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Datification and the Pursuit of Meaningfulness in Work

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Datification and the Pursuit of Meaningfulness in Work

Abstract

Proliferation of digital means of tracking worker activities has contributed to the rise of data-driven approaches to managing people, with employees often required to record their activities for accountability purposes. Increased requirement for such datification work occurs at a juncture where meaningfulness is one of the most sought-after work features. Datification work could both facilitate and hinder the pursuit of meaningfulness, yet literature provides little guidance into the nature of the connection and how it transpires. Our inductive study of academic professionals using an accountability system suggests that datification work characteristics link to meaningful work experiences in complex ways. We advance current theory on work meaningfulness by theorizing the role of a new work condition – datification – in meaningfulness experiences of professionals, outlining how system design and the institutional context become important elements influencing meaningful work experiences, and explaining how meaningfulness experiences are constructed through system appropriations.

Keywords:

Accountability systems; Appropriation; Datification work; Meaningful work experiences; Professional employees

Introduction

“As a result of pervasive computer mediation, nearly every aspect of the world is rendered in a new symbolic dimension as events, objects, processes, and people become visible, knowable, and shareable in a new way. The world is reborn as data...”

(Zuboff, 2015, pp. 76-77).

Professional work in the 21st century is going through significant changes due to ubiquitous information and communication technologies, automation, and more recently, datification (Forman et al., 2014; Günther et al., 2017; Susskind and Susskind, 2015), resulting in what *Wired Magazine* called the ‘quantified self’ (Fuller, 2015). Datification (Newell and Marabelli, 2015) refers to the process of taking an activity, event or characteristic, codifying it and turning it into data. The data thus collected allow organizations to assess worker performance and productivity, and so are a key element in the “audit society” (Power, 1997) and in a data-driven approach to managing people at work (Bersin, 2015; Waber, 2013).

While datification can be automatic (as when a GPS system tracks a delivery driver’s movements), many organizations rely on the adoption of accountability systems (Vieira da Cunha, 2013) that involve individuals manually entering data about their activities – we term this activity datification work. Datification work has the capacity to shape work experience in significant ways because, depending on what is codified, “work roles, knowledge practices and labor processes of professional practice” can transform (Edwards and Fenwick, 2016, p. 216).

Increased requirements for professionals to engage in datification work occur at a juncture where meaningful work is considered “the single most valued feature of employment for the majority of employees” (Bailey et al., 2017, p. 416). Meaningful work is a salient pursuit because it helps employees answer the question ‘Why am I here?’ (Pratt and Ashforth, 2003) and contributes to positive outcomes including job satisfaction, motivation, engagement, and

creativity (Cohen-Meitar et al., 2009; Fairlie, 2011; May et al., 2004; Rosso et al., 2010). Thus, it has been found that “employees actively seek ways to construct meaningfulness, even in cases of repetitive drudgery” (Bailey et al., 2017, p. 416). These are interesting co-developments in that while meaningfulness and datification work both have implications for the employee experience, at this point, research evidence appears to be divided about whether such work has positive or negative implications for experiences of meaningfulness. As such, the overall goal of our inquiry was to reach a greater understanding of *how datification work influences experiences of meaningfulness for employees*.

Datification work has been described as standardized, reductionist, and highly controlling (Alcaez et al., 2012; Brivot and Gendron, 2011; Findlay and Newton, 1998).

Meaningfulness, on the other hand, stems from autonomous and significant work (Bailey and Madden, 2016; Cartwright and Holmes, 2006; Lips-Wiersma and Morris, 2009). Based on this contrast, we could deduce that employees required to codify their work activities on a regular basis for accountability purposes (i.e., to engage in datification work) might experience a lack of meaningfulness. However, some studies suggest that accountability systems can also function as technologies through which one’s self can be examined and transformed (Covaleski et al., 1998; Townley, 1994; Styhre, 2001). Tracking and recording data about one’s activities is considered by some to be a superior, objective form of pursuing the age-old adage of “know thyself” (Hong, 2016).

This seeming contradiction suggests that the manner in which datification work influences meaningfulness may be complex. It is known that various factors influence how employees respond to their work, including the technologies they use, and that workers “do not simply impute meaning from the characteristics of their jobs” (Rosso et al., 2010, p. 103). Meaning is not the property of a job, rather employees construct accounts of why their work is meaningful (or not) in a particular context (Lepisto and Pratt, 2017). Also, employees craft

their jobs and appropriate the technologies that they use in order to shape the meaning of their work (Wrzesniewski and Dutton, 2001). Taken together, these two tenets indicate that the contradictory predictions about *whether* datification will impact work meaningfulness positively or negatively, need to be addressed by considering *how* this impact unfolds.

In order to explore how positive and negative effects of datification work influence meaningfulness experiences, we conducted an inductive field study. We chose a university setting because it provides a good current example of employees conducting seemingly meaningful jobs (Lepisto and Pratt, 2017) while also having to increasingly engage in datification work (Dodd 2014).

Our study stands to make a number of contributions. First, it answers the call for research to examine work meaningfulness experiences (and lack thereof), considering meaningfulness from the viewpoint of the contemporary employee, and relatedly, utilizing research methods that permit the ‘story’ of the meaningfulness experience to unfold (Lips-Wiersma and Morris, 2009). By immersing ourselves *in situ*, we were able to obtain a rich understanding of how academics were personally experiencing meaningfulness with the introduction of a specific work condition – the requirement to engage in datification work. Second, we make advances in our theoretical understanding of how accountability system design, via specific datification work characteristics, becomes an important element influencing meaningful work experiences. Third, we contribute to the theorization of work meaningfulness construction by detecting system appropriation patterns, supporting the idea that instead of being “passive recipients” employees may enact a role of “motivated crafters of meaning” when faced with work conditions influencing meaningfulness (Rosso et al., pp. 60-61). Fourth, we expand current theory on work meaningfulness by identifying how the institutional context may moderate the impact work conditions have on meaningfulness experiences. In sum, our findings bridge the literature on work meaningfulness with that addressing behavioral aspects

of technology adoption and use, and in so doing, advance theory in both realms. Practically, our findings should prove useful in guiding organizations in their approach to successfully develop accountability through technology whilst simultaneously improving experiences of meaningfulness among employees.

Work Meaningfulness and Datification

Meaningfulness in Work

In broad terms, meaningful work refers to “work [that is] experienced as particularly significant” (Rosso et al., 2010, p. 95). In principle, all jobs can be experienced as being more and less meaningful (Bailey and Madden, 2017). Work meaningfulness may stem from a variety of sources such as developing and becoming one’s authentic self, serving others, and expressing one’s full potential (Lips-Wiersma and Morris, 2009; Rosso et al., 2010).

Meanwhile, there are many barriers to work meaningfulness, such as lack of control over, and inability to see value in, one’s work (Lepisto and Pratt, 2017). Debates around how workers performing seemingly enriched jobs can experience a lack of meaningfulness and vice versa are ongoing (Bailey et al., 2017; Lepisto and Pratt, 2017) and scholars have called for a greater understanding of the experience of meaningfulness (Weiss and Rupp, 2011). So what characterizes a work experience that is meaningful versus an experience lacking in meaningfulness?

A meaningful work experience could include both meaningfulness *in* work and *at* work (Bailey et al., 2017; Pratt and Ashforth, 2003). While the first focuses on the nature of work that employees conduct, the latter focuses on the context in which work is performed. There is some agreement that meaningful experiences are characterized by feeling that our work is significant, results in receipt of just rewards; permits autonomy to decide how, when and where to work (Bailey et al., 2017; Cartwright and Holmes, 2006; Dik et al., 2013; Lips-

Wiersma and Morris, 2009; May et al., 2004); aligns with our personal values and identity (Cohen-Meitar et al., 2009; Pratt and Ashforth, 2003; Scroggins, 2008), and provides a sense of community comprised of trusting and respectful social interactions (Bailey et al., 2017; Cartwright and Holmes, 2006; Dik et al., 2013) where individuals feel free to speak and act in opposition (Lips-Wiersma and Morris, 2009) and hold a valued social position (Cartwright and Holmes, 2006). Meaningful work experiences are also characterized by a sense of personal growth and fulfilment of a greater purpose (Dik et al., 2013; Fairlie, 2011; Lips-Wiersma and Morris, 2009). Lepisto and Pratt (2017) suggest that the characteristics listed above manifest in two main meaningful work conceptualizations: self-realization (feeling able to fully express and realize oneself in one's work) and worthiness (feeling able to justify that one's work holds value).

Experiences of lack of meaningfulness (Bailey and Madden, 2016) have received less research attention but are primarily characterized by feelings of self-estrangement, powerlessness and low intrinsic fulfilment (Sarros et al., 2002). Such experiences also include feelings of "being used for purposes other than one's own" (Lepisto and Pratt, 2017, p. 105), of conducting tasks that are "pointless" (Bailey and Madden, 2016), involve unfair treatment, lack recognition and feelings of isolation from supportive relationships (Bailey and Madden, 2016), as well as the inability to connect personal contributions to a larger purpose (Sarros et al., 2002) or see continuity and coherence in one's life (Lips-Wiersma and Morris, 2009). Such characteristics can manifest as alienation (sense of separation from oneself and personal control) or a general sense of anomie (uncertainty and ambiguity regarding the basic value of one's work) (Lepisto and Pratt, 2017). While prior studies often treat lack of meaningfulness and meaninglessness as equivalent, the two may be conceptually different (Lips-Wiersma and Morris, 2009).

