Talking about Chat at Work in the Global South: An Ethnographic Study of Chat Use in India and Kenya

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ABSTRACT

In this paper, we examine how two chat apps fit into the communication ecosystem of six large distributed enterprises, in India and Kenya. From the perspective of management, these chat apps promised to foster greater communication and awareness between workers in the field, and between fieldworkers and the enterprises administration and management centres. Each organisation had multiple different types of chat groups, characterised by the types of content and interaction patterns they mediate, and the different organisational functions they fulfil. Examining the interplay between chat and existing local practices for coordination, collaboration and knowledge-sharing, we discuss how chat manifests in the distributed workplace and how it fits – or otherwise – alongside the rhythms of both local and remote work. We contribute to understandings of chat apps for workplace communication and provide insights for shaping their ongoing development.

CCS CONCEPTS

• **Human-centered computing** → **Field studies**; **Collaborative interaction**; **Ethnographic studies**; *Empirical studies in HCI*; *Collaborative content creation*; *Computer supported cooperative work*; • **Social and professional topics** → Economic impact;

KEYWORDS

ethnography, chat apps, mobile messaging, distributed workforce, collaboration

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1 INTRODUCTION

We examine the adoption of chat apps by large organisations, to understand how they fit into the organisational communication ecosystem: specifically, their impact on communication practices, knowledge-sharing, awareness and coordination work. Managing communication is a challenge for large organisations with highly distributed field workers, who typically spend much time on-the-road. Traditionally such organisations manage their workforce through their organisational structure: with central managerial and administrative staff (called HQ for headquarters in this paper), and regional teams of fieldworkers and local managers. The division of labour tends to be such that little day-to-day coordination of work is required between HQ and fieldworkers. Workers inhabit their site of work; doing coordination work, knowledge-sharing and collaboration locally. In the Global South, a limited supply of expensive computing devices, such as laptops, means that fieldworkers primarily rely on their mobile phone, often a feature phone, for calls and SMS. More recently, however, smartphone penetration has increased, with many distributed organisations either

buying them, or encouraging their workers to buy them. At the same time chat apps are becoming prevalent [38] and many highly distributed organisations are keen to take advantage of this popular method of communication to foster knowledge-sharing. Indeed, chat apps are already being appropriated by workers, from hospital staff [27] to software engineers [32].

In the Global South, WhatsApp has been widely adopted for workplace communication. Whilst this trend has been observed in passing [43] and popular media [2], there has been little focused academic investigation [5]. To begin to shed light on this trend, we conducted an ethnographic study examining how chat apps were incorporated into six workplaces in Kenya and India. The organisations studied used two chat apps: WhatsApp and Kaizala. Kaizala is a chat app for work, supporting the usual chat functionality of one-to-one and group messages of text, photos, documents and videos. The Kaizala app has additional functionality to support work including polls, surveys and geotagged photos, as well as a dashboard through which administrators can create hierarchical groups, manage permissions, etc.

Our findings describe how chat groups were used in everyday work, with a focus on core communication concerns including knowledge-sharing and coordination work. Moreover, by focusing not just on what goes on in chat, but also on the wider minutiae of everyday work, we examine how well chat fulfils the organisational dream of more direct communication and greater awareness between fieldworkers and HQ, as well as between fieldworkers. We found that rather than transforming organisational communication and bypassing hierarchy, chat was made at home in [54] the existing organisational structure and work practices. Whilst not transformative, chat was however moderately successful in creating more direct communication and greater awareness between staff. Our contribution is twofold: First, we illuminate the little-studied, but increasingly important phenomenon of chat as a workplace tool in the Global South; Second, we provide insight into where and how chat might best fit into an organisation's communication ecosystem.

2 RELATED WORK

Chat apps are lightweight messaging applications typically targeting mobile phones. Exploiting the widespread adoption of smartphones, today's chat apps enable increasingly sophisticated interactions. They transform basic text-based mobile messaging into a rich interactive multimedia communication platform on which text, audio, photos, video and geolocation may be captured, edited, exchanged and archived. The focus of this paper is on chat at work and we set the scene by reviewing studies of workplace communication in the Global North, before describing technology and chat app adoption in the Global South.

Communication at Work in the Global North

Workplace communication has been extensively studied in Human Computer Interaction (HCI) and Computer Supported Co-operative Work (CSCW) in part because of the widespread adoption of communication technologies, from email to instant messenger. Like email before it, chat apps offer the promise of improved organisational productivity, even a better quality of life [55]; Sproull and Kiesler characterised the benefits of email as reduced effort required in coordinating groups for task assignment and reporting, and potential democratisation of organisational information and reduction in hierarchy. Yet, even then they warned of associated risks in distributed electronic communication in networked organisations: information overload and the pitfalls of misinformation contagion inherent in communicating rapidly with wider groups of recipients. They called for practical guidelines and techniques for filtering, archiving and indexing email content.

With the advent of PC-based messaging platforms, Churchill and Bly [14], concluded that such platforms provide an adjunct to existing communication tools, based upon; 1) messaging's simple lightweight nature, 2) work practices amenable to its introduction, 3) the organisational context. More recently, looking at software teams, Slack use was categorised into three purposes: personal networking and fun; team collaboration and communications; engaging with communities of practice and special interest groups [32]. In one tech firm case-study [47], Quan-Haase et al., refer to the "social transluscence of technology", suggesting work tools should support social processes, to enhance collaboration [20]. They claim chat groups at work, may provide 'social distance' for workers and management alike–meaning interaction up and down the organisational hierarchy is made easier by chat because of the absence of hierarchical social cues in the chat groups. While the lack of cues in computer-mediated communication is often thought to inhibit interaction, here it is perceived positively and used strategically, reminiscent of different approaches to mitigating the effects of hierarchy, such as 'management by wandering around' [8]. On the flip side, some workers may feel uncomfortable discussing work in such a persistent and public format, and even experience surveillance at work [12, 34].

