency was acceptable (Cronbach's $\alpha = 0.827$).

Platform effectiveness (IV): This construct combined responses to three survey items: satisfaction with the digital tools used for cross-cultural collaboration, the perceived effectiveness of communication within the team, and the perceived effectiveness of digital collaboration tools in reducing misunderstandings. Each item was measured on a 5-point Likert scale and coded so that higher scores reflected greater perceived platform effectiveness. Internal consistency was acceptable (Cronbach's $\alpha = 0.840$).

Items were organised conceptually using BCT (Shachaf & Hara, 2007) to reflect the requirements of global virtual collaboration and strengthen construct alignment. As a supplementary operationalisation, the study also interpreted reported tool use through a BCT-informed media-repertoire logic. By drawing on respondents' selections of workplace communication and collaboration tools, platforms were categorised according to their primary built-in function (communication versus collaboration) and the breadth of affordances they offered for dispersed teamwork. Following the broader coding approach developed for the study, tools were assessed in terms of the diversity of communication modes supported (e.g., written, audio, and visual), the availability of synchronous and asynchronous options, and their capacity to support coordination and collaboration tasks (see Appendix A). This produced an ordinal interpretation of platform sophistication ranging from very limited to highly diverse media repertoires. The purpose of this categorisation was not to rank brands per se, but to capture whether teams had access to tool environments that enabled flexible media selection under conditions of temporal dispersion.

Quantitative analysis

Quantitative analyses were conducted using SPSS. The study reports descriptive statistics, Spearman's rank-order correlations, and ordinal regression, reflecting the ordinal nature of

the dependent variable. Assumptions for ordinal regression were examined, including the proportional-odds requirement assessed through the test of parallel lines.

Because the data are cross-sectional and self-reported, the ordinal regression models are used to estimate ordered associations rather than causal effects. The purpose of the regression is to test whether higher perceived platform effectiveness is systematically associated with higher reported collaborative performance after accounting for the ordinal structure of the outcome variable. The analysis therefore supports comparative and theory-informed interpretation, but it does not establish causal direction.

Furthermore, several methodological limitations should be noted: Endogeneity cannot be entirely excluded because teams with higher performance may rate their digital platforms more positively, and unobserved organisational routines may affect both variables. Second, as both key variables are self-reported and collected within the same survey, common method bias may be present. To mitigate this risk, procedural measures were implemented, including ensuring anonymity, recruiting participants directly rather than through managerial channels, and combining closed-ended with open-ended questions. Multicollinearity is unlikely to be a major concern in the main ordinal model, as the specification relies on a single composite predictor. Finally, a robustness check using an alternative, Behavioural Complexity Theory-informed measure of media repertoire (based on reported tool use) produced consistent results and supports the stability of the findings.

Qualitative analysis

Open-ended responses were analysed using thematic analysis following Braun and Clarke (2006). Coding was data-driven and iterative. In vivo labels were used to preserve respondents' language. A documented codebook and analytic memos were used to support rigour. Code co-occurrence relationships were visualised through a code map to support interpretation of dominant themes.

The qualitative analysis drew on all usable responses to the open-ended survey items concerning positive collaboration experiences and encountered challenges (n=86). Themes reported in the Results represent repeated patterns across these responses rather than isolated examples (see Appendix B).

Results

Sample profile

The final sample in this study includes diverse nationalities (i.e., American 9%, Spanish 8.4%, Nigerian 7.8%, and Indian 7.2%) to ensure a balanced distribution and reduce the likelihood of a single demographic group exerting disproportionate influence. The sample was close to gender balanced, with approximately 52% female and 48% male participants. Respondents also

reflected a range of organisational seniority: most occupied managerial or team-level roles, while others held mid- to senior-level positions, and a smaller proportion were in executive leadership.

In addition, respondents brought substantive exposure to fully remote work, with many reporting several years of experience in remote environments, which increases the relevance of their assessments of digital collaboration practices.

