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Understanding Platform-facilitated Interactive Work

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Abstract:

The changing nature of work in the digital age is much in evidence these days. One newly prominent form, not yet fully understood, is platform-facilitated interactive work, where for individuals undertaking it, the interaction is with others, both people and organizations, mediated by a digital platform. Its nature is explored here in terms of its routine dynamics, where it can be modeled as interwoven paths of actions undertaken to perform tasks, supported by technology attractive of participation, as illustrated by Instacart and its multi-sided platform for grocery shopping, which must attract and retain customers, shoppers, and groceries alike in order to succeed. Such facilitating technology differs in its adoption, use, and diffusion from conventional enterprise technology, as it may entail work choices more freely made by participants, reflecting broader dynamics of further importance to its understanding. Several avenues of research that might shed more light on the future of platform-facilitated interactive work are suggested.

Keywords: Digital Work, Digital Platform, Routine Dynamics, Routine Capability.

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1 Introduction

The “changing nature of work” is much studied and talked about these days, and has been for some years now (Malone, 2004; Brynjolfsson & McAfee, 2014; Barley et al., 2017). With automation, digitalization, and business on the Web, new forms of work are readily identified, as with gig work in providing rides (for example Uber) or grocery shopping and delivery (for example Instacart), or a wide range of digital services (for example Amazon MTurk), together with new and growing digital occupations such as web design and data analysis (Erickson et al., 2014; Wood et al., 2019; Duggan et al., 2020). Other, older work forms have faded or even apparently disappeared, as with typists, secretaries, and switchboard operators. But how work is understood is often rather vague or taken for granted as not problematic in its discussion and in the published literature.

Work is most commonly associated with what people do in their employment, whether by others or themselves, especially as seen by labor economists (Zysman & Kenney, 2018; Kenney & Zysman, 2019). But while this focus is understandable, as employment provides for income, our grasp of work in this context is narrow and weak. Much is overlooked that is consequential. Taking a more inclusive perspective on work, and drawing from the important insights of others, four broad points can be made.

First, work, defined as an action undertaken in the performance of a task, is what people do most of their time whether they are employed or not, in their various practices. This has always been so. As Appelbaum (1992) notes, “The human condition compels the existence of work as the condition of life” (p. ix). Today, as for many years past, apart from any job, people may do housework, provide child or elder care, fetch groceries, and transport kids to and from school. Housework has long been demanding of our time, though it has undergone large changes, especially with appliances (Gordon, 2016). Some people, unemployed, may work hard at finding a job. Many arguably work even in their leisure, as when they exercise, play the piano, or cultivate a garden. Work can bring enjoyment, not only income, and when it does it can expand to fill the time available for it, whether in employment or not.

Second, nevertheless, because work is costly of time, and can be physically challenging, there are often incentives to do it more easily and efficiently, with better tools, especially in paid employment, and this has been so for centuries. With industrialization, much work came to be done by machines, displacing work done by craftspeople (see, e.g., Allen, 2009). With “scientific management” (Taylor, 1911), human work was studied to find the most efficient methods for carrying it out. With hierarchical organization, “white-collar work” was dedicated to making much “blue-collar work” disappear except as needed to tend the machines (Zuboff, 1988). Whether work brought enjoyment or not to employed workers was often at best a secondary consideration to its costs.

Third, with the advent of computers and programming, certain organizational work done by people and machines converged around a basic structural form based on human reasoning. Computers used much the same if-then reasoning in data processing as did white-collar employees in a wide variety of administrative tasks across functional areas such as accounting, purchasing, operations, marketing, and management (Orlikowski & Scott, 2016). What we now call information systems (IS) emerged with this convergence and now dominate much of organizational life (Swanson, 2022). A consequence is that much routinized “white-collar work” centered on information is displaced except as necessary to tend IS and its computers (see, however, Autor (2015)).

Fourth, with the rise of communication networks, and with PCs, laptops, and smartphones, much work has also become newly distributed, mobile, and digitally *interactive* with others, with people engaging their devices to get it done, wherever they happen to be, whether in their employment or in their personal lives. Much of this interaction is with both organizations and other people, as with ride-sharing by means of Uber, handyman work via Taskrabbit, or article editing in Wikipedia, and entails the use of *digital platforms* that facilitate it (Constantinides et al., 2018; de Reuver et al., 2018; Alaimo et al., 2020). It is here where more recent changes in the nature of work and organization have arisen and deserve to be more closely studied, as has been recognized by others, see, for example, Mitchell and Brynjolfsson (2017).

