

# **IMPACT OF MOBILE PLATFORMS ON PERFORMANCE MANAGEMENT: AN IMBRICATION PERSPECTIVE**

*Research in Progress*

## **Abstract**

*Although extant research on mobile platforms emphasises the strategic benefits of the platform ecosystem, little is known about how mobile platforms influence organisational routines. In this paper, we explore the process through which smartphones and mobile platforms became incorporated within the performance management routines of a luxury hotel resort. Drawing on an imbrication framework, our case study research that the different sets of affordances and constraints arising during the smartphone adoption process acted as building blocks that reconfigured the performance management routines. The paper contributes to the accounting IS literature by unpacking how smartphones and mobile platforms affect the performance management routines through an improvised process involving various groups of hotel employees. Our results highlight the importance of improvisation and the flexibility of mobile platforms in improving the management control system.*

*Keywords: Organisational Routine, Change, Technology change, Mobile Platform, Performance Management*

## **1 Introduction**

Digital platforms are characterised as a sociotechnical assemblage involving both technical elements (such as software and hardware) and associated organisational process and standards (de Reuver et al. 2017, p. 4). In recent years digital platforms have become a crucial part of our social and business lives (de Reuver et al. 2010; Tilson et al. 2012). Types of digital platforms include social networking (e.g. Facebook) (Gawer & Cusumano 2014), travel reviews (e.g. TripAdvisor) (Scott & Orlikowski 2012); multi sided markets (e.g. eBay, Airbnb). A more sophisticated type is mobile platforms with both hardware (smartphone) and software (operating system, applications) elements. Multi-sided markets on mobile platforms are sustained by smartphone manufacturers, smartphone operating system (OS), and application (apps) markets that allow 3rd party innovations (eg. Apple) (Tilson et al. 2012). Digital platforms enable various groups of users to be involved in development, commercialisation, and value creation processes (Thomas et al. 2014). Platforms shape interactions among different users, with multiple interests, and adapt to fit the current market demand (Parker et al. 2016; de Reuver et al. 2017). The flexibility of digital platforms has encouraged various organisations to attempt to incorporate different digital platforms into organisational routines; for example, hotels began to incorporate reviews from TripAdvisor into staff performance management (Scott & Orlikowski 2012) and rail engineers use a smartphone camera app to improve safety checking routines (Pritchard & Symon 2014).

Prior research has explored the strategic benefits, management, and outcomes of different platform types (e.g., de Reuver et al. 2010; Tilson et al. 2012; Gawer and Cusumano 2014), but less attention has been focussed on how platforms influence organisational routines. Although Scott and Orlikowski (2012) provide a number of examples of how information from TripAdvisor can be used in employee performance management there remains a gap in our understanding of how platforms become incorporated into organisational performance management routines.

To date, there is a paucity of research concerning the detailed processes for incorporating smartphone and mobile platforms into organisational routines and a lack of systematic analyses of how mobile platforms affect existing performance management routines. This paper aims to fill these gaps by addressing the following research questions:

*How do smartphones and mobile platforms influence of performance management routine change?*

To answer this question, we draw on Leonard's (2011) imbrication framework to analyse how the social and technological aspects of both intended and unintended organisational change become entangled over time. We present findings from our case study of a luxury resort hotel in Vietnam where smartphones were incorporated into a mobile platform as part of an improvised solution to overcome technological constraints and had unexpected influences on service performance management routines. Our findings highlight how different technologies interact with performance management routines and adapt themselves to achieve the best outcome from given a set of affordances and constraints through improvisations.

The paper is organised as follows: In section two, we provide the theoretical background by reviewing the related literature on platforms and performance management. In section three, we introduce the imbrication theoretical framework. Section four presents the overview on our research design and methodology. Following this are the findings, discussion, and conclusion.

## **2 Literature review**

Our literature review covers two related streams: platforms and performance management.

The term “platform” has been used as both a metaphor to describe the networked organisational structure and to explain management phenomena at various levels such as supply chains, products, operating systems, and business ecosystems (Thomas et al. 2014). The first of these (i.e. as a metaphor) dates back to research in the 1990s which focused on the internal/organisational level and emphasised the importance of improvisation and working around the various organisational constraints (e.g., Utterback and Suarez 1993; Ciborra 1996). This early platform research emphasised the importance of short-term adaptive behaviour in innovation management. The authors used the term “platform” as a

metaphor to highlight the role of coordination between various parties (e.g., organisations, individuals, departments) in achieving efficiency in innovation management.

