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What is the impact on knowledge management when small to medium non-profit organisations move from local information systems to cloud or decentral information systems?

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Abstract

Besides the for-profit and governmental organisations, non-profit organisations support individuals or communities in various ways and situations. In Europe, the number of non-profit organisations, particularly smaller ones, have continued to increase during the last years.
In light of the ongoing information systems transformation from local to cloud, the question arises if the knowledge management of organisations has been impacted. As the literature review shows, the organisations today mainly need and rely on knowledge as a capability, including those in the non-profit sector. The influence of the information systems transformation to knowledge management is under-researched, especially for the many smaller non-profit organisations which contribute to society.

The key difference between non-profit, governmental and for-profit organisations, is that non-profits do rely on donors and volunteering, hence they need to ensure a high motivation for all stakeholders.
Information systems cloud providers offer everything *as a Service* and *Software as a Service* is recommended for NPOs due to its direct consumption possibility.
Knowledge management can be condensed down to information shared with the ones who need it. But information shared - orderly and transparently - also allows to keep up motivation.

New quantitative primary data was gathered via a questionnaire about information systems and knowledge management usage. Non-profit organisations in three European countries, Germany, the UK and France were asked. The feedback was analysed for trends and relations by frequency tables, cross-tabulation, Independent-Samples T, ANOVA and other tests.

Findings show non-profit organisations have, with more than 40%, higher cloud adoption than the literature suggests. Knowledge management was not statistically impacted, and the use of the cloud was rated slightly improved, compared to local information systems. Their main focus, being also internet related, is having a homepage or social media presence. This presumably allows them to exchange information as needed to ensure high motivation for stakeholders.

Although practical recommendations for smaller non-profit organisations are made to improve cloud adoption, this has little impact on knowledge management. As non-profit organisations largely matter to society, it is of general interest that they work cost-efficiently with cloud, hence they should be informed.
This research had limited resources and time, hence suggests further research with the provided framework in order to draw more generalised or more specific conclusions.

Keywords: Information systems, cloud, transformation
non-profit organisations, knowledge management

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Contents

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- List of Figures and equations
- List of Tables
- List of Abbreviations
- Diagrams and subtext
- Appendices
- References and Bibliography
- Any chart, table or slide texts

List of Figures and equations

List of Tables

List of Abbreviations

CIO	Chief Information Officer
CKMPEF	Capability-based Knowledge Management Performance Evaluation Framework
DIS	Decentralized Information Systems
FPO	For-Profit Organisation
IS	Information Systems
IT	Information Technology
KM	Knowledge Management
NPO	Non-Profit Organisation
SaaS	Software as a Service
SM-NPO	Small to Medium Non-profit Organisation

1. Chapter: Introduction

This research is critically evaluating if and how local non-profit organisations (NPO) are affected - positively or negatively - in their knowledge management (KM) when moving from local information systems (IS) to decentralised information systems (DIS) or cloud.

While international resources are reviewed for all science areas to get the most accurate picture, the primary data will be from representative European countries, like Germany, the UK and France.

1.1. Overview

IS are currently going through a large-scale transformation, where on-premise information technology (IT)/IS are enhanced or even replaced by cloud-IT/DIS (Abolhassan, 2017). Research of impact on KM of such transformations is rare, especially for small and medium NPOs (SM-NPOs).

With scarce resources, the focus for NPOs is on their vision. Therefore, they want to spend as little as possible on things that do not benefit the vision, including all areas of IS (Epstein & McFarlan, 2011).

However, Information Systems (IS) and their design for storing data and information in organisations are the keys for KM (Alavi & Leidner, 2001).

The author could witness that SM-NPOs sometimes rely on a paper-based solution for IS, which is quite common in smaller NPOs, founded long before the age of affordable laptops, smartphones or cloud storage.

Before note-worthy content was digitalised, it was locked in people's mind, local storage or private mailboxes equally caused knowledge to be only with one person of the SM-NPO (Sather, 2018). Without KM, organisations potentially have a loss of resources, re-creating best practices and alike (North & Kumta, 2014).

This raises the question how SM-NPOs are affected by the current IS to DIS/cloud move, possibly leading to improvements, especially in terms of KM, a key part of any organisation (Drucker, 1969).

1.2. Research Environment

The current academic research consensus for non-profit organisations, IS, DIS/cloud and their relationship to KM was gathered from the literature review. The literature review is based on books, peer-reviewed articles and legitimate publications in the sectors. This chapter will show a first overview of the areas of IS, DIS/cloud and NPOs.

NPOs are established with a vision to improve communities, society or lives of individuals. Most of their profits are spent to drive the mission, any excess profit will not be paid out to executive members, this is a key difference to for-profit organisations (FPOs) (Epstein & McFarlan, 2011).

NPOs depend on donations from private and public individuals, but also on cooperation with the government or FPOs, as Simpson, Lefroy, and Tsarenko (2011) stated.

Most European NPOs, like the ones in the sports sector, are small, work locally and have - like medium and large ones - constrained time and resources (Schlesinger & Nagel, 2013).

IS are presumed to be a key factor to FPOs, allowing them to produce cheaper, spend less and have higher innovation rates than competitors (Rathi & Given, 2017). NPOs benefit as well from well suited IS (Kobelsky, Larosiliere, & Plummer, 2014). When the internet developed more ubiquity and prices for storage and computing consequently lowered, decentralised information systems - some called cloud systems – have become a huge and popular part of IS today (Koch, Assuncao, & Netto, 2012). With some cloud services being available to NPOs at no cost, some larger NPOs have moved to cloud-based services like *G-Suite* and *Office 365* (NASDAQ OMX, 2018). They see benefits in sharing information more freely via cloud *Information Reporting system* and *Decision Support System* (PRWeb Newswire, 2015) and communicate more efficiently with the provided *Group Support Systems* (Sun & Teng, 2012). Smaller NPOs' strategy in IS have not been researched yet, but with the outlooked cost savings it is deemed that NPOs would join cloud-based solutions usage. (Wright, Roberts, & Wilson, 2017)

An increase in communication aids all stakeholders (Bell, Lindenfeld, Speers, Teisl, & Leahy, 2013). Most NPOs rely on IS-based communication to keep engagement of donors, volunteers and members high, to show accountability and to cooperate with other organisations (Wright, Roberts, & Wilson, 2017).

The speed of information exchange is seen as the key to any organisation to stay competitive and avoid losing resources, for example, by committing the

same error again or spending too much time on an issue where a solution is already known. The right information at the right time with the right person or team can be called knowledge (North & Kumta, 2014).

Continuous research of IS use in FPOs led to developing organisations' tasks with the IS/IT capabilities in mind, and usually knowledge management plays a central role (Sarnikar & Deokar, 2017).

Since Taylor first applied knowledge to work by recording and optimizing the steps of physical work, it is seen that knowledge drives productivity (Kanigel, 1997). Allowing people to access knowledge, for example, as part of an information system, can enable them to know what their tasks are, and also aids them to complete these tasks responsibly and productively (Drucker, 1999).

Organisations should establish knowledge management systems to allow employees to log issues and the supposed solution or assign tasks as they arise (Blankenburg, 2018, p. 154). For this, the organisations must assign resources, like IS, facilitate and encourage that members have time and trust to participate (Krogh & Nonaka, 2009).

Helander, Kukko and Virtanen (2010) showed that KM can achieve savings, a key element for NPOs. Further, it is perceived that NPOs can start easily and benefit from KM when moving to a DIS/cloud solution (Patockova, 2012).

Recent studies assessed KM in large and international NPOs, like the World Bank (Heggli, 2011), but small to med-sized NPOs (SM-NPO), for example,

with less than 20 employees or executive members, were not evaluated (Takahashi, et al., 2015).

1.3. Aim

While DIS/Cloud can be assumed ubiquitous, SM-NPOs still rely on local IS, even non-computerized ones, in comparison to larger NPOs or FPOs (Dourish & Bell, 2011).

With ever ongoing transformations in IS, the impact on KM during the transition of technologies, like the growing tendencies of cloud computing usage, requires more attention.

As SM-NPOs are the majority of NPOs and drive positive local social activities, it is worth investigating how they can do this with the biggest success possible for the benefit of society.

The research aims to produce results that can be used by SM-NPOs, IT providers and knowledge management users to conserve or improve knowledge management.

1.4. Objectives

This research will critically evaluate how smaller and local non-profit organisations' (SM-NPOs) are impacted on their KM during IS changes.

Therefore, this research will investigate the impact on knowledge management, a vital part of any organisation, of SM-NPOs in the times of broad changes from local to cloud-based IS.

For this a literature review for current theories will be conducted, further new primary data will be gathered from SM-NPOs in order to understand their current state of IS and KM.

Objectives:

- Review of current academic literature for IS, cloud and DIS theories, concepts and models from peer-reviewed sources
- Estimation of the key differences of NPOs to FPO and government-run organisations from the literature review
- Review of current academic literature for KM theories and concepts, in relation to applicability for NPOs, and IS/cloud.
- Gathering new data from SM-NPOs in order to evaluate IS/cloud, KM status and usage.

1.5. Research Question

It must be assumed KM contains the NPOs' vision and effective approaches to fulfil it. Since NPOs are founded on their strategic vision, the research will critically evaluate how moving from IS to DIS/cloud impacts KM. To understand the impact on non-profit organisations, an academic definition of such organisations and its key aspects has to be discovered.

Today's academic literature is focusing on FPOs and large, international NPOs for the usage of IS, DIS/cloud and KM. European SM-NPOs represent the majority of NPOs, yet their IS migration is under-investigated. Furthermore, how collaboration in SM-NPOs - internally and externally - would work best has not been researched sufficiently yet. Current research seeks generalisation on a too narrow range of organisations, not regarding knowledge management nor cloud usage. Non to little room is given to conclusions or relations between IS migration and knowledge management in general.

This results in the following research question:

> ***Research Question****: What is the impact on knowledge management when small to medium non-profit organisations move from local information systems to cloud or decentral information systems?*

1.6. Structure of the research

The above-described environment is the scene for the literature review below. The topics will provide the definition and key aspects of an NPO, the migration from IS to DIS/cloud, KM and the impact on KM of an IS migration.

Following the introductory section there will be a critical literature review, presenting academic research and concepts in the three main fields as NPOs, IS/DIS/Cloud and KM. This will establish the current academic state and, where possible, link the findings to current practice, showing the framework for this research.

A methodology chapter for the data capturing will follow with a comprehensive review of the valid options and theories, showing how data was captured and processed and for what reason.

The results, analysis and discussions chapter are going to present the results of the captured data and any correlation. It will show in which direction the research question will be answered.

Chapter five will draw conclusions from the main part of this research by giving advice to NPOs and DIS/Cloud and KM vendors based on the data found.

Chapter six will show the research’s limitations as well as delimitations, suggest further research activities and reflect on the study process.

2. Chapter: Literature Review

The literature review will critically evaluate the current academic theories in regard to NPOs, IS/DIS/cloud and KM.

Firstly, the IS definition and development until today will be presented. Secondly, it will be reviewed how IS developed towards DIS/cloud and the relationship to KM. The KM review will demonstrate the worth of knowledge to the organisations and especially NPOs. Finally, the definition of an NPO will be reviewed and what distinguishes them from other organisational types and what the impact on their KM is, as the research question suggests.

2.1. Information systems

Ackoff (1989) described data as an attribute of an item, for example, a temperature value. But only by adding a descriptive factor, the value can be gathered from it (Busby, Ernst, & Varnado, 2009). This combination can then be called information and, conceivably, combined with further information can lead to answers (Ackoff, 1999).

Brynjolfsson and Mendelson (1993) wrote that availability and quality of information determine how good an organisation is managed, based on decisions, appropriate to the information received. When individuals and groups make a decision, knowledge can aid to take risks, reducing personal risk aversion as a result of the decision (Sandland, 2016).

Computers are not necessarily required for such information distribution, as the history of non-computerized *systems of information provision* proves.

Eisenstein and Bouwsma (1979) showed that the book, especially during the print revolution in the 15th century, did convey the role of holding and sharing information.

While this method is still used today, since the 1960s, information could get moved to computerized systems, the so-called *Information Technology* (IT). In the 1970s, IT became more affordable, wider-spread and more powerful, replacing paper-based mechanisms of information sharing.

With an ever-growing research area, after *computer science* and *business management* extended into *accounting* and *organizational theory*, the field *Information Systems* (IS) was formed, combining all perspectives of IT usage under one umbrella (Hirschheim & Klein, 2012).

Teubner (2013) perceived in the 1990s, IS strategy established a competitive advantage by applying the most appropriate and recent IT solutions for business tasks, which overall was activity led by business departments. Since the year 2000, IS strategy has become part of the organisations' planning, leading to review appropriate IT solutions from the start of a task's design. The special thing about this strategy was, that the IS and organisational strategy could be aligned. A solution could be searched altogether. While Teubner's (2013) facts were gathered from academic activities in the IS fields at that time, they can be considered representative for the general organisational IS strategic trends.

To combine IS and organisational strategy, constant adjustment of the organisations' tasks is required. This could be done, for example, via

Business Process Management in order to use the latest technologically enabled opportunities in IS for the tasks at hand (Cummins, 2015).

This also led to the rise of the Chief Information Officer (CIO) role, facilitating approaches between IS/IT and the organisations' targets (Hirschheim & Klein, 2012)

New approaches were not necessarily successful, especially in organisations with insufficient hardware, funds or low IT maturity (Lin, Huang, & Cheng, 2007). The level of user acceptance and the use of technology can be benchmarked by the UTAUT(2) theory, offering an estimation of transformation outcome related to IT maturity (Venkatesh, Thong, & Xu, 2012). Top management should facilitate and support IS changes. Additional communication of requirements and proper project management have to be deployed to guarantee people's acceptance and everyday usability of the solution (Kiwana, Johansson, & Carlsson, 2016). According to Zhu, Kraemer and Xu (2006), such adoption can be described as diffusion or assimilation of technology.

The IS of an organisation allows its workforce to use, receive or process data for *net benefit*, aiding the organisation's success. These systems can be split into three main groups: Firstly, the *Information Reporting system*, which offers instant access to the organisation's operation and performance. Secondly the *Decision Support System*, that provides simple or complex - possibly visually enriched - information that supports users with their decision. Thirdly, the *Group Support System*, which allows communication

and collaboration between organisational members or external parties (Sun & Teng, 2012).

In SM-NPOs, information is generally stored in the memory of their members. Where on-premise infrastructure exists, the strategy is to reuse it rather than to invest in new off-premise IT (Sather, 2018). Whereas larger NPOs or FPOs, in the past, evaluated outsourcing, permitting a lack of IT knowledge in the organisation, SM-NPOs tended to use on-premise or private computers because this was the most cost-efficient option (Sawas & Watfa, 2016).

2.2. Decentral and cloud-based IS

Since the late 1990s two factors have been creating the IS area of ubiquitous computing: Firstly, the common availability of the internet allows permanent and quick information exchange. Secondly, the widespread introduction of affordable laptops, tablets and smartphones has enabled constant and mobile information creation, modification or consumption (Hirschheim & Klein, 2012).

The academic definition of *cloud* seems to have escaped the classic IS fields, as it was largely hyped (Vaquero, Rodero-Merino, Caceres, & Lindner, 2009). It combined existing technologies, for example, distributed systems, virtualisation, IT consumption and networking. Birman, Chockler and Renesse (2009) stated that the ubiquitous IT consumption via networks, like the internet, and systematic drawings are contributing to its name, the **cloud**. While technical aspects are still being discussed with the topic of *Cloud*

Computing Systems (Rimall, Choi, & Lumb, 2009), just *cloud* is commonly used. There is little use of the presumed topic *cloud IS* (Westfall, 2012). The decentral aspect of the cloud concerns the academic area of *decentral IS,* which includes private peer-to-peer (P2P) or public and private cloud solutions (Müller, Ludwig, & Franczyk, 2017). To include and highlight both aspects, like decentral consumption and cloud technology, this research uses the term *DIS/cloud*.

With the general availability of the internet, SM-NPOs could use their privately-owned computers to synchronise data via a so-called P2P mechanism. This can create a distributed storage space, where every node can have the same information and there is no need to store data on any third-party servers (Mork, 2018). Not many SM-NPOs were found to use P2P, probably due to the technical hurdles, like appropriate security, of such a decentral IS (Cano, 2017; Hugoson, 2009).

The internet enabled cloud computing consumption, where several layers of IT services "*Everything as a Service*" (XaaS) are offered at low investment costs, see Figure 2.1: Common XaaS and P2P overview (Koch, Assuncao, & Netto, 2012). The service environment is owned by a service provider, who usually shares the hardware between tenants via secure virtualisation (Liu, et al., 2015).

Major types are *Infrastructure as a Service* (IaaS), where the users can still customize operation software, the *Platform as a Service* (PaaS), where one specific service like a database is offered. Finally, the most common

Software as a service (SaaS), is the one, where the user can start consuming the software without additional steps (Liu, et al., 2015).

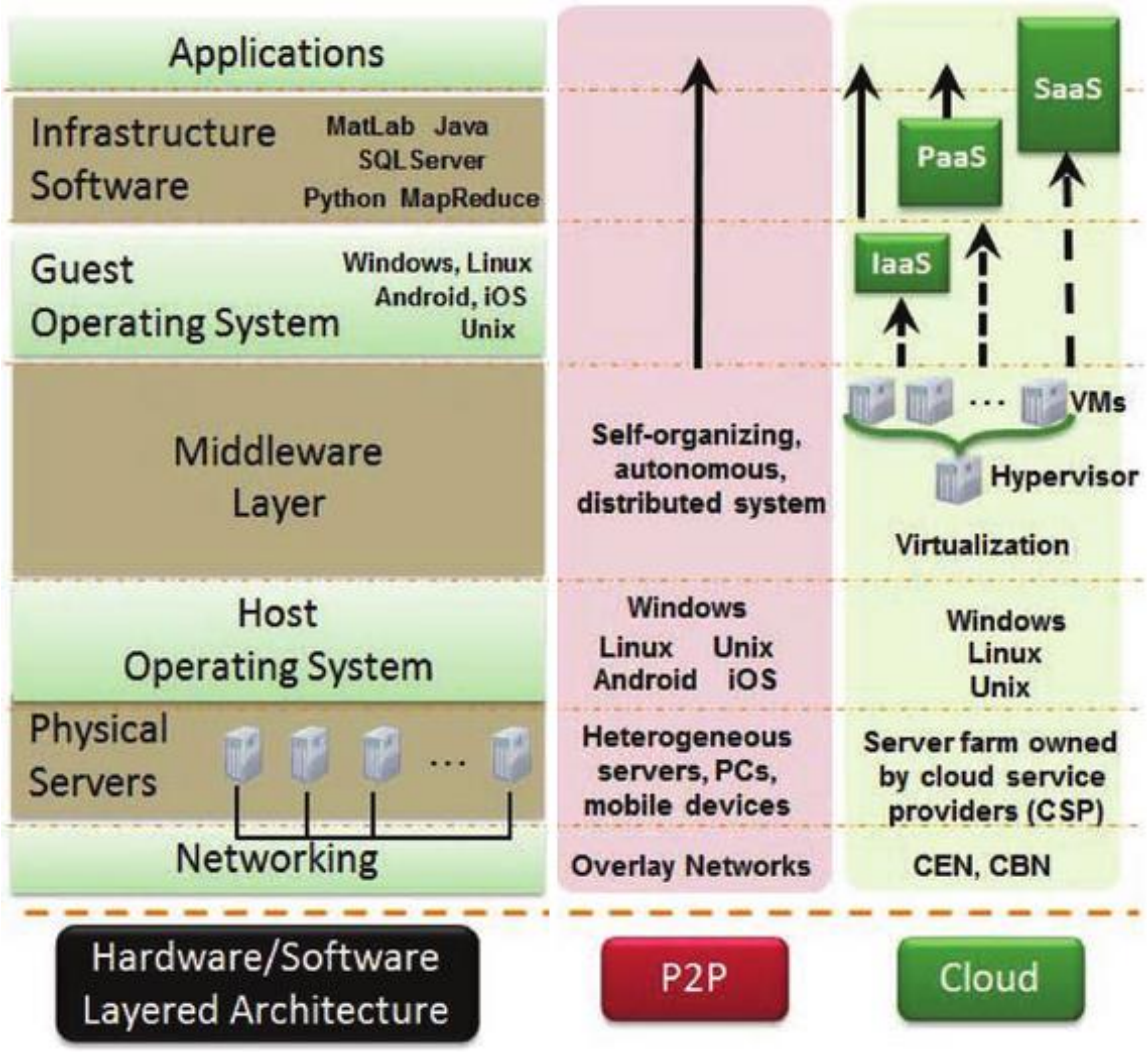


Figure 2.1: Common XaaS and P2P overview
Source: Adapted from Liu, et al., 2015, p.17

SaaS usually includes some storage by the service provider, an example may be Microsoft's *Office 365*, which is available for free for NPOs (PRWeb Newswire, 2015). Still, NPOs were found to be slow adopters of new technology including DIS/cloud, even the SaaS model was recommended to be used by NPOs to reduce costs and save time. Recently established NPOs were quicker establishing SaaS for IS/information consumption and

distribution, presumably due to a lack of legacy IT (Wright, Roberts, & Wilson, 2017).

