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EVERYTHING FLOWS: STUDYING CONTINUOUS SOCIO-TECHNOLOGICAL TRANSFORMATION IN A FLUID AND DYNAMIC DIGITAL WORLD[1]

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*Ongoing digital innovations are transforming almost every aspect of our contemporary societies—rendering our lives and work evermore fluid and dynamic. This paper is an invitation to likewise remake our theorizing of socio-technological transformation by shifting from **actor-centric** orientations toward a **flow-oriented** approach and vocabulary. Such a shift from actors to the flows of action allows us to offer an innovative theory of socio-technological transformation that does not rely on self-contained actors or technologies as originators of transformation. To do this, we turn to the work of social anthropologist Tim Ingold to advance a theoretical vocabulary of **flowing lines of action** and their **correspondences**. We expound three modalities of correspondence, namely: **timing**, **attentionality**, and **undergoing**, which together explain the dynamics of creation, sensing, and actualization of (trans)formative possibilities for action along socio-technological flows. We demonstrate the application and utility of this vocabulary through an empirical illustration and show how it reveals novel insights for research vis-à-vis existing theoretical alternatives. Finally, we outline the implications of our approach for research and suggest some guiding principles for studying and theorizing digital phenomena through this orientation. In addition to theory, our vocabulary also provides practitioners an alternative approach on managing digital transformation—one that emphasizes cultivating favorable conditions under which transformative possibilities can be created, sensed, and actualized at timely moments. As such, we invite both scholars and practitioners to engage with our approach to develop novel ways of understanding, theorizing, and engaging with socio-technological phenomena **along** our increasingly fluid and dynamic digital world.*

Keywords: Transformation, flow of action, temporality, becoming, process theory, actor-centricity, Ingold, correspondence, timing, attentionality, undergoing

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We are not good at thinking movement
(Chia 1999, p. 209)

Introduction

As we undergo momentous flows of digital innovations, our lives and work continue to transform and are evermore characterized by mobility (D'Mello and Sahay 2007), interconnectivity (Sandberg et al. 2020), virtuality (Schultze 2014), complexity (Benbya et al. 2020), hybridity (Cecez-Kecmanovic, Galliers et al. 2014), and fluidity (Bauman 2013; Mol and Law 1994). This digital transformation (Majchrzak et al. 2016) not only offers a chance to reveal more lucidly a world always already flowing, but also arguably intensifies this flux—rendering boundaries evermore ephemeral and categories leaky (Kallinikos et al. 2013; Nambisan et al. 2017; Scott and Orlikowski 2014; Yoo 2010). At this historical moment, where the digital phenomena that immerse us increasingly overflow our conventional concepts and models, our ways of studying and theorizing in research also need to undergo transformation.

In this paper, we argue that our digital age of fluidity requires us to move away from theorizing socio-technological transformation using an *actor-centric* habit of thought and vocabulary, whereby bounded actors are deemed as the significant and original causes of transformation. Indeed, in locating the ongoing transformation *within* or *between* actors, we tend to structure our ideas about the fundamental nature of IS phenomena in spatial terms (e.g., as arrangements of bounded entities such as systems, components, modules, artifacts, users, organizations) at the expense of the *temporal flow of action* (e.g., the rhythmic trajectories, directionalities, intensities, and momentums with which IS phenomena flow). As such, we arrest the going-on of the flow of action into bounded actors/entities, which then requires a "sprinkling of agency" on them, as well as a "traffic of interactions" among them, to bring them to life, as it were, and study their dynamisms (Ingold 2011, p. 28). What is lost in such an actor-centric orientation and account is the happening of life (action as it flows) in all its vitality. Instead, we will argue for a shift toward a theoretical vocabulary that orients us to foreground the ongoing temporal flow of IS phenomena, as they flow.

The move away from actor-centricity is not new in IS research. Indeed, we shall trace a multiplicity of lines in the history of IS research along which different streams have engaged in moving the discipline away from actor-centric orientations. From classical process studies (Barley 1986; DeSanctis and Poole 1994; Newman and Robey 1992) to approaches more rooted in relational and process ontologies (Cecez-Kecmanovic, Kautz et al. 2014; Orlikowski and Scott 2015; Riemer and Johnston 2017; Schultze 2014), IS studies have made important strides to decenter actors in various ways. However, we argue that, either due to their ontological assumptions or theoretical vocabularies, such studies tend to foreground spatial relationality—as in interactions *between* categories or intra-actions *among* boundaries of actors—at the expense of the temporal confluences *along* flows of action. This paper thus productively resonates with, and invites a complementary orientation to, such process oriented IS research by making a case for reorienting our theoretical gaze from spatial relationality to the temporal qualities, conditionalities, and directionalities of flows of action.

To that end, we attend to the work of the social anthropologist Tim Ingold to advance a theoretical vocabulary that explicitly foregrounds the conditioning and (trans)formative[2] dynamics of temporal *correspondences* along *flowing lines of action.* We will expound how all correspondences always entail a *moment of timing*, an *attentional orientation*, and *an experience of undergoing.* These respectively explain the creation, sensing, and actualization of (trans)formative possibilities for action along correspondences. We demonstrate the application and value-added of this vocabulary through an empirical illustration of #TCOT, a collaborative-competitive Twitter-based stream of political action which became an organizer of the U.S. Tea Party Movement in 2009. The fluid yet consequential nature of this social media story, with the integral and ever-present role of technological concerns therein, allows researchers to experience our vocabulary in action and see how it reveals novel insights vis-à-vis existing theoretical alternatives.

We believe our proposed flow-orientation and vocabulary has substantial implications for research and practice. First, it offers an innovative theory of socio-technological (trans)formation that does not rely on originating actors for its accounts. Instead, it allows us to foreground how contingent, unpredictable, and sometimes seemingly insignificant confluences of heterogenous flows of action explain the conditionalities and directionalities of the course of (trans)formation. Second, it reorients and reanchors our research and theorizing practices to further embrace process thinking and theorizing (Cecez-Kecmanovic 2016; Orlikowski and Scott 2014). Specifically, in discussing our vocabulary, we outline some guiding principles for studying and theorizing temporality,

[2]Throughout this paper, by (trans)formation we aim to signal a break with the conventional duality between formation and change. Instead, we aim to highlight continuous and never-ending transformation as the primary condition of all "things," or better, processes. Although as we shall argue, our approach does also account for seemingly discontinuous moments of consequential change but that within a continuous calculus of (trans)formation.

relationality, and (trans)formation when researching IS phenomena through what we refer to as flow-oriented genealogical research.

Moreover, although this paper is focused on theory, it also offers practitioners a novel way to understand and navigate our increasingly overflowing digital world. While IS practitioners have already been on the forefront of exploring and experimenting with alternative practices for more agile and continuous adaptation to change (Highsmith 2001), they can still benefit from a greater sensitivity to questions of timing, attentionality, and undergoing. For example, practitioners might move away from thinking of digital transformation as local interventions to some entity (e.g., system, organization, users). Instead they can approach it as a question of exposure and attuning to a diversity of corresponding flows to sense and actualize (trans)formative possibilities at timely moments. As such, practitioners and popular culture might deemphasize the myths of heroic inventors, overinflated leaders, or hypermuscular entrepreneurs as "change agents" and rather focus more on how to cultivate the conditions under which favorable correspondences along flows of action can come about.

We believe that researchers within the broader discipline (and not just process-oriented researchers) can gain valuable insights by productively resonating with our vocabulary and flow ideas to augment and reimagine their models and practices of theorizing, as we shall outline in the discussion section. In the spirit of ontological pluralism (Tummons 2020), we encourage any such correspondences. Overall, we suggest that a temporal flow-oriented approach has the potential to facilitate an entirely new generation of knowledge, not at the expense of existing theory, but rather as its generative supplement.

Motivation: A His*tory* of Actors in IS Research

Over the past decades, IS research has offered a multiplicity of theories to explain the role of information technologies in organizational and societal change or transformation. We summarize this work based on their treatment of the nature and role of human and technological actors and/or entities into three research streams—on a spectrum ranging from entity-oriented to process-oriented as outlined in Table 1. A thorough review of these streams, especially the more entity-oriented ones, is beyond the scope of this paper. Rather, our aim here is to trace specific lines in this history along which different traditions of IS research have engaged in moving the discipline away from an actor-centric[3] view of socio-technological transformation. We will also outline an emerging fourth stream that contributes to this history by explicitly focusing on the temporal flow of action and becoming.

Entity Orientation: Placing Actors at the Center

The first two streams fall more or less on the entity-oriented end of the spectrum, where IS phenomena are taken as comprised of distinct and separate entities. This work puts human actors and/or technological entities front and center, and views change or transformation as the product of their interactions.

Stream 1: Variance Approach

Stream 1, dominant in IS research, conceives of change as the outcome of antecedent forces (e.g., Agarwal and Karahanna 2000; Jasperson et al. 2005; Venkatesh et al. 2003; Wade and Hulland 2004; Zigurs and Buckland 1998). A key assumption here is that actors, entities, aspects, components, and so on are points or loci of original causes (hence the notion of *independent* variable) that shape, impact or influence other entities through determinate action. As such, the task of researchers is to locate such bounded actors/entities *spatially*—that is, in a well-defined finite region of space and time—and then proceed to ask about the correlational *interactions* between them—to, in a sense, reconnect what has been assumed separated.

Streams 2: Emergent Process

Alongside Stream 1, a second stream has emerged that shifts the focus from finding *what* determinants explain variance in observed outcomes toward searching for explanations of *how and why* those observed outcomes occur. Stream 2 abandons the notions of self-contained actors/entities and determinable outcomes, in favor of embedded actors/entities and emergent

[3]X-centrism generally refers to a tendency to take X as the most important, original, or superior factor in explaining phenomena. For example, eurocentrism refers to taking Europe as the point of reference in explaining phenomena, just as geocentrism used to do with Earth. Similarly, actor-centrism in IS research refers to explaining IS phenomena by reference to (non)human actors and their attributes or actions. Moving beyond actor-centrism, then, does not mean denying the existence of people or refraining from mentioning their names. Rather, what is at issue is what we gain by adopting a more *decentered* understanding of phenomena.

Table 1. Streams of IS Research

	Entity Oriented *Phenomena are substantially constituted by distinct entities/actors* →		**Process Oriented** *Phenomena are relationally constituted through ongoing processes*	
	Stream 1: ***Variance Approach***	**Stream 2:** ***Emergent Process***	**Stream 3:** ***Relational Enactment***	**Stream 4:** ***Temporal Becoming***
Understanding of actors & relationality	Distinct and bounded entities that interact correlationally	Embedded entities that mutually shape each other in interactions	Enacted entities within relational fields of practices	Ongoing accomplishments along temporal co-becomings
Understanding of change	Quantitative change in secondary attributes	Dialectic and emergent process of mutual shaping	Configuration of boundaries in sociomaterial practices	The default condition of phenomena as ongoing (trans)formation
Understanding of time	• Discarded in cross-sectional studies • Clock time • A linear and quantitative variable	• A structural parameter • Sequence of activities • Experiences of actors	• A backdrop to spatial relationality • Temporal orders enacted & experienced in practice • Orientations toward past/present/ future	• As reality itself • A quality of the flow of action • Duration
Examples of theories used in IS research	• Theory of reasoned action • Technology acceptance model • Resource-based view • Game theory	• Institutional theory • Adaptive structuration theory • Sociotechnical theory • Systems theory • Affordances	• Actor–network theory • Social practice theory • Performative practice lens	*(Published in OS):* • Process theories • Flow theories • Theory of lines
Conceptual vocabulary	• Independent variables • Impact • Moderating effect • Mediating effect • Causality • Correlation • Outcomes	• Structure/Agency • Intentionality • Affordance • Dialectic • Dynamic • Emergent causality • Mutual shaping • Temporal sequence • Life cycle system • Micro/macro • Institutionalization	• **ANT**: Actor, network, association, (non)human actants, intermediary, mediator, assemblage • **Social practice lens**: Situated practice, enactment, habit(us), field, X-in-practice • **Performative practice lens:** Mangling, performativity, sociomateriality, material-discursive practice, apparatus, entanglement, agential cut, intra-action	• Evolution • Becoming • Multiplicity • Flow • Movement • Duration • Creativity • Conditionality • Correspondence
What is foregrounded in IS research accounts?	• Causal or correlational interactions • Generalized patterns of behavior • Cognitive dimensions (e.g., motivations, traits, intentions) • Structural properties • Effects	• Intentional acts • Agency structure interplay • Contextuality • Discursive & interpretive frames • Emergent outcomes • The dynamic mutual shaping of socio-technical actors	• **ANT**: Symmetric (non)human agencies, interests, negotiations, enrollments, inscriptions, translations • **Social practice lens:** Habitual patterns, repetition, improvisation, tensions, unintended consequences • **Performative practice lens:** Performativity, emergent agency, co-constitution, inseparability	• Change as "all that there is" • Flow of action • Temporal conditionality • Temporal becoming
What is backgrounded in IS research accounts?	• Situatedness • Contextuality • Contingency • Emergence • Nonhuman agency • Temporal flow	• Co-constitution • Change as ontological • Leakiness of actors/ categories • Nonhuman agency • Temporal flow	• **ANT**: The blurriness of the (non)human agencies, unintended actions & consequences • **Social practice lens:** Non-givenness of social actors, non-repetitive action, consequential serendipity • **Performative practice lens:** temporal conditionality of enactments, flow of practices	• Local stability & local spatiality • Boundaries & boundary making • Planning & planned action

outcomes. As such, change is understood as a dialectic process of interactions between technologies, specific meanings, actions, structures, cultures, and so forth over time (Barley 1986; DeSanctis and Poole 1994; Markus and Robey 1988; Orlikowski 1992; Robey and Boudreau 1999)—where time is often clock time or a sequences of events/phases (Boland et al. 2004). A notable example is the affordance studies in IS that focus, though not always over time, on the emergence of action possibilities from the interactions of goal-oriented users with IT artifacts (Leonardi 2011; Volkoff and Strong 2013; Zammuto et al. 2007). Overall, in this stream, as with Stream 1, actors or entities remain what we take them to be with their primary or essential qualities unchanged, and only change in their secondary qualities (Smith 1990).