Quantitative results (RQ1): platform effectiveness under high temporal dispersion

In line with RQ1, Spearman's correlation indicated a strong positive association between perceived platform effectiveness and collaborative performance in teams operating under high temporal dispersion and limited time-zone overlap (ρ = 0.500, $p < .001$). Ordinal regression further showed that platform effectiveness was significantly associated with collaborative performance (B = 1.915, $p < .001$), corresponding to an odds ratio of approximately 6.79. Model fit was acceptable (Pearson/Deviance $p > .05$), the proportional-odds assumption was supported (test of parallel lines $p = .080$; robustness check $p = .705$), and the model explained a moderate proportion of variation (Nagelkerke pseudo - $R^2 = .367$).

Table 1: Association between platform effectiveness and collaborative performance.

Predictor / Statistic	Value
B	1.915
Degrees of freedom (df)	1
p-value	< 0.001
Odds ratio (exp(B))	6.79
Spearman's ρ	0.500 ($p < 0.001$)
Sample size (N)	167
Pearson goodness-of-fit (p)	0.898
Test of parallel lines (p)	0.080
Nagelkerke pseudo R^2	0.367

Source: *The author.*

Spearman's correlation indicates a strong positive association between the perceived effectiveness of digital collaboration platforms and collaborative performance in teams operating with limited time-zone overlap. As shown in Table 1, these findings suggest that higher perceived platform effectiveness is associated with higher reported collaborative performance in highly dispersed global virtual teams.

Substantively, the estimated odds ratio indicates a strong association: teams that report higher effectiveness of their digital collaboration platforms are much more likely to rate their collaborative performance at higher levels. However, this finding should not be interpreted as a purely

technological effect. In this context, perceived platform effectiveness likely reflects a combination of the platform's technical features and the work practices through which teams use it, particularly in terms of documentation, task handovers, and reducing the need for meetings.

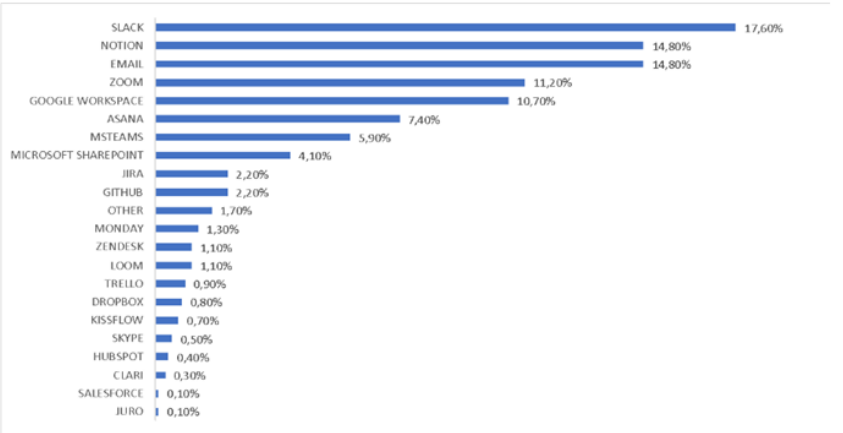


Figure 2: Digital Platforms Reported by Respondents as Used in Their Workplace. (***Source:*** *The author.*)

Descriptive results indicate that respondents used a portfolio of digital tools serving distinct coordination purposes. The most commonly reported communication tools were Slack, email, and Zoom, which suggest that teams rely on a combination of rapid messaging, asynchronous written exchange, and synchronous meetings depending on task demands and time-zone overlap. The most frequently used collaboration tools were Notion, Asana, and Microsoft SharePoint, highlighting the importance of shared workspaces, project management, and structured documentation in remote-first teamwork. Taken together, these patterns suggest that collaboration in highly dispersed settings is supported not by one dominant platform, but by an ecosystem of interoperable tools used for complementary purposes.

These descriptive patterns are elaborated further in the qualitative findings, which show how respondents combine these tools in asynchronous documentation, task coordination, and low-overlap communication routines.

Qualitative results (RQ2–RQ3): media choice, asynchronous coordination, and enabling features

The code co-occurrence analysis showed that references to effective platform use clustered most strongly around documentation, knowledge sharing, asynchronous work benefits, and rapid alignment through messaging tools. This pattern indicates that respondents did not experience

platform effectiveness as the property of a single tool but as the coordinated use of communication and documentation systems. The code map in Appendix B supports this interpretation by showing that documentation, knowledge sharing, and the benefits of asynchronous work are central to effective platform use. In contrast, specific tools such as Slack and Notion appear as interconnected enablers within this system, rather than as standalone solutions.