When NPOs use a cloud-based solution, the required service can scale dynamically with the number of users (Sawas & Watfa, 2016), which would allow NPOs to handle information streams appropriate to their forecasted growth (Blankenburg, 2018); (Shiozawa, 2012).

Cummins (2015) estimated that upcoming cloud computing will permit organisations to work together more effortlessly to deliver goods or services via a shared platform. This would allow information to transverse from one organisation towards another without the need of connecting their systems or manual sharing - like emailing the information - which would be particularly suitable for NPOs with the communication paths to other NPOs, the public sector or FPOs. For smaller NPOs, such a platform should be established by a facilitating third party, like the community or a university, as suggested by Hurley and Green (2005).

Sather (2018) explained SM-NPOs still use local IT due to constraints on time, financial and IT-knowledge, hindering regular investments into new IT and migration to cloud. During a change from IS to DIS/cloud, they also have the same challenges as FPOs, like acceptance of new systems by the users.

While most SM-NPOs may not need to leverage all benefits of the cloud, like massive scaling, nor do they need to combine and exchange large amounts of data like in Industry 4.0, they may benefit from the security standard and from scalability without the need to build particular IT knowledge (Abolhassan, 2017).

There are also disadvantages when working with the IS cloud. One is that the organisation relies on a network connection - usually the internet - to the cloud. Moreover, service providers often have waiver clauses, making them not liable in case of an outage, however low that probability is. If this cannot be tolerated by the organisations, they should restrain from cloud usage (Sultan, 2010). Organisations should not store controversial data - in the view of the provider – which may lead to a weak customer position for NPOs. When several organisations have access to one cloud system, the permissions must be set to ensure the right level of access to avoid a loss of data (Oppenheim, 2013).

While Rathi and Given (2017) showed that over 96% of SM-NPOs still use a physical medium as IS and also for KM, 50% of NPOs use cloud IS, but exclusively for data storage.

Nevertheless, all digitalisation in all industrial sectors will continue to develop, resulting in the need for adjusting organisational tasks accordingly in order to be run efficiently. To accomplish this change, leadership needs to support and “think IT”, which may require a new generation of managers, also for SM-NPOs, to transform their work environment via using cloud computing for IS needs (Abolhassan, 2017). Sawas and Watfa (2016) estimated that in the foreseeable future the executive boards in SM-NPOs will have to join the change to gain forecasted flexibility and cost reduction.

2.3. Knowledge Management

While F.W. Taylor started an optimisation of the workspace in the industrial era, the need to optimize continues for today's workplaces and organisations (Kanigel, 1997). Drucker (1969) was convinced that our society, including all organisations, had become a knowledge society where knowledge is the key to success.

Whereas manual or blue-collar workers had to submit to motion-optimisation, today's widespread office or white-collar work has to create, modify and receive information to fulfil a task as effectively as possible.

According to Polanyi (1966), knowledge can be split into two types: Firstly *tacit* knowledge, a type of knowledge that cannot be written down easily as it may relate to creativity, social skills and alike, and secondly *explicit* knowledge, a knowledge that can be written down easily – so-called *codification* - and stored on paper or in an IT system. The term *stickiness* is used to describe how well-stored knowledge can be applied (Szulanski, 1996).

Based on the work of Polanyi (1966), Nonaka (1994) described how knowledge creation may be viewed in an organisation and he identified four steps: internalisation, externalisation, combination and socialisation, see also below, *Figure 2.2: Spiral of organisational knowledge creation*. The spiral, representing knowledge, works towards socialising knowledge, sharing knowledge for usage, after the combination phase, where knowledge is reviewed in groups sizes. This loop can have several iterations.

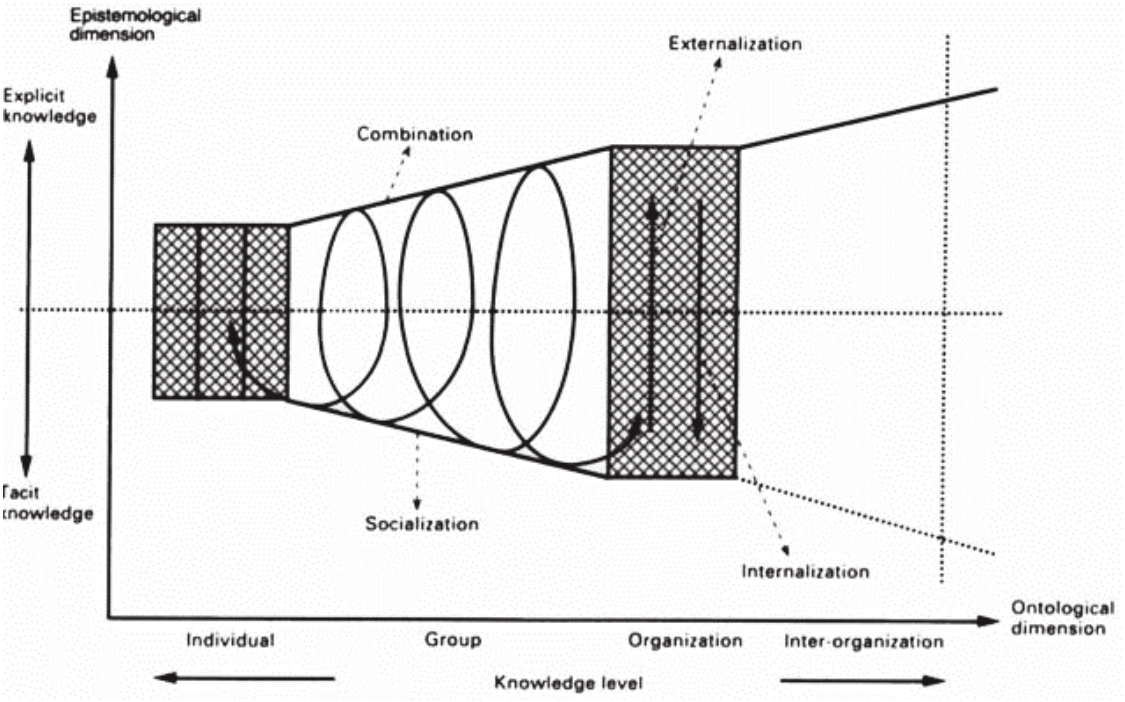


Figure 2.2: Spiral of organisational knowledge creation
Source: Nonaka, I., 1994, p20

While Nonaka's (1966) research was focused on Japanese organisations, it was widely adopted in the East and the West alike, showing its relevance (Bandera, Keshtkar, Bartolacci, Neerudu, & Passerini, 2017).

A KM system (KMS) that is recognised by all employees for creating, storing and receiving information enriches values throughout the organisation (Maravilhas & Martins, 2019), and will support the need in KM to transfer knowledge (Nissen, 2002). Akhavan and Philsoophian (2018) propose one of the main reasons for maintaining a KM in an organisation is making informed decisions. A basic KMS should contain information about three steps, starting with the question or challenge, the action appropriate for it and the desired outcome (Lettieri, Borga, & Savoldelli, 2004). While there are special systems for KMS, any information management tool can be and is actually used in NPOs for KM (Rathi & Given, 2017).

Where user engagement and awareness are high, and when users take part in the KM process - sharing their knowledge in the KMS - wasteful efforts can be reduced which enables cost savings, an imperative for NPOs (Hahn & Subramani, 2000); (Helander, Kukko, & Virtanen, 2010). Not only do people need to be able to join knowledge sharing, but they must also be motivated to do so (Reinholt & Pedersen, 2011). Ragsdell, Ortoll-Espinet and Norris (2014) therefore suggested to have a work climate that encourages trust to foster participation in KM, which does not enforce strict rules, as people work voluntarily, and such enforcement would reduce motivation. The engagement to share knowledge in NPOs was found to be higher, compared to FPOs, as a mutual target is envisioned.

One of the easiest applications of KM is the use of a checklist, where past experience becomes part of a *best practice* document. When these are paper-based, and mostly they are, they would be one of the oldest IS forms (Dani, et al., 2006). More commonly the high rate of IS/IT diffusion had the effect that these tasks are mostly done on IT, allowing easier sharing and copying (North & Kumta, 2014).

Using local IS, the World Bank established a cross-department KMS which shared knowledge via a web-frontend in its intranet. Monetary incentives were given out, as well as team awards, which would target the employees' motivation on the higher levels of the Maslow Hierarchy of needs like the approval by others (Heggli, 2011). Taking any generalisations away from this case-study would be a mistake. For example, considering the tense financial

situation in SM-NPOs, only awards would be an option but not monetary incentives.

Centrally provided knowledge sharing platforms across departments or organisations allow relevant expertise to be built up and shared with lower investment costs and with the ability to scale to the usage require (Johnson, Whittington, Scholes, Angwin, & Regnér, 2017) d.

Heggli (2011) stated that the KMS tools can be the same throughout all organisations to increase competitive advantage, regardless of their major differences in purpose, as long as the tools are customized to them.

Davenport and Prusak (1998) added that KM systems cannot work without applying the received information from it.

Alavi and Leidner (2001) and also Ragsdell, Ortoll Espinet and Norris (2014) suggested that IT technology provides a better environment for knowledge management, like effective communication paths, including video, tools and easy access to information and data repositories. Local IS/IT, as well as DIS/Cloud, can be aligned to the organisational context to use KM, where appropriate to the organisational tasks (Sarnikar & Deokar, 2017). Heggli (2011), however, argued that IS/IT would not be the major driver in KM, but the organisations' aims.

Alavi and Leidner (2001) concluded that large, international FPOs would implement KM quickly, but it is unclear how small and medium enterprises (SME) or SM-NPOs would pick up KM.

The overall influence of technical factors on KM has not been investigated thoroughly from today's point of view. Alavi and Leidner (2001) argued that IT would enable rapid knowledge application, along with knowledge creation and storage, but they examined it within the framework of an organisation's classic IS like intranet, not DIS/cloud.

2.4. Non-Profit organisations

For a brief history of NPOs, see Appendix: A3 History of NPOs

In literature organisational types can be split into three sectors, firstly state or government-run organisations, secondly private organisations that work for profit, and thirdly, non-profit organisations. One of the main determinations to place an organisation in one of the three sectors is their source of income. While the government organisations receive their money from taxpayers and private organisations receive their funding from their customers, the NPO sector receives funding mainly from their members or donors (Blankenburg, 2018).

The question of why there are NPOs apart from the government and FPOs was answered by Weisbrod (1986). He stated that the government only requires a 51 per cent satisfaction of the average voter's needs to show good use of the tax for the majority. But due to the differentiated preferences of people, more differentiated goods or services are appreciated (Shiozawa, 2012).

Delivering these goods or services is not the only – maybe not even the main – contribution of NPOs, according to Child (2010, p. 146). Democratic

societies value them for bringing people together and allowing them to maintain social capital and thus preserve values. This is resonated by Hundstorfer (2009), when he said NPOs work fosters social trust and cohesion. Hence Shiozawa (2012) stated that the government and NPOs "are presumed to maximize social benefits", either on the receiving or on the giving side. In Germany and overall Europe, the number of NPOs and volunteers has been growing for the last decade and has made non-profits an even larger, vital sector of organisations (Simonson, Vogel, & Tesch-Römer, 2016).

In the 1990s, the UK government handed over governmental functions and responsibilities of, example given, schools and hospitals to NPOs, while other areas became contracted out to FPOs (Cornforth, 2012). Such a decision to split work between FPOs and NPOs was described by Shiozawa (2012), when he stated that desired outcome should be evaluated, as FPOs and NPOs could produce varying results in terms of cost and time in different scenarios.

In most European countries NPOs are tax exempted, which requires them to regularly hand in a tax report, which shows the governmental support (Blankenburg, 2018). There are various rules to be applied to keep a tax-exempt status and to maintain this status more and more details need to be disclosed (Smith, 2012). Financial reports are shared with the goal of providing public transparency, but at a slower pace compared to FPOs. They need to be handed in yearly in the UK (Smith, 2012) and every three years for registered associations in Germany (Blankenburg, 2018).

Most FPOs are measured in high-frequency financial metrics like the growth of market and stock prices. This cannot be transferred into the NPO world according to Blankenburg (2018). The main performance factors usually are non-financial performance targets like numbers of volunteers, members, media mentions per year, clients served (forecast vs. actual) and projects completed (Blankenburg, 2018).

Relying mostly on voluntary income streams, NPOs need to ensure and show that they did not misapply their funds, possibly resulting in a reduced income stream which would reduce the ability to fulfil their primary mission. Moreover, increased publicity about fraud in NPOs may create an unwillingness to donate in general (Songelwa, 2011). A strong personal relationship will ensure that donors and volunteers continue to support the mission with their resources (Holtzhausen, 2014).

Where funding from the government was reduced, NPOs increasingly worked together with FPOs and accomplished challenges that any single organisation could not have tackled on its own, for example, the big society agenda 2010 in UK politics (Cornforth, 2012).

Fortis, Maon, Frooman and Reiner (2018) stated that more and more NPOs and FPOs work together. They perceived that the NPOs need more financial support whereas FPOs try to improve their image as part of their corporate social responsibility (CSR), which usually is not their main motive. While NPOs are obliged to focus on their mission and FPOs on their income, working together can sometimes add value to both organisations and presumably to society as a whole (Epstein & McFarlan, 2011). A formal

governing mechanism, like contracts, could protect each of them from opportunism, whereas having a connection, based on trust and experience, was found to work more efficiently over time. Constant application of knowledge is needed to be done to keep risks down. Governance tasks have to be completed to avoid relationships from failing (Simpson, Lefroy, & Tsarenko, 2011). Simpson, et al. (2011) indicated that a working relationship achieves a joint target more effortlessly by combining resources and knowledge.

It was detected that the growth of NPOs has led to higher competition and an increased need to be economical, particularly in areas that overlap with FPOs, as stated by Theilengerdes (2012). As Kim (2017) highlighted, a good mission statement should show recent accomplishments, restrain from exaggeration and, as a key factor, should attract volunteers, members and donors. To avoid losing focus, the so-called *mission drift*, the executive board needs to check that the organisation is still fulfilling the tasks that drive the mission. This cannot be achieved exclusively by donors or employees who are busy with operational work (Epstein & McFarlan, 2011).

Theilengerdes (2012) suggested that people who engage in NPOs have a motivation to do so and the NPOs' mission consists of re-enforcing this motivation. Turan and Horowitz (2010) described that motivated people have a target towards which they work without being side-tracked. They could have three major motives to establish targets: Firstly to be with like-minded people, secondly to influence their physical and social environment towards their view and thirdly to reduce their insecurity.

These motives can be traced back to one of the five layers of Maslow's (1954) Hierarchy of Needs. The two bottom layers are basic physical needs, the third "Love & Belonging" layer determines satisfaction through working on a social level, the two top layers are "Esteem" and "Self-Actualisation" (Schmutte, 2013). Sadowski (2011) confirmed that Self-actualisation is the first motive, with 97%, for volunteer engagement in the UK.

A summary of these motives is what drives a person to work. An NPO's work can establish satisfaction on the upper three layers by doing meaningful actions, taking responsibilities and stopping mistreatment (Theilengerdes, 2012). Turan and Horowitz (2010) concluded that knowledge must be applied to keep up motivation. Theilengerdes (2012) suggested looking at the Rubikon model, which basically demonstrates that people who want to volunteer are looking for an opportunity. While people's decision to do something is usually made autonomously and without any goals beyond an NPO's primary intent, so-called *intrinsic.* People could as well be motivated by so-called *extrinsic* factors, for example, avoiding guilt/punishment or gaining satisfaction/money, which would not be regarded as relevant for an NPO's intent (Deci & Ryan, 1987).

Blankenburg (2018) expected that the executive board of an NPO should be skilled not only in law matters but also in the social framework within which it leads the organisation. The latter consists of sharing and working together on the mission targets, expectations and needs of everybody in the NPO. Setting incentives and allowing all members to participate in finding new ideas and decisions also compliments volunteers on their work.

The relationship between members and executive members could be described as a circle with input and output on each side. Theilengerdes (2012) showed that the key element is a clear task assignment, information flow from both sides as well as appreciation of each other's work.

Ragsdell, Ortoll Espinet and Norris (2014) argued that NPOs do not recognize and manage a loss of members and their knowledge well enough. With high fluctuation rates in NPOs, including the chair (Epstein & McFarlan, 2011), this could lead to a loss of knowledge. Hence KM based on DIS/cloud was evaluated usefully by Patockova (2012). When NPOs need additional staffing, for backfilling or for growth, details like compensation, mission statement and contacts need to be centrally accessible for executive staffing and members (Theilengerdes, 2012).

Stakeholder management is the administration of expectations, that is of everybody who works on NPOs activities or can be affected by them. Stakeholder management was found to be useful when several organisations are involved, this results in multiple information flows, greater coordination needs and higher efforts for sharing documentation (Eskerod & Huemann, 2013). This also permits systematic documentation and provides information when opportunities arise for networking and knowledge sharing (Bell, Lindenfeld, Speers, Teisl, & Leahy, 2013). Stakeholder management can lead to higher motivation internally by informing the SM-NPOs' members regularly, for example, about the current projects (Theilengerdes, 2012).

Governance in NPOs happens on multiple levels like employees, executive board and members and was found to require a high level of collaboration as

discovered by Cornforth (2012). This was confirmed by Blankenburg (2018), who stated that most NPOs are knowledge- and service-based, which is in line with Drucker's (1999) statement about becoming an overall knowledge society.

Blankenburg (2018) uses Hall's (1998) and Petrash's (1996) concepts to show information exchange paths, highlighted in Figure 2.3 below, making the information flows from the different *Capitals* and various directions visible.

