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Recommended Citation

Knoesen, Henri and Seymour, Lisa F., (2019). "BUILDING THE BUSINESS CASE FOR MOBILE ENTERPRISE APPLICATIONS IN THE INSURANCE INDUSTRY". In Proceedings of the 27th European Conference on Information Systems (ECIS), Stockholm & Uppsala, Sweden, June 8-14, 2019. ISBN 978-1-7336325-0-8 Research Papers.
https://aisel.aisnet.org/ecis2019_rp/16

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BUILDING THE BUSINESS CASE FOR MOBILE ENTERPRISE APPLICATIONS: AN INSURANCE INDUSTRY CASE

Research paper

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Abstract

The use of mobile enterprise applications (MEAs) is becoming part of the computing landscape in organizations. To build a strong business case for a MEA project, justifying the financial investment, it is necessary to include realistic benefits to be derived from the use of MEAs. Also, it is equally important to include the possible risks to the benefits being realized so that mitigating actions can be put in place. Then the benefits need to be managed. Yet the benefits from MEAs are not clearly understood. Hence the purpose of this study was to describe the benefits from using MEAs and the impediments to the benefits realization. This was done by analysing qualitative data collected from stakeholders in 3 MEA projects in a single organization in the insurance industry. The practical contribution of the study includes a list of tangible and intangible benefits that can be used to build business cases for MEA projects. Also, the risks that organisations need to manage to realize the expected benefits are described. The academic contribution of this study is the addition to the body of knowledge regarding business cases for and benefits from MEAs.

Keywords: Mobile enterprise applications, mobile apps, MEA benefits, risks to benefits, mobile business process

1 Introduction

Mobility is one of the most important current market and technology trends affecting information technology (IT). Today's ubiquitous use of mobile technologies is due to the advancement of mobile infrastructure and the resultant rise in the use of mobile applications (Hoos et al., 2014). Mobile applications, commonly known as 'mobile apps', typically run on smartphones and tablets. By 2017 there had been approximately 197 billion mobile apps downloaded (Statista, 2018). This has fuelled an interest in mobile enterprise applications (MEAs) (Stieglitz, Lattemann, and Brockmann, 2015), which are described as a top ten strategic technology trend (Hoos et al., 2014). MEAs are mobile apps designed for and operated on mobile devices by users within the core and/or support processes of their enterprises (Giessmann, Stanoevska-Slabeva, and de Visser, 2012). Market research in 2016 showed that 87% of employers expected their employees to use their smartphones for work-related activity (Viasasha, 2017). Furthermore, CIOs are recognizing that enterprise mobility is a core component of digital transformation (Ismail, 2017).

The rapid growth in MEAs has led to a consequential growth in IT spending (Gebauer and Shaw, 2004; Giaglis, Rangone and Renga, 2006; Picoto, Palma-dos-Reis and Bélanger, 2010; Vuolle, 2011). Yet, companies do not have strategies to utilize and derive maximum benefit from MEAs (Ismail, 2017). IT business cases are all too often based on the belief in the benefits and not on actual measurement of the benefits (Vuolle, 2011). Companies usually do not have the ability to measure the overall impact of MEAs and therefore identifying the real benefits are troublesome, are most often neglected, and are underestimated (Gunasekaran, Ngai and McGaughey, 2008; Irani, 2002; Vuolle, 2011). There is growing evidence that shows that benefit management practices enhance the likelihood of IT

investments achieving organizational goals, therefore, understanding these benefits becomes crucial (Breese et al., 2015). Organizations benefit most from IT projects when benefits are identified up front in the business case and then managed throughout the project lifecycle (Terlizzi and Albertin, 2017).

Limited research is available on the benefits accruing to organisations deploying MEAs and users of MEAs and no study was found describing risks to MEA benefits realization. The question thus asked in this study is; What are the benefits of using MEAs and the risks to their benefits realization? To this end, this paper studies 3 MEA projects in a single organization in the insurance industry in South Africa. Qualitative data is analysed and tangible and intangible benefits from the use of MEAs are described as well as the risks that the organisation needed to manage to realize the expected benefits. This paper extends the limited empirical research on MEAs.

The rest of the paper will be structured as follows. It will start with a short discussion of the literature followed by an explanation of the research method used in this study. This will then be followed by the results and a discussion of the results and finally the limitations and conclusion.

2 Literature Review

Improved computing capability in mobile computing devices coupled with the new wireless connectivity enhancements of 3G and other mobile networks spawned the rapid development and creation of mobile apps that together created the disruptive innovation of the Mobile Internet (Manyika et al., 2013). The proliferation of MEAs in turn, has occurred as a result of a convergence of several factors such as the improvement of technology in smartphones and tablets, the widespread adoption by consumers and businesses of the mobile Internet, the adoption of mobile business services, and the increasing technological ability of mobile workers to work remotely. Mobile devices have resulted in new types of computing based on nomadic behaviour (Lyytinen & Yoo, 2002). Nomadicity was defined by Kleinrock (2001) as the ability of systems to support rich computing and communicative capabilities and services for nomads as they move in a transparent, integrated, convenient, and adaptive manner.