We will refer to this newly prominent form of work as *platform-facilitated interactive work*, where for those undertaking it the interaction is with others both people and organizations, by means of digital platforms, constituting a form of *digital work* (Orlikowski & Scott, 2016) now common to many fields, as in healthcare, which engages medical professionals, service providers, administrators, related businesses, and patients in intricate interaction increasingly documented and coordinated through electronic health records (Jha et

al., 2010). Physicians, for instance, may now spend a significant portion of their time with patients interacting not only with them but with their electronic records (Gawande, 2018). Patients themselves may now access and update their records as EHR also becomes a platform for personal health management (Davidson et al., 2018), even as it remains the property of the hospital enterprise that maintains and extends it. We might call such a platform an *enterprise platform*, in contrast to those of Uber, TaskRabbit, and Wikipedia, which might be termed *platform enterprises*, in that the platform constitutes the enterprise. Van Alstyne et al. (2016) explain how platform value is created through participant interactions in both cases. Importantly, from our perspective, both feature platform-facilitated interactive work.

How should we understand and assess such multi-party interactive work, not only by the persons involved but by organizations and their systems, including the platforms that facilitate it? And given its rising prominence in both our employed and everyday lives, what does this bode for our future?

In this exploratory paper, we address these questions, extending the concept of work beyond that focused on in the current platform literature (Ajunwa & Greene, 2019; Kenney & Zysman, 2019; Vallas & Schor, 2020; Möhlmann et al., 2021). We put human and machine work together on a conceptual footing that allows us to better grasp new facilitated forms, including novelties such as cloud consultancies, micro-tasking, and the "aspirational work" of influencers (Vallas & Schor, 2020), which may elude traditional employment interpretation. Doing so enables us to examine new "digital/human configurations" as called for by Baptista et al. (2020). Such configurations, understood as "assembled arrangements between digital features and human intent and performative actions in organizations" (p. 7) are also to be found *among* organizations and individuals, as mediated by platform enterprises, as will be seen here.

We are by no means the only ones seeking to understand these emergent digital/human configurations and the new division of labor between humans and machines that involves platforms. For instance, Marton and Ekbia (2019) take a political economy perspective, different from our own, in calling for an examination of platform enterprises such as Uber as "mechanisms for the extraction of value, distribution of wealth and power, as well as a particular relationship between humans and machines." (p. 1) (see also Ekbia and Nardi (2014)). Vallas and Schor (2020), taking a sociological perspective, characterize platforms as "permissive potentates that externalize responsibility and control over economic transactions while still exercising concentrated power" (p. 273). Our rather different perspective focuses not on what accrues to a platform enterprise, but rather on a micro-level understanding of the work organized around it, as a foundation for broader level understandings.

Following Orlikowski and Scott (2016), we take a practice-centered view, where work is seen as a kind of "doing," recognized in its performance, and explore *routine dynamics* (Feldman & Pentland, 2003; Goh & Pentland, 2019; Feldman, et al., 2021; Pentland et al., 2022) as a foundation for its examination, centered on "the emergence, reproduction, replication, and change in recognizable patterns of action" (Feldman et al., 2021, p. 1). Such patterns of action are characteristic of routines and work. Mostly through ethnographic studies, routines are found to be a source of innovation, not only organizational stability, hence their relevance to addressing changes in work. But routines also make use of devices, such as platforms, which are a source of innovation as well, along with the practices that humans seek to advance when introducing new routines as in healthcare (Swanson, 2019).

We attempt to distill and build from this theory of practice and routines, drawing upon a few basics with which to examine the platform-facilitated interactive work now everywhere with us, yet still underexplored as to its ongoing course of development with implications for our future well-being. From this endeavor, we provide a novel analytic approach to interactive work assessment that joins everyday human work to that done by organizations and their machines, enabling the changing nature of the work to be seen more comprehensively.

The paper proceeds as follows. We first develop and model the concept of platform-facilitated interactive work, anchored in routine dynamics and its notion of action paths. We then discuss how these basics help us understand the changing nature of this work at a micro-analytic level, with implications for addressing change in broader contexts. In a third section, we discuss the platform technology that facilitates interactive work, and the modes of change in both the platform and its use. The fourth section discusses the research opportunities that arise from the analysis. In a concluding section, we summarize the paper's contributions.

2 Interactive Work and its Basics

To begin, an everyday illustration may help to stage and frame our thinking. Consider the case where we shop weekly and routinely for groceries using Instacart delivery on the Web, for example. Li et al. (2022) provides background on Instacart. To place an order, we go to the Instacart near-me Web page and scroll and point-and-click our way through what is now a familiar interactive shopping process, at our chosen grocery store. Note that this constitutes work on our part, but also work on the part of the platform with which we interact. The communicative exchange to complete the order placement task follows if-then reasoning at both ends (e.g., if our preferred yogurt is shown as in stock, then we order it; if we order it, then it is added to our virtual shopping cart). Once the order is placed, further work is done by an assigned shopper, in fulfilling the order, with additional communication as needed, and eventual delivery to our doorstep.

