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Analysing Sociomaterial Imbrication: Smartphone and Big Data in Hotel Service Performance Management

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TOPIC AREA: UBIQUITOUS AND MOBILE INFORMATION SYSTEM

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Abstract

This research aims to deepen our understanding of the detailed process of technologies and organisational routines change by adopting the sociomaterial imbrication framework. We present some findings from an ongoing case study of a Vietnamese hotel where employees use smartphones as an important part of their service performance management practice. By focusing our analysis on sociomaterial imbrications under different sets of affordances and constraints, we show how smartphone and big data based service performance measures can be used in the enactment of control process both self-control and as a monitoring tool over employees. We make two main contributions. First, we extend Scott and Orlikowski's (2012) work on online accountability in Travel 2.0 to specifically identify and explain how hotels use big data generated from Travel 2.0 and other sources to measure and manage service performance. Second, we contribute to existing research on smartphones at workplaces by providing a detailed illustration of how smartphones can become incorporated into service performance illustrated using the case study.

Keywords: Big data, sociomaterial imbrication, affordance, performance management system, smartphone, technological change

1.0 Introduction

In the context of the hotel industry, Scott and Orlikowski (2012) demonstrate how sociomaterial entanglement of TripAdvisor's ranking mechanism and online reviews from users (hotels, guests) leads to the emergence of online accountability. Reviews from TripAdvisor, Booking.com, etc (collectively known as "Travel 2.0") are processed using big data technologies such as Hadoop and combined with data from other sources (e.g., surveys, operational call logs) to form the information relevant to hotel performance measurement and management (Marr 2016). Our understanding of the components of big data is derived from the commonly accepted "3Vs" (Volume, Velocity, and Variety) which refers to large amounts (Volume) of both structured and unstructured data (Variety) that are produced in real-time (Velocity) (Mello et al. 2014).

Scott & Orlikowski's (2012) study only focuses on how small hotels process reviews from TripAdvisor and the implication of internally generated information on service performance management (i.e. systemised practice to monitor and manage service quality) is neglected. This research aims to extend Scott and Orlikowski's work by drawing attention to a case of a large

Analysing Sociomaterial Imbrication:

Smartphone and Big Data in Hotel's Service Performance Measurement and Management

organisation where the big data from Travel 2.0 and intra organisational sources are processed and shared via various technologies and subsequently used to measure and manage service performance.

Big data in the hotel industry has been growing exponentially alongside advancement in mobile internet and smartphone technologies, as they enable customers to access and contribute feedback/reviews on the move. However, few studies have explored how organisations use big data and smartphones in their management practices (Chen et al. 2012; Pritchard & Symon 2014). Moreover, studies exploring the application of big data and smartphones in service performance management are very limited.

Research has been conducted to study how mobile phones are used at the workplace (e.g., Sorensen & Pica 2005; Ferneley & Light 2008). However, these studies only consider the communication aspect of a basic mobile phone (i.e. mobile phone without sophisticated mobile operating system and its own app market) with limited functions and do not consider how smartphone and its various applications are used in organisational practices (Pritchard and Symon 2014). Although there are many types of mobile devices (eg. tablet PC and laptops), previous studies in non-office settings attribute smartphones with the highest usage rates (e.g., Ferneley and Light 2008, Pritchard and Symon 2014). Our focus here is on big data usage in non-office settings to measure and manage service performance. Specifically, we identify how smartphones and applications are used to share various performance related information among employees and managers.

There is also a gap in the literature on big data regarding its impact on organisational practice. Much of the existing literature on big data tends to focus either on technical aspects from a computer science perspective (e.g., Philip Chen & Zhang 2014), or 'factor-based' studies aimed at generating best practice implementation methods (e.g., Dhar & Mazumdar 2014). Big data is more than a large-scale analysis of data; rather it is a phenomenon that involves social, political and economic issues (Boyd & Crawford 2012). Interpretive research that explores the detail of social and political impacts of big data in management practice is still relatively scarce (Bhimani & Willcocks 2014). Our research aims to fill these gaps by presenting findings from an ongoing case study of a hotel in Vietnam where the use of smartphones and the big data-based service performance management system has led to a self-motivating environment where

Analysing Sociomaterial Imbrication:

Smartphone and Big Data in Hotel's Service Performance Measurement and Management

the employees are keeping track of various performance measures to motivate themselves without managers intervention.