Process Orientation: Moving Toward Decentering Actors

Alongside and in response to these entity-oriented streams, other streams of work have emerged that are more rooted in a process ontology (Helin et al. 2014; Langley et al. 2013; Tsoukas and Chia 2002), where IS phenomena are taken as comprised not of entities but of ongoing processes. This ontology flips the classical relation between actors and change—from things that change to the idea that change, or better, (trans)formation is "all that there is" (Sandberg et al. 2015). As such, these streams have further moved away from the view of actors/entities as bounded and pre-given loci of action—and therefore explanation—and offer different approaches to decentering actors/entities.

Stream 3: Relational Enactment[4]

Drawing from Actor–Network Theory (ANT), social practice theories, or post-humanist practice lenses, studies in Stream 3 primarily foreground the ongoing relational enactments of actors/entities in practice.

Stream 3a: ANT Studies: ANT-based IS studies contribute to decentering actors by foregrounding heterogenous—and importantly nonhuman—agencies as equally engaged in constructing IS phenomena (Latour 2005; Law 2004). Specifically, they foreground the relations of enrollment, inscription, and translation amongst such different agencies belonging to managers (Gasson 2006), developers, but also documents and methodologies (Cecez-Kecmanovic, Kautz et al. 2014), ERP systems (Elbanna 2013), and so forth. However, by emphasizing the symmetry of human and nonhuman agencies, the ANT vocabulary tends to backgrounds the increasing blurriness of any division between such agencies (Orlikowski and Scott 2015). Moreover, by often foregrounding strategic negotiations or interest-laden translations (Cho et al. 2008; Heeks and Stanforth 2007), these studies tend to background unplanned actions and unintended consequences.

Stream 3b: Social Practice Studies: Studies drawing from social practice theories (Bourdieu 1977; Nicolini 2012; Schatzki et al. 2001) contribute to decentering actors/entities by shifting the focus away from the actions of *individual actors* toward social practices (Feldman and Orlikowski 2011). Specifically, they foreground how organizational phenomena, such as patterns of technology use (Orlikowski 1996) or offshore collaborations (Levina and Vaast 2008) are enacted in everyday practices through diffused improvisations (Orlikowski 1996), situated negotiations (Azad and King 2008), or even onlookers' unintentional reactions (Sergeeva et al. 2017). They also foreground how such enactments are complex and multiple, fraught with tensions, contradictions (Oborn et al. 2011), and unintended consequences (Schultze and Orlikowski 2004). However, while the "practice lens" vocabulary foregrounds how phenomena, such as technology, are not pre-given but always enacted-in-practice (Orlikowski 2000), its human-centrism backgrounds a similar problematization of human actors (Orlikowski and Scott 2008). Indeed, studies often treat practices simply as *what social actors do*, more or less habitually, but also sometimes strategically (Oborn et al. 2011). Moreover, by foregrounding patterns and repetitions this vocabulary tends to background serendipity, non-repetitive actions, and one-off yet consequential events.

Stream 3c: Performative Practice Studies: Finally, studies that adopt a performative practice perspective further contribute to decentering actors/entities by foregrounding "non-dualist couplings" (Pickering 2010) of social and material actors or by foregrounding the inherent inseparability of those categories (Barad 2007). As such, they foreground socio-material configurations (Cecez-Kecmanovic, Galliers et al. 2014; Orlikowski and Scott 2008; Suchman 2007), and not any social or material actors, as responsible for producing phenomena such as plagiarism (Introna and Hayes 2011), activist solidarity (Stewart and Schultze 2019), or value in online communities (Barrett et al. 2016). Drawing from Pickering's (2010) mangle of practice, studies foreground how such outcomes are emergent through a process of tuning where human and material agencies continually resist and accommodate each other (Barrett et al. 2011; Venters et al.

[4]We summarize these approaches based on their underlying theories, although we recognize that some studies might be quite actor-centric in their application of theory. Moreover, we acknowledge that although IS studies drawing on these approaches might not explicitly draw from process metaphysics, their foundation in a relational ontology is processual in nature (Cecez-Kecmanovic 2016; Introna 2013; Shotter 2006).

2014). Other studies drawing from Barad's (2003, 2007) agential realism problematize the givenness of human actors and foreground how the boundaries, properties, and roles of various sociomaterial participants within phenomena—such as anonymity (Scott and Orlikowski 2014), embodied identity (Schultze 2014), or subjectification (Hultin and Introna 2019)—are locally determined through the agential cuts made in material-discursive practices. While these vocabularies offer some of the most sophisticated treatments of the human–technology relationship, they too tend to background certain issues. For example, by taking recurrent sociomaterial practices as the point of departure and foregrounding their iterative outcomes, they tend to background the temporal flows along which those practices coevolve themselves and continually become what they are at any moment. They also often tend to background the directionalities of such flows: how prior enactments create the conditions for the next enactment to become possible. Moreover, as with social practice studies, such a foregrounding of recurrent patterns tends to background serendipity and consequential coincidences.

Overall, Stream 3 has made important strides in moving us away from actor-centricity; by recognizing the multiplicity of distributed actors and agencies that participate in the enactment of phenomena, by acknowledging how actor/entity categories are not pre-given but enacted in social practices, and by problematizing any pre-given separation between different types of sociomaterial actor categories. However, the underlying vocabularies in Stream 3 often foreground relational enactment over temporal becoming (Cecez-Kecmanovic 2016). To be sure, studies interested in the role of temporality have complemented or nuanced their underlying vocabularies by adding to them different temporal dimensions—such as, cycles and rhythms (Lee and Liebenau 2000), windows of opportunity (Tyre and Orlikowski 1994), temporal symmetry (Lee 1999), time–space regionalization (Nandhakumar 2002), and so on. For example, Scott and Wagner (2003) highlight the temporality implicit in ANT's notions of negotiation and translation by studying how "multiple times, especially subjective temporal perceptions" can shape an ERP implementation. Similarly, Orlikowski and Yates (2002) highlight the enactment of temporal structures in social practices, such as "weekly meeting schedules, project deadlines, academic calendars, financial reporting periods" (p. 685), while Kaplan and Orlikowski (2013) highlight the work required for settling competing temporal interpretations, such as "what has happened in the past, what is at stake in the present, and what might emerge in the future" (p. 965). Similarly, Venters et al (2014) use a trichordal approach (Emirbayer and Mische 1998) to foreground the role of divergent interpretations of the past, present, and future to highlight the temporality of Pickering's tuning approach.

However, to develop a more nuanced and explicit understanding of the (trans)formative dynamics of temporality, we need to move beyond adding temporal dimensions to our existing frameworks in an *ad hoc* manner and instead develop vocabularies with temporal "units" of ontology and analysis. That is, we need to move toward an explicitly *temporalizing vocabulary*.[5] This is where Stream 4 comes in.

Stream 4: Temporal Becoming

Although this stream has not produced any significant research in the IS literature, it is producing a growing number of studies in organization studies (see for reviews Cloutier and Langley 2020; Holt and Johnsen 2019). Sharing a similar processual ontology with Stream 3, these studies however explicitly draw from process philosophies (Bergson 2007; Helin et al. 2014; Whitehead 1978) and aim to foreground the temporal flow of change. For them, reality *is* change rather than things that change and therefore whenever and wherever we find the world it is already on the move,[6] in a state of ongoing becoming, or better, (trans)formation.

In studying, for example, sensemaking (Introna 2019; Sandberg and Tsoukas 2020), leadership (Tomkins and Simpson 2015), institutional endurance (Weik 2019), identity reconstruction (Schultz and Hernes 2013), or translation of management ideas (Hultin et al. 2020), these studies background actors and instead foreground the temporal conditioning of the flows of everyday practices. In doing so, they treat action not as originating from actors and exercised in interactions among them (Chia 2002; MacKay and Chia 2013; Tsoukas and Chia 2002). Rather, they foreground the historically contingent and situated flows of action along which actors/entities are always in the making—that is, action prefigures and configures actors.

Although, this work has had some influence in IS research, we still stand to benefit from a deeper engagement with it. Indeed, despite the overall aim of this stream to foreground

[5]When we propose a new vocabulary, we are not suggesting that we should merely be speaking about the world differently (i.e., use different words to describe reality). Words (or vocabulary) do not just refer to something, they also do something. Differently stated, our theoretical language is performative. For example, we take ourselves as actors because different discourses refer to us as actors. In taking ourselves as such we then imagine ourselves in particular ways (e.g., as having original intentions, thoughts, or feelings). A new vocabulary thus introduces a new conceptual landscape rather than a new description of an existing landscape.

[6]Such an emphasis on *movement* as the primary condition of becoming, shows the connection of spatiality to temporality. Space is always and already about spacing or dwelling which is itself a temporal process (Gherardi 2019; Malpas 2008).

the temporal qualities and conditionalities of flows of action, we currently lack a nuanced and empirically applicable analytical vocabulary to actualize this potential—a decidedly temporality-first vocabulary that makes it more difficult for us to fall back on the old actor-centric and spatial habits of thought; a vocabulary of flow, movement, and ongoing becoming—with which to *think movement* (Chia 1999).

We have now summarized three broad streams along which IS research has studied and accounted for socio-technological transformation. We also presented an almost absent Stream 4 along which this paper is positioned. At this historical moment, where contemporary digital reality is no longer containable within neat boundaries, categories, and models, we argue for an increasingly critical need for IS research to embrace such temporal—and flow-oriented— understandings of IS phenomena.

From Interaction, to Intra-action, to Correspondence

In this section, we will outline our proposed flow-oriented vocabulary, which is inspired by our readings of the works of Bergson (1910, 2007), Foucault (Dreyfus and Rabinow 1983; Foucault 1977, 1980, 1984), and, more importantly, that of the social anthropologist Tim Ingold (2007, 2011, 2013, 2015, 2017)—himself influenced over the years by the works of Marx, Heidegger, Gibson, Bergson, Deleuze, and Dewey, among others. We will also argue in more detail why and how this vocabulary is different from existing work and why that matters.

Vocabulary Matters: The Logic of Inversion and its Consequences

Everybody knows that *life flows*. When we wake up in the morning the world is different to the one that we "left behind" when we fell asleep. We talk about "falling behind" and "catching-up" in our work, with our friends, and so on. When we look out of our window, we see the "going on" of life—life as always on the move, always and already *going on*, flowing from somewhere toward somewhere (Gergen 2012; Hernes 2014). Yet, we tend to treat things otherwise in our theorizing (Chia 1999). Ingold (2015) suggests that our habits of thought orient us to grasp this flowing world in terms of bounded entities, using spatial metaphors, such as building blocks, containers, modules, points, nodes, and so forth. Think of how often we conceptualize information systems as collections of components or modules, or how often we think of context as a container of relevant actions or events (Avgerou 2019; Winter et al. 2014). These spatial metaphors lead us to think of phenomena as assembled from preformed externally bounded things or events.

