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Upload or not to upload

A study of cloud services in the education system

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Upload or not to upload: Stakeholder in the education system

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Abstract:
The use of cloud computing is increasing in many different areas, and one of these areas is education. As using cloud in education becomes standard in many schools, some ethical concern regarding student information arises. This thesis aims to identify the issues that Swedish schools in the region of Skåne are facing regarding the use of cloud computing. This is achieved by creating a theoretical framework based on literature on issues with cloud computing. This framework consists of four components: *cloud in education, stakeholders, contracts and regulations* and *PAPAM framework (privacy, accuracy, property, access and motivation)* Thereafter is a qualitative research conducted, based on interviews with the stakeholders in education that are in contact with cloud computing. These stakeholders are identified to be *teachers, principals* and *IT-professionals.* By understanding how these stakeholders manage the ethical issues of cloud computing, and comparing this with the theoretical framework, several guidelines and propositions are reached. The guidelines are advised to be applied by the stakeholders for them to manage cloud in education in a way that avoids any ethical concerns. The guidelines concern policies for cloud use, clearer laws from the government, and solid contracts with the cloud providers and clear responsibility distribution.

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1 Introduction

This chapter start by explaining the background of this thesis and continuing with describing the problem area. Then describing the reasoning behind the research question to make it clear where it is derived from. Following, a purpose is explained and how it contributes to the research field of IS. Short thereafter, the delimitation of the thesis is demonstrated.

1.1 Background

Cloud computing is a technology that is gaining space in the research field and it is rising significantly in popularity (Timmermans, Stahl, Ikonen & Bozdag, 2010; Lim, Grönlund & Andersson., 2015; de Bruin & Floridi, 2016). Cloud computing gives users and organisations the ability to store data with online, on-demand services, which contributes to cut costs on IT support and hardware (de Bruin & Floridi, 2016), as well as providing a competitive advantage in that it allows users to store and processes huge amounts of data (Alajmi & Sadiq, 2016). However, there have been incidents concerning data leakage within cloud services. For instance, CloudFlare that were hosting 5.5 billion sites accidentally leaked sensitive data about their customers for months due to a bug in their system (Hackett, 2017), in the so called "Cloudbleed". Cloudbleed is just one example of attacks on cloud that has resulted in damage of people's information.

Another example is Code Spaces that mainly was built on Amazon Web Services. What happened with Code Spaces was not a hacker attack, but someone got access to the Amazon Web Service control panel, and blackmailed Code Spaces for money under the threat of deleting information. Code Spaces did not answer to the threat, and accordingly, much of its resources got erased. This incident had disastrous effects for Code Spaces and drove it out business (Venezia, 2014).

These two incidents are just two cases of the disadvantages with cloud computing but as mentioned, there are also advantages with a cloud solution. An institution that have recognised these advantages are the Swedish schools and their stakeholders (Lim et al., 2015). However, cloud services are used differently within schools and therefore, needs its own explanation. As cloud services is becoming standard in many fields, Swedish school systems have also stated to adopt cloud computing (Lim et al., 2015). Cloud services in education is used by teachers and principals to communicate with each other and with the students, it is used for distance learning as well as a tool for evaluations in that sense that it enables to store any kind of data and documentation of student performances (Lim et al., 2015; Lindh & Nolin, 2016). These are some

the advantages that teachers and principals use to improve their pedagogical performance (Lim et al., 2015).

Fortunately, there has not yet been any major attacks on the school cloud system. Yet, with the increased use of cloud services, and the amount of sensitive data that the schools has, it is a possible target. This is an issue that should be taken seriously, and acted upon before it is too late. The most significant issues are privacy and security, and the uncertainty that often rises in who has access and the rights to the data (Timmermans et al., 2010; Bélanger & Crossler, 2011).

Storing data, and especially personal data in the cloud can bring ethical issues (Timmermans et al. 2010; Bryant, Land, & King, 2009). These ethical issues are of concern for the teachers and principals since Sweden has strict laws on how to manage sensitive information (Datainspektionen, 1998). The teachers, principals and IT-professionals are the stakeholders with different responsibilities and together they manage different ethical issues regarding the cloud service. Therefore, it is important to highlight their position in this matter. The usage of cloud computing in schools affect many different groups of stakeholders and have changed the daily work life, for most of all teachers and students. However, it has also changed the way principal's makes decisions and set up security policies, and it is with the principals the final responsibility of the cloud initiative lies (Lim et al., 2015). The rise of cloud has also been given the IT-professionals at school new areas of necessary expertise in IT security (Alajmi & Sadiq, 2016).

It is not only the teachers that are concerned with ethical issues but also the Swedish government. The Swedish Data Protection Authority (DPA) has shown a degree of scepticism towards the use of cloud computing in education This has mainly concerned the contracts with the cloud providers that has been said to be fuzzy and inaccurate. This crystallises down to ethical issues such as privacy (Holmström, 2014). Therefore, it is up to the school and organisation to handle this matter.

Most organisations consist of several stakeholders, and so does the school system. According to Freeman (2010, p.31), a stakeholder is "*those groups without whose support the organisation would cease to exist*". Accordingly, the stakeholders in schools are teachers and principals, and, with the aspect of cloud computing in education, the IT-professionals at the schools or at the municipality that are responsible for the cloud solution. However, what kind of information is being stored about students could be an ethical concern and relevant in this day and age of digitisation of schools. Hence, it is important to study how stakeholders in the education system manage different ethical issues concerning the usage of cloud services.

1.2 Problem area

Cloud services are information systems, and along with it comes different ethical issues that are not just concerning privacy (Mason, 1986; Conger, Loch & Helft, 1995; Woodward, Martin & Imboden, 2011). The use of different cloud services within Swedish schools is not only sunshine and rainbows, there are also a factor of ethical issues that emerge with the use of cloud services. Schools in Sweden are increasingly turning their attention to different types of cloud services. For instance, Simrishamn got approved by the DPA to start using Google Apps for Education in 2015. Privacy is the main concern of the DPA and other ethical issues are equally important since they are not in the constitution (Rydberg, 2015). Yet, the DPA are still concerned about cloud services in schools (Holmström, 2014). The temptation of using cloud services within the schools of Sweden is palpable due to the low maintenance cost and accessibility (Skolverket, 2016).

The DPA clearly states that students and teachers, whose information is handled in the cloud service, should feel safe that their personal information is not used by the cloud provider for their own purposes (Datainspektionen, 2017). It is up to the school's principal; the municipality or the private schools board to ensure that the information in the cloud is managed properly. Thus, it is their responsibility to ensure that the teachers, that are an actual user of the cloud services, understands the regulations and follows it (Datainspektionen, 2017). Cloud in education is a relatively new phenomenon, and the literature concerning the precis matter is limited. Therefore, this paper will investigate how the stakeholders within education manage information system ethics. The usage of cloud services is an increasing trend and ethical issues that concern information system (cloud) will become ever more important (Mason, 1986).

1.3 Research question

This thesis aims to explore how stakeholder within the Swedish education system manage different ethical issues concerning the use of cloud computing. The thesis is not set out to solve a problem nor telling schools what they are doing wrong. The reason why this is important narrows down to the fact that digitising of the Swedish schools is increasing, more data than ever is being uploaded and businesses have lost billions over the years due to ethical issues surrounding information systems (Banerjee, Cronan & Jones, 1998). Therefore, the RQ was created to give the field of IS research an insight how ethical issues with cloud computing are managed within Swedish schools.

RQ: How do stakeholders in the education system manage ethical issues regarding the use of cloud services?

1.4 Purpose

The purpose of this thesis is to understand how school stakeholders manage different ethical issues when using cloud services in their work. This will be achieved by examining the current literature on cloud computing and the risks of it; role of the stakeholders; understand the ethical issues identified by the literature; understand the contract and regulations; and based on this create a framework. This framework will be used to empirically examine the stance stakeholders in schools has towards the cloud, as well as how the stakeholders manage the identified issues while working with cloud in education. By understanding this, several guidelines will be reached that aims to assist the stakeholders to manage cloud services in a safer way to avoid misuse of student data.

There is a clear demand from the schools that they want to digitise some of their procedures and become more efficient, yet there are concerns (Holmström, 2014). Therefore, it is important to understand the ethical issues that might become a problem further down the road when most of the school's procedures are digitised. The findings in this thesis will provide an understanding of the ethical dilemmas that stakeholders within the education system face and act upon when interacting with a cloud service. This thesis will provide to the field of IS research by giving an understanding how stakeholders within the Swedish education system deal with ethical dilemmas when they are interacting with cloud services.

1.5 Delimitations

The location restriction will be restricted to Region Skåne and therefore, conclusions cannot be made for the whole nation of Sweden. Research will be made of both public and private schools, but it will only investigate primary schools and high schools, and not higher education. The perception is that high school and primary school teachers have more responsibility for their students. Therefore, the interaction between teacher-student is higher compared to university level. This, makes the amount of data larger and the daily usage of cloud more frequent. If students are to be considered a stakeholder in schools can be debatable, but this paper will not treat them as such and will not be interviewed.

2 Theoretical Framework

This section of the thesis covers the relevant theoretical background. A close examination of the existing literature is performed and is also the foundation for the thesis. Literature involving stakeholders, ethics in information systems, cloud services with sub-categories and contract and regulations are covered. First off, an introduction of cloud computing is demonstrated to understand its purpose in the whole picture. Secondly, a review of ethical issues within information systems are brought up to light. Continuing with explaining stakeholder's role and the different perspectives, and a description of the Swedish laws of cloud in education provided by the Swedish Data Protection Authority. *Finally, a compiled theoretical framework that summarise the literature review and will be the foundation for this thesis.*

2.1 Cloud computing

This section will define different terms that are used in cloud computing by reviewing the existing research that exist within the field. The definitions of different elements within cloud computing will be done in a non-technical manner, since an in-depth review of every technical aspect is not required for this thesis. In this thesis, cloud computing will use the definition described by the National Institute of Standards and Technologies (NIST), that describes Cloud computing as model that enables access on demand to a shared collection of data resources, e.g. networks, servers, applications and services, that quickly can be accessed with minimal effort from management and the cloud providers (Mell & Grance, 2011). There are three different types of Cloud computing models, Private Cloud, Public Cloud and Hybrid Cloud. Private Cloud has an infrastructure that is meant only for a specific organisation and hence also closed to others unless special access is granted. Public cloud has an open infrastructure that the public can own and use. A hybrid cloud is a combination of public and private, where sensitive data is handled internally by the organisation and less sensitive data is supported by a cloud provider. Hybrid Cloud are as of today the most common type of cloud. (Tole, 2015).

Cloud computing is a widespread phenomenon and is not only making it easier for people to collaborate in different projects. Paying for physical hardware, powerful computers and expensive software is no longer required for companies to keep their business going. Cloud computing emphasise and promotes the concept of pay-as-you-go (de Bruin & Floridi, 2016). Thus, companies, organisation and even private users might only pay for the service that they require (de Bruin & Floridi, 2016). Cloud computing is a model that allows on-demand network access to networks; data storage; applications; services; and this is made possible by pooling computer resources (Mell & Grance, 2011).

2.1.1 Service Models

Cloud computing is generally divided into three different service models, Software as a Service (SaaS), Platform as a Service (PaaS) or Infrastructure as a Service (IaaS) (Daylami, 2015; Mell & Grance, 2011).

Software as a Service - Rittinghouse and Ransome (2010) states that SaaS is when an application runs at a provider and the service that is available over the internet, and hence differ from a traditional on premise solution where the application runs on local hardware. SaaS has been developed because of the quick expansion of bandwidth and increased capacity (Rittinghouse & Ransome, 2010). The application is then available either through a web browser or a program interface, and the users does not control the elementary infrastructure of the application, i.e. networks, servers or operating systems (Mell & Grance, 2011).

Platform as a Service - PaaS can be explained as a development platform with pre-defined programming languages and development tools (Rittinghouse & Ransome, 2010). The user does not control any underlying infrastructure, but it is, however, in charge of the configuration of hosting the application (Mell & Grance, 2011).

Infrastructure as a Service - The cloud provider owns the infrastructure that is shared between users. The resources are scalable and the costs are based on how much resources used (Rittinghouse & Ransome, 2010). In IaaS, the user does not control any underlying infrastructure, but controls operating systems and storage, as well a limited control of the chosen components (Mell & Grance, 2011).

2.1.2 Cloud Ethics

When cloud computing is implemented, ethical issues can follow (Timmermans et al., 2010) The two large issues of ethics in cloud computing are privacy and security, and the biggest problems usually occurs when it is not clear who has access to personal data on the cloud (Timmermans et al., 2010). Moreover, a risk with cloud computing, seen from the clouders, i.e. the customers of the cloud service, perspective, is that many clouders do not fully understand what cloud computing results in or exactly what they are buying, which is a result of inadequate communication between the cloud providers and the clouders (de Bruin & Floridi, 2016). De Bruin & Floridi (2016) also states that regulations of the cloud providers should be as small as possible, otherwise the innovation can be harmed. However, de Bruin & Floridi (2016) strongly argues that regulations of the clouders, or the customers of cloud services is highly necessary, and they also argue that sensitive data from the military, medical records or lawyers' client's data ought to be forbidden to store in the cloud. De Bruin and Floridi (2016) points out the uncertainty of laws as an argument to this stance, as a customer storing data in the cloud might not always be aware of in what country or region the data is stored in. Therefore, there are

uncertainties of what country's' laws are applied, which can lead to misunderstandings or other unexpected implications.

Another stance is argued for by Lewallen (2012), who suggests that, in his highlighted case of lawyers handling client data, there should be regulations towards how data is stored on the cloud by the customer. This should be regulations that forces the lawyers to handle the data with care and with responsibility, and in addition, it is necessary that lawyers understand how to use cloud computing and keep their ethical duties (Lewallen, 2012). Lawyer's client data is sensitive personal data that can have consequences to individuals if leaked, as does student data. Therefore, the same arguments as Lewallen (2012) and De Bruin & Floridi (2016) lifts can be used in storing student data on cloud.

Timmermans et al. (2010) lifts ten of potential ethical issues with cloud computing, issues that only follows from cloud computing. These issues are general issues for cloud computing and not specifically for education systems, but they are noted as they still give a comprehensive image of any potential issues that the stakeholders should be aware of:

1. *Control.* Cloud computing means a limitation of control since the data is stored and handled by an external provider. When something then goes wrong it is very difficult to find what party involved is responsible.
2. *Problem of many hands.* Cloud computing involves a spread of responsibilities between the "clouder" and the provider. This complex structure makes it hard to know who's responsible when something bad happens.
3. *Self-determination.* Self-determination is the individual's' right to personal control over use, disclosure and collection of their own personal data by others. This is difficult since cloud computing brings such large sharing of data.
4. *Accountability.* Data on the cloud must be ensured to be stored responsibly, and accountability is used to ensure this. But as accountability requires information about the users, it can arise a problem between the privacy and the accountability.
5. *Ownership.* Storing data remotely from the organisation can raise an issue of ownership of the data, and also raises the question of what the cloud providers can do with this data. It can also be argued that data stored remotely has lesser privacy protection
6. *Function Creep.* Data that has been gathered for a specific purpose, can with time become useful in another purpose, and by unwanted outside actors.
7. *Monopoly & Lock-in.* If the future gives us only a handful of cloud providers handling the cloud services in the world, the user autonomy could be at risk.
8. *Privacy.* Vagueness of privacy of storing data on the cloud can be very harmful as the control of data is handled by the provider.