Mak and Chui [35] propose using text-based communications channels as a resource for new employees to review and learn about an organisation's culture. Further, chat apps offer positive implications for teamwork [29]: non-work-related activities like sharing personal pictures via chat can increase trust amongst unfamiliar remote collaborators [61]. Choi et al. advocate social media networks for augmenting cooperation in the workplace [11]. Although, Peyton et al.,

[45] warn against the risk of overstating the need for social sharing with strangers.

Increasingly, communication channels are not being replaced, rather users adopt more, adding to their 'surrounding communication ecology' [21, 60]. A diverse set of interfaces will suit diverse user needs and whilst communication technology adoption is often initially driven by one explicit purpose, long-term use is influenced by the technology's ability to support more complex task requirements [60]. User perception of messaging services further influences adoption, and Church et al. [13] found popularity of WhatsApp was driven by lower cost and enhanced social interaction, while SMS was still perceived as more reliable and privacy-preserving.

Workplace communication ecosystems may seem to develop in ad hoc ways. Yet, as Bødker et al. have noted [6], while these artefact ecologies are somewhat messy and complex, they are productive, being used as they are across overlapping groups of usage, activity and technology in the course of everyday work. Nouwens and Klokmose [41] call for further empirical exploration of the 'application-centric computing paradigm' in non-standard knowledge-work, to reveal what determines use of particular applications in the midst of apps of similar functionality; noting the influence of the broader communication ecosystem, including different media, tasks and people, which may influence channel choices.

Chat App Use in Specific Domains

While less studied in the everyday workplace, chat app use within specific domains such as healthcare [10, 17, 26, 28, 37, 39, 40, 49, 58, 62], education [1, 9, 48, 63, 64, 66] and even online news gathering and consumption [3, 30, 33, 36] is becoming an established site for research. WhatsApp's low cost, widespread use, availability and perceived security, has motivated use [28]. Studies highlight aspects which appear to have facilitated rapid adoption: Johnston et al. [26]found the communications in the group chat of emergency surgical teams to be less hierarchical. Clinical information documented in the chatstreams of mixed teams, including senior and junior practitioners, provided teaching and learning opportunities, and auditable records. In clinical decision-making and patient care, [26] chat apps allow healthworkers to maintain awareness of information. Further, the ease and high quality of photography in chat apps, supported the strong visual aspect of diagnosis recall for healthworkers [26]. Another important benefit of chat apps in the clinical setting was reduced interruption from synchronous communication like voice calls and pagers. Thus chat apps are adopted by the medical domain as an adjunct to existing communication channels [21]. WhatsApp is found to improve patient care whilst preserving their privacy [10, 40]. In contrast, concerns are raised over privacy, data stewardship and security [37]with scant attention to patient confidentiality, consent and data security, resulting in a growing need for guidelines for WhatsApp use in the medical domain. More generally, in workplace collaboration, a group chatstream becomes a repository for conversations between colleagues resulting in user-generated information relating to shared communities of practice–potentially accessible for the purpose of ongoing digital learning [63].

Technology Access in the Global South

Despite huge increases in mobile phone coverage and internet penetration in India and Africa, costs of access, lack of high speeds and sometimes electricity prevent access anytime anywhere [19], meaning the "vast grey area between the haves and have nots" [46] remains. There has been little research on the ways this shapes workers' technology use since Wyche et al. [65] described constraints on professionals living and working in Nairobi, Kenya. Indeed, while mobile devices have made the Internet more widely available to those on low incomes Donner argues [16] that "it may not be the same Internet". While not focusing on mobile workers per se, an extensive diary study in South Africa by de Lanerolle et al. [15] of people who access the internet primarily by mobile phone provides insights into the fragility of connections and the frugality of the mobile practices of under-connected people in the Global South. For instance, diarists described many strategies to minimise the costs of their connectivity, and manage their cash flows, from leaving their data connections off except to check messages to restricting communications to close social networks. They rarely explore the broader landscapes of the World Wide Web to search for information or visit national news sites.

Chat Apps in the Global South

Chat apps have become immensely popular across the Global South, because of their ability to work on low-speed intermittent connectivity. Roongta [53] lists three factors making chat app technology the most suitable platform for online learning in rural areas: existing knowledge of the apps; the informal nature of interactions; and continued personal use of the apps beyond learning. Furthermore, given access to a data network and a device, digital learning via mobile devices can reduce the barrier to access to learning materials. Chat app platforms can thus encourage those who may otherwise be excluded in traditional classroom settings, to pursue skills and training in a way that they can manage [1, 48]. Sending and receiving photos and video within the chat application broadens the learning potential for varying degrees of literacy–pertinent for an audience with variable literacy and multiple languages [9, 31]. Indeed O'Neill et

al. [43]found WhatsApp enabled low text-literate people to participate in group interactions by sharing good morning greetings and memes, reminiscent of Rangeswamy's findings on Facebook [51].

Perhaps unsurprisingly the widespread popularity of chat apps meant their adoption into the workplace too. This widespread trend has been observed in passing [43] and popular media. However, it is only just beginning to be the focus of academic investigation. For example, Bidwell et al. [5] describe how WhatsApp both contributed to, and performed awareness amongst a team of technologists during distributed and co-located work. They applied Ingold's concept of 'inhabiting' [25] to bring to the fore the ways people create shared meanings as they go along together on collaborative and related tasks.