The fundamental objectives of MEAs are effectiveness, customer satisfaction, security, cost, and employee acceptance (Nah, Siau and Sheng, 2005). It is not only these objectives that organizations seek, but they also create MEAs for a range of productivity and efficiency reasons (improved business process efficiency; lowered operational costs; improved decision making) (Falk and Leist, 2014; Varshney et al., 2002). Furthermore, companies are also being forced into adopting MEAs by demand pressures from the market as well as employees (Manyika et al., 2013).

In order to justify the cost of implementing information systems and to ensure projects successfully deliver the promised benefits, strong business cases for IT projects, which detail the benefits from the software project as well as the possible risks, are critical (Remenyi and Sherwood-Smith, 2000). Business cases explain the benefits to be derived from an investment and explain the business drivers which will allow business managers to improve their business performance (Remenyi and Sherwood-Smith, 2000). Firstly, it is necessary to identify the benefits, so they can be managed, and then it is equally important to manage the risks that could prevent these benefits from being realized (Gilbert, Balestrini and Littleboy, 2004).

While there are a growing number of researchers investigating mobile apps (Chung, Lee & Kim, 2014; Gebauer, Shaw, Gribbins, 2010), the majority of studies (Hoehle, Zhang & Venkatesh, 2015; Sivakumar & Reddy, 2015) have focused on consumer-facing mobile apps and there is still little research focusing on MEAs (Picoto, Bélanger & Palma-dos-Reis, 2014; Xiao, Meredith & Gao, 2017). Various studies have been conducted to understand the goals (Kim, Chan & Gupta, 2007; Lee & Park, 2008) and the perceived value of utilising mobile apps (Kaasinen, 2009). These studies are not transferable to a business context as business expectations dictate the value analysis of corporate services and not individual goals as is the case in consumer services (Paavilainen, 2002). Falk and Leist (2014), in their review of mobile business process case studies, note that many studies focus on the business to customer interaction. While, some cases are employee-centered, they limit their focus to changes in workplaces or roles, and some focus on pre-requisites for implementation. There has been one case study, in financial services in Germany, but it focuses on optimizing business process criteria (Gruhn and Köhler, 2007). While studies by Picoto et al. (2010) and Basole (2007) have identified the business value of

mobile services and classified the benefits, the benefits derived from the use of MEAs specifically in the context of financial services is lacking.

2.2 Benefits

There are two types of project benefits, target benefits, those benefits identified prior to project commencement that the project funder expects to realize from the investment, and fortuitous benefits, the benefits which emerge during the project (Zwikael and Smyrk, 2011). The literature defines target benefits as strategic project goals that once the project is completed, will improve business performance (Zwikael, Chih and Meredith, 2018). Target benefits are identified and set during the initiation phase of a project and then tracked and monitored throughout the project and at the end for project performance evaluation (Zwikael et al., 2018). The importance of identifying target benefits was highlighted by the PMI in 2016 which showed that 74% of the organizations that identify target benefits in their business case meet their project goals compared to 48% that do not.

An additional type of benefit which needs to be considered is that of *intangible benefits* that have been demonstrated to have a positive impact on the productivity of the organization but do not appear in the conventional balance sheets. It was found by Vuolle (2011) that intangible factors may account for the majority of benefits resulting from investing in mobile business services. While it is true that companies mainly deploy mobile services for tangible benefits such as cost reduction and productivity improvements (Alahuhta, Ahola and Hakala, 2005), if intangible benefits are excluded, their deployment could erroneously be viewed as a failure (Vuolle, 2011).

The benefits of IT creating business value have been well documented and researched for many years (Hitt and Brynjolfsson, 1996; Mooney, Gurbaxani and Kraemer, 1996; Tallon, Kraemer and Gurbaxani, 2000). Mobile apps and traditional applications have significant differences (Kaur & Kaur, 2015; Krogstie, 2009). To understand how the benefits derived from MEAs might differ from those of previous IT systems, it is necessary to understand the additional affordances of the mobile devices on which MEAs operate. The differences have been categorised in prior research (Krogstie et al., 2004) into user-orientation and personalisation, technological aspects and methodology for development and operations. *User orientation and personalisation* matter more in mobile apps (Krogstie et al., 2004). Mobile devices have less computing capability such as screen size, storage capability and memory, yet there is a convergence of technologies now available on mobile devices such as accelerometers, gyroscopes, location determination and photography capabilities (Pitt, Berthon and Robson, 2011).

Mobility creates the advantage for MEAs over traditional business applications. The impact of mobile technologies can be experienced on a personal or professional level with improved flexibility either in a time perspective (i.e. when the application is accessed) or from a spatial perspective (i.e. where the application is accessed) or a time and special perspective (i.e. checking on the delivery time of a courier) (Balasubramanian, Peterson and Jarvenpaa, 2002). The value of mobile apps is dependent on the extent to which the application is *location sensitive* (e.g. Requires GPS coordinates); is *time critical*; or is *controlled by the information receiver or by the provider* (Balasubramanian et al., 2002). Due to the lack of literature on MEAs, for this study, the literature on the benefits in the literature for mobile business services and mobile apps was reviewed and are discussed with the findings, in the results and discussion section of this paper due to space considerations.