Ingold characterizes this habit of thought as resulting from an implicit *logic of inversion*[7] which "turns the pathways along which life is lived into boundaries within which it is enclosed" (Ingold 2011, p. 145). He likens this to "confusing the curling movement of your hand in drawing a circle, and the trace it leaves, with the perimeter of the completed figure" (Ingold 2015, p. 54). Through this logic, the flowing, open and decentered going-on of action is often inverted into a localized and outward expression of *something already inside* (e.g., inherent agency, cognitive schemes, or cultural scripts within an actor's head). As such, beings that are originally open to, and intrinsically bound up with each other are closed in upon themselves. Ingold argues for a different orientation, one that takes the world as always and already flowing, on the move. Going back to the example of drawing a circle, he invites us to see the circle temporally, as a coil—a spiral. This implies, for example, shifting from a focus on users and computer systems toward foregrounding the temporal flows of *using* and *computing* (Yoo 2010).

Thinking Temporally with and Along Flowing Lines of Action

According to Ingold, the primary condition of being in the world "is not to be *in* a place but to be *along* a path," not to be contained but rather to be *on the move* (Ingold 2011, p. 12). Indeed, he has taken to talk about *lives* rather than individuals to denote this idea, for

> lives are not closed-in entities that can be enumerated and added up; they are open-ended processes whose most outstanding characteristic is that they *carry on*. And in carrying on, they wrap around one another, like the many strands of a rope. A whole that is made up from individual parts is a totality in which everything is articulated or "joined up." But the rope is always weaving, always in process and—like social life itself— never finished. Its parts are not elementary components but ever-extending lines (Ingold 2011, p. 11).

Ingold invites us to shift from thinking about phenomena with bounded entities (i.e., in spatial terms) toward thinking with lines, or better, *flowing lines of action* (i.e., in temporal terms). A flowing line of action does not connect already existing entities (like the lines of a network), nor is it com-

[7]This is similar to Whitehead's (1978) notion of the *fallacy of misplaced concreteness*, which treats the universe as consisting of self-sufficient isolated bits of matter.

posed of a sequence of activities. Instead, they are lines along which growth, movement, and (trans)formation occur—they are "trails *along* which life is lived" (Ingold 2016, p. 81), or for our purposes, they are *trails along which actions flow*.

Let us take the example of a software application. Traditionally we could think of software in spatial terms as static assemblies of interacting modules and features that were delivered on physical disks and carried out specific computing tasks. However, as agile development, continuous deployment, cloud computing, subscription models, and so forth have transformed the development, delivery, and consumption of software into nonevents, they have also made such a spatial (entitative) view limited and limiting. Instead, we can think of contemporary software in temporal terms as continuous meandering flows of computational services or experiences—experiences that are made possible through confluences along unfolding trajectories of languages, frameworks, devices, data streams, web services, APIs, but also along (trans)forming careers, habits of use, trends and fads, regulation, best practices, and so forth. Any version release is but a milestone along this continuous process, a process that is already temporally stretched beyond that version in many directions (e.g., in the form of Git branches). Such an appreciation of the temporal nature of contemporary software can already be seen, for example, in the shift by agile developers from specifying requirements in terms of features toward a focus on "user stories" and "user journeys" to better map and facilitate how users move through and along a software solution.

What is then so fundamental about a flowing line of action? First, such a flowing line has duration (Bergson 1910); it cannot be reduced to a sequence of instances, events, stages, or acts. The flow of a melody, a football match, or an IS project is more than a mere sequence of notes, player/ball positions, or project meetings, although they can be represented as such before or after the fact (e.g., for planning or analysis) *but exactly at the expense of the flow itself*. Rather, their flow is about their very continuity and the impossibility of breaking them up without losing what they are (Chia 2002). That is, *in the moment,*[8] *what characterizes phenomena is how, and along which lines, they are flowing*. We know this already when we say, "the match is not flowing in our favor" or when we ask, "Where is this project going?" Flow thus refers to a *quality* that emerges through the creative absorption of previous trajectories of action and their ongoing weaving into ever-new paths (Chia 2002). In other words, if we wish to appreciate the flowing line of action, we need to focus on how trajectories of unfolding action create the "conditions of possibility" for further action along certain directions (Foucault 1980).

[8] Throughout this paper, by *moment* we refer not to an instance of clock time but a duration (Bergson 1910).

Second, just as a line is prior to any shape, the flowing line of action is prior to any actor brought into existence along its flows. Whenever and wherever we find ourselves acting we are already animated along some flow. Indeed, for Ingold, the things we assume to be alive and active are so not because they possess some innate spirit or agency, but rather because they continue to be swept up along the generative flows of action that go into animating them: "things are in life rather than life in things" (Ingold 2011, p. 29). Just think of how paralyzed you feel when your phone battery dies, or worse your computer gets locked by ransomware. Without the flows of power that animate your phone, you are no longer the same "connected" person. Without the flows of operating system, internet connection, apps, search engines, data streams, online discussions, etc., you are no longer the same "developer" or "writer." Alternatively, visit an abandoned Facebook group or a "dead" GitHub repository and you will see how without (most of) the flows of action that animated them, they no longer do much nor provide much possibilities for action. As such, to bring things to life in our studies is a matter of "restoring them to the generative fluxes … [along] which they came into being and continue to subsist" rather than of "adding to them a sprinkling of agency" (Ingold 2011, p. 29). But how exactly can flowing lines generate new possibilities for action and (trans)formation?

Correspondence: Creating, Sensing, and Actualizing Possibilities for Action

In a world of ever-extending lines, knotting or weaving together is the fundamental principle of form (Ingold 2015). In such a world, phenomena are continually formed and transformed when a multiplicity of flows of action, issuing forth along different lines, coincide and coil around one another "in a countervalence of equal and opposite twists which hold [them] together and prevent [them] from unravelling" (Ingold 2015, p. 11). Ingold develops the concept of *correspondence* to refer to such weaving together of flowing lines of action, which we define here as the *(trans)formative interweaving of co-responsive flows of action*. Thus, correspondence offers a notion of relationality that goes beyond spatial relations and that is decidedly temporal. Correspondence is not about a relation *between* one thing and another—an actor and its environment, a human and a technology—one "here" and the other "there." Rather it denotes a relationality *along* paths "through the terrain of lived experience" (Ingold 2011, p. 161), where a multiplicity of flowing lines of action join in a confluence and give rise to specific (trans)formative dynamics, as we shall see below. Such a co-responsive interweaving of flowing lines of action is exactly that which forms and transforms the trajectories of a melody, a football match, an IS project, in the moment and as they flow.

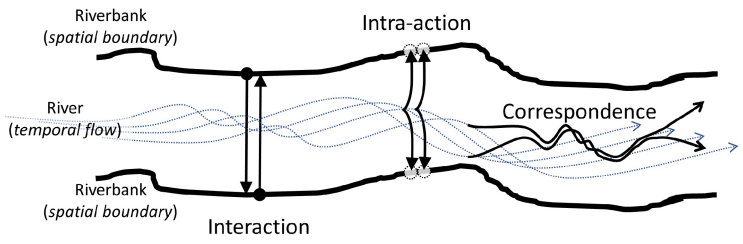

Figure 1. Different Conceptions of Relationality: Interaction, Intra-action, and Correspondence

Before further developing the notion of correspondence, it might be helpful to contrast it with alternative notions of relationality in IS research via the imagery of a flowing river (Figure 1). The traditional more entity-oriented approaches start with locating bounded entities (the riverbanks) and then seek to understand their relationality as the *interaction* between those separated entities. This interaction is seen as the cause of any changes between them. An alternative notion of relationality in the process-oriented approaches is *intra-action* according to which the boundaries (the riverbanks) do not preexist their relative demarcations in different practices. That is, riverbanks are enacted differently through cuts made in practices—such as, cartography, drawing, swimming, jumping, bridge construction—that explicitly or implicitly delineate the banks relative to each other and to the river.

The notion of correspondence, however, suggests that we shift our gaze away from spatial relations between the river banks, toward temporal relations, or co-responsiveness, among ongoing flows of the river. As such, it specifically brings into focus the different temporal qualities, conditionalities, and directionalities of interweaving flows of action to account for their (trans)formative potentials. In other words, it is a vocabulary that allows us to move along the flow of the river (flows of action), as it gnaws away at the banks while also bringing them nourishment and fertility (Ingold 2016), rather than opting for the relative stability and certainty of the riverbanks (bounded categories).

To elaborate on the (trans)formative dynamics of correspondence, we will now focus on how, in our reading of Ingold, new conditions of possibility for action are *created*, *sensed*, and *actualized* during correspondences among flowing lines of action. We do this by characterizing three modalities of correspondence: timing, attentionality, and undergoing.[9] In the interest of space and the flow of reading, we will develop these concepts here and will postpone their illustrations to the next section.

Correspondence Is a Matter of Timing

Correspondence along flowing lines of action is a matter of *timing*, which concerns how new conditions of possibility for action are created along the flow. Following a distinction recognized since ancient Greece (Smith 1969), the notion of time here does not refer to *chronos*—a single uniformly marching forward arrow divisible by clocks into discrete instances that are distinct only in their order of happening (past–present–future). Rather, it refers to *kairos*—the quality of being the "right" time, or the "best" time; what we capture in English with the word timing (Smith 1969), or the timely moment. This shift from chronos to kairos entails several implications for how new conditions of possibility are created along corresponding flows.

First, temporality in correspondence is not merely a matter of the past–present–future order of events. Rather, kairotic timing foregrounds the conditioning and (trans)formative dynamics of other temporal qualities of flows of action, such as their directionalities, tempos, intensities, rhythms, momentums, urgencies, timeliness, and so on. Second, kairotic timing goes beyond a single universal timeline. It instead recognizes that different lines of action flow with different temporalities, each with its own rhythmic directionality, intensity, and so on. Here we do not simply mean a difference in subjective perceptions of a universal time. Rather, that different lines of action command different practical temporalities (Heidegger 1962; Orlikowski and Yates 2002; Sandberg and Tsoukas 2020). Finally, kairotic timing denotes that not all moments are equal for action. Rather, an opportune or timely moment arises when different flowing lines of action, issuing forth with different temporalities, converge and flow co-responsively along a shared path. Figure 2 depicts such a kairotic *meshwork* (Ingold 2015).

[9]In reading Ingold's work, one can trace an evolution of the three "principles" of correspondence. Here, based on deep engagement with this concept, we have constructed a framework that make the most sense for our purpose of proposing a flow-oriented view of socio-technological (trans)-formation.

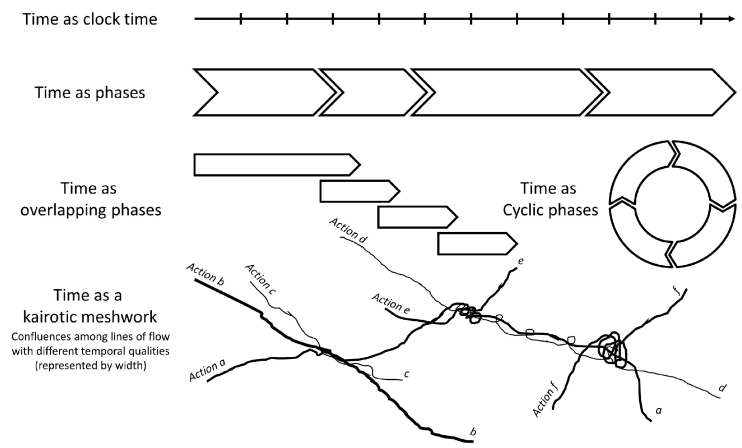

Figure 2. Chronological Versus Kairological Time

Such a notion of timing *reveals how kairotic correspondences among diverse flowing lines of action create new conditions of possibility for action*. Such a notion of temporality allows going beyond linear or circular conceptions of temporality whereby only the previous event/phase/act conditions the next, to one in which different lines, flowing from different directions and with different temporal qualities, impart heterogenous conditionalities to any specific moment. Importantly, sensing such timely possibilities requires attentional attunement.