Analytically, consider that the interactive order placement involves a sequence of *actions* both on our part and on the part of the platform and that the particular action sequences constitute *action paths* in the performance of the work (Goh & Pentland, 2019). Moreover, because the work performed is interactive between two parties, there exists not only the dual action paths of the individual parties but also a third *interaction path* that threads between the parties. This suggests how the work might be modeled and graphically represented, as in Figure 1.

What is portrayed in this graph is characterized metaphorically as the "anatomy of a two-party communicative interaction." Beyond the illustrative example of grocery order placement, it plausibly applies to other such interactions (e.g., humans with chatbots) and generalizes to multiple parties beyond two. It perhaps constitutes the *elemental action path structure* of all such interactive work, the basic component from which more complex structures are assembled. As one insight, note that the if-then reasoning of each party is unknown to the other party except as might be inferred from the actions of each. Further, because every action draws from a range of available options, every interaction path represents a unique performance involving if-then reasoning at every step until concluded.

While the action path structure portrayed in Figure 1 suggests a certain symmetry between the two parties, note that in order placement it is the platform that dictates the terms in which the task is carried out. Its if-then reasoning anticipates our own, and as we are a returning customer, its delivered Web pages for shopping will be tailored to our previous purchase history, with buy-again options prominently displayed, easing our own selections. Certain promotional and sponsored options will also be featured, often leveraging our buying history. The larger enterprise system further determines when the order placement task and the full transaction including delivery with payment is concluded.

Instacart's platform and system also accumulate a full record of each transaction and its interaction paths, from which the business may learn how to improve upon its if-then reasoning. How it does so is nicely described in Rao and Zhang (2021), which we draw from next. Li et al. (2022) provide additional background.

Briefly, Instacart provides a platform for shopping at some 500 groceries with 40,000 stores in the U.S. and Canada. Some 600,000 shoppers work as contractors or part-time employees to pick, pack, and deliver customer orders. Each supermarket typically has some 40,000 unique items that it stocks and communicates availabilities to Instacart, not necessarily in real-time, which has led Instacart to develop and employ a machine learning model to estimate availabilities in representations to customers, as well as a replacement recommendation model to communicate options should items not be found by the shopper. Thus, we see that the action path undertaken in order taking draws upon substantial and sophisticated underpinnings in its if-then reasoning, entirely masked from the customer (see Wan et al. (2018) and Crowston and Bolici (2019) on applications of machine learning to work).

Too, the platform's order taking system must be coordinated with its shopping and delivery systems, with further if-then reasoning, in this case in communications with the shopper, and with platform-mediated communications (texts) between the shopper and customer as may be needed. Apart from these communicative interactions, constituting the digital work, the shopper does the associated physical work as well. On the whole, a complex work pattern will be associated with each performance.

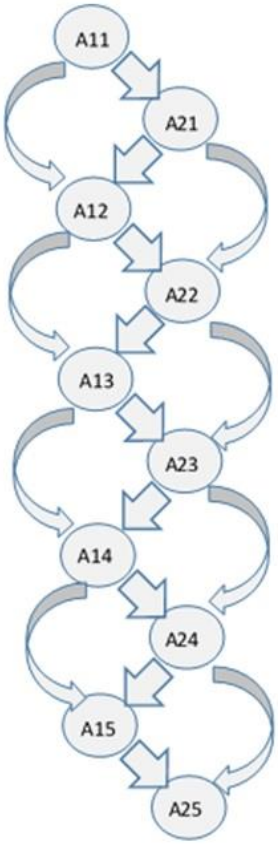

Figure 1. Anatomy of a Two-Party Communicative Interaction

Notes: First party messages second party, who replies in kind. Interaction continues as shown until the first or second party ends it. Here nine messages comprise an *interaction path* as shown by the short block arrows. *Individual paths* taken by each of the two parties are shown by the curved arrows. Actions are labeled to indicate party and sequence.

Figure 2 below provides a sketch of the Instacart platform and how it functions. It includes not only the work associated with each shopping performance but the additional enabling work that involves the grocery and its suppliers. Both digital work and associated physical work are included. Each of the four lines of communication shown represents a two-party communicative interaction as described in Figure 1 above.

From this brief exercise, and drawing from research on routine dynamics, we can more precisely explicate the nature of platform-facilitated interactive work.

Generalizing from Figure 1 and the illustration, *digital work may be broadly conceived as one or more communicative paths of actions undertaken to perform a task*. Such actions follow if-then reasoning (explicit or implicit) in their execution and may be undertaken by individuals, groups, or organizations, and by their machines. Furthermore, the work is *interactive* where its action path structure includes one or more interaction paths, and *platform-facilitated* when at least one of the individual paths is taken by an enabling platform. Note in Figure 2 that with Instacart all four interaction paths are platform-facilitated.