2.3 Risks

Project risk has also been defined as the measure of the degree of possible variation in the outcome or benefits of a project (Teltumbde, 2000). If risks which could prevent benefits from being realized are not recognized and dealt with then there is a low probability of value being derived from deploying the IT in the organization. One of the challenges which software projects face is that there are seldom validated lists which project managers can use to identify the nature and types of risks typically faced (Schmidt et al., 2001). The problem with non-context specific lists of published risks is that they might be biased by specific cultural ways of interpreting management perception and its propensity to handle and manage risky situations (Schmidt et al., 2001). For example, the lists of risk factors which do exist in the literature were at one time predominantly created from an American perspective (Schmidt et al., 2001). The challenges found in less developed countries such as skills shortages and technology

readiness are less of an issue in developed countries where these studies take place and therefore different risks might be dominant. Due to space considerations, the literature identifying the risks limiting the realization of benefits for mobile business services and mobile apps is discussed in the results and discussion section of this paper.

3 Research Method

A case study approach was used to determine the benefits and risks. Three MEA projects in a single organization case were analysed. By collecting qualitative data through one-on-one interviews as well as by analysing project documentation, the benefits and risks to the success of the projects were determined. This study formed a part of a larger action research project.

3.1 The Case Organization

InsureUs is a short-term insurance company in the Western Cape, South Africa. The insurance business is very complex and is made up of many business units ranging from personal short-term insurance to commercial, specialist, and agriculture insurance. The short-term insurance industry is susceptible to disruption due to innovative ways of selling insurance policies in an ever increasingly competitive market. These companies are under pressure to find efficiencies which can reduce their costs and the costs of their products. Innovation and technology is one way they can do this. Digital has also been recognized as a driver for achieving new and innovative competitive advantage in the insurance space. This makes MEAs a necessary addition to their IT environments. Understanding the benefits MEAs might offer in achieving these advantages is of great importance to insurance organizations.

InsureUs has made a strategic decision to make digital a strategic focus for growth and sustainability and as such portals and mobile apps have received special attention. While the organization has many legacy systems that drive the back-office daily operations, new technology is welcomed and as such MEAs are being investigated as business applications which can exploit newer technologies such as tablets. MEAs are ideally suited to this industry because most of the service providers such as brokers and assessors spend most of their time out of the office visiting clients and sites so mobility plays an important role in their daily work.

The three applications selected for this study were the first three that were built internally by the IT department. The Multi-Peril Crop Insurance (MPCI) and Agricultural assessment (Agri) MEAs were created for the agricultural business and are used by assessors whose job it is to go out to farms and do assessments of the risk insured as well as assessing claims. The MPCI MEA is a mobile app which is used to assess the growth stages of the crop being insured so that a value may be derived for the insurance cover. It is a technical process that requires various crop samples to be taken from the planted area so that the quality of the crop can be assessed. The manual process required the assessor to carry multiple manuals which were used to calculate the values. The Agri MEA was used for the claim process for crop insurance. When a farmer has a crop loss, the assessor is required to assess the extent of the damage manually by referring to lookup tables in multiple books which were laborious and time-consuming and prone to errors. The third MEA, the Risk assessment (risk) MEA, is a risk survey tool. Surveying risks is a problem due to the high number of assessments needing to be conducted in the organization. The Risk MEA was intended to be used by brokers to do their own risk assessments for new policies and renewals. The relationship with the organization between the two user groups, the assessors and brokers, is different. The Agri and MPCI MEAs are mandatory use while the Risk MEA is voluntarily used by the brokers. In December 2015, the MPCI MEA went live. The Agri MEA project started in January 2017 and finished in November 2017. The pilot phase started in July 2017 and the app was rolled out to everyone in October 2017. The Risk MEA project started in June 2017 and the Risk MEA was being released to users in July 2018.

3.2 Data Collection

Permission was obtained, from the CIO of the organization, and ethics permission from the university, where the researcher was a PhD student, to conduct the research. The project stakeholders agreed to participate in this study so that an improved benefits management capability could be created for MEA projects in the company. Data Collection started in February 2017 after the MPCI MEA had been live

for over a year was concluded in September 2018. The data was collected primarily through 13 interviews with 6 purposefully identified stakeholder in each MEA project who could give insights into the MEA benefits. For the Agri and Risk MEAs interviews were conducted at the start of the projects and then again during the projects and at the end. The initial interviews focused on both the MPCPI and Agri MEAs. Table 1 lists the interview participants, their roles, and their level of seniority within the organization. In addition, 13 secondary data sources, such as the business cases for each MEA and meeting minutes were analysed. Table 2 details the secondary data.