Correspondence Is a Matter of Attentionality

Correspondence along flowing lines of action is a matter of *attentionality*, which concerns how possibilities for action are sensed along the flow. Attentionality here does not merely refer to a cognitive faculty, a mental resource at the disposal of some originating actors. It is not an awareness *of* something. Rather, for Ingold, the main quality that makes correspondence attentional lies in the skillful *attunement*[10] of a line with the rhythmic trajectories of other flowing lines of action in any habitual practice (such as, walking, talking, playing an instrument, writing, browsing). This does not mean of course that there is no cognition at work in such practices. However, in engaging with these practices, for example, in playing an instrument, our cognition is fully *immanent* along the flow of the song, the rhythmic directions of the melody, and the tunes of the other musicians we might be playing with, rather than an originating source to which the music may be attributed as an effect. Attentionality thus forgoes the cognitivist model of intentional planning and (un)faithful execution in favor of sensing possibilities for action through exposure and attunement, experimentation and fine-tuning.

Indeed, in contrast to the notion of intention, attention is not consciously directed by a subject. Attention "can be caught or captivated, pulled in one direction or another, or sometimes in several directions at once" (Ingold 2017, p. 19). It is emergent in the flow of action, "activated by the force of the directionality [it] calls forth" (Manning 2016, p. 154)—as any jazz player (but also social media user, stock trader, manager, and so on) already knows. Intentions on the other hand are but milestones, often retrospectively designated, in the flow of attentionality. As such, correspondence is not simply an outcome of intentional acts, but rather the very process of attentionally going along with flows of action (i.e., of skillfully attuning and co-responding to their temporal qualities) to sense the emergence of new possibilities along the flow.[11] Overall, the notion of attentionality *reveals how sensing possibilities for action is about being exposed and attuned to corresponding flows of action*. It is closely related to kairotic timing: sensing the opportune conditions of possibility for action requires attentional attunement to the flow. Importantly, actualizing such possibilities entails an undergoing.

[10]The notion of *attunement* is used here both in the everyday sense of being in harmony with or responsive to something, and in the philosophical sense, as outlined by Heidegger (1962) and Merleau-Ponty (1996) with his notion of "intentional arc." As Haar (2002, p. 149) argues, for Heidegger, attunement is a manner of being engaged with the world that reveals "the co-presence of all things in a way more comprehensive than any comprehension, more immediate than any perception." Such attunement comes from exposure and absorption in the flow of the moment, what jazz musicians call "being in the groove."

[11]This is similar to Bergson's notion of intuition (Bennett 1916).

Correspondence Is a Matter of Undergoing

Correspondence along flowing lines of action is a matter of *undergoing,* which concerns how possibilities for action are actualized along the flow. According to grammatical conventions, acting/doing is something you do; undergoing is something that happens to you. However, Ingold challenges this dualism in favor of a temporal view that predicates moments of mastery/leading as emerging along an encompassing process of submission/following. He calls this continual interplay *doing-in-undergoing*, or undergoing for short. Think of how we are often swept along by a conversation, or whilst browsing, or by the flow of a meeting, where we both have the sense of actively participating but also being pulled along unexpected paths.

Thus conceptualized, undergoing is about actualizing (trans)formative possibilities. It enables us to put the "I" who acts not in front but in the midst of the experience undergone. That is, the notion of undergoing implies a shift from a view where agency is inherent in actors or circulating among distributed actors, to one where we become enabled to actualize (trans)formative action possibilities by having submitted to different corresponding flows of action. Think of how one must submit to the flow of the wave in order to actualize the action possibilities enjoyed by the "surfer"—slowly (trans)forming from someone kneeling on a board to an actual surfer as they become more skillfully attuned to the flows of the wave. As such, correspondence is not something that an actor does vis-à-vis another actor/entity thanks to her inherent agency. Rather, it is a creative (trans)formation a line goes through while being attuned to other flowing lines of action.

Therefore, the notion of undergoing *reveals how actualizing possibilities for action is about creatively rediscovering and reinventing one's path of becoming, animated by the corresponding flows of action one has submitted to*. As such, it is closely related to attentionality: actualizing possibilities for action sensed along a flow entails interweaving with that flow in (trans)formative ways.

From Intentional Acts over Time to Attentional Undergoings along Kariotic Flows

Taken together, our interpretation of these notions reveals how temporal relations, or correspondences, among flowing lines of action can give rise to (trans)formed flows of action without a need for invoking original actors. Specifically, correspondence entails a *moment of kairotic timing*, an *attentional orientation*, and an *experience of undergoing*. Timing is about the creation of new conditions of possibility for action along corresponding socio-technological flows, attentionality is about sensing such possibilities, and undergoing is about actualizing them along a (trans)formative path. This is not to imply a temporal order among these co-equal and co-present modalities of correspondence. For example, we do not wish to imply that during a correspondence sensing happens before actualizing (Csikszentmihalyi 1997; Sandberg and Tsoukas 2020). Rather the three unfold along and implicate each other. As a shorthand, we can say correspondence is about attentional undergoings along kairotic flows as opposed to intentional acts over time. Let us imagine this difference by looking at the relationship between a traveler and a boat. We might imagine a traveler *acting* on a stationary boat by *intentionally* boarding it, at any point in *time*. If, however, we are dealing with a moving boat and a swimmer, then boarding becomes a matter of carefully *attuning* the swimming to the motions of the boat (and if possible vice-versa), waiting for the best *timing* for boarding to present itself, only to be swept along by the movement of the boat that will allow for new potential destinations to become possible. Another example of such a correspondence with a moving target, is the correspondence among the path of a YouTuber and YouTube's flows of video recommendation and consumption. To make it as a YouTuber, content creators need to continually be exposed and attuned to those algorithmic flows to get a sense of what they reward and what they punish in terms of receiving attention and engagement—an ever-shifting target that can only ever be partially grasped through "guesstimating" and fine-tuning. Moreover, when they rediscover that their channel is picking up traction on a specific path, or when one of their videos goes viral, they often creatively reinvent themselves along that path, from sticking to a rhythm of uploads, to making their speech, hair style, attire, gestures, and apartment more YouTube-friendly, to increasingly sharing their personal lives, to leaving their jobs to become professional YouTubers, and much more besides.

Figure 3 depicts these three modalities of correspondence. In accordance to our flow-oriented thinking, we view our own concepts and their mutual implications as intertwining lines. This has the benefits of highlighting the temporal nature of the concepts and clarifying their relationship with their existing counterparts.

We suggest that the logic of inversion inverts the temporal intertwining of timing, attentionality, and undergoing into well-defined and bounded notions of time, intentionality, and doing/acting that are only externally related. On the other hand, an orthogonal cut in the flow produces mutually implicated notions of time, intentionality, and doing/acting that are internally related—but this, while backgrounding the flow itself. (To be sure, in the case of agential realism's cuts the

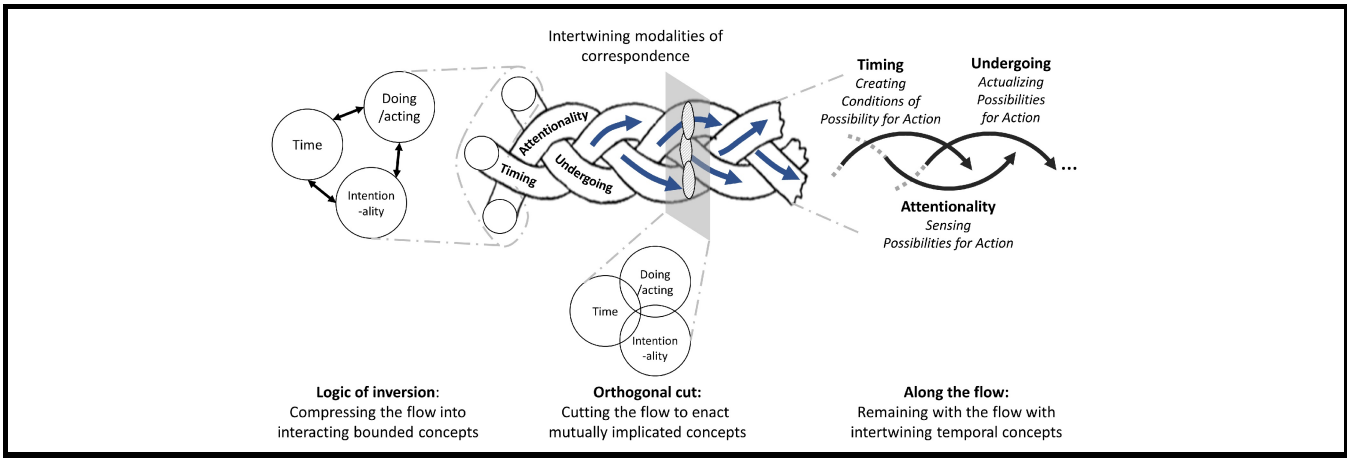

Figure 3. The Modalities of Correspondence, Seen Through Inversion, Cuts, and Along the Flow

Table 2. Theoretical Comparison with Alternative Streams

	Streams 1 & 2 Entity Orientation	Stream 3 Agential Realism	Stream 4 Flow Orientation
Ontological orientation	Actors (as bounded entities)	Phenomena (as entangled agencies)	Lines (as flows of action)
Epistemological orientation	Representational	Performative	Performative
Relationality	Interaction (empirical)	Intra-action (ontological)	Correspondence (ontological)
Temporality	Clock time	Temporal ordering	Timing
Orientation to the world	Intentionality	Boundary making	Attentionality
Agency/ becoming	Inherent agency	Co-constituting	Doing-in-undergoing
Methodological orientation	Locate actors and study interactions	Study enacted agential cuts in practices	Study corresponding flows by tracing story*lines*

three produced notions would be temporal ordering, boundary making, and co-constituting, see Table 2). Our aim in attending to Ingold's work on lines and correspondence is to study and theorize quite differently by staying with the flow and foregrounding the (trans)formative dynamics of its temporal qualities. And this requires concepts which explicitly foreground temporal qualities and conditionalities—as is the case with lines, flows, but also correspondence and its modalities of timing, attentionality, and undergoing. We believe such an approach to the world in its ongoing becoming, is closer to our actual experience of it—in all its contingencies, coincidences, intensities, and chaotic becoming. Table 2 summarizes in more detail the differences between our proposed flow-oriented vocabulary with those of Streams 1, 2, and 3.

Empirical Illustration: A Genealogy of #TCOT

In this section, we will further elaborate on and illustrate our proposed vocabulary through analyzing a genealogical story (Dreyfus and Rabinow 1983; Foucault 1984; Wilson 1995) of #TCOT—short for Top Conservatives On Twitter.[12] To this date one of the most popular conservative hashtags, #TCOT began in earnest as an amateur ranking of conservative Twitter users (self-dubbed as conservatweeps), but it soon evolved into a collaborative-competitive stream of political action, and eventually in 2009 became an integral organizing

[12]We will outline genealogy as a mode of inquiry in more detail in the discussion section below.

hub for the United States' Tea Party Movement. The overflowing nature of #TCOT as well as its showcasing of the role of social media in contemporary political democracy makes it specifically relevant to IS research. Specifically, it directly relates to work on novel forms of organizing (Vaast et al. 2017), online self-organization (Nan and Lu 2014) and collaboration (Faraj et al. 2011), but also collective sensemaking (Oh et al. 2015) and solidarity (Stewart and Schultze 2019) in IT-enabled social movements (Selander and Jarvenpaa 2016; Young et al. 2019). Our goal here, however, is to capitalize on the integral and ever-present role of technological concerns in this fluid phenomenon to showcase for researchers the value-added of our vocabulary in revealing the dynamics of creation (timing), sensing (attentionality), and actualization (undergoing) of new possibilities for action along corresponding socio-technological flows. In the following vignettes, *italics* indicate direct quotes from twitter streams, while "double quotation marks" indicate quotes from other sources.