The notion of an action as the basic unit of work is important to this conception, just as action is fundamental to the processual view of routines (Feldman & Pentland, 2003). So too is that of the associated task (Pentland et al., 2012) as it indicates purpose and delimits action initiation and completion. Broadly and intuitively the more actions needed to complete the task the greater the required work. Coincidentally, the conception mimics that of work defined in physics as force multiplied by distance. In our terms, actions provide the force, path length provides the distance.

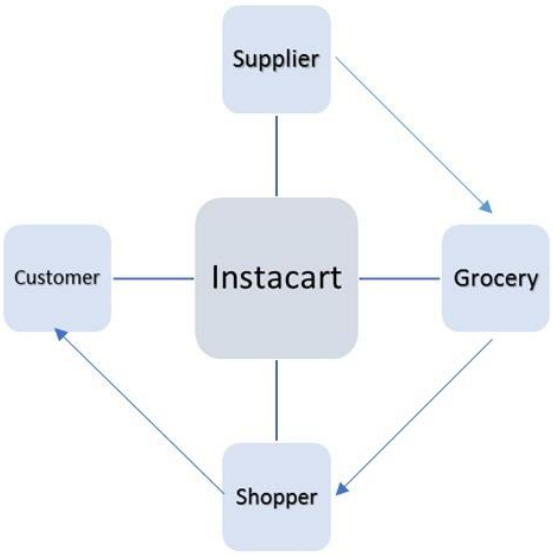

Figure 2. Interactive Shopping via Instacart

Notes: Digital work is represented by lines of communication between Instacart and customer, shopper, grocery, and supplier. Customer places an order. Shopper fulfills order. Grocery provides item data. Supplier places ads.
Physical work is represented by arrows between supplier, grocery, shopper, and customer. Supplier provides goods to the grocery. Grocery provides goods to shoppers. Shopper delivers goods to the customer.

3 Toward a New Understanding

With these few basics, we now have an apparatus for modeling work at the action level where it takes place, with some potential for building up from there, following advice by Tsoukas and Chia (2002, p. 580) to give theoretical priority to microscopic change in addressing change more broadly. How then might this conception facilitate our understanding of the changing nature of work, in general, and of platform-facilitated interactive work, in particular, and what are the challenges in building up from this?

First and foremost, it suggests that much work can be understood in terms of *routines* for getting it done, and that research on routine dynamics should be informative to its changing nature, as it places humans and machines such as platforms and robots on comparable footing as *actants*, as in actor-network theory (Latour, 1996; Walsham, 1997), but modeled rather differently in routine dynamics, where actions are the focus and nodes in the network. As an important caveat, this comparable footing is not to suggest that machines reason as do humans in actual performances. In our understanding, they do not, a point of contention where AI is concerned (see, e.g., Pearl & Mackenzie, 2018). As seen here, human reasoning is open, unbounded, and often ephemeral in performances, whereas computer applications one way or another follow scripts, based on the if-then reasoning given to them.

Second, it highlights the importance of routines in the study of interactive work such as that described in the Instacart illustration, which notably focuses on a *transaction*, a rather specialized form of interaction. Such *transactional work* is increasingly common but needs to be better understood beyond its cost economics (McIntyre et al., 2021). It not only features interaction and shared work between humans and computer-based systems, but it further entails work in online marketplace exchanges, often between individual buyers and organizational sellers who may dictate the terms of the transaction, which is carried out by its machines. It is, in other words, the important work associated with today's e-commerce (Wigand, 1997), which intersects with but differs from the coordinated interactional work of the organizational hierarchy as characterized by Malone and Crowston (1994).

While interactive work between two actants as modeled in Figure 1, can also be between two humans or between two computer-based systems, our primary interest here is in platform-facilitated interactive work, with its issues of *conjoined agency* featuring humans, organizations, and their machines in the exercise of intentionality, where one may have the upper hand over the other (Murray et al., 2021). Thus, in grocery shopping with Instacart, the platform has the upper hand in the protocols employed, if not the actions taken

by customers and shoppers, and is an "arresting technology" in this regard (Murray et al., 2021). However, as seen here, its agency is wholly *derived* from that of Instacart as an enterprise and should be understood as such (see also Shapiro (2017). Machines do not act with intent as do humans and organizations, although they may be built to feign it, as with ChatGPT purposed to act as a personal digital assistant (see, e.g., Weiser (2023)).

Third, the basic concept of work as expressed above applies equally to paid and unpaid work, which allows exploration of how the two are entwined, as with Instacart, where the unpaid customer shares the everyday work with the paid shopper. While customers are well-studied in marketing research as to their shopping choices (e.g. in filling their virtual grocery carts (see Chintala et al. (2023)), they are understudied in terms of their everyday work as a whole and how this and their paid work shapes their choices of how to do both.