Recent research suggests that experienced lack of meaningfulness can be common among professionals with seemingly enriched jobs characterized by job autonomy, task significance and task variety (Hackman and Oldham, 1980), including bankers (Sennett, 2006), physicians (Cardador et al., 2011) and educators (Berg et al., 2010). For academics, the focus of this paper, lack of meaningfulness has been associated with feelings of insecurity “about meeting [...] aspirations, as well as having existential doubts concerning the meaning of what they were aspiring to” (Knights and Clarke, 2014, p. 341). Such inclinations may become manifest in feelings of “intellectual phoniness,” fear of failure and tension between pursuit of meaningfulness and achievement of career goals and, in our context, are often attributed to managerial controls (e.g., research quality audits) imposed on faculty (Knights and Clarke, 2014). Conversely, meaningful experiences among academics are particularly related to “the degree to which environmental demands are seen as challenges that are worthy of commitment and involvement” (Kinman, 2008, p. 824). Respect, academic freedom, flexibility, professional growth, and collegiality have also been identified as key characteristics of meaningful academic work (Alvesson and Spicer, 2016; Chandler et al., 2002; Gappa et al., 2005; Kallio et al., 2016). These findings reinforce the idea that meaning is not a property of a job. Therefore, it is important to examine how meaningful work experiences are constructed based on the given conditions (Lepisto and Pratt, 2017, p. 111): “One does not find meaningfulness because the work provides self-efficacy. Rather, the label “self-efficacy” is part of the raw materials for an account or rationale that I tell others and myself about why my work possesses positive worth.”

Construction of meaningful work experiences does not occur in a vacuum (Lepisto and Pratt, 2017). As institutional theory explains, organizations and those that work in them, are embedded in a context comprised of social expectations defining appropriate behavior (Scott, 1995). This perspective implies that people and organizations are constrained in terms of how

they interpret and explain events and actions. Thus, accounts that people create about their work and its meaningfulness are derived, at least in part, from the institutional context that frames what is valued in an organization (Cornelissen and Werner, 2014; Kennedy and Fiss, 2009) and provides scripts or narratives that can legitimize what is done (Baumeister et al., 2013). Next, we turn to what we know about the role of accountability systems and datification work in this process of meaning construction.

Accountability Systems, Datification Work and Meaningfulness

We see datification work as a selective codification process (Kallinikos, 1995, p. 19) whereby an individual inputs data about their work activities into a digital accountability system. Datification work is, therefore, a process of accounting for one's work by recording one's activities, inputs and outputs. As already described, meaningfulness experiences are not a direct result of the work that is done; rather, they are constructed based on how individuals account for the significance and value of their work (Lepisto and Pratt, 2017). Furthermore, we know that employees actively seek to make changes in their work activities in search of meaningfulness (Rosso et al., 2010). It follows that datification work may influence meaningfulness experiences through two mechanisms: 1) the extent to which datification work helps or hinders a person in constructing accounts of meaningful work, and 2) the extent to which individuals make changes in datification work by appropriating the underlying accountability system in search of meaningfulness.

The extent to which datification work could help or hinder a person in constructing accounts of meaningful work is likely to depend on the design of the accountability system. Often, accountability systems are designed for a high degree of quantification and standardization requiring that activities be converted into numbers and homogenous descriptors (Markus, 2017; Swan, 2013). Some aspects of professional activities can easily be converted into

numerical data. Others may not be naturally quantifiable, but often become datified when individuals “enter qualitative descriptors [...] or enter numbers where qualitative phenomena have been modulated onto quantitative scales” (Swan, 2013, p. 94). If such systems are adopted “off-the-shelf” and not customized to a specific context, the likelihood that categories and scales provided for datification meet the needs of workers is further reduced (Wagner and Newell, 2004). For example, among academics, describing work output according to a standardized quantitative scale such as the Academic Journal Guide, may make academics feel that their research activity is being policed and their academic freedom limited (Mingers and Willmott, 2013). The associated “management-by-results” has been shown to reduce intrinsic motivation (Kallio and Kallio, 2014). In sum, if an accountability system is designed in a way that emphasizes “box ticking” (Alvesson and Spicer, 2016), “counterfeit reflexivity” (Hoecht, 2006, p. 547) or “bureaucratic tasks and form filling” (Bailey and Madden, 2016, p. 5), as some researchers suggest (Findlay and Newton, 1998; Townley, 1993), then datification work may negatively affect work meaningfulness.

Meanwhile, qualitative measures of performance providing the ability to describe one’s achievements in text (Kallio and Kallio, 2014), and performance management practices that enable and reward performance, rather than control it, have been shown to positively impact intrinsic motivation and well-being (Franco-Santos and Doherty, 2017). An accountability system designed to allow qualitative description of one’s performance, could thus, positively shape meaningful work experiences because the associated datification work can lead to an examination and transformation of the self, contributing to self-realization (Covaleski et al., 1998; Townley, 1994; Styhre, 2001).

How datification work may influence work meaningfulness is complicated by the fact that professionals can make changes to their datification tasks to increase job meaningfulness (Wrzesniewski and Dutton, 2001). It is established that making changes in the physical,

cognitive, and relational boundaries of tasks, also known as job crafting (Wrzesniewski and Dutton, 2001; Wrzesniewski et al., 2013), can increase work meaningfulness (Berg et al., 2013; Rosso et al., 2010). Resistance, for example in relation to management control, can increase the experience of work meaningfulness, specifically the feeling of being able to act in opposition (Lips-Wiersman and Morris, 2009). Modifications related to technology and its use, including resistance to technology, are known as appropriations (DeSanctis and Poole, 1994; Majchrzak et al., 2000; Schmitz et al., 2016; Stein et al., 2015) and can form an important element in job crafting (Wrzesniewski and Dutton, 2001). Individuals can simultaneously engage in multiple appropriations (Leonardi et al., 2016), such as reconsidering their role to better integrate mandated technology use into their work, altering their usage of a system to make it meet their needs or modifying the technology itself (Schmitz et al., 2016; Stein et al., 2015). Resistance to systems can range from passive forms such as complaining and cynicism (Mumby, 2005), and gaming the system (Hoecht, 2006; McGivern and Ferlie, 2007; Mingers and Willmott, 2013), to more active modes such as lobbying to replace the system or even sabotage (Lapointe and Rivard, 2005). While academics may not always resist management control (Knights and Clarke, 2014), they are known to resist the associated accountability systems and engage in other appropriations (Stein et al., 2015; Wagner and Newell, 2004) that are likely to influence the relationship between datification work and meaningfulness experiences.

As a consequence, then, our research addresses the overall question of *how datification work influences experiences of meaningfulness*, aiming to explore the factors and mechanisms that explain how datification work may increase or reduce work meaningfulness. In considering this question and drawing on existing knowledge on the topic, we address the following sub-questions: How can datification work help or hinder individuals in accounting for the meaning of their work? How do the accountability system's design and the institutional

context impact whether datification work positively or negatively influences meaningfulness experiences? How do an individual's system appropriations influence whether datification work positively or negatively influences meaningfulness experiences?

Method

Our inquiry stemmed from a broader study investigating the impact of an accountability system on the experience of professional employees. Because commercialization of higher education (Kallio et al., 2016) has led to universities paying increased attention to the market in order to compete for students and assure revenue streams, they have increasingly adopted accountability systems in an attempt to track relevant performance data. We therefore chose to conduct field research at two North American universities (“State” and “Private”) that were implementing the same accountability system – the People Analytics (PA - a pseudonym) system.

The timing and phase of the implementation projects were central to our selection of these sites. We sought to examine how users responded to this technology during the adoption and early use of PA. Second, we selected the cases on the basis that State had adopted the system more or less “off-the-shelf” whereas Private engaged in considerable customization of PA. This distinction permits observable differences in system design that can impact the experience of users (Wagner and Newell, 2004). Third, our intent was to choose cases that would demonstrate differences in institutional context as well. “State” is a large public institution comprised of three colleges and four schools, covering a broad range of disciplines such as engineering, social work, business, natural sciences, and fine and performing arts. “Private” is a smaller private university predominantly emphasizing business education but also offering programs in the arts and sciences. We focused our study on the academic colleges found at both universities: arts, humanities, sciences and business. Fourth, in-depth

access to multiple data sources (interviews, observations, documents) was an important practical factor in site selection.

Case Description

The PA system codifies faculty teaching, research, and service activities for later performance evaluation analysis. Academics input activities into PA through a web-based user interface and data are stored on the vendor's cloud-based repository. At the time of data collection (2011 and 2012), there were approximately 3,000 PA adopters in over 25 countries. Teaching and student evaluations are automatically entered into the system while research output and service activities must be entered manually. Once entered, academics are able to generate their curricula vitae and annual activity reports, while administrators can also run aggregate reports for different purposes, such as for accreditation or to contrast departmental productivity. The system is structured in such a way that it can be customized to each university during the implementation phase.