9. *Privacy across (cultural) borders.* Data stored on the cloud can be stored on servers basically anywhere in the world, and there can be differences in culture that can affect the privacy of storage
10. *Cultural imperialism and dealing with diversity.* Using cloud computing is getting more and more global, and hence it is important to understand diversity.

2.2 Stakeholders in the education system

Freeman (2010, p.31) defines stakeholders as "*Those groups without whose support the organisation would cease to exist*". Stakeholders can also be individuals or groups that are confronted with consequences of corporate activities, affecting interest or rights (Freeman, 2010).

Mitchell, Agle and Wood (1997) divides stakeholders into primary stakeholders and secondary stakeholders, i.e. owners of assets or owners of less definite capital. Mitchell et al. (1997) also describes three attributes that can be used to classify different types of stakeholders:

1. Their ability to affect the firm
2. The legitimacy of their relationship with the firm
3. Their urgency of claim to the firm.

In conclusion, it is stated that managers must be aware of entities that have power and that wants to make decisions that affects the organisation (Mitchell et al., 1997).
Individuals and groups are stakeholders that can affect the performance of a company or affected by the achieved business goal (Buysse & Verbeke, 2003). The stakeholders could be owners, investors, employees, customers, suppliers, competitors, governments and the environment (Freeman, 2010). These stakeholders might have different agendas and different interest. The literature provides a managerial strategic perspective when explaining different stakeholders. However, the following section explains every stakeholder from a management perspective with parallels to cloud computing. The stakeholders might affect a cloud computing service in different ways which could have both positive and negative effects. An issue here is according to Myers and Miller (1996) that it can be difficult for different stakeholders to act ethical since there might be a clash in interest, where government or corporation have interests that can interfere with the good of individuals.

2.2.1 Governments and PUL law

Governments of today do play an important role even for businesses that are not directly involved with them. Different business has different relationship with their government and the cumulative effect can be palpable depending on the situation. Therefore, it is important for management and other stakeholders to incorporate the effect of the government into their strategic plan (Freeman, 2010; Lärarförbundet, 2017). A government can engage in two different

stakeholder roles. Firstly, they can create laws to embrace the usage of cloud computing or decide to close it down. Secondly, they can function as a hosting company, cloud service and a business clouder (user of the cloud) (de Bruin & Floridi, 2016). For instance, the Dutch government value data security and thus, they have a closed cloud computing service that is restricted only to employees of the government (Rauch, 2012). This is one example of how a government can be a stakeholder. There are other examples of governments have their cloud service either open, closed or a mix between them both. In Sweden, there are strict laws concerning personal information and the law is called Personal information law (PUL). The purpose of this law is to protect the individual and their integrity. PUL covers different areas where personal information is violated, for instance, gathering, registration, processing and more. The law is based on the regulations from EU, which means other countries have somewhat the same law. For this law to work it must be to handle agreements and consent between two different parties (Datainspektionen, 1998).

2.2.2 Employees

Often employees are customers, stockholders and members of special group of interests that have a certain relationship to their employer. Freeman (2010) states that every business must understand the relationship since it could be one of the causes to low productivity. Moreover, this problem is not as simple as it sounds and understanding the needs of the employees is not solution to the whole problem. Applying a cloud computing service perspective to this situation could be what employers enforce what cloud computing service to use. Some employees might not comply with a certain cloud computing service and might be concerned what is being stored.

2.2.3 Customers

The possibility to choose between products is greater than ever before and there is no longer a product that overwhelm better than the next one in terms of quality. For instance, the US is no longer in general creating products with the highest quality and US managers have become too market-driven. This attitude combined with not investing in new business processes have made the US fall behind in quality products. This have made customer look elsewhere when choosing products (Freeman, 2010). From a cloud computing perspective, this might not matter about the quality of the cloud computing service, but rather how and what kind of information they are storing about their customers because customers rarely know for certain what is being stored about them (de Bruin & Floridi, 2016).

2.2.4 Competitors

Freeman (2010) states that competition is prominent in a variety of different markets and the nature of the competition is changing. These stakeholders are not any different from the other since it is also changing and companies are competing on a global market. Today there is an umbrella effect where companies crouch and when the day come when an outside company figure out how to create a high-quality product with less expensive cost, the umbrella will

collapse (Freeman, 2010). What does this have to do with cloud computing? Today there are four giant companies that cover most of the market shares and whereby Amazon cover 31 % of it, second Microsoft with 11 %, IBM 7 %, Google 5 %, the rest are companies such as Alibaba, AT&T, Oracle and more (Forbes, 2016). This clear advantage from Amazon in cloud computing service market might affect either in a positive or negative manner for companies that use cloud based services.

2.3.5 Suppliers

Freeman (2010) makes an example where the OPEC nations had immense control over the oil distribution in the world. However, the dependence on these nations is not as high as it used to be due to alternative energy sources. A parallel can be drawn to cloud computing services providers; what happens to their customer data when they are no longer profitable? There is plenty concern of security already, but sometimes a more alarming concern could be when a cloud computing Service Company goes dark. One of the biggest storage providers MegaCloud suddenly went dark and the stored data were no longer accessible (Mckendrick, 2013). Therefore, relying on the most popular cloud computing service provider is not always the best option, in terms of reliability.

2.3.6 Stakeholders in education

There are different types of stakeholders in most organisation s, and so is also the case in education. The stakeholders in education that are most relevant to the use of cloud solutions will be examined further in this thesis, and these stakeholders are principals, teachers and IT-professionals.

Principals
The principals are according to the Swedish Data Protection Authority, together with the municipality or the private schools board the ones responsible to ensure that the cloud services are managed properly. They are the ones that should make sure that teachers understand the laws in place (Datainspektionen, 2017). As they are also, together with the municipalities, initiators of the cloud services, and therefore, they are a relevant stakeholder.

Teachers
The teachers are the ones that uses the cloud services daily, and it is between the teachers and the cloud service that any issues can arise. Considering this, they must be a relevant stakeholder.

IT-professionals
IT-professionals have the technical details of how the cloud solution is built up. They have also gotten new work tasks since the upcoming of cloud services in education (Alajmi & Sadiq, 2016). Therefore, it is of relevance to further consider their perspective on the use of cloud in education and are thus also a relevant stakeholder.

2.3 Ethical issues within information system and PAPAM

Humans are social and it has been a requirement for our survival and with the rules, norms and conventions allowed humans to exist and prosper (Stahl, 2012). Ethics is a part of philosophy and it is meaning comes down to moral judgement and reasoning (Conger et al., 1995). The definition of ethics is a philosophical issue and can hence be difficult define. Mingers and Walsham (2010) state ethics as development of specific manners that are meant to shape a well-being for people and for a society, which can be regarded as honesty, moderation, fairness and courage. Information Systems (IS) are integrating with humans every day and it is field that multifaceted. Therefore, ethical issues will also appear, since more and more information is stored that can have an impact on people that are interacting with a IS (Myers & Miller, 1996). The misuse of the computers and other system have increased drastically: Whereby, the proper use of IS within businesses have shown fruitful and misuse have shown significant losses to business and society (Banerjee et al., 1998).

Computers and IS in general arbitrate the human relationship and which causes a loss of psychological being to the other person at the end of the line (Conger et al., 1995). This can cause some ethical issues when using computer or IS (Bryant, A., Land, F., & King, 2009). Myers & Miller (1996) highlight four ethical dilemmas regarding storing sensitive personal data, which is also listed by Mason (1986) in the PAPA framework, these issues are: (1) Privacy, (2) Information accuracy, (3) Access to information and (4) Intellectual property rights. Conger et al. (1995) lifts two additional issues to these four, whereby only one of the two will be used in this thesis, motivation.

2.3.1 PAPA

Mason (1986) presented four ethical issues concerning IS and they are recognised as one of the most influential frameworks considering IS ethics (Peslak, 2006) and have been used in a variety of ethical studies (Conger et al., 1995; Myers & Miller, 1996; Banerjee et al., 1998; Peslak, 2006; Woodward et al., 2011). However, this paper will also incorporate the motivation issue from the study made by Conger et al. (1995). The focus of Mason four ethical issues (1986) was to define issues and agendas how to deal with them. Conger et al. (1995) have the focus on individuals and attitudes about user behaviours which is the same direction this paper will have. Therefore, a thoroughly explanation of the four ethical issues presented by Mason (1986) are still relevant even though they were created more than thirty years ago (Woodward et al., 2011).

The PAPA framework was created by Mason in 1986 and highlights four ethical issues of the information age (Mason, 1986). This framework is still accurate and the four factors lifted are still as of today important ethical issues (Peslak, 2006). The ethics in the age of information technology is rather unclear, however, Peslak (2006) states that the framework by Mason is still

accurate. Cloud computing and its services are part of the information age and therefore, the PAPA framework is fully viable to investigate how ethical issues are managed.

Privacy

As stated in the previous section, a vast amount of data is stored about users when they are interacting with an IS. The data stored in these systems could be both sensitive and intrusive in the wrong hands. Moreover, the growth of IS with increasingly better performance and the increased value of information is concerns of our privacy (Mason, 1986). Information privacy is about individuals having the control of the data that have an influence over them. Privacy can be defined differently depending on the situation. For instance, it is an important factor within law, management and many other fields (Bélanger & Crossler, 2011). Keeping other unauthorised user away from data that they are not allowed to take part of is a matter of privacy (Walsham, 1996).

Mason (1986) states two factors that are a threat to people's privacy and it is the increase of information technology and the increase of information of decision making. For instance, electronic patient journal contains information about a patient and that information is supposed to be private between the patient and the physician. However, anyone within that certain hospital can read the patient journal even though they are not allowed to. This is inflicting the privacy of the patient. This example is quite subtle and maybe not as invading on the privacy as other cases might be. However, what happens when enough information about a person is gathered, merged together and prohibits a person from applying to a job? This is the ultimate trespassing and the ultimate cost of an invasion of our privacy (Mason, 1986). Therefore, a data subject or an individual should be deciding for himself what information should be shared about them and to whom this information is directed to (Myers & Miller, 1996).

Accuracy

The accuracy of information is important because without accuracy it is not possible to know if the information is reliable or not (Manson, 1986). Information system accuracy defines the completeness and correctness of data. For instance, algorithms that improve the storage of files in a database and reducing file corruption. Accuracy in the context of information system can be viewed from two perspective within ethics. On one side of the coin accuracy is about the factors above and developing detect-free applications. On the other side is explaining how inaccuracy could be damaging (Conger et al., 1995). For instance, the case explained by Mason (1986) where a customer of a bank had rigorously paid his debt every month. However, due to inaccuracy in the banking system, the customer got charged for not doing so even though reliable proof could be provided.

Property

According to the *Dictionary (2017)* property is defined as the following: *that which one person owns; the possession or possessions of an owner*. Property within in the field of IS is quite broad since it involves both software, documents, physical databases and more. However, it also involves non-computerised properties such as design ideas and application development (Conger et al., 1995; Mason 1986). For instance, when a user uploads information to Facebook, is it a property of the user or Facebook? That depends on the agreement or contract between Facebook and the user.

Access

Access relates to property and the definition is quite similar. *Dictionary (2017)* states the following: *the ability, right, permission to approach, enter, speak with, or use; admittance.* The difference between the two factors is, access is an ability not a right. For instance, a certain an employee will not act ethically if they use their entry card to access different databases to read, copy or delete information that is not necessary (Conger et al., 1995). For instance, information about user's internet habit is stored every day for the sake of convenience both for the user and companies. However, ethical issues appear when certain stakeholders want to access this information for personal gain.

2.3.2 Additional ethical dilemma

Mason (1986) four ethical dilemmas are still relevant to this day. However, additional ethical dilemmas have been added and reviewed by other authors such as Conger et al. (1995) and used by Woodward et al. (2011).

Motivation

Motivation is a new addition or expansion of the PAPA framework and was identified by Conger et al. (1995). The motivation IS ethical issue have also been used recently by Woodward et al. (2011). Motivation does not have any direct connection to the other ethical issues stated in the PAPA framework, yet it is relevant since it concerns who is affected by certain computer act. The motivation factor identifies more than just the computer users but also other stakeholders. This is relevant since the two parties might affect each other and only studying one group would be bias and unethical decisions. The awareness of other stakeholders than the user's needs to raise since other stakeholders might benefit or suffer from their decision (Conger et al., 1995).

2.4 Contracts and regulation

The Swedish Data Protection Authority states that it is highly important to consider the student's personal integrity when their personal data is stored on the internet. The Swedish Data Protection Authority also states that students and teachers should always feel safe in that sense that the

cloud provider cannot use their personal data in their own interests as well as that the data is erased from the servers when it is no longer necessary to store. The responsible authority varies depending on the school, if the school is a public school, the municipality is the responsible authority, and if the school is a private school, it is the board of the owning corporation or foundation that is the responsible authority (Skolverket, 2017). In addition, it is the responsible authority at the school that has the final responsibility and is the one that must ensure that students and teachers personal data is stored safely in the cloud.

The responsible should ensure that the data handled at the schools are in accordance to PUL. This responsibility cannot be delegated or be given away, and when a teacher uses a cloud service, it is still the up to the responsible authority, and not the teacher to ensure safe handling hand storing of the personal data. It is important with clear instructions on who is authorised to make commitments to cloud providers. (Datainspektionen, 2017).

The PUL law is stricter when it comes to structured data and with unstructured data is less strict. Structured data is information that is stored in a database (in this case cloud) or register. Unstructured data is information that is stored on an email or on a paper. For example, a list over students is allowed as long it is not connected to a personal number. In case of incident of integrity trespassing, the authorities need to do an overall assessment to be able to make a legal judgement. Depending on the situation, the institution and purpose of the handling of the sensitive information the legal judgement can vary and in some cases, be legal (Datainspektionen, 1998).

The Swedish Data Inspection Board is specific in that the responsible authority provides teachers and students with guidelines about (Datainspektionen, 2017):

- Who can sign contracts on account of the responsible authority
- What personal data that can be handled in a cloud service
- How personal data can be handled in a cloud service
- What laws to apply when publishing a video or a picture
- If, and then how, a cloud service provided by the responsible authority can be used by students and teachers for private causes.
- What consequences any breaking of these guidelines can lead to.

Furthermore, the Swedish Data Inspection Board states that it is not enough with approval from teacher and students to treat personal data in a cloud service unless the cloud service does not fill the requirement for PUL. The responsible authority should also always be able to inform students and teachers how their perusal data is handled in the cloud.

2.5 Summary of the literature

Table 2.1 demonstrate the articles that was used for each topic and is the theoretical foundation for the compiled framework. Table 2.1 provides an overview of the main references used in this thesis.

Subject	Topic	Main references
Stakeholders in information system	Types of roles	(Freeman, 2010) (Mitchell, Agle and Wood, 1997)
PAPAM and IS ethics	Ethics in IS	(Myers & Miller, 1996) (Banerjee, Cronan & Jones, 1998) (Mingers & Walsham, 2010) (Stahl, 2012) (Bryant, Land & King, 2009)
	PAPA-framework	(Mason, 1986)
	Additions to the PAPA-framework	(Walsham, 1996) (Conger, Karen & Helft, 1995) (Woodward, Martin & Imboden, 2011)
Cloud computing	Service models	(Mell & Grance, 2011) (de Bruin & Floridi, 2016) (Rittinghouse & Ransome, 2010)
	Cloud Ethics	(Timmermans et al., 2010) (de Bruin & Floridi, 2016) (Lewallen, 2012)
	Cloud in education	(Lindh & Nolin, 2016) (Alajmi & Sadiq, 2016)
Contracts and regulations	Laws and PUL	(Skolverket, 2017) (Datainspektionen, 2017) (Datainspektionen, 1998):

Table 2.1 Summary of the literature

2.6 Theoretical framework

To clearly demonstrate what this thesis is trying to accomplish, a theoretical framework was created which is based on the literature review. Figure 2.1 is an illustration of framework and consist of four different components:

1. Cloud computing in education - This component is what type of cloud service that the stakeholders use. Depending on the cloud service that is being used some functionality might change but the core concept is there. The stakeholders that interact with the cloud service might have to upload or download different kind of information that is work related. However, this information might in some cases be sensitive or compromise other ethical factors within the PAPA + Motivation.