Fourth, as recent research has shown, because platform-facilitated interactive work provides a data record of its path structure in task performance, it offers new opportunities to examine this performance over multiple occurrences across extended time frames. Thus, over the period in which we have been a customer, Instacart can prospectively examine from its *digital trace data* (Howison et al., 2011; Pentland et al., 2020) changes in the task structure and hence, indirectly, the work put into order placement. It can do the same for its on-site shoppers. It can thereby gain insights into the changing nature of this interactive work over longer time periods, as well as shorter ones, where it aims to adapt the if-then thinking of its systems in response to that of its customers.

Note, however, that from this data Instacart's view of its customers' and shoppers' interactive work is entirely one-sided, as it has no direct knowledge of the if-then reasoning that went into it, let alone the larger context in which customers and shoppers do other everyday work, and fit their Instacart shopping into it (both customers and shoppers can do their Instacart work whenever they want). Examining the changing nature of platform-facilitated interactive work over time can therefore not be done by analysis of digital trace data alone.

Thus, fifth, although routine dynamics studies using digital trace data have surprising potential beyond the action modeling discussed here (Pentland et al., 2020; Mahringer & Pentland, 2021), further theorizing, together with studies yielding more contextual data (e.g., through ethnographic methods (Dittrich, 2021)), is likely needed to examine change in platform-facilitated interactive work more thoroughly. Note in this regard that this digital work may be accompanied by associated physical work, as with Instacart, where the very motivation for the customer-originated digital work may be avoidance of the physical work. We suggest next that studies be done by theorizing what relates routine basics to broader change in practices such as grocery shopping, and through in-depth studies that illuminate how platform facilitation is achieved.

4 Exploring Facilitation and Change

We will say that interactive work is facilitated whenever its platform makes it attractive to those who engage in it and carry it out. Following our discussion above, such facilitation might make the work newly possible, more enjoyable, or easier to complete, depending on the circumstances. In terms of basics, it might shorten the action path to complete a task, or simplify the if-then reasoning at each step, to reduce the burden of time and effort. It might also follow from efforts to advance the broader practice, by providing new technology to support it, or by adapting it to shifts in other practices.

Consider again our Instacart illustration. As an enterprise, Instacart aims to advance the practice of grocery shopping, offering a new means to accomplish this everyday task, and from this business earn a profit. Its multi-sided platform provides for building this capability and must attract and retain customers, shoppers, and groceries alike in order to scale and be successful. Each of these three populations is free to participate or not, hence the importance of facilitation. However, the work and facilitation challenges differ.

As the focal practice is grocery shopping, the customer's engagement comes first. With Covid and new precautions, many customers altered their shopping practices, placing orders online at home, engaging others to do the in-store pick-up and delivery, using a service such as that provided by Instacart. This *practice shift* created substantial new business for Instacart and others, as well as for the shoppers who took up the work no longer done by the customers. It also created incentives for groceries to adapt accordingly, in partnering with Instacart and others who provide pick-up and delivery services, so as to retain or grow their customers.

In short, with the pandemic, practice shift in grocery shopping, facilitated by technology such as that provided by Instacart and others, has led to a change in this work, with likely spill-over effects, as customers

free up time for other things, while shoppers do the reverse with added paid work taken on. Looking ahead, for Instacart and others, the question is whether this practice shift will endure, as the threat of Covid continues to subside. For those customers that have newly routinized their grocery shopping with Instacart, will they stay with it, or will they return to prior practice? Browning and Griffith (2022, 2023) report on the drop in Instacart's business and its recent turn toward more advertising.

Addressing such questions in our research poses challenges. While routine dynamics research may address endogenous changes in patterns of action within and among routines, as studied through micro-level analyses of digital trace data, for example, or even by means of traditional ethnographic methods (Dittrich, 2021), it may or may not be sensitive to important *contextual change*, such as practice shift and change by design, as with a platform upgrade or new feature, that sets these dynamics in motion. The broader study of change in platform-facilitated interactive work must take such contextual change and interventions into account.

Swanson (2019), interpreting technology as routine capability, identifies four modes of associated change: (i) *design*, developing new or modified devices and routines to achieve new capabilities; (ii) *execution*, building capabilities in routine performances; (iii) *diffusion* of new capabilities to others as preferred practice; and (iv) *shift*, adapting capabilities to shifts among other practices. Each is consequential for platform-facilitated interactive work, as may be illustrated with the Instacart example.

In the case of change by design, we note that the Instacart platform undergoes continuous modification of its protocols, informed through its use, to better serve customers and shoppers (Li et al. (2022) describe some of this in more depth). This too constitutes work, in this case sophisticated "backstage" development, and would have its own engineering routines and change methods. It is likely to be highly imbricated with the use of the platform (Leonardi, 2011), as it seeks to shape and facilitate it, but may go unseen in the examination of use only.