We adopt a sociomaterial lens (Leonardi 2011) to study how big data and smartphone technologies are entangled with service performance management. This research is guided by the following research question:

- How do smartphones and Big data from Travel 2.0 and other sources influence hotel's service performance measurement and management practices?

The paper is organised as follow. The second section will review relevant literature including our conceptual framework, especially the work of Leonardi (2011). Section three and four we briefly explain our methodology and case background. Section five will present our analysis of the findings using the sociomaterial imbrication framework. In this section, we will explain how the introduction of different technologies (smartphone and big data based performance measure) can bring unintended changes in the case hotel's service performance management system. The final section presents conclusions with a plan for our future study.

2.0 Theoretical Background

2.1 Performance Management System in Hotel Industry

Performance management system is systemised management practice to strategically measure and manage performance at both individual and organisational level (Kloot & Martin 2000). Many researchers argue that for a performance management system to effectively connect performance measures with organisation's strategy, it requires careful selection of both financial and non-financial measures to monitor (e.g., Kaplan & Norton 1992; Otley 1999; Kloot & Martin 2000; Tuomela 2005).

Non-financial performance measures, such as service quality and customer satisfaction, are crucial for organisations in the service industry as they are directly linked to their reputation which drives the success of the business (Atkinson & Brown 2001). However, despite the importance of non-financial performance, its significance is often overlooked by managers and researchers mainly due to the difficulties in identifying and quantifying non-financial performance in day-to-day business (Atkinson & Brown 2001). Consequently, prior studies on

Analysing Sociomaterial Imbrication:

Smartphone and Big Data in Hotel's Service Performance Measurement and Management

hotel performance management system have largely focused on either financial measures such as average daily rate and, revenue per room (Ciucă 2009), or economic value added (Kim 2006). Despite their usefulness, neither of these measures can be used as indicators for the future performance of hotels which is more likely to be captured by non-financial performance measures (Atkinson & Brown 2001).

One of the key function of an effective performance management system is to motivate employees to perform better in a way that individual performance gets transferred to organisational level performance (DeNisi & Smith 2014). Some scholars have argued that a self-motivation and self-controlling environment where employees are acting with a sense of volition and self-control can lead to better individual performance (e.g., Ne Gagné & Deci 2005; Deci et al. 2010).

2.2 Sociomaterial Imbrication

Sociomateriality is a theoretical perspective that was first proposed by Orlikowski and Scott (2008) to argue that human/organisational routine and technologies are inseparable in nature. Orlikowski and Scott's approach to sociomateriality helps deeper understanding of how and why technologies and organisational routine works in such way but it lacks the ability to explain how and why technologies and organisational routines change overtime.

To study how technologies and organisational routines change within an organisation, Leonardi (2011) combined the idea of sociomateriality with the theory of affordance (Gibson 1986) and built a framework to study the process of technologies and practice routines change within an organisational context. The theory of affordance suggests that affordances are users' perception of what technologies can or cannot do and not what it was initially designed to do.

Leonardi (2011) then used the term 'imbrication', which literally refers to overlapping but mutually supporting layers or edges (e.g., tiles, scales), as a metaphor to explain the how human and material agencies act as building blocks to an infrastructure that produce technologies and/or organisational routine changes. Leonardi's imbrication framework assumes that human and material agency has pre-existing distinct properties that are shaped by the context, such as culture and norms. Leonardi (2011) defines human agency as the goal shaped by people's perception of their practice and role of technology, and material agency as pre-existing

Analysing Sociomaterial Imbrication:

Smartphone and Big Data in Hotel's Service Performance Measurement and Management

functions of the material agencies (things that a technology can or cannot do). The framework suggests that imbrication of human and material agencies creates new sets of affordances and constraints, ultimately inducing changes in technologies and practice routines (Leonardi 2011; Inrona & Hayes 2011). This relationship between material and human agencies are shown in Figure 1.