2. Stakeholders - Teachers, principals and IT needs to follow the contracts and regulations that are set up for their organisation. The stakeholders are the employees that have direct or indirect connection to the school. For example, IT-responsible might not be an employee at a specific school but rather the municipality but still is responsible for the management of the IT for that school. Teachers and principals are the stakeholders that directly work with the cloud daily and therefore, they are stakeholders who should manage different ethical situations concerning the cloud usage.

3. Contracts and regulation - This component in the framework considers the regulations and contract the stakeholders within the education system needs to accept. This component is usually based upon different agreements between the school, the cloud provider and the government. The government is mostly concerned about the law that is concerning personal information. Schools are concerned about getting the wanted functionality and following the demands of the government. The contracts and regulations can vary depending on the school but regulations concerning personal data should be the same for every school.

4. PAPA + Motivation (PAPAM) - This component has its background in the PAPA-framework with the addition of motivation. The stakeholder manages different ethical issues which is demonstrated by figure 2.1. This connection between stakeholder and ethical issues will be investigated and demonstrate how stakeholders manage different possible ethical issues when they are using a cloud service in their work.
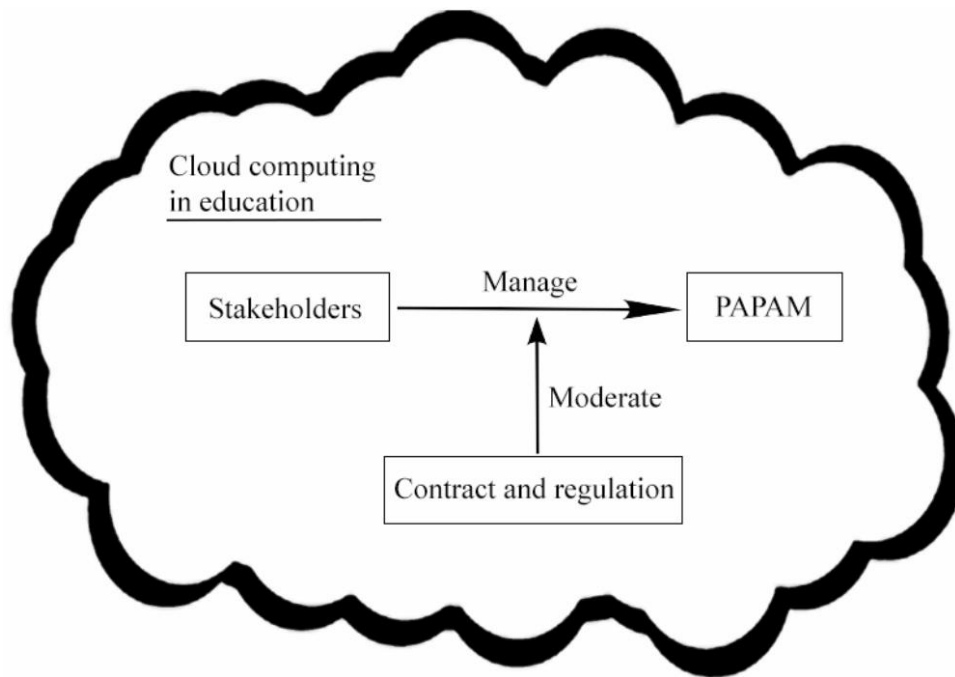
Figure 2.1 Compiled theoretical framework

3 Case: schools in Skåne

In this chapter, the school system of Sweden is briefly explained, along with a description of the different cloud solutions used by schools in Skåne.

3.1 Swedish school system

Swedish children start school in general by the age of 7, with compulsory school for nine years. Following this is upper secondary school, which consists of three years, and is offered to any youth in Sweden who has completed compulsory school. Students are not obligated by law to attend upper secondary school (Skolverket, 2017).

The compulsory school has a large, local responsibility and it is the parliament and government that decides of the rules and laws regarding the schools. The municipality has together with the principal the responsibility for the day to day operation in the public schools. In independent schools or private schools, the responsible actors are the owners of the schools, which usually are a corporation or a foundation (Skolverket, 2017).

3.2 Skåne School case

The schools that were selected were all located in the region of Skåne and they are all regulated by Swedish law. The schools in Skåne are in the process of digitising communication between all the stakeholders. The use of cloud in education is something that is becoming more and more common for schools to use in Sweden as well as the rest of the world (Lindh & Nolin, 2016). This process started at different points in time depending on the school but today different cloud and digital communication services are common tools. The cloud is used partly as a tool for interaction between the teacher and the students (Lindh & Nolin, 2016; Lund Municipality, 2016) e.g. Google Apps for Education (GAFE), and partly for documentation of evaluations of student's performance, grading and documentation (Lund Municipality, 2016) e.g. Unikum or Dropbox. Therefore, schools in Skåne become an interesting case to study. The respondents that were chosen are both from public and private schools. However, in this case this does not matter from an information system ethical perspective since they are responsible to the Swedish laws. A specification of which respondent is representing what school will not be demonstrated, in respect of the respondents.

Google Apps for Education
GAFE is a free-to-use, SaaS suite to increase the student teacher interaction in schools and simplify the learning process (Google for Education, 2017). It is meant for teachers to give students a teaching environment to increase the learning of cooperation, confrontation and

discussion (Sultan, 2010). In Sweden, the first schools to adopt GAFE was the public schools in Salem municipality (Lindh & Nolin, 2016). This raised concerns in the Swedish Data Inspection Board, stating that the privacy and integrity of the students were put at risk, and even if this issue never came to a solution, many Swedish municipalities have adopted GAFE and are currently using it (Lindh & Nolin, 2016).

Unikum

Unikum is a web education tool, like GAFE, used by 50 municipalities in Sweden (Unikum: Partners, 2017). The main idea of Unikum is to fit every student specific needs by user-friendly web based tools for students, teachers and parents (Unikum: Vår Vision, 2017).

Dropbox

Dropbox is a SaaS tool used for storing files, documents photos etc. on a web application. It is used by students, professionals and individuals and allowed the users to share files and folders (Dropbox: What's Dropbox?, 2017).

SchoolSoft

SchoolsSoft is an administration tools for education, and is used by Swedish municipalities and private schools as well as for higher education. SchoolSoft is used for cloud based tools to facilitate the communication between teachers, students and parents, and provide them with the information about the education that they are entitled to. It is also used to store schedules, as well as personal information about students. (School Soft, 2015).

The economic advantages of adopting cloud computing in education are frequently highlighted in the literature (Alajmi & Sadiq, 2016; Sultan, 2010; Lindh & Nolin, 2016). Notably less is written about the risks or issues following this, but Lindh & Nolin (2016) lifts privacy and integrity by using GAFE. When GAFE is used as standard, the students are given no choice but to use application from Google, which essentially means that Google can survey student's online activity (Lindh & Nolin, 2016). This leads to an issue that should be considered for municipalities to act in accordance to an ethical approach.

4 Research Method

In this chapter, the qualitative study that has been performed is described. It aims to explain and motivate the selected research methods, the data collection process, how the interview questions were written and how the subjects in the interviews were chosen. This chapter ends with a discussion about validity, reliability and ethics regarding the design of the empirical study.

4.2 Research strategy

This study aims to understand the stakeholder's perspective on storing student data on the cloud, and thus, identify the ethical issues regarding this. To understand the stakeholders, take on this problem, semi-structured interviews has been conducted with the relevant stakeholders, i.e. teachers, principals and municipality IT-professionals, or IT-professionals at the schools. The multiple stakeholder's perspectives have been gathered to gain a comprehensive view of the situation. The methodology used in this paper is thus a qualitative approach, as qualitative research will provide the researchers with an understanding of a phenomena in its context (Recker, 2013). Qualitative research is about words and what people say, instead of a quantitative approach that are more number oriented, hence, it is important with interpretation of the interviews to completely understand the responses. Interviews are a base in many interpretive studies and is something that is necessary to access the interpretations of the interviewees (Walsham, 2006). There is no off-the-shelf solution to understand the results of a study, and all research is interpretive (Gummesson, 2003). The interviews will be conducted on people with different levels of skill and understandings of the issue, which probably make the answers from the interviewees to differ, and therefore it is extra important to interpret the results.
Within the field of qualitative research methods, interviews are the most common (Recker, 2013; Bhattacherjee, 2012), and will also serve as method in this study. More specifically, descriptive interviews since these often focuses different personal perspectives of a certain phenomenon, and this will give the research a versatile description of the issue (Recker, 2013).

4.3 Data collection

There are several different strategies to apply when conducting interviews as a part of a qualitative approach. One of the most frequently used is semi-structured interviews (Recker, 2013). Semi-structured interviews are when the interviewer during the interview follows a script of questions, these questions have certain topics to be addressed throughout the interview. Semi-structured interviews will also allow the interviewer to ask follow-up questions (Lundahl & Skärvad, 1999). The empirical data gathered from the interviews are hoped to give an understanding of the considerations and perspectives that stakeholders have on storing data in the cloud, semi-structured interviews are well-advised to use, as they are flexible in that sense of

exploring new knowledge areas throughout the interview when new questions arises based on the answers from the respondents (Recker, 2013). The openness of semi-structured interview is also very well suited to identify the different stakeholder's perspective of what ethics are in this context. Ethics are often a matter of interpretation, and it is therefore important that the respondents are given the opportunity to explain their thoughts without being bounded of a script (Mason, 2002). To better understand the judgment of stakeholders when interviewing them in an empirical investigation, semi-structured interviews are also suitable because it gives good insights as well as answering straight questions (Friedman, Kahn & Borning, 2008). Some heuristics are also suggested by Friedman et al. (2008) to use in interviews, and that is to ask "why", to find out the stakeholder's reasons to their judgement, and ask about values, both direct and indirect.

4.3.1 Interview guide

Qualitative interviews are performed and is used as a tool to generate rich data to give a hint how of the respondent's reality. However, this method is somewhat criticised since the respondents might affect the interview results for political or other agendas. An interview guide was created to minimise this possibility and the impact of the researchers on the final data, (Schultze & Avital, 2011). The interview questions are semi-structured to enable follow up questions to the respondents. The questions that have been prepared before the interviews begun has been based what is highlighted in the theoretical framework. They will surround around three topics: *Cloud Computing, Stakeholders within information system, Ethical issues within information system and Contract and regulation.* To further address the issues, the four fundamental dilemmas lifted by Myers and Miller (1996) as well as in the PAPA framework, Privacy, Accuracy, Property, Access and Motivation will set the agenda of the questions (Mason, 1986; Conger et al., 1995). The general issues of cloud computing noted by Timmermans et al. (2010), will also make a print on the interview questions.

Cloud computing
This part is used to find why cloud is used, and what the different stakeholder's views are on why cloud applications are used. It aims to find if there are different views between the stakeholders on motivation to using cloud and find if there are different advantages to different stakeholders. This part also aims to find what the different stakeholders think about usability and security regarding cloud computing, and with this see if there are different opinions between different stakeholders.

Stakeholders
This part of the interviews was aimed to clarify the different stakeholder's positions in the use of cloud and identify the stakeholder's roles within the use of cloud applications. This part also aims to understand how the responsibility distribution of the cloud application looks like within the schools and the municipality. That means to find out who is in charge when something

unforeseen happens to the data, as well as finding out if different stakeholders has different perspectives on storing personal data in the cloud. Furthermore, the interviews aim to find how the stakeholders view the responsibilities of the cloud provider and how they act within the cloud in accordance to these assumptions.

Ethics in information system

The interview addressed the ethical issues in using cloud applications, and it aims to find a fundamental understanding of the stakeholder's considerations about ethics, what they believe that acting ethical mean, and how one act ethical when using the cloud for sensitive personal data. The questions in this part are about what the different stakeholders think before making decisions that affect personal student data and what they believe the consequences of this might be. This part is also an attempt to understand the actions the different stakeholders take to fully ensure that data is stored safely, for instance how careful they are with login information or how generous they are with lending accounts or information to colleagues.

Contracts and regulations

This part of the interview provided the needed insights what the stakeholders knew about contract, regulations and laws. This was necessary to be able to compare what the stakeholders knew compared to what the contracts and laws said. Without these type of question, it would not be possible to understand how the different stakeholders manage different ethical issues.

4.3.3 Selection of respondents

The aim with the empirical research is to interview three different types of stakeholder in the education system that are in contact with a cloud solution. Three different stakeholders are chosen since a wide range of opinions and different takes and experiences of the cloud applications are desired. The three identified stakeholders are *Teachers, IT-professionals* and *Principals.* A motivation why is respondent (stakeholder) have been chosen is described below under respective title.

Teachers

The teachers work with the cloud solution on an everyday basis, and will therefore, be a good source of information. They use the cloud to store information about student, make schedules, create agendas etc. The teachers are not expected to have any technical knowledge of the cloud solution, and the interview questions will be formulated to fit their level of knowledge. The teacher informants are working at private schools which means that they are a financed by outside investors and not by the state. However, the Swedish laws and regulations are still applicable to the private schools. The teachers have different backgrounds and experiences but they are all working with cloud services daily. Teachers are also the one on these three groups that works most the cloud solution, and thus will they be overrepresented as respondents.

IT-professionals
These are IT-people in schools, that have knowledge about the how the cloud based system works and responsible for providing it to different. They are assumed to have a deeper understanding of the technical details in the system, and therefore will the interview questions be designed in consideration to this. The IT-professionals that was interviewed are responsible for the IT services at both private schools and public school. They have been working with cloud services in schools since 2009 and before that they worked with other services and clients within the education system. Now, they are working with further implementation and improving Google Apps within their schools. They are also preparing and educating teachers for EUs new regulations, GDPR.

Principals
The principals are the ones in charge of the use of cloud at the specific schools, and it is therefore important to understand how they relate and view ethics in storing data on the cloud.
By investigate the views of the different stakeholders, a comprehensive view on the problem is hoped to be created. The different perspectives will then be discussed and evaluated based on the identified issues highlighted in the literature. An additional criterion in selecting respondents is that the municipality uses cloud applications in their education systems and that the teachers have experiences using these applications. The details of the respondents are specified in the table 4.1 below.