In the case of change by execution, this pertains to what may be learned in examining routines as already discussed. We note again that capabilities are built through repeated performances, observable in the variation of action paths taken according to circumstances. Learning in use accrues accordingly. With Instacart this learning is important to both customers and shoppers (Shapiro, 2017), as they are relatively atomized, isolated in their respective action paths. Learning by individual doing is a necessity.

In the case of diffusion, we note its fundamental importance to the business success of Instacart, as it pertains to its ongoing uptake by customers, shoppers, and groceries alike. Notably, how use scales or not may be reflected in communications by Instacart to its current customers, both within and apart from everyday use, through texts and email. Instacart not only offers incentives such as discounts to customers to deepen and expand upon their continued use, but it also offers rewards to those who recruit others to become Instacart users. Such marketing by Instacart (see Li et al. (2022)) is still another form of work that underpins its use.

Lastly, in the case of shift, we note that various changes in the practices of Instacart's customers, shoppers, and groceries, as well as those of related others, such as shopping centers, are also ongoing and will shape the dynamics of Instacart use. Sometimes such a shift can be profound and pose threats or opportunities, as occurred with Covid, and attention to it is of obvious importance to Instacart's management and strategy. For Instacart's customers, interrelated shifts include: working at home, reduced commuting, shopping online, preparing meals at home, or ordering them for home delivery. Li et al. (2022) discuss Instacart's strategy in depth, but its routines for this, if any, and attention to practice shifts are not mentioned, though they may be implicit.

Table 1 summarizes and illustrates, posing a sampler of research questions pertaining to change in facilitating platform use, reflecting both routine and contextual dynamics. We note that most routine dynamics research has, to date, focused on execution and change, through illuminating studies of routine performance. Most have also employed ethnographic methods well suited to process discovery in situated contexts, yielding novel insights from enriched observational, interview, and archival data, beyond narrow explanations of performance (Dittrich, 2021). However, contextual dynamics have not been much studied in this body of work.

Table 1. Exploring Change in Facilitating Platform Use

Change Mode	Research Questions	Grocery Shopping Illustration
Design	What platform features are attractive to use? What platform features contribute to the continuation of use? How are platform features adapted to growth in adoption and use?	What Instacart features attract and retain customers? How has Instacart developed its features so as to better attract and retain customers?
Execution	What routine capabilities are achieved in use? How are these capabilities built? How have capabilities expanded with growth?	What is achieved by grocery shopping with Instacart? How do customers learn and routinize their use of Instacart? How is customer use expanded with the introduction of new features?
Diffusion	How quickly and to what extent does use scale? Do new users learn from experienced users? What explains the pattern of growth in use over time?	What is Instacart's pattern of growth among grocery shoppers? How do Instacart's customers differ from those yet to adopt? What explains Instacart's pattern of growth?
Shift	How does use adapt to change in related practices? How does use change with disruption, as with a pandemic?	How did Instacart use change with the Covid pandemic? What explains which customers continue to use Instacart after Covid subsides and which do not?

Accordingly, the study of change in platform-facilitated interactive work should extend beyond routine dynamics, as narrowly modeled, to embrace broader technology and practice dynamics. As theorized by Swanson (2019), these dynamics are based on the premise that humans seek to advance their various practices, providing impetus for innovation and the achievement of new capabilities. Adaptive change is thus an ongoing process.

5 New Study Opportunities

It is suggested that multiple case studies of the interactive work associated with one or more organizations and their platforms offer a way to address the broader research challenge. We have used Instacart as one such case, albeit lightly, as an illustrative example. The primary advantage of the organizational case is that it necessitates a description of the context in which the work takes place, which anchors the findings, understood to be specific to the case. Individual cases can be largely exploratory, with generalizations then sought across cases, taking contexts into account (Yin, 1984). Essén and Värlander (2019) provide an insightful and related example, examining both short and longer-term changes in Swedish e-health practices, although not in terms of routine dynamics per se.

With this in mind, focusing first on routine dynamics, the suggested case studies might take either a micro-level analytic approach, employing digital trace and other data to examine change specific to practice, or, alternatively, a meso-level approach to analyze change that spans multiple related practices, again in an organizational context.

At the micro-level, there might be longitudinal studies of human work in platform interactions, where individuals would explicate their if-then reasoning, providing insights into their changing path structures. For instance, one can imagine studies in which customers shop via Instacart and orally express their reasoning as they go about placing their order, with this reasoning recorded. This would provide at least a crude representation of their own work as customers. Something similar might be done in the case of Instacart shoppers. It is not hard to imagine that such studies might be directly useful to Instacart, in the ongoing design of its platform and other arrangements, as well as to researchers interested in answering questions such as those pertaining to how individuals juggle employment work with everyday work such as housework and how this may be changing.