The thematic analysis complements the quantitative association by explaining what 'effective platform use' looks like in practice for highly dispersed GVTs.

Qualitative coding further showed that effective platform use was closely tied to asynchronous work benefits (26 mentions), knowledge sharing (15), Slack (12), and Notion (11), with additional emphasis on meetings (8), documentation (7), project/task management (7), and feedback (7). This pattern suggests that respondents experienced digital collaboration as most effective when communication, documentation, and coordination tools were used in combination rather than in isolation. Slack was most often associated with fast communication and alignment, while Notion was more closely linked to structured documentation and knowledge sharing.

As summarised in Figure 3, respondents described four recurring asynchronous practices—structured documentation, threaded or delayed discussion, lightweight recorded updates, and time-zone-aware handoffs—as central to collaboration under low time-zone overlap. These practices appear to support continuity and clarity while reducing dependence on synchronous meetings and, consequently, contributing to collaborative performance.

Theme 1: Adaptive Media Repertoires Rather Than Default Reliance on Synchronous Richness

Respondents describe employing a flexible combination of written, audio, and visual media across both synchronous and asynchronous channels. Tools such as Slack and Notion are frequently cited, which illustrate how rapid messaging can be complemented with structured documentation and long-term knowledge repositories. Lightweight recorded video messages (e.g., Loom) are highlighted as enabling richer nuance without requiring meeting overlap. These practices align with Behavioural Complexity Theory's emphasis on situational and adaptive media choice (Shachaf & Hara, 2007) and provide limited support for Media Richness Theory in low-overlap settings where synchronous video meetings are neither always feasible nor efficient.

This was reflected in one respondent's description of combining different media intentionally: 'I experienced effective communication through the use of Slack, Notion, and Loom videos to work asynchronously. This way we have seamless collaboration, allowing my team to stay aligned and productive without causing delays or bottlenecks. Everyone can contribute at their own pace, maximising efficiency and clarity across the board' (Product Manager, Nigeria).

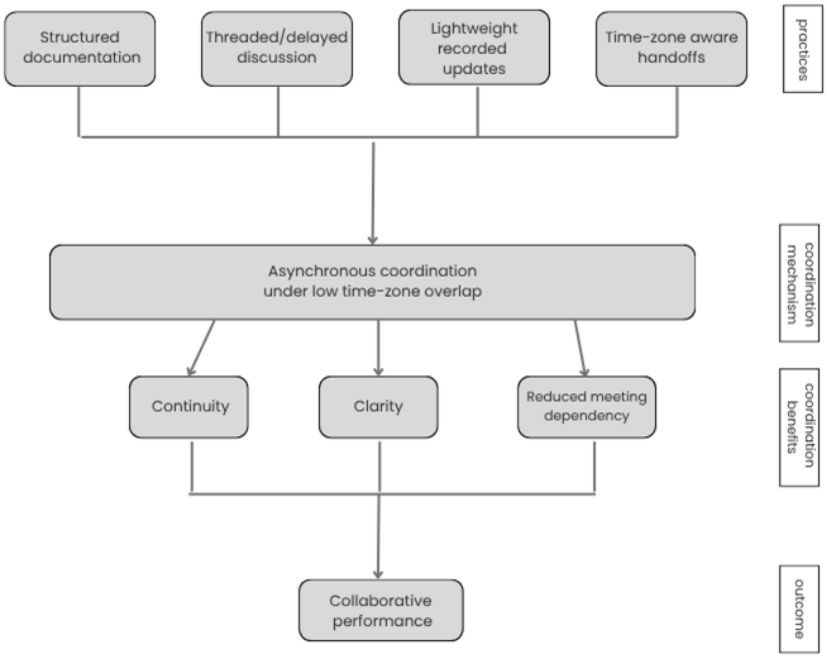


Figure 3: Core asynchronous practices supporting collaboration under low time-zone overlap. (***Source:*** *The author.*)

Theme 2: Asynchronous-First Coordination With Strong Documentation Norms

Participants report replacing lengthy meetings with shared documents, collaborative editing, threaded comments, and asynchronous approval processes. Meetings that do occur are described as brief, purposeful, and sparingly scheduled. Asynchronous coordination is framed as essential for maintaining workflow continuity across time zones and for reducing dependency bottlenecks.