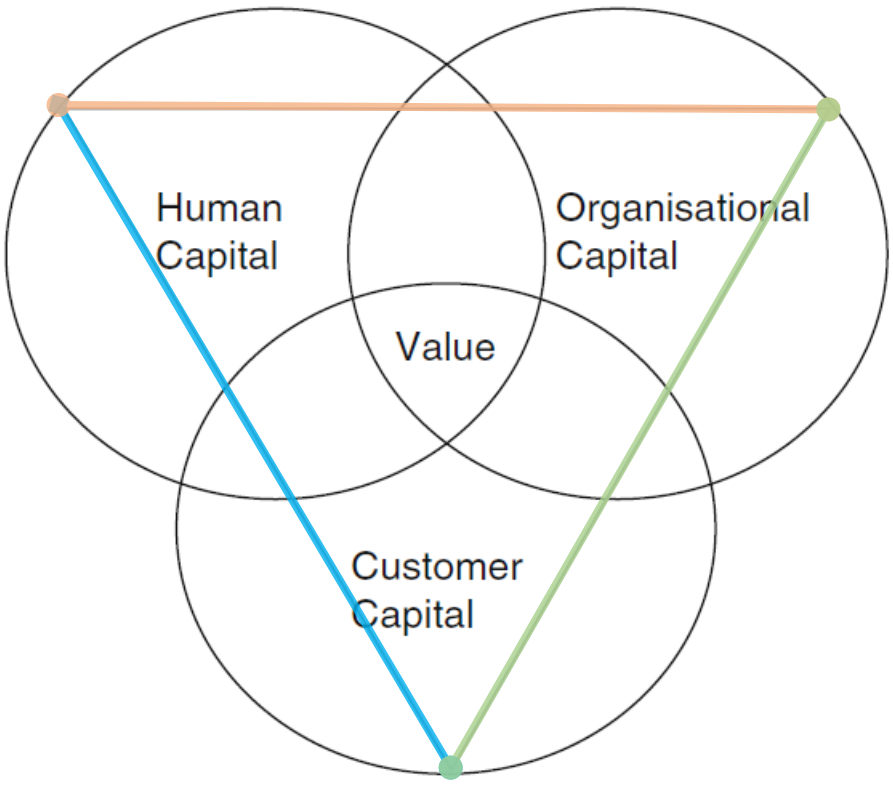


Figure 2.3: Value platform of intellectual capital by Petrash with highlighted information paths
Source: Adapted from Blankenburg, K., 2018, p. 13, figure 2.1

Information relies on information systems and these are transforming currently, being an additional task in most organisations. IS asks the SM-NPOs to invest time and resources. SM-NPOs which still use non-computerized IS, for example, a paper-based solution, need to think about investing into IS to allow their mission and organisation to be presented appropriately and collaborate, as expected by today's donor and volunteer/employee (Rathi & Given, 2017).

Despite their low IT maturity, as found by Renshaw and Krishnaswamy (2009), the focus of NPOs has to be on information exchange within the organisation and establishing - formal or informal - structures to collaborate and share key information among partners. While in the UK such infrastructure is provided by local development agencies, NPOs in other countries were found to usually provide resources for such infrastructure on their own. New sourcing models for IS must be found to reduce large costs unrelated to the mission (Osborne, 2003).

With the ubiquity of the internet, the focus on social media, like Facebook, is a growth factor for NPOs. The social media can be used to ensure current stakeholders are informed about activities, to keep them involved and ensure donors and volunteers can be kept or new ones attracted. Social media works most effectively when an NPO has a corporate identity. However, according to Holtzhausen (2014), too little effort has gone into corporate identity until now.

Blankenburg (2018) found that NPOs used social platforms just as an information channel and not for donation or membership management/ engagement.

Nisara, Prabhakar and Strakova (2019) encouraged organisations to share knowledge via social media. Although IS/DIS/cloud usage is not fully related to social media, NPOs combine cloud services to increase effective communication to all stakeholders (Raman, 2016).

2.5. Literature Review: Summary

The use of IS allows fast information access, exchange and interpretation, for example, visualisation, allowing organisations to make the best decision possible at the time given (Sarnikar & Deokar, 2017).

Organisational strategy and IS strategy should be combined, possibly by a CIO, to achieve the best results, but decent IS/IT require funding, planning efforts and IT maturity. Local IS requires investment in hardware, software and knowledge to run it, factors which the average SM-NPOs are short of.

IS moves to cloud IS are perceived to facilitate cost-saving, highly important for the tight-budgeted NPOs, along with easier communication methods to members and other stakeholders, ensuring a high level of engagement and transparency, another key attribute for NPOs (Koch, Assuncao, & Netto, 2012).

The cloud provider uses a public network to share IT hardware and mostly software as well. The Software as a Service (SaaS) allows to use it without any hardware costs and presumably will lead to lower – but steady – costs,

scaling easily with the number of users. Executives of all organisations have to evaluate the use of DIS/cloud. If they want to store their data off-premise, they need to access the network but have to ensure that loss or theft of data are inhibited. It is assumed that the low entry and running costs will cause most organisations to move their IS to the cloud. Alternatives like decentral information systems seem unlikely due to the high effort and IT knowledge required.

KM is regarded as a key for all organisations in today's knowledge society and KMS support organisations in storing and transferring explicit knowledge. KM is used to give the people the opportunity to inform themselves about any action or decision. This will probably avoid making mistakes and may lead to an effective solution (North & Kumta, 2014). IS/IT helps to increase stickiness providing tacit frameworks, for example, video telephony. If leadership supports KM and shares information about KMS with employees, if it grants them time and motivates them, they will engage in KM activities, increasing the benefits of KM. Though large organisations have engaged in KM deployments, no research was done to investigate the foreseeable move from IS to DIS/cloud in the light of KM impact, leaving assumptions for SM-NPOs open.

NPOs fulfil a vital role in bringing supporters and people in need together, especially where the government or FPOs have no funds or interest to engage. The main resources of NPOs are donors, members and/or their volunteers. This implies that it must be ensured to keep them all informed and motivated to drive the NPO's mission. NPOs can also work jointly on tasks with the government or FPOs, requiring stakeholder management and further communication. Any changes in IS have had an impact on NPOs. Keeping up with those changes, like social media, was found to be of relevance for informing current and attracting new stakeholders - like donors or members. This requires extra resources of NPOs of any size.

With the little budget for IS, NPOs resort to using non-computerized IS, but increasingly accept the requirement to be present on social media (Raman, 2016) and information sharing, although they often lack dedicated staff for any of the IS topics (Holtzhausen, 2014).

Abolhassan (2017) predicted a cloud-based adoption in the many SM-NPOs. But its impact on knowledge management has not been properly researched, also due to a lack of SM-NPOs' cloud acceptance and their presumably slower adoption of new technology, according to Gumbi and Mnkandla, (2015).

3. Chapter: Methodology

3.1. Methodology: Introduction

This Chapter will review known concepts and approaches in academia, which are perceived as appropriate for this research. The author will show why a question is asked in the questionnaire and how data in this research will be acquired, processed and presented.

The data processing and information about the sample size is presented. It further outlines the relations to data points and basic ideas on how to visualise them.

3.2. Research Philosophy

This research targets to explore the impact on KM where SM-NPOs move from local IS to DIS or cloud. The literature review has shown SM-NPOs depend on volunteers and that in IS a transformation to move to DIS/cloud is progressing, with an unknown impact on KM. While KM relies on IS/cloud in order to improve organisational benefit, its usage in SM-NPOs is under-used.

Since the combination of the research fields, as shown above, is still not sufficiently developed, this research started without a hypothesis to be tested but follows an *exploratory* approach. As no existing quantitative research data could be found, consequently, no secondary data analysis could be done, and new primary data needed to be obtained. Hence, new data will be gathered by asking several SM-NPOs about their current relationship to local IS, DIS/Cloud and KM. The selected research philosophy will be *Positivism*

in an *objective manner,* where collected data will reflect the understanding of the participants. The exploratory nature of this research results in an *inductive* approach, where recommendations will be built from the data gathered.

As the answers to the research question should come from several participants, the mono *quantitative* data method was found to be the most appropriate one. Opposed to a motivation or behaviour study of SM-NPOs, where a qualitative approach would be indicated as stated by Denscombe (2010, p. 165).

The decided strategy will be a *survey*, leveraging the web-platform SurveyMonkey© to share Web questionnaires. All possible participants only need an email address and after receiving the invitation, they can *self-complete* the questionnaire without distortion or contamination from the researcher. The short time to fill in the questionnaire is in favour of the limited time given for this research, without major cost increase. Another advantage is that the data are already digitalised and can be transferred easily for statistical analysis.

With limited time and resources, the time frame of this research will be a *cross-sectional* snapshot of time, rather than an enduring longitudinal approach.

3.3. Research Design and Strategy

This section will describe how the questionnaire, key to this research's data has been constructed.

As recently confirmed by Macedo (2017), the UTAUT2 set of questions is a reliable IS questionnaire to get IS usage and acceptance, Venkatesh, Thong and Xu (2012) enhanced the classical UTAUT with financial expectations, which are crucial to the NPOs as they mostly work with donated funds. The financial turnover might produce anomalies concerning SM-NPOs as highlighted by Hume and Hume (2008) due to different donor behaviours.

It must also be considered how mature KM is in an organisation, and the recent *capability-based KM performance evaluation framework* studies and the SM-NPOs must be asked its relevant questions, especially in relation to IS (Chen & Fong, 2012). As the framework has 51 questions, low completion rates would be the result, so only questions relevant for this research will be selected. These selected questions ask about IT impact on the organisation, commitment, motivation and time of the members to contribute to KM. The KM section of the questionnaire was added with a self-evaluation of the KM maturity within the organisation.

The questionnaire of Turner, Ledwidth and Kelly (2012) was chosen to gather relevant demographic data from SM-NPOs as these authors have investigated small enterprises three times via a web-questionnaire and offered the most developed approach. These questions are about country, size, sector, income, budget and the average age of the executive members. Personal demographic or other attributes of the person completing the questionnaire will not be asked, as the organisational attributes are the object of this research.

Further questions about IT will come from the findings from Wright, Roberts and Wilson (2017) and Sather (2018) to inquire about the resources and knowledge on DIS/Cloud and local IS.

With the research question in mind: "What is the impact on knowledge management when small to medium non-profit organisations move from local information systems to cloud or decentral information systems?", there are questions that need to be asked referring to local IS, cloud and KM usage. To find out relationships to, for example, the type of the NPO, location, the age of employees and the average age of the executive staff, further questions must be asked.

The first questions were identified during the completion of a data requirements table with the research question in mind.

The questions were not picked from the frameworks and hence these few questions were tied back to the literature review to provide a reasonable answer, for an overview see appendix chapter 8.1 A1 Questionnaire.

Organisations will be asked local IS questions; If paper-based solutions are used, if social media is used and how large their [IT-] budget is.

Care will be taken in wording the questions to get honest and accurate answers, henceforth asking uncomfortable questions will be avoided to prevent negative feelings for the participants and possibly reducing the completion rate.

The next section will discuss the data collection methods and the anticipated path of this research.

3.4. Data Collection Methods and questionnaire design

The *population* of this research consists of all European SM-NPOs, represented by France, the UK and Germany. The report *Volunteering in the European Union* by Mathou (2010), a research in EU volunteer work on behalf of the European Commission, has counted 1.7 million NPOs in these two countries, which cannot be investigated via a *census*. As asking all of them is above the time and financial limits of this research, sampling will need to be applied.

Non-randomised organisations and their umbrella organisations throughout the countries selected will be asked to fill out the questionnaire, the target is to get as many organisations as possible, but at least 30 responses are required to allow statistical methods, more to draw any generalisable conclusion from the data (Tennent, 2014). SM-NPOs will be asked via a personalised email invite, urging them to support research for the SM-NPOs and ensuring no technical know-how is needed, for the full cover letter, see Appendix 8.6 A6. The Email further contains non-personalised links for sharing in three languages English, German and French.

To get a meaningful representation of the NPOs, samples will be taken in the distribution of the three main NPO sectors: sports 50%, culture 25% and education 25% (Simonson, Vogel, & Tesch-Römer, 2016), disregarding other sectors and forming the *target population*. In Germany, France and the UK, this is 25% of all NPOs, are concerning to a *target population* of still 450.000 organisations, based on a report from Backhaus-Maul and Speck (2011).

The final percentages per sector for the invites were Sport 49.3%, Culture 27.6% and Education 23.1%, but as the feedback was collected anonymously and invites were sent to some umbrella organisations, the final percentage of the feedback may be skewed. Organisations were selected from the non-profit organisations' register, up to ten from a region like a city, ensuring the split of 50%,25%,25% between the selected sectors, NPOs from other sectors were not regarded.

Using Central Limit Theorem, for equation see below, with a 90% confidence level and a confidence interval, also called the margin of error, of 10%, a minimum sample size of 69 is suggested to gather statistical relevant sample data. With the standard of 95% confidence level, a sample size of 385 will be required.

$$\text{Unlimited population: } n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

$$\text{Finite population: } n' = \frac{n}{1+\frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2 N}}$$

Equation 1: Formula to use Central Limit Theorem for sample size calculation, where z is the z score, ε is the margin of error, N is the population size and p̂ is the population proportion
Source: https://www.calculator.net/sample-size-calculator.html

Contact information will be selected for each case from the register of associations per country, but it is unclear how many organisations would respond, the rate might only be 10% according to Neumann (2013).

All SM-NPOs will be asked exactly the same questions as all the same attributes from the NPOs are required, leading to a consistent dataset which

can be used for a *systematic* comparison between cases as suggested by De Vaus (2013).

The questionnaire is divided into four topics, 1. NPO with all their demographic data, 2. IS, 3. KM and 4. DIS/Cloud move, the complete questionnaire can be found in the appendix chapter 8.1 A1 Questionnaire.

In order to ensure a high response rate, the questionnaire will be available in English, German and French and a personal statement will be made to explain why this research is valuable for all SM-NPOs (Dillman, Smyth, & Christian, 2014). To increase the completion rate, the background colour of the survey was changed to a warm yellow tone as suggested by Capecchi (2018).

An advantage of using a web-based questionnaire is that the delivery is quick, medium-reliable and the default presentation is sophisticated. The standard layout shows the questions clearly and well-spaced on the screen. Questions that are currently not being answered, are faded out, allowing the participants to focus on one question and hence move through the questionnaire quickly.

The questionnaire will use the input modes: *open* and *closed.* The closed options allow the participants to select from a predefined value, *ratio* selections, like yes/no, or from a five-level Likert rating. Categorical values can be codified as countable, *nominal* data, for example, frequency (Oates, 2006). Easy codifying of the Likert rating allows finding trends while showing effortless comprehension during the survey time. The example given, “Agree

“, or „Disagree” shown to the participant could be related to “2”, “4” in the codified dataset, called *ordinal data* (Esterman, 2003).

The open values in this survey will make it possible for the participants to enter any numerical data, like yearly spending on IT. This results in *interval data* which can be added or subtracted to get insights, which is not feasible with ordinal or nominal data. (Oates, 2006). Numerical data can further be split into *continuous* data values, representing any values within a range, or *discrete* data. Discrete data are usually a whole number with a finite length of numbers, for example, the number of NPO’s members.

Regardless of open or closed options, where the captured data cannot be classified as numerical data, they are *categorical* data, also called *nominal*, for example, a sector of an NPO. This data could be codified, a mapping of numbers, allowing discrete data collection, but will be given since a list of pre-set value as upcoming processing can be done with the standardized text values.

While there are many international standardization schemes (ICS) under academic discussion, no standard has been established yet and none was applied to the categorical data collected in the questionnaire, permitting new research to use the ICS of their choice with the data (Phillips & Ormsby, 2016).

3.5. Analysis of Data

After completion of the survey, several options stand available to gain and share insights from the data gathered.

SurveyMonkey will be used as a data store, allowing for fast digital data extraction and pre-limitary analysis. It is planned to move the questionnaire data out of SurveyMonkey and process the resulting data matrix on the local PC. The headings of the questionnaire will remain the same and each case/line will have one case-ID, making further anonymous data processing possible. Data from all cases that were not dismissed – due to member size - will be used for statistical calculation.

The gathered data variables may have relations with each other. Basic theory suggests an *independent* variable will affect a *dependent* variable. Some example relationship assumptions and expectation for this research are listed in Table 3.1: Examples of expectations for variable dependencies.

Variable1	**Variable2**	**Expected Relationship**
NPO's Country	Average member contribution	none
Number of members of an NPO	Income, Benefit, Executives	Independent to dependent (1 to 2)
Executive support for KM	Rating of organisation's KM evolvement	Independent to dependent (1 to 2)
NPO does accumulate Knowledge in cloud	NPO does apply knowledge	Independent to dependent (1 to 2)

Table 3.1: Examples of expectations for variable dependencies
Source: Author

The example in the first row can, if a relationship is detected, show in which country the work per member is higher, indicating to check further relationships towards KM rating differences between the countries. The statistic tool of Independent-Samples T Test will be used to calculate the basic relationships if there are any.

An overview of the sample's population will be given by calculating several frequencies and where possible medians of, for example, country, number of members, IS, use of cloud, KM knowledge ratings and if their adoption changed KM usage.

For a numerical interval and continuous data, the standard deviation will be calculated, to see how consequently the medians can be applied or if cases' data varied considerably or if remarkable information will be shared. Only the relevant ones will be presented.

In order to find significant differences, dependencies or associations in the data, two tools will be used: Excel with *R Project for Statistical Computing* and *IBM's SPSS* which also allows statistical data calculation.

They will be used to run the Kolmogorov-Smirnov (KS) test for data consistency, calculate degrees of freedom (df) and probability (p-value) or significant. Running the KS test towards two datasets, for example, NPOs sector A and B could show if they differ significantly and allowing further to assume a normal distribution.

Results will be presented in tables, enabling the viewer to come to his own conclusion about relationship and interdependencies within the data. Where considered appropriate, an impression of the data's graphic will be made to allow easier digesting of the data and the suggested conclusions.

3.6. Validity

The validity of research and its survey depends on the use of the right measures and the application of precise data analysis, only then justifying

the findings to be generalised or the research question to be answered. A small-scale pilot survey will be launched to correct possible problems prior to a final launch as recommended by Everitt (2002). The piloting of the questionnaire will raise the validity and reliability of the questions to be asked, resulting in high-quality data. The philosophy of this research will be shown openly by following the line of *inductive positivism*.

Missing data in a case will lead to case's dismission as suggested by De Vaus (2013), which would not happen due to the web-based collection which should only allow a full submission or none at all.

No weighing will be applied between cases, since this is a controversial approach, as stated by Hays (1994). A case that does not suit the addressed target population - SM-NPOs with less than 20 executives/employees or less than 500 members - will lead to dismission the case.

To ensure furthermore that the data is going to be valid, several measures will be applied, like a *validation question*, eliminating false data submissions.

All gathered data will be statistically reviewed to avoid any false conclusions or relationships like Type I/II errors. The chi-square will be calculated, and the relationships will be monitored to be true, not leading to false conclusions.

3.7. Reliability

High reliability facilitates a replay of the research within the same or similar framework, resulting in the very similar or the same data. Showing how the

data will be collected and processed, as shown above, is the major step contributing to that.

Piloting the questionnaire, the storage of the data at a cloud-based service provider and a large sample group will ensure quality and therefore reliability within the limits of this research. Piloting did not only achieve minor wording improvement but also resulted in the adding of a short description of the knowledge management section. This apparently improved the understanding of the research topic where participants did not encounter the topic before, resulting in unfitting answers.