Accordingly, while recent research has addressed how platforms have evolved into larger ecosystems (Alaimo et al., 2020), research is also needed to address how human work evolves systemically as well, not only in occupations but more fully, to incorporate everyday tasks. Increasingly, much of this work is interactive as exemplified with Instacart, where the timing of the work done by customers and shoppers is

at their discretion, as they fit this work into still other work they do throughout the day. The question is *how* they fit this interactive work into other demands on their time.

A conjecture is that individuals as well as organizations will seek to *mesh* their various routines in their performances, such that the various tasks undertaken are successfully completed without unnecessary complications and interferences, which with uncertainties and time constraints may be problematic to achieve. How individuals go about this meshing of routines would be interesting to study.

It is worth noting that the *time* associated with work and the actions that make it up (absent in the modeling of Figure 1) may be of significant importance. All actions have durations and these can vary substantially in performance. In interactions involving multiple people, this can be consequential, where one person may need to wait for another's action to be completed, as their respective work needs to be coordinated or synchronized (classic workflow management). For the platform or enterprise system, this may not be quite the same problem, as it is built to multi-task, able to work concurrently with multiple individuals in its interactions, even though coordination and synchronization may be its primary task.

A further conjecture is that *flexibility* in engagement will remain an attractive feature of platform-facilitated interactive work (Wood et al., 2019). Such flexibility applies not only to time but to place, as became apparent with Covid and the rearrangement of work to accommodate distancing (see, for example, Dougherty et al., 2022). While the advantages of time and place flexibilities in doing work have long been recognized (Davis, 2002; Stanford, 2017), it is perhaps only with an extreme disruption, such as a pandemic, war, or economic collapse, that large scale shifts take place rather suddenly, highlighting the importance of work flexibilities in adapting to the circumstances.

From the human perspective, a profound aspect of doing work is that while it might be done in any number of places, it must always be done *somewhere*. And humans are not indifferent to where they are at any one time. A similar story applies to platforms, which require hardware, communication, and human support resources. In short, platform-facilitated interactive work is always *situated* in time and place. And researchers may need to be especially aware of this, or even focus on it, in their studies. Le Breton and Galiare (2023) provide an example in a study of platform-facilitated food delivery. Cameron (2022) contributes an ethnographic study of how ride providers find meaning in their work supportive of their continued engagement through interaction "games" of their own devising, and adapting their routines.

Again, such situatedness would seem to be a key aspect of routine dynamics, with implications for micro-level research. Because digital trace data might not provide direct evidence of certain important situatedness in the choices of human actors, where these actors explicate their reasoning to researchers, as suggested above, this situatedness might well be spoken to, recorded, and thereby taken into account, in exploring the role of time and place flexibility in shaping engagement in interactive work such as that facilitated by Instacart.

Complementary studies of dynamics beyond those of routines are also needed to discern and explain change in platform-facilitated interactive work. Much of this change is initiated by design, as with new platform features regularly introduced to better attract and retain users. Studies that examine how such feature-related change is reflected in subsequent routine dynamics should be particularly informative to understanding ongoing change in the associated work. Shapiro's (2017) ethnographic study of platform-facilitated food delivery, which details the imbrication of platform modifications with the choices made by delivery workers in response, provides a good example of the studies needed, not only of paid workers but also of customers.

Studies of the growth in the use of platforms supporting everyday practices such as grocery shopping are also needed. From prior research, it is known that how technology is used with apparent success in one organization provides a template for its use among subsequent adopters and that consultants play a key role in making this happen, in particular with enterprise systems (Swanson, 2010). But how does such a process play out with platform-facilitated interactive work, where the adopters are individual customers and shoppers? Might social media play an important role in this? Do the resulting routine dynamics vary widely in the user population or do they normalize as the technology itself diffuses widely? Yao et al. (2022) find that social media enable atomized gig workers to support and learn from each other. With customers, influencers might play a significant role (Instacart has reportedly initiated an influence marketing program, enabling food influencers to make affiliate income from customer choices made in filling their shopping carts (West, 2023). Might influencer work complement that of customers and contribute to platform dynamics and growth?

Lastly, studies are needed to address practice shift and how it impacts platform-facilitated interactive work, as already illustrated with Instacart and its growing use during the pandemic. While such a shift may occur rather suddenly, with a major social disruption, it may also take place more slowly, as seems to be the case with healthcare practices over decades (Davidson et al., 2018). Research attention to such shifts of whatever kind should at a minimum provide needed context for studies focused more narrowly on a technology and the routine dynamics associated with its use. Schlosser et al. (2023) provide a recent contribution, in the case of Covid, finding that change in human needs drove much of the shift in technology use.