More contemporary research has built on these insights to focus on network effects and two or multi-sided markets related to the design of platforms (e.g., Rochet and Tirole 2003; Gawer and Cusumano 2014; Parker et al. 2016). These researchers suggest that, for platform leaders to create an effective platform ecosystem, they need to focus on bringing multiple groups together to create value for each other, i.e. multi-sided effects (Rochet & Tirole 2003) and on sustaining a sufficient number of users to create a positive feedback circle to further increase the usefulness of the services and products, i.e. network effects (Katz & Shapiro 1985; Arthur 1989).

The early conceptualisations of platforms assumed a hierarchical design process governed by a firm or firms which act as the core of the platform, such as Intel, Google, and Microsoft (e.g., Ciborra 1996; Gawer 2014; Thomas et al. 2014). However, such design assumptions do not hold in the context of contemporary digital platforms which are external to the organisation and very dynamic (de Reuver et al. 2017). More contemporary digital platforms, such as mobile platforms, incorporate physical and software elements, multi-layered architecture and a flexible core (Yoo et al. 2010; Henfridsson et al. 2014). Mobile platforms are intermediated by a technological ecosystem with both physical (eg. smartphones) and software elements (app stores, development kits, and mobile operating systems such as Android and iOS). They are sustained by a complex network of content providers, a vast community of developers, users, and complex technologies (Tilson et al. 2012). Such complex and dynamic interaction among various groups of users, organisations, and developers creates a highly dynamic and unpredictable business environment (de Reuver et al. 2017).

However, research on the influence of smartphones and mobile platforms on organisational routines is still embryonic. Prior studies have either focused on a sample of managers (Wajcman & Rose 2011) or on basic mobile phones rather than smartphones (Sorensen & Pica 2005; Ferneley & Light 2008). Although the IT consumerization literature (i.e., the use of mobile consumer devices in the workplace) explores the implications of workplace use of personal smartphones (e.g., Harris et al. 2012; Weeger and Gewald 2014; Koffer et al. 2015), these studies focus on either the strategies for managing the IT consumerization process (Harris et al. 2012) or the impact on employees' work-life balance (Weeger and Gewald, Koffer et al. 2015). Moreover, while existing studies of mobile platforms emphasise the platform developers and platform business strategies (e.g., Boudreau 2012; Tilson et al. 2012; Parker et al. 2016), they do not explore the impact on organisational routines.

The second stream of literature reviewed here concerns performance management, which is defined as strategically measuring and managing performance at both individual and organisational levels (Kloot & Martin 2000). The processes of performance measurement and management consist of the collection and analysis of strategically relevant data for management decision making, and the dissemination of performance information to the various levels of employees to motivate and/or impose discipline (Bourne et al. 2003).

Many researchers argue that it is essential to design performance measures and performance management routines to provide strategically relevant performance measures for the different parts of the business (e.g., Kaplan and Norton 1996; Otley 1999; Kloot and Martin 2000; Tuomela 2005). These researchers argue that traditional performance measures, which rely on financial information often obtained from financial reports, are too slow and too distorted to be relevant for management planning and control purposes (Johnson & Kaplan 1987; Kaplan & Norton 1992; Kloot & Martin 2000). In order to achieve timeliness and strategic relevance in performance measurement and management, they emphasised the importance of more frequent measurement of performance and the inclusion of non-financial performance measures, such as customer satisfaction, and also even employee satisfaction (Kaplan & Norton 1992; Kloot & Martin 2000).

Another important aspect of performance measurement and management design is to provide the ability to share organisational strategies, values and beliefs with other managers and employees (Simons 1994; Huy 1999). Prior management control literature has argued that 'belief' systems, where managers and employees share their values through, for instance, mission statements, can help the organisation inspire employees to take initiatives to solve problems and create new value (Simons 1994). However,

performance measurement and management design approaches to date have been largely top-down process, with little opportunity for lower-level employees to express their values and beliefs.