3 METHOD

We conducted an ethnographic study [22, 42, 52] of six large organisations (see Setting) who had adopted Kaizala, a new chat app for work. The observations and interviews were designed to encompass the whole communication ecosystem of each organization including Kaizala, WhatsApp, SMS, email, mobile phones and face-to-face meetings. We investigated each organisation in varying levels of depth over the course of six months from December 2017 to May 2018. The most in-depth fieldwork was conducted with two of the six organisations–GovernmentOrg and PrivateBank, India, where we observed HQ staff, fieldworkers and their managers as they undertook their normal work, both in the office and on-the-road. At any time two to three of the five authors were out in the field, working individually or in pairs. At both organisations we conducted initial interviews with senior managers, then shadowed staff in various roles, where we examined in detail their communication practices, with a focus on the messages sent and the situated use of both Kaizala and WhatsApp. With GovernmentOrg we spent 24 days in the field, observing staff in HQ and fieldworkers in 12 mandals. As well as shadowing individuals as they went about their work, we conducted broader observations of mandal offices and many meetings. In addition, we conducted 20 semi-structured interviews. With the exception of some HQ staff and senior management, who were comfortable in English, all of the interviews and observations were conducted in Telugu, the local language. The third author is a fluent Telugu and Kannada speaker. At PrivateBank, India, we conducted seven person days of field work, covering HQ, branches and urban fieldworkers (Mumbai) and rural inclusive banking fieldworkers (Karnataka). We conducted 19 semi-structured interviews with bank personnel. All, apart from one (in Hindi) of the interviews and observations were in English, as that is the language of work in the bank.

Data collected consisted of field notes, audio and video recordings (of interviews and observations) and photographs of the setting and relevant artefacts, especially emails, chat and SMS messages. The field notes were written up, the audio transcribed, translated and shared amongst the team.

For the remaining four organisations, we conducted semi-structured interviews in English, which all interviewees were comfortable with, with key personnel regarding their experience with Kaizala. These interviews took place after the fieldwork observations at GovernmentOrg and PrivateBank, India. We interviewed three managers in-person in PublicBank's datacenter in Mumbai. Whilst we saw some messages, we were not able to take photos or audio-recordings. We conducted Skype interviews with one member of HQ staff in Kenya for each of the final three organisations. We recorded and transcribed these interviews. These interviews provided complementary data to the fieldwork, giving us a wider understanding of organisational chat use.

Our analysis took a broadly ethnomethodologial perspective. Ethnomethodological ethnographies explicate the knowledgeable, artful ways in which participants organise their practice and reveal the ways in which technologies and other artefacts are used as part of the accomplishment of that practice [7, 50]. The data was analysed in group sessions and individually, with the team then coming together to discuss and develop the individual analysis, and also in ad hoc sessions with two or three authors explicating a particular topic, as is typical of the ethnomethodological approach. As well as analysing field notes, all authors reviewed each chat thread recorded together to examine, in detail, the work being done within each chat group. These group analytic sessions allowed interesting topics to be identified, and endogenous themes to develop out of the data itself: such as the work done in chat to provide accountability and awareness in collaborative work.

4 SETTING

Kaizala was launched in 2016. It is a mobile chat app for work, designed in and for the Global South. It supports 1-1 and group chat, media and document sharing. It comes with customisable tools for polls, surveys, and announcements as well as geo-tagged photographs and various administrative tools. Kaizala supports large groups (>500 members), as well as user and group permissions, such as group creation by hierarchy. The app was piloted in several organisations in India and Kenya and is now available in 28 countries across the Global South.

Although our focus was on Kaizala, we examine both Kaizala and WhatsApp usage. Whilst Kaizala had been organisationally-mandated in each organisation, WhatsApp had already been appropriated by many workers. Organisations were concerned about the security and appropriateness of WhatsApp

as an organisational tool and adopted Kaizala as part of their IT strategy. Nonetheless WhatsApp remained in use to a greater or lesser extent.

Organisations

We use pseudonyms for the organisations in India for anonymity and, with permission, the actual names of the organisations in Kenya.

(1) GovernmentOrg is an autonomous organisation working closely with the government of the Indian state of Andhra Pradesh, to implement and monitor a range of community driven projects to reduce rural poverty. It has around 125 staff in central HQ, >5,000 field staff plus many more village-level volunteers. It has around 4,500 Kaizala users and 30-40 active chat groups. GovernmentOrg implements and monitors projects at village level across the vast state, and is a highly structured, hierarchical organisation.
(2) PrivateBank is a retail bank in India with 440 branches and 20,000 employees of whom approx. 6,700 used Kaizala, in 150 active chat groups. As well as its core business, PrivateBank has an inclusive banking business aimed at building financial inclusion in rural areas.
(3) PublicBank is a state bank in India with 24,000 branches and 278,000 employees. At time of study, Kaizala was being piloted from the datacentre in Mumbai and had approximately 1,700 users and 10 chat groups.
(4) M-Kopa provide solar energy systems for off-the-grid households, who purchase the equipment over the course of one year. M-Kopa has a 20-person HQ in Nairobi, Kenya, approx. 100 regional managers and a network of 1,200 sales staff, across rural Kenya, Tanzania and Uganda. They adopted Kaizala in July 2017 and had approx. 900 users.
(5) Mawingu Networks use wireless technology and solar power to deliver affordable internet access in rural areas of Kenya, serving 5-600 merchants and approx. 78,000 end users. At time of interview, they had been using Kaizala for three months with their 40 full time staff (HQ and technicians), 30 sales 'commandos' and their network of merchants. They had 3-4 active chat groups.
(6) Well Told Story run a youth empowerment comic operating in Kenya and Tanzania, with over a million readers. They had just adopted Kaizala when we spoke to them and we discussed their plans to use Kaizala first with their 3,000 distributors and later their customers.

5 FINDINGS

We examined the communication ecosystem in each of the six organisations. Whilst workers (both management and fieldworkers) had already appropriated WhatsApp for work communication, Kaizala was introduced by HQ as part of their communication strategy. They hoped to use chat to foster more direct communication and greater knowledge-sharing between fieldworkers, and between fieldworkers and HQ.