3.8. Ethical matters

The author will apply the highest ethical standards in relation to organisations' members as well as other people potentially being affected by the research.

This project does not involve any tissue, fluids or dangerous substances and no risk could be detected that how this research could impact humans or animals in any negative - physical or psychological - way. The research questionnaire will be sent to any NPOs and will make no difference in terms of equity, allowing no space for discrimination. The intention will be to present the literature review, method and predicted conclusion as transparent and honestly as possible as also suggested by Joyner, Rouse and Glatthorn (2018, p. 707).

To ensure the research will respect the standards of the Salford and Robert Kennedy College, the research author asked for ethical approval, see 8.4 A4 Taught Ethics Application stating the research matter and approach.

People are approached on a volunteering basis and all participants are asked to review and fill out the full consent form online, see the copy in appendix chapter 8.5: A5 Research Participant Consent Form. Their consent is given at the beginning of the survey and participants have the option to stop or have their data removed at any time - without giving any reason - while the questionnaire is active.

For the use of the data provided, the rules of the General Data Protection Regulation will be honoured by the author and also by the questionnaire tool: https://www.surveymonkey.com/curiosity/surveymonkey-committed-to-gdpr-compliance/.

All collected data will remain anonymized, kept confidential and secured for the maximum legal duration or until it is not needed anymore and then it will be deleted permanently.

This research will be solely executed by the author, *see Declaration of Originality / Conduct of Assessed Work*, and has not received any funding or the like from people or companies, see also appendix chapter 8.2: A2 Funding.

4. Chapter: Results, Analysis and Discussion

4.1. Results: Introduction

This chapter presents the results of the research data combined with the literature review findings, where relevant to confirm or contrast a trend and briefly sum up what this means for the research question: *What is the impact on knowledge management when small to medium non-profit organisations move from local information systems to cloud or decentral information systems?* A full conclusion will be done in the below chapter 5 Results: Analysis and Discussion chapter. The results of the research data will be shown via several statistically relevant methods and graphs, provided with the interpretation of the data.

4.2. Results from new primary data

Results of the survey will be presented, and it will be briefly stated, how the analysis of the data correlate with the existing theories and concepts from the literature review. At first, the parts that assist to answer the research question will be presented and afterwards, the data will be tested for frequency and validity, showing how robust the data captured is in itself and what other obvious conclusions could be gathered from it.

Members are highly motivated to act in the best interest of an organisation as shown in *Figure 4.1: Motivational levels in the NPOs* and statistics. Below, the descriptive statistics show a mode of four, higher than the average three of a five-scale Likert value. The standard deviation of 0.86, see Table 4.1, further shows a low spread of this mode, which can also be seen by the sharpness of the bell-like distribution in Figure 4.1.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	1	2.2	2.2	2.2
Disagree	2	4.4	4.4	6.7
Neither agree nor disagree	10	22.2	22.2	28.9
Agree	15	33.3	33.3	62.2
Strongly agree	17	37.8	37.8	100.0
Total	45	100.0	100.0	

Statistics of „How strongly are the employees motivated to act in the best interest of the organisation?“		
N	Valid	45
	Missing	0
Mean		4.00
Median		4.00
Mode		5
Std. Deviation		1.000
Percentiles	25	3.00
	50	4.00
	75	5.00

Table 4.1: Rating for question 23 on motivation
Source: Author

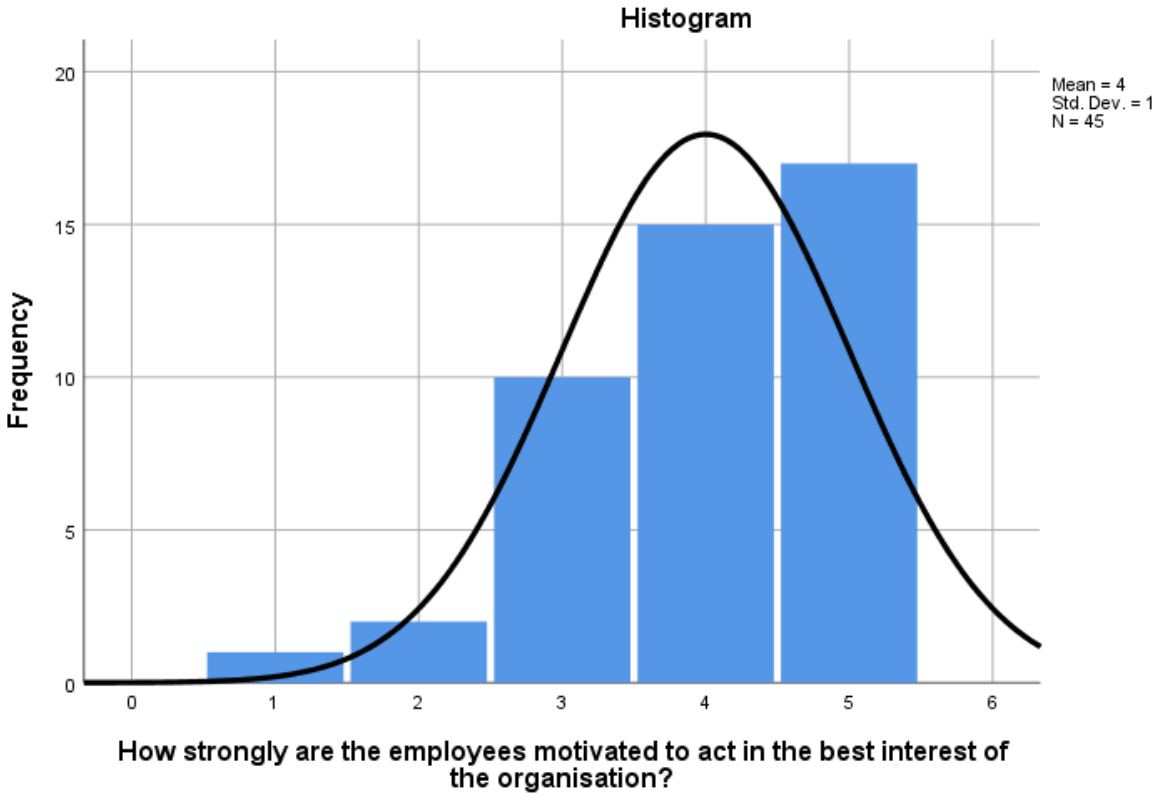


Figure 4.1: Motivational levels in the NPOs
Source: Author

The ANOVA test combining Question 20 *Do the NPO executives encourage open communication?* as a factor for the level of knowledge management was inconclusive, see table 4.2 below.

The ANOVA test for the means was significant but Post Hoc tests could not produce details to show a trend. The means plot, however, showed leadership involvement harms knowledge management, see Figure 4.2

Bayesian Estimates of Coefficients (a,b,c)					
Parameter	Posterior			95% Credible Interval	
	Mode	Mean	Variance	Lower Bound	Upper Bound
Do the NPO executives encourage open communication? = Strongly agree	2.000	2.000	.045	1.581	2.419
Do the NPO executives encourage open communication? = Agree	2.857	2.857	.048	2.424	3.290
Do the NPO executives encourage open communication? = 2	2.674	2.674	.338	1.528	3.821
Do the NPO executives encourage open communication? = Neither agree nor disagree	3.500	3.500	.085	2.927	4.073
Do the NPO executives encourage open communication? = Disagree	3.333	3.333	.226	2.397	4.269
Do the NPO executives encourage open communication? = Strongly disagree	3.667	3.667	.226	2.731	4.603
a Dependent Variable: How evolved do you rate the knowledge management in your organisation? b Model: Do NPO executives encourage open communication? c Assume standard reference priors.					

Bayesian Estimates of Error Variance (a)					
Parameter	Posterior			95% Credible Interval	
	Mode	Mean	Variance	Lower Bound	Upper Bound
Error variance	.611	.677	.026	.431	1.059
a Assume standard reference priors.					

ANOVA - Compared means of results Q20 - Q25					
How evolved do you rate the knowledge management in your organisation?					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16.477	4	4.119	6.399	.000
Within Groups	26.392	41	.644		
Total	42.870	45			

Table 4.2: ANOVA test with question 20:
"Test interest and executive commitment and openness" as a factor for KM level in the organisation.
Source: Author

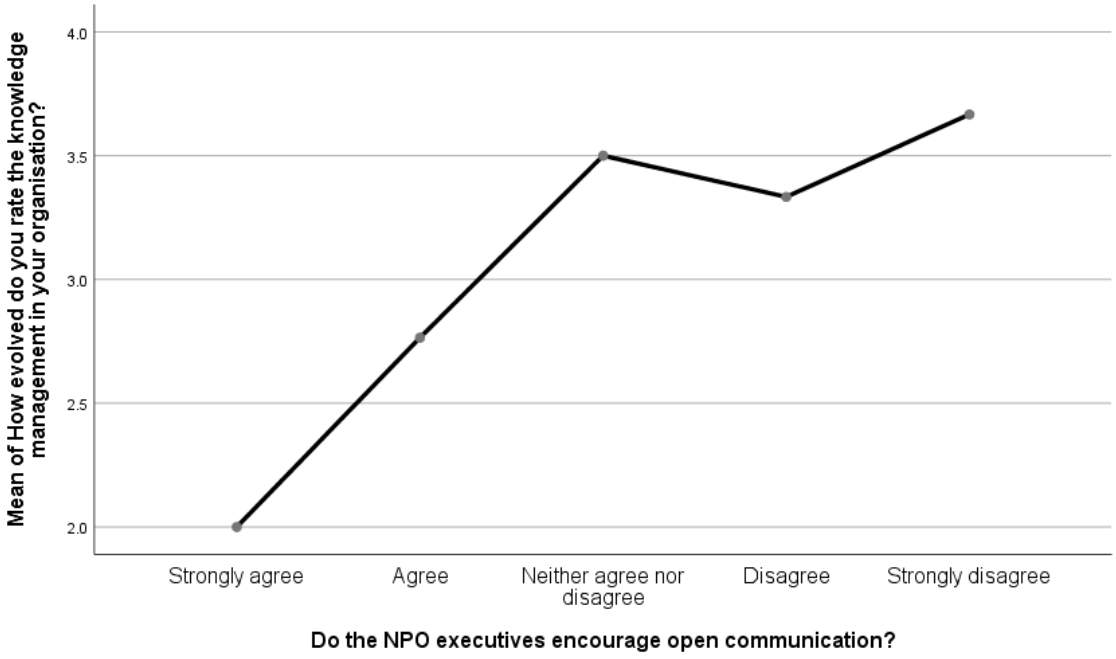


Figure 4.2: Means plot of the ANOVA test for executive openness and knowledge management
Source: Author

When comparing answers to the sophistication of the organisation's knowledge management in relation to the cloud use (*Q25: How evolved do you rate the knowledge management in your organisation?* and *Q33: Does your organisation use cloud-based solutions for information sharing and conserving?*) in an Independent-Sample T-test, the results were inconclusive, even with a confidence value of p=0.10, see Table 4.3.

Independent Samples Test										
How evolved do you rate the knowledge management in your organisation?		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
	Equal variances assumed	.016	.900	-.623	44	.537	-.183	.294	-.776	.410
	Equal variances not			-.628	40.034	.534	-.183	.292	-.773	.407

Table 4.3: NPOs rating of the evolvement of their knowledge management with cloud usage
Source: Author

The communication with members and donors is also achieved via social media or dedicated homepages, leveraging the internet for information sharing. The mode of yes (1), indicating homepage or social media account possession, clearly shows this communication path and its importance too, see *Table 4.4* and *Figure 4.3: Social media presence or active homepage for the SM-NPOs*.

Does your organisation have an up to date homepage or social media presence?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	41	91.1	91.1	91.1
	No	4	8.9	8.9	100.0
	Total	45	100.0	100.0	
N	Valid	45			
	Missing	0			
Mean		1.09			
Median		1.00			
Mode		1			

Table 4.4: Social media or homepage presence
Source: Author

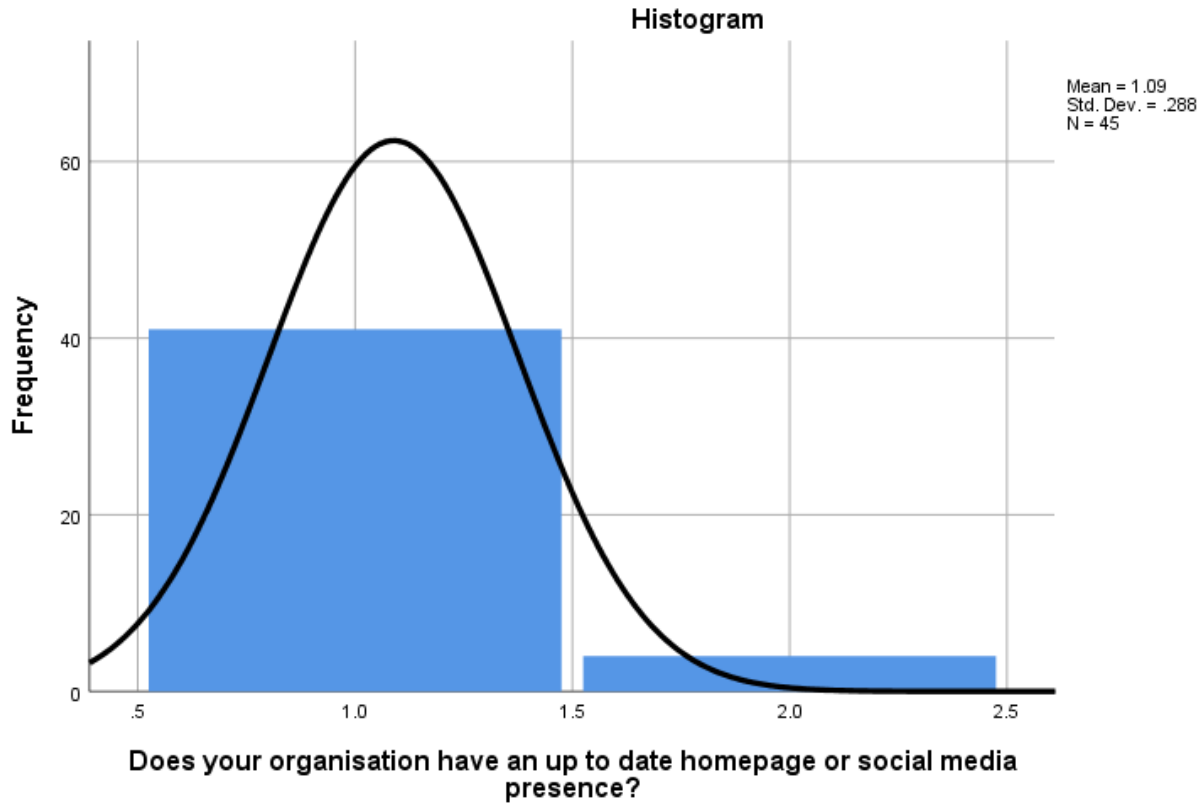


Figure 4.3: Social media presence or active homepage for the SM-NPOs
Source: Author

When analysing the feedback for Question 33 "*Does your organisation use cloud-based solutions for information sharing and conserving?"*, the cloud usage is at 40%, as shown below in Table 4.5, so just below every second organisation uses it already and with that is slightly higher than expected from the literature review.

Does your organisation use cloud-based solutions for information sharing and conserving?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	18	40.0	40.0	40.0
	No	27	60.0	60.0	100.0
	Total	45	100.0	100.0	

Table 4.5: Cloud usage in SM-NPOs
Source: Author

An even bigger turn away from the paper-based solution is shown in the results of question 10 *"Does your organisation mainly use paper-based solutions for information sharing and conserving?"* with only 22,2 per cent mainly using paper-based solutions as IS, see Table 4.6 below.

Does your organisation mainly use paper-based solutions for information sharing and conserving?					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	10	22.2	22.2	22.2
	No	35	77.8	77.8	100.0
	Total	45	100.0	100.0	

Table 4.6: Distribution of organisations relying on paper-based solutions.
Source: Author

While this suggests that there is no primary tendency towards either system, just a rejection of both as primary as shown in the mode in Table 4.7: Cloud and Paper information systems in comparison.

		Does your organisation use cloud-based solutions for information sharing and conserving?	**Does your organisation mainly use paper-based solutions for information sharing and conserving?**
N	Valid	45	45
	Missing	0	0
Mean		1.60	1.78
Mode		2 = No	2 = No
Std. Deviation		.495	.420

Table 4.7: Cloud and Paper information systems in comparison
Source: Author

So, could a change of KM be detected in SM-NPOs which moved to the cloud? In order to find an answer, an *Independent-Samples T Test* was run with the dependent variable on knowledge management rating and the cloud usage as a factor.

The outcome shows that the impact on knowledge management is not significant at a 95% confidence level, see Table 4.8: *Independent-Samples T Test for cloud IS impact on knowledge management*, suggesting that the knowledge management is not impacted from the cloud usage by the organisation.

Independent Samples T-Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
How evolved do you rate the knowledge management in your organisation? (Cloud)		F	Sig.	t	df	Sig. 2-tailed	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
	Equal variances assumed	.016	.900	-.623	44	.537	-.183	.294	-.776	.410
	Equal variances not assumed			-.628	40	.534	-.183	.292	-.773	.407

Table 4.8: Independent-Samples T Test for cloud IS impact on knowledge management
Source: Author

In contrast, an Independent-Samples T Test was run with the same settings as for the above, but this time using the answers from question 10, paper-based IS, instead of question 33, cloud IS, as a factor for knowledge management.

This showed a significant level with p=0.14 on knowledge management level when paper-based was the main solution at a confidence level of α=0.05, see Table 4.9.

Independent Samples T-Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
How evolved do you rate the knowledge management in your organisation? (paper-based)		F	Sig.	t	df	Sig. 2-tailed	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
	Equal variances assumed	.257	.615	2.56	44	.014	.844	.329	.181	1.508
	Equal variances not assumed			2.73	16	.015	.844	.309	.188	1.501

Table 4.9: Independent-Samples T Test for paper-based IS impact on knowledge management
Source: Author

Using the Chi-Square test between question 16, dedicated IT hardware, with question 33, resulted in no relation between each other, see Table 4.10.

When correlating the usage of paper-based and cloud-based information sharing, question 10 and 33, no significant relationship between the two options of information systems can be seen. Chi-Square/Fishers Exact-Test and Cramer's V test confirmed no relationship, see Table 4.10. An assumption would be made that an organisation uses either or IS, the value Cramer's V over 0.2 just shows a moderate relationship.

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.392a	1	.122		
Continuity Correction b	1.401	1	.237		
Likelihood Ratio	2.568	1	.109		
Fisher's Exact Test				.160	.117
Linear-by-Linear Association	2.340	1	.126		
N of Valid Cases	46				
a 1 cell (25.0%) have expected count less than 5. The minimum expected count is 4.13. b Computed only for a 2x2 table					

Symmetric Measures			
		Value	Approximate Significance
Nominal by Nominal	Phi	-.228	.122
	Cramer's V	.228	.122
N of Valid Cases		46	

Table 4.10 Chi-Square test and relation of paper- and cloud-based information systems
Source: Author

The Levene's Test for Equality of Errors Variances for both relations, question 10 and 33 was over p>0.05 so statistically, relevant homogeneity variance was given in the data provided and tests were read accordingly.