One respondent described this asynchronous-first routine particularly clearly: 'We first create a proposal, ask people to contribute their own ideas for a period of time, [and] if everyone agrees there's no need to meet. If there are open questions, we then agree to a 30 min call' (Team Lead, Germany). It illustrates how documentation and delayed input can substitute for routine meetings, reserving synchronous interaction for unresolved issues only.

Theme 3: Established Time-Zone Coordination Routines

Respondents detail routine practices for managing temporal dispersion, including the use of scheduling tools to identify limited windows of overlap, rotating meeting times to distribute inconvenience fairly, and reserving synchronous time primarily for critical alignment or

decision-making. These routines help teams balance efficiency with equity in geographically distributed work.

Time-zone coordination was also described as an operational routine rather than an occasional workaround. For example, one respondent noted: 'We introduced a 24-hour shift system, allowing us to provide continuous support and use a shared online dashboard for real-time updates and handovers. This solution ensured timely and efficient customer service around the clock' (Customer Support, New Zealand).

Theme 4: Interoperability, Temporal Visibility and Digital Infrastructure

Participants emphasise the importance of platform configurations that minimise friction. Key elements include interoperability across communication and project-management tools, transparent visibility into colleagues' time zones, and infrastructure that supports seamless handoffs across regional customer-support teams. Such features are viewed as critical for maintaining coordination in highly dispersed environments.

Respondents also emphasised the value of visibility and shared infrastructure. As one participant explained, 'The best thing is that we know at every moment when someone is busy, when they are available, or when they are out of office. Using Notion as a main tool for documentation has helped us find everything we need to make sure we provide the right service to clients' (Customer Support, Greece).

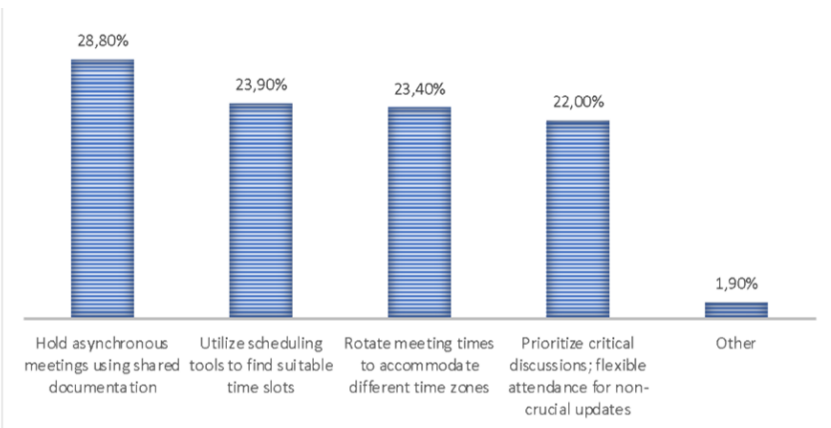


Figure 4: Meeting minimisation and scheduling practices in temporally dispersed teams. (***Source:*** *The author.*)

Two respondent quotations highlight the managerial and cultural framing of effective cross-time-zone collaboration:

'Timezone flexibility and recognition of work–life balance are keys' (Finance/Accounting, United States).

'The company leads by example when it comes to global virtual team collaboration' (Team Lead, Germany).

Table 2: Observed collaboration patterns in relation to MRT and BCT

Observed pattern	**MRT expectation**	**BCT expectation**	**Evidence in this study**
Complex work handled asynchronously	weak / partial fit	strong fit	Supported
Short, selective meetings	partial fit	strong fit	supported
Documentation-centred coordination	weak fit	strong fit	supported
Recorded video updates used instead of meetings	limited fit	strong fit	Supported
Synchronous use only for high-urgency alignment	conditional fit	strong fit	supported

(***Source:*** *The author.*)

Discussion

Interpreting the association between platforms and performance

The present study focuses on how platform affordances and asynchronous coordination practices help teams work effectively despite limited temporal overlap. Across both the survey and qualitative evidence, the perceived effectiveness of digital collaboration platforms is positively associated with collaborative performance in highly dispersed GVTs. Notably, the qualitative insights suggest that platform effectiveness is not determined solely by the sophistication of the tools themselves. Rather, it reflects the degree of alignment between platform affordances and the collaboration practices adopted by teams, particularly under conditions of limited temporal overlap.