Code	Delegation	Level	MPCI and Agri MEAs interviews	Risk MEA interviews
PO1	Product owner 1	Senior	1	
DM1	Development manager	Senior	2	3
HD	Head of digital	Senior	1	
PO2	Head of project office	Senior	1	
PO3	Product owner 2	Senior	1	1
BC1	Business Change manager	Senior	1	2

Table 1. Interview participants

Document Title	Document type	Case study
MPCI MEA Business Case	Project documentation	MPCI MEA
AGRI MEA Business Case	Project documentation	Agri MEA
Agri MEA Benefits in initial business case	Project documentation	Risk MEA
Risk MEA Targets	Project documentation	Risk MEA
Risk Assessment benefit matrix	Project documentation	Risk MEA
Risk MEA scope matrix	Project documentation	Risk MEA
6 Risk MEA steering committee minutes	6 Meeting minutes	Risk MEA
Risk MEA usability results	Project report	Risk MEA

Table 2. Secondary data documents

3.3 Data Analysis

While MEA benefits and risks are not well researched, benefits from various types of enterprise applications are well researched (Davenport, Harris and Cantrell, 2002). For data analysis two approaches are possible. Firstly, the expected benefits and risks may be identified in the literature and then deductively assessed with specific relation to the MEAs in this study. Secondly, through an inductive approach, new benefits and risks could emerge which are specific to this new type of technology and application within corporate environments. Induction emphasizes the understanding of the meanings that people attach to events and allows for a close understanding of the research context, and it is less concerned than a deductive approach with the need to generalize (Saunders, Lewis and Thornhill, 2009). A hybrid inductive-deductive approach similar to that described by Fereday and Muir-Cochrane (2006) was used which included a data-driven inductive approach and a deductive approach using a priori list of seed categories determined from the literature. This approach allowed for the benefits and risks from the 3 cases to surface from the researcher's interpretation of the qualitative data while being guided by the prior research on mobile benefits. Hence, the literature informed the interview protocol for the first two cases. The results of the first two cases then informed the protocol for the third case. Each interview was transcribed and uploaded with the relevant secondary data sources computer-aided analysis software called HyperResearch. Each case had its own HyperResearch project.

For all three case the inductive coding followed a process described by Marnewick (2016). Open coding was first performed by considering segments of text and generating a large number of codes. Then axial coding was performed where codes were examined for duplication and clarity and where appropriate, codes were combined, new ones were created, and codes were grouped into themes. Thirdly, selective

coding was performed, where codes were revisited, and instances in the data which demonstrate the themes well were identified. Finally, codes were compared back to the initial themes. Figure 1 visualises the steps undertaken while coding.

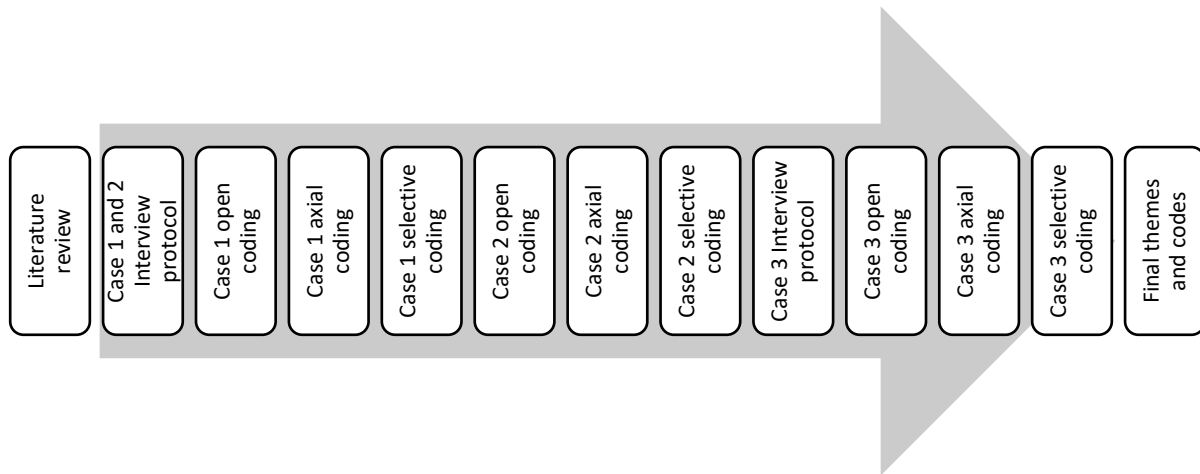


Figure 1. Data Analysis steps followed.

To improve the quality and research rigor of qualitative analysis, Anfara, Brown and Mangione (2002) refer to trustworthiness criteria such as credibility, transferability, dependability and confirmability and tabulate strategies that can improve these. All these strategies were employed in this study. The main author used prolonged engagement in the field as he was intimately involved in the project over a 20-month period as part of a larger action research study which formed part of his PhD. Data triangulation was used as both primary data and secondary data were used. Thick descriptions of all themes were recorded, a code-recode strategy was employed, and the code descriptions were constantly modified, reflexivity was practiced and after the analysis had been completed the results were validated with the respondents. Four iterations of benefit and risk templates were documented and given to the business to interrogate and check, after the literature review and after each MEA went live. These iterations also formed part of an analysis audit trail. The second author who supervised the PhD member checked the themes which are now described.

4 Results and Discussion

First, the benefits and then the risks will be discussed. The tangible (T) as well as intangible (I) benefits of using MEAs, and references which indicates the literature supporting these benefits from previous studies on mobile business services and mobile apps, are listed in Table 3. The table specifies the benefits identified for all eight benefit themes and the text counts, or number of times a code was listed in interviews or secondary data, per benefit. These text counts do not necessarily mean that the theme is more important.