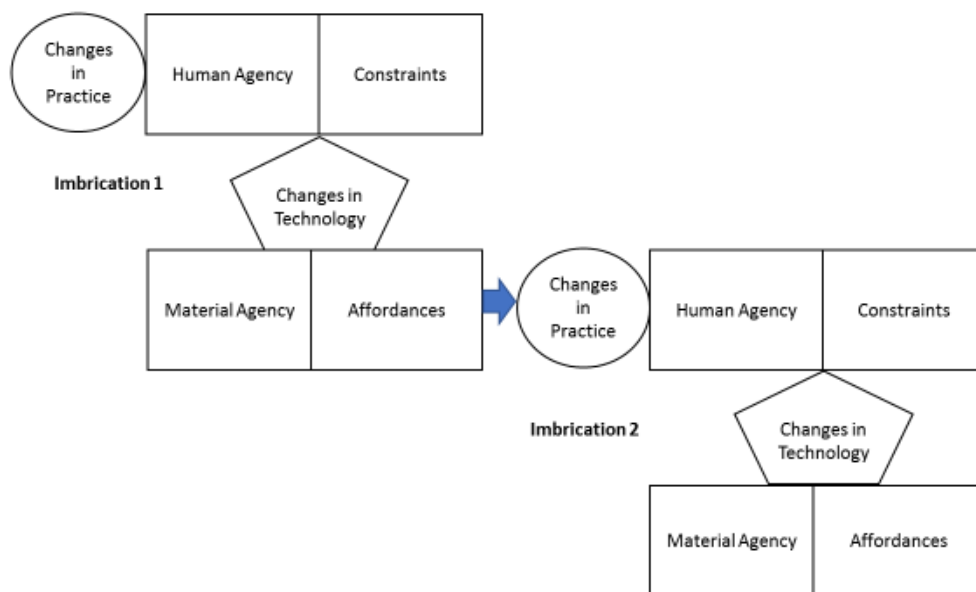


Figure 1: Imbrication of human and material agencies producing changes in routines and technologies

2.3 Smartphone at workplace

Smartphone is a ubiquitous device that is deeply embedded in social and business life (Sorensen 2010; Pritchard & Symon 2014). This device allows communication from the sharing of pictures and videos to accessing different media applications (the internet, social media, blogs) regardless of location. Although the basic mobile phone offers some of these functions, the smartphone is unique because it offers a greater level of customisation and sophisticated mobile computing functions. Unlike basic mobile phones, smartphones are built with mobile operating systems (e.g., IOS, Android) that allow users to download various third-party applications from the app markets (e.g., Google Play, Apple iTunes app store) to

Analysing Sociomaterial Imbrication:

Smartphone and Big Data in Hotel's Service Performance Measurement and Management

customise their smartphone to fit their needs. Smartphone usage within organisations is rising and likely to continue to increase (Pritchard & Symon 2014).

However, research on the impact of smartphones on organisational practices is still embryonic. Prior studies have focussed on a sample of managers (Wajcman & Rose 2011) or study basic mobile phones instead of smartphones (Sorensen & Pica 2005). More recently, Pritchard and Symon's (2014) study on how smartphone photography is used to bridge the physical distance between managers and engineers shows how smartphones can improve organisational practices but at the same time create additional stress for users.

3.0 Methodology

This paper reports on initial findings from an ongoing interpretivist case study (Walsham 2006) of IC Resort, located in Da Nang, Vietnam. The names of the interviewees were anonymised on request and a total of 16 interviews (8 formal, 8 informal discussions) were conducted from two separate field visits of two weeks. Interviews were recorded and copious notes were taken in or soon after informal discussions and following observations.

4.0 Case Description – IC Resort

The case hotel, IC Resort, located in Da Nang Vietnam, opened in mid-2012 with an aim to establish itself as the best luxurious hotel/resort in Asia. IC Resort is owned by a local hospitality development company, SV Group, but managed by one of the major international hotel chain, MIG, with over 5000 hotels in 100 different counties. MIG hires over 800 employees for the management of the IC Resort. MIG also provides many management techniques and technologies for IC Resort, such as intranet and service performance measures based on social media analytics and questionnaires. IC Resort has a unique hotel design where the rooms are scattered along the seashore. Due to this unique physical feature of the hotel, the guests move around the hotel with golf cart taxis.