Each organisation had multiple work-based chat groups, each having a set of members (and permissions for Kaizala), and a chat stream for messages and content. Surprisingly only a small amount of the chat stream observed involved what we might commonly think of as chat involving conversational turns. Instead different chat groups were characterised by different content and interaction patterns, fulfilling different organisational functions. Broadly, there were two types of groups: 1) a number of *non-conversational groups*, consisting of groups that were *non-conversational by design*, meaning they used Kaizala features to structure channels and restrict who can post, and *open non-conversational* groups where anyone could post but nonetheless conversational turns did not typically occur; and 2) a much smaller number of *conversational groups*, characterized by turns of interaction.

Non-Conversational Groups – By Design

Kaizala functionality enables group admins to create groups in which only restricted parties are allowed to post content. For example, only assigned personnel can post in the chat stream in GovernmentOrgs "CEO Broadcast" and Mawingu Networks "Merchants Group". Recipients can respond only to structured content, e.g. surveys or polls, or reply to or like individual posts in nested replies that are not shown in the main chat stream Figure 1(left). Most organisations had some sort of broadcast group intended to communicate en-masse to staff to create awareness of new organisational policies, tasks to be completed, upcoming training and so on. For example, four personnel from HQ were authorised to post to the CEO Broadcast group in GovernmentOrg, which all approx. 4,500 staff on Kaizala were members of. CEO Broadcast was used to disseminate information on organizational processes and documentation relevant for fieldworkers, such as circulars on agricultural policy. It was also used to collect information from the field through polls and surveys. In contrast, Mawingu Networks used the broadcast functionality to create a Merchants Group to post announcements and other information for their merchant network. Merchants were not employees of Mawingu and whilst the group enabled merchants to send questions or complaints to Mawingu, these

were only visible to the group admins (Mawingu employees), rather than to the whole group. They had previously had a WhatsApp group for merchants, but because everyone could see all messages, Mawingu were concerned that complaints became exaggerated because other merchants saw https://www.overleaf.com/project/5c310ae41f875638c74a9f2fthem and joined in, making the 'situation seem bigger' as a Mawingu manager explained. They therefore created the Kaizala group to deliberately stifle conversation and restrict awareness *between* merchants. We now discuss the different types of work being done in the "non-conversational by design groups".

Information Dissemination and Work Allocation. Chat streams routinely contained detailed organisational information, such as user manuals, product information, details of new incentive schemes, news reports, templates and task documentation, such as processing a death certificate in CEO Broadcast, GovernmentOrg, Figure 1(left). Other posts directed workers to do various tasks such as renewing their contacts (CEO Broadcast, GovernmentOrg). As well as disseminating necessary documentation, organisations sought to raise workers' awareness about various organisational matters from process changes to tasks to be done. However, framed in a top-down broadcast channel, this produced *ambiguity about the upwards flow of information.* The workers in PrivateBank, for example, received a message requesting they update their Kaizala app. It elicited seven likes and five queries by workers who were unable to get the application to work properly Figure 1(right). This shows that at least some of the fieldworkers had attended to the post, but it is unclear whether the poster even monitored their comments as they did not receive any replies. If these requests for help had appeared within the sequence of the chat steam, they would have been more clearly visible and likely have received more attention (see Conversational Groups below).

To encourage action and ensure awareness, messages were often sent multiple times through multiple channels, and hierarchy was invoked to elicit responses to important tasks. Sometimes managers made use of the 'public' nature of broadcasting to a group. For example, not averse to naming and shaming, the training manager announced in CEO Broadcast the names of districts that had not yet nominated villagers for an award. Combining *visibility in the group* with hierarchy meant his nudge to action was not just a concern between HQ and the fieldworkers concerned but had moral implications for those highlighted.

Whilst HQ sought to use chat streams to communicate directly with, and create awareness amongst, fieldworkers, this did not mean that workers actually attended to it. Instead, work often cascaded down the hierarchy in the traditional manner. For example, during an in-situ interview, a GovernmentOrg fieldworker scanned past a message "renewal of

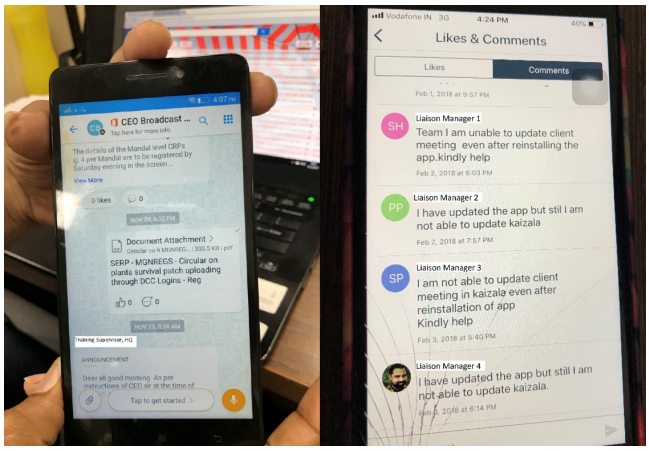

Figure 1: Left: information-sharing in CEO Broadcast, GovernmentOrg. Right: Replies to request from HQ to update Kaizala, GovernmentOrg

contract agreement for FTEs" as he showed us his Kaizala messages Figure 2(left). When asked, he could not clearly articulate what it was about, and said he did not think it was for him and would not take any action on it. In fact, he only attends to messages he knows are important because his manager tells him, or colleagues talk about them. In fact, the renewal of contract message was important, as staff would not get their five-year contracts renewed without completing the form. The next day we saw his manager urging staff to complete the form, by printing it from email and helping them fill it in. As this task was time-sensitive and important it was conveyed through multiple channels, including chat, email, and in management's regular teleconference, and was passed down the hierarchy from HQ to district-level and then to mandal-level managers. Thus, although all received it through Kaizala *it did not become actionable* by fieldworkers until directed by their manager. Thus, chat does not always perform its function as HQ's direct channel with fieldworkers, who continued to rely on people to identify what is relevant to them. Messages in the chat stream are *undifferentiated* meaning the *relevance and urgency* of posts in these large broadcast groups are indistinguishable, meaning fieldworkers must work out themselves what is important for them.