Themes and Benefits	Benefit Type	Text Count	Related References
Business process efficiency			Alahuhta et al., 2005; Basole, 2004; Basole, 2005; Falk and Leist, 2014; Gebauer and Shaw, 2004; Gribbins, Shaw and Gebauer, 2003; Giaglis et al., 2006; Heck, 2004; Hoos et al., 2014; Liang and Wei, 2004; Markova and Aula, 2007; Nah et al., 2005; Picoto et al., 2010; Scornavacca and Barnes, 2008; Rangone et al., 2007; Stieglitz and Brockmann, 2012; Unhelkar and Murugesan, 2010; Vuolle, 2011
Faster turn-around times for claims	T	6	
Claims pay-out accuracy	T	10	
Improvement in claims calculation	T	4	
Assessor and survey cost saving	T	6	
Claims handling cost saving	T	3	
More assessments and surveys completed	T	4	
Less underwriting leakage	T	4	
Cost avoidance with better underwriting	T	2	

Effectiveness and productivity		13	Falk and Leist, 2014; Giaglis et al., 2006; Markova and Aula, 2007; Nah et al., 2005; Picoto et al., 2010; Scornavacca et al., 2008; Unhelkar and Murugesan, 2010; Vuolle, 2011
Increased effectiveness of assessors and users	T	2	
Workforce mobility	I	8	
Workforce productivity	T	3	
Eliminate unnecessary tasks		9	Giaglis et al., 2006; Markova and Aula, 2007; Nah et al., 2005; Scornavacca et al., 2008; Unhelkar and Murugesan, 2010
Eliminate back-office recapture	T	7	
Eliminate repeat visits to the client due to incomplete or lost documents	I	2	
Workforce management		9	Giaglis et al., 2006; Unhelkar and Murugesan, 2010
Assignment of assessments and surveys	T	5	
Monitoring of productivity of assessors	T	3	
Decrease time required for skilling assessors	T	1	
Improved customer experience		11	Basole, 2004; Campos et al., 2016; Falk and Leist, 2014; Liang and Wei, 2004; Nah et al., 2005; Picoto et al., 2010; Rangone et al., 2007; Vuolle, 2011
Improved customer experience and service	I	3	
Process efficiency for farmers	I	2	
Improved risk advice from brokers	I	6	
Competitive advantage		3	Gröger et al., 2013
Market leadership for insurance tools	I	2	
Brand leadership	I	1	
Knowledge leader in risk advice	I	2	
Increases professionalism of brokers	I	3	
Data collection and accuracy		16	Falk and Leist, 2014; Gröger et al., 2013; Rangone et al., 2007; Tiwari, Buse and Herstatt, 2007; Unhelkar et al., 2010; Vuolle, 2011
Better customer and risk data for underwriting	I	13	
Improved location data from geo-coding	I	3	
Convenience		3	Campos et al., 2016
Information while on the move	I	3	

Table 3. Benefits from MEAs

4.1 Improve business process efficiency

Table 3 lists the benefits identified which relate to improvements in business process efficiency, all of which were tangible. This category had the most benefits identified in the data which shows that efficiencies are the biggest benefit brought about by MEAs. Efficiencies in cost savings and time savings are frequently found in mobile services literature and they are also found in this study from the use of MEAs. The pay-out accuracy and improvements in the claim's calculations are specific to MEAs in this insurance context and were not found in prior studies.

All respondents discussed benefits brought about by the MEAs in this category of improvement in efficiency. For a start, they explained that MEAs enable faster turn-around times for claims, *"In the paper process they go back to the office then fax it to the farmer. Now it happens right there. Immediately"*.

They also explained how the improvement is not only in time but in the accuracy of the amount claimed or paid-out according to a respondent, *"The core benefit is the accuracy of claims"*. Improvements in the amounts claimed and paid out for claims is enabled by more accurate calculations which are no longer manual but facilitated by tables and calculations done by the device which eliminates human error. The product owner explained how the benefit of improved claims payments was enabled by the MEA, *"We're using a different calculation method which should be more accurate to both sides"*. This created fairness for the claimant and the organization.

A further efficiency benefit is a reduction in the cost of conducting assessments and surveys because of more accurate time tracking and reduced re-work. The product owners from two different MEAs explained what the initial expected benefits were when they requested the MEAs be developed;

“...there were only two benefits to this and the one is saving to the assessors’ costs and the other is the saving on the processing costs”

and *“We can quantify survey admin cost savings and add it as a benefit”*.

The cost of handling claims and processing them is reduced by using the MEA which creates another cost reduction benefit. *“This is an efficiency, lower handling costs. It lets you complete a faster cycle.”* The development manager explained that by automating certain steps in the process with the MEA, the handling cost is reduced.