5.0 Summary of findings

Since its opening in 2012, IC Resort has gone through several changes to achieve a balance between the local culture and the hotel group's established management systems and information technologies. In 2015, IC Resort went through significant changes in its service performance management routine and technologies driven by different affordances and constraints shaped by human and material agencies. The detail of this change process is shown in Figure 2.

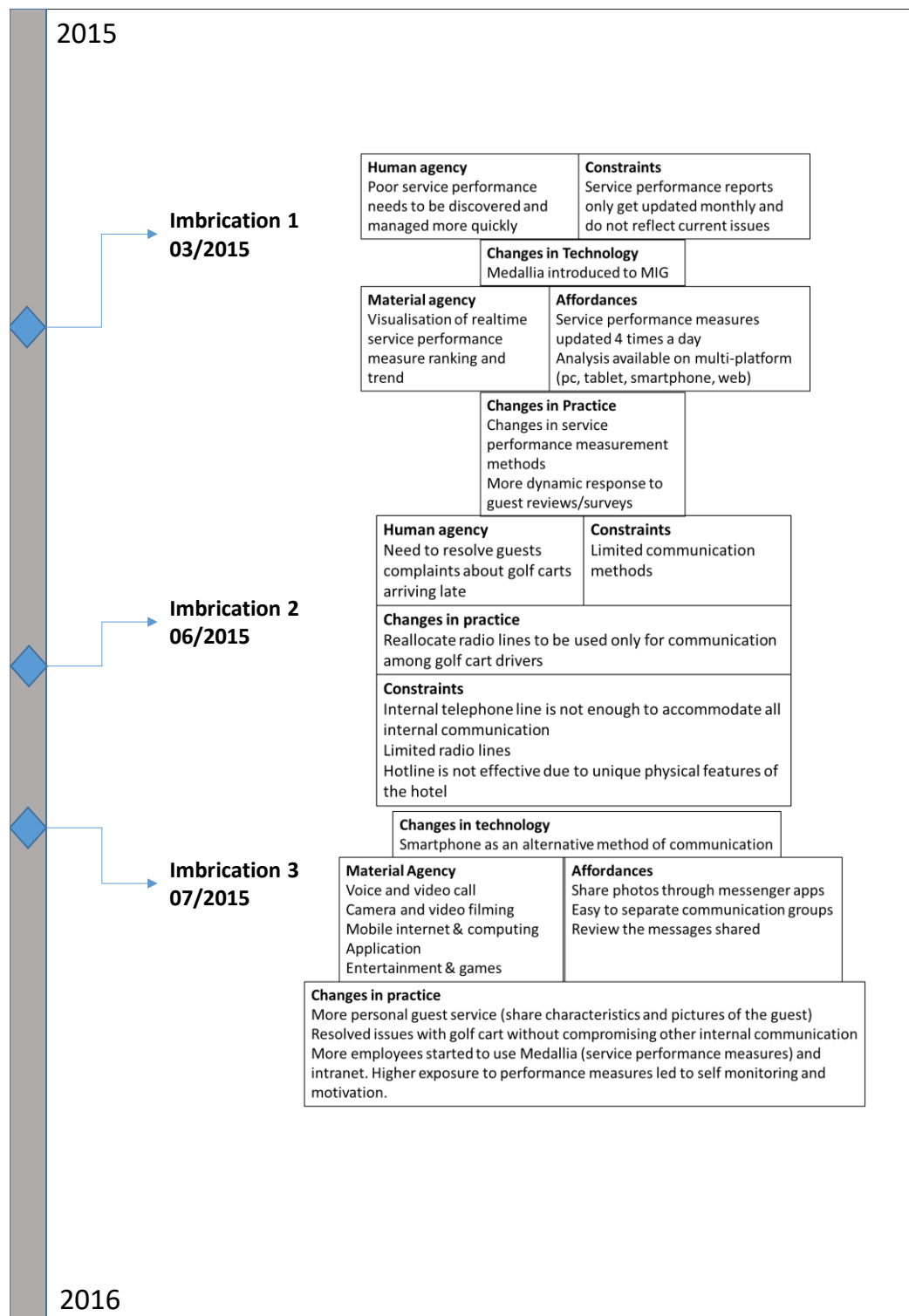


Figure 2: Process of sociomaterial imbrication in IC Resort

5.1 Imbrication 1 – Introduction of Medallia

In this first imbrication, there were major changes with the way MIG measures and shares their service performance. Their unique big data-based service performance measurement system, which was developed and managed in-house, was outsourced to a company that offers a cloud-based customer experience software platform, Medallia (change in technology). This change was triggered by MIG's intention to quicken its response to bad reviews (human agency) by improving the existing system which only offered monthly service performance reports (constraint). The cloud-based service from Medallia created new sets of affordances by enabling MIG to access service performance data with various devices with different operating software (e.g., Android smartphones, iPhones, laptops). Medallia also enables IC Resort to compare its performance ranking against other MIG hotels (material agency) and the service performance data is updated four times a day. Consequently, the introduction of Medallia has changed IC Resort's service management practice making it more dynamic as they are now responding to guest reviews daily.

5.2 Imbrication 2 and 3 – Introduction of Smartphone

To resolve one of the most common complaints in the hotel relating to the golf carts service (human agency), IC Resort decided to reallocate all radio lines to be used only for communication among golf cart drivers (change in practice). This improved the guest experience in the hotel but also created a shortage in internal communication methods. There were limited radio lines allocated for the hotel and due to the unique design the internal telephone line was not sufficiently effective to work as the sole internal communication method (constraint). To overcome this constraint, employees started to use their personal smartphone and messenger applications (e.g., WhatsApp, Viber) to communicate with each other (change in technology). The use of a personal smartphone is very unusual in hotels' practices as formal rules often forbid them to do so. This improvised informal solution also brought other positive changes to IC Resort's service performance management practice.