A Short Story of #TCOT[13]

> The year is 2008 and social media is gaining exponential momentum. Facebook has just surpassed Myspace and Friendster in popularity. The one-year-old Twitter has taken online the popularity of text messaging and is also establishing the practices of unilateral following and hashtagging. The emerging iPhone and Android ecosystems have begun disentangling social media from desktops and making it mobile. It is also the time where the U.S. presidential election season is unfolding. Barack Obama—a young senator with a light résumé and little traditional clout—is becoming an unstoppable candidate partly thanks to his campaign's social media work. In the process, social media is also leaving behind its Myspace teen aura and is en route to becoming a forceful stream of political action—a stream that is surpassing those of conservative political action, leaving them behind an increasingly widening "Technology Gap." Pundits' analyses goes that the Republicans have remained the "talk-radio Party" with the traditional discipline of central and top-down communication and "staying on the message," while the Democrats have "discover[ed] …a better grassroots model" to raise money and "get boots on the ground" in electoral races.
>
> Amidst these streams, MPL, a 53-year-old Nashvillian IT consultant, agile enthusiast, blogger, and "political junkie," finds himself obsessing over Obama's number of Twitter followers and McCain's lack thereof—despairing that *liberals own the internet* and that the G.O.P. *is not getting it*. He finds Twitter a lonely place for conservatives—the *liberals' paradise* with conservatives being few, disconnected, and *lurking in the weeds*. He thus experiments with the idea of creating *a grading system of conservatives on Twitter*. On November 28, 2008, he compiles an amateur ranking of around 10 conservatives he knew on Twitter based on their numbers of followers and calls it Top Conservatives On Twitter. The response is more than enthusiastic—with the enlisted conservatives expressing how much they *love lists and scores*, recommending other names to be added to the list, and using the list to find other conservatives on Twitter. "All of a sudden people not [only want]…to be on the list" but are also admitting to being "proud" and "honored" about it. Encouraged, MPL continues expanding the list and with it comes more chatter and more exposure.
>
> It's early December 2008 and TCOT is already overflowing into the realm of collective action with a campaign to get all the 168 members of Republican National Committee (RNC) to join Twitter. An early relative success is leading others to join the effort. The next day, trying to stay abreast of the growing list (around 180 tweeple) and the new direction that TCOT was going, MPL seeks help for automating the ranking. Another conservative blogger and IT consultant, RN accepts and rolls out an *automated* and *sleek* ranking.
>
> It's January 2009. The TCOT list has grown to around 4,500 accounts. The #TCOT is heavily used

[13]The main source of data is 15,000 tweets from around 1,400 distinct accounts posted between November 2008 and February 2009. A self-developed application was used to scrape and store noteworthy historical tweets while scrolling through #TCOT stream for later qualitative coding. In the process, notes were taken on how the flow of TCOT was emerging and evolving and how in the process "conservatweeps" were learning and becoming skilled at twittering practices. The tweets were coded based on recurring patterns of actions and expressed experiences, twittering practices, but also evolving storylines, contingent events, and other emerging ideas. In many cases the tags were effectively used to code streams of tweets rather than individual ones as the focal tweets were not standalone acts but part of a stream of tweets that constituted the evolving multi-party storyline. Thanks to the specificities of the TCOT case, the analysis goes beyond a content analysis of *tweets* as speech acts and instead focuses on the practical activities accomplished in the flow of *twittering* practices (i.e., sociomaterial practices in, around, and related to Twitter). Through this process, we analytically delineated different constitutive practices, events, and emerging lines of action and formed a particular understanding of TCOT's corresponding storylines.

by conservatives to reach each other—leading it to become trending. The now "TCOT community" is boasting to have around 30 "self-organized Action Projects" in its portfolio—projects as varied as finding *new recruits*, producing a *TCOT manual* for newcomers, sending angry caricatures to congresspersons, and most ambitiously identifying and supporting conservative candidates to run for Congress in 2010. In time these action projects become a template and key force for organizing the first Tea Party rallies. Although the ranking itself suddenly goes down on April 30, 2009, #TCOT will continue to be the conservative hashtag for years to come, as the Tea Party Movement continued to gain momentum and become a major stream of political action in U.S. politics and before eventually feeding into the emergence of the Trump train.

Timing: An Opportune Moment along Flows

Grounded in the story above, in this subsection we will demonstrate how correspondence is a matter of *timing* and what this implies for research. Specifically, we demonstrate how this notion reveals the ways in which kairotic correspondences among multiple historical and situational flowing lines of action *create new conditions of possibility for action*.

In the above story, we can already see how what we might take as *a simple act* of creating a ranking of conservative Twitter users became possible and plausible during an opportune moment when different broad-stroke historical lines of action, issuing forth from different times and places and carrying different conditionalities, corresponded in contingent yet consequential ways. Had twittering not been an up-and-comer on the techno-cultural scene; had the new feature/practice of unilateral following not disentangled twittering from the flows of offline friendship and thus not created possibilities for "unbounded reach" and "influence" on Twitter; had Obama not done well on social media and was not poised to push his agenda with the clout of an online army (PBS 2008); therefore, had social media not been *en route* to becoming a forceful stream of political action, had the G.O.P. not been lagging behind on their "digital ground game" and had MPL not been already well-versed in IT as well as conservative political action, had these historical lines of action not converged in November 2008, conditions might not have been favorably aligned for an idea like TCOT to be conceived and to work the way it did.

Moreover, in the vignette below we can also see how opportune correspondences among fine-grained situational lines along which different practices flow further created the conditions of possibility for starting the TCOT ranking:

> The date is November 27th—one day before the creation of TCOT: For a while MPL has been on a path of "picking up" followers by following tweeple en masse and banking on the percentage that might follow back. However, approaching following 2000 tweeple, he realizes that Twitter won't allow him to follow more. Asking around, he is told that the so-called 2000 Follow Limit is there to counter follower farming and that to surpass it he needs to first gain around 2000 followers (he has around 1300). The next day, while @replying to prominent tweeple (a recommendation of Mr. K, a famous tech guru, for "picking up" followers), MPL gets lucky when Mr. K himself responds. The short correspondence ends with: *[@K] I think my goal will be more modest. To be the #1 conservative on Twitter. Since there are so few trying, how hard can it be?* Over the next hours, this exchange attracts the attention of two tweeple scrolling in California and Texas. The former, a *women's fitness coach*, @replies MPL rather jokingly: *set up your own grading system and you can get your #1 ranking. :)*. At first, MPL doesn't take the idea seriously, @replying: *Yes, but so tranparently self-promoting! LOL*. After a few hours though, and with the help of the latter woman, a *conservative home schooling mom*, he compiles a list of around 10 conservative tweeple, ranks them based on their number of followers, puts it on a clumsy-looking blog, uses a hashtag for his first time, and tweets *#conservativesontwitter Here's the ranking! [link] if you're not on the list, tweet me!*

We can see how the emergence of TCOT cannot be fully explained simply with reference to a user's perceptions/goals (e.g., to gain followers) and a technology's features (e.g., unilateral following, 2000 Follow Limit, @Reply vs. @Mention), if those are to be considered *outside the flows of action that enacted them in specific ways*. For example, had MPL's follower cultivation unfolded in a different direction with a different rhythm and intensity, the 2000 Follow Limit would not have been invoked to stop him, he would not have had to search for a way to overcome the limit, and his path of becoming a tweep might have unfolded in a different direction—one in which creating the TCOT ranking would not become an obvious course of action.

Another example is the conditioning nature of different flows of scrolling. As a tweep, the "reach" and "influence" of MPL rested on *his followers' flows of scrolling and engaging*. Specifically, the tempos and intensities as well as the timeliness of their scrolling, coupled with how Twitter's algorithms order, organize, and translate these into flows of tweet streams, was conditioning MPL's possibilities for meaningful action. With less scrolling, more premium is placed on

the most recent tweets, on instantaneity, and on constant twittering. On the other hand, more scrolling might give more chance for other tweeple to materialize on screens, and for more serendipity to become possible. TCOT was born at such a serendipitous correspondence along different flows of scrolling where different attentional flows coincided in a timely way. Namely, since MPL had unwittingly @replied Mr. K (as opposed to @mentioning him), his tweet would not enter the Home streams of all his followers but only those of a subset who followed both tweeple—and thus were more likely to be attentive to technology and/or conservative concerns—which in turn conditioned the direction the conversation developed. This of course required that subset of tweeple to be scrolling enough through their Home streams before the conversation would become buried. And *by coincidence* two such tweeple attended to the correspondence: one gave MPL the idea and the other helped him compile the first list. As such, we can see how through an opportune correspondence the *seemingly insignificant* became significant in a moment, and how our notion of timing offers a way to reveal this.

Overall, we can see how *timing is constitutive of conditions of possibility for action*. Such a focus on the timing aspect of correspondence offers a decentered view of the emergence of action possibilities. For example, it allowed us to refrain from arresting the flows of action within the confines of what we might have taken as Twitter, or from solely focusing our "gaze on the intersection between people's goals and a technology's material features" (Leonardi and Vaast 2017, p. 152). Instead, it allowed us to reveal how contingent correspondences among diverse flows of action, imparting conditionalities from different times and places, made certain actions possible and plausible at certain moments.[14] Moreover, it allowed us to go beyond intra-active enactments of tweeple and Twitter in repetitive patterns of twittering practices, and also attend to how kairotic correspondences along the flows of such practices (and others) can give rise to serendipitous and coincidental new possibilities for action. In sum, the notion of timing reveals how *unlike interaction or intra-action, correspondence cannot take place at any moment but rather requires the timing to be "right."*

Attentionality: Exposure and Attuning to the Flows

In this subsection we will demonstrate how correspondence is *attentional* and what this implies for research. Specifically, we demonstrate how this notion reveals the ways in which *sensing possibilities for action* entails being exposed and attuned to the temporal qualities of corresponding flows of action.

We have already seen above how it is difficult to attribute the emergence of the TCOT ranking to an originating intention. Rather, TCOT was conceived when certain tweeple who were going along the flows of their home streams attended to a correspondence out of which came, rather jokingly, the idea for TCOT. Here, we will show the role of attending to and corresponding with the rhythmic directions and intensities of the flows of the emerging TCOTing practices:

> A few days after the creation of the ranking and already hashtagging with #TCOT has become a *highly addictive* way to engage with other conservatives, to socialize, share news, ask practical questions, chat about political issues, or even drive traffic from the #TCOT stream to one's website or blog. The more the #TCOT stream is getting popular, the more its rhythm becomes instantaneous: *there is no 'get back to it when I have time.' Then it is already lost* and the more difficult it is to *keep up* and not get *overwhelmed* by #TCOT's *tweetstorm*. As such, conservatweeps who don't want to feel left out begin investing more time to keep up with the rhythms of TCOT. Some are spending more time twittering, updating their blogs more frequently to stay relevant to daily #TCOT trends. Others are taking their laptops to the kitchen whilst cooking or are asking their family for a smartphone for Christmas. Still others are using third-party add-ons: *#tcot has forced me to learn to use @TweekDeck groups to maintain my sanity...and I only have 112 followers*.

We can see how hashtagging was channeling conservatweeps' dispersed twittering flows into the #TCOT stream where they were more likely to be corresponded with, "pick up" new followers, and thus boost their possibilities for action and becoming. However, as #TCOT was becoming more popular, conservatives who did not want to miss out on where TCOT was going, needed to keep up with the increasingly demanding temporal rhythms of this stream—especially its morning/evening traffic which had become for some *like taking a sip from Niagara Falls.* As such, some were adjusting the tempo of other flows in their lives to the flows of TCOTing by twittering more frequently and on-the-go while others were enlisting the help of third-party add-ons to create groups and filters to improve their responsiveness across multiple conversations, @Replies, DMs, and hashtags. As such, we can see how to sense the possibilities to act as conservatweep was about tuning into flows of TCOTing,

[14] In addition to the flowing lines of action covered here, the main genealogy also traces TCOT's path through timely correspondences among flows of book deals, blogging, radio shows and podcasts, third-party Twitter add-ons, conference calls, online TV shows, and finally on-the-ground rallies.

going along their rhythmic directions, intensities, storms, and periods of dullness—being pulled and pushed in different algorithm-laden directions.

Note that, unlike intention, attention does not presuppose an initiating or directing subject. Rather, attention can be "caught or captivated, pulled in one direction or another" by the directionalities of flows. For example, it was not so much the conservatweep's intentions that conditioned what they attended to, it was also the flows the #TCOT stream—itself constituted by other conservatweep's flows of engagement as well as the algorithmic actions that continually prompt, channel, and match those flows:

> #TCOT has become trending on Twitter *even higher than #santa* and is thus attracting more attention to itself. It is heartening for conservatweeps to see their hashtag among the most popular on Twitter and thus keeping #TCOT trending has become a goal in itself: *keep those keyboards hot!* Since becoming trending TCOTers are constantly called upon to answer newcomers' question of *What is #TCOT?*, the standard response to has become *its conservative folks banding together in community, action & dialogue* in addition to giving a link to TCOT's website and blogposts about it. However, trending for #TCOT also means reaching outside the conservative *twitterverse* attracting 'unwanted' attention: *Conservatives are really taking over the trends, #TCOT*. This is leading to different flows of spamming and trolling attacks. Since there is no organized liberal hashtag for conservatweeps to attack in retaliation, some are using #TCOT itself to confront the trolls—furthering the "Twitter war" that is engulfing the stream. Although the new traffic in the stream is pushing #TCOT higher in trending, but it is also threatening to dilute or overtake the stream. Conservatweeps are facing a daunting realization that they *cannot control a hashtag* nor apparently their community.