By reducing how long it takes an assessor to complete a survey or assessment, more assessments can be done by each assessor which creates the benefit of increasing the number of surveys and assessments that can be concluded in a given period. This time benefit was highlighted by a respondent when asked how can quicker surveys be a benefit to the organization? *“At the moment we only have survey 10% of our physical risks. Whereas now it will be increasing the sight of these new risks.”*

Underwriting leakage occurs because bad risks are not identified which results in losses for the insurer. The benefit of reducing underwriting leakage is a revenue benefit related to improved efficiency. A respondent believed that underwriting leakage alone was a big enough benefit to justify the MEA project, *“The improvement in underwriting leakage saves us money. With that benefit alone, we have enough to build the business case.”*

When asked what the biggest benefit the MEA gave the organization was, a senior manager explained: *“We’re using the app because we want to collectively have a better understanding of client’s risk”*. The MEA enables improved accuracy of underwriting which ultimately allows for lower costs to both the client and the organization.

4.2 Increase effectiveness and productivity

The second highest number of text counts was in the effectiveness and productivity theme. The three benefits in this theme are listed in Table 3. MEAs increase the effectiveness of the work done by assessors and surveyors. The respondents raised these effectiveness benefits by saying, *“The Agri app was done to make the relationship managers more effective.”* and *“There are immediate benefits, productivity benefits, efficiency benefits, and then there is better control”*.

MEAs increase productivity and effectiveness by allowing users to be mobile. Being able to work while on the move and offline allows people to be more productive. A senior manager explained why he believed the MEA added to productivity, *“That is a huge benefit being able to work offline and not have to be connected. It is a huge productivity benefit”*.

Another benefit related to workforce productivity is being able to assign work based on the user’s location. Location context enabled by the smart device makes the users more productive. This was explained by a respondent, *“If you know there was a storm in the region. You will know I have this property that is also in the same vicinity and you can give it to the assessor in the same area”*.

The effectiveness and productivity benefits of MEAs found in this study are similar to those of mobile services found in the literature. Increased productivity is described for other types of information systems in prior studies.

4.3 Eliminate unnecessary tasks

MEAs allow certain tasks to be made redundant which allows for cost savings by reducing staff used in back-office recapturing. The benefits associated with this theme are listed in Table 3. By uploading captured forms from the MEA to the server, the need for recapturing is eliminated which creates a cost benefit by reducing staff needed for the process. Also losing paper documents is common which requires revisiting the client. By automating the upload of the data, this problem is completely eliminated which saves costs. When the product owner was asked about the process efficiency of the MEA she explained how the MEA reduced rework, *“They worked out they would get two benefits, no more back- office capture, and the paper won’t get lost”*. This finding of eliminating re-capture is also found in the literature as a benefit of other types of information systems and likewise is applicable to

MEAs. The elimination of repeat visits to clients because of automatic data uploads is not mentioned in the literature and was found in this study.

4.4 Improve workforce management

Three benefits related to workforce management were identified in the data and are listed in Table 3. The mobility and mobile location context of the user makes it simpler to allocate job tasks to the user based on where they are situated. Assignment of work is a major benefit of MEAs. This benefit was explained by a business owner,

“There is also better resource management. Because you doing that through the app, the assignment of tasks through portal and app, you actually have sight of how many requests you have”.

The MEA gives the organization much better control over the workforce by being able to better track time on tasks and number of jobs completed. This saves costs because of increased productivity. The development manager explained how this workforce management benefit was achieved,

“I think you also have more control by the fact that they claim the time and the expense for travel. By knowing where you can control the cost because you can ask, why did you take so long?”

Because the MEA automates much of the manual calculation and prompts the user for necessary data, it requires less skill from the user. *“Faster skilling up of assessor resources is a big benefit.”*, was a claim made by a business manager. This benefits the organization by reducing the amount of time it takes to train staff. Workforce management as a benefit of mobility is found in the literature and is similarly confirmed for MEAs in this study. This benefit is particularly relevant for the insurance industry which relies heavily on external contractors to do much of the assessments on their behalf. Being able to efficiently manage this workforce has significant productivity and cost benefits.

4.5 Improve customer service

MEAs enable improved customer experience. The benefits assigned to this theme are listed in Table 3. MEAs give the users a tool which gives them access to data while with a client, enabling them to give better service immediately. This benefit improves client experience. A senior manager claimed this benefit to customer service as follows, *“I’m also going to put customer and broker experience accruing from the app”*.

Indirect benefits for clients accrue from using the MEA. Process efficiency improvements have benefits which are indirect spin-offs and unintended but still benefit the client. This comment explained how faster processing of the assessment enabled the farmer to obtain financing sooner than prior to the use of the MEA.

“What’s happens is if we process the emergence report which is the first report of the process, he gets financing. He gets additional financing to carry on his farming practice. If we are late with the report then he doesn’t get his finance.”
(PO1)

This was an unintended benefit for the client from the MEA, however, it allows for an improved client experience from the organization.

The MEA enables the broker to give a more professional appearance and give the client better risk advice based on the improved survey process with the MEA. This is achieved in the following manner as explained by the project manager, *“We want to get them to proactively advise clients on how to reduce their risk which is good for everyone”*. This MEA benefit is unique to the insurance industry however the benefit of improved customer service from mobility is validated in the literature. The type of improved customer service is context specific, however, the grouping is also found in prior mobile studies.