At State, the decision to purchase PA was made solely by the Provost and was mainly driven by the need for a central CV database allowing for easier productivity reporting that would eventually feed into a performance-based budgeting approach. At Private, the purchase decision was made by a committee, and driven mainly by the need to collect accurate activity data for accreditation reporting.

Data Collection

We collected different types of data specific to faculty use of the PA system: interviews, direct observations, and archival documents. We selected informants from different disciplines and roles in order to get a variety of perspectives. We conducted 31 semi-structured interviews (17 State, 14 Private) with faculty, administrators as well as PA system implementers (Table I). We interviewed 9 faculty members at State, of which 4 were

interviewed twice. We interviewed 11 faculty members at Private, of which 4 were followed up with observation sessions. In both settings we conducted the interviews a few months after PA's use had become strongly encouraged and followed up with further interviews or observations a few months later to elicit more details. Most faculty members involved in the study were tenured as we wanted to focus on individuals who, in principle, had more latitude in PA adoption and use. In both settings, we interviewed a mix of faculty from different disciplines to ensure comparability across settings (Table I) and included faculty members who had served, or were serving, as department chairs. These dual role faculty were an important source of information because they used the system to codify their own activities, but also to assess other faculty members' performance. We also interviewed a few key administrative and implementation personnel in each setting (Table I) because although not key users, they could provide crucial information regarding PA design and its communicated purpose.

Four of the authors conducted the interviews lasting 30 - 90 minutes, with an average length of one hour. Interviews were audio recorded and transcribed. Seeking to explore the interviewees' experiences of PA, we started by framing the research project as investigating how standardized accountability systems are made to work in a specific context. We asked the informants to reflect on their experiences with PA. This introduction prompted open-ended storytelling by the interviewee, which was followed up with questions from a list that had been prepared in advance (Table A1). We did not directly ask informants about their meaningfulness experiences to avoid the problem of reactivity where the respondents focus on what the interviewer wants to hear (Oltmann, 2016). Rather, we wanted to see what kind of evidence of the relationship between meaningfulness and datification work our data revealed.

Two authors collected 17.5 hours of non-participant observational data of faculty members using the PA system, and meetings of faculty members and system implementers (Table I). Observational data from meetings were not recorded but extensive notes were taken. Observation sessions, lasting between 35 and 100 minutes, of faculty members using PA were video recorded and transcribed. We also collected electronic versions of documents such as the PA system user-guide and various university-wide and unit-specific e-mail memos related to PA.

INSERT TABLE I ABOUT HERE

Data Analysis

As recommended for in-depth qualitative studies following the realist paradigm (cf. Sutton and Hargadon, 1996; Yin, 2009), we relied on a triangulation of data from multiple sources (Table II), which contained rich descriptions of PA, its use and faculty members' experiences with it. After a close reading of the data, we performed an initial analysis of the interview, observation and document texts via open coding in Dedoose (a web-based qualitative data analysis software). Consistent with our inductive and qualitative approach, we then followed the analysis steps reported in Courpasson and Monties (2017), Harrison and Rouse (2014), and Pratt et al. (2006), whereby we (1) examined the data to identify statements or first-order codes, (2) integrated first-order codes to identify theoretical categories, and (3) delimited theory by aggregating theoretical dimensions.

First order coding revealed participants' descriptions of datification work, their understanding of the purpose of the PA system, the rationale of their work, the outcomes they experienced from doing datification work, and actions they took in response to using the PA system. For example, a faculty member described their work of codifying activities in PA as "*one size fits*

all,” the purpose of PA as “*reporting*” to higher administration, the rationale of their work as freely advancing “*discipline-specific*” scientific knowledge, the following experience as feeling unable to “*represent*” their unique contributions, and their response to this experience as refusing to use PA (“*I sort of opted out...* ”).

Discussion and comparison of first-order codes revealed statements coalescing in a manner that suggested a theoretical category. We then consulted published research to help us understand our inductive insights and integrate them into theoretical categories. For example, descriptions of datification work revealed an emphasis on a subset of characteristics that have been addressed in prior studies on datification (Baars and Kemper, 2008; Swan, 2013) and use of data-driven management approaches in academia (Alvesson and Spicer, 2016).

At the third step, we examined the theoretical categories we had generated to determine how, and if, they fitted together in meaningful ways. We relied on the nature of the categories in terms of what made sense conceptually, evidenced patterns across individuals in our data and relationships reported in prior research. We provide an overview of our complete data structure including sample first order codes, theoretical dimensions, and aggregated theoretical dimensions in Figure 1. Our final analysis step entailed exploring the data for possible patterns of relationships among the main aggregated theoretical dimensions.

INSERT TABLE II ABOUT HERE

INSERT FIGURE 1 ABOUT HERE

Findings

Seven aggregated theoretical dimensions, representing the main constructs for our study, emerged from the data: (1) datification work characteristics; (2) institutional context; (3)

work meaningfulness experiences; (4) lack of work meaningfulness experiences; (5) augmenting appropriation practices; (6) offsetting appropriation practices; and (7) no appropriation practices. Datification work characteristics describe the nature of PA and the corresponding datification work in terms of four attributes – quantification, standardization, structure and visibility. Quantification refers to the extent to which data must be numerically codified (e.g., contributions codified through binary choices, such as “peer-reviewed” or not) (Swan, 2013). Standardization refers to the extent to which data must be entered according to pre-defined categories (e.g., only pre-defined scholarly contributions can be entered, otherwise the category “Other” must be used) (Swan, 2013; Mingers and Willmott, 2013). Structure refers to the extent to which data must be arranged and ordered in a particular way (e.g., entry of journal articles is structured into entering authors, year, title, outlet, etc. into separate fields; no additional fields can be added) (Baars and Kemper, 2008), and visibility to the extent to which data is made public for viewing, and to whom (Alvesson and Spicer, 2016). Institutional context describes two inter-related elements. The first relates to the institutional framing of PA, or how the universities conveyed its purpose and intended use. The second relates to the common rationales faculty members used to describe the purpose and value of their work. Individual faculty used different descriptions, but the commonalities reveal underlying institutional logics of what is considered legitimate academic work (Friedland and Alford, 1991). Work meaningfulness experiences were characterized by an overall sense of self-realization (work reflects and fulfills who the individual is) and worthiness (work provides justification of why one’s work is valuable) (Lepisto and Pratt, 2017). Lack of work meaningfulness experiences were characterized by a sense of alienation (separation from sense of self and control) and anomie (ambiguity and uncertainty regarding work value) (Lepisto and Pratt, 2017). Augmenting appropriation practices reflect techniques employed to gain greater advantage of PA’s positive influences on meaningfulness

experiences by either altering what is entered into the system (task appropriation) or attempting to change the PA system itself (technology appropriation) (Leonardi et al., 2016).

Off-setting appropriation practices refer to techniques used to decrease PA's negative influences on meaningfulness experiences through either passive or active resistance (Lapointe and Rivard, 2005) to the system, or using datification work to alter one's role to avoid a perceived disadvantage (role appropriation) (Leonardi et al., 2016). The no appropriation dimension captured the choice to accept, and use the system as-is.

Our data analyses revealed a pattern of relations suggestive of the model depicted in Figure 2.

In sum, we find that meaningful work experiences are influenced by specific datification work characteristics, but this influence depends on the institutional context as well as, indirectly, on the various appropriation practices faculty engage in to modify the datification work. In the following sections, we discuss these findings and provide illustrative data.

INSERT FIGURE 2 ABOUT HERE

Datification Work in PA and Meaningfulness Experiences

Our results suggest that datification work can help professionals with “account making” (Lepisto and Pratt, 2017) by justifying the worth of one's work and showcasing corresponding achievements, thereby contributing to experiences of meaningfulness.

However, our findings indicate that the characteristics of codification play an important role in how the account making unfolds and whether it contributes to experiences of meaningfulness, or lack thereof. Although datification work characteristics across State and Private were fairly similar, there were two variations in the PA design that had implications for the work meaningfulness of academics using the system. Specifically, there were two customizations to PA at Private: (1) narrative sections of the old MS Word annual report

were added to PA, and (2) PA database was integrated with standardized faculty web profiles. These customizations permitted open text fields to describe activities in narrative form, and linked data in PA to public web profiles for displaying a short biography, teaching activities, publications, media engagements, and the like. The first variation allowed faculty at Private to complement quantitative, standardized and structured data with qualitative, personalized and unstructured data that could provide a richer depiction of their activities and contributions. While both universities' PA system provided internal visibility by channeling data to intra-university entities such as higher administration, Private's additional, external-facing data channeling provided employees with a mechanism for greater visibility for showcasing accomplishments to a broader audience.