More recently, however, some scholars have recognised the importance of making accounting information, such as performance measures, more accessible in an effective performance measurement and management process (Boedker & Chua 2013; Chenhall et al. 2014). They have identified a number of elements that make performance measurement and management more accessible, such as ‘playfulness’, “comfort in communication” (Chenhall et al. 2014) and also visualisation via various technologies and templates (Boedker & Chua 2013). These elements can reduce the need for training in specialised techniques and/or concepts by presenting information in simple and easily digestible formats, so staff can process them easily without extensive training.

There is a paucity of research which considers how performance management is influenced by digital platforms. An exception is Scott and Orlikowski (2012) who highlight how new sets of performance measures (e.g., TripAdvisor rankings and online customer reviews) can be used for management control. Their research illustrates how such new forms of performance measurement and management can emerge through the entanglement of platform participants, such as customers, hotels, and restaurants. However, their study sheds little light on how mobile platforms become incorporated into existing performance management routines.

### 3 Conceptual framework

Sociomateriality is a theoretical perspective that was first proposed by Orlikowski and Scott (2008) to argue that human/organisational routines and technologies are inseparable in nature. Orlikowski and Scott’s approach to sociomateriality helps deepen our understanding of how and why technologies and organisational routines work together, but it lacks the ability to explain how and why technologies and organisational routines change over time.

To study how technologies and organisational routines change within organisations, Leonardi (2011) combined the idea of sociomateriality with the theory of affordance (Gibson 1986) and proposed a framework to study the process of technology introduction and change in routines within an organisational context. Affordances are understood as users’ perception of what technologies can or cannot do, rather than what they were initially designed to do. **For example, the IT consumerization literature shows how products initially designed for the consumer sector, such as smartphones and tablets, are increasingly being interpreted by users as productive devices to be used in workplaces (Harris et al. 2012; Koffer et al. 2015).**

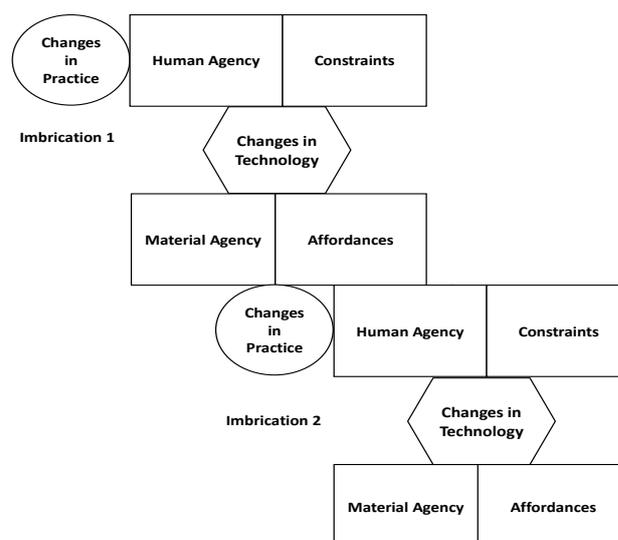


Figure 1: Imbrication of human and material agencies producing changes in routines and technologies (Leonardi 2011, p. 158)

Leonardi (2011) used the term ‘imbrication’, which has the literal meaning of overlapping but mutually supporting layers or edges (e.g., tiles, scales), as a metaphor to explain how human and material agencies act as building blocks in an infrastructure that produces technologies and/or organisational routine changes. Leonardi’s imbrication framework assumes that human and material agencies have pre-existing and distinct properties that are shaped by context, including culture and norms. Leonardi (2011) defines human agency as the ability to perform things that available technologies can or cannot do, specifically, reconciling goals with the material agency. The framework recognizes that human and material agencies are fundamentally interdependent, and also flexible and capable of change. Furthermore, as material agencies are shaped by human actors’ perceptions and contexts, different sets of technological affordances and constraints can be realised whenever there are changes in routines and/or technologies. These different sets of affordances and constraints subsequently produce the incentive for actors to either reconcile their routines or bring changes to existing technologies as an attempt to achieve the best possible outcome. This changing process and the relationship between material and human agencies are illustrated in Figure 1.

## **4 Research Design and Methods**

Our research is based on a three-year (2014-2017) interpretivist case study (Klein & Myers 1999; Walsham 2006) of IC Resort, a luxury resort hotel located in Da Nang, Vietnam, which opened in mid-2012. It is owned by a Vietnamese developer, SV group, but managed by an international hotel chain brand, MIG. As our primary interest was to study the process of technology and organisational routine change, access to the case organisation offered an ideal opportunity to observe the many critical events related to this process.