Doing the One-Sample Kolmogorov-Smirnov test with question 4, income, and question 33, cloud usage, showed that there is no normal distribution, see also Figure 4.4 below.

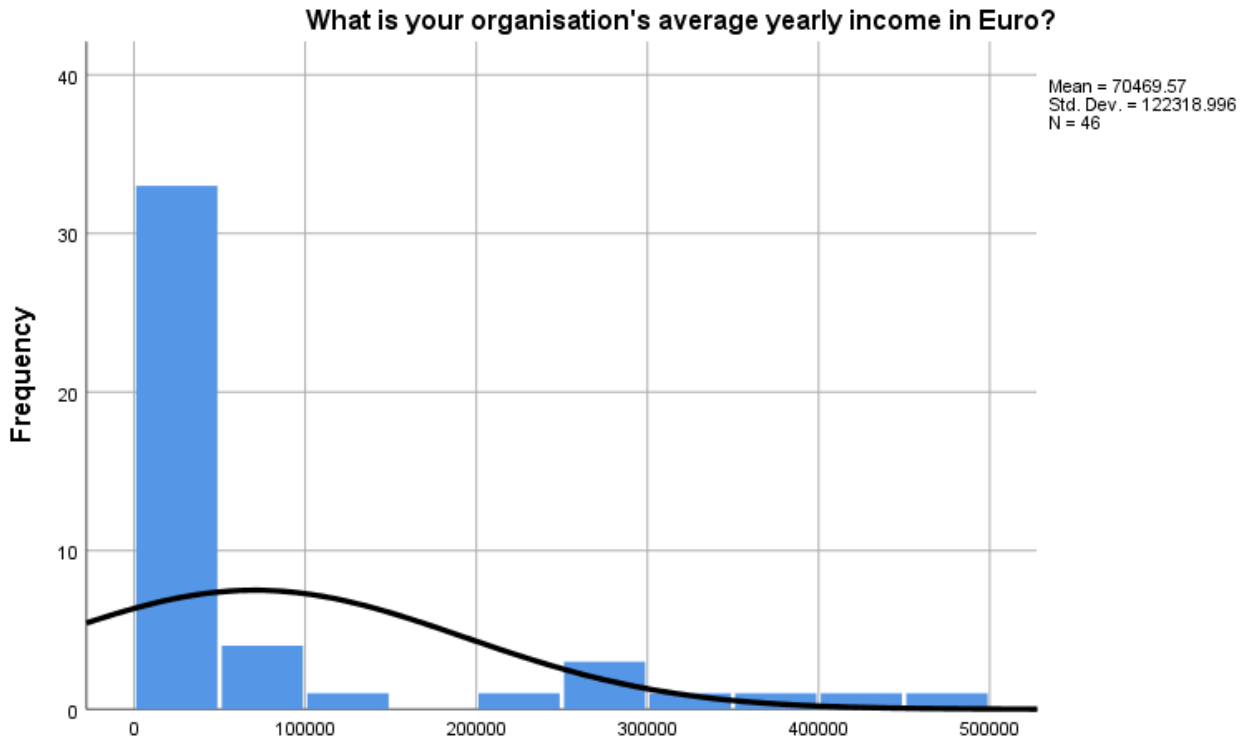
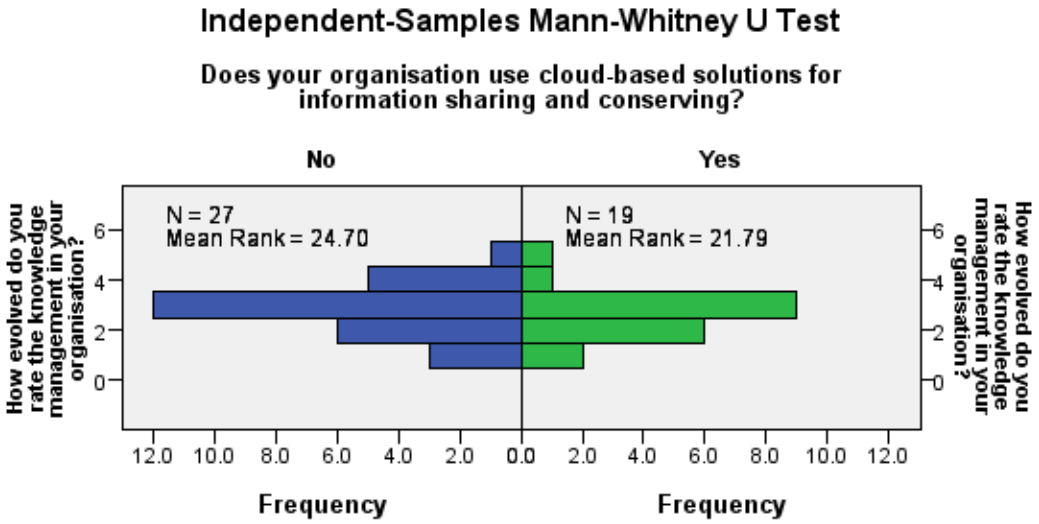


Figure 4.4: Income distribution of the SM-NPO cases
Source: Author

Running a Mann-Whitney U test to see if there is a relation between the level of knowledge management and the use of cloud-based services did conclude that there is no relationship - no benefit or down-side - in using

cloud IS or not, at a probability of 0.247 with a confidence level of 0.05, for details see Figure 4.5.



Total N	46
Mann-Whitney U	289.000
Wilcoxon W	667.000
Test Statistic	289.000
Standard Error	42.143
Standardized Test Statistic	.771
Asymptotic Sig. (2-sided test)	.441

Figure 4.5: Mann-Whitney U test for Knowledge management evolvement and cloud-based usage for IS
Source: Author

The SM-NPOs that applied cloud IS were asked in Question 34 '[…] *Did your use of knowledge management increase since the IT move to the cloud?'*, so how they themselves rate their knowledge management after using cloud IS. The outcome shows that moving to cloud IS was an improvement of knowledge management with a mean between "Neutral" and "Agree", details see Figure 4.6 and Table 4.11. Members who did state they do not use Cloud IS were removed from the dataset to show conclusive results from this group.

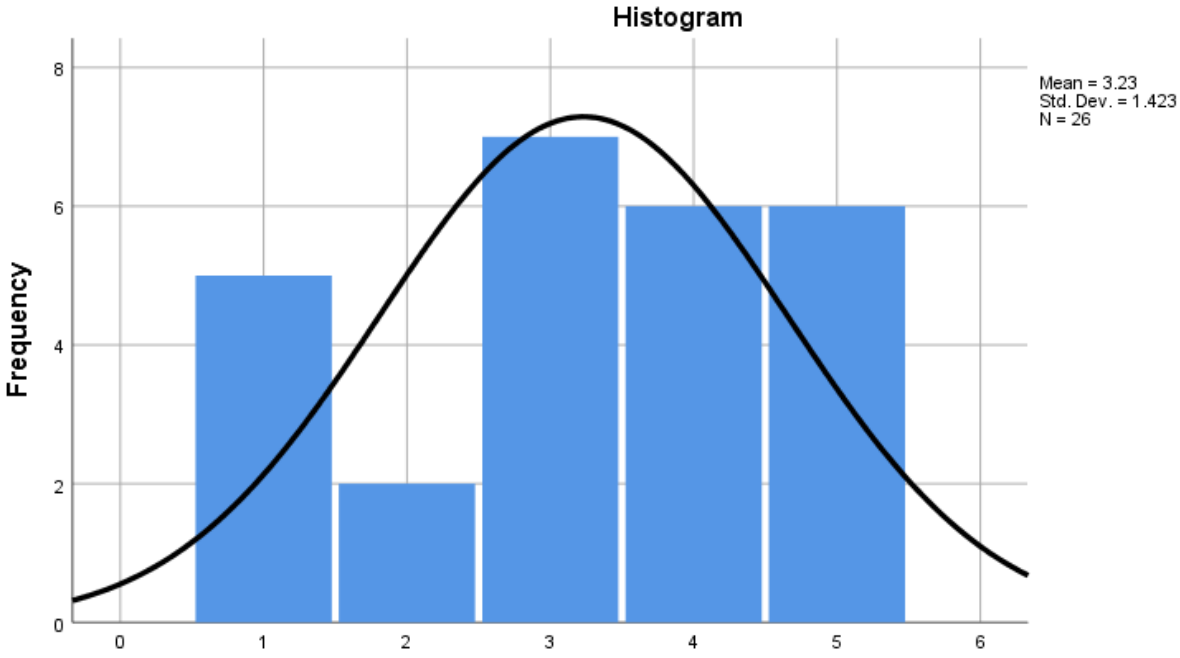


Figure 4.6: Cloud-based IS Knowledge management rating histogram chart
Source: Author

Did your use of knowledge management increase since the IT move to the cloud? For example, is it easier to communicate and share information than before?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	10.9	19.2	19.2
	Disagree	2	4.3	7.7	26.9
	Neither agree nor disagree	7	15.2	26.9	53.8
	Agree	6	13.0	23.1	76.9
	Strongly agree	6	13.0	23.1	100.0
	Total	26	56.5	100.0	
Missing	System	20	43.5		
Total		46	100.0		

Table 4.11: Cloud-based IS and knowledge Management rating in numbers
Source: Author

The large majority did not know about the discounted options – up to 100% – available for NPOs, see *Figure 4.7: Awareness of discounted cloud solutions* below. No organisation stated that they know another cloud service provider.

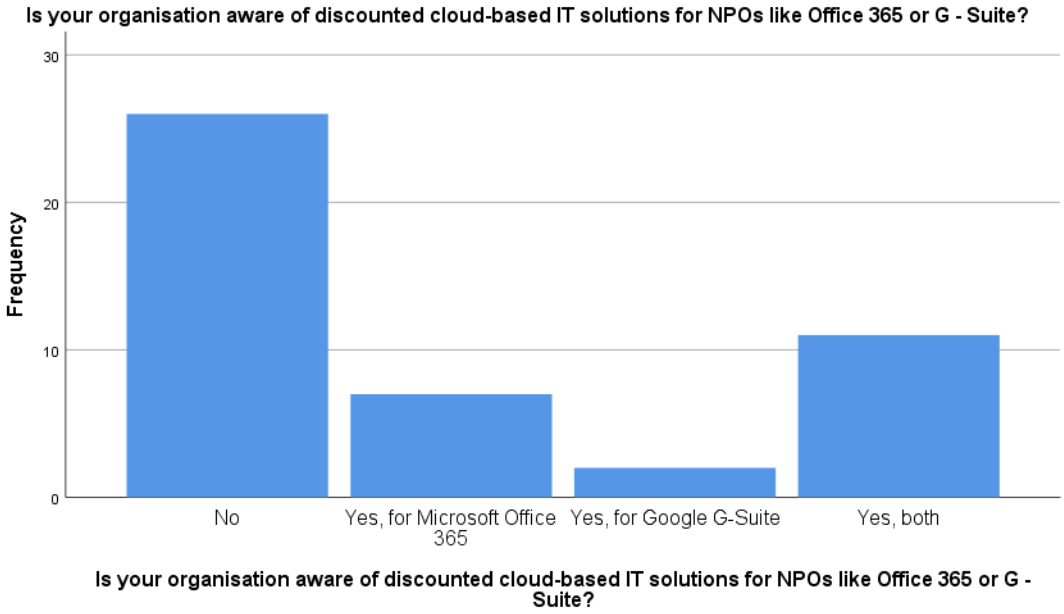


Figure 4.7: Awareness of discounted cloud solutions
Source: Author

The following are mainly the tests for the robustness of the collected data.

All cases are assumed to be independent, as they are from different, unrelated, NPOs so their data is assumed to be also independent of each other.

When investigating for normality cases with incomplete data were discovered, this happened where the invite link was only opened but the questionnaire was not filled out completely, all cases like this had to be dismissed.

The test question 32 - where the participants were asked to answer with four on the five-level Likert scale if all questions were read correctly - was answered with four by all participants who completed the survey, indicating that everybody read the question carefully. No test case needed to be removed from the sample as all the participants indicated that they had less than the 599 members or less than 20 executive employees, qualifying all further cases as submitted by SM-NPOs and hence could be used for the quantitative data research and ensuring valid data has been collected. Six cases had more than 600 members, but none had more than 20 executive employees.

This outcome provides rather good and representative data which we may be used to answer the research question.

Of the 46 usable cases, the most responses came from Germany as shown in Figure 4.8: *Organisations' main countries*, although the cover letters and questionnaires were offered in German, French and English and organisations were invited in their respective primary language per country.

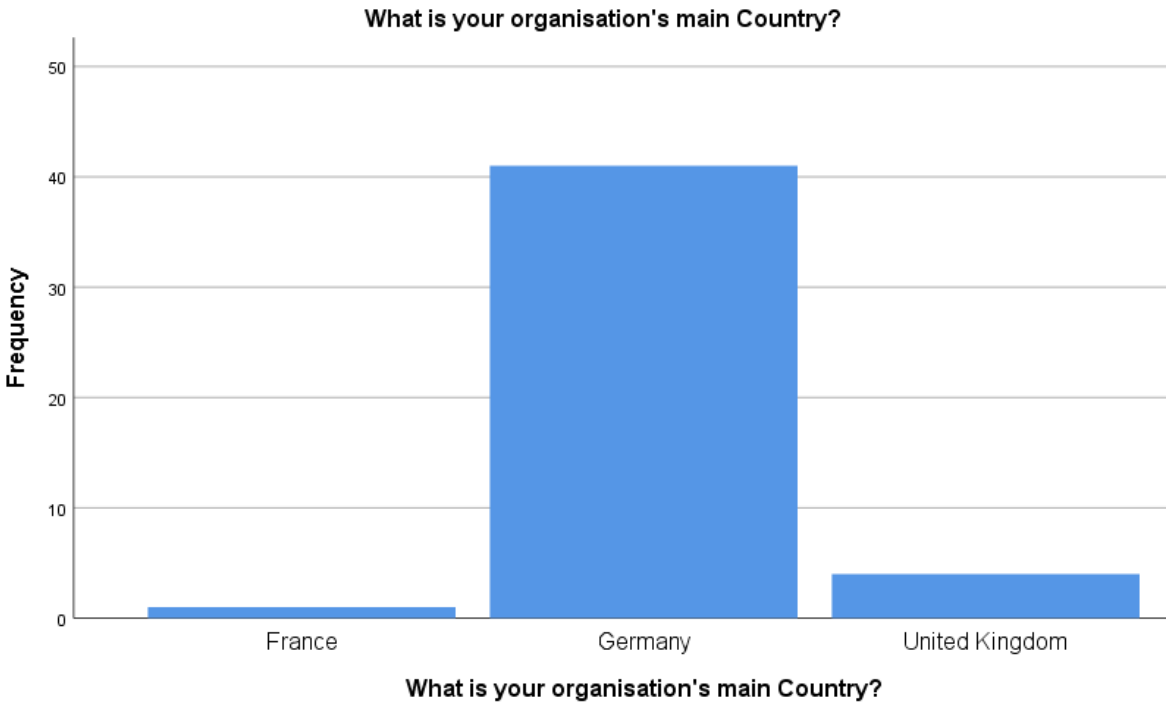


Figure 4.8: Organisations' main countries
Source: Author

The descriptive statistics, *see Table 4.12: Descriptive statistics of the founding year of the organisations*, shows a mean of 1968, so the organisations are 50 years old on average, which allows the conclusion that they created knowledge before any computerization was widely accessible.

In what year was your NPO founded?			
		Statistic	Std. Error
Mean		1965.74	6.198
95% Confidence Interval for Mean	Lower Bound	1953.26	
	Upper Bound	1978.22	
5% Trimmed Mean		1968.26	
Median		1982.50	
Variance		1.767.264	
Std. Deviation		42.039	
Minimum		1846	
Maximum		2017	
Range		171	
Interquartile Range		55	
Skewness		-.912	.350
Kurtosis		.043	.688

Table 4.12: Descriptive statistics of the founding year of the organisations
Source: Author

As the standard deviation is still high in years, it can be assumed that later founded organisations had - even at the time of their founding - access to local IS/IT. Figure 4.9 shows a heatmap of KM Level, NPO founding year and paper-based IS/KM which has no final tendency.

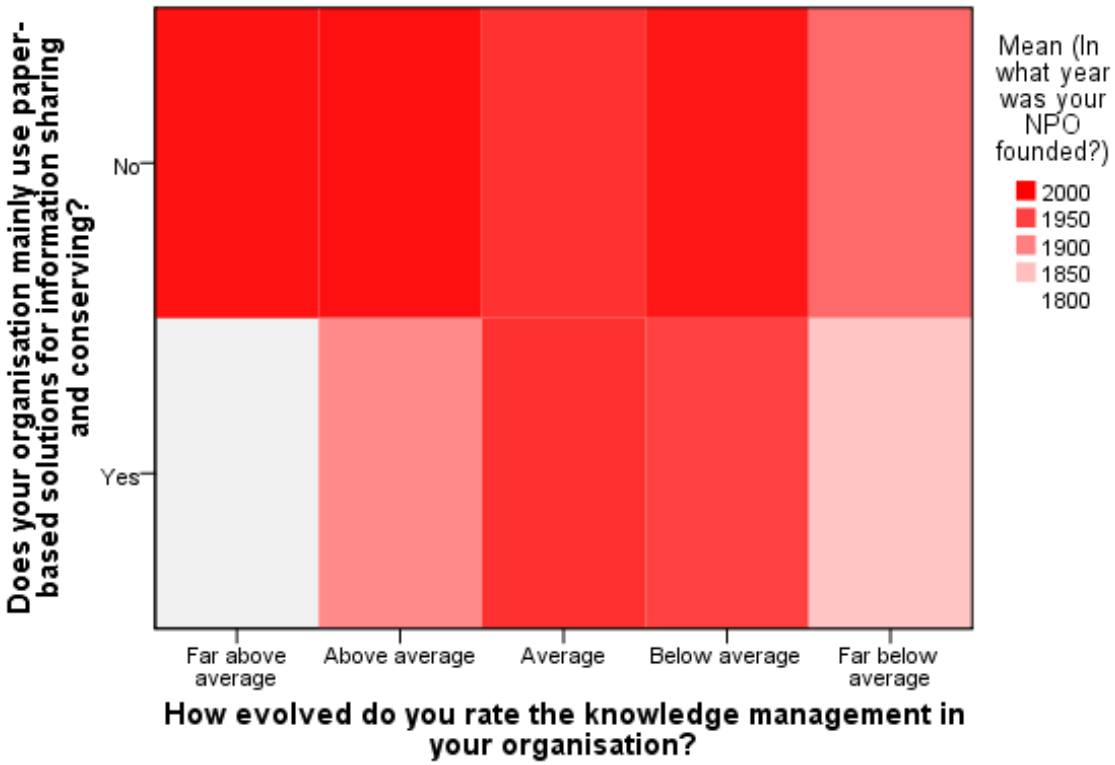


Figure 4.9: Heatmap of KM Level, NPO founding year and paper-based IS/KM
Source: Author

The executive members are from all age ranges, also there is a sharp drop at the age of 64 years, so the majority of the executive board members today are below 64 years of age, details see Figure 4.10: Average age of the executive members.