Respondent #	Stakeholder Type	Date	Length (min)	Medium	Transcription
T1	Teacher	2017-04-17	38	Skype	Appendix 2, transcript 1
IT1	IT-Professional	2017-04-18	32	Phone call	Appendix 3, transcript 2
IT2	IT-professional	2017-04-18	22	Skype	Appendix 3, transcript 3
T2	Teacher	2017-04-27	32	Face-to-Face	Appendix 2, transcript 2
T3	Teacher	2017-04-27	37	Face-to-Face	Appendix 2, transcript 3
P1	Principal	2017-05-04	54	Face-to-Face	Appendix 4, transcript 1

Table 4.1 Respondent table

4.3.4 Shaping the interview questions

The topics that the interviews will address are now determined, and interview questions are to be constructed. There are three different respondents to be interviewed as specified above. The different respondent group will in general follow the same structure, and that is questions about *Cloud computing, stakeholders* and *ethics in the information system*, and the questions will loosely be based on the PAPA + motivation framework. There will however be some differences in the interview guides to the different stakeholders, some questions might be irrelevant to ask, for example: "*What type of information do You upload"* is addressed to teachers and has no meaning to a IT-professional as they do not use the cloud system in that way. Furthermore, to promote the interviewees to elaborate on their answers, the questions has, when possible, been shaped as scenarios. For example, "*If there would be a leakage of student data, for example a data breach, or someone unauthorized would get access to data, who would you say is responsible? What would you do?"*. Doing scenario questions are also done to make the interviewees better understand the questions, as well as get more accurate answers that could be applicate to reality and reflect how the respondents would react in a real situation.

4.3.5 Interviewing

When performing a qualitative study, there are some pitfalls that should be considered to perform adequate interviews. Myers and Newman (2007) mentions a classic pitfall often encountered by the researcher, that pitfall is that the subjects feel that they have to come up with an answer or opinion during the limited time of the interview has, and this can lead to misleading

answers. This is to be avoided by making sure that there is no rush through the interviews and that the subjects are given all the time they need to answer the questions. Another pitfall when not giving the subject enough time is that it can result in lack of trust between subject and the researcher (Myers & Newman, 2007). This is important since this investigation include different people with different experiences. By conducting interviews that avoid the common pitfalls; the respondent become more confident and can explain their reality with their own words (Kvale, 2006). Allowing the respondents to use their own word and not be afraid to say the truth is of high importance in this thesis. The reason why it is important comes down to the fact that the respondents might be afraid of telling the truth because the information that they say might not be according to their school policy concerning the usage of cloud services.

This is also a motivation to the researchers to spend enough time on the interviews, and it is also important to create a trustful relationship with the subjects. This is especially important in this type of study since some questions handles privacy. For instance, will questions address how stakeholders store sensitive data that could be dangerous if it was leaked? Another pitfall to consider is the Hawthorne effect, which might make the answers differ from reality if the subject hasn't done similar interview before. The Hawthorne effect can be avoided by using a dramaturgical model as guideline to the interview. The interviews have semi-structured questions the interview material can vary to some degree and the questions might be interpreted differently from each respondent. However, there is no right or wrong way to how to elaborate the questions because each respondent thinks and acts differently depending on their situation (Qu & Dumay, 2011). Some of the interviews was performed through digital medium such as Skype and mobile phone. A program called *Amolto* was used to record the interviews done in Skype. The interview made with mobile phone a laptop microphone was used to record the sound.

4.3.6 Pilot interview

The first interview that was performed with T1 was (teacher) in the early stages in the thesis. Therefore, some of the questions were different compared to the questions that was asked to the other teachers. However, the answers that was provided by T1 was still of importance and of value for this thesis. The answers that was provided helped the authors to shape the new questions that was more valuable for this thesis and to get an understanding how schools could work with different cloud services.

4.4 Data analysis

There are several ways to operate when analysing data collected in a qualitative study, it depends partly about the study, but in general, it is important that the collected data is easy to overview and easy to understand (Cohen, Manion & Morrison, 2013). Jacobsen, Sandin and Hellström (2002) describes three steps that is used in this study to perform the analysis: *Description, systematization and categorization* and *combination.* Analytic and integrative skills are required from the authors to be able to perform a qualitative analysis (Bhattacherjee, 2012).

4.4.1 Interview transcription

The first step in the analysis process is to transform the audio recording from the interviews into text, which part of the description step (Jacobsen et al., 2002). This will be done by manually transcribing the recording into text, to make them easier to follow and to interpret. The interviews were conducted in Swedish and hence it is required to translate the interview to English, which was done in connection to the transcription. The transcriptions were performed by one of the authors, and to ensure that no misinterpretation of the interview was made in the transcription, the other author reviewed the transcription and translation of the audio recording. The transcription of the interviews does not contain every word that was said during the interviews and the reasoning behind this was to make easier for the reader, simplify the data analysis and codification. However, word as "like" and" so" is included in the transcript since it in some cases add value to what is being said by the respondent. Moreover, the transcripts are almost exact reproduction of the interview and major reduction are not made which is some of the guidelines presented by McLellan, MacQueen and Neidig (2003). What is not included in the transcript is different human aspects such as emotion and general state of the respondent.

Table 4.1 demonstrate each position of the respondent (stakeholder), the author who transcribed and quality assured the transcription. Both authors attended all the interviews and the author who transcribed or quality assured could vary. The reason it could vary was because one of the authors were not able to work online and therefore, one of the roles were more fitting.

Respondent	Transcript	Transcribed by	Quality assured
Teacher	Transcript 1	Herman Engström	Henrik Warrol
IT-professional	Transcript 2	Herman Engström	Henrik Warrol
IT-professional	Transcript 3	Herman Engström	Henrik Warrol
Teacher	Transcript 4	Henrik Warrol	Herman Engström
Teacher	Transcript 5	Herman Engström	Henrik Warrol
Principal	Transcript 6	Herman Engström	Henrik Warrol

Table 4.2 Transcript scheme

4.4.2 Coding and analysing the data

The next step in the data analysis process is to code the transcribed interviews. Coding is the most common form of qualitative data analysis and the steps presented by Bryman (2015, p.767) was used to perform the coding. The coding is necessary for gaining a better understanding of what is being said in the interviews when performing the data analysis. However, it is important

to let the interview speak for themselves and not let the data analysis become to the centre of attention (Kvale, 1996). The following steps in the coding process is based on the steps presented by Bryman (2015).

The first step in the coding process was to read through transcriptions from every interview without taking any notes. This gave an idea what was being said during the interview and possible codenames was thought of. After the first step was complete; the second step was initiated which meant to read it again but this time taking notes about what was said by the respondent. There was no limit how many notes or keywords that you could make, everything that came to mind was written down. These notes generated a list with codes that later would be reviewed by the two authors.

Initiating the third step of the coding process, the authors reviewed the list with codes and removed the ones that were redundant or not relating to the literature. For example, a separation between primary data and metadata was made. Metadata explains who the informant is was not coded since it was outside the scope of the interview and therefore, few questions about such information was asked. The primary data that did not get coded was either outside the scope of the interview or redundant, therefore, some paragraphs are not coded. The final list can be seen in table 4.3. The fourth step in the coding process was to categories the codes under three different topics. This was done to get a better overview of what is being said by the respondents and to easily perform the data analysis. Table 4.3 is the result of the coding and data analysis process. Later in the process of data analysing it was noticed that only have one or two letters in the case was not the optimal solution. However, it was solved by making the search case specific, for example, the search function would only search for AC. This search method did not include lower cases, therefore, only letter with uppercases was found in the search.

Cloud computing	Stakeholders	PAPAM	Rules and regulations
CS: Cloud service **CK:** Cloud knowledge	**G**: Government **R**: Responsibility **PE**: Teaching performance	**PR**: Privacy **AC**: Accuracy **PY**: Property **AS**: Access **MO:** Motivation	**PO**: Policy **CSS**: Contracts

Table 4.3 Coding Scheme

4.5 Research quality

To ensure that the empirical study was made in an ethical way and in accordance to scientific ethical principles, four main principles has been used. These main principles have been highlighted by the Swedish Research Council (2002) and are *Information principle, principle of consent, principle of confidentiality* and *principal of usage.* These principles have been used

when the interviews were performed to ensure the integrity of the respondents as well as the quality of the empirical research. The principles are:

1. *Information principle*. The respondents were informed before the interview begun about the purpose of the study and what their role in the study were as well as a brief description of how the interview would proceed.
2. *Principle of consent*. The respondents were informed that they are free to participate in the interviews, and they are also free to cancel the interview whenever they want.
3. *Principle of confidentiality*. The respondents were informed that they can be completely anonymous if they so desired.
4. *Principle of usage*. The respondents were informed that the material and information gather from the interview only would be used in a research way. It will not be used in any commercial or other non-research ways. The respondents are also offered to receive the results to check for any possible misinterpretations or misunderstandings before the paper is finally published.

4.5.1 Reliability

Reliability means to what degree a scale can be used to measure the same construct several times to get a similar result every time (Bhattacherjee, 2011). The more similarity in the results the higher is the reliability. To ensure reliability in a qualitative research as this thesis is, it is crucial with an examination of the trustworthiness (Golafshani, 2003) Therefore, the results from the interviews were critically examined. That means that the transcriptions were carefully read through and a background check on the respondents was also made so that there was no doubt that the respondents knew the area they were interviewed about. To ensure further reliability, all the transcripts and interview questions are attached in the appendix so the reader easily can follow the procedure of the qualitative study and perform a similar study with similar outcome. Lastly, the interviews were recorded with two artefacts to completely ensure good quality of the audio files.

4.5.2 Validity

Validity is how accurate the measures made in the research match what it is supposed to measure (Bhattacherjee, 2011; Golafshani, 2003; Recker 2013). The validity in this report has been ensured by constructing the interview questions based on what has been highlighted in the literature review. As the literature review aims to give an in-depth explanation of the concepts that the research question consists of, it would be an accurate foundation to build the qualitative study on. The PAPA framework has been a foundation in the questions, and the questions will regard the three main parts of the literature review: *Cloud computing, stakeholders* and *ethics in information systems,* in order ensure that the interviews are aligned with the research question. Myers and Newman (2007) also discuss the importance for the interviewee of "situating as an actor" before the interview starts, because the interview is a social meeting, and the interviews

are ideographic. Myers and Newman (2007) also encourages questions like "Who are you?" or "What is your background?". These kinds of questions will be integrated in the interview guide because of the information they provide can be useful to the readers of the thesis so that they can evaluate the validity of the results and interview answers (Myers & Newman, 2007).

While conducting the interviews, the interviewees has been trying to be as objective as possible, both when following the interview guide, but also when asking follow-up questions. The interviews have also been conducted in such way that the respondent elaborate on their own thoughts and perspectives on the issues as much as possible without interfering or attempts to push them into a certain direction. The authors, whom also conducted the interviews, has also tried to avoid letting the interviews in the early stage of the data collection process set the tone for the latter ones, so that every respondent receives the same questions.

4.5.3 Ethics

This section aims to describe how the thesis will relate to ethics and how ethics in the qualitative study will be achieved. Also, note that ethics in this section is about ethics in the research methodology and thus is not to be confused with the ethics that the research question aims is about. Ethics in research is of importance to the study because it deals with what is right, wrong, virtue and justice (Recker, 2013). Interviews has been conducted with respondents what might work with sensitive or private information, and hence it is important for the researcher to consider ethical aspects when conducting the interviews. It is thus the responsibility of the researchers to ensure that everyone involved in the interview process feels safe with sharing information and it is up to the researchers to protect the respondents and their privacy (Recker, 2013).

There are several situations highlighted by Brinkmann and Kvale (2005) that could occur while conducting interviews. One example is that the interview becomes loft sided, a one-way dialogue or a manipulative dialogue, this is something that should be avoided as it doesn't follow the ethics of qualitative research. Furthermore, information that has been gathered from the interviews might have to be edited or deleted before the final publication of the thesis, depending on what the respondents thinks about the information they've provided, that means that confidentiality is very important (Recker, 2013). The purpose of the thesis and why we need the opinions of the respondents will be clearly stated before the interviews starts, as well as information about that the respondents have no obligations to participate. The AIS code of conduct gives information about how to avoid plagiarism, falsification of data and misinterpretation (Bhattacherjee, 2012), which will be useful to generate a higher quality of the qualitative research as well as avoid ethical mistakes.

4.5 Writing up the thesis

After all the data is gathered and processed through transcription, analysing and coding, the structure of the manuscript will be designed. There are several different structures to be used in when writing up the thesis and the selected structure is dependent of the topic of the thesis (Recker, 2013). To identify a suitable structure, Recker (2013) suggests looking at similar studies that has previously been written on the same topic by a trustworthy author to be used as a template. Recker (2013) further describes a structure that is advised to be used when writing about information systems as this thesis does, and that structure is the following: Introduction, background, research model, research method, results, discussion, conclusion, abstract and acknowledges. This structure will be used in this research, with a complement of a case description that are chapter 3. Before the thesis is finally published, it is suggested that it is to be review and read through several times, both by the authors, and by a co-student to leave feedback and ensure that the study is properly written (Recker, 2013).

5 Empirical findings

Presented in this chapter are a summary of the semi-structured interviews that has been conducted throughout the thesis. It aims to provide a broad picture of how cloud is used in education today, and what the different stakeholder's perspective on the use of cloud computing. This will also provide information about how stakeholders within education manage ethical issues.

The respondent is divided in three different stakeholder groups: Teachers, Principals and IT-professionals. All the respondent, independent of group, have insights in the use of cloud. The teachers do work every day in the cloud, although they might lack technical understandings. The principal is the decision maker and the responsible of the system, and thus also has administrative knowledge on how the cloud solution work. The IT-professionals have a deeper technical knowledge. Based on interviews with these stakeholder groups, a result of how cloud is used in education today will be reached. The referencing will be based on the coding for example, IT1 will represent what is being said by IT1 in the respective interview. Row X will reference what row that certain information was said.

5.1 Cloud computing

5.1.1 Cloud services

Cloud services in schools started to be used around 2009 (IT1, Row 10). The most common cloud service to use is without doubt Google (T1, Row 8; T3, Row 8; T2, Row 10). Google is stated by IT1 to be free of charge, is according to the respondent the reason why Google is dominating the education sphere, and it is impossible for a competitor to conquer market shares unless the service is for free (IT1, Row 42). The cloud services allow the teachers and student to communicate with each other more easily (P1, row 16). Google Drive is used by teachers to communicate between other teachers, manage email services etc. And Google Apps for Education (GAFE), or Google classrooms are used by teachers and students (T2 row 12), it is mainly used for uploading documents to make them available for students, but also for students to hand in assignments. T2 states that she tries to limit the amount of data uploaded to Google's apps, because of an unawareness of the laws regarding this (T2, row 18), regarding the rules she states: *"...is a bit fuzzy on this, so we try to minimize information about students and call them by name"* (T2, row 18).

All the examined schools use Google in their everyday work, but the requirement on using it appears to vary. Respondent T1 states that Google has been implemented by the municipality and the teachers are supposed to use it, at T3: s school they have gotten strict directions to use Google's applications while T2 says that they are encouraged to use GAFA in their education,

and all teachers are given access but it is not a constrain. T2 states however, that they are forced to use another cloud application, School Soft, which is used more for reporting (T2, Row 64; T3, row 55). But she also says that at her school, it is mostly up to the teachers to use whatever application they like best, there are no united policy in what application to use for what (T2, row 22). "*Some use a lot of Classroom, and some uses SchoolSoft, some uses maps in Drive for their students, so there is not united policy* " (T2, row 22). More cloud services that is used is Onedrive and other Microsoft applications as well as Fronter (IT2, row 8; T2, row 10). The cloud service that P1 use at their school is GAFE for sharing simple documents and information with the students. For sensitive information, they use Fronter and email even though they that email is not the most secure (P1, row 10; P1, row 12). For student health, they use a closed system called Asynja (P1, row 14). P1 also mention that they are going to start use the software Its Learing for reporting grades soon (P1, row 18)

5.1.2 Cloud knowledge

Respondent T1 states that not all the teachers completely understand the concept of shared folders and no one does not know anything about what to do or not to do in the cloud (T1, row 42). T2 says that she has received no training in how to use cloud (T2, Row 20). T1 also believes it is not only the teachers, but the principals and the municipality as well that lacks understanding about the cloud and what they can upload (T1, row 70).*"I do not think anyone within the municipality really know what is ok and what is not, I think that is the biggest problem"* (T1, row 70). However, T1 points out that teachers generally know what sensitive data is, and T2 explains that at her school it is up to the teacher's' judgement to decide whether something is suitable to upload to the cloud (T2, row 22). T1 believes that it is just a matter of time before someone uploads something that they not are supposed to (T1 row 93). But it is not only administrative staff that lacks knowledge about the cloud, T2 express some doubts in that parents and students are aware of the consequences storing data in the cloud can have (T2, row 50). Despite the lack of general knowledge using cloud, T3 has experiences some advancements, she explains that they use to write students' grades in Google drive, but they recently changed that to a what is believed to be a more secure system (T3, row 29).