The primary data, which was collected over the period 2014-17, includes semi-structured interviews, and informal conversations which took place during three separate field visits (2 weeks in July 2014, 2 weeks in Aug 2016, 3 weeks in April 2017). Additionally, we adopted an ethnographic approach during the third field visit when one of the authors shadowed the three main departments involved in service performance management in IC Resort. During the shadowing, extensive observation notes and photographs were taken to provide a more detailed understanding of the context of the previously identified critical events.

Data analysis was conducted by identifying key events and actors from the collected data (Miles & Huberman 1994) and arranging them into a timeline and case narrative. Our selection criteria for critical events were that the events should be related to significant changes in the technologies used in the case organisation and/or its service performance management routines. The identified critical events and actors involved were then triangulated with a combination of observation notes and secondary sources of information, such as company blogs and articles in the business press, before inserting them into a timeline. Next, we undertook a thorough review of the findings using elements identified in the sociomaterial imbrication framework: human agencies, material agencies, affordances, and constraints. This enabled us to break down several key episodes of change during which the imbrication of human agencies and technologies could be observed to provide an explanation of the changes in IC Resort’s service performance management routines.

## **5 Findings and Analysis**

Figure 2 depicts the significant changes in IC Resort’s service performance management routines and technologies driven by the affordances and constraints shaped by human and material agencies.

Prior to 2015, MIG’s analytics for performance measurement and management were based on MIG’s in-house developed system which produced monthly service performance reports. This system helped MIG hotels monitor service performance, by focusing on guest loyalty and guest satisfaction, as expressed in their own surveys and questionnaires. However, due to the increased influence of social media and especially TripAdvisor on the hotel industry, MIG needed a more sophisticated method to the analyse data generated from these platforms. To do this MIG implemented Revinat, an online reputation management system and social media analytics service. Revinat helps IC Resort and MIG

aggregate and analyse externally produced data such as online reviews in TripAdvisor and social media, and provides regular social media analytics. This new technology enabled IC Resort’s service performance measurement and management to reflect its service performance measures in more detail. The former resort manager gave an example to explain how data analytics can enhance their service performance management.

*“When you look at the customer satisfaction and it shows a great result, it does not necessarily mean that the hotel’s service is perfect. For example, when you filter the data according to customers nationality, it could show very different results. Customers from countries with highly developed service industries are often more difficult to please than customers from countries with less developed service industries.”*

Subsequently, MIG and IC Resort began to adapt new technologies for their service performance measurement and management by introducing new performance measures into their existing system. First, there were major changes in the way MIG measured and shared service performance data. The smartphone app for service performance measurement and management, initially developed and managed in-house, was replaced by “Medallia” a cloud-based service performance measurement system providing text analytics of unstructured information (collected from social media, reviews on TripAdvisor, Blogs, etc.) and a mobile app. This change was triggered by MIG’s intention to quicken its response to bad reviews on TripAdvisor by improving the existing system which only offered monthly service performance reports. **Medallia’s cloud-based service allowed MIG to access service performance data via various devices with different operating software (e.g., Android smartphones, iPhones, laptops).** Medallia also enabled IC Resort to compare its performance ranking against other MIG hotels, with service performance data which is updated four times a day. Consequently, the introduction of Medallia changed IC Resort’s service management practice, making it more dynamic as they can now respond daily to guest reviews.