Information Gathering. The same broadcast channels were often used for efficiently gathering organisation-wide insight, since Kaizala provides several tools to quickly elicit information from fieldworkers. All six organisations used and valued the polls and surveys to informally take the organisations pulse and engage employees. Management hoped polls would make organisations participatory, although sometimes

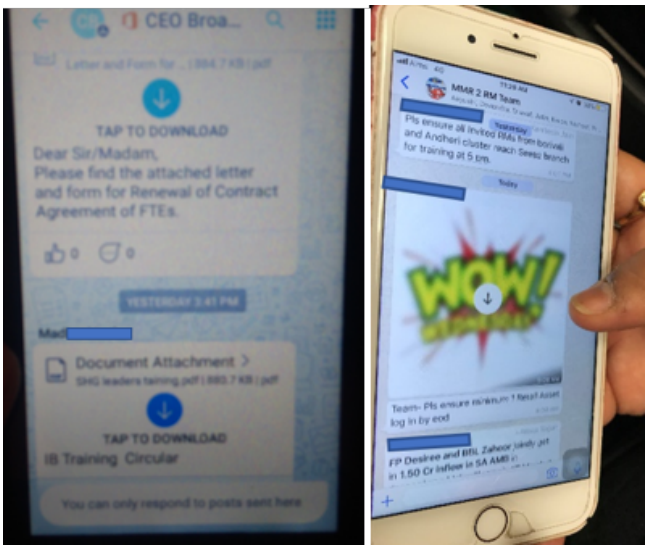

Figure 2: Left: Contract renewal message, GovernmentOrg. Right: Non-conversational open group in PrivateBank WhatsApp

appearances mattered more. For example, GovernmentOrg sought to get feedback on a new organisation logo but, when asked which logo would be chosen when the poll closed, the admin officer said "*I don't know, it's the CEO's choice. I just want everybody to be …I wanted to be democratic*". Other times real-time insight was sought to help decision making. The M-Kopa sales director explained *"We've definitely at the start of a two-hour meeting had a question. Just posted a poll, and halfway through the meeting had an answer to a question we were kind of debating. In that way, it's just been wonderful for us to get direct access to our staff"*.

In addition, to providing management with some awareness of what is happening in the field, Kaizala's surveys were used by most organisations for gathering information as part of business processes or *reporting*. For example, GovernmentOrg received over 5,000 responses to a survey to nominate a village, linked to performance-based incentives 3,500 responded to Kaizala messages and 1500 came from email. The Kaizala responses feed directly into Excel sheets. PrivateBank used surveys extensively to elicit daily and monthly reports on customer visits. In-the-field, the inclusive banking team used Kaizala surveys for document checks and so on, which served not just as reporting but also as checklists. Kaizala provided a simple mobile way to complete various reporting activities, when and where the work was being done, outside of the office and corporate network, and by sales staff who often did not have laptops. M-Kopa fieldworkers, used a wide selection of tools for lightweight reporting on their sales activities, often undertaken in small 'TV Parties' where neighbours were invited to visit a solar powered house, and refreshments were provided. Fieldworkers took photographs of guest lists and receipts and geo-located photos of attendees to get reimbursed.

However, reporting through surveys is one-sided, in that the reporting data is only visible to managers in HQ not the individual or teams of fieldworkers. Since this information is pertinent to performance-related pay, fieldworkers often need to share this same information with team leads and colleagues. For example, in PrivateBank, workers shared details of the performance in 1-1 messages with their team lead, who summarized the whole team's performance each day in a team WhatsApp group. Thus, resulting in double work for the fieldworkers, in what Nouwens and Klokmose [41] describe as the everyday costs that "workers face in this anachronistic application model". The organisations themselves were aware of, and wished to reduce these costs and both PrivateBank and M-Kopa wished to share relevant summaries of reported information with their fieldworkers.

Whilst broadcast groups, and the various tools for information gathering in Kaizala, are useful for more direct communication between HQ and fieldworkers both down and up the hierarchy, the use of broadcast channels neither replaces nor fully supports local practices of information-sharing, which continue around these channels.

Non-Conversational Open Groups

Most non-broadcast groups in WhatsApp and Kaizala were also characterised by streams of individual posts, such as (geotagged) photos, announcements, 'action requests' and documents, but little discussion. Some functioned like the broadcast groups in Kaizala, with top-down information flows at regional or team level. These groups usually had a *clear audience and organisational purpose*. For example, in PrivateBank, updating specific banking teams on products and promotions, to share with customers, or the WhatsApp groups in which the team lead shared team performance (above) contained only those updates. Whilst not containing discussion, non-conversational groups could still be *participatory*. For example, in GovernmentOrg staff posted a series of photos of offices and toilet facilities in various regional groups after the CEO asked about the poor state of mandals' facilities. Whilst the CEO initially posted in CEO Broadcast, since they could not reply in that restricted channel, staff used various non-broadcast groups to respond. The request, and its responses, served to create awareness between central, district and mandal managers, and prompted action to clean the facilities.

However, the audience for these bottom-up posts in open groups is not always clear. For example, many groups in GovernmentOrg comprised long streams of fieldworkers 'checking in' by posting about on-going work, often including geotagged photos with messages, captioned photos or

just messages. However, district managers do not systematically check such streams, and fieldworkers coordinate at mandal level by meeting in the office each morning. These groups may create shared awareness across fieldworkers; indeed, when one fieldworker posted this seemed to prompt others to do so. However, not all fieldworkers looked favorably on such activity by their colleagues, making disparaging remarks about colleagues who posted frequently or the number of 'useless' messages in the chat stream. Further, such streams quickly clog up low-end phones and fieldworkers were inclined to uninstall Kaizala, as described by one: "Every 10 days I uninstall and install the app. The reason is too many photos come in and the groups get full".