5.2 Stakeholders

5.2.1 Performance

Performance is how the stakeholders view upon performance of the cloud services, if it helps them to manage ethical issues or not depending on the efficiency. T3 believes that the popularity of cloud in education has given the education a larger variety, and made the classes more fun, as well as changed the way of working (T3, row 71). Cloud in education has also given teachers an increase in flexibility of work, in a sense that the work station can be accessed anywhere (T1, row 32). IT1, an IT-professional, talks about the ability cloud gives to audit cloud activity, that

means, according to him, that it' possible to see exactly how many documents are shared outside the domains (IT1, row 22). This is something he recommends other to do, to use tools that can monitor user activity (IT1, row 58), and GAFE offers tools like that.

IT1 points out the advantage that GAFA is free to use, and he further speculates that this is according to Google's strategy, to later, the users of GAFE will be used to Google's software and apply it to their businesses (IT1, row 42). But even though cloud services can offer advantages and make the work more efficient, there are downsides. For users that lacks general computer knowledge, it can be time consuming, for example remembering different passwords to the multiple tools (T3, row 51). T2 explain that the teaching process and the pedagogical work becomes easier since cloud service enables fast sharing of information (T2, row 62). T3 spends around six hours a day on cloud services both during teach and administrative work (T3, row 47). Even though six hours are spent every day on cloud services it has made the work for T3 easier and more fun (T3, row 71; T3, row 73). P1 is not spending that much time on cloud services but is a fan of the flexibility and the possibility to share information in an instant (P1, row 54). With that said P1 thinks that the teachers have become more effective in some sense but it might also have increased the workload (P1, row 98; P1 row 94).

5.2.2 Responsibility

In case of a leakage of data, it is the board that has the final responsibility, both in private and public sector (IT1, row 26). The board is responsible to provide teachers with policies to follow regarding what to upload and what not to upload, and in case of a mistake made by a teacher, both the teacher and the board is held responsible (IT1, row 30). Regarding security system, the IT offices is the one responsible to provide this and to address any exploits or misuses (IT2, row 25), and it is the IT department's responsibility if the system for some reason is unavailable for the teachers (T2, row 40). Respondent T3 describes an incident where the internet connection broke down for two hours, which essentially made her cancel the lecture because she is so dependent of internet to give her lecture in social science (T3, row 43). T3 explains that at her school, it is the principal's responsibility to know what to upload in the cloud, but at the same time, she is uncertain that the principal is aware one what is allowed and not allowed (T3, row 45). P1, the vice principal, is uncertain of who is responsible when something leaks out, (P1, row 46). If a teacher is the one whose carelessness has resulted in a leak, he thinks that teacher is responsible, but at the same time, he believes the board will get the blame for it.

5.2.3 Government

The empirical findings are covering everything that must do the government and their regulation. For instance, their regulation and policies concerning the use of the usage of cloud services in school. An example could be, Malmö municipality and their actions within areas that touches upon cloud computing, stakeholders and information system ethics. T1 mention that it is Malmö municipality that moderates their Google drive (T1, row 16). Malmö municipality have quite

large influence what type of functions Google Apps should have and an example of this is the downscaling of the amount of functions (T1, row 18). This is both positive and negative, since Malmö municipality maintain control over their service but the downside is that they must control every update thus the functionality is scaled down (T1, row 20).

This kind of control and centralisation of communication have caused employees to be confused. Moreover, all the information that Malmö municipality release goes through Google and individual communication goes through Outlook (T1, row 28). T1 continues and explain that Malmö municipality is responsible for all the contracts with Google and not the school itself (T1, row 48). The municipality that is responsible for the push of GAFE to P1 school was the imitative of respective municipality (P1, row 82). However, P1 trust the board that they would never buy a leaking system," I *trust my board that they would never buy such a system"* (P1, row 110)

Regarding policies, it is according to IT1 up the board to assure that these are in place (IT1, row 30), and as of the teacher T2, it is the IT-department that answers questions regarding uncertainties of cloud usage. P1 is making a clear statement that the Swedish Computer authority have made little to no effort to try explaining for their school how to handle cloud services, especially concerning ethical rules. A clearer statement from this authority concerning ethical rules and cloud regulations would be appreciated (P1, row 36). The law that the Swedish Computer authority is most concerned about is the PUL that contains the regulations of personal information. P1 says if they would have done an inspection when something went wrong, it would be all over, but then again which school could handle such an inspection? If you use personal number is in the wrong place connected to a name, then you have violated the law (P1, row 64). PUL is also the law that IT1 is referring to (IT1, row 24).

5.3 PAPAM

5.3.1 Privacy from principal and IT-professional perspective

In this case privacy is concerning sensitive information about the students and general school information. There seems to be somewhat consensus what sensitive information is between the teachers but with some uncertainty if you compare it to the Swedish Computer authority regulations. IT1 explains what the Swedish computer authority says about sensitive information in the schools and the following is stated "*Sensitive data, is information that can refer to the laws, for example discrimination, PUL, health and social life, according to the law*" (IT1, row 18). IT1 also states that you cannot exemplify this because then it becomes uncertain what it means and that we must stick to the laws that we got (IT1, row 18). To be able to follow the laws properly, policies should be created. For example, you do not write or save anything that have to do with sensitive data not even an email which people tend to do, people think it is ok

but it is not (IT1, row 18). IT2 that also is an IT-professional are aware of the problems that might occur if sensitive information or privacy is handled with care. Therefore, at IT2 school they have well-constructed agreements with Google that are in favour of the school and not Google in the sense of privacy concerns (IT2, row 29; IT2, row 41).

These statements about privacy and sensitive information about the students, gets confirmed by the principal that say "*When you are starting to connect, expressions like if someone have difficulties reading and writing or maybe some languages problems connect to a personal number and maybe a name.*" (P1, row 30). Information concerning a student's health they do not use a normal cloud service like Google Drive, instead they use a legitimate information system called Asynja (P1, row 31). This information lays the foundation what privacy is within Swedish schools and the next step in this empirical finding is to demonstrate how the teachers manage this factor.

5.3.2 Privacy from the *teacher's* perspective

The teacher does not have the same concrete understanding what sensitive information and privacy is. T1 is unsure what sensitive information really is and the education that T1 got said that you should never upload any sensitive information but never explained what it really is. Therefore, T1 relies on common sense and do not upload sensitive information that could be sensitive such as protected identity (T1, row 64). However, T1 says that they have pictures, names, age and a phone number to each parent. If this information is sensitive T1 do not know and asks where do you draw the line for what sensitive information is (T1, row 64). T1 also asked the colleagues at the school concerning privacy and they knew even less than T1 does.

The perception that T1 got about this concern is that somewhere along the road someone will make a mistake and upload something illegal. T1 thinks that not even Malmö municipality fully understand privacy or cloud services at all (T1, row 93). The understanding of what can be uploaded and not seems to be a trend that is not only a concern at T1 school but also at T2 school. T2 states the following "*we try to limit the amount of data that we upload, because we are not sure about how much we can upload, we have tried to figure it out, but the Swedish Data Inspection Board is a bit fuzzy on this...*" (T2, row 18). However, T2 is a bit surer what sensitive information is than T1 but still unsure what can be uploaded.

Sensitive information according to T2 is social security numbers, information that is about me or my students that could be used against them (T2, row 30). However, T2 do not upload that could be sensitive, instead School Soft is used that is a closed system. Instead T2 use School Soft that have policies that explain what you can upload if it is sensitive information such as personal numbers (T2, row 36). T2 have tried to figure out what sensitive information is and did so by

emailing the emailing the IT department. However, the answer T2 got was just "*... Use common sense"* but T2 wanted to hear "*according to law you can do this"* (T2, row 56).

It is also important to mention that the parents and students are aware that information is stored about them (T2, row 46). Moving over to what T3 thinks about sensitive information is somewhat the same understanding as the other teachers. However, there is still an uncertainty what can be uploaded. T3 thinks of sensitive information as different layers; where one layer is where the student cannot see each other's work; the other layer is that T3 do not show results from different exams to the students; another layer is that the student cannot know what the teachers are saying about a specific student or student group (T3, row 31).

T3 also mention that the students must sign an agreement with the school that it is allowed for them to store pictures of them, because School Soft allows the students to have a profile picture (T3, row 31). Everything is not digitalised, for example, when T3 is taking notes from a meeting then T3 rather use pen and paper. Then, conclude the information and send it to the respective parties (T3, row 41). The perception that T3 have is that the student should be aware that information is being stored about them since everything is happening on the cloud (T3, row 51). T3 mention that they have a class guide where they store information about different classes. T3 says the following concerning this folder "*For example, some students that work with each other and some do not maybe one student have health issue, but very important is that the medical journal is not on the drive or any folder but maybe some required adaptations*" (T3, row 23). The reason why this folder exist is that the teacher easily can check up any special requirements. For instance, if some students need extra time during exam or separate room. Moreover, there are also folders that is also is only shared by the teacher that contain information about meetings and school progress (T3, row 23). At T3 school they had problem with privacy about three years ago where student took pictures of each other, this created concern amongst the parents, especially since it can be very dangerous for students with protected identity. Therefore, they have a zero tolerance against these types of action (T3, row 53). It is important to remember that School Soft takes care of the results but comments about a certain exam can be made in both Google Drive and School Soft (T3, row 55).

5.3.3 Accuracy

T1 points out that a concern regarding the use of cloud in education is that older generations does not completely understand why they should use it, and thus does not use it as much as they could. He argues that it then is difficult for him to make use of it to its full potential, since it is based on sharing (T1, row 30). T2 explains that at her school, they use a system called SchoolSoft for storing more sensitive student information. In this system, SchoolSoft decides when the information is filed, and it is up to the school itself to decide what information to file. However, she describes an incident where the IT administrator at the school forgot thinks which

resulted in a loss of data. This school has since this incident implemented backups and routines to avoid this from happening again. (T2, row 40).

P1 does not ensure that the information teachers upload to the cloud is adequate, instead he hopes that everyone understands the limits of what and what not to upload. He further explains that he could not ever control everything that is being uploaded (P1, row 38). P1 also explains that if something unforeseen would happen to the data, they would review the logs to try to identify where the problem happened (P1, row 44). He says though that he thinks a good hacker would cover its tracks, and he quotes: *"But I am really afraid of the day when someone implement some malicious software into our organisation"* (P1, row 44).

5.3.4 Property

A problem explained by T1 is that the IT responsible own the account with authority to edit the school website, if he would quit his job, all the things he has on his drive must be copied and added to the new IT responsible account, if this is not done within two months, the account is automatically deleted and the whole website would be gone. (T1, row 46). T2 raises similar concerns in that sense that when someone quit, his or her Google drive folders remains, and no one can access them, as the one who quit still is the owner (T2, row 28). She explains that this is something they are currently battling, and it makes the whole system a bit insecure (T2, row 28).

The idea of Google is that everyone should participate, and there should be no hierarchies, however, IT2 points out that this has made everything a bit chaotic (IT2, row 19). So, to solve this, they have at his school made a super user in Google drive, who can create a folder hierarchy, which have partly solved this problem. IT2 also says that it is their organisation that own all documents produced within it (IT2, row 27). Like this, IT1 explains that it is the organisation, i.e. the school, that owns any documents produced, so it is not the teachers that produces the documents and it is not Google that stores them (IT1, row 32), this is also what T3 has experienced in her organisation (T3, row 80). Vice principle P1 doesn't know about any contracts regarding ownership with Google, but in ItsLearning, which is the system they use for more sensitive information, they have a contract saying that it is the school that owns the information stored there. The teacher T2, however, believes that the ownership of information is unclear, *"And of course if information is spread in wrong way and the ownership is not clear."* (T2, row 68). She signed a contract when she started working saying the information created is owed by the organisation, but, it is according to her confusing when the creator of a folder in Google drive is the owner of this (T2, row 70). Another issue regarding ownership is per T2 that folders can have multiple owners, which makes it difficult to know whose responsible (T2, row 79).

5.3.5 Accuracy

Using Chromebooks together with Google drive appears to be a common way to go, IT2 says that at his school, they use Chromebook so that the students can't store anything on them, but still access GAFE (IT2, row 37), Chromebooks is also something IT1 and T2 uses at their schools (T2, row 50; IT1, row 36). Different positions at the school has different privileges in Google apps (T1, row 22), and Google Apps can be accesses from anywhere (T1, row24; IT1, row 36; IT2, row 17; T2, row 66). T1 says that he can see in Google drive what folders are shared with who (T1, row 36), and since that everything is logged, T1 thinks it'd be difficult for someone to leak information or do anything else illegal (T1, row 89), this is also something that P1 points out, but he believes that if someone would hack their system, he probably also knows how to clear his tracks (P1, row 44). T3 explains that they share folders, planning and schedules freely at her school through Google drive (T3, row 56). She also says that the access to folders make her think of what to upload. She is more careful with uploads depending on who, or how many, have access to the folder (T3, row 63).

5.4 Contracts and regulations

5.4.1 Contract

T1 explains that Malmö municipality has an agreement with Google, but these agreements makes the functionality of Google Apps suffer, when Google updates something, Malmö municipality must make reviews of the changes before adopting them, which always makes the private version better (T1, row 18). IT1, an IT professional describes that they also have agreement with Google, and this agreement is very strict in that sense that if Google does something wrong with the data, it is Google fault and IT1s organisation have the right to sue Google (IT1, row 32). IT1s agreement also states that Google have no right to use the information for marketing purposes (IT1, row 44; IT2, row 41). IT1 is confident with the agreement with Google: "*It is a consensus amongst service people that Google have better security solution than most in-house constructions*". IT2, however, says that the Swedish Data Inspection Board, have concerns regarding Google apps, but according to new contracts, it is possible to ensure that data is stored within EU and thereby covered by EU regulations (IT2, row 29).

P1 however, states that he, as a vice principle at a school that uses Google Apps, never has seen a contract from Google (P1, row 102). He continues and says that everyone should understand that information about you on the internet will never disappear (P1, row 102), and he admits that he is a bit scared that they don't own the information (P1, row 104).

5.4.2 Policy

According to T1, all the schools within Malmö Municipality are supposed to use Google drive in their education (T1, row 12), T3, who also works at a school in Malmö, but private, has similar directives on using GAFE (T3, row 13). T2 explains that they use multiple systems, GAFE, SchoolSoft and Fronter, but that there are no policy regarding what system to use in what situation, but she believes that a policy is being worked on (T2, row 22), and she says that they at least are aware of that this is a problem (T2, row 26). However, regarding student's personal development, there is a policy to use SchoolSoft (T2, row 36). The result of privacy will contain more information because it is the factor of highest concern compared to the other factors.