We can see how TCOTing flows corresponded with those of Twitter's trending algorithm. The latter continually attends to flows of twittering practices in order to pick up and promote not necessarily the most popular hashtags but those that it deems most likely to generate new attentional flows. Becoming trending not only amplified and extended the flows of TCOTing, but also created conditions for new correspondences with other flows of twittering. On the one hand, in correspondence with flows of curious questions, existing TCOTers had to constantly make sense of what is happening in and around TCOT. On the other hand, it also exposed #TCOT to non-sympathizing attentional flows in the form of spamming and trolling attacks that were disrupting the flow of the #TCOT stream—making it difficult for conservatives to attune themselves to the flow (e.g., by discovering they had been trolled after several exchanges). However, the attunement of conservatweeps to a multiplicity of the other TCOTing flows (e.g., flows of ranking, reciprocal following, action projects) eventually made TCOT resilient against the attacks and allowed it to live on. Contrary to what its opponents understood, TCOT was not *just a hashtag.*

Moreover, this vignette also shows how our notion of attentionality is not human-centric and thus allows us to go beyond the issue of attribution of intentionality in human–technology relation. Just as we acquire a practical skill in attentionally corresponding with salient aspects of the flows that permeate and surround us, algorithms also arguably continually become attuned to certain signals and variations in streams of trace data in order to maximize some engagement metric. The notion of correspondence between these attentional flows thus offers a specific orientation to account for the ways in which algorithms can condition and influence us, by curating what we do and do not get to attend to and thus precondition what we end up intending.

Overall, we can see how *attentionality is constitutive of action possibilities*. Such a focus on the attentional aspect of correspondence relaxes the assumption of preformed intentions or goals in technology use. As such, it allowed us to go beyond a goal-oriented view of action possibilities—or affordances (Faik et al. 2020; Leonardi 2011; Volkoff and Strong 2013)—and instead appreciate technology use without assuming users who knew in advance why they were engaging with a technology. Moreover, it sensitized us to how, at least on social and collaborative technologies, action possibilities related to a feature (e.g., hashtags) depend on keeping up and going along with the tempos, intensities, rhythms, and momentums of the socio-technological flows that permeate and enact that feature. As such, those action possibilities can change without a change in features or in users' goals, but with a change in the conditioning flows. Such a flow-oriented view also differs from an intra-action view by explicitly focusing on the ongoing attuning and co-responsiveness among different flows. In sum, the notion of attentionality reveals how *unlike interaction between entities or intra-action among boundaries, correspondence takes place along resonating flows*.

Undergoing: Creative (Trans)Formation Along the Flows

In this subsection we will demonstrate how correspondence is an *undergoing* and what this implies for research. Specifically, we demonstrate how this notion reveals the ways in

which *actualizing possibilities for action* entails creatively rediscovering and reinventing one's path of becoming while animated by the flows one has submitted to.

In the above, we have already seen how in order to sense opportune conditions of possibility, the enlisted conservatives needed to remain exposed and attuned to the flows of TCOTing. Here we will show how actualizing those possibilities was more than simple acts, doings, or *using technology features*. Instead it entailed doings-in-undergoing; moments of doing possible only along a (trans)formative process of undergoing. The vignette below shows how through this process the enlisted conservatives were rediscovering themselves on a path of (trans)formation:

> Since the early days of TCOT, the enlisted conservatives who have been so far *lonely on Twitter* are gratefully using the TCOT list to find and follow *like-minded* tweeple they *never would have met any other way: In non computer life most of my girlfriends are liberal or non political. Nice to find [TCOT]*. This sweeping approach of following tweeple off the list means that the enlisted are gaining followers themselves, some even without knowing why: *I am experiencing a relative explosion of new followers with no change in Twittering habits....New tweeps, how did you find me?* These and other flows of TCOTing are making the #TCOT stream *where things are happenin'* and *the place to be* if one is *conservative and on Twitter*. As a result, not only conservatweeps are seeing a boost in their Twitter numbers, but are also happy to see their Twitter li[ves] improving: *where have you guys been all my twitter life? Felt oddly alone with both Obamamericans and libertatrians all around me!*

We can see how the enlisted found themselves swept up and animated along the emerging flows of TCOTing. Indeed, many were added to the list unbeknownst to themselves and only later became attuned to, and carried away by, the ensuing flows they had become exposed to and the possibilities they offered. They discovered in great surprise the formation before them of new possibilities for action and thus paths for becoming as conservatives on Twitter—something they did not think was possible. Suddenly, they could see their *Twitter lives* as already (trans)forming by becoming part of an emerging like-minded community. Note that there is nothing inherent to *using* hashtags or follows *as features* that can account for the (trans)formative relationship among the enlisted conservatives and Twitter, without referring to the conditioning flows of TCOTing—flows, such as those of reciprocal following or cathartic hashtagging with #TCOT (as seen before), that permeated and animated those features in those specific ways.

Specifically, in addition to rediscovering their twittering paths as already (trans)forming, the enlisted conservatives were also creatively reinventing their paths in correspondence with the flows of TCOT to continue to embody their newfound possibilities:

> A few days in and already "follow[ing] everybody on the list" and reciprocal following have become daily routines for many of the enlisted: *Just wanted to say hi to everyone. Daily I go to the list to follow the new folks. If I've missed you - @ me & I'll follow you*. Deviance from these practices is considered *bad manners* and would lead to shaming and losing followers: *Holy cow, I fell way behind on following all my interesting followers. Sorry, guys. Hold on. Am catching up & working thru [the] list...phew*. As the ranking is becoming 'the way' of gaining followers for conservatives—TCOT's top 19 will reach Twitter's top 1000 most followed with at least two among the Top 100—and as different positions on the list have become infused with status, competition is afoot: *Dang! 1300 followers is the entry level for #TCOT 50 - I was at 500 followers and in the top 40 last week. Crazy*. Wanting to become and remain *part of something bigger*, many also strive to be *#TCOT worthy* and to *make following [them] worth…while* by *primarily tweeting about conservative issues so as not to disappoint or to tick off [their] newly found friends*. As a result, TCOTing is increasingly becoming more than *just Twitter* but instead a manifestation of conservative *focused energy*, *momentum*, and *organization*.

We can see how the enlisted conservatives were reinventing their paths along the flows of TCOT. For example, in order to retain their newfound followers, they needed to go along with TCOT's emerging norms of prompt reciprocation and community engagement. We have already seen before how in order to keep up with such flows some conservatives were *forced…to learn* third-party Twitter add-ons and thus embark upon a more tech-savvy path. Moreover, to effectively engage with the #TCOT, they needed to stay relevant to the daily topics otherwise they would be shunned as flooding the stream. Indeed, to continue their correspondence with TCOT and thus continue to move along this path of becoming, they needed to strive to be *#TCOT worthy*—by becoming more overtly political—especially as "following" was considered a scarce resource due to, among others, the spectre of the 2000 Follow Limit. Some were even putting #TCOT in their profile bio, directly linking their profile to the #TCOT stream. In the process, Twitter was becoming *the* social media for conservatives: *On Fire: #TCOT, Wired: Twitter, Tired: Facebook, Expired: MySpace (I'm just sayin')*. As such, we can see how conservatives were not simply using Twitter fea-

tures. Rather, in actualizing the action possibilities available along the flows of TCOTing, they were undergoing a process of (trans)forming their own and others' possibilities for action and becoming. Specifically, their correspondence along TCOTing flows entailed for them an undergoing; an achieving of something which simultaneously was being achieved in them. Having rediscovered themselves already swept up and animated along the TCOTing flows and longing for the possibilities to act and to be as conservatives on Twitter, they were reinventing themselves as exactly that: becoming *conservatweeps* rather than simple tweeps. It felt for them that things were moving and that they were embodying this movement.

Overall, we can see how *undergoing is constitutive of actualized action possibilities*. Such a focus on the undergoing aspect of correspondence offers a view of agentic becoming in which we get to embody (trans)formative possibilities while, and exactly because of, being swept up and animated along corresponding flows of action. As such, it allowed us to refrain from pre-attributing agency to users or technology, and therefore to transcend the issue of symmetric or asymmetric interactions between such agencies (Latour 2005; Leonardi 2011; Pickering 2010; Venters et al. 2014). Moreover, it allowed us to appreciate how, at least with social and collaborative technologies, we do not simply use or interact with features anymore; we undergo a process whereby we continually (trans)form our own and others' possibilities for action and becoming along the flows that permeate and enact features in specific ways. Moreover, the notion of undergoing offers a temporal view of how intra-active performativity (Introna 2013; Orlikowski and Scott 2015; Scott and Orlikowski 2014) unfolds along corresponding flows. As such, performative becoming entails an experience of rediscovering oneself as already (trans)forming along corresponding flows, longing (Ingold 2017) for the possibilities for agency experienced on that path, and creatively reinventing oneself to continue actualizing those possibilities. In sum, the notion of undergoing reveals how *unlike interaction between entities or intra-action among boundaries, correspondence entails embodying a (trans)formative path.*

All in all, this illustration demonstrates the value-added of our vocabulary in explaining the creation, sensing, and actualization of (trans)formative possibilities for action along corresponding socio-technological flows. Table 3 summarizes the differences between our flow-oriented vocabulary and those of Streams 1, 2, and 3 in terms of what each approach would foreground and background in studying TCOT.

Considering Some Possible Objections

Before moving on, it might be appropriate to consider some possible objections to our approach, specifically, about the questions of agency, resistance, breakdowns, context, and finally boundary conditions.

What about agency? One might ask, *does this flow orientation not deny the agency of individuals?* We approach this question temporally. That is, for us it is not simply about whether people (or things) have a capacity to act. The question is rather when—and through what kairotic correspondences among which flows of action—do they get to sense and actualize certain possibilities for action. For example, people involved in TCOT were not "dupes" simply being swept along. Rather, they were also animated along the flows of TCOTing to *actively curate their storylines*. However, like the surfer, their agency was made possible by the (trans)formative energy of the flows they were corresponding with, more or less skillfully—what we call their attentional undergoings. Accordingly, it is not that people do not sometimes act intentionally. It is rather that such intentional contributions are made possible along their attentional attunement along the flow. In sum: Flows condition, they do not determine. Turning such conditions to actualized possibilities requires attentional undergoings.

What about resistance? Another related question that might arise is, *what about resistance? Are we simply swept along by the force of the flow?* No not at all. Resistance is possible because there is always more than one flow and one correspondence; and because we are not simply swept along but also animated along such multiplicity of flows; and finally, because correspondences can always give rise to (trans)formed flows. Thus, resistance is possible, but we need to think of it differently. We need to shift from viewing it as *opposition*—where an actor, individual or collective, resists the impositions of a more powerful or dominating actor—toward viewing it as *competition*—where minor flows correspond to produce momentous confluences to compete with a major flow. We already know this when we talk about not opposing the narrative but rather creating a more compelling counter-narrative; or when we let our initiative go along another that already has more traction—and inevitably be transformed in the process. The story of TCOT can also be seen as one where conservatives became exposed and attuned to a competing twittering flow that enabled them to resist the mainstream of social media in 2009. In sum: Resistance is not an actor heroically standing against a flow, but rather about becoming swept up and animated along a competing flow.