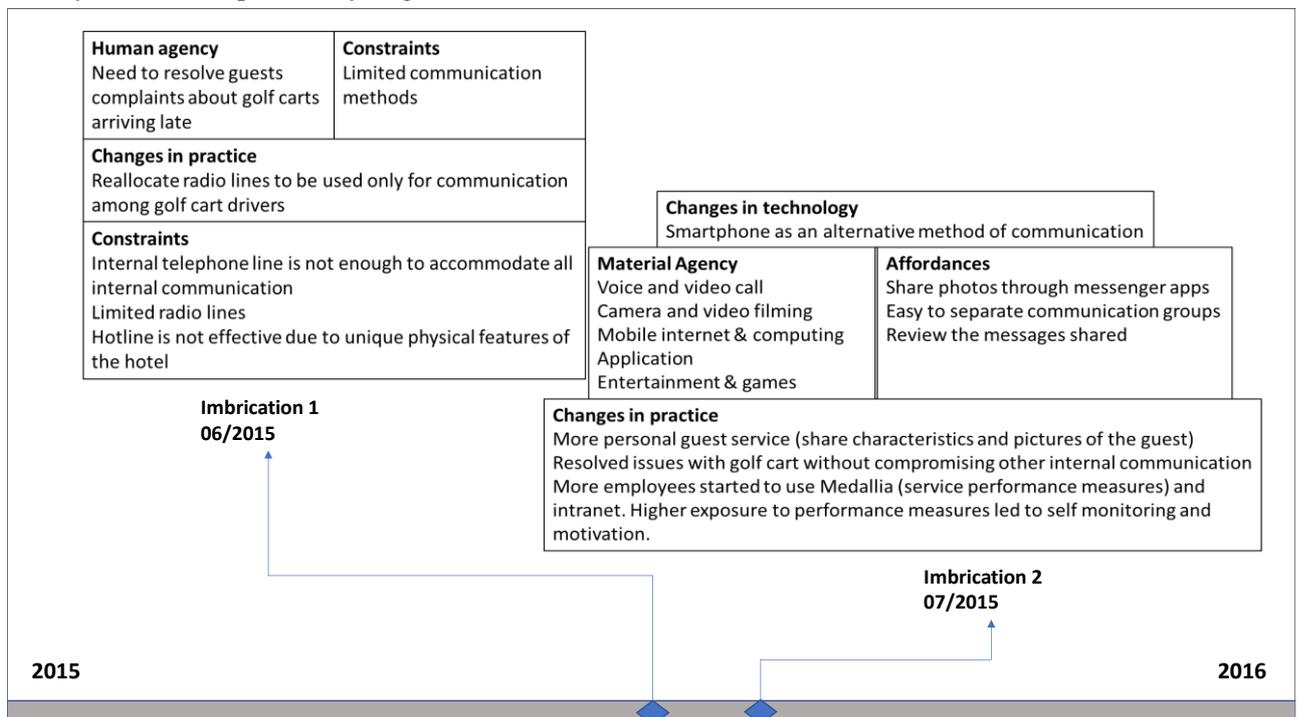


Figure 2: Process of sociomaterial imbrication in IC Resort

## **5.1 Imbrication 1 and 2 – Introduction of Smartphone**

The hotel is spread across several acres and guest rooms are scattered around in small scale lodges on the beach. Due to the distance involved and the hot sunny weather, guests are transported around the site via a golf cart service. To resolve one of the most common complaints in the hotel relating to the hailing and coordination of the golf cart service (human agency), IC Resort decided to reallocate all radio frequencies to communications among golf cart drivers (change in practice). This improved the guest experience, but also created a shortage of internal communication methods as there were limited radio frequencies allocated to the hotel. Due to the hotel's unique design, with guests being widely dispersed, the internal telephone system was not sufficient as the sole internal communication method (constraint). To overcome this constraint, employees started to informally improvise with their personal smartphones and messenger applications (e.g., WhatsApp and Viber) to communicate with each other (change in technology). The use of personal smartphones was at the time very unusual in the hotel, as the formal rules had in the past forbidden their use. However, this improvised solution for coordinating guest transport brought unintended consequences in the form of positive changes to IC Resort's service performance management routines.

The use of messenger applications on smartphones enabled employees to share pictures of guests and any problems they experienced (e.g., broken facilities). It was highlighted by various managers and employees that the use of messenger applications helped them provide a more personalised guest service and enhanced employee communication. Over time, the improvised informal use of personal smartphones became an integral part of the resort's performance management routines, with each department using a mobile messenger chat room to share such information as the daily tasks, the hotel's service performance ranking on Medallia, and matters that require immediate attention (changes in practice).