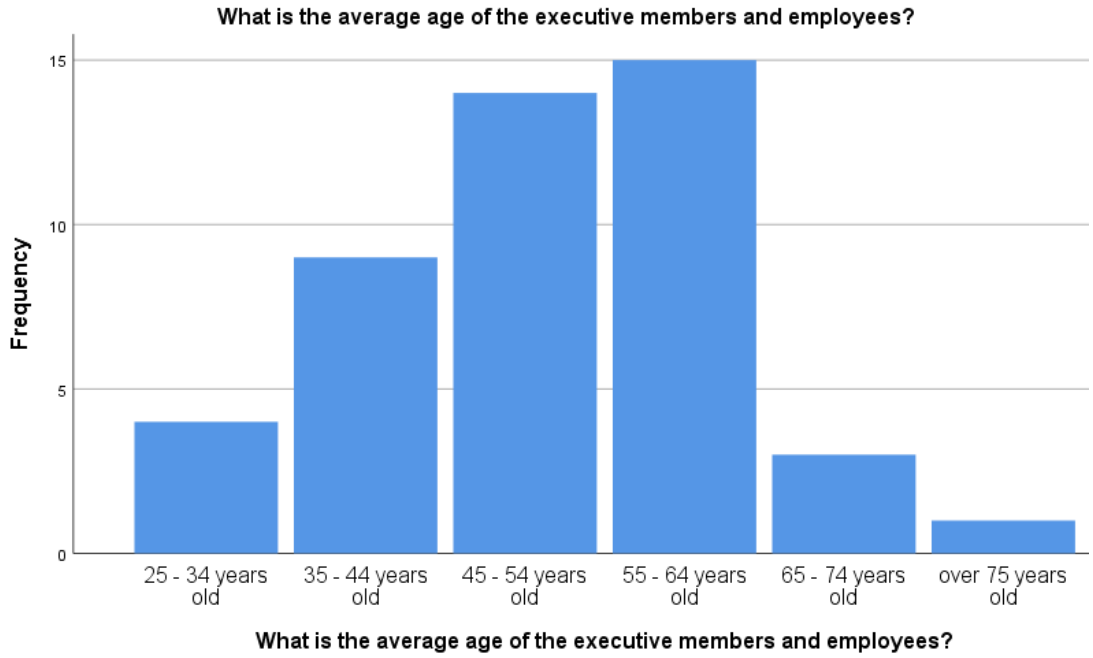


Figure 4.10: Average age of the executive members
Source: Author

Using Equation 1: Formula of the Central Limit Theorem again, with the 46 usable cases, 95% confidence level and 60% proportion does result in a confidence interval of 60% ± 14 %.

The survey was available for just over one month: 25th of February to 27th of March. Most feedback was received either when the invites were sent or when the reminder was sent after two weeks.

4.3. Qualitative Feedback

The author received a lot of feedback via email which was shared in the questionnaire invite outside the research questionnaire itself, and as comments in the questionnaire. Excerpts are in Appendix 8.7 – *A7 Qualitative Feedback*. Two ideas need to be highlighted.

A first comment was made about the KM approach of CKMPEF, with its origin from research in the FPO sector, does not concern passive members and assumes all people of the organisation are required to actively participate in the organisation's knowledge management. However, for NPOs, this is commonly not the case as, for example, members who have a donor role, do not pursue any active volunteering work and hence have no yearly working hours.

Secondly, feedback regarding question 13: "*What are your average hours for IT maintenance and setup per year?"* shows concern, about how to distinguish between the asked for *IT support hours* and *base working hours* of the NPO in Question 14 "*How many hours does the average member contribute to the organisation (including IT support)?". W*hen the main NPO's activities are IT based, in the example of this participant an internet streaming service, it was stated that there is no clear line what a volunteer is working on.

One case stated, that they take advantage of their IT training obtained in FPOs to handle SM-NPOs' IT management and to use their private hardware for the NPO work, while another case stated, they have no dedicated

hardware (computers) for the organisation and hence would need to rely on paper-based solutions to run their organisation, including knowledge management. If so, it must be assumed then, that all their knowledge management is paper-based with no plans to digitalise.

Another case stated that due to the lack of common IT knowledge in the executive team and perceived risk of data loss when moving to cloud, its usage was not planned for them in the near future.

4.4. Results: Analysis and Discussion

The findings of the data analysis suggest that the SM-NPOs are not behind as to technology adoption - like IT assimilation of the cloud IS - unlike Sawas and Watfa (2016) estimated. One could even say, maybe due to their small size, they are more agile and can adapt quickly to new technologies. Compared to the cloud usage in FPOs documented by Sawas and Watfa (2016), the reviewed SM-NPOs in this research have a high rate of IT/Cloud IS assimilation as shown in Table 4.5, with 42% per cent already using the cloud.

When investigating the motivational level of the organisation's people, it shows, that what was suggested by Theilengerdes (2012) is very true as *Figure 4.1: Motivational levels in the NPOs* suggests – the people in NPOs are very motivated about the work, possibly also because they can relate to the mission as detailed by Turan and Horowitz (2010) and others, see chapter 2.4.

Knowledge management in SM-NPOs with cloud adoption was higher compared to no cloud usage, see *Table 4.3: NPOs rating of the evolvement of their knowledge management*, so that one must assume the cloud adoption was a beneficial factor to the knowledge management process. This could be due to the easier ways of sharing data and communication, or due to the ambition of the SM-NPOs leadership views, to do knowledge management on IT see Johnson, Whittington, Scholes, Angwin and Regnér (2017) and chapter 2.3.

However, there is one minor cluster in the sample group that uses mainly paper-based knowledge management, which seems to be the most time efficient and sufficient for their needs and IT skills, as shared in the qualitative feedback, see chapter 4.3. Although, this further seems to be unrelated to cloud adoption, as a lot of the SM-NPOs use cloud services *in addition* to paper-based information systems, mixing both media for knowledge management, see Table 4.8, Table 4.9 and Table 4.10.

This may be due to a legacy process which has not been mapped into a *business process* in the new cloud or they may think they work faster on paper. Yet, most organisations use a mix of both media, see chapter 2.1 with Cummins (2015) summary about business processes and IS. Figure 4.9 shows no clear trend for IS which is contrasting Wright's, Roberts' and Wilson's (2017) statement, that more recent organisations have a higher cloud adoption rate.

The member size of an organisation and its income, see Figure 4.4, did not affect it is of knowledge management according to an ANOVA test for members and Kolmogorov-Smirnov test for income, suggesting the same level of knowledge management throughout bigger NPOs.

Although the SM-NPOs' knowledge management seems to benefit from cloud usage, the qualitative feedback, see chapter 4.3, still indicates some reservation on the members' side as to privacy and technical skills required to use cloud resources, but internet or service availability was not mentioned and may have a lower role for knowledge management which allows concluding that it is not always time critical.

What all NPOs have, see Figure 4.3, and a clear indication was set in chapter 2.4, is a social media or homepage presence, so that they can found and be presented publicly, but presumably also to have the option to share, socialise and discuss knowledge easier, as Alavi and Leidner (2001) suggested and Nisara, Prabhakar and Strakova (2019) demanded.

These presences of course help to maintain the motivation and enable the SM-NPOs to get their volunteer and donors engaged before, along and after

their mission fulfilling projects, maintaining the motivational levels which are so important for NPOs according to Theilengerdes (2012). The data from the sample cases confirmed this in this research again, especially when management did support open communication, see Table 4.4.

Failure to keep up information and positively influence stakeholders could ultimately lead to the termination of an NPO as stated by Epstein and McFarlan (2011). One reason why still many paper-based information is used (Dani, et al., 2006), could be that such information was historically recorded that way and is reused as is, maybe due to time-constrains, allowing some executive members to raise motivation, see Table 4.6 and Figure 4.9: Heatmap of KM Level, NPO founding year and paper-based IS/KM.

5. Chapter: Conclusions and recommendations

This Chapter will evaluate the results of the present research and show how they differ from or match the literature review and then draw conclusions relevant to these results. Based on this, recommendations for further research, the use of cloud and knowledge management in SM-NPOs will be made.

5.1. Conclusions

It must be concluded that more guidance should be given to SM-NPOs to establish their IS and KM in a cloud, as this would allow them to reduce costs and increase their level of knowledge management, as shown in this research. Although cost-saving is imperative for NPOs, they as a whole have no normal distribution of income between them, as Hume and Hume (2008) predicted and also this research shows again, see Figure 4.4, suggesting different needs of cost-saving among them.

Having an online presence is imperative for today's NPOs. Establishing KM on cloud IS should also be a key target for the surrounding political apparatus, like the country, the county or the city government because SM-NPOs support their local communities, where the state is not able to, which the state knows and therefore nowadays mostly grants them tax-exempt status. Through this process, the government could hand out advice to NPOs, sending them documents or internet links about cloud adoption possibilities, increasing the NPOs' potential. Where this advisory task is not picked up by governmental bodies, NPO umbrella organisations which

support IS for NPOs today, should share such information proactively, for example, via email or newsletters, advising and asking them to move to cloud IS, in case they work with information and knowledge management, which, as Drucker (1999) said, nearly any organisation does today.

One of the points that Sawas and Watfa (2016) explained, is that FPOs usually approach cloud adoption very cautiously, checking application compatibility and alike. This research, however, shows that NPOs seem less risk-averse and migrate to the cloud more easily, especially as SM-NPOs – of smaller size – are able to act faster, as Müller, Ludwig and Franczyk (2017) pointed out.

It can be assumed, that the new standard for IS definitely is cloud unless special privacy concerns or extreme online requirements exist. Therefore, quick adoption should be advocated as a great advantage for all NPOs, particularly where competing with FPOs. The only relevant service of the many "*Everything as a service*" for SM-NPOs seems to be the "*Software as a Service*" since this contains the software and some basic storage which makes usage possible right away (Wright, Roberts, & Wilson, 2017). That is the main reason, why NPOs should investigate the two prevalent options that are currently free of charge for them: *Microsoft Office 365* or *Google's G-Suite* (PRWeb Newswire, 2015).

The research further demonstrates that generally until the present day NPO members have received no training concerning IS/IT, except for FPO workplaces.
It can be concluded that training for NPO members could enable them to fully

leverage the benefits of cloud-based IS and KM instead of paper-based ones. Particularly because an increasing number of elderly people may campaign for NPO work, due to the demographic shift as predicted by Mathou (2010).

IS transformation should be initiated and supported by NPO leadership for the success and benefit to all affected groups. This will possibly require further efforts to transfer paper-based knowledge management, like how-tos and checklists, into the digital realms and remove paper-based processes and knowledge management methods which have been used for decades in older NPOs. This demands training and commitment from everybody involved, including the executive members, in line with the suggestion of Wright, Roberts and Wilson (2017).

The questionnaire feedback showed that the sample group of SM-NPOs continue to use paper-based KM together with cloud IS, see Table 4.10. But they should align tasks to be done on the cloud to avoid an unintended lock-in of knowledge in either system. As emphasised by Maravilhas and Martins (2019), NPO stakeholders ought to know one place to store and find their information.

The feedback to the questionnaire further showed that knowledge management in the first place means information shared. The online presence of many NPOs can have dedicated knowledge management systems like the one described by Heggli (2011), but Rathi and Given (2017) suggested any information system can - at its core - be used as a knowledge management system. The simple paper-based checklist and alike can just be

uploaded or re-created as a spreadsheet and the location could be shared via email to establish a first migration away from the paper-based solutions.

The answer to the research question *What is the impact on knowledge management when small to medium non-profit organisations move from local information systems to cloud or decentral information systems?* has to consider two main aspects.

On the one hand, standard knowledge management can greatly benefit from central storage with ubiquity usage via mobile devices. This enables easier creation and modification of knowledge and promises high consummation of knowledge, see Table 4.11, Figure 4.6 and Chapter 2.2 (Hirschheim & Klein, 2012). Not everyone, however, agreed that their knowledge management did improve. Although IS benefitted KM, see Figure 4.6, where this was not the case the factors for this were unclear, if this was due to poor transition, low IT maturity, lack of funds or the cloud IS simply did not fit the organisation's tasks could not be determined.

On the other hand, a large number of SM-NPOs has already moved information presences to the internet, the eponym of *cloud IS*, and has, in alignment to their requirements and needs, stepped into basic knowledge management for their stakeholders, see Figure 4.3. They now need to ensure to fully migrate over, even if this means using resources like volunteering time, in order to digitalise paper-based information. Otherwise, parts of knowledge might drift apart or get locked-in within either system, as emphasised by Maravilhas and Martins (2019).

A cloud alternative where privately owned computers are used for SM-NPO work, and where management has low trust in public cloud services, a decentral syncing, peer-to-peer based, system would make sense. Awareness of this option should be increased, combined with easier configuration it could lead to an increase in occurrences. Tools like *Syncthing* enable such contemporary peer-to-peer creation rather easily and securely (Mork, 2018) and could be recommended to SM-NPOs more openly.

An own could service, shared among local NPOs, as suggested by Hurley and Green (2005) would also be a possible solution in such a case.

With the key difference of FPOs and NPOs in their funding structures, where NPOs mostly rely on donation and volunteered time, NPOs have to ensure they communicate with their stakeholders regularly (Snell, Bell, & Leahy, 2013). A further conclusion of this research confirms that the cloud enables SM-NPOs stakeholders – like members – to take part in the management process, review knowledge management or business processes, which result in higher motivation and hence continued contributions (Theilengerdes, 2012). Nevertheless, it has to be taken into account that large donors and governmental support might have great influence on NPO governance, also on IS transformation. Cloud IS may make any such influence visible.

The dissemination of knowledge management via internet and cloud is one area of work for the NPOs' mission and is expected to become more and more important with the ubiquity of the internet and mobile devices enabled to access information from nearly everywhere (Holtzhausen, 2014).

But to keep an NPO **itself** alive, strategies and channels to share information efficiently, for example, what, when to whom in a group support system (Sun & Teng, 2012), can be stored as **NPO-internal** knowledge management. This is allowing NPOs to work most efficiently and not to risk elimination due to a lack of interest or visibility to volunteers and donors or even their own members, who are often their only income stream as set out by Hahn & Subramani (2000), see also chapter 2.3.

5.2. Recommended steps

This is a summary of the recommendations for the governmental institutions, NPOs and cloud service providers to ensure the transition to cloud is seamless from a KM perspective.

- NPOs should evaluate if a public cloud option can be used, depending on trust and online requirements.
- If a public cloud is not suitable, NPOs should find out how they can use decentral information and storage systems (DIS).
- NPOs should establish online presence via social media or a homepage, sharing information and knowledge with stakeholders if possible.
- Governmental institutions or NPO support organisations should guide SM-NPOs to start a cloud move where possible, enabling better sharing of knowledge and potential cost savings.
- NPOs are to provide IS training to all affected persons, which allows higher involvement and raises motivation.
- NPOs should ensure the knowledge transfer from local or paper-based IS to cloud or DIS is fully done.
- NPOs ought to be transparent to stakeholders if possible, share information to keep up positive interest and ensure involvement.
- Cloud providers shall share more information about how they secure data on their cloud IS to SM-NPOs as part of their discounts.

6. Scope for further Research, Limitations, Delimitations and Evaluation

6.1. Scope for further research

This research revealed the first view on KM and cloud usage in the European SM-NPOs and presented conclusions and concrete recommendations. However, as there are numerous opportunities for additional research, the author suggests the following:

Firstly, research with more resources, especially time, would be a good follow-up. The author experienced that non-profit organisations are very pressed for resources, and time is one of them, so a questionnaire offering a duration of at least two months is suggested.

Secondly, a research with different geographical focus would be suggested, with either focus on one country or even on a smaller population size like a city, which could lead to new or more specialized recommendations for organisations in these areas.

Thirdly, the scope of the organisational type could be altered, as the literature review did actually not yield a lot of academic theory about knowledge management in light of the changes from local IS to cloud. Consequently, FPOs and governmental organisations may as well be explored, with new recommendations as a result.

One point to highlight for any new research would be to make high efforts on research framework, especially if a questionnaire was chosen again. As this

research - despite the pilot questionnaire phase - could not capture the possibly unsuited questions from the CKMPEF framework, coming from an FPO environment, research in a governmental organisation would possibly face the similar challenges.

6.2. Limitation of the research

The research was limited in time, finances and resources, thus resulting in a sampling method with relatively small sample size.

Information gathered was based on published material, mainly peer-reviewed journals and academical books, which were available in a digital form. Applicable theories that were discussed only, for example, in offline-conferences could not be used.

It could not be ruled out that the feedback in the questionnaire was free of distortion or contamination from the respondent, although they had been asked to provide honest feedback and a validation question was used.

The findings of this research, in line with the research target population, are mainly applicable to western European countries but specialities within countries, for example, current or new laws concerning NPOs, could make these findings less relevant than from the sample size at the time of the research.

The research has captured the current development of KM and affordability of IS/cloud for NPOs. It is in the nature of science - and IS - to have new

developments, with new theories and concepts that are being publicised. Related to this point is a possible change in local hardware or cloud service provider's pricing models. Both could possibly skew the applicability of one or more findings, results or conclusions of this research at a later time.

6.3. Delimitation and assumption

The researcher is based in Germany and the sample population in Europe. NPOs of the main representative sectors were chosen like sport, culture and education. No product placement was intended, but Microsoft's *Office 365* and Google's *G-Suite* were mentioned to participants, with probably no IT/IS knowledge, to relate and identify the cloud concept or services. The questions were based on UTAUT2 for IT User experience (Macedo, 2017) and CKMPEF for Knowledge management (Chen & Fong, 2012), extended by a legitimate mix of the authors own questions, because no framework existed for the investigation of the relationship of the three areas NPO, KM and IS/cloud.

Although the target was to get objective feedback, the participants would reflect their subjective view, for example, when being asked, how sophisticated their level of knowledge management is, they will respond with their experience and expectation about this subject. It was assumed that the participants would answer honestly and in the best interest of this research as no incentive was introduced to do otherwise.

6.4. Evaluation

Even with the restraints given, the research achieves credible results based on new primary data and can offer concrete recommendations.

While completing this research the author had to pick up several topics.

In the first place, the dissertation process and possibly most other academic processes would have needed to follow the steps of completing the chapters in sequence. Normally the sequential process starts with an idea, puts it in an environment and only at that point creates a data analysis methodology. The author tried to do the latter first because he presumed the NPOs needed longer feedback time but there was no viable alternative to the sequential process as he had to find out. More time for the research, on the whole, permitting a sequential start, could have solved the problem.

The author had to read the literature and then pick out the relevant academic concepts without describing alternative theories. He presumed the reader has not much knowledge of the literature and the methodology in general, which led him to write too elaborately in the beginning.

For similar tasks, the author would follow the research process in sequence and would restructure and reword the questionnaire and leave out a few questions. The questions that asked for yearly averages would be changed to monthly or weekly, as this would make feedback for participants easier. In addition, the issues of application of FPO frameworks in NPO areas, *see chapter 4.3 Qualitative Feedback* , would require further adjustments to fully suit NPOs passive members.

The scope of the questionnaire could have been smaller, especially in terms of language, as only one feedback in French was filled in.

As time is valuable for NPOs, their feedback was scarce. Therefore, NPOs should have more time for the questionnaire.

7. References

This chapter will include details of all references from the literature review and other chapters.

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8. Appendix

The appendices contain complementary information to the research, which was not important enough to be included in the main part of the document but still holds value in the perspective of the author.