Implications for media selection theory (RQ2)

The findings indicate that in contexts with minimal time-zone overlap, Media Richness Theory's recommendation to use rich, synchronous media for complex tasks is substantially constrained by feasibility and coordination costs. Instead, the collaborative practices reported by respondents

Table 3: Platform affordances and asynchronous practices supporting low-overlap collaboration.

Practice	Example tool use	Coordination function	Reported benefit
Shared documentation	Notion / SharePoint	preserves context	fewer delays
Threaded messaging	Slack	Delayed discussion	reduced bottlenecks
Recorded updates	Loom	Rich asynchronous explanation	less meeting dependency
Time-zone visibility	Scheduling tools	Overlap planning	fairer coordination
Interoperability	Chat + docs + PM tools	Seamless handoffs	continuity across regions

(***Source:*** *The author.*)

align more closely with the principles of Behavioural Complexity Theory. Higher-performing teams appear to rely on flexible, context-responsive media repertoires that combine written, audio, and visual modalities across both synchronous and asynchronous channels, selecting tools according to situational demands rather than defaulting to synchronous communication (Shachaf & Hara, 2007).

The findings do not require a rejection of Media Richness Theory but they do suggest that its traditional recommendation to match complex tasks with richer, synchronous media is less applicable in structurally low-overlap environments. In highly dispersed teams, synchronous richness is not always feasible and may introduce coordination costs, delays, and workflow interruption, especially where working hours barely overlap and team members differ in language proficiency or communication pace. In such settings, written and recorded asynchronous channels can provide advantages that are underemphasised in classic richness arguments: they allow greater time for interpretation and response, preserve context across handoffs, and broaden participation by reducing pressure for immediate verbal contribution. The present findings are therefore better aligned with Behavioural Complexity Theory, which treats media choice as adaptive and context-sensitive and is more capable of explaining why dispersed teams benefit from flexible repertoires of written, audio, and visual communication rather than from default reliance on synchronous meetings.

Enabling features and practices (RQ3)

The findings converge on several key mechanisms that enable effective collaboration in highly dispersed GVTs. First, asynchronous collaboration affordances such as shared documents, version

control, threaded discussions, and lightweight recorded updates provide continuity across time zones and reduce dependency on synchronous interaction.

Second, features that enhance time-zone visibility and support scheduling help teams navigate limited overlap more efficiently.

Third, interoperability across communication, knowledge-management and task-coordination systems reduces friction and supports cohesive workflows. Finally, established norms around documentation and meeting discipline, brief, purpose-driven meetings and explicit written context play a central role in maintaining alignment despite geographical and temporal dispersion.

Practical Application and Managerial Relevance

For managers leading remote-first global teams, the findings suggest that performance gains are most likely when organisations adopt practices that align technological affordances with the realities of temporal dispersion.

Managers can translate these findings into a small set of practical interventions:

- Maintain a centralised, searchable knowledge repository
- Use recorded updates to replace some routine meetings
- Rotate meeting times across time zones for fairness
- Document roles, responsibilities, and ownership
- Train employees on tool use and channel choice
- Improve search/navigation across systems
- Strengthen integration across communication, documentation, and PM tools

Together, these practices help reduce coordination friction in low-overlap global teams.

Therefore, tool ecosystems should be designed to support asynchronous continuity. Teams benefit from cultivating a deliberate media repertoire, combining written communication with lightweight audio and visual formats, strategically matched to task complexity and the degree of time-zone overlap available. Establishing clear norms for documentation, handoffs, and meeting discipline is essential to maintaining alignment and reducing dependency bottlenecks. Sustained investment in digital literacy and onboarding helps ensure consistent tool use across the organisation, which helps mitigate fragmentation in practices and reduce coordination costs.

Finally, managers must balance transparency with respect for privacy, as overly intrusive monitoring features can undermine trust and hinder collaborative engagement.