The director of the guest service department pointed out that service employees had started to actively monitor and discuss their department's performance ranking using their smartphones. This change in behaviour can be attributed to the increased accessibility for service employees of the service performance measurement and management information. Unlike the prior service performance report which top management distributed on a monthly basis, the Medallia application provides a daily update on IC Resort's service performance ranking using simple numbers and trend graphs, in addition to detailed breakdowns of service performance and guest reviews. The simple visual summary of service performance has made this management accounting information more accessible to service employees who are not familiar with accounting jargon. Moreover, the Medallia application allows employees to view their department's performance on their smartphones, a very personal device, instead of having to find performance measures in a formal document issued by top management. Feedback gathered from the interviews and the ethnographic fieldwork showed that employees gave high regards to the use of their personal smartphones and the various apps (Medallia, and WhatsApp). As most service employees previously had no regular access to performance information, the use of their personal smartphone has created a more conducive environment for them to view and process performance information. Medallia is more accessible for employees than the previous service performance measures.

## **6 Discussion and Conclusion**

This research studies the process through which smartphones and mobile platforms can influence organisational routines. Our analysis illustrates how improvisations and unexpected consequences can play a significant role in the use of smartphone and mobile platforms. We observed how the different functions/roles of the smartphone were realised and reshaped through the imbrication of different material and human agencies. Scott and Orlikowski (2012) highlight how new forms of information from the online platform, TripAdvisor, are used to measure and manage the performance of employees in the hospitality industry. We build on their insights and provide evidence to show that information from TripAdvisor can interact with mobile platforms, and employees' use of smartphones and various apps. Our findings show that the flexibility and customisability of the smartphone enhanced, by the vast number of apps available on a mobile platform, can help improvisation and workarounds in organisational routines to be more effective and easier to understand. We extend previous research by

introducing the notion of improvisation and workaround (Ciborra 1996) to understand the influence of mobile platforms on performance management routines provide an empirical illustration of how the use of smartphones and various apps can create a flexible and interactive performance management system. Traditionally, the design of performance measurement and management control systems was based on a top-down approach to the selection of performance measures and reward schemes (Kaplan and Norton 1992; Simons 1995; Otley 1999). However, the dynamic and unpredictable business environment enabled by digital platforms, calls for a flexible bottom-up approach. Our findings provide an illustration of this flexible approach to performance measurement and management design. As shown in our empirical illustration, the new performance measures are very dynamic, involving such things as pictures taken by employees and comments on various social media. Furthermore, the smartphone implementation took place through improvisation and workaround *from the bottom up*. Thus, our research contributes to knowledge about how mobile platforms can enable performance measurement and management practices to be more dynamic and flexible through improvisation and workarounds at the employee level.

Previous research has acknowledged the importance of accessibility and understandability of management control system and performance measures (Boedker and Chua 2013; Chenhall et al. 2014). Recent studies suggest that informal arrangements and/or space in the workplace, together with the visualisation of information, can enhance employees' engagement with performance management routines. Informal space can create a relatively safe and protective environment for employees where they have the freedom to participate in discussions and share their ideas (Huy 1999). However, these previous studies focused on informal arrangements, such as games played during meetings (Chenhall et al., 2014). Our empirical findings suggest that similar informal arrangements need not be limited to physical activities but can also be created virtually through the use of various apps downloaded on employees' personal smartphones. In addition, our findings illustrate how simple visualisation of service performance measures, combined with the familiarity personal smartphones, can help employees to better comprehend organisational goals.

Our study provides important implications for practitioners as it causes us to revisit the work of Ciborra (1996) on improvisation which highlights the importance of bricolage and workarounds in achieving efficient management control through adaptability to rapid changes – from the technological to the economic. Our study is one of the first to explore the role of smartphones and mobile platforms in studying dynamic performance management routine change. Our findings provide a glimpse of possible future changes in the role of management accountants in service organisation as smartphone and mobile platform make performance measures more accessible to users without sophisticated accounting knowledge.

While our research in progress provides some indication of the potential contribution of smartphones and mobile platforms in performance management routines, we recognise that our research has several limitations. First, our study does not explicitly discuss the potential pitfalls of using smartphones, such as the invasion of privacy, increased workload and stress. Although we considered the potential negative effects of using a smartphone in the workplace, the theme was not central to our analysis. Second, unlike Scott and Orlikowski's (2012), our study does not explicitly analyse how accountability is reconfigured in a restructured, flexible and continuously changing organisational environment influenced by new platforms and information technologies. Nevertheless, we aim to address the reconfiguration of accountability in an organisational context, where the active use of smartphones and mobile platforms become the norm, in our future research.

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