8.1. A1 Questionnaire

Currently online at **https://www.surveymonkey.de/r/H6DQQT6 and may vary from below due to evolvement until shared.**

The following questionnaire will be used for collecting data to answer the research question:

Question	Relates to Area	Type	Answer range	Relates to Method / literature review author(s).	Selection options	Numerical or categorical?	Interval or ratio	continuous or discrete	Literature Review - "Why" excerpt:
What is your organisation 's main Country?	NPO	Closed	Any: Free text/number	Theilengerdes, 2012	European Countries	Categorical	-	-	Germany has an increased Engagement in NPO.
In what year was your NPO founded?	NPO	Open	Any: Free text/number	Wright, Roberts, & Wilson, 2017		Numerical	interval	continuous	Recent NPOs are quicker with Cloud adoption.
What is the main sector of your organisation?	NPO	Closed	Selection: Pre-defined Ranges/Categories	Blankenburg, 2018	Relief of poverty Advancement of science or religion Advancement of education Beneficial to the community Beneficial to nature	Categorical	-	-	Sports sector is the largest one; must be in a predefined sector in Germany
What is your organisation's average yearly income in Euro?	NPO	Open	Any: Free text/number	Blankenburg, 2018		Numerical	interval	continuous	see below
What is your organisation's average yearly benefit for the cause (income minus running costs) in Euro?	NPO	Open	Any: Free text/number	Blankenburg, 2018		Numerical	interval	continuous	The NPO uses little money for itself (like wages), most of it is spent on the cause.

How many members and/or regular donors do you have (without employees)?	NPO	Closed	Selection: Pre-defined Ranges/Categories	Research SME - Takahashi, et al., 2015	Less than five 5-19 20-49 50-99 100-199 200-399 400-599 600-999 Over 1000	Numerical	interval	discrete	Small NPOs are below 400 Members
How many executive members and employees do you have?	NPO	Closed	Selection: Pre-defined Ranges/Categories	Research SME - Takahashi, et al., 2015	Less than three Three to six seven to ten 11-20 20-50 50-100 Over 100	Numerical	interval	discrete	Small NPOs are below 20 executive members
What is the average age of the executive members and employees?	NPO	Closed	Selection: Pre-defined Ranges/Categories	Macedo, 2017	18-24 years old 25-34 years old 35-44 years old 45-54 years old 55-64 years old 65-74 years old over 75 years old	Numerical	interval	discrete	Age can drive adoption speed (cloud)
Is there anything else you want to mention about your non-profit organisation (optional)?	NPO	Open	Any: Free text/number	Questionnaire design - Holbrook, A., 2017		Qualitative	-	-	-
Does your organisation mainly use paper-based solutions for information sharing and conserving?	IS	Closed	Dichotomous like: yes/no	Eisenstein & Bouwsma, 1979	Yes No	Ordinal	ratio	discrete	Information was stored on paper (book)
Does your organisation have an up to date homepage or social media presence?	IS	Closed	Dichotomous like: yes/no	Raman, 2016	Yes No	Numerical	ratio	discrete	Social Media is beneficial for NPOs.
Does your organisation use local PCs/IT solutions for information sharing and conserving?	IS	Closed	Dichotomous like: yes/no	Sun & Teng, 2012	Yes No	Numerical	ratio	discrete	Organisations need IT to share information

What are your average hours for IT maintenance and setup per year?	DIS/cloud	Open	Any: Free text/number	Wright, Roberts, & Wilson, 2017		Numerical	interval	continuous	NPOs have little time to support IT, cloud could save time.
How many hours does the average member contribute to the organisation per year (including IT support)?	IS+DIS/cloud	Open	Any: Free text/number	Wright, Roberts, & Wilson, 2017; Sather, 2018		Numerical	interval	continuous	NPOs have little time to support IT, cloud could save time; SM-NPOs have time constraints.
What is your organisation's IT budget per year in Euro?	IS	Open	Any: Free text/number	Sather, 2018		Numerical	interval	continuous	SM-NPOs have cost constraints.
Does your organisation have dedicated IT Hardware?	IS+DIS/cloud	Closed	Dichotomous like: yes/no	Sather, 2018	Yes No	Numerical	ratio	discrete	Invest in local hardware hinders cloud migration
Is your organisation aware of discounted cloud-based IT solutions for NPOs like Office 365 or G-Suite?	IS+DIS/cloud	Closed	Selection: Pre-defined Ranges/Categories	Sather, 2018	Yes No	Numerical	ratio	discrete	Invest in local hardware hinders cloud migration
Does your IT department keep up-to-date with technological developments that could affect your organisation?	KM	Closed	Scale: Likert Scale 1-5	CKMPEF (Macedo, 2017); Sawas & Watfa, 2016	1 2 3 4 5	Numerical	interval	discrete	Organisation uses the invested local hardware - does the IT look into other options?
Are executive members and employees committed to managing organisational knowledge?	KM	Closed	Scale: Likert Scale 1-5	CKMPEF (Macedo, 2017)	1 2 3 4 5	Numerical	interval	discrete	Does Leadership support KM?
Do the organisation's executives encourage open communication?	KM	Closed	Scale: Likert Scale 1-5	CKMPEF (Macedo, 2017)	1 2 3 4 5	Numerical	interval	discrete	Does Leadership encourage employees to take part in KM?

Do executive members and employees' have the freedom to make decisions and take actions to generate useful information?	KM	Closed	Scale: Likert Scale 1-5	CKMPEF (Macedo, 2017)	1 2 3 4 5	Numerical	interval	discrete	Do executive members and employees have time to work on KM?
Does your organisation apply knowledge learned from mistakes?	KM	Closed	Scale: Likert Scale 1-5	CKMPEF (Macedo, 2017)	1 2 3 4 5	Numerical	interval	discrete	*Stickiness* is used to describe how good stored knowledge can be applied (Szulanski, 1996)
How strongly are the employees motivated to act in the best interest of the organisation?	KM	Closed	Scale: Likert Scale 1-5	CKMPEF (Macedo, 2017); Reinholt & Pedersen, 2011 Theilengerdes, 2012	1 2 3 4 5	Numerical	interval	discrete	1.) Motivational theory - Employees/volunteers work because they are motivated, high motivation can be created via good information sharing. 2.) KM can increase Motivation, motivation increases KM usage.
Does your organisation circulate written documents to share knowledge, for example, best practice recommendations?	KM	Closed	Dichotomous like: yes/no	CKMPEF (Macedo, 2017)	Yes No	Numerical	ratio	discrete	Is a KMS-like practice established?
How evolved do you rate the knowledge management in your organisation?	KM	Closed	Scale: Likert Scale 1-5	North & Kumta, 2014; From the Research Question	1 2 3 4 5	Ordinal	interval	discrete	Smaller organisations don't plan for knowledge management
Do executive members support IT development?	KM	Closed	Scale: Likert Scale 1-5	CKMPEF (Macedo, 2017)	1 2 3 4 5	Numerical	interval	discrete	Does the current leadership support KM?
Are executive members and employees trained to use IT?	KM	Closed	Scale: Likert Scale 1-5	CKMPEF (Macedo, 2017);	1 2 3	Numerical	interval	discrete	KM is usually done on IT bases (explicit as well as tacit)

				North & Kumta, 2014	4 5				
Is there anything else you want to mention about knowledge management (optional)?	KM	Open	Any: Free text/number	Questionnaire design - Holbrook, A., 2017		Qualitative	-	-	-
Do the organisation's executives and employees interact effortlessly with computers and the Internet?	DIS/cloud	Closed	Scale: Likert Scale 1-5	UTAUT2 (Venkatesh, et al., 2012) Yong, et al., 2018	1 2 3 4 5	Numerical	interval	discrete	Internet as a basis of DIS/Cloud IS
Using computers or the internet helps organisation's executive members and employees to accomplish things quicker?	DIS/cloud	Closed	Scale: Likert Scale 1-5	UTAUT2 (Venkatesh, et al., 2012) Wright, Roberts, & Wilson, 2017	1 2 3 4 5	Numerical	interval	discrete	DIS/Cloud does save time
Do the organisation's executive members and employees plan to continue to use computers and the internet frequently?	DIS/cloud	Closed	Scale: Likert Scale 1-5	UTAUT2 (Venkatesh, et al., 2012) Yong, et al., 2018	1 2 3 4 5	Numerical	interval	discrete	Internet and computer usage a basis of DIS/Cloud IS
Have you read these questions correctly, then please select four?	DIS/cloud	Closed	Scale: Likert Scale 1-5	Questionnaire design - Holbrook, A., 2017	1 2 3 4 5	Numerical	interval	discrete	-
Does your organisation use cloud-based solutions for information sharing and conserving?	DIS/cloud	Closed	Dichotomous like: yes/no	Research SME - Takahashi, et al., 2015	Yes No	Numerical	ratio	discrete	Questionnaire standards according to Holbrook
If you work primarily with a cloud-based	DIS/cloud	Closed	Scale: Likert Scale 1-5	Sarnikar & Deokar, 2017;	1 2 3	Ordinal	interval	discrete	Business process are aligned to IT/Cloud

solution: Did your use of knowledge management increase since the IT move to the cloud?				From the Research Question	4 5				
Is there anything else you want to mention about your organisation's cloud / decentralized information system usage (optional)?	DIS/cloud	Open	Any: Free text/number	Questionnaire design - Holbrook, A., 2017		Qualitative	-	-	-

8.2. A2 Funding

This research did not receive any special grants from any organisations in the public, commercial, or not-for-profit sector.

8.3. A3 History of NPOs

The history of the NPOs probably started at the stage when people had some free time, apart from work for profit or family, to work for civic good, example given, for hungry, poor or disabled people. At first privileged people could afford to do so, like Saint Elizabeth of Thuringia in 1207 A.D.. With the industrial revolution and efficient production, more people could allow themselves to allocate some time for doing good (Smith & MacGill, 2014).

At the end of the 18th century, cities assigned people to watch after rules in their districts, to look after the homeless and ensure cleanliness. Even these organisations thrived, they were forbidden or swallowed by the national regime from 1933 onwards. (Theilengerdes, 2012).

As Stephen P. Osborne (The voluntary and non-profit sector in Japan: the challenge of a change, 2003) showed, the NPOs in Japan also originated from state organisations in the 17th Century. People in residents' councils, so-called 'jichikai', shared responsibilities to take care of the communities' daily life and collect taxes from up to five households, so-called 'gonin-gumi'. In the Meiji Restoration in the 19th century, these residential councils played a complementary role in fulfilling and complementing the local authorities. After Japan's occupation from 1945 onwards, the foreign forces abolished the system as they felt it might hinder the democratisation process (Osborne, 2003).

After the Second World war, in 1948 Germany passed a law that allowed to found associations again in Germany (Theilengerdes, 2012).

In Japan, community organisations did spring back into life and organized support throughout the community. As they were no longer tied to the state, they became stand-alone complexes and were accepted by the current governmental apparatus. In the 1960s and 1970s people in Japan did not have time anymore to participate as much in NPOs as their time would be consumed by commuting or change lifestyles. Today Japan's NPOs are covered under the "Non-profit Organization (NPO) law" ratified in 1998 (Osborne, 2003).

Theilengerdes (2012) states that in Germany too, due to war impact, increased emancipation and a huge amount of work on the "Wirtschaftswunder" from both genders, only a little time could be invested in the new NPOs in the reconstruction years after the war, leading to little growth of NPOs. Starting in 1980, new laws allowed the social sector to grow again, as social efforts were seen and patronised from the state (Theilengerdes, 2012).

8.4. A4 Taught Ethics Application

This Table is the relevant excerpt of the application for ethics approval for this dissertation.

SECTION I: CHECKLIST (select as appropriate)	
Does the project/dissertation involve work with human tissue/body fluids?	No
SECTION II: Risk of Harm and Related Issues (select as appropriate)	
Is there any realistic risk of any participants experiencing either physical or psychological distress or discomfort?	No
Are drugs, placebos or other substances (e.g. food substances, vitamins) to be administered to study participants?	No
Is there any possible psychological risk to the researcher? (NB: Physical risks to the researcher are considered in the Risk Assessment, not in this form)	No
Will participants undergo sound exposure beyond the Lower Action Level of the Physical Agents Directive?	No
Does the project require the use of hazardous substances?	No
Is the use of radiation (if applicable) over and above what would normally be expected (for example) in diagnostic imaging?	No
SECTION III: Vulnerable Groups and Financial Inducements (Select as appropriate)	
Will financial inducements (other than reasonable expenses and compensation for the time) be offered to participants?	Yes
Will participants fall into any of the following special groups?	
Children (Under 18 years of age);	No
People with learning difficulties or communication difficulties;	No
People whose first language is not English;	Yes
Patients or clinical populations and/or their carers;	No
Pregnant women or research on conception or contraception;	No
People in custody or any form of detention;	No
People engaged in illegal activities (e.g. drug-taking).	No
SECTION IV: OTHER (Select as appropriate)	
Are there any other potential significant ethical issues not covered above? If YES, please give details.	No

Table 8.1: Filled out taught ethics application form for this research

PART A – Application Form for Ethics Approval for Taught Programmes

For completion by the student

To be completed by the student and signed off by the supervisor to confirm that they have seen the proposal and are in agreement that it is sound but requires ethics approval. This form concentrates on the reason for the project and the methodology to be used, with

Full Programme Title:	MSc in Information Systems Management	**Award** MSc
Title of Research Project:	Research the effects of decentralised information systems for knowledge management in local non-profit organisations	
Has this project received external funding?	NO If **YES**, please provide the name of Research Council or other funding organisation: Click here to enter text.	
Do you use non-human genetic materials from the outside UK for your research?	NO If **YES**, has this been collected since the 12th of October 2014? NO	
1. Project Aims and Objectives		

Aim (What)

The research will focus on SM-NPOs, because while it is thought that DIS are ubiquitous, SM-NPOs still use local IS, even non-IT ones, in comparison to larger NPOs or FPOs (Dourish & Bell, 2011).

It will be analysed, how a move from IS to DIS impacts the KM within SM-NPOs.

Objectives (How)

Data gathered would be about resources, like time and finance, the complexity of the information system (IS), number of members, executive committee and current KM.

These factors for a DIS could also allow seeing what restricts or hinders NPOs from using DIS in comparison of small to mid-sized profit-oriented enterprises (SME).

2. Research Methodology

Main source for contact details will be the register of associations and finding out if they have a web presence and email, to send them an informed consent form and a customized link to the questionnaire to gather information about there is usage and their non-numeric indication of use of a decentralized information systems and Knowledge Management situation in their non-profit organisation.

3. Organisational Agreement (if applicable):

Not Applicable

4. Approaching individuals (if applicable):

Not Applicable

5. How will you ensure 'informed consent' is gained from anyone involved in the research?

Informing participants about giving their consent when filling out the questionnaire and the option to fill out a consent form at https://bit.ly/2Rodo3I.

The following is displayed on the first page of the questionnaire:

> *By submitting this survey, you consent that the give data can be used.*
>
> *The full consent form can be found at https://bit.ly/2Rodo3I, where you can e.g. withdraw your data at any time without the need to mention any specific reasons.*

6. How will you approach the General Data Protection Regulations during your research?

GDPR regulations will be applied to all data stored on a personal computer and hosting servers with existing compliance agreements in place.

7. Does this project require that the researcher applies for a Disclosure Barring Service (DBS) check?

No

If YES, please cite the code and either include it as an appendix to this application or provide details below about where it can be consulted electronically.

Click here to enter text.

8. What other ethical issues should you consider when conducting this research and how will potential ethical risk/harm be avoided?

No other concerns could be found

9. Does the project involve human subjects (e.g. volunteers to take part in interviews/questionnaires) and/or animals and/or human tissue and/or animal tissue?

Yes

If YES, please give details:

Human subjects as part of the non-profit organisations are asked to fill out the questionnaire; This does not include any involvement of any kind of tissue.

8.5. A5 Research Participant Consent Form

Title of Project: Research of the knowledge management impact when local non-profit organisations move their information systems to the cloud

Name of Researcher: Frederik Unser
Name of Supervisor: Richard Adlam

I confirm that I have read and understood the information sheet for the above study and what my contribution will be. □ **Yes** □ **No**

I have been given the opportunity to ask questions via E-mail. □ **Yes** □ **No**

I agree to take part in the interview □ **Yes** □ **No** □ **N/A**

I understand that my participation is voluntary and that I can withdraw from the research at any time without giving any reason □ **Yes** □ **No**

I agree to take part in the above study □ **Yes** □ **No**

Name of participant:
Signature:
Date:
Name of the researcher: Frederik Unser
Researcher's e-mail: research@frederik-unser.com

8.6. A6 Cover letter for participants (English Version)

From:
research@frederik-unser.com
Subject:
Aid the research for your local non-profit organizations!
Email Body Content:
Hello,

I am Frederik and I work in society for the primary school in Groß-Gerau, Germany.
Today I get in touch with you as I conduct research for charitable associations and societies as part of my studies.
I want to explore how small to medium-sized organization create, store and share their knowledge today, especially when the local IT is replaced for Cloud IT. However, no expertise is required from your side. Your participation is voluntary and anonymous.

As a small thank you, you can participate in a Tombola.
The winner is determined at random, and your non-profit organization can win 50 pounds for their club treasury.

Click the link below to start the survey. Thank you for your participation!
[personalized] [SurveyLink]

Start the Questionnaire in another Language:
English: https://www.surveymonkey.de/r/a
French: https://www.surveymonkey.de/r/b
German: https://www.surveymonkey.de/r/c

Thank you for your participation in the survey, I appreciate your valuable feedback.
The survey may be shared with other associations, but only filled out once per association.
The survey will be open until at least March 16th.

Privacy:
[PrivacyLink]

Unsubscribe:
[OptOutLink]

[FooterLink]

8.7. A7 Qualitative Feedback

Feedback received via Email and noteworthy

Respondent ID	Text German	Text English
10566745516	Es gibt Mitglieder in unserem Verein die keinen Computer haben, dadurch sind Informationen in papierform erforderlich.	There are members in our club who do not have a computer, so the information in the paper form is required.
10567011129	1) Die Führungskräfte arbeiten alle ehrenamtlich, IT-Wissen ziehen sie aus der jeweiligen Berufstätigkeit. Für die Kommunikation wird private Hardware genutzt. 2) Aufgrund des sehr unterschiedlichen Wissensstandes einzelner Vorstandsmitglieder wird eine Cloud-basierte Kommunikation derzeit überwiegend aus Datenschutzgründen skeptisch betrachtet.	1) The executives all work on an honorary basis, IT-knowledge pulls them from the respective occupation. For the communication private hardware is used. 2) Due to the very different level of knowledge of individual board members, cloud-based communication is currently viewed sceptically for privacy reasons.
10557143974	[...] IT Aufwand pro Jahr: Ich halte diese Frage weiterhin für zu schwammig für eine Ableitung fundierter Erkenntnisse. Aus Sicht der Geschäftsführung wird der obige Arbeitsaufwand dem Jahreszeitbudget der dafür abgestellten Mitarbeiter entsprechen. Aus Sicht des Administrators wird einmaliger Einrichtungs-aufwand, Pflege / Aktualisierung, Monitoring und Backup einfließen. Aus Sicht des First-Level-Supports (im Kontext des Radios, für das ich antworte wäre dies die Orga-Gruppe, die die Radio-Aktiven betreut) wird die Zeit durch den Kommunikationsaufwand in beide Richtungen dominiert. Bei der aktuellen Fragestellung vermute ich eine Unschärfe des Faktors 10 unter identischen Bedingungen. Aber vielleicht genügt dies ja für die angestrebte Klassifizierung.	[...] IT effort per year: I still think that question is too vague for a derivation Findings. From the perspective of the management, the above work is the Season budget corresponds to the staff assigned to it. From the administrator's point of view, one-time set-up, Maintain / update, monitor and backup. From the point of view of first-level support (in the context of the radio I answer for. If this is the organization group that oversees the radio assets, time will pass the communication effort in both directions dominates. In the current issue, I suspect a blur of factor 10 below identical conditions. But perhaps this is enough for the desired

	(eine Klassifikationsfrage wäre dann vielleicht passender gewesen) [...] Zeit pro Mitglied: Der Rückschluss mag einheitlich, aber nicht aussagekräftig sein. Beispielsweise gibt es die beiden folgenden üblichen Struktur-Modelle für freie Radios: A) ein gemeinnütziger Trägerverein B) ein gemeinnütziger Förderverein Ersterer hat nur eine Handvoll Mitglieder. Letzterer idealerweise hunderte oder tausende. Beide leisten dasselbe IT-Volumen für den Betrieb eines Radio-Senders und sind in der Organisations-struktur nicht voneinander zu unterscheiden. Der durchschnittliche Zeitaufwand pro Mitglied dürfte sich aber um den Faktor 100 unterscheiden. Dieses Spektrum zwischen aktiver und fördernder Mitgliedschaft dürfte sich in vielen Vereinsstrukturen widerspiegeln. Dieser Umstand lässt sich aus der obigen Frage aber nicht ableiten. [...]	Classification. (a classification question might have been more appropriate then) [...] Time per member: The inference may be consistent, but not meaningful. For example, there are the following two common structural models for free Radios: A) a non-profit association B) a non-profit promotion association The former has only a handful of members. The latter ideally hundreds or thousands. Both provide the same IT volume for the operation of a radio station and are indistinguishable in the organizational structure. The average time per member is likely to be around a factor of 100. This spectrum between active and supporting member is expected to be in reflect many club structures. This circumstance can be deduced from the but do not deduce the above question. [...]
10568774456	-	I have tried, but your wording and assumptions that you make in questions make it impossible to answer your survey, so I am afraid I can’t help.