Thus, we find that at Private datification work characteristics were generally less restrictive, and more likely to lead to experiences of work meaningfulness. Following is a passage relaying how having access to both quantitative and qualitative data (i.e., "facts" and "narratives") through PA could contribute to a feeling of self-realization in conducting one's job, with an alignment between PA and one's work role (May et al., 2004; Pratt and Ashforth, 2003):

"Having all of the "facts" coming out of PA I think is wonderful, because I think it helps everybody understand what the net of gathering data is that we want to use... and the narratives are subjective ... a personal expression of the faculty member's interpretation of the facts. I thought that it [PA] was particularly valuable in that it ... normalized the categories that the chairs wanted to look at ... I have the sense that I'm actually looking at the whole department ... I'd like to see whether or not I'm creating an outlier accidentally or if I'm being unfair in measuring in different ways... So [PA provides] a mechanism where I can justify my own answers with some degree

of confidence. I think that also leads to more fairness [...]” (Department chair, tenured faculty member, Computer Science, Private)

While the narratives provided opportunity for qualitative, non-standardized data entry, PA at Private also relied on many pre-defined categories, which fit some disciplines better than others. For example, an Economics faculty member comments on the value of a wide variety of categories in accounting for his contributions, contributing to a feeling of self-realization:

“[PA] is detailed in terms of the categories, so it means there’s not as many ‘others’... Clear location for consulting now, for media stuff, for academic advising... One word for PA: comprehensive. It provides real value for accreditation reports and for displaying stuff too.” (Tenured faculty, Economics, Private)

Meanwhile, a Natural Sciences faculty member comments on the lack of flexibility in PA to express the achievements (i.e., quality of journal publications) of all faculty equally, contributing to a feeling of alienation:

“[In Natural Sciences], we have a huge number of sub-specialty journals, and these have lower Impact Factor, but higher prestige... and there’s something in [PA] about the quality of journals, but we do not have such a thing as A, B and C journals. So [PA] has no flexibility beyond listing things and a lot of Arts & Sciences faculty feel it’s being foisted upon them by business needs.” (Tenured faculty, Natural Sciences, Private)

At State, PA did not permit narratives and the datification work characteristics were generally more restrictive, contributing to a sense of individuals’ value being reduced to simple quantifications, as the following e-mail from the faculty union indicates:

“Do you remember PA? The program that required us all to quantify our work ‘output?’ Administration is now proposing to use the data generated through PA to

initiate a gradated pay increase... This proposal is unacceptable... it fails to recognize meaningful standards of quality in academic work. PA only assesses the quantity of papers published, students taught, committees chaired; it can't measure quality: whether one accomplishes those tasks poorly or well..." (excerpts from e-mail to all unionized faculty members, State)

The reliance on PA's pre-defined categories at State also contributed to faculty feeling unable to fully express themselves (Sarros et al., 2002) through the data, lack of discretion (Lips-Wiersma and Morris, 2009) in entering the type of data they wanted, and having data visible to higher administration when there was a lack of trust in how they would use the data (cf. Bailey et al., 2017; Cartwright and Holmes, 2006) – all factors associated with a sense of alienation linked to lack of work meaningfulness (Lepisto and Pratt, 2017):

"PA very much does seem to be a "one size fits all" kind of thing... this is a really big problem because ...your discipline is different than mine (duh?), but ... PA says here are the categories - fit your stuff in it [...] This [entering data into PA] is one more meaningless thing we have to do, ... and we are never going to understand what happens to the data, we're never going to see the actual results. We just know that if we don't do it, we're going to lose. ... [there's] just no transparency in the process at all..." (Department chair & Tenured faculty, Linguistics, State)

With regard to the characteristic of visibility, we find that it had the potential to contribute to a sense of achievement, the ability to reflect on one's work and improve (Dik et al., 2013; Fairlie, 2011; Lips-Wiersma and Morris, 2009) at both universities. However, the customization of linking PA data to public web profiles at Private further facilitated this link between visibility and meaningful work. The following passage illustrates how external visibility through a web profile linked to a self-realization experience via representation of contributions:

“I know if someone is going to be looking for me on the web and invite me someplace, they’re going to want to find what I have done most recently; so even book reviews, I put them into PA almost immediately to make sure that they get represented. So, I can keep the outside world updated. ... if I blog I make sure I include a link to it [web profile generated from PA data].” (Tenured faculty member, History, Private)

At State, despite PA allowing for internal visibility only, PA could demonstrate how faculty members contribute to the collective, contributing to an experience of worthiness:

“You need the facts and this [PA] is an opportunity to get useful data. How much publication are people doing, etc...? I think every university needs to be profoundly more productive...So [PA] is a nice tool ... Everybody has different strengths and weaknesses. I can’t make this university successful, but if we have lots of ways to show our contributions and we can gross them up and look if there’s a place where systematically we’re off.... tools like [PA] could help us understand our research, if we were looking at it broadly, not just at an individual level” (Tenured faculty member, Director of a Ph.D. program, State).

Interestingly, in both sites visibility also had the potential to limit attention to only those activities that can be codified (Alvesson and Spicer, 2016), thereby contributing to a feeling of inability to express what an individual’s work is really about (Lepisto and Pratt, 2017) as well as a sense of neglect of one’s greater purpose (Dik et al., 2013; Lips-Wiersma and Morris, 2009). For example, at Private, some faculty felt that PA’s representation of their work left much to be desired:

“My faculty were extremely resistant to using PA because they saw no advantage to them ... In their opinion PA was clumsy, ineffective, and did not represent them in the way that they wanted to be represented either to me or to the outside world. I

happened to agree with them about this... ” (Department chair, tenured faculty, Philosophy, Private)

At State, emphasis on the activities made visible in PA was seen as a shift away from the real mission of universities:

“For the last two years ... all we ever heard was money... And ... we’re here to educate students. At least admit that’s our mission. And that just never happened, because the money pressures were so great... the software is allowing ... monitoring ... and makes it easier without any human contact, and no particular feedback ... this [PA] just doesn’t feel right, cause it doesn’t seem to be about what our mission is...”

(Department chair, tenured faculty, School of Business, State)

These different influences of the same datification work characteristics on meaningfulness experiences can be explained partially by the institutional context of both sites – as explained next.

The Impact of Institutional Context

The customizations made to PA at Private not only impacted the datification work characteristics, but also influenced how PA was communicated at Private. We find that Private and State utilized different framings (Cornelissen and Werner, 2014) when communicating the purpose of PA and the data collected with it. State utilized a framing indicative of valuing faculty productivity, conveying PA as a “*reporting*” tool, important for providing “*evidence of program or department-level productivity.*” In contrast, Private framed PA mainly as a communication tool for enabling faculty to show their activities to the public by “*maintaining attractive public profile webpages,*” as well as conveying annual achievements to department chairs. Such framing provides the broader socio-cultural context for understanding what kind of work is valued and how PA is part of accounting for this

value. This serves as a basis for constructing experiences of what work is meaningful and what work is not (Lepisto and Pratt, 2017). As Goffman (1964) indicates, frames enable participants to impart meaning on to events, allowing individuals to interpret particular events, in this case the introduction of a new accountability system. As highlighted in the quote above, many faculty at Private experienced PA as a meaningful tool to communicate their achievements in alignment with the framing of PA. At the same time, framing PA data as evidence of productivity went against what many faculty at State saw as the mission of their work (i.e., to educate students).

However, the framing of PA alone cannot explain the differences in experiences we observed in response to the same datification work characteristics, especially among faculty within the *same* university. Our data revealed indications of disciplinary differences, but these were not consistent. A rather more stable and revelatory explicator of differences in meaningfulness experiences was how well the datification work aligned with the values faculty members expressed (Cohen-Meitar et al., 2009; May et al., 2004; Pratt and Ashforth, 2003) regarding legitimate work in the university context. In our settings, faculty expressed two traditional university-related values when discussing the rationale of their work: “*intellectual freedom*” and the “*mission to educate students*”. However, they also expressed a more contemporary value of being “*productive*” and “*efficient*” (cf. Kallio et al., 2016). This is suggestive of an institutional context where contrasting institutional logics co-exist (Lounsbury, 2007), a phenomenon that is now recognized as fairly common, especially in contexts undergoing significant change (Smets et al., 2015). Generally, we find that faculty members who believed that universities need to be productive and efficient were more likely to experience meaningfulness in undertaking datification work at both universities. For example, at State, the faculty member seeing PA as a tool to show one’s contributions to the collective quoted earlier (“*You need the facts and this [PA] is an opportunity to get useful data...*”) clearly

expressed the value of high productivity at universities (“*I think every university needs to be profoundly more productive ...*”).

As observed in earlier studies of academics (Alvesson and Spicer, 2016; Knights and Clarke, 2014), faculty members often express both intellectual freedom and productivity values simultaneously, revealing conflicting logics guiding what is considered legitimate and valuable work in academia (Dunn and Jones, 2010). When datification work in PA accommodates the intellectual contributions of the faculty member, we find that these two values can effectively co-exist (Reay and Hinings, 2009) and contribute to experiences of meaningfulness. Only when datification work forces faculty members to codify their work according to categories that were perceived as not applicable did the two values conflict and contribute to a lack of meaningfulness. This pattern is exemplified by the lack of positive validation of the worth of one’s contributions experienced by librarians at State:

“We are 12 month faculty... so a different model... and at the same time I am trying to figure out what it means to be a tenure-track faculty and what’s required... but the more we say that it’s a different model, the less of a case we make for being tenure-line faculty, even though we’ve been that way for 50 or 60 years here... E.g., some of our biggest achievements with our presentations don’t count as refereed ... It also feels sort of yucky when you have a lot of blank categories [in PA]... PA feels connected to all of these issues around tenure and promotion and productivity and conversations we’re having with the Provost and, in general, the library isn’t very valued at this campus, our budget is cut, we’re losing tenure-lines ... (Tenure-track faculty member, Librarian, State)

Experiences of meaningfulness, thus, involve feeling an alignment between datification work in PA and the values one subscribes to (cf. Cohen-Meitar et al., 2009; May et al., 2004; Pratt

and Ashforth, 2003), while lack of meaningfulness is characterized by a lack of such alignment. Faculty members found many ways to improve this alignment – as we discuss next.