Finally, consider again the Instacart case, as we have discussed it. It is at once an organizational story, a technology story, and a story about work. Whether Instacart is successful or not as a new and evolving organizational form hinges on its multi-sided platform which brings grocery stores, customers, and shoppers together in mutually beneficial interactive work. While the technology as such provides returns to all participants, Instacart itself, as the enterprise that orchestrates and adapts it with new features, will ultimately prosper only if it can earn a premium over its own costs, and its own work in providing it. Li et al. (2022) offer an extended discussion of how Instacart pursues this, with business specifics beyond what we have covered here.

New technology and the future of some interactive work may thus rest at least momentarily on vagaries associated with business entrepreneurship, its risks and rewards, and the fates of ventures such as that of Instacart (see Browning & Griffith, 2022). This is well explored in the strategy literature and largely beyond the scope of the research on platform-facilitated interactive work discussed here (see, for example, Hitt et al. (2011) on strategic entrepreneurship). However, certain aspects of the suggested case studies may need to be sensitive to this at least in an organizational context. Whether firms such as Instacart can continue to recruit shoppers on their own contract terms, without hiring them as regular employees, is still to be resolved, it may be noted (Provenzano, 2023), with potentially important consequences for all parties to the work.

6 Conclusion

This paper contributes to the growing literature on the changing nature of work, in exploring one newer and now prominent form, termed platform-facilitated interactive work. It examines this work in terms of its routine dynamics, where the usual concern has been adaptive smaller-scale change within and among routines in the performative achievement of organizational stability (Pentland et al., 2011), but where related and larger-scale change may be largely fenced off as a consequence. Recently, however, this same “paths of action” thinking has been extended to theorizing transformative change (Pentland et al., 2022), a welcome departure deserving further study. Here, we have taken a complementary tack, exploring the nature and rise of platform-facilitated interactive work conceived in terms of its routine basics. We have drawn on Swanson’s (2019) theory of technology as a routine capability to bridge between routine and broader dynamics, and thus between smaller-scale and larger-scale change. We have argued that this opens new doors for research on platform-facilitated interactive work.

In examining the nature of this work, we have also contributed to the understanding of digital platform technology as facilitative technology, frequently oriented to attracting voluntary participation, as with Instacart, in contrast to what might be termed “compulsory technology,” such as conventional enterprise systems which command participation from organizational users, and which have been extensively studied as to their adoption and use (see, for example, Markus et al. (2000)). While paths of action thinking may no doubt be applied to the study of change associated with both facilitative and compulsory technologies, it seems particularly suited to change with facilitative technologies, where individual adoption and use decisions may be ongoing, and participation can either grow or fall off.

At the same time, in exploring the centrality of routine dynamics to understanding platform-facilitated interactive work, we have found that building such an understanding from routine dynamics alone is unlikely to suffice, in the absence of addressing the broader dynamics within which any routine dynamics play out. Among the considerations associated with these broader dynamics in the case of digital platforms are those associated with power and politics, as reflected in monopolistic advantage, customer and worker exploitation, privacy guarantees and violations, and government regulation (for instance Vallas and Schor (2020) explore these ramifications in some useful depth). We are thus reminded that over the longer haul, *institutional* solutions to issues associated with this work are also sought. We conclude that useful knowledge of the routine and broader dynamics associated with platform-facilitated interactive work must be built in tandem.

A likely approach to building this knowledge might focus on the work associated with a particular practice, such as grocery shopping, and embed routine dynamics studies within a broader framework, such as that suggested here. Rather than attempting to build by "zooming out" from routine dynamics studies (Nicolini, 2009), it might be preferable to "zoom in" from a framework that positions these studies to be informative within it. Such a framework might employ an extended time frame with which to examine meaningful change, for instance, say ten years, within which a two-year ethnographic study of routine dynamics, anchored in say five years of prior history, might yield insights into likely practice change over say three years ahead. By whatever approach, sensitivity to practice shifts and associated institutional factors over a significant time frame is likely necessary to draw the most helpful insights.

We have also contributed here to understanding platform technologies as a means of work, not only enterprise. While platforms are already much studied, especially in terms of their enterprise economics (see, for example, Parker et al. (2016)), and as vehicles for paid gig work (Le et al., 2015; Shapiro, 2018; Le Breton & Galiare, 2023), they have been less studied as means of everyday work, from a practice perspective. In choosing grocery shopping by means of Instacart as an illustrative case, with order placement by the customer (unpaid) and order fulfillment by the shopper (paid) as an example of shared everyday work, we have sought to highlight the work aspects of platforms that are foundational to their use and thus impactful to their enterprise economics. Doing so enables us to keep in mind that the future of digital platforms likely rests not only on network externalities and such but on their associated work, including the everyday work that consumes us all, paid or not.

Finally, we have suggested several new avenues of research that might shed more light on the future of platform-facilitated interactive work. These are rather fragmentary and hardly exhaustive, but they may provoke fresh thinking on the subject.

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