8.8. A8 Quantitative Feedback

This is the relevant data which was used to calculate the statistics in chapter 4. For the full text of the questions see appendix chapter *8.1 A1 Questionnaire*.

RespondentID	q0001	q0002	q0004	q0005	q0006	q0007	q0008
10555138227	Germany	2003	1000	0	20 - 49	Three to six	25 - 34 years old
10557143974	Germany	2005	250000	0	400 - 599	seven to ten	35 - 44 years old
10555490959	Germany	1996	4200	1500	20 - 49	seven to ten	25 - 34 years old
10567011129	Germany	1909	60000	1500	20 - 49	seven to ten	55 - 64 years old
10566645566	Germany	2002	20000	1000	Less than five	Three to six	55 - 64 years old
10566685298	United Kingdom	1919	800	0	100 - 199	Less than three	65 - 74 years old
10567247441	Germany	1985	22000	2000	100 - 199	Three to six	45 - 54 years old
10566727165	Germany	1980	10000	0	20 - 49	Three to six	35 - 44 years old
10566741297	Germany	1945	50000	10000	400 - 599	9 -20	55 - 64 years old
10566745516	Germany	1951	25000	8000	100 - 199	Three to six	45 - 54 years old
10566777734	Germany	1909	1200	500	100 - 199	Three to six	45 - 54 years old
10568229467	Germany	1990	20000	15000	20 - 49	Three to six	45 - 54 years old
10568763452	Germany	1946	0	0	600 - 999	Three to six	55 - 64 years old
10568774456	United Kingdom	2016	50000	30000	Less than five	Three to six	25 - 34 years old
10567918982	Germany	1991	50000	200	50 - 99	Three to six	45 - 54 years old
10568103231	Germany	1923	15000	1000	Less than five	Three to six	45 - 54 years old
10568172061	Germany	1947	28000	3500	50 - 99	Three to six	45 - 54 years old
10571428475	Germany	1949	0	0	Over 1000	Three to six	45 - 54 years old
10570719624	Germany	1999	125000	5000	20 - 49	Three to six	35 - 44 years old
10573954941	Germany	1918	0	0	600 - 999	Three to six	55 - 64 years old
10577760981	Germany	1989	40000	39000	20 - 49	seven to ten	55 - 64 years old
10576209280	Germany	1987	15000	14000	100 - 199	Three to six	65 - 74 years old
10581315683	Germany	1888	20000	5000	5 - 19	Three to six	45 - 54 years old
10593001334	United Kingdom	1996	471000	390559	20 - 49	9 -20	35 - 44 years old
10592065437	United Kingdom	1944	260000	200000	Over 1000	Three to six	55 - 64 years old
10597563676	Germany	1999	1500	0	50 - 99	Three to six	35 - 44 years old
10600323326	Germany	1994	5000	4900	200 - 399	Three to six	45 - 54 years old
10599062436	Germany	1950	3000	200	Less than five	seven to ten	35 - 44 years old
10599101745	Germany	1894	0	0	20 - 49	Three to six	35 - 44 years old
10600606794	Germany	2003	15000	12000	50 - 99	Three to six	55 - 64 years old
10599231279	Germany	1896	340000	30000	Over 1000	seven to ten	65 - 74 years old
10599321054	Germany	1892	0	0	Over 1000	Three to six	55 - 64 years old
10599331746	Germany	1992	370000	0	400 - 599	Less than three	55 - 64 years old
10599407644	Germany	2005	1000	0	5 - 19	Three to six	55 - 64 years old
10599479728	Germany	2011	20000	5000	100 - 199	Three to six	45 - 54 years old
10601837568	Germany	1972	1700	1600	20 - 49	Less than three	55 - 64 years old
10606976543	Germany	1969	25000	500	600 - 999	Three to six	45 - 54 years old
10607195507	Germany	1982	10000	1000	100 - 199	seven to ten	45 - 54 years old
10614785870	Germany	1983	1200	0	5 – 19	Three to six	55 - 64 years old
10616526565	Germany	1955	250000	200000	200 - 399	Three to six	45 - 54 years old
10616042836	Germany	1846	400000	0	Over 1000	Three to six	over 75 years old
10616119449	Germany	2010	30000	25000	Over 1000	9 -20	55 - 64 years old
10616180999	Germany	2017	10000	200	20 - 49	Three to six	35 - 44 years old
10615461035	France	2001	200000	1000	20 - 49	Three to six	25 - 34 years old
10619317171	Germany	2009	20000	12000	50 - 99	Less than three	55 - 64 years old
10623391669	Germany	1957	0	0	600 - 999	Three to six	35 - 44 years old

q0010	q0011	q0012	q0013	q0014	q0015	q0016	q0017
No	Yes	No	100	1	100	Yes	No
No	Yes	Yes	80	2	4000	Yes	Yes, both
No	Yes	No	20	50	100	No	Yes, both
Yes	Yes	Yes	0	60	300	No	Yes, both
No	Yes	Yes	2	1	100	No	No
No	Yes	Yes	300	200	32000	No	Yes, for Microsoft Office 365
No	Yes	Yes	10	0,5	350	Yes	No
Yes	Yes	Yes	3	0,5	0	No	Yes, for Google G-Suite
No	Yes	No	300	250	0	No	No
Yes	Yes	No	0	4	0	No	No
No	Yes	Yes	20	20	0	No	No
No	Yes	Yes	10	10	50	No	No
No	Yes	Yes	80	120	500	No	No
No	Yes	Yes	300	180	40000	No	Yes, for Microsoft Office 365
No	Yes	Yes	10	0	0	No	No
Yes	No	Yes	50	60	30	No	No
Yes	Yes	Yes	12	0	250	No	No
No	Yes	Yes	0	0	0	No	No
No	Yes	Yes	300	2	6000	Yes	Yes, both
No	Yes	Yes	20	0	200	No	Yes, for Microsoft Office 365
No	Yes	Yes	10	1	0	No	No
Yes	Yes	Yes	1500	600	500	Yes	Yes, both
No	Yes	Yes	2	12	130	No	No
No	Yes	Yes	40	10	0	No	No
No	Yes	Yes	10000	4200	1500000	Yes	Yes, both
No	Yes	No	175	350	50	Yes	Yes, both
No	Yes	No	12	3	200	Yes	No
Yes	No	Yes	1	30	0	No	No
No	Yes	Yes	10	600	0	Yes	Yes, for Microsoft Office 365
No	Yes	Yes	100	27	500	Yes	Yes, for Microsoft Office 365
No	No	Yes	20	0	500	Yes	Yes, both
Yes	Yes	Yes	5	0	0	Yes	Yes, for Microsoft Office 365
No	Yes	Yes	60	0	0	Yes	No
No	Yes	Yes	24	20	80	No	No
Yes	Yes	Yes	12	1	500	No	No
No	No	Yes	6	2	200	No	No
No	Yes	Yes	150	0	1000	Yes	Yes, both
No	Yes	Yes	20	0	0	Yes	Yes, both
No	Yes	Yes	60	80	0	No	No
No	Yes	Yes	250	15	0	No	No
Yes	Yes	Yes	300	0	0	No	No
No	Yes	Yes	150	600	2000	No	No
No	Yes	No	300	500	0	Yes	Yes, for Microsoft Office 365
No	Yes	Yes	0	180	5000	Yes	Yes, both
No	Yes	Yes	150	36	200	No	No
No	Yes	Yes	10	50	100	No	Yes, for Google G-Suite

q0018	q0019	q0020	q0021	q0022
Neither agree nor disagree	Agree	Strongly agree	A great deal	Always
Strongly agree	Agree	Strongly agree	A great deal	Always
Strongly agree	Strongly agree	Strongly agree	A moderate amount	Sometimes
Neither agree nor disagree	Agree	Neither agree nor disagree	A lot	Usually
Neither agree nor disagree	Neither agree nor disagree	Agree	A great deal	Sometimes
Neither agree nor disagree	Neither agree nor disagree	Agree	A lot	Usually
Strongly agree	Strongly agree	Strongly agree	A lot	Usually
Neither agree nor disagree	Neither agree nor disagree	Neither agree nor disagree	A moderate amount	Usually
Neither agree nor disagree	Neither agree nor disagree	Agree	A lot	Sometimes
Disagree	Neither agree nor disagree	Neither agree nor disagree	A lot	Usually
Strongly agree	Strongly agree	Strongly agree	A great deal	Always
Neither agree nor disagree	Neither agree nor disagree	Strongly agree	A great deal	Usually
Agree	Neither agree nor disagree	Disagree	A moderate amount	Sometimes
Neither agree nor disagree	Neither agree nor disagree	Agree	A lot	Usually
Disagree	Neither agree nor disagree	Strongly agree	A great deal	Always
Neither agree nor disagree	Neither agree nor disagree	Neither agree nor disagree	A little	Rarely
Neither agree nor disagree	Neither agree nor disagree	Agree	A lot	Usually
Agree	Agree	Agree	A lot	Usually
Neither agree nor disagree	Disagree	Disagree	A great deal	Sometimes
Strongly disagree	Strongly disagree	Neither agree nor disagree	A lot	Rarely
Neither agree nor disagree	Neither agree nor disagree	Agree	A lot	Usually
Neither agree nor disagree	Neither agree nor disagree	Strongly agree	A great deal	Always
Neither agree nor disagree	Neither agree nor disagree	Agree	A lot	Usually
Agree	Agree	Agree	A moderate amount	Always
Agree	Strongly agree	Agree	A lot	Usually
Agree	Agree	Strongly agree	A great deal	Usually
Neither agree nor disagree	Disagree	Disagree	A moderate amount	Sometimes
Strongly disagree	Strongly disagree	Neither agree nor disagree	A great deal	Sometimes
Agree	Agree	Neither agree nor disagree	A moderate amount	Usually
Strongly agree	Neither agree nor disagree	Strongly agree	A little	Usually
Neither agree nor disagree	Agree	Agree	A moderate amount	Usually
Agree	Agree	Agree	A lot	Usually
Neither agree nor disagree	Strongly agree	Strongly agree	A great deal	Always
Neither agree nor disagree	Agree	Agree	A lot	Usually
Strongly disagree	Strongly disagree	Strongly disagree	None at all	Never
Strongly disagree	Disagree	Strongly disagree	A moderate amount	Usually
Strongly agree	Agree	Strongly agree	A great deal	Always
Strongly agree	Neither agree nor disagree	Agree	A little	Sometimes
Strongly disagree	Neither agree nor disagree	Neither agree nor disagree	A great deal	Sometimes
Neither agree nor disagree	Agree	Agree	A moderate amount	Always
Strongly disagree	Strongly disagree	Strongly disagree	A little	Never
Strongly agree	Strongly agree	Strongly agree	A great deal	Always
Strongly agree	Strongly agree	Strongly agree	A great deal	Usually
Strongly disagree	Strongly agree	Strongly agree	A great deal	Always
Strongly disagree	Neither agree nor disagree	Agree	A moderate amount	Always
Agree	Agree	Agree	A moderate amount	Usually

q0023	q0024	q0025	q0026	q0027	q0029
Agree	No	Average	A lot	Average	Far above average
Strongly agree	Yes	Above average	A lot	Above average	Above average
Agree	No	Above average	A moderate amount	Far above average	Far above average
Agree	No	Average	A moderate amount	Average	Average
Agree	Yes	Average	A lot	Above average	Far above average
Neither agree nor disagree	Yes	Average	A moderate amount	Above average	Average
Neither agree nor disagree	Yes	Average	A lot	Average	Above average
Strongly agree	Yes	Average	A moderate amount	Average	Average
Agree	No	Average	A little	Average	Average
Agree	Yes	Below average	A moderate amount	Average	Average
Strongly agree	No	Far above average	A great deal	Far above average	Far above average
Strongly agree	Yes	Above average	A lot	Average	Average
Neither agree nor disagree	No	Below average	A moderate amount	Below average	Far below average
Neither agree nor disagree	No	Above average	A lot	Average	Far above average
Strongly agree	Yes	Far above average	A moderate amount	Average	Average
Neither agree nor disagree	No	Average	A lot	Above average	Above average
Agree	Yes	Below average	A moderate amount	Average	Below average
Agree	No	Above average	A lot	Average	Average
Neither agree nor disagree	Yes	Above average	A lot	Average	Far above average
Disagree	No	Far below average	A little	Far below average	Below average
Strongly agree	Yes	Above average	A moderate amount	Above average	Above average
Neither agree nor disagree	Yes	Average	A moderate amount	Average	Far above average
Agree	Yes	Average	A little	Average	Above average
Strongly agree	Yes	Above average	A moderate amount	Average	Average
Strongly agree	Yes	Average	A lot	Above average	Average
Agree	No	Above average	A lot	Above average	Above average
Agree	Yes	Below average	A little	Below average	Average
Disagree	No	Below average	None at all	Far below average	Below average
Strongly agree	No	Average	A moderate amount	Average	Above average
Agree	Yes	Average	A great deal	Above average	Above average
Neither agree nor disagree	No	Average	A moderate amount	Average	Above average
Agree	Yes	Above average	A lot	Above average	Average
Strongly agree	No	Average	A moderate amount	Average	Above average
Neither agree nor disagree	Yes	Average	A moderate amount	Average	Above average
Neither agree nor disagree	No	Average	A moderate amount	Below average	Average
Strongly agree	No	Average	A little	Far below average	Below average
Strongly agree	Yes	Above average	A great deal	Far above average	Far above average
Agree	No	Average	A lot	Average	Average
Agree	No	Average	A moderate amount	Far below average	Above average
Strongly agree	Yes	Average	A lot	Above average	Far above average
Strongly disagree	No	Far below average	None at all	Far below average	Far below average
Strongly agree	No	Far above average	A moderate amount	Average	Far above average
Strongly agree	Yes	Far above average	A great deal	Above average	Far above average
Strongly agree	Yes	Far above average	A great deal	Far above average	Far above average
Strongly agree	Yes	Below average	A moderate amount	Above average	Above average
Agree	No	Above average	A lot	Above average	Average

q0030	q0031	q0032
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Agree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Neither agree nor disagree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Strongly disagree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Neither agree nor disagree	Neither agree nor disagree	four - test OK - "Not so valuable"
Agree	Neither agree nor disagree	four - test OK - "Not so valuable"
Agree	Neither agree nor disagree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Neither agree nor disagree	Agree	four - test OK - "Not so valuable"
Agree	Disagree	four - test OK - "Not so valuable"
Neither agree nor disagree	Disagree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Disagree	Disagree	four - test OK - "Not so valuable"
Agree	Agree	four - test OK - "Not so valuable"
Strongly agree	Agree	four - test OK - "Not so valuable"
Agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Agree	four - test OK - "Not so valuable"
Strongly agree	Agree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Neither agree nor disagree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Strongly agree	Agree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Disagree	Strongly disagree	four - test OK - "Not so valuable"
Neither agree nor disagree	Agree	four - test OK - "Not so valuable"
Agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Agree	four - test OK - "Not so valuable"
Agree	Agree	four - test OK - "Not so valuable"
Strongly agree	Neither agree nor disagree	four - test OK - "Not so valuable"
Neither agree nor disagree	Neither agree nor disagree	four - test OK - "Not so valuable"
Neither agree nor disagree	Strongly agree	four - test OK - "Not so valuable"
Agree	Agree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Agree	four - test OK - "Not so valuable"
Agree	Strongly agree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Disagree	Neither agree nor disagree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Strongly agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Strongly agree	four - test OK - "Not so valuable"
Agree	Agree	four - test OK - "Not so valuable"

q0033	q0034	q0034b
Yes	Strongly agree	Strongly agree
No	Our organisation doesn't work with cloud	
No	Our organisation doesn't work with cloud	
No	Our organisation doesn't work with cloud	
Yes	Strongly agree	Strongly agree
Yes	Disagree	Disagree
Yes	Strongly agree	Strongly agree
Yes	Neither agree nor disagree	Neither agree nor disagree
Yes	Agree	Agree
Yes	Neither agree nor disagree	Neither agree nor disagree
No	Our organisation doesn't work with cloud	
Yes	Agree	Agree
No	Our organisation doesn't work with cloud	
No	Agree	Agree
No	Our organisation doesn't work with cloud	
No	Our organisation doesn't work with cloud	
No	Strongly disagree	Strongly disagree
No	Our organisation doesn't work with cloud	
Yes	Neither agree nor disagree	Neither agree nor disagree
Yes	Strongly agree	Strongly agree
No	Our organisation doesn't work with cloud	
No	Neither agree nor disagree	Neither agree nor disagree
No	Our organisation doesn't work with cloud	
Yes	Agree	Agree
Yes	Disagree	Disagree
Yes	Agree	Agree
No	Our organisation doesn't work with cloud	
No	Strongly disagree	Strongly disagree
No	Our organisation doesn't work with cloud	
No	Our organisation doesn't work with cloud	
Yes	Neither agree nor disagree	Neither agree nor disagree
No	Our organisation doesn't work with cloud	
No	Strongly disagree	Strongly disagree
No	Our organisation doesn't work with cloud	
No	Strongly disagree	Strongly disagree
No	Our organisation doesn't work with cloud	
Yes	Neither agree nor disagree	Neither agree nor disagree
No	Our organisation doesn't work with cloud	
No	Strongly disagree	Strongly disagree
Yes	Strongly agree	Strongly agree
No	Our organisation doesn't work with cloud	
No	Our organisation doesn't work with cloud	
Yes	Agree	Agree
Yes	Strongly agree	Strongly agree
No	Our organisation doesn't work with cloud	
Yes	Neither agree nor disagree	Neither agree nor disagree

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