Active Pursuit of Meaningfulness: Augmenting and Offsetting Appropriation Practices

We find that faculty appropriated the PA system to augment experiences of meaningful work and to offset lack thereof. We observed that faculty experiencing more meaningfulness-related facets in using the PA system engaged in activities to further enhance their meaningfulness experience. In contrast, faculty whose experiences were more in line with lack of meaningfulness when using the PA system, tended to pursue means to counteract the negative effects of datification work. Also, a small subset of the of faculty did not actively engage in any form of appropriation.

Augmenting Meaningfulness through Technology Appropriation

To further enhance positive experiences, faculty members engaged in a form of technology appropriation by attempting to modify and further improve the PA system to take better advantage of its benefits:

“[PA] is very detailed in terms of the categories ... and the implementation team know I’m just looking to make a better product. ... So you have all your articles, some are published, some accepted, some re-submitted... but [last year] it didn’t tell you what was what in terms of the status. You can’t send your chair a list of seven papers when it doesn’t show what’s going on... so this year ... they show the status on the report. So I went over to [PA implementers] to tell them I was happy about [it].” (Tenured faculty member, Economics, Private)

In this case, changes in the technology lead to changes in datification work characteristics and the ability to better express what one’s work is about in PA, thereby, helping to construct work meaningfulness experiences.

Augmenting Meaningfulness through Task Appropriation

Our data show that the tactic of task appropriation had a similar effect to that of technology appropriation and was used for the same purpose. While task appropriation did not improve the technology itself, it altered how the technology was used:

“I like using the PA piece as my webpage... to see what I’ve done lately. And the annual reports, they are in a much more standard format. ... But there’s still plenty of room for self-expression. For example, professional development [category in PA] is a little stranger in that it is often things that you’re not instantly getting credit for, you know, it’s not a publication. So, I always read this section as ... the things you did that you wouldn’t get credit for otherwise...It’s always a bit redundant ... but if you have a dynamic career you’re always doing more than you need to.” (Former Department Chair, tenured faculty member, Mathematics, Private)

Here, task appropriation introduced changes into datification work directly. Faculty members using this tactic took the data recording activity in PA as an opportunity to play on their strengths (Dik et al., 2013) and construct meaningfulness at work. Table A2 in the Appendix offers additional evidence of augmenting appropriations.

Offsetting Lack of Meaningfulness through Role Appropriation

As noted earlier, experiences of lack of meaningfulness included a sense of alienation from inability to express one’s achievements and have control over one’s work, and a sense of anomie characterized by uncertainties, such as whether one is neglecting the mission of one’s work (Lepisto and Pratt, 2017). These negative experiences were counteracted in multiple ways. For example, the tenure-track librarian previously quoted described her appropriation technique in the face of lack of meaningfulness, suggestive of role appropriation through PA:

“I’m a librarian, but I’m also an assistant professor ... At my previous institution, I wasn’t on the faculty... So [PA] felt like something I needed to do right away, but it wasn’t clear where things fit ... For example, some of our biggest achievements with our presentations don’t count as refereed ... So [X] did something really interesting, he found out from somebody which categories will be reported up [to the Provost]. And then he sent it out to all of us and said ... these are the most essential pieces of information. ... Well, I’m not gonna enter my x and y and z if only z is being reported.

(Tenure-track faculty member, Librarian, State).

As illustrated, role appropriation is geared towards improving one’s social position (Cartwright and Holmes, 2006). The faculty member was attempting to counteract the situation in which their achievements, and thus status, did not appear as valuable by altering how and what data is entered into PA. This action helped boost their standing with higher administration and offset the lack of meaningfulness.

Offsetting Lack of Meaningfulness through Passive or Active Resistance

Passive resistance involved complaining about PA, using it on a limited basis, and opting to use a different system in parallel to PA to account for one’s contributions. In prior research, passive resistance has been shown to be the overwhelming response to datification initiatives among academics (Alvesson and Spicer, 2016; Hoecht, 2006). However, we also found evidence of active resistance – outright rejection of PA:

“I’m a full professor and have been at [State] for five years. This is my second year as department chair ... our dean told us that all faculty were expected to enter their entire CV into PA. PA very much does seem to be a “one size fits all” kind of thing... And bigger questions about why are we doing this were never really discussed ... that’s why I think the chairs went through the roof about it... we know those numbers are

meaningless ... so are no numbers better than really bad numbers? I investigated further but couldn't get an answer about categories that matter to the administration. So, I ignored PA and told my faculty to do so as well... ” (Department Chair, tenured faculty, Linguistics, State)

Active resistance allowed faculty members to regain control by acting in opposition (Lips-Wiersma and Morris, 2009), which offset alienation-related experiences of lack of meaningfulness. Table A2 offers additional evidence of offsetting appropriations.

No Appropriation

We found two instances of ‘no appropriation’ in our data (Table A3, Appendix). No appropriation emphasizes inactivity with no altering of task, technology or role, no rejection of the system. It may involve complaining to oneself. While passive resistance also involved complaints, this behavior was deliberate and oriented towards others – a step up from apathy and a clear indication to others that the individual was not happy with the situation (Lapointe and Rivard, 2005). Our examples of ‘no appropriation’ indicate that there were two reasons for doing nothing: (1) the individual thought the PA system and how it is used were “*out of my control;*” and (2) the individual attempted to appropriate by asking implementers to make a change in PA, but the request was not granted. Both cases suggest that the ‘no appropriation’ option is associated with a perceived lack of control, resulting in a form of resignation. While there is little research specifically on ‘no appropriation,’ this pattern is in line with the idea that appropriation requires discretion (Wrzesniewski and Dutton, 2001) and self-efficacy (Schmitz et al., 2016). Furthermore, the ‘no appropriation’ response was present only in response to lack of meaningfulness experiences, not in response to meaningfulness experiences. While possibly counterintuitive, this finding is in line with prior research showing that appropriations are common in response to positive technology experiences (Stein et al., 2015).

Discussion

Our investigation of datification work highlights three factors influential to meaningful work experiences. These include (a) the design of the accountability system and corresponding datification work characteristics, (b) the institutional context of the system, and (c) the appropriation responses adopted in relation to meaningfulness experiences.

The primary contribution of this study is that it fleshes out the role of datification work, increasingly common in the 21st century, in experiences of meaningfulness. In tracing experiences of work meaningfulness (and lack thereof) to different datification work characteristics (Baars and Kemper, 2008; Swan, 2013), we are able to advance theoretical understanding of how system design, by constraining or enabling datification work characteristics, becomes an important element influencing work meaningfulness. Generally, we find that more restrictions in datification work contribute to lack of work meaningfulness. When datification work is restricted to “one size fits all” (cf. Alvesson and Spicer, 2016; Bailey and Madden, 2016), it becomes a constraining work condition (Hackman and Oldham, 1980; Rosso et al., 2010) and a source of “impoverished meanings” (Lepisto and Pratt, 2017, p. 108) that contributes to alienation and anomie (Lepisto and Pratt, 2017). However, when a standard system is complemented with less structured and more qualitative forms of data entry possibility, datification work can also contribute to experiences of meaningfulness (cf. Kallio and Kallio, 2014). In such form, datification work can lead to an examination of the self (Townley, 1994) and facilitate development, self-actualization and justification of the value of one’s work (Lepisto and Pratt, 2017). The datification work characteristic of visibility adds a twist to this story. Quantification, standardization and structuring of data happen in the context of being aware of how, for what, and by whom the data is viewed and used. As professionals are increasingly familiar with social media, they do not necessarily

mind making data about themselves visible. They do, however, like to “strategically target” those data (Stohl et al., 2016). For example, faculty members may want to showcase all activities in a report to their department chair but may only want a selection of these activities (e.g., contributions to society) to go on the web, and another selection (e.g., publications in top journals) to go into the report for higher administration. Designing systems that permit more flexibility in datification work allows for such differentiation and, as we show, can contribute to experiences of meaningfulness. Theoretically, this finding implies that accountability systems and datification work, despite on the surface appearing as “repetitive drudgery” (Bailey et al., 2017, p. 416), can foster self-expression (Pratt and Ashforth, 2003), as well as feelings of achievement (Fairlie, 2011; Lepisto and Pratt, 2017; Lips-Wiersma and Morris, 2009).