4.6 Gain competitive advantage

MEAs give the organization a competitive advantage which is brought about by several benefits listed in Table 3. MEAs provide insurance tools which can give the insurer an advantage over the competition in the marketplace. A senior manager had the following explanation regarding the advantage,

“We can also position InsureUs as a leading insurer from a surveying aspect. As an industry leader in surveying. They can’t keep up with us”.

By having MEAs which none of the competition has, it creates brand awareness and brand loyalty for the insurer as a superior brand. The product owner viewed the advantage of the MEA for the organization in the following way,

“The second side was [a competitor bank] had something. We need to at least be better than [the competitor bank] and we have an opportunity to streamline that process with the app”.

Because better risk data is collected through using the MEA, this gives the insurer better knowledge of insured risks and creates the benefit of knowledge leadership. When asked how the MEA creates an advantage over the competitors, the product owner explained, *“Because now from what we are picking up from the data, we can write media articles related to the topics”.*

Using the MEA gives the brokers and other users a more professional image which creates a competitive advantage over other insurers. The head of digital explained the benefit to the organization as well as the industry as follows,

“It is used to improve the professionalism of the industry. The benefit to InsureUs is that because it is integrated with InsureUs it becomes easy to place the business with us.”

Competitive advantage created by mobility is found in the literature however the type of advantage created by the MEAs in this study is specific to risk management. The findings in this study confirm the competitive advantage created by MEAs which is found in the literature for mobility.

4.7 Improve data collection and accuracy

MEAs create benefits concerning improved data collection and improved data quality. These benefits are listed in Table 3. The ability to get more accurate data from the MEAs in the form of photos and rich customer specific data from both the features of the device as well as the process of data capture with the MEA leads to improved risk information related on the insured risk for better underwriting. This becomes a cost saving for the insurer as explained by the development manager,

“The data accuracy allows you to price risk accurately because of correct occupation. Exposure management allows you to identify risk types in occupations and manage exposure.”

The geo-location feature of smart devices gives accurate risk locations which improves risk profiling and underwriting. The product owner had this to say about the MEA’s ability to collect better data,

“The other thing is, what we implemented with the MPCCI app, is we’re getting images and we’re getting GPS co-ordinates which are part of our GPS project of getting co-ordinates and analysing our information visually”

The literature lists improved data as a benefit of mobility. The improved data in the case of MEAs is also derived from the geo-location capability of the devices which is a new feature of smart-devices and which can be incorporated in the MEA. Location awareness is a MEA benefit found in this study which creates improved data quality.

4.8 Increase convenience for users

The mobility created by MEAs creates a benefit for the users which is in the form of convenience and productivity. The ability to work remotely and away from the office on client premises is convenient for the users of the MEAs. The product owner expressed her view regarding convenience by saying, “*That is a huge benefit being able to work offline and not have to be connected is a huge benefit.*” This convenience benefit from mobility is found in the literature and confirmed for MEAs in this study.

4.9 Risks to benefit realization

The risks, identified in this study, which could prevent benefits from materializing from the use of MEAs are listed in Table 4 with the related literature.

Risks	Related References
Resistance to change	Alahuhta et al., 2005; Basole, 2004; Basole, 2005; Basole, 2007; Nah et al., 2005; Rangone et al., 2007
User resistance because of not purchasing device	Kim, 2008
Poor user adoption	Gilbert et al., 2004
Poor functional design	Stieglitz and Brockmann, 2012
Poor usage due to poor training	Nah et al., 2005; Rangone et al., 2007; Scornavacca and Barnes, 2008
Technical challenges of MEAs	Alahuhta et al., 2005; Basole, 2004; Basole, 2005; Basole, 2007; Nah et al., 2005; Stieglitz and Brockmann, 2012
Organization productivity at the expense of user productivity	Lindley, Topping and Lindley, 2008

Table 4. Risks to benefit realization

User resistance to changing their established way in which they conduct assessments and surveys and the consequential resistance to using MEAs for these processes poses a threat to benefit realization. The lack of enthusiasm for the MEA can result in the expected efficiencies from the MEA’s use not being realized. This explanation was given in a project meeting by one of the stakeholders, “*Assessors aren’t jumping up and down because of the apps. It reduces their time spent doing assessments, so they get less money*”. User resistance to change is found in the literature for new technology and confirmed for MEAs in this study.

Not providing mobile devices to the users can lead to user resistance and the consequential risk in expected benefits from the MEA. The product owner explained the approach taken to devices in the organization, “*We’re not buying the equipment. If we gave everyone a tablet they would be much more enthusiastic*”. Kim (2008) found that the company’s unwillingness to fund to cost of technology for users had a negative impact on the use and this risk was confirmed in this study.

A lack of user adoption of the MEA can erode the expected benefits from the MEA’s use. There is not only a threat to resisting the use of a MEA which replaces a manual process but if a MEA creates an entirely new process which is rejected by the users then the expected benefits will be under threat. This point was made in a project meeting as to why adoption of the MEA was a challenge, “*A few brokers don’t do a risk assessment and do not want to do it at all*”. The risk of low adoption threatening benefits is found in the literature. This same finding is confirmed in this study.

