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ABSTRACT

Organizations have long used analytics to improve performance. Modern enterprise technological landscapes are being impacted by the increasing individuation of information systems (IS). One promising technological advancement in this regard will be the use of personal analytics within an enterprise setting. While traditional organizational intelligence metrics deliver a big picture of structures, processes, and roles, more detailed and personalized analytics enables employees to scrutinize their personal productivity in terms of their desired versus their actual way of working. Personal analytics empowers individuals to analyze and exploit their own data to achieve a range of objectives and benefits across their work (e.g. productivity, quality, performance) and personal lives (e.g. sleep, exercise, health). This topic has only been minimally analyzed in IS research. Furthermore, there have been increased calls by academics to investigate the individuation of IS which has largely gone unnoticed in the IS research discipline. While the mainstream application

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of personal analytics in an organizational setting remains relatively niche, we believe its impact will fundamentally change enterprises across all sectors. Thus, in the scope of this monograph, we shall focus on this emergent category of analytics which we refer to as "enterprise personal analytics" which encompasses the concept of organizations enabling their employees to use their individual analytics to manage their digital working lives from descriptive, diagnostic, predictive, and prescriptive points of view. Our comprehensive review of the existing empirical research on the use of personal analytics within an organizational setting identified that the only consistency pertaining to the concept was inconsistency. Therefore, this monograph offers the following theoretical and practical contributions:

1. We present an overview of specific analytics trends which have shaped the personal analytics landscape which include: learning analytics, the quantified self, human-centric analytics, gamification, sports analytics, personal cloud, and Neuro IS.
2. We present a framework, derived from a comprehensive review of the personal analytics literature, which consists of various combinations of research stakeholder perspectives and concerns. This framework can be used to guide and coalesce future IS research on enterprise personal analytics.
3. We provide an overview of possible research questions aimed at highlighting how the framework can be used.
4. We propose a visual mapping artefact aimed at assisting companies with their enterprise personal analytics digital transformation journeys.

Keywords: Business intelligence, business analytics, enterprise personal analytics, research perspectives, research concerns

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1

Introduction

> "We're in the age of auto-analytics, or the capturing and analysis of personal productivity data". Thomas and Cook (2006)

According to Watson (2013) "there is considerable 'buzz' about analytics. It is the topic of numerous articles, books, web seminars, white papers, and research reports and there is growing evidence that analytics is becoming an important component of organizational success". As our lives "become immersed by powerful digital devices and services, questions of implications for individuals' lives as well as their social interactions and structures arise... this emerging fully digitized and connected environment implies changes to the development, exploitation and management of personal information and technology systems" (Matt *et al.*, 2017). Organizations have long used analytics to improve performance. Indeed, research shows that top performing organizations use business analytics five times more than lower performers do (LaValle *et al.*, 2011). In 2016 the business analytics industry was worth an estimated US $130 billion. For example, it is estimated that industrial sectors such as discrete manufacturing, process manufacturing, telecommunications, and healthcare manufacturing will invest a combined total of $101.5 billion

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in business analytics by 2020 (IDC, 2017). One promising technological advancement in this regard will be the use of personal analytics. While traditional organizational intelligence metrics deliver a big picture of structures, processes, and roles, more detailed and personalized analytics enables employees to scrutinize their personal productivity in terms of their desired versus their actual way of working. Personal analytics "empowers individuals to analyze and exploit their own data to achieve a range of objectives and benefits across their work (e.g. productivity, quality, performance) and personal lives (e.g. sleep, exercise, health)". Personal data can relate to biometrics, personal finance, social media activities, health status, behaviors, emotional states, mobility, personal interest areas, and so on. In Chapter 3, we will highlight how advances in analytical and business intelligence technologies have resulted in the emergence of a number of personal analytics trends which have resulted in a dramatic increase in the manner with which consumers use personal analytics in their everyday lives (e.g. wearable technology). As a result of the multitude of benefits which consumers are deriving from the use of personal analytic technologies, organizational interest in personal analytics is also beginning to gain traction. In this article, we will focus on an emergent personal analytics concept that we call "enterprise personal analytics" (or EPA, for short). EPA can be defined as the manner with which "organizations enable their workers to use their personal data to manage their digital working lives from descriptive, diagnostic, predictive, and prescriptive points of view".

Like many information systems (IS) researchers (e.g. Clohessy and Acton, 2017; Davenport, 2014b; Lee and Balan, 2014) and information technology (IT) analysts (e.g. N. and Herschel, 2015; Kleynhans, 2015) we believe that the emerging concept of EPA has the potential to become the new frontier of competitive differentiation. EPA may be of interest to a multitude of organizational sectors such as manufacturing, utilities, energy, and aviation. For instance, EPA can enable skilled and unskilled industrial operators to analyze their own personal data to understand why they're making the choices they're making and then to combine their human expertise with the underlying objective data to create new operating procedures and processes (Bell and Bell, 2016). Wearable technology is increasingly being used in the manufacturing industry for

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employee safety, employee monitoring, video applications, field service, and plant monitoring (Leavitt, 2017). Organizations can also leverage the rich insights provided by nonverbal data—which can be captured by personal digital monitoring technologies for time management (e.g. Microsoft MyAnalytics), facial coding (e.g. Affectiva, Microsoft Emotion), brain imaging (e.g. Neurosky, Emotiv), pupillometry (e.g. Tobii, Eye-Square), and physiological monitoring (e.g. Empatica, Fitbit) — to improve efficiency and attention management, increase well-being, and reduce mistakes. Enterprises can use all this EPA data and more to provide actionable insights that directly support their most important business decisions (automating a process versus losing employees' tacit knowledge, rewarding star players/teams, enhancing the physical and mental well-being of employees, etc.).

However, the use of personal analytics in an enterprise setting is different from its use in other environments (e.g. private use). This has implications for which aspects of personal analytics should be considered in an enterprise context. Thus, further research is needed to elucidate both the benefits and most significantly the challenges that organizations could face when adopting EPA digital initiatives. To advance the EPA concept we conducted a comprehensive literature review (see Chapter 2) of the extant empirical research of the use of EPA in organizational settings. We identified five specific concerns pertaining to the use of personal analytics in an enterprise setting: individual information systems architecture, knowledge and intellectual property, motivation and remuneration, information governance, and quality assurance. As EPA involves different stakeholders, it is useful to study the concept from juxtaposing perspectives. Our analysis has revealed three relevant perspectives: company, worker, and modality (i.e. the mode through which companies enable their workers to use personal analytics). Consequently, we have used a two-dimensional grid (concerns versus perspectives) to define a research framework that can be used to guide future IS EPA research efforts (see Chapter 4). We have also devised a companion visual mapping artefact (see Chapter 5 which we have coined the "EPA digital transformation metro map" which depicts possible routes which companies must navigate for the five concerns across the three perspectives raised. Ultimately, both artefacts have

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been designed to advance the concept of EPA to assist organizations to embrace its potential while concurrently avoiding the pitfalls (Clohessy and Acton, 2017).

To summarize, this monograph examines an emergent category of personal analytics which we refer to as "enterprise personal analytics" which encompasses the concept of organizations enabling their employees to use their individual analytics to manage their digital working lives from descriptive, diagnostic, predictive, and prescriptive points of view. The monograph is structured as follows. First, the individuation of IS is examined. Second, the methodology is explained. Third, an overview of the recent personal analytical trends is provided. Fourth, an EPA research framework comprising specific perspectives with regards to stakeholders and concerns is delineated. Finally, the monograph concludes with a discussion pertaining to theoretical and practical implications and limitations.

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