In practice, a narrow understanding of datification and corresponding design of accountability systems which emphasizes quantification, standardization, and structure, can serve as hindrances in fostering meaningfulness through datification work. Given the increased adoption of datification work in a variety of professional realms, our findings generalize to other accountability systems beyond academia. A good example is the medical field where physicians spend increasing amounts of time entering data related to their activities. Physicians express scepticism towards overly standardized electronic patient record (EPR) systems and have been shown to try to actively make EPR into a “meaningful” tool (Winthereik et al., 2007). Experimenting with system design to generate alternative approaches to datification could, thus, be a valuable avenue for both future research and practice. From our study, it is clear that the most important element in any approach will be the level of control granted to employees over their data – for example, being able to add to and comment on the data that is entered, as well as decide how and what bits of data to combine into reports for different audiences. However, while this accommodation will reduce

perceptions of managerial control (Knights and Clarke, 2014) and institutional censorship on work (Gappa et al., 2005) that are so detrimental to work meaningfulness, it can also introduce more work. Automated systems that pull data from other databases can help with this. Combining such automation with the opportunity for people to comment on the results may help alleviate demands on individuals while simultaneously fostering experiences of meaningfulness. Regardless, it should be noted that accountability systems functioning as a way to measure self-worth can leave our “exposed selves at stake” and vulnerable, especially when “outcomes are crystalized through a numerical system and put on public display” (Alvesson and Spicer, 2016, p. 39). As suggested by Hoecht (2006), professionals are not opposed to accountability, they are opposed to verification rituals and box ticking (Bailey and Madden, 2016) that leave them vulnerable and encourage “gaming the system” (Alvesson and Spicer, 2016).

Practically speaking, therefore, creation of work tasks that allow for enrichment (Berg et al., 2013; Wrzesniewski and Dutton, 2001) must increasingly consider design of systems and data practices and the impact they may have. As exemplified by the PA system, performance management and accountability systems tend to be developed for multiple organizations and, thus, must rely on some standardization. It becomes the responsibility of the organization to customize the system so that it encourages meaningful work experiences. Customization may occur before the system is implemented, but may also happen post implementation as a result of appropriation practices. The latter was demonstrated in our study at Private, where users were listened to and the system was modified to support user requests.

As suggested by our findings, experimentation in system design should include considerations of institutional framings. Institutional framing (Cornelissen and Werner, 2014) of an accountability system provides the context for professionals to understand what is valued in their organization and how datification work features in accounting for this value

(Lepisto and Pratt, 2017). As indicated by Franco-Santos and Doherty (2017), whether performance is managed through a directive or an enabling approach has a significant impact on the well-being of professionals. Our findings similarly suggest that an institution's approach to datification influences whether professionals find datification work as more or less supportive of meaningful work. Practically, this suggests that organizations need to think carefully about how to present a new accountability system in terms of what they communicate about its intended purpose, as well as how the data it generates will be used. From the perspective of "the management of meaningfulness," it is critical that the framing of the system match its actual purpose so the framing does not come across as manipulative (cf. Bailey et al., 2017, p. 418).

In addition, we suggest that the issue of datification work alignment with values may be influenced by the institutional context. The different values expressed by the faculty members we interviewed (e.g., intellectual freedom and productivity) are a product of competing systems of meaning or institutional logics (Friedland and Alford, 1991; Suddaby, 2010) observed in many fields including academia (Dunn and Jones, 2010). This means that there are different goals, norms and expectations about what is legitimate (Thornton and Ocasio, 2008) that can co-exist in a particular institutional context, with people in different roles or with different histories subscribing to one or other of these logics more strongly. These institutional logics are, then, likely to influence what are seen as meaningful work experiences. For example, having a greater purpose or a calling is important for meaningful work (Dik et al., 2013; Lips-Wiersma and Morris, 2009) and institutional logics can provide a common base for professionals in a particular occupation to decide what these callings can be. Generally, our findings would suggest that datification work in academia aligns better with the more contemporary market-oriented institutional logic that values efficiency and productivity. The prevalence of this institutional logic (cf. Kallio, 2016; Kallio and Kallio,

2014) suggests that data-driven approaches may be increasingly accepted as meaningful ways to reflect on one's work and its value (Bailey et al., 2017; Lepisto and Pratt, 2017; Pratt and Ashforth, 2003). However, the traditional institutional logic of intellectual freedom remains strong in academia (Kallio, 2016) so that datification work that allows academics to report on things that they see as important is likely to help facilitate the harmonious co-existence of these two logics (Reay and Hinings, 2009), and contribute to meaningfulness experiences. Our findings, thus, suggest that in other contexts, organizations could usefully identify co-existing institutional logics, and look at ways to design accountability systems that can accommodate both. For example, in relation to the previously mentioned resistance to EPR systems, it has been shown that having record systems that allow doctors to write narrative reports, as well as check boxes related to symptoms, diagnosis and treatments, are more likely to be accepted (Newell and David, 2012) because they align with traditional and new logics within healthcare.

From a theoretical perspective, our detection of the role that the institutional context plays on the datification work-meaningfulness experience connection has some interesting implications. To date, theory concerning work meaningfulness has mainly focused on its nature, antecedents and outcomes (cf. Rosso et al., 2010). Our findings suggests that we need to advance our thinking to include the potential impact of contextual types of 'moderators' that shape employees' meaningfulness experiences in response to work factors. The manner in which academics responded to their institution's communications regarding why the accountability system was adopted and how its data would be used, is indicative of an incremental sensemaking process whereby employee interpretation of the intent of work factors (e.g., to control or enable) based on contextual cues, has a meaningfulness-related effect beyond that of the basic characteristics of the work factor itself. However, while both institutional framing and logics help explain why the same datification work characteristic

(e.g., visibility) may have a positive and a negative impact on work meaningfulness, both issues need further research. As indicated above, we saw some differences between faculty members from different disciplines. Institutional logics guiding the values of faculty from different disciplines, or in another context individuals from different functions, would, thus, constitute one important future research avenue.

Further, our study shows that professionals are not passive in their responses to datification-related meaningfulness experiences, tending rather to engage in some form of appropriation (DeSanctis and Poole, 1994; Leonardi et al., 2016). In our settings, most faculty members doing datification work in PA reported using appropriation tactics in response to their experiences of meaningfulness. This finding aligns well with the notion that employees craft their jobs in order to shape the meaning of their work (Rosso et al., 2010; Wrzesniewski and Dutton, 2001). The two cases of no appropriation reflected a perceived lack of control and a failed attempt to appropriate, suggesting that opportunities to shape the meaning of work arise from both internal (perception) and external (prohibited modifications) factors (Schmitz et al. 2016; Wrzesniewski and Dutton, 2001). The appropriation tactics chosen differ depending on whether professionals' initial experience is that of meaningfulness, or lack thereof. While job crafting has been considered mostly in response to dissatisfaction and to rekindle old meaningfulness experiences in long-term jobs (Berg et al., 2013), our findings are consistent with observations that the active pursuit of meaningfulness is related to employee engagement (Fairlie, 2011), including willingness to invest effort in one's work. Although some of the appropriation tactics, such as resistance and task appropriation, have previously been shown to impact meaningfulness experiences (cf. Berg et al., 2013; Lips-Wiersma and Morris, 2009), technology appropriation has not been previously addressed. Our findings, thus, bridge the literature addressing work meaningfulness with that addressing behavioral aspects of technology adoption and use. For example, appropriations in

technology and its use, while sometimes going against the organizational intent for the technology, may help to better align the goals of individuals and the organization (Stein et al., 2015), and improve the performance of both (Leonardi et al., 2016). Our study suggests that technology appropriation may be one mechanism that helps individuals increase their experiences of work meaningfulness and their individual performance in an increasingly digitized world (cf. Bailey et al., 2017). Accordingly, we advance current theory by suggesting appropriation as both an antecedent and additional outcome of meaningfulness experiences. Given the increased prevalence of datification work, understanding appropriations is important, especially as it demonstrates practical ways that organizations can help employees augment experiences of meaningfulness. For example, an organization positively responding to employee requests to modify and customize an accountability system, may enhance work meaningfulness while further motivating the employee to use the system, instead of resisting it.

Study Limitations and Future Research

We opted for an inductive study design because our intent was to elaborate theory regarding work meaningfulness. However, given the dynamic nature of the setting, it was difficult to tease out temporal aspects in our data with complete confidence. For example, our model (Figure 2) depicts the institutional context of the accountability system having an early effect on the association between datification work and meaningfulness experiences. It is possible, however, that the institution's communication about the system's purpose and the co-existing logics may have had effects on system appropriations too. As such, a useful next step would be a longitudinal empirical study that would provide for further testing of the relationships we suggest here. Longitudinal study would also help to tease out how datification work may influence work meaningfulness not only periodically during times when professionals must account for their work, but also on a more continuous basis by introducing new

considerations into discourses around mentoring and demonstration of value to external stakeholders.

A second potential limitation is the number and nature of our study participants. While our overall number of informants may appear small, it serves the purpose of our study. Our aim in this paper was not to uncover all possible types of datification work characteristics that influence meaningful work experiences, nor all types of appropriations that may facilitate the pursuit of meaningful work among academics. Rather, our aim was to explain *how* datification work may influence meaningfulness experiences. Our data indicate that this process depends on the design of the accountability system, the corresponding restrictiveness of datification work characteristics, the institutional context of the system as well as augmenting and offsetting appropriation practices that make adjustments to the system or datification work. All of our data support these identified relationships. Second, in some regards, academe might be considered a unique employment setting with academics having varied work, and privileged conditions such as tenure. However, academics also share a number of job traits consistent with other types of professionals such as physicians, and the accountability system implemented in our study settings is consistent with those used in other professional work settings. The strength of the academic setting lies in it providing the opportunity to document the practices of how professionals respond to datification-related meaningfulness experiences. These practices may be less explicit in a corporation where, for example, employees may not have guaranteed employment and active resistance may lead to job loss.