T1 states that there is a great uncertainty in what can do in the cloud, nobody knows and there are no policies on this either (T1, row 42). He has not signed any contracts regarding cloud usage either, "*No, I have not written my name on any paper concerning this, who responsible and so on" (*T1, row 76). T2 has similar thoughts, she turns to IT when she has questions about what to upload to the cloud, but usually the answers are fuzzy, or "*just use common sense*" (T2, row 56). T2 points out the need for a clear policy and a guide to using the cloud (T2, row 74). P1 explains that they have some guidelines at his school on how to be invited to folders in Google (P1, row 51), but more than that, there are no written policies or rules for the teachers to follow when operating in the cloud (P1, row 70). T2 have confronted the board with the problem but problem have only been recognised and not solved (T2, row 74).

IT1, an IT professional, points out that, in his municipality, they have policies of data regarding ethnicity, religion, health conditions etc., that data like these are forbidden to store on the cloud as well as sent over email (IT2, row 13; IT1, row 18), and it is up to the board to make sure that these policies are in place (IT1, row 30). He also states that the documentation, education and policies surrounding the use of cloud will increase as the EU regulation General Data Protection Regulation (GDPR) will start to act (IT1, row 36). IT1 also believes that teachers generally know what sensitive data is, and how it is supposed to be handled (IT1, row 66). IT2 explains that they have routines and instruction which teachers are to follow, and that this is the documentation they rely on to ensure secure usage of cloud (IT2, row 31).

6 Discussion

This chapter discuss the empirical findings in combination with the theoretical framework. The layout of the discussion is based upon the four topics that are included in the theoretical framework: Cloud Computing, Stakeholders, PAPAM and Contract and regulation. At the end of every sub-chapter a summery will be demonstrated.

6.1 Cloud computing

Cloud computing has become popular in education, and all respondents from the empirical study says that they use Google apps mostly for communicating with other teachers or their students, as well as for sharing files and folders. Some schools use it more and some use it less, but common for all schools is that they have other cloud based software than Google when reporting grades and handle other data that according to the Swedish law, PUL, is considered sensitive, i.e. health condition, political or religious views etc. (IT1, row 18).

A risk with cloud computing highlighted by Timmermans et al. (2010) is that of monopoly and lock-in. When there is only one or a few providers of cloud services available, which is the case today of Google in education, there is a risk of that the user autonomy is harmed (Timmermans et al., 2010). However, this could also be a safety, if more organisations are using the same cloud service it could also decrease the possibility of that company going out of business (IT1, row 56). Google is free of charge to use by schools, and thus nearly impossible for other operators to compete with Google, at least when it comes to software for communication, sharing files and folders as Google drive and GAFE is used for. It appears to be some uncertainties to what to upload and what laws that are in place. T2 (row 18) states that she tries to limit the amount of data uploaded to Googles platforms because she is uncertain of the laws to apply. T2 further explains when asking the responsible actors (IT department & principles) about what laws to refer to, the answer has been that it is up to the teacher's judgement to decide if the data is suitable to upload or not. Regarding this concern, P1, a vice principle, are aligned with this view and states that it is up to the teacher's judgement (P1, row 72).

The knowledge about cloud vary between teachers, letting the judgement of teachers decide what to upload and what not can be argued to be a doubtful stance. The respondent teachers say that they have no training in using cloud services (T1, row 58), thus is it argued here that it is not advised to lay the responsibility of deciding what or what not to upload to the cloud on the teachers without providing proper training in using the software.

Lewallen (2012) highlights an example of lawyers handling sensitive client data, where it is argued that laws should be applied that forces the lawyers to handle this sensitive data

responsible and with care within the cloud. Lawyer's client data is sensitive data just as student data is, and it can thus be argued that these suggested laws should cover schools as well. Providing schools with clear, governmentally instituted laws about what to upload or what not to upload could be a solution to the uncertainty teachers are experiencing in what to upload to the cloud (T2, row 18). It is suggested that laws applied to cloud used in education will clarify for the teachers and thus minimise the risk of wrong data gets uploaded, and avoid future incidents. Not only would this force the teachers to think about what to upload to the cloud, but also it would also it would ensure a responsible handling of student data. Having strict laws is a moderation of what Bruin and Floridi (2016) argues for, not to upload any sensitive data at all to the cloud. This is a very harsh approach, and as more and more software move to the cloud, it can be considered as a step backwards to completely forbid the use of cloud for sensitive data, especially in education where cloud is becoming standard, and a necessary tool for teachers to have a flexibility in their work.

As the teachers examined in the empirical study has not received any, or in one case just a brief special training in using the cloud or risks with the cloud, (T1, row 58; T2, row 20; T3, row 25), the knowledge about cloud and risks related to cloud can be assumed to be inadequate. Hence, it is advised that teachers receive proper training in using the cloud if it is up to the teacher's judgement to decide what and what not to upload, as the case apparently is in many schools (P1, row 72; T2, row 24). Moreover, governmentally instituted laws on what to upload to the cloud is in place today. However, these laws are somewhat unclear, and they appear not to have reached the teachers completely, T2 quotes: "*the Swedish Data Protection Authority is a bit fuzzy on thi*s, *so we try to minimize information about students*". So again, it is up to the teacher's interpretation what gets uploaded to the cloud, and thus must the laws be clearer and ensured to reach the teachers knowledge. This results in two propositions to improve the management of ethical issues of cloud solutions in education. 1) Provide the teachers with proper training in using the cloud and the risks with using the cloud; 2) Ensure that the appropriate laws reach the teachers, and that the teachers completely understand them which reduce ethical errors.

6.2 Stakeholders

Teachers, principals and IT-professionals are not the only stakeholders that have an impact on the cloud services that schools use. Other stakeholders are also Google (supplier), the Swedish government and different municipalities. These stakeholders have an influence of how the organisation is going to work with their cloud service (Freeman, 2010). For instance, one municipality controls what functionalities each schools cloud service should have access to (T1, row 18). This means that the one municipality have taken an active stand as stakeholder, embraced cloud service and taken in into their strategic plan. Bruin and Floridi (2016) also suggests that the regulations of the cloud providers should be as small as possible, or else the innovation of the cloud solution can be harmed. This is one position that the government can take to gain control (de Bruin & Floridi, 2016). However, the cost to have this control is

decreased cloud functionality, but the municipality gain control over their cloud service. The teachers might think this is an unnecessary precaution since no incidents have happened yet. However, there have been incidents such as the *CloudBleed* where sensitive information has leaked from the users of the cloud services and with the increasing digitation of the school, this might become a reality for the schools as well.

A different municipality might take a different path and not have any control of their respective school cloud services. This is the case for one of the performed interviews, where it is up to the teachers and principals how to control the cloud service. The only directions they got from their municipality was to follow the PUL law (P1, row 36; P1, row 64). This means that the government as a stakeholder have taken no position in the matter and just trusting the principals and teachers that they follow the PUL law. This tendency of trust in the teacher's professionalism permeate the whole school (P1, row 116). However, it is important that the teachers understand this relationship else it could cause low productivity (Freeman, 2010). Therefore, at this school it is up to the teachers how to manage their cloud services. If the school had better regulations and policies it could probably increase the productivity and make the teacher more confident on how to use the cloud service. More about how policies and regulations could improve the management of cloud services will be discussed in the Contracts and Regulations section following below.

The two examples above are examples where the stakeholders have taken two different paths due to directions from their municipality. However, from the interviews with the two other teachers from private school, they seem to have taken a path in between no control and a bit more control. An important stakeholder in this matter is the school board that take the macro decisions such as implementing cloud services. T3 are forced to use cloud services such as GAFE in their work which is a school board decision (T3, row 68). This means that the board as a stakeholder is actively embracing cloud services (de Bruin & Floridi, 2016). However, at T3: s school they have received almost no information from the school board how to manage cloud service and even less information about ethical issues. T2 is in the same position but is not directly forced to use GAFE but still use it daily and needs directions or regulations from the school board (T2, row 74). However, the board might have problems seeing future issues and developing policies could be a clash of interest (Myers & Millers, 1996).

This negligence of not contracting any guidelines, regulations or policies on how to use the cloud services is a concern of the teachers. This is a question of responsibility, is it up to the Swedish Data Protection Authority, IT-professionals or the municipality to constructs these guidelines or policies? According to the interviews with the teachers there are no policies or regulations except the PUL law. However, at one school they do have a manual with some policies but what kind of policies this manual is containing is uncertain (IT1, row 48). Yet, there is no information about who is responsible for constructing these. The only statement the government says as a

stakeholder to the schools is to follow the PUL law (P1, row 64, IT1, 18). The problem with that statement is that not everybody understands what the PUL law means or no one has explained it to the stakeholders within the schools (T3, row 39; T1, row 14; T2, row 22). This could be solved by delegating responsibility and constructing policies (Timmermans et al, 2010). These policies should be part of the cloud education that some teachers have received. The policies should provide information about what the teacher can upload and what they can write and not write (IT1, row 18). The last stakeholder in this discussion is the cloud provider that have a significant role as a stakeholder.

Timmermans et al. (2010) lifts several concerns regarding cloud computing and provider. Cloud computing means a loss of control towards the cloud provider, this can lead to difficulties in finding the responsible when something unforeseen happens (Timmermans et al., 2010). This also connects to "*Problem of many hands".* Where the more people are involved, and the larger spread of responsibilities, the harder it gets to find the responsible. This is already happening at some schools since every teacher has the privilege to create their own folders. By letting the teachers have this privilege, it becomes increasingly difficult to keep a clear structure, and this could be solved by having a super user (T2, row 28; IT2, row 21). Then what would happen to the folder structure if the amount of teacher would increase at the? The cloud service would probably become more difficult to work with and the risk for mistakes could increase. The mistakes could be everything from sharing the wrong folder with the wrong person to uploading sensitive student information.

Another risk of cloud computing and stakeholders is that the customers (schools and municipality) does not really understand what they are buying, which can result in inadequate communications between the cloud providers and the customers (Bruin & Floridi, 2016). This is the case at one of the schools, where the principal has never seen a contract or agreement regarding the use of GAFE (P1, row 102). This case is the right opposite compared to the first case that was presented where the municipality decreased the functionality to gain control of the cloud service. According to the IT-professionals this is important, since otherwise Google could be in control of everything that is being upload, use it for other purposes and in case of dispute it would be easy to just refer to the contract (IT1, row 32).

The stakeholders within respective profession have about the same view how their cloud services should be managed and what the problems are. To conclude the discussion regarding the stakeholders, there are certain situations that could be improved. 1) Take the cloud service into the strategic plan of the school and do not let control decrease the functionality; 2) Educate the stakeholders that are involved with the cloud service, to avoid possible illegal mistakes; 3) Delegate responsibility to make the stakeholders more comfortable in case of an incident; 4) Create contracts and agreements between all stakeholders to avoid confusion and uncertainties; 5) Trusting the teachers professionalism is not a guarantee that no sensitive information will leak; 6) Have a super user that control the structures of the folders in the cloud service. These are

the six propositions regarding stakeholders that have been concluded based on the research to improve the management of ethical issues regarding the use of cloud services in schools.

6.3 PAPAM

The PAPA IS ethical issues that have been identified by Mason (1986) and the Motivation IS ethical issue by Conger et al. (1995) are used in this research to investigate how IS ethical issues are managed in schools. The most concerned IS ethical issue is the privacy issue in this paper and it also stated by Mason (1986) that privacy is the most concerned IS ethical issue. This is also the case for the teacher, principals and IT-professionals working with cloud services that have been interviewed for this paper. Therefore, the privacy issue will get more attention than the other ethical issues.

6.3.1 Privacy

Privacy is of the highest concern for the stakeholders that have been interviewed compared to the other IS ethical issues. For instance, T1 have been told to not upload any sensitive information to protect the student's privacy, yet no one have explained what either sensitive information or privacy is (T1, row 14). T1 is not the only teacher that who is not completely certain what it is, T3 also mention uncertainties (T3, row 31). However, all the teacher has common sense and they know when something could intrude another person's privacy. The IT-professionals are very clear when defining what sensitive information and privacy is, and highlight to follow the PUL law. Then, how do the teachers and principals manage privacy issues when using the cloud and is it possible to prohibit privacy incidents? First off, privacy is a multifaceted ethical issue but some examples of privacy issue could be: unauthorised users gain access to sensitive information and health information about a person is leaked (Bélanger & Crossler, 2011; Mason, 1986). From a school cloud perspective, privacy issues could be connecting personal number to a name and displaying protected identities (P1, row 30).

Back to the question, the teachers manage privacy issues a bit differently but the cornerstone is that they trust their professionalism to not commit any mistakes that could result in privacy issues (P1, row 115; T2, row 56). Myers and Millers (1996) states that it is up to the individual to decide what information should be shared about them and who it is directed to. This means that it is up to the student to decide if they want to share information about them to the teachers/school. However, since the students are less forced to share personal number and name (sensitive information) to the school they have most likely no choice than to share their information. According to the interviews all the teachers are responsible for sensitive information about the students. This means that the teachers and the school have full responsibility to protect the student's privacy.

The teachers are protective of personal numbers and names, therefore, not using GAFE for that. However, as Mason (1986) states with the increasing amount of information technology; then privacy becomes a concern. For example, T3 receive the assignments through GAFE, what happens if the student enters his or her personal number and name on that document (T3, row 15). Then, that document is uploaded to a folder that the teachers share between them and even former teachers at the school can review the document (T2, row 28; T1, row 46). However, the legal line is thin and it does not require much to trespass the legal line, if you connect name and a personal number in a structured data environment (cloud) is a felony (Datainspektionen, 1998). Therefore, it is important for the teachers to keep anything that concerns privacy and sensitive information to the allowed systems. Yet, SchoolSoft have other functionality problems that might detract teachers from using School Soft and use GAFE instead (T2, row 41).

6.3.2 Accuracy

Accuracy of information that is being uploaded by the teachers is now not as important for the teachers as privacy. Confusion arise when the respondents was asked about if they control the accuracy of the information that they upload to the cloud. The reason behind the confusion comes down to that the stakeholders do not process or manage that many students as a bank does, as in the case described by Mason (1986). When the teachers feel that they are unsure if they can upload certain information they either contact IT-support or the principal. However, more than often the principal or IT-support cannot answer the question that the teacher has about what kind of information that can be uploaded to the cloud (T3, row 59; T2, row 56). That is how the teachers are managing the accuracy issue. This issue connects back to the importance of having policies and stakeholders with cloud knowledge to avoid this type of confusion.

6.3.3 Property

Issues with ownership (property) of data can occur when data is stored remotely, as well as issues of what authority the cloud provider has over the data stored on their servers (Timmermans et al., 2010). This can also raise the issue of "*function creep*", which means that data gathered for a specific purpose, for example student assignments or student evaluation, can with time because useful in a different purpose and used by unwanted actors (Timmermans et al., 2010). The way the schools and municipalities have combat this issue is by having strict agreements about who owns the uploaded information with their respective cloud provider (IT1, row 31). Yet, there is one school where they have no contract with Google and their GAFE, at least not what the principal knows of (P1, row. 102). To have a contract with the respective cloud provider is a requirement by the Swedish Data Protection Authority. The agreement or contract that DPA requires is to avoid function creep as mentioned by Timmermans et al. (2010). To avoid legal and ethical issues, a contract with the respective cloud provider is must, since property involves almost every aspect in IS (Mason, 1986; Conger et al., 1995).