Limitations and Future Research

This study has several limitations that should be considered when interpreting the findings. First, the empirical setting is industry-specific: the sample was drawn from remote-first, tech-enabled HR professional service firms, which may limit transferability to other sectors with different task structures, operating models, or collaboration requirements. Second, the study is based on self-reported survey data, which introduces the possibility of common-method bias and perceptual inflation in both predictor and outcome measures. Third, the cross-sectional design allows the identification of associations but does not support causal inference. Fourth, the use of non-probability purposive sampling limits representativeness and means the sample should not be interpreted as statistically representative of all remote workers or all global virtual teams. In addition, respondents in this sample were drawn from remote-first organisations and may therefore be more favourably disposed toward remote work than the broader working population, which creates the possibility of self-selection bias and an over-representation of employees who are more comfortable with, or supportive of, asynchronous and distributed work arrangements. Therefore, future studies could use multi-source or longitudinal designs to reduce reverse-causality and common-method concerns.

In addition, examining how emerging platform capabilities, such as AI-assisted features, automated translation, and knowledge-retrieval tools, affect virtual collaboration in GVT would further extend the scope of this study, particularly with regard to coordination costs as well as potential privacy and ethical implications.

Conclusion

In remote-first, highly dispersed teams, the perceived effectiveness of digital collaboration platforms is positively associated with collaborative performance. In this professional service context, the findings suggest that effective collaboration depends less on a default reliance on synchronous, media-rich communication and more on how teams configure and use flexible combinations of written, audio, and visual tools across asynchronous and synchronous workflows. Accordingly, the results align more closely with Behavioural Complexity Theory than with a strict interpretation of Media Richness Theory in settings where time-zone overlap is structurally limited.

The qualitative findings further indicate that platform effectiveness is closely linked to the presence of asynchronous-first routines, shared documentation practices, interoperable tool ecosystems, and explicit time-zone coordination norms. In this sense, technology appears to support collaboration most effectively when embedded in structured practices for documentation, task handovers, knowledge sharing, and the selective use of meetings.

These findings should be interpreted within the empirical scope of the study, which focuses on employees in remote-first, HR professional service organisations operating across multiple time zones. Within this boundary, the study contributes to understanding how collaboration is sustained under conditions of limited temporal overlap and strong reliance on digital infrastructure. It also offers practical guidance for managers designing platform ecosystems, documentation standards, and time-zone-aware coordination routines in highly dispersed work settings.

Theoretically, the study advances media-choice research by showing that Media Richness Theory is best treated as conditional rather than universal in dispersed contexts. When temporal overlap is limited, Behavioural Complexity Theory provides a more comprehensive explanatory lens, as media use becomes shaped not only by task ambiguity but also by timing constraints, documentation requirements, and language-processing conditions.

Methodologically, the study demonstrates the value of combining ordinal association models with thematic analysis in research on remote work. While the quantitative model identifies the strength of the platform performance relationship, the qualitative evidence clarifies the organisational routines through which this relationship is enacted in practice.

Future research should test the proposed model using longitudinal, multi-source, or digital-trace data as well as compare low- and high-overlap teams across industries and examine more directly how AI-enabled capabilities such as translation, summarisation, and workflow orchestration reshape the balance between synchronous communication and asynchronous coordination.