We detected some differences in terms of meaningfulness experiences within the same institution across different employees. However, our study was not designed to decisively draw out patterns within and across disciplines and roles. While variations in the institutional framing of the system explain some of these differences, other variations were also present.

For example, State included many more schools and disciplines, a unionized faculty, and a less experienced implementation team than was the case with Private. It was not possible for us to explicitly conceptualize the impact of each of these factors on meaningfulness experiences. As noted by Rosso et al. (2009), studies are needed that account for the interplay of multiple factors in meaningfulness experiences. Further studies exploring additional organizational and institutional factors that could account for differentiated meaningfulness experiences in an integrative manner would, thus, be useful.

Conclusion

With their sheen of objectivity (Hong, 2016), impression of certainty and control (Hoecht, 2006), and usefulness in creating metrics, accountability systems have become “strangely seductive” tools for organizations (Alverson and Spicer, 2016). As a result, datification work appears to be an ever-increasing aspect of organizational and employee life. Our findings demonstrate that the new reality of datification work has significant implications for work meaningfulness. We suggest a number of relevant issues for both researchers attempting to develop comprehensive theory on work meaningfulness, and for practising managers in their attempts to increase accountability, while also managing meaningfulness. Although there is a certain intuitive appeal to the notion that imposed quantification of one’s work within defined parameters may erode meaningfulness, our study suggests that data-driven accountability systems are not the death knell of work meaningfulness for 21st century professionals and, indeed, can be designed and appropriated so as to contribute to meaningful work.

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Table I. Data sources

Data Sources	State	Private
Interviews	17 interviews with 12 individuals	14 interviews with 14 individuals
<i>Implementers</i>	<ul style="list-style-type: none"> • 3 interviews, 2 implementation team members (twice with team leader) 	<ul style="list-style-type: none"> • 1 interview, implementation team leader
<i>Administrators</i>	<ul style="list-style-type: none"> • 1 interview, provost 	<ul style="list-style-type: none"> • 2 interviews, 2 associate deans
<i>Faculty</i>	<ul style="list-style-type: none"> • 13 interviews, 9 faculty members including 2 department chairs <ul style="list-style-type: none"> ○ 6 Arts, Humanities and Sciences ○ 3 Business 	<ul style="list-style-type: none"> • 11 interviews, 11 faculty members including 2 current and 1 former department chair <ul style="list-style-type: none"> ○ 5 Arts, Humanities and Sciences ○ 6 Business
Observations	<p>Approximately 7.5 hours:</p> <ul style="list-style-type: none"> • 2 faculty advisory group sessions • Limited observations of faculty use during interviews. 	<p>Approximately 10 hours:</p> <ul style="list-style-type: none"> • 4 sessions with faculty filling out their annual reports using PA • 1 recording of a meeting with 21 individuals including implementer, administrators, department chairs
Documentation	<ul style="list-style-type: none"> • E-mails on introduction of PA, faculty union complaints, etc. • PA user guide 	<ul style="list-style-type: none"> • E-mails on introduction of PA, faculty senate complaints, • PA user guide

Table II. Triangulation of data sources for results

Theoretical dimensions emerging from iterating between data and literature	Data sources						
	Interviews			Observations		Documents	
	<i>Faculty</i>	<i>Administrators</i>	<i>System implementers</i>	<i>PA use</i>	<i>Meetings</i>	<i>E-mails</i>	<i>PA user guide</i>
<i>Datification work characteristics</i>	Strong evidence*	Moderate Evidence	Strong evidence	Strong evidence			Moderate evidence
<i>Institutional context</i>	Moderate evidence	Moderate Evidence			Moderate Evidence	Strong evidence	
<i>Work meaningfulness experiences</i>	Strong evidence	Moderate Evidence		Strong evidence			
<i>Lack of work meaningfulness experiences</i>	Strong evidence			Strong evidence	Sporadic evidence	Sporadic evidence	
<i>Augmenting appropriation practices</i>	Strong evidence	Moderate Evidence	Moderate evidence	Strong evidence			
<i>Offsetting appropriation practices</i>	Strong evidence	Moderate Evidence		Strong evidence	Moderate evidence	Sporadic evidence	
<i>No appropriation practices</i>	Strong evidence		Sporadic evidence				

* Strong evidence = dominant theme in source; Moderate evidence = frequent but not constant theme in source; Sporadic evidence = theme appearing occasionally in source. Empty cell indicates no evidence for theme in the source.

Figure 1. Overview of data structure (¹ Data generated from interviews; ² Supplemented with data from observations and videos; ³ Supplemented with data from archival sources)

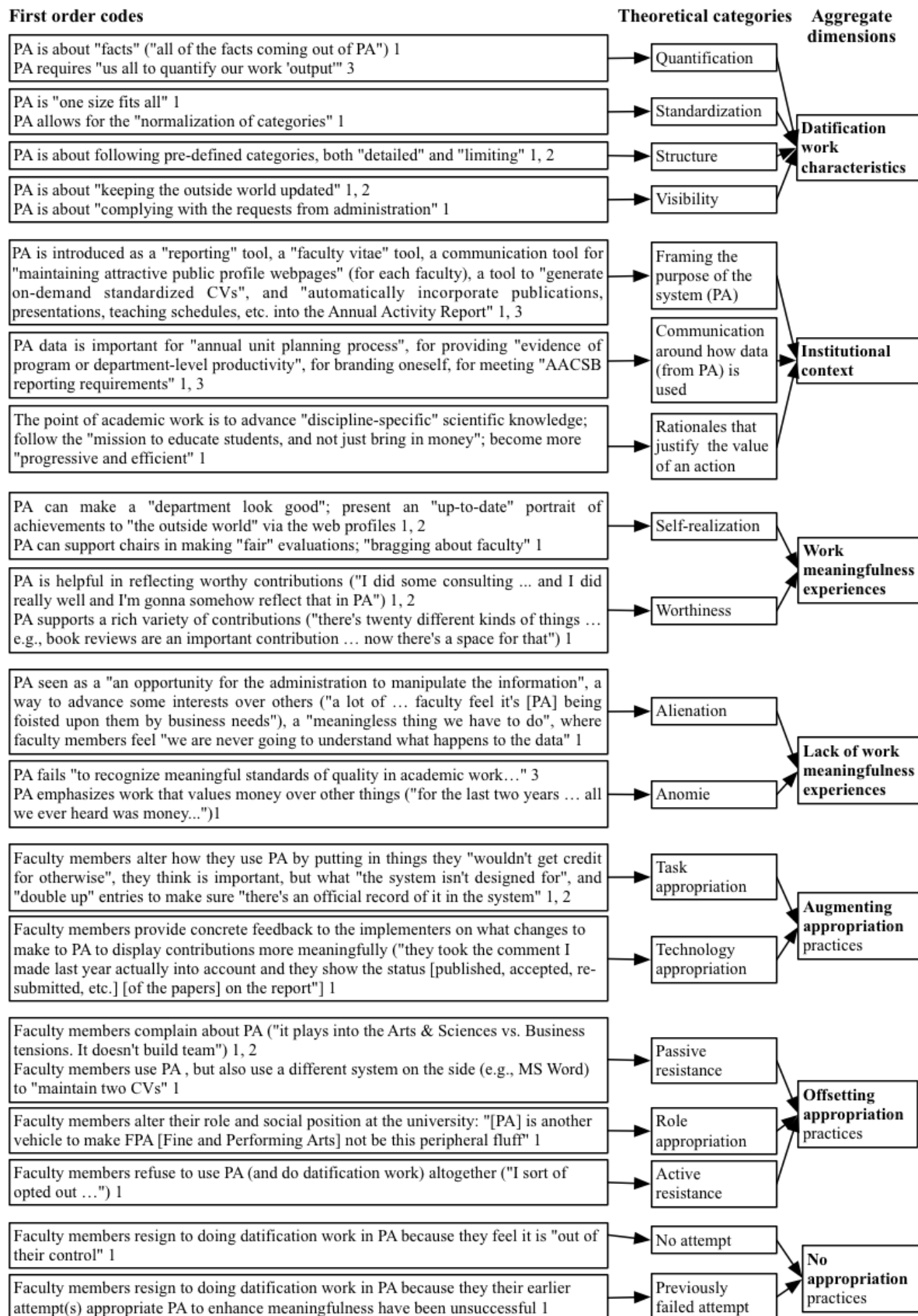
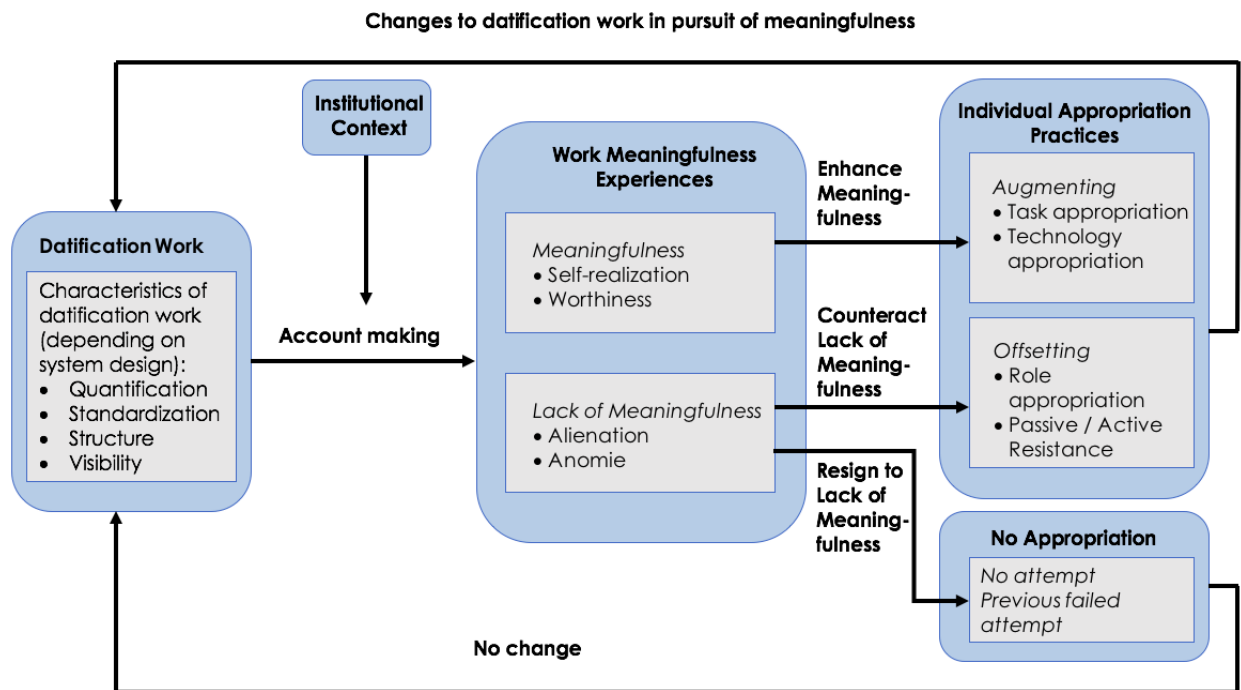