What about breakdowns? One might further suggest that it is plausible that our vocabulary refers to the moments when things are flowing, but *what about moments of breakdown?* Of course, not all confluences are generative, some are also disruptive. For example, as we saw, trolling and spamming attacks interrupted some of TCOT's flows and led to an epi-

Table 3. Empirical Comparison with Alternative Streams

		Streams 1 & 2 (Interaction)	Stream 3 (Intra-action)	Stream 4 (Correspondence)
Temporality *(creating possibilities)*	**Foregrounds**	**Local interaction:** How possibilities for community building, collective action, etc., emerged through local interactions between users and Twitter (possibly over time)	**Recurrent patterns:** How meanings of and possibilities for collaboration, leadership, etc., materialized in recurrent material-discursive TCOTing practices	**Timing:** How conditions of possibility for TCOTing emerged through contingent confluence of heterogenous flows of action
	Backgrounds	Heterogeneity of factors creating action possibilities	Extraordinary moments of possibility	Local stability & local spatiality
Orientation to the world (*sensing possibilities*)	**Foregrounds**	**Intentional use:** How activists intentionally made sense of the possibilities of using Twitter's different features for their goals	**Boundary making:** How boundaries, properties, and roles of sociomaterial categories (e.g., Twitter, activist) were locally made sense of through agential cuts in TCOTing practices	**Attentionality:** How sensing possibilities for action along TCOTing flows entailed being exposed to and carried away by the rhythmic directions and intensities of those flows
	Backgrounds	Non goal-oriented technology use	Relations among flows of practices	Boundaries & boundary making
Agency/ becoming (a*ctualizing possibilities*)	**Foregrounds**	**Inherent agency:** How TCOT evolved through symmetric or asymmetric interactions between human agency of users and material agency of Twitter	**Co-constitution:** How TCOT conservatweeps, or other sociomaterial categories were co-constituted through iterative intra-actions in TCOTing practices	**Undergoing:** How actualizing possibilities for action along TCOTing flows entailed continually (trans)forming one's own and others' possibilities for action and becoming
	Backgrounds	Temporal constitution of agency	The flow of performative becoming	Planning & planned action

sode of sense-making (Weick 1993). However, we suggest that this sense-making is about fostering novel correspondences by being already attentionally attuned to the flow, as was also argued by Weick: "bricoleurs proceed with whatever materials are at hand. Knowing these materials intimately, they then are able…to form the materials or insights into novel combinations" (1993, p. 639). Thus, breakdowns and sense-makings—even in the most detached representational forms, such as an inquiry committee (Sandberg and Tsoukas 2020)—are not "outside all flow" but rather intrinsically related to skillful attunement to the different ongoing flows and the opportunities they offer. In sum: Some flows might breakdown sometimes, but even then, sense-making is possible by being attuned to and animated along other flows.

What about context? One might alternatively ask, *what about context? Does the intelligibility of these flowing lines of action not presuppose some context?* Of course, this depends on what we mean by context. The traditional notion of context is one of (spatial) containment (Avgerou 2019; Winter et al. 2014)—something is *within* a context, be that an environment, a background, a frame, a structure, and so forth.

As a result, context is often treated as a relatively stable and separate container for the activities of the actors that provides them and observers with intelligibility about the situation. This separation is paralleled in how we often delineate the context and finding sections in our papers. Such a notion of context, however, is incompatible with a flow-oriented approach, where the focus is on the myriad meshwork*ings* of flowing lines of action without assuming an inherent difference between the foregrounded and backgrounded lines of action. Such a temporal meshwork reveals, in a decentered and flat manner (Latour 2005), the active and dynamic

multiplicity of flowing lines of action that we often arrest and bundle together as context. It instead keeps open the possibility for any flowing line of action to become more or less significant in accounting for the intelligibility and (trans)formations of other lines. In sum: The intelligibility of lines of action is not so much due to relations between context and actors as about relations along lines of action themselves.

What about limitations? One might finally wonder about the boundary conditions of our proposed vocabulary: *What doesn't this approach capture? Is everything flow?* While our approach is rooted in well-articulated arguments about the processual nature of reality, we could nonetheless establish some practical boundaries to its usefulness. As Table 3 suggests, our vocabulary backgrounds the apparent stability of the local here-and-now situations in daily life, the dynamics of boundary making in recurrent patterns of action, and the role of planning and planned action. Although, these are not inherent limitations, but purposeful shifts in orientation, in practice these backgrounded issues might limit the usefulness of our vocabulary in certain situations. This is especially the case where the rate of (trans)formation is slow relative to the purpose of the study, where therefore boundaries are practically stable relative to observation, and where thus a model of planning and execution might work relatively well. Moreover, our approach is not focused on foregrounding the dynamics of boundary making in recurrent practices for which other approaches such as agential realism with its notion of agential cuts might be more suitable.

Discussion: On Researching Along Flowing Lines of Action

We have argued for and demonstrated a new way of theorizing socio-technological (trans)formation. Specifically, we started by identifying an increasingly critical need for researchers to shift from the conventional ways of thinking about IS phenomena in spatial terms (i.e., between bounded actors/entities) toward conceiving them in temporal terms (i.e., along flows of action). Drawing from Ingold's work on lines (2015, 2016, 2017), we then advanced a theoretical vocabulary that allows to identify and bring into focus the *conditioning and (trans)formative dynamics of correspondences along flowing lines of action*. This flow-oriented vocabulary allows us to explain the dynamics of socio-technological (trans)formation without a need for invoking self-contained actors or technologies as originators of such (trans)formation. Specifically, it explains the creation, sensing, and actualization of possibilities for action along diverse flows of action through three modalities of correspondence, namely, kairotic timing, attentional attuning, and (trans)formative undergoing. We demonstrated the application and value-added of our vocabulary through an empirical illustration and showed how it reveals novel insights for researchers to understand and theorize the temporal dynamics of action possibilities along our overflowing digital world.

In what follows, we extend an invitation to scholars to productively correspond with our proposed flow-oriented vocabulary to develop novel approaches to think about and account for socio-technological (trans)formation along our increasingly overflowing digital world. To contribute to this endeavor, we will suggest some guiding principles for studying and theorizing IS phenomena through this orientation.

Invitation to Correspond: Reinterpreting IS Phenomena Along the Flow

Recently scholars have made calls to go beyond the traditional focus on IS phenomena, such as, organizations (Majchrzak et al. 2016) or innovation (Nambisan et al. 2017), as bounded entities and instead to view them as "complex and decentered network[s] or system[s] of actors" (Majchrzak et al. 2016, p. 273). Our approach resonates with these calls to decenter what was conventionally viewed as bounded entities, but also extends them in an orthogonal direction. That is, instead of stopping the decentering project at networks of bounded actors, we call for a further temporal decentering that results in viewing IS phenomena as intertwined meshworks of flowing lines of action. This is similar in spirit, though not in approach, to the idea of bracketing off actors in favor of action networks (Pentland et al. 2017).

As reviewed before, our work productively resonates with existing work that draws on ANT (Cecez-Kecmanovic, Kautz et al. 2014; Elbanna 2013; Hanseth et al. 2006; Locke and Lowe 2007), social practice theory (Gherardi 2000; Levina and Vaast 2008; Schultze and Orlikowski 2004; Sergeeva et al. 2017), and the performative practice lens (Barrett et al. 2016; Orlikowski and Scott 2014, 2015; Schultze 2014)—or sociomateriality. However, we suggest that our vocabulary has a broader relevance and implications for IS research at large. Specifically, we suggest that even research streams without processual ontological assumptions can correspond with our work. Indeed, conceptual tools are flowing lines that cannot be owned or controlled, and that have a life on their own (as Latour discovered with ANT). Instead, through correspondence with different research streams our flow orientation can create different ideas and insights into our realities—thus becoming performative in a broader sense. Therefore, in the spirit of ontological pluralism (Tummons 2020), we encourage productive correspondence with the ideas and vocabularies presented here. Below we present some examples for how correspondence with our vocabulary

offers promising paths for reinterpreting theories or generating new insights into many traditional and contemporary IS research concerns, such as, technology affordances, coordination in virtual teams, or agile software development.

First, working with our vocabulary, researchers can extend their conceptualization of IT *affordances* (Faik et al. 2020; Fayard and Weeks 2014; Leonardi and Vaast 2017; Vaast et al. 2017; Volkoff and Strong 2013; Zammuto et al. 2007) by decentering their classic focus on the interaction between users' intentions and technology's features as the locus of the emergence of action possibilities. Instead they can explore:

1. How are the conditions of possibility for specific affordances created during moments of correspondence among diverse socio-technological flows that animate an IS phenomenon?

2. How are specific IT affordances sensed (or perceived) through keeping up and going along with the flows that animate the technology in specific ways? Or, how does actualizing such affordances often entail (trans)forming them for oneself and others?

Such a flow-oriented view of affordances will help us go beyond the notion of technology use as intentional goal-oriented action and to instead pose questions such as:

3. What are the dynamics and implications of becoming swept along the absorbing flows that animate a technology? How do people (and other lines) creatively reinvent their paths in co-respondence with such flows?

4. How do changes in the temporal qualities of the flows that animate a technology condition the dynamics of sensing and actualizing affordances?

Second, our approach allows studies of *virtual teams* to go beyond a view of time as a constraint, structure, or a resource (see Shen et al. 2015) toward a generative view that foregrounds the (trans)forming nature of the temporal qualities of corresponding flows of action. As such, researchers can complement the notion of temporal coordination (Espinosa et al. 2007) often seen as a matter of scheduling, synchronization, and time allocation (McGrath 1990) across objective temporal borders (O'Leary and Cummings 2007) and rhythms (Massey et al. 2003) and/or subjective temporal visions and frames (Saunders et al. 2004). They can thus explore:

1. How can teams, especially those working in innovation, foster conditions of possibility for serendipity? And, how can they cultivate practices that allow to sense and make use of such timely moments?

Moreover, going beyond the classic focus on ICT-mediated communication and access to information about team members (Dabbish and Kraut 2008; Majchrzak et al. 2005), they can explore the implications of contemporary collaborative solutions that allow teams to work together synchronously or asynchronously on more upstream and downstream branches of the same project (e.g., using Git). As such they might explore:

2. How can teams cultivate awareness and fine-tuning practices aimed at fostering rhythmic attunement and co-responsiveness among synchronous and asynchronous flows of action?

Third, our approach allows studies of *agile project management* to nuance their understanding of flow (Ågerfalk et al. 2009; Conboy 2009). Indeed, a concept of flow (as rate)—captured through practices such as workflow visualizations and metrics such as team velocity (Dennehy and Conboy 2017; Lee and Xia 2010)—is often mobilized as a primary condition to transition from agile methods to continuous deployment (Fitzgerald and Stol 2017). Our concept of flow allows researchers to enrich this view with questions such as:

1. How do a broader range of temporal qualities of unfolding actions (their rhythmic trajectories, directionalities, intensities, momentums, or timeliness) continually condition the path of a project?

2. How, and through which practices, can organizations foster correspondence along the flows of different agile teams—thus cultivating agile at scale?

It also helps research to go beyond a sole focus on the flow of development and instead explore:

3. What new correspondences among the different flows that have a bearing on IS projects will contribute toward more agility? How and through cultivating what practices can IS projects foster such correspondences?

For example, the rise of DevOps is such an attempt to foster more correspondence among the flows of development and operation (Hemon et al. 2019). Finally, research can explore:

4. How can project teams accommodate and adapt to the (trans)formative undergoings that will accompany such new correspondences among previously separated flows of action?

These examples are not exhaustive. Indeed, we believe that productive correspondence with our work can provide similar opportunities for rethinking and reinterpreting socio-

technological (trans)formation along other IS phenomena such as, open source development, open innovation, crowd sourcing, and social innovation. In what follows, we will offer some guiding principles for studying and theorizing IS phenomena through our proposed flow-oriented vocabulary.

Some Guiding Principles for Flow-Oriented Theorizing

In this section, we first make a case for flow-oriented genealogical research and then outline some of the ways in which it can reorient and reanchor our research and theorizing practices to further embrace process thinking and theorizing (Cecez-Kecmanovic 2016; Cloutier and Langley 2020; Orlikowski and Scott 2014).

Tracing the Flow: Lines as Storylines

To account for flowing lines of action and becoming is to reanimate (hi)stories, or simply, to tell stories—"every line is a story" (Ingold 2015, p. 168). Enclosed in every "actor" or "entity" there is a story of how it became what we now take it to be, and where it is heading. Therefore, what is interesting about them is not so much in what they currently are as in their unfolding story*lines*—their contingent histories and conditioned directionalities along which they have grown and carry on (trans)forming. If that were not so, writers would only write the last page of stories (Watts 2011)! So, when studying IS phenomena, we would shift from asking, *what is this an instance of*, in response to which we tend to move upward into higher and higher levels of abstraction. Rather, we would seek to answer, *how and along which lines is all this brought into being and carry on (trans)forming*, in response to which we would follow along trails that take us so far, until we come across another story to take us further.

There is an obvious connection between our emphasis on stories and narrative studies in OS (Czarniawska 2004) and in IS research (Boland and Schultze 1996; Wagner et al. 2004). However, we do not take *narrative data* as representations of the intentions, actions, or goals of actors that are situated in a temporal horizon (Wagner et al. 2004), or as representative of deeper structures (Pentland 1999). Instead, we take storylines as the very coming into being of the actors along multiple flowing lines of action. They allow us to not only make multiple connections among events, but also to preserve multiple temporalities (Tsoukas and Hatch 2001), especially kairotic timing. Of course, in such stories, as in life, we will inevitably have named characters, but these are not to be treated as premade static characters—identifiable by fixed attributes (e.g., cruel, brave, nerdy, activist, entrepreneur, leader) and with their basic nature unaffected by the crisscrossing flows of the story. Rather, their nature, growth, and (trans)formations are explainable *only* along the flow of the story that sweeps them up and animates them at particular moments and places. That is, in these narratives, the *actors are their storylines*.