Conversational Groups

Of the chat groups we observed in India, only a very few contained much conversation. These groups came about when fieldworkers needed to interact with HQ, or to know what others were doing to get work done. All three Indian organisations were characterized by a central HQ and highly distributed fieldworkers who were managed locally. However, some teams required regular interaction with HQ, and chat provided an easy shared space to work together despite being remote and often never having met in person. Conversational groups included: 1) PrivateBank's "Non-Resident Indian (NRI) Sales Team" group which shared updates from HQ to relationship managers (RMs) who managed the accounts of Indians living abroad. In this group RMs often asked questions about these updates and supported new RMs; 2) GovernmentOrg's active Kaizala and WhatsApp pensions group for supporting the vast logistical and communication task of pensions distribution, monitoring and technical troubleshooting across the state; 3) PublicBanks Bank Support Chat group (BSC), a technical troubleshooting group, set up during a massive overhaul of the banks servers. It received around 100 messages a day from different bank branch staff about urgent technical problems.

Maintaining Awareness of Ongoing Activities. Chat is useful for maintaining awareness of ongoing activities because detailed documentation and reports can be shared, along with short messages about what to attend to; precise figures can be communicated and the one-to-many nature of group chat helps to create a lightweight shared awareness of what is going on, both in the field and at HQ. For example, PublicBank's troubleshooting chat group, Bank Support Chat (BSC), enabled HQ to learn about urgent technical incidents which needed addressing, providing a more direct route to recourse and more effective support of time-critical issues than the organisations' official workflow system for reporting technical troubles. Chat enables more *direct and interactive* contact between branch staff and the technical support team than the workflow system. Further, photos of error messages and other critical artefacts can be shared easily. Since this chat group lacked the structure provided by the workflow system, branch staff often did not enter all the information required by the technical team to resolve the problem. Nonetheless, this ad hoc intervention, provided immense value to both the back office and the customer-facing arms of PublicBank, enabling them to *work-around the formal, and rigid, workflow system.* This is reminiscent of public administration [43], where co-located call-centre and back-office staff worked around formal processes to provide a more efficient service.

The pensions chat groups in GovernmentOrg also helped HQ and fieldworkers stay in touch with each others activities during pension distribution. GovernmentOrg monitors the distribution of approx. 4,500,000 cash pensions in 13 administrative districts of Andhra Pradesh and tracks distribution status in real-time using biometric authentication. Monitoring distribution requires coordination between a team of five staff in HQ, who could see the bigger picture of distribution around the State, and 52 Assistant Project Officers (APO) in the field who monitor the work of approx. 16,000 Pension Distribution Officers (PDO), and are aware of the state of play on the ground.

Chat is used to *mediate* between distribution targets, live pension distribution numbers, and what distribution looks like on the ground. HQ received a variety of reports and other information on the status of distribution across Andhra Pradesh from vendors. They would receive these by email and then share critical information and progress updates with the field. To ensure maximum reach, HQ sent many messages to both the Kaizala and WhatsApp groups. These included routine progress updates, shared at similar times each month. Fieldworkers also posted frequently, keeping HQ (and their colleagues) aware of progress on the ground. Fieldworkers messages included photos of pension disbursements, and up-dates on the human, resource and technical problems they faced, such as pensioners not turning up, lack of cash and broken scanners. Although HQ have not met most APOs, nor worked in the field themselves, they have an idea of the *rhythms of each others work*, from the familiarity of month-on-month pensions distributions, and what types of information is sent out when. HQ use chat to both give fieldworkers an overview of how things are going in their area and to gain insight into what is happening on-the-ground, and what might be causing discrepancies in the numbers they see in their reports. The routine-ness of the 'normal, natural troubles' [59, pp109–127], of monthly pension distribution meant not asking 'why have you not done this' or 'why is this like this' but instead putting up the numbers and saying "this is where we are, please concentrate on x" where x means resolving the problem. As the pensions director said, *"According to me it's already been one hour and*

my expectation is that within an hour 100 pensions will be disbursed. But I can only see two. This is because they have spent half the day in the bank waiting to get the cash sorted." Thus, chat is used to make sense of the numbers, which cannot in themselves communicate the complexity of pension distribution occuring on-the-ground.

Chat in the Office. In these groups, chat is used as much by office-based workers supporting distributed fieldworkers, as by fieldworkers on the move. An advantage of chat is it enabled office staff to get on with their on-going work, whilst keeping an eye on what is happening in the field. Members of HQ actively monitored the chat stream during the six-day pension's disbursement period. Whilst checking for and reading messages certainly requires some attention, monitoring the chat stream is less intrusive than receiving phone calls [28]. For example, during our observations the biometric scanners were not functioning across the state. Had every fieldworker with a scanner problem phoned in, it would have disrupted the entire pensions team. With chat, the messages can be monitored in between other work, and fieldworkers can be quickly updated on problem status – both what their colleagues are experiencing and HQ's response. Unlike non-conversational groups, fieldworkers also can see in the chat stream *that the groups are actively monitored:* this was chat with a clear purpose and audience. Chat also served as a convenient back channel. For example, the scanner supplier was in a meeting when the pensions officer phoned, so requested (by chat) he message him instead. In doing so he was able to collect important information whilst otherwise occupied *and* attend to the urgency of the problem, despite being otherwise engaged.