Figure 2. Proposed theoretical model: Datification work and the pursuit of meaningfulness



Appendix

Table A1. Example interview questions

Source	Example interview questions
<i>Faculty Interviews</i>	<p>“Why do you think PA was implemented?”</p> <p>“What was the messaging that was sent out to the faculty about the purpose of PA?”</p> <p>“Please describe the steps you follow in order to enter your activities into PA?”</p> <p>“What has the impact of the system been?”</p> <p>“Please describe aspects of the software that work well/not well for you?”</p>
<i>Administrator Interviews</i>	<p>“What is the purpose of PA?”</p> <p>“How was the system chosen?”</p> <p>“Who made the decision?”</p> <p>“Do you think the implementation was successful? Why/why not?”</p>
<i>Implementer Interviews</i>	<p>“Can you describe what the system does?”</p> <p>“How was it implemented?”</p> <p>“How was the system customized?”</p> <p>“What kind of feedback do you receive from users?”</p> <p>“How has the software been modified in response to this feedback?”</p>

Table A2. Additional evidence of different types of PA appropriations

Appropriating PA for meaningfulness	Total # of individual faculty members in each type	Example quote
Augmenting meaningfulness through technology appropriation	<p>1 tenured faculty, Arts & Sciences, Private</p> <p>2 tenured faculty, (one department chair), Business, Private</p>	<p><i>[PA provides] a mechanism where I can justify my own answers with some degree of confidence. I think that also leads to more fairness [...] [datification work in PA helps to fulfil and account for one’s role; enabling self-realization] [...]. I spent a fair amount of time talking to [implementation team head] about where do I put this, etc.... some categories were missing... we got around a variety of those things, and there are several areas where you can put in some narrative now... ” [technology appropriation; addition of categories and open text fields]. (Department chair, tenured faculty, Computer Science, Private</i></p>
Augmenting meaningfulness	2 tenured faculty, (one former department chair)	<p><i>“[PA] is a nice tool, I love the idea of being able to do comparative stuff... [...] tools like [PA] could help us understand our research [...]. [datification work in PA</i></p>

through task appropriation	Arts & Sciences, Private 1 tenured faculty Business, Private 1 tenured faculty/ admininstrator, Interdisciplinary, State	helps to account for different contributions; enabling self-realization and worthiness] <i>I have a lot of data to put in, not just publications, but all the service stuff. So I made the decision that I would mark the major events for my students and I've been on a 100 dissertation committees ... while the system isn't designed for that, you can just log those as events in PA and they'll show up somewhere [task appropriation; change how PA is used to account for more types of contributions].</i> " (Tenured Faculty, Director of PhD program, State)
Offsetting lack of meaningfulness through role appropriation	1 tenured faculty / administrator, Arts & Sciences, State 1 untenured faculty, Library, State	"[PA] has major problems with the categories that were not appropriate for the school of Fine and Performing Arts [making data standardized]. So people would be guessing where to put things... like creative activities. What's refereed and what's not refereed? [datification work in PA does not help to account for important achievements; fostering alienation] As one of those outlier colleges in our schools, I would say yes [to a standardized software like PA], because people don't understand what the faculty do ... So as it [data in PA] passes out of this school and goes further up [making data visible to higher administration], they know that this is the equivalent of what this is in another school. So I think that's important ... We're working very hard to make FPA [Fine and Performing Arts] not be this peripheral fluff, but a main part of [State] and valued as such. So ... [PA] is another vehicle to do that [role appropriation; improves social position in relation to higher administration]." (Dean, School of Fine and Performing Arts, State)

<p>Offsetting lack of meaningfulness through passive resistance</p>	<p>2 tenured faculty (one department chair), Arts & Sciences, Private</p> <p>1 tenured faculty, Business, Private</p> <p>2 tenured faculty, Arts & Sciences, State</p> <p>1 tenured faculty / administrator, Interdisciplinary, State</p>	<p><i>“My faculty were extremely resistant to using PA PA ... did not represent them in the way that they wanted to be represented ... [datification work doesn’t help account for one’s work or express oneself, fostering alienation]. ... so most of my faculty now maintain two CVs: one is PA, which is used very reluctantly, and then the CV that they keep for themselves. So PA from the perspective of most of the people from my department is an administrative requirement that ...is of little if any advantage to any of us.” [passive resistance: still use PA because required, but resist by using a parallel system on the side] (Department chair, tenured faculty, Philosophy, Private)</i></p> <p><i>“I tried to put in the descriptives (e.g., qualitative descriptions of different duties) into PA, but then when you output it, none of it came out. [datification work doesn’t help to describe details of one’s work, fostering alienation] So now I export a CV that covers maybe 2 months and then I copy-paste the new stuff into my master Word CV, which is based on PA, but has all the added descriptives and formatting ... If I don’t put my activities into PA, my stuff does not show up on my activity report ... so I have to do it [passive resistance: still use PA because it’s required, but resist by having a parallel system on the side].” (Tenured faculty, Film Studies, State)</i></p>
<p>Offsetting lack of meaningfulness through active resistance</p>	<p>3 tenured faculty (one department chair), all disciplines, State</p>	<p><i>“For the last two years ... all we ever heard was money ... And ... you need to acknowledge that we’re here to educate students. ... [...] [PA] just doesn’t feel right, cause it doesn’t seem to be about what our mission is... [datification work doesn’t help account for the work that really matters, fostering anomie]” ... So I just admitted that I didn’t do it... And what I’ve seen from the output that just looks so bad ... you wouldn’t want to give it to anyone) [active resistance: rejection of system].” (Department chair, tenured faculty, School of Business, State)</i></p>

Table A3. Evidence of no PA appropriation

No appropriation of PA	Total # of individual faculty members	Example quotes
No appropriation in response to lack of meaningfulness	1 tenured faculty, Business, Private 1 untenured faculty, Business, Private	<p><i>“I put in my activities into PA and then apparently PA makes a report... I’m not real happy about that magic behind the scenes. I’m a little bit of a perfectionist about that ... For example, there was something on my web profile that said like 2010 -2010. And I was like– I would never make that mistake, cause that’s not how I operate. And I went in and realized it was automatically generated [datification work restricts discretion, fostering alienation]. But I do my best with PA. I guess I’m a rule-follower, you tell me to do it this way, I’ll do it this way. I’ve never thought about opting out. It’s out of my control. It’s gonna do what it’s gonna do irrespective of my input [no appropriation due to perceived lack of control].”</i></p> <p><i>“I use PA for making sure that all my research, teaching and service activities are recorded ... I don’t use it as a means to advertise my (online) profile; there’s no character to the profile, it’s ... a bit boring. Also, it pulls in my full name from the HR system, but I publish under a slightly different name [datification work does not allow for self-expression, fostering alienation]. I contacted the implementation team, but they could not do anything about it. So I have no good solutions for PA, it is what it is [no appropriation due to perceived failure to enact change]. It might be problematic in the future, but right now it’s mostly consumed internally... and helps me organize my tenure packet.”</i></p>