6.3.4 Access

Access is rather important and goes together with privacy since it concerns various privacy issues (Mason, 1986). The teachers and the principal have access to different types of cloud services and their privileges are usually the same. However, some folders might only be shared between two teachers and this restricts the possibility of unauthorised access. The teachers and principal handle Masons (1986) identified ethical issues by being specific who they share their cloud folders with. Every stakeholder seems to be strict with this ethical issue and only let the authorised people review their folders with the small exception of former teachers (T1, row 78). Yet, there is still a risk and the IT-professional handle the risks by doing risk analysis, to get an overview if documents can get out of their control (IT1, row 22).

6.3.5 Motivation

There is a consensus between the stakeholders that the most prominent motivation to use cloud services is accessibility and simplicity. However, these positive factors may also have a back side to them since there might be other stakeholders that suffer from this e.g. the students (Conger et al., 1995). For instance, the teacher might enable high accessibility to document that could contain sensitive information because of bad folder structure; no contract with cloud provider; uncertainties about sensitive information; and no policies (IT2, row 17; P1, row 110; T1, row 14; T3, row 39). These two positive factors enable the teachers to work more efficiently but it also means that the teacher can access documents from any computer which also become an access issue (Mason, 1986). This also connect to privacy and security that are the two major concerns regarding cloud computing, and these issues are usually sprung from uncertainties in access to the data, i.e. who has access to what (Timmermans et al, 2010). Therefore, it is important to remember what the consequences of accessibility and simplicity. The stakeholder manages PAPAM a little different but in general they face the same problems and uncertainties. Therefore, a short presentation of how stakeholders could manage and be more proactive against future ethical incidents. 1) Use the allowed system when handling sensitive information such as personal numbers and names such as School Soft; 2) The legal requirements increase with structured information; 3) When uncertain what can be uploaded, contact a stakeholder that understands the law and can explain it; 4) Have a contract with the respective cloud provider to avoid legal issues; 5) Accessibility is not only positive, it might get out of control.

6.4 Contracts and regulations

Policies regarding the use of cloud in education is, based on the empirical study, something that many schools lack (T1, row 75; T2, row 22; P1, row 70). Teachers explains that they are uncertain on what they can do within the cloud solutions (T1, row 42), and T2 states that at her school, they have many different cloud based software's, and she is not sure what software to use for what purpose (T2, row 22). She furthers explains that the teachers themselves use whatever software they think is easiest. This refers again to the lack of knowledge teachers have of cloud

due to the absence of education of teachers in cloud. Uncertainty in what software to use and for what purpose together with a lack of knowledge creates a security risk. When data is stored in locations that it is not supposed to be stored at, a risk of *"Function Creep"* can arise, where the stored data gets misused by unwanted outside actors (Timmermans et al., 2010). This uncertainty of use of cloud services can also bring problems with privacy and security, as Timmerman et al, (2010) explains usually occurs when there are doubts in who has access to personal data. The IT-professionals has somewhat a different view of policies and they say that they have, at their schools, policies of that says that anything covered in PUL, i.e. health conditions, religion etc. is forbidden to upload to the cloud. This law is based on EU regulations, which means that other European union countries have similar laws (Datainspektionen, 1998). Bruin & Floridi (2016) discusses the unawareness among cloud users about the geographic location of the servers storing the organisation s data. Different countries or regions might have different laws, and this can have unexpected implications or lead to misunderstanding between the provider and the customer (Bruin & Floridi, 2016). The IT-professionals seems to be aware of this issue and IT2 refers to new agreements and contracts with Google that should assure that the data is stored within EU and thus is covered by the EU regulations (IT2, row 39).

The contracts and agreements with Google varies some between the different respondents, T1, IT1 and IT2 know that there are agreements with Google in place on how to store data and what Google can do with the data (IT1, row 33; IT2, row 41; T1, row 18). These agreements can be argued to be highly necessary to avoid *Function Creep* (Timmermans., 2010). The public school where P1 is vice principle quotes on the question about contracts with Google: "*I have never seen a contract and I mean everybody should understand that if you upload information about yourself it will probably never disappear"* (P1, row 102). He continues and explains that he is a bit scared that the school doesn't own the information (P1, row 104). As GAFE is a relatively new phenomenon, there are reasons to believe that this unawareness of contracts is more widely spread than just this school. The problem with this is that the teachers doesn't have training or guidelines to what to upload to the cloud, and there are no clear policies for them to follow either. Thus, there are no controls of what gets uploaded and who has access to this data. Having contracts with Google could, as IT2 says, assure that the data is store safely within the EU, but also, ensure that Google never becomes the owner of the data, and give the school the right to sue Google if they do something wrong with the data (IT1, row 32).

Policies and contracts are necessary to ensure that data is safely stored and not misused in any way, and this is something that schools must consider as cloud becomes standard in education. To ensure this, three propositions is suggested to consider while managing the cloud services in a safer way. 1) Have clear policies on what software to use for what purpose and what can be uploaded to the cloud; 2) ensure that the contracts and agreements with the cloud provider make the school or organisation the owner of the data; 3) ensure that the contracts and agreements with the cloud provider guarantees that the data is stored on servers within the EU.

7 Conclusion

This chapter summarises the thesis by combining the findings and discussion to answer the research question. A demonstration of possible guidelines for different stakeholders within education are provided with different perspective and purpose within cloud ethics. Finally, a suggestion for future research within the area is provided.

This thesis was set out to demonstrate how different stakeholders within schools managed different ethical issues concerning the usage of cloud services. This was made possible by constructing a theoretical framework based upon the chosen literature. The theoretical framework that guided this thesis was four different subjects: Cloud computing/service, information system ethics, stakeholder theory and law and regulation. By conducting a qualitative research with semi-structured interview questions, it was possible to gain insight how stakeholders within schools manage different cloud related ethical issues. The research demonstrate room for improvement concerning the management of cloud ethical issues. This resulted in several propositions and guidelines for the stakeholders to consider when managing cloud services such as GAFE.

The research reveals two guidelines that the teacher can follow to reduce ethical incidents when using the cloud: 1) Provide the teachers and other involved stakeholders with proper training in using the cloud and the risks with using the cloud; 2) Ensure that the appropriate laws reach the teachers, and that the teachers completely understands them which reduce ethical errors.

Regarding the stakeholders, the thesis have identified four major propositions to support their management of cloud ethics: 1) Take the cloud service into the strategic plan of the school and do not let control decrease the functionality; 2) Delegate responsibility to make the stakeholders more comfortable in case of an incident; 3) Trusting the teachers professionalism is not a guarantee that no sensitive information will leak; 4) Have a super user that control the structures of the folders in the cloud service.

With the help of the already identified issues presented by the literature and PAPAM framework, it was possible to create two guidelines that could support the stakeholder's ethical management of cloud services: 1) Use the allowed system when handling sensitive information such as personal numbers and names such as School Soft; 2) When uncertain what can be uploaded, contact a stakeholder that understands the law and can explain it.

Laws and regulations creates a legal framework for schools to follow and without it there would be no consistency between schools. Therefore, two guidelines have been highlighted, 1) Have

clear policies on what software to use for what purpose and what can be uploaded to the cloud; 2) ensure that the contracts and agreements with the cloud provider make the school or organisation the owner of the data, and that the data is stored within the EU.

7.1 Future research

This thesis has identified possible improvements to the stakeholders concerning cloud ethical issues. All the teachers and principal have in common is the uncertainty what they can upload or not upload which concerns ethical issues. Therefore, it would be a possibility for future research to investigate if these uncertainties about ethical issues are nationwide or just locally. This could be done by performing a quantitative study to get a wider perspective. The topic is highly relevant since digitalisation of schools is a fact and will most likely continue. Therefore, more studies concerning IS and cloud ethics in schools are required to keep transparency. This thesis could be the foundation for such a study and continued elaboration of the literature would be required.

Appendix 1 interview guide

IT-personnel

Basic information
1.   What are your responsibilities and position?
2.   For how long have you been at your current position?

Cloud service
1. What cloud applications have you been in contact with while at this position?
2. Can you briefly what this application is used for.
3. Who has access to the data stored on the cloud?
4. What is sensitive data for you?

Information system ethics and cloud service scenario
1. What access do you have to the cloud service? That is how much can you edit, delete, add etc.
2. In case of a leakage of student data, for example a data breach, or someone unauthorized would get access to data, who would you say is responsible? What would you do?
3. When teachers upload documents, files and data to the cloud, who do you, in your opinion, consider to be the owner of the data?
4. When the teacher is using the cloud service to upload files of different type, how do you ensure that they do it in the safest way possible?
5. In your opinion, what is most valuable in the use cloud application, security or usability?
6. When the teachers got introduced to start using cloud services in your work, did your employer tell you about any terms or policies how to use the cloud service?
7. Are the students or parents aware that information about them is being stored by an external provider? If not, should they be or maybe their parents?
8. When information is uploaded to a cloud service provider, the information might be stored abroad which have different laws than in Sweden. Which means different laws and regulations apply to the stored information. For instance, if the information is stored in a country where the government can review any information they want, they could do so without your consent. What is your thoughts on this concerning uploading sometimes sensitive information?

Teachers

Basic information about the interviewee
   1. What is your position?
   2. For how long have been working with schools?

Cloud service

   1. For how long have you been using cloud services, both professionally and private?
   2. What cloud services do you use in your work? (if one service: What do you think about using only one?)
   3. When did you start using cloud services in your work?
   4. How do you use your cloud service? Give examples.
   5. What type of information do you upload to the cloud service?
   6. Do you share school related files between the teachers?
   7. Have you had any cloud education? If yes what did you learn?
   8. What do you consider to be sensitive data?

Information system ethics and cloud service scenario
   1. When you got introduced to start using cloud services in your work, did your employer tell you about any terms or policies how to use the cloud service? If not what do you know about any regulations or laws that is concerning cloud usage in your work?
   2. If you are uploading student information to the cloud, do you upload everything about that student or just parts?
   3. You have taken notes from a council meeting meeting that contains that could personal information, what do you do if you want to store that information digitally?
   4. If the information that you have stored on the cloud, suddenly is not accessible any more, what do you do?
   5. How much and effort do you spend daily on using the cloud?
   6. Are the students aware that information about them is being stored about them by an external provider? If not should they or maybe their parents?
   7. How would you handle a situation where a colleague want to access one of your files on the cloud?
   8. How do you handle a situation where you feel unsure if you can upload a certain file to the cloud? Give example.

9. How would you ensure that the information that is uploaded to the cloud is correct?
10. Could you name a few examples what motivates you to use cloud services in your work?
11. Are you forced by your employer to use a cloud service or is it your own initiative?
12. How did you work with information before start using the cloud?
13. How did cloud services change your daily work activities compared to before? (discuss if it is more efficient than before cloud.
14. What are your thoughts on digitising and using the cloud with everything school related? Does it increase efficiency, performance etc? Could you give pros/cons?
15. What do you know about ownership of the information when it is uploaded to the cloud? If the information is owned by google how would you work with the cloud? If the information is owned by your organisation how you would work with the cloud?

Principal

Basic information about the interviewee
1. What is your position?
2. For how long have been working with schools?

Cloud Service

1. For how long have you been using cloud services, both professionally and private?
2. What cloud services do you use in your work? (if one service: What do you think about using only one?)
3. When did you start using cloud services in your work?
4. How do you use your cloud service in your organisation? Give examples.
5. What type of information do you upload to the cloud service? What are you allowed to upload and not?
6. Do teachers/principals share school related files on the cloud service?
7. Have you had any cloud education? If yes, what did you learn? Did the management initiate any education to the users of the cloud solution?
8. What do you consider to be sensitive data?

Information system ethics and cloud service scenario

1. When you got introduced to start using cloud services in your work, did your employer or IT-personnel tell you about any terms or policies how to use the cloud service? If not what do you know about any regulations or laws that is concerning cloud usage in your work?
2. How do you manage that all the information that the teacher upload is adequate?

3. You have taken notes from a meeting that contain personal information, what do you do if you want to store that information digitally? What do you inform to your employees concerning that they could be in a similar situation with students?

4. If the information that you have stored on the cloud, suddenly is not accessible any more, what do you do?

5. How much time do you allow your employees to work with cloud services during their work hours? Is it up to the teachers how much they want to include it in their work?

6. What does the Swedish authorities say about cloud services in school? Any policies, laws, or general information?

7. Are the students aware that information about them is being stored about them by an external provider? If not should they or maybe their parents?

8. How would you handle a situation where your employees want to access each other's files on the cloud?

9. How do you respond to data leakage incident, who is responsible?

10. How do you handle a situation where a teacher ask you what information that is allowed to upload a certain file to the cloud? Give example.

11. How would you ensure that the information that is uploaded to the cloud is correct?

12. Could you name a few examples what have motivated you to use cloud services in your work?

13. Who initiated the use of cloud services? (Are you forced by the municipality to use a cloud service or is it your own initiative)

14. How did you work with information before start using the cloud? Pen and paper, folder etc?

15. How did cloud services change your daily (the school) work activities compared to before? (discuss if it is more efficient than before cloud.

16. What are your thoughts on digitising and using the cloud with everything school related? Does it increase efficiency, performance etc? Could you give pros/cons?

17. What do you know about ownership/property of the information when it is uploaded to the cloud? If the information is owned by google how would you work with the cloud? If the information is owned by your organisation how you would work with the cloud?

18. Have you been involved when creating the contract with your cloud provider? Do you understand it? Is it beneficial for the school?

19. What data do you think is proper for teachers to upload to cloud?

20. Do you have any written guidelines or policies for uploading data? If yes: what? IF no: do you think it would be necessary?

21. Do you prefer easy access instead of high privacy and vice versa?

22. When information is uploaded to a cloud service provider, the information might be stored abroad which have different laws than in Sweden. Which means different laws and regulations apply to the stored information. For instance, if the information is stored in a country where the government can review any information they want, they could do so

without your consent. What is your thoughts on this concerning uploading sometimes sensitive information?

Appendix 2 Interview Teachers

Interview transcript 1 Teacher
This interview was performed 17 April 2017 by Herman Engström and Henrik Warrol and we will be referred as the interviewer and the interviewee as T1. Duration 38 min.

Row#	Actor	Text	Code
1	Interviewer	What responsibility and what position do you have at your workplace?	
2	T1	I am hired as teacher in Malmö at the moment but since I am studying to become a teacher while working I cannot get the title as a teacher yet, but I have the same responsibilities as a teacher. So I am working with mainly social study classes and leisure and helping my colleagues with IT issues since I've taken some courses within IT.	
3	Interviewer	So, you are responsible for students?	
4	T1	Yes, I am	
5	Interviewer	For how long have you been at this position?	
6	T1	Since 2012	
7	Interviewer	What cloud services have you been in touch with in your work?	
8	T1	Dropbox, Google Drive, One Drive, Samsung's own cloud service is something.	CS
9	Interviewer	But, primarily within your work?	
10	T1	Google Drive, that has been my first cloud service that I have used	CS
11	Interviewer	Is it only you who use Google drive or does the other teacher do that as well?	
12	T1	Google drive has been implemented to all the schools within in a Town municipality and we are supposed to use it	CS, PO

13	Interviewer	Can you shortly present what you google drive for?	
14	T1	We pretty much use it for everything, but when we attended to different lectures that teach us about not to post sensitive/private information on the drive but at the same time are we told to save every document within the drive and do everything on the drive. So, I do not know what they mean when they say that we are not supposed to save any sensitive/private information on the Google drive.	CS. PR
15	Interviewer	That sounds pretty unclear	
16	T1	Yes, but it is this Malmö municipality that moderates the Google drive, the IT department	CSS, G
17	Interviewer	So it is the IT department that make the negotiations with Google?	
18	T1	Yes, they have made a wide agreement with Google, and some functions have been removed and downscaled compared to the private version. For example, when google updated their Google Apps which is the service that Malmö Municipality have bought, instead of having the name Google Apps it is named Malmö Apps. The problem with this is every time google make a change Malmö Muncipality have to control the changes before releasing them. So, at the moment we use really old version of Google Apps compared to the private version	CSS, CS, G
19	Interviewer	Pros and Cons with that method	
20	T1	Ye, websites are supposed to be done i Google Apps, so if you use the old version, then it does not adapt for mobile phones. A lot of functions disappear when we want to make a survey, that we want the parents to fill in and then it becomes pretty restricted what we can do.	CS, G
21	Interviewer	You need to use Google Apps for everything related to your work?	