Teamwork. Phones were often shared as part of collaboration, with chat woven into supporting particular tasks. In PublicBank, the BSC team coordinated their work locally, picking up new jobs coming into chat according to who was available at that time. The HQ pensions team often worked interchangeably: using a group email address and phone line. As the pensions director said *"Anyone from our four-member team can attend to the call . . . Whatever information I have the other three will also have the same information. That's how we have built it"*. Each had an individual chat account, yet they often shared phones, using one phone for WhatsApp, and another for Kaizala. At other times, they posted consecutive messages using their own phones and accounts. In Figure 3left-hand image, K, in the back-office pensions team posts a message regarding 'Not commenced GPs', then R qualifies K's message by stating that the above Excel sheet pertains to 'Not commenced GPs up until 12 noon'. Next, the program officer sends a related message instructing fieldworkers to focus on updating pensioners' contact details. Each complementary turn works to ensure that information

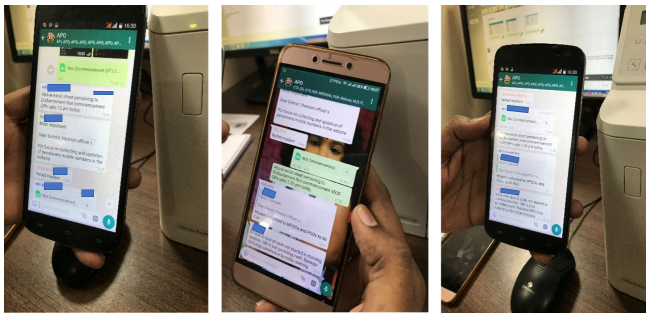

Figure 3: Messages shared on WhatsApp APO group, which the back-office Pension Team at GovernmentOrg use to contact district Area Project Officers re monthly pension disbursement

is consistent and transparent for the fieldworkers. Viewable together, the sequence is both easier to access than three consecutive emails referring to previous information, and it provides immediate consistency that ensures the message from the team to the field is correct. The open unstructured nature of the chat platform enables more transparent communication than email, and the shared space of chat is supported by, and supports, the local coordination. Teamwork is therefore performed in and around the chat stream, through local coordination, building on each others messages but also sharing devices. Despite having individual chat accounts, because HQ operates as a team, in effect it does not matter if one member of HQ posts from their colleague's account and the chat tools become artfully integrated into the ongoing work of the team.

Whilst many studies talk about the benefits of social communication at work and how messaging enhances it [11, 29, 61] we saw relatively little in either WhatsApp or Kaizala. PublicBank had an active social group where we saw occasional work-related jokes, or birthdays and leaving celebrations. These tended to be confined to flat groups where members were co-workers and the boss was not present, countering the idea that chat groups are inherently less hierarchical [47]. Whilst chat may, in this way, contribute to team spirit, outside of PublicBanks social group, work-related messages were far more prevalent.

Sharing Timely Information. Chat was a convenient, lightweight way to share timely information, for example, between many highly-distributed people working on pensions distribution in GovernmentOrg; bank branches and HQ in BSC in PublicBank; or HQ and their merchants or distributors in Mawingu Networks and Well Told Story. The immediacy of chat is not always key, since it can be scanned later. For example, in both pensions and NRI-Sales, the exact moment of sending is generally not important for doing the job but

its general timing must fit in with work's rhythms. Information in these groups are time critical by the hour or day, not the minute or second. HQ provides information to the field as it becomes relevant, they decide what should go out when. Fieldworkers may respond, or report troubles of their own, with confidence that these groups are being actively monitored and someone will pick up the message soon.

Co-ordination Work and Chat. Use of chat for coordination work tended to be limited to routine work such as in PrivateBank where client details are passed on for others to follow up. Just as task assignment in Broadcast Groups was human-mediated, for complex coordination work, the fall back was coordination through the hierarchy and locally. That is, talk (face-to-face meetings and phone calls) was preferred for the vast majority of coordination work on the ground. Fieldworkers met local colleagues and managers daily in GovernmentOrg, PrivateBank and PublicBank and weekly in M-Kopa. As one mandal manager in GovernmentOrg said, *"I don't need to use Kaizala to talk to my fieldworkers, we meet every morning at the office"*. Another explained how he preferred talk because that way he ensured the message had got across. This is partly a question of language as it is harder to type in Telugu, but it is also just easier to do more complicated coordination work verbally, and being face-to-face enables rapid often seamless coordination because of the moment-by-moment awareness of ongoing activities. Whilst chat provides some level of shared awareness, it is far from recreating face-to-face environments, where coordination is often seamless because a colleague's actions are locally available for inspection, without explicit communication. The chat apps provided an adjunct to existing channels of communication; a means of sharing or requesting information quickly, as well as focused conversation within teams on known work-related tasks and topics. However, more complex work required follow up to ensure clarity and comprehension of specific details.

6 DISCUSSION

Examining the *interplay of local practice and chat*, helps us to understand the role of chat in large organisations. We highlight types of groups not typically discussed in research about chat, but actually found to be more prevalent (in both WhatsApp and Kaizala) in the organisations we studied: ones where there is little conversation. Echoing previous research [4, 18, 23, 24, 56, 57], where remote interaction is needed to get the work done, chat is a powerful addition to the communication ecosystem. Chat groups become valuable shared spaces; enabling monitoring with less disruption [28] for office staff; mobile and to-hand for fieldworkers. Awareness is created in-and-through the content shared and when supporting routinised activities, like pensions, creates familiarity with the rhythms of others' work. As Petterson et al. notes about landing strips used in air traffic control, the *materiality of the chat stream*, as a collection of content types viewable at-a-glance, provides a publicly available "representation of both the current and the prospective state of play" [44]. However, overall, chat's promise of more direct communication and greater awareness was only moderately successful. We discuss why, by examining the *tension between organisational communication strategy and local communication practice*. We finish by highlighting some particularities of chat in the Global South