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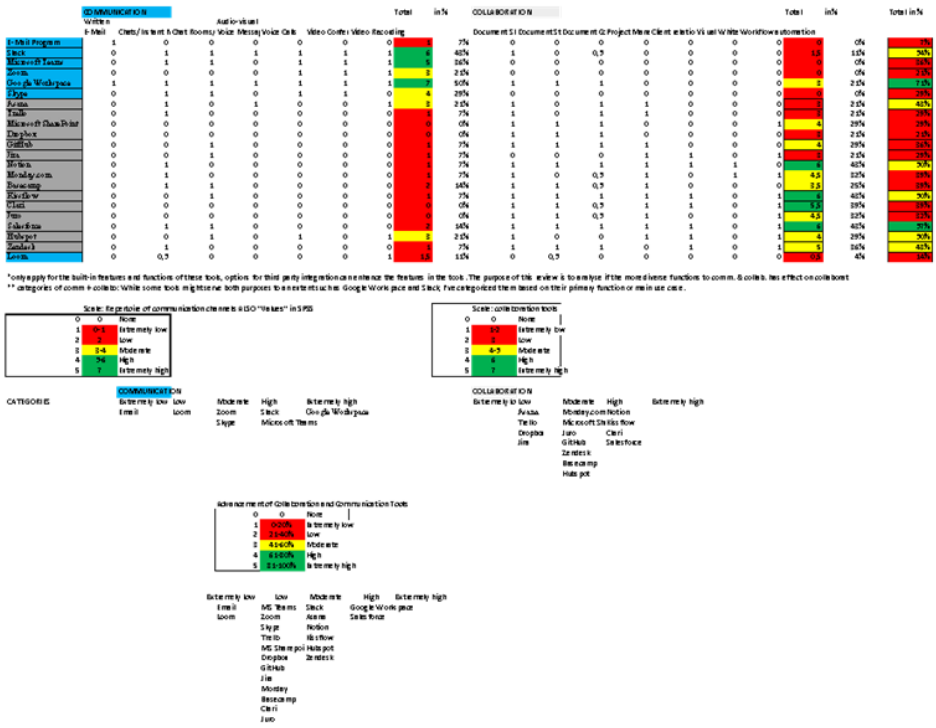
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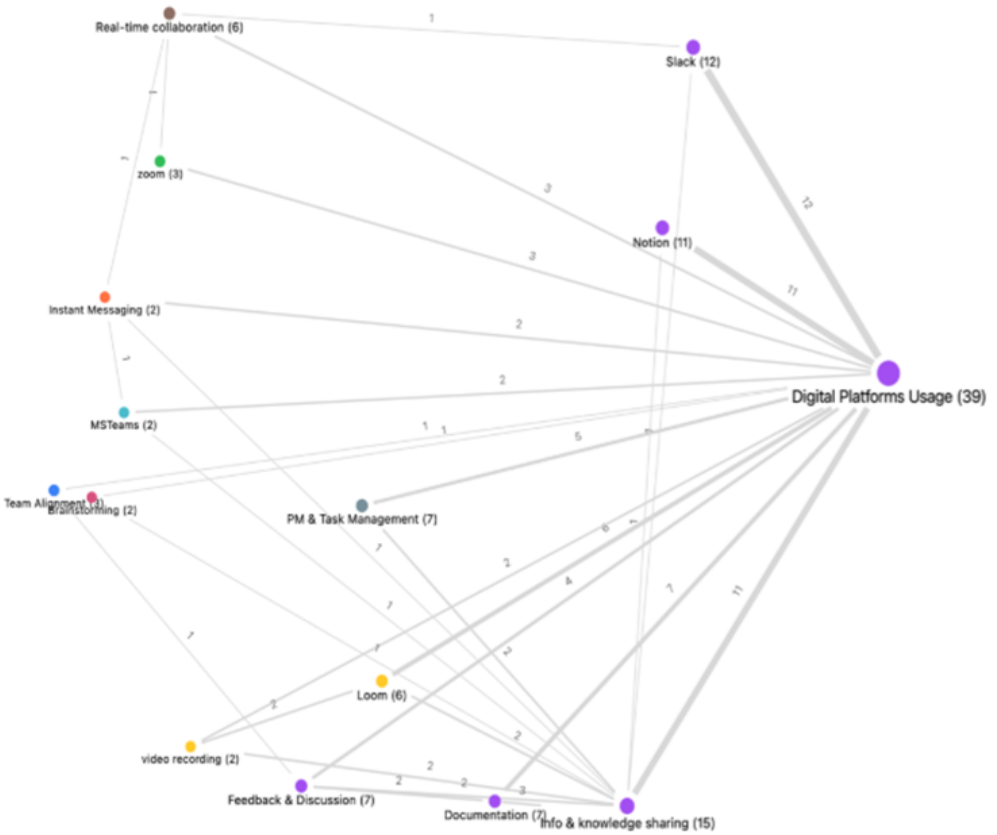
Anh Ngoc Tran (2026). Collaborating Across Time Zones – Digital Platforms, Asynchronous Practices, and Performance in Global Virtual Teams. *Transformational Management Review*, 01(02), 236-264.

Appendix (A)



Evaluation of Digital Platforms(***Source:*** *The author.*)

Appendix (B)



Code Map of Employees' Experiences with Digital Platforms Used in the Workplace (***Source:*** *The author.*)