The poor functionality of information systems is a risk found in the literature and also confirmed in this study. Poor functional design threatens benefit realization if the MEA does not facilitate the user’s job function as they expect it to. Having insufficient functionality in the MEA which results in extra effort to get a job done will lead to lower user adoption and lack of enthusiasm towards the app. The development manager explained this risk as follows,

“There’s a gap between us and the end user. When we’re doing mobile, there shouldn’t be a gap. Early in your process, you should be saying before I design a new assessment let me go on a trip and see first-hand and you make notes. We do it late which puts our benefits at risk.”

Inadequate training of users of the MEA can be a risk to the benefits realization because of a lack of correct usage of the MEA. The efficiencies and benefits in data quality and process efficiency amongst others will not be realized if users don't know how to use the MEA correctly. The development manager explained how this risk affects the benefits from the app, *"If our own staff don't really have the tools and don't understand apps and don't understand the value that it brings then how do you expect them to play the role to bring the others up to speed?"* Poor training is a project risk found in the literature for software projects and this risk is confirmed in this study.

Technical challenges to the use of a technology are a risk described in the literature. This same risk was confirmed in this study. MEAs should be designed to deal with the technical challenges of being used on mobile devices. Issues such as loss of connectivity and the user possibly using the device outdoors where the light could affect the screen visibility. Poor design decisions regarding technical challenges could impact usage and adoption. The development manager explained the risk,

"The other challenge is a big challenge. I suppose we knew it upfront but the data, the quality of the network, speed. So, for them to download in Bloemfontein or in some outpost took a lot of time so those are learnings".

An important consideration of a MEA which could become a risk is when organization productivity and benefits come at the expense of user productivity. If users believe that the MEA benefits the insurer more than themselves, adoption can be affected. The product manager explained how this risk affected possible benefits realization of the MEA,

"Productivity I think for me, that maybe it might be increasing our productivity perhaps at the cost of the broker's productivity. We get our coverage up, but the broker is going to spend the time to do it when he should be selling".

This risk was not identified in the literature for mobile services however it has been reported as a risk associated with ERP systems (Lindley et al., 2008). When the benefits of the MEA accrue to one party at the expense of the other, this could have the consequence of the affected party not using the MEA which impacts negatively on the benefits realization.

5 Conclusion

The purpose of this study was to firstly identify the benefits which an organization in the insurance industry could expect to derive from the deployment of MEAs and secondly to identify the risks posed to realizing these benefits. Insurers are under pressure because of increasing competition and as such need to find efficiencies and improved data for better underwriting. This study showed that MEAs create the efficiencies that are needed in this industry along with many other benefits. Understanding these benefits and the risks which could impede their realization enables organizations to better manage their expected benefits. Eight categories of benefits were identified, that organizations can expect to include in their business cases, namely improve business process efficiency, workforce management, customer experience, data collection and accuracy, effectiveness and productivity, gain competitive advantage, eliminate unnecessary tasks and increase convenience for users. These benefits could arguably be generalized to other contexts. These categories of benefits were broken down and described in terms of 26 actual benefits identified in the South African insurance case study. The seven risks to benefits realization identified are resistance to change, user resistance because of device purchase, poor user adoption, poor functional design, poor usage due to poor training, technical challenges of MEAs, and organization productivity at the expense of user productivity. These risks should be generalizable to any MEA project.

The contributions from this study are to both practice as well as theory. The practical contributions are to provide validated lists of benefits and risks for MEA projects which can be used by organizations to build robust business cases for their MEA projects. This was confirmed by a manager, *"If you have a checklist you don't have to reinvent the wheel every time. You can run through the checklist of benefits and risks. You might forget about something and this checklist will make you think about it. The value of the list is it forces you through a way of thinking and it gives multiple perspectives. You could also*

find something new which is not on the checklist and can be used for future projects. It is extremely useful. If we have something like that it will just simplify the whole BM because people tend to just push that aside. They know there are benefits but they push it aside. This makes it easier to build the business case". This allows for improved benefits management and steps can be taken to mitigate and address the risks which could prevent the benefits from being realized. The theoretical contribution is to extend the body of knowledge in the benefits realization field for this new type of information system.

There are limitations in this study. The first major limitation is that the actual users of the MEAs were not interviewed and therefore the benefits were more focused on the organizational perspective. A survey has been sent to users to gain some of their perspectives. We also acknowledge that not all benefits identified had quantitative measures that showed improvements for the organization, they were the perceived benefits which the project stakeholders believed were realized. Also, the risks identified in this study focused on risk factors pertaining to the benefits of using the MEA and not broader project risk factors such as changes in the environment and project finance risks. An additional limitation is that the study although performed over a few years was still cross-sectional and that it is a single organization case and the MEAs in this study were used in the claims and assessments process which might not give a clear understanding of the generalization of the findings to other contexts.

In terms of future research, a longitudinal study would allow for benefits to be tracked over time and further benefits could materialize over a longer period of use. In addition, interviewing the actual users and determining their benefits and any unintended benefits is needed. It is known that mobile devices and apps are often appropriated in unexpected ways. Further research is also needed to identify benefits and risks from other industries utilizing MEAs in other business processes.

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