Stitching Together an Organisation and its Fieldworkers

From the perspective of management and administrative leads, one of the most alluring aspects of chat is the opportunity for more direct information-sharing. Indeed, organisations were keen to use Kaizala's broadcast functionality in direct-to-worker communication strategies. Yet, chat did not transform organisational communication and, typically, workers relied on established local practices of knowledge-sharing and coordination work. That is, chat was 'made at home in the world' [54] in each organisation's existing practices, shaped by the hierarchy and division of labour. To understand why, we examine how the characteristics of chat fit with various organisational parties' orientations, in doing so we see that organisations and workers have different perspectives on what is important. Organisations are concerned with how to get company information such as policies, work documentation out to fieldworkers, and to gather information back from them. By contrast, workers are concerned with getting the information they require to do their job, with as little effort as possible. Workers certainly need to know about changes in processes and new documentation, but getting, grasping and remembering this is *extra work* that sits outside of the doing of their day-to-day work. The organisational dilemma lies in aligning these perspectives or at minimum in communicating to each person what they need to know to follow due process and procedure. On the surface, chat seems like a great way to do this: providing a direct channel to workers wherever they are and sharing all sorts of content in a lightweight way. Yet each layer of hierarchy that chat attempts to bypass, is doing vital communication work. Managers at each level *filter, curate and customize information* given the context of their part of organisation and the ongoing stream of work, as a routine part of passing it on. Moving to chat alone means losing this work, furthermore, chat streams consist of an *undifferentiated, time-based stream of everything posted*. Fieldworkers, the base of this hierarchy, are unable to easily locate what is important to them in the chat and so continue to look locally. Meaning chat ends up

as more of a *medium of distribution* than communication, especially in company-wide groups.

Chat can be more helpful, when information is *timely* and *pertinent to ongoing work*. For example, compare the new death certification process posted by GovernmentOrg in CEO Broadcast, to customer event and product releases posted to team groups in PrivateBank. For the former, a fieldworker might not encounter a death for weeks by which time they are unlikely to remember or find the post, not to mention most likely having uninstalled and reinstalled Kaizala to clear their cache. The latter are useful in the doing of today's work and should be communicated to clients. Additionally, these PrivateBank groups were smaller, team-based groups and therefore the information had *already been curated* for that team, thus was more directly relevant.

The extra functionality in Kaizala, especially surveys and polls, enabled it to effectively bypass the hierarchy in bringing information from the field to HQ, from capturing the pulse of the organisation to reporting. For example, polls enabled HQ to get rapid responses to questions to inform decision making in a way that was impossible before. It is the *structure* provided by polls and surveys that makes them powerful, rather than a series of unstructured replies in chat. However, on the downside, HQ only hears about what they ask about, in the way they ask about it.

Chat in the Global South

Of the organisations we investigated most deeply, GovernmentOrg operates in the most resource-constrained settings, so it is worth examining the ways in which chat is accessible to people across languages and literacies. In GovernmentOrg, we saw communication cascading down and outwards from the top, with messages sent in English or Telugu. Communication typically started digitally at the top, in chat or email, reaching mandal level in digital form. Typically, from this point messages are passed verbally – through phone calls, face-to-face, or in the large meetings that characterise GovernmentOrg's on-the-ground communication strategy. Verbal communication is much preferred for longer interactional turns and judging comprehension. As already proposed [9, 31, 43, 51] photo functionality can enable people with different literacies and languages to partake in chat and a few village volunteers used it despite low print literacy. However, more complex non-visual information is not easy to convey in photos, and so field staff turn to verbal rather than textual communication to get the message across.

Whilst too much information can be a problem anywhere [55], this was compounded by the range of mobile phones used by fieldworkers. Avoiding 'overload' requires a sensitivity not only to small screen size, but also to issues of accumulating too much stuff on cheap phones, and work stuff cluttering up personal phones. Active chat groups produce quantities of data, including many photos, overwhelming both workers and their phones. We could call it a *chat data deluge*, and in response workers uninstall and reinstall, delete, or do not open the app for days on end. In India we did not see the same patterns reported in [15, 19, 65] because of cheaper mobile internet plans approx. 150 Rs a month (2 USD) for 1 GB of data *per day*) and handsets. GovernmentOrg had a major drive, about a year before, that encouraged all fieldworkers to buy smartphones and provided SIM cards and data. Problems arose from lack of mobile internet coverage in places and the low-end phones getting clogged up. However, in Kenya, data usage, and indeed smartphone penetration, were more of an issue.

Finally, observations in Namibia and Uganda (new and unpublished) show that micro and very small enterprises (such as electronic repair shops, dressmakers and home "handymen") depend on WhatsApp in business-to-business and business-to-customer communications. Uses include ordering, invoicing, sharing information amongst many small businesses across countries, and marketing to customers. These diverse uses have emerged within local patterns of work and extended geographically at the bottom and across. This contrasts with the cases we observed, which by and large recreated and reinforced existing hierarchies. Unlike Johnston et al.[26]and Quan-Haase et al. [47] our study *did not provide evidence for less hierarchical communication*, and despite hoping for more direct information-sharing with workers, most organisations created chat groups around their hierarchies. Even the younger Kenyan companies, which had less traditional structures and were doing more innovative things with chat, still implemented chat as a *top-down organisational tool and, thus, recreated traditional power structures*, with HQ in charge.

7 CONCLUSION

In describing how chat was used in six large organisations, we outline the tension between organisational and worker perspectives, and how chat does not provide a solution to this organisational dilemma. We found many different types of chat groups and whilst some of the differences may be technical, due to Kaizala's additional functionality, the differences were, in the main, socio-organisational. Even with apparently similar content, groups could be socio-organisationally very different, for example, according to the timeliness and appropriateness of content. Understanding this requires *going 'beyond chat' and examining its context of use within the ongoing flow of work.*

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