The messenger applications on smartphone enabled employees to share pictures of guests and problem areas (e.g., broken facilities). This led to a more personalised guest service and more effective employee communication. In addition to the improvement in communication, the imbrication of a new set of affordances (ability to use applications, sharing photos, group chatroom) introduced via smartphone and dynamic service performance management practice

Analysing Sociomaterial Imbrication:

Smartphone and Big Data in Hotel's Service Performance Measurement and Management

with real-time response to guest reviews has led to an unexpected change in IC Resort's service performance management practice. A self-controlling environment within IC Resort was created where employees are motivating themselves by following the hotel's performance ranking within MIG shown on the Medallia application.

6.0 Contribution

This research aims to extend Scott and Orlikowski's (2012) study of online accountability formed through Travel 2.0 by exploring the detail of service performance measurement and management practice of a major international hotel chain. By exploring a large hotel's service performance management system, we found that online accountability from Travel 2.0 alone is not sufficiently significant to create significant changes in the hotel's management practices. However, when Big data gathered from various sources, including Travel 2.0, is processed and imbricated with other technologies (such as the smartphone), a new form of accountability emerges with a significant change in the hotel's service performance management practices.

This research also aims to contribute to the existing literature on smartphone usage in organisational practices by providing additional empirical context about the use of smartphone to manage day-to-day service performance in the hotel industry. In contrast to previous research, our findings provide an illustration of how smartphones and big data-based service performance measures can be used not only to improve communication, but also enables employees to control and motivate themselves, ultimately improving both individual and organisational level performance.

In our next phase of data collection and analysis, we plan to extend Leonardi's (2011) imbrication framework by gathering more insight on different human agencies within the case hotel. At the moment, we gathered data mostly from interviewing managers and directors of the case hotel. However, the hotel's service performance management system involves employees from both management and lower level employees. Therefore, in order to deepen our analysis and understand whose human agency is reflected in the determination of affordances and constraints of routines and technologies, we plan to adopt ethnographic methods (e.g., shadowing and working alongside lower level employees).

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Analysing Sociomaterial Imbrication:

Smartphone and Big Data in Hotel's Service Performance Measurement and Management

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