In producing such stories, we advocate a specific type of historical account—one that is produced through a *genealogy* (Dreyfus and Rabinow 1983; Foucault 1984; Wilson 1995). Genealogy is a mode of inquiry that avoids bounded essences and underlying logics or laws in favor of contingent correspondences, which in one way or another turn out to be fundamental to the ongoing (trans)formation of a phenomenon. Although genealogy is a historical investigation, it is not a history in the traditional sense; that is, an actor-centric account that takes certain key actors in the past as the "authors" or "movers" of the storyline—"a biography of great men," as it were (Carlyle 1993). Rather it is a *history of the present* (Foucault 1984). But how exactly can we conduct and recount a genealogical story consistent with our flow orientation?

Toward Flow-Oriented Genealogical Research

A flow-oriented genealogy invites us to formulate research questions that aim at revealing the dynamics of conditions of possibility for action along the flows of different IS phenomena. In this section, we propose three fundamental shifts in research and theorizing to enact such a flow-oriented genealogy and outline how these shifts translate to more concrete research questions and sensitivities in research practices (see Table 4). We will also argue how these shifts address and go beyond five challenges for process theorizing identified by Cloutier and Langely (2020), namely, the moves (1) from variables to events, activities and trajectories, (2) from entities to dynamic entanglements, (3) from correlation to contingent interaction, (4) from outcomes to potentialities, and, finally (5) from predictions to generative mechanisms.

Shift #1, a flow-oriented genealogy invites us to *trace correspondences along flowing lines of action rather than interactions between actors*. In studying and theorizing IS phenomena, it invites us to extend our temporal horizon and view phenomena, artifacts, systems, practices, affordances, users and other subject/object positions as spread out over time—that is, as corresponding story*lines*, coming from and going to somewhere. Specifically, through such a genealogy we take what we observe, or are told (i.e., the IS phenomenon as "already made up") as an occurrence, a correspondence, and therefore ask:

Table 4. Some Principles for Flow-Oriented Research and Theorizing

	Shifts in Research & Theorizing	Questions Capturing These Shifts	Sensitivities for Research Practice
Relationality	Interactions between actors ↓ Correspondences along flowing lines of action	• Which are the flows of action (storylines) that coalesce to produce this phenomenon? • How and along which lines is this phenomenon flowing? • What are their contingent histories and conditioned directionalities? • Why and how did they correspond in the manner that they did?	• Keep on the move. Never center data collection, analysis, and theorization on supposedly important human or technological actors. • Focus on a notable occurrence and retrace the histories and directionalities of the lines of action that go into it, as storylines. • Let this tracing of lines take you away toward another upstream or downstream correspondence for which you do the same. • Zoom in and out between situational and historical lines to practically account for movement and flow.
Temporality	Chronological sequences or cycles ↓ Kairotic meshworks	• How did that significant moment of correspondence come about? • How and why its timing became significant, including what contingent, arbitrary, and seemingly insignificant happenings that came to make a difference there? • What are the temporal qualities of the storylines that coalesced to produce it? • What conditionalities were carried into this correspondence through each storyline? • What new conditions of possibility for action were created at their confluence?	• Do not impose chronological timelines or linear phases on your account. Organize your account around timely (kairotic) moments of correspondence. • Do not simply relate each moment of correspondence to a previous one. Admit into each moment different lines stretching back to different moments of correspondence. • Account for how the flow of each line constrains or enables certain actions to become (im)possible. • Account for how those conditionalities collectively give rise to new conditions for possibility for action in that moment.
(Trans)formation	Outcomes of intentional doings ↓ Attentional undergoings	• How did specific storylines get attuned and corresponsive to each other's temporal qualities along this correspondence? • How did such mutual exposure and attunement allowed for sensing emergent possibilities for action along the flow? • How did in the course of actualizing those possibilities, lines rediscovered themselves on a (trans)formative path? • How did they then creatively reinvent their paths to continue embodying those possibilities along the flow?	• Do not prompt nor stop at the invocation of intentions, decisions, choices, goals, or plans by research participants. • Foreground how the flows of (assumed) people and technologies become exposed and skillful attuned to each other. • Account for how certain ways of thinking, feeling, or doing emerge through such attentional movements that propel different storylines. • Do not account for transformation as the occasional result of bracketed (inter)actions. • Foreground how flows of people and digital technologies creatively rediscover and reinvent their trajectories through timely correspondences, as they happen.

Which are the flows of action (storylines) that coalesce to produce this phenomenon? How and along which lines is this phenomenon flowing? What are their contingent histories and conditioned directionalities? Why and how did they correspond in the manner that they did?

In addressing such questions, we refrain from centering our data collection, analysis, and theorization on we might have supposed as the important actors and artifacts and instead always keep on the move, upstream or downstream, by following the flowing lines of action from one correspondence to another for which we would do the same—even if this leads

us away from the ostensible boundaries of the IS phenomenon under study (Nambisan et al. 2017). While we might not be able to follow or retrace the flows of action in every possible direction, by recognizing that they might overflow pre-given boundaries, we can uncover otherwise unaccounted-for storylines that come to make significant differences in phenomena. Moreover, when tracing correspondences, we would often need to zoom in and out (Nicolini 2009) between more fine-grained situational and more broad-stroke historical lines in order to account for movement and flow in a practical way. That is, lines are to be viewed as fractal—every line itself being a correspondence among finer lines. In sum: By foregrounding flowing lines of action over variables and correspondence over interactions, this shift allows us to address and go beyond process theorizing challenges #1 & #2 (Cloutier and Langley 2020).

Shift #2, a line-oriented genealogy invites us to *treat time as a kairotic meshwork rather than a chronological sequence or cycle*. In studying and theorizing the temporal evolution of IS phenomena, it invites us to go beyond relating activities, phases, events, or even correspondences to each other through linear, parallel, and recursive styles of process theorizing (see Cloutier and Langley 2020). Instead, we need to retrace kairotic meshworks (see Figure 2; Ingold 2015; Introna 2019) and therefore about each correspondence we would ask:

> *How did that significant moment of correspondence come about? How and why its timing became significant, including what contingent, arbitrary, and seemingly insignificant happenings that came to make a difference there?*
>
> *What were the temporal qualities of the storylines that coalesced to produce it? What conditionalities were carried into this correspondence through each storyline? And what new conditions of possibility for action were created at their confluence?*

In addressing such questions, we need to be critical of temporal boundaries (e.g., events, stages, phases) being called out by the participants involved. In other words, we need to be deeply suspicious of all "ends of" and "beginning of" narratives and all causal accounts. All boundary making acts and attribution of causality must be unpacked to trace the contingent and opportune correspondences that they enclose. Moreover, kairotic meshworks allow us to go beyond simply relating each moment of correspondence to a previous one. That is, by organizing our accounts as kairotic meshworks, we can account for different storylines, and the conditionalities they impart, exactly when they become a participant in creating new conditions of possibility in a specific moment (if needed using flashbacks and forwards, as it were). Finally, we should remain skeptical of seemingly inevitable trajectories and keep on the lookout for ways in which the storyline is wrought with contingencies. In other words, we should attempt to avoid grand narratives that try to establish a logic that can explain the whole trajectory of a storyline (Dreyfus and Rabinow 1983, p. 108). In sum: By foregrounding contingent histories and conditioned directionalities along moments of timing, this shift allows us to address and go beyond process theorizing challenge #3 (Cloutier and Langley 2020).

Shift #3, a line-oriented genealogy invites us to *treat (trans)-formations as attentional undergoings rather than outcomes of intentional doings*. In studying and theorizing IS-related transformations, it invites us to refrain from focusing on actors and entities as initiators or origins of action, but rather situate their (trans)formations along the diverse flowing lines of action that sweep along and animate them in the first place. As such, about each correspondence, we would ask:

> *How did specific storylines get attuned and corresponsive to each other's temporal qualities along this correspondence? And how did such mutual exposure and attunement allowed for sensing emergent possibilities for action along the flow?*
>
> *How did in the course of actualizing those possibilities, lines rediscovered themselves on a (trans)-formative path? And how did they then creatively reinvent their paths to continue embodying those possibilities along the flow?*

In addressing such questions, we would neither prompt nor stop at the invocation of intentions, decisions, choices, goals, or plans by our research participants. Rather, we would capture how certain ways of thinking, feeling, and doing temporally emerge in the course of (trans)formative exposure and attunement to the conditioning flows of corresponding storylines (see Table 5 for how we might frame our data collection questions differently). That is, we would be inviting our research participants to present themselves not as original sources of action, but rather as emerging and developing storylines. As such, these story-inviting questions attempt to capture the attentional movements through which lines continuously adjust to emergent correspondences, as they happen. Moreover, we will not only ask different questions we will also listen differently. We will remain attuned to how moments of correspondence in the flow of ongoing experience constantly pull people away from their habitual practices, exposing them to, and making them adjust to, new streams of experience. In sum: By foregrounding the dynamics of sensing and creatively actualizing possibilities over predicting outcomes, this shift allows us to address and go beyond process theorizing challenges #4 & #5 (Cloutier and Langley 2020).

Table 5. Asking and Listening Differently

Actor-Centric Questions	Line-Oriented Questions
What is X?	• When and how did X become seen or taken as being this or that?
Why did you do X?	• How did you find yourself doing X? • Why did you feel X was the appropriate thing to do?
Why did X do Y?	• How can we make sense of what X did? How did X get to the position that it seemed self-evident to them that they had to do Y?
What caused X to happen?	• What is the story of the happening of X? • What were the significant events that happened at the same time as X? • What is significant about the timing of X?
What is your view on X?	• How did your view on X develop? • How did you find yourself thinking/feeling that way?
Who were the most significant actors in X happening?	• What were the most significant moments of the development of X? • What were the accidental coincidences and why did they matter?
Why did you think X?	• How did you find yourself thinking about X in a particular way? • How did X come to your attention?
When did X start and when did it stop?	• Where did X emerge from and what did X develop into?

Overall, flow-oriented genealogical research, with its specific treatments of relationality, temporality, and (trans)formation, as outlined in Table 4, will allow researchers to identify and bring into focus significant confluences of diverse flowing lines of action—each with different temporal trajectories—to explain the dynamics of socio-technological (trans)formation without a need for invoking self-contained original actors or technologies. Specifically, it will allow researchers to explain the dynamics of creation (timing), sensing (attentionality), and actualization (undergoing) of new possibilities for action along corresponding socio-technological flows. Such a flow-oriented approach foregrounds, we argue, the vital lively manner in which digital phenomena grow and develop—or stagnate and perish.

Studies produced this way can contribute to research in several ways. For example, they would constitute a critique (Cecez-Kecmanovic et al. 2008; Howcroft and Trauth 2004) by revealing the contingent and conditioned storylines whose confluence bring a specific IS phenomenon, practice, subject, object, or category into existence as meaningful, appropriate, and legitimate (Butler 2002; Foucault 1977). Moreover, they would allow us to "grow into knowledge" (Ingold 2015) by following along the paths of knowing that the genealogists have retraced. That is, such contributions are not so much about offering us more mental content to accumulate as about fine-tuning our *abilities to tell* when dealing with similar IS phenomena. Furthermore, some of the historical storylines retraced in such studies can be useful to other researchers to draw from in their future studies. By producing such a form of storied knowledge (Ingold 2015), we shift from building blocks to lines, from spatial to temporal thinking, from classical theories to hi*stories*, from the abstract to the concrete, from validity to vitality, and so forth.

Conclusion

We wrote this paper as a radical call for researchers to take the flow of action more seriously. The idea that our world is constantly—and (trans)formatively—flowing has been advocated for millennia by both Eastern and Western process philosophies. Our contemporary overflowing world of continuous digital innovations and transformations has only made such an orientation evermore pertinent. Such a shift from the dominance of spatial, entitative, and actor-centered thinking toward temporal, processual, and flow-oriented approaches, we argued, will not only offer us an innovative theory of socio-technological (trans)formation, it will also transform our theorizing and research practices, significantly. We believe this is indeed the horizon of possibilities opened up by this paper. We invite scholars to embrace this horizon of possibilities to develop novel ways of understanding, practicing, and theorizing ever-transforming IS phenomena *along* our increasingly overflowing digital world.

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