22	T1	Yes, so when you get hired you get your own account and you get added to a database called Extence and depending on your position you get different privileges on Google Apps. And group functionality is created automatically.	CS, AS
23	Interviewer	So you can access it from home?	
24	T1	Yes, I am using it right now	AS
25	Interviewer	More cloud oriented questions now, when did you start using cloud services within your work?	
26	T1	Hmm, we started to make more initiatives against cloud services this term, but it has probably been used since 2014 I think.	CS
27	Interviewer	How do you use Google drive/Apps in your work?	
28	T1	First off, people use Google Drive/Apps very differently and people are still using Outlook. At the moment we have one Outlook address, one Gmail and other sources, and the information is reaching us in different ways. So, all the information from Malmö Municipality goes through Google Apps and individual information through Outlook. People do not understand that they are supposed to use the word editor in Google Apps instead of Word, then upload the word document to the drive. A lot of easy stuff that people do not understand	CS, G
29	Interviewer	But you use the cloud service to its full potential?	
30	T1	I use every application within Google Apps, I try to do calendars etc. A major concern is that the older generation have do not fully understand why they should use Google Apps, so it is as hard for me to really use the full potential of Google Apps since it is based on sharing with your colleagues and they are still using pen and paper on our meetings.	CS, AC, PE
31	Interviewer	What is your motivation to continue using cloud services in your work?	
32	T1	Simplicity and accessibility, to be able to access it from my phone and work station. For instance, I can bring up my phone	PE, AS, MO

		when a parent is asking me a specific question concerning the calendar.	
33	Interviewer	Do you upload everything to the cloud service?	
34	T1	Now it becomes uncertain to say the least, we went to a IKT-course where they explained how we are supposed to work the cloud service. They say that we are supposed to upload everything to the drive maybe not sensitive data but then again what is sensitive data? Where do you draw the line? At the moment we have list with student information on Google drive and we do not have any students with protected identity, so in my opinion there is no problem. So, name of the students that we had in physical paper form before, is now uploaded digitally to the cloud	CS, CK
35	Interviewer	Sensitive might be very subjective	
36	T1	Yes, but there is no one outside my school that can access these files. I can enter every folder and see what folder is shared with who.	AS, PE, PR
37	Interviewer	So, you share files amongst the teachers?	
38	T1	Yes	AS
39	Interviewer	Do you share everything you upload or do you also have a private folder?	
40	T1	Both, but everybody do not understand that concept	CK
41	Interviewer	When you got introduced to start using cloud service in your work, did your employer give any policies or alike that you should stick to while working with cloud service in you work?	
42	T1	No not really, and I think that has been missing. From my understanding nobody really know anything what we can do and can not do concerning cloud service. But I know if you want to start a social media account representing the school, there is a lot rules to be concerned of.	CK, PO

43	Interviewer	If you upload information about a student, do you upload everything about that student or just parts? Because you know some parts of this information is sensitive.	
44	T1	At the moment, I do not have any information about any student on my own drive, but I know there are some pictures somewhere in a folder that is shared with everyone on the school. But there is no folder where it says "Anders Andersson folder" and contain all the information about him, that does not exist. It is up to every single teacher what they want to upload on the drive.	PR
45	Interviewer	Who you turn to in case of cloud service problems?	
46	T1	Probably the IKT-teacher on this school, then he turns to higher instances. But this have been a problem, if the IKT-teacher on our school is the creator of our website for the school and technically the account is his own. If he quits our school, then someone needs to copy all his stuff that he have shared on the drive, since after two months it is automatically deleted. So the whole website disappear.	CS, PY
47	Interviewer	Are the parents and students aware of that an external provider is saving information about them?	
48	T1	I do not know, but what I know it have been back and forth a lot between paralegals and Malmö Municipality and they have somehow resolved the problem and it is supposed to be okay. But I do now think every parent is aware of that information is being saved about their child, no.	G, PR
49	Interviewer	Do you know if it is Google's own servers or is it Malmö Municipality servers that stores the data?	
50	T1	Its Googles servers, I am pretty sure.	CS
51	Interviewer	Depending on the agreement between Malmö Municipality and Google; the ownership of the information could be of concern, what is your thoughts on that?	
52	T1	I feel generally, if you do not create your own servers and a own intranet from scratch then you never know. I do not think there is a municipality in Sweden that have the resources or the will to	CS

		do this. My opinion is, do not upload anything if you do not want anyone to see it.	
53	Interviewer	What functions does Google Apps provide?	
54	T1	Google mail, Google plus, Docs, Sheets, Slides, Sites and then we also have Outlook as I said before.	CS
55	Interviewer	Do you know what happens if, for instance, Google goes bankrupt or any other incident occurs?	
56	T1	Well, hopefully, someone have made a backup but probably not	
57	Interviewer	Have your teacher gotten any education from the board how to use your cloud service? Concerning, security policies and such	
58	T1	Nothing at all, we had a short lecture but i did not consider security in the manner you mean, it was mostly about how to use social media that are concerning the students. There is a website where you can read about policies but I think it was mostly concerning social media and nothing about cloud services. It was mostly if you want your organisation on Facebook etc.	CE, CR
	Interviewer	Is account sharing something that occurs at your workplace?	
60	T1	No, if I want to share something I will just share the folder on the cloud. I would never say my password to anyone, I would rather just hand him the computer.	AS
61	Interviewer	For instance, if you upload a list on the cloud that contains every student in your class, how do you ensure that the information is correct that is being uploaded to the cloud?	
62	T1	If I understand you correctly, we use a different system for that. It is pretty unclear, at the moment we use a system called "Extens", were we register all the students, class lists, names etc. Then we have skola24 were we handle absences and then we just some lists about who is in leisure on the drive at the moment. So, it is the daily lists that we print daily that we have uploaded to the drive and that is documents that someone had in a word file on their computer before. But it is hard to answer that question, at least in our organisation.	CS, PE

63	Interviewer	According to you, do you save any sensitive information, that you teachers share together?	
64	T1	Maybe, depends, in my opinion the only sensitive information on there is some pictures of the students. But in my opinion that is ok as long these children do not have a protected identity, since school pictures in my opinion is public document. The only information we have about the children is the name, age, number to parents and if they are allergic to something and I do not think that kind of information is super sensitive. But then again where do you draw the line for what is sensitive information or not?	PR
65	Interviewer	But do you keep like diarys of the children on the cloud or something like that?	
66	T1	We write diaries about some children that require special needs, but we still do that with pen and paper but when the day comes when it is easier to it with an Ipad or alike it will probably be uploaded to the cloud.	PR
67	Interviewer	Is it the teachers initiative to use the cloud or is your employer that have forced you to use it?	
68	T1	It is Malmö Municipality that have forced us to use it, just the way it is. The intranet we had before, were you logged in with your email, then it downloaded all the files to that computer, so you could use any computer that you like. But from a security point of view I think we have better security now than ever.	G
69	Interviewer	Do you see any problems with using the cloud in your work?	
70	T1	Yes, I do not know what I can upload and not. If you ask a principal then I do not think they know either. I do not think anyone within Malmö Municipality really know what is ok and what is not, I think that is the biggest problem. You can probably ask the paralegals and they will probably give you answer, and they will probably give you a wide answer and not be very specific, but that is just my opinion.	CK

71	Interviewer	Who is responsible in case of an information leakage from your cloud service, is you, the principal, Malmö Municipality or someone else?	
72	T1	I do not know really, but I am guessing it is the person that have been leaking?	R
73	Interviewer	Yes, but if you do not know how have been leaking?	
74	T1	Well it will not be me as a teacher I guess	
75	Interviewer	But there is no policies or contract that you have seen concerning this?	PO
76	T1	No, I have not written my name on any paper concerning this, who responsible and so on. But it is quite weird since if I as a teacher want to start a Instagram account for the school you actually write a contract with the school concerning different factors	PO
77	Interviewer	Do you choose your own privileges on the cloud or is it a moderator/IT responsible who does that?	
78	T1	I can decide for myself, and choose what I want to share and depending if I trust the colleague or not I can share my folder. If you enter our drive only to find sensitive information, you could probably find it. But we are few at this school, I think we are 18 employees here at this school. It will be complicated for someone just to enter and sabotage our drive since everything is logged anyway. For instance, I can see that my colleague deleted this file and so on. So it is hard to stay totally anonymous within our cloud.	AS, PR
79	Interviewer	Of course everything is from school to school what is being uploaded	
89	T1	Yes, but I think in most cases teacher know what is sensitive information and what is not. Either they do not upload anything or they upload everything because they do not know the rules or policies.	CK, PR

90	Interviewer	As long cloud is more effective than pen and paper teacher will continue to use it, what do you think?	
91	T1	Yes, I think so, I think it is the future. I think it is more secure than what you can create on your own as a tiny Municipality as Malmö. And I also know that the school in the US also use cloud services. But I also think that we do not know yet what the security issues are yet. In the end it is a paralegal issue and what sensitive information really is. I mean there is no company today that do not use some kind of cloud service.	G
92	Interviewer	Do your colleagues have any thoughts concerning what we have talked about?	
93	T1	I have asked around and they know even less than I do. I think it is required that someone really gives this issue the attention it requires, in case of incidents. Either way it does not really matter since, somewhere along the road someone will upload something that they are not suppose too, and when it is uploaded it will never truly disappear. Generally, I do not think the schools of Malmö really understand the whole concept either privacy nor cloud services at all.	CK, PR
94	Interviewer	I think that is all for now, thank you for participating, it have been really useful.	
95	T1	Thank you	

Interview transcript 2 Teacher

This interview was performed 17 April 2017 by Herman Engström and Henrik Warrol and we will be referred as the interviewer and the interviewee as T2. Duration 32 min.

Row#	Actor	Text	Code
1	Interviewer	What is your job title?	
2	T2	I'm a Chairman (Förstelärare) and teacher in Swedish, Swedish as a second language and English	
3	Interviewer	How long have you been working as a teacher?	.

4	T2	I took my degree in 2010, so since then.	
5	Interviewer	How long have you been working with cloud services?	
6	T2	Also since 2010.	
7	Interviewer	And then comes a follow-up question: what cloud applications have you used?	
8	T2	How do you define cloud services?	
9	Interviewer	We mean any kind of service where you upload information, files etc. to the internet	
10	T2	Alright, so it can be any kind of service like Google drive, Google classroom, there are also two teaching platforms, SchoolSoft and Fronter. But it mostly Google. SchoolSoft is our large administration tool	CS
11	Interviewer	What are the purpose of using Classroom and google drive?	
12	T2	Classroom is for teaching, and uploading document to the students that they need, and also for them to hand in assignments. But i don't really use it to give feedback to the students, i do that in SchoolSoft instead. That's where i give my formative and summative response. I use Google Drive in communication with my colleagues most of all, but i also have a Classroom in my Chairman role where me and my colleagues collaborate.	CS
13	Interviewer	What kind of information do you upload to the cloud?	
14	T2	Parts of it is everyday information, for example small changes, but most of all class planning and what we will do during the class, sometimes, if i have time, a summary of what has been done for the students that missed the class. And it is also assignments, sometimes i've worked with surveys, and that is something they should do before class starts.	CS
15	Interviewer	What information do you share between teachers?	

16	T2	It can be that we share documents for example if we are to reach a new policy in something, is the first step to open a shared document to work together digitally, and that's basically it.	PO
17	Interviewer	Do you have any more examples? You don't have to be so specific, but can it be information about students or classes etc?	
18	T2	It a little different in what we use the different systems for, in Google Drive and Classroom, in the Google Apps, we try to limit the amount of data that we upload, because we are not sure about how much we are allowed to upload, we have tried to figure it out, but the Swedish Data Inspection Board is a bit fuzzy on this, so we try to minimize information about students and call them by name. Instead we use SchoolSoft which is a protected system.	CS, G, PR
19	Interviewer	Do you have any training in how to use cloud services?	
20	T2	No	CK
21	Interviewer	Not even any guidelines?	
22	T2	Some use a lot of Classroom, and some uses SchoolSoft, some uses maps in Drive for their students, so there is not united policy. But we are working on it	CS, PO
23	Interviewer	But it is up to you teachers to decide if something is suitable for uploading to the cloud?	
24	T2	Yes sort of like that	CK
25	Interviewer	Have you had any discussions about this or do you do whatever is easiest?	
26	T2	Yes unfortunately it is like that currently, but we are starting to understand that it is not so good to have a unified policy and not exactly know where to store things. We are aware of that it is probably is not entirely OK to work like this	PO
27	Interviewer	Do you see any direct problems with that no one knows?	
28	T2	Yes, it is a problem when we should distribute information to our students, no matter where that information is, if it is	CS, PY

		information about an assignment or if it is information about a cancelled class. Then the student's know that there are three different places to look for information, but generally they only look for information in what platform they're most comfortable in using. That's a problem. Another problem is that if we're not supposed to upload things.. I mean, Google drive: someone creates a folder, this person is owner of this map, that person quits his or hers job, but are still owner of the folder. That is a problem that we are currently battling and make it feel a bit insecure.	
29	Interviewer	What are sensitive data for you?	
30	T2	Social security numbers, mine and students, it is other information about me and my students that could be used against them. There are an imbalance in power, so as soon as i have some personal information about someone, it is my responsibility that it doesn't leak. But if we have applications where there are a risk of leakage, that's not good, I'm not saying that we have that kind of application, SchoolSoft is working fine. That's a closed system	PR, CS, R
31	Interviewer	When you started using cloud services in your work, did your employer inform you about the risks of using cloud?	
32	T2	No	CE
33	Interviewer	But it is your employer who told you to use cloud?	
34	T2	Yes	
35	Interviewer	Let's assume that you have having a council meeting with a student about his or hers progress, and you've taken notes and you want them digitally, what do you do? Do you upload this in the cloud as well?	
36	T2	Yes, but in schoolSoft, there are actually a policy there. Anything that regards the students personal development is on SchoolSoft, while information about how good a student have done on a specific assignment can be on Google Classroom. But for Council meetings there are policy of using SchoolSoft.	PO, CS, PR

37	Interviewer	If the information on the cloud suddenly is not accessible, how would you act in a situation like that?	
38	T2	We start to cry. Haha. I don't know	
39	Interviewer	Does it occur?	
40	T2	Yes, it has actually happened with School Soft that is a closed system. School Soft decides when everything is filed, but we are the ones that decides what to be filed. When an IT administrator might miss that, it can be very problematic, because then it is gone. but hopefully we have a backup on the server. This has happened but now we have a routine for avoiding this to happen. Otherwise we have an IT-department in Stockholm that we call if any problems like this occur and hopefully they can help us.	CS, R, AC
41	Interviewer	How much time do you spend daily on work in cloud service.	
42	T2	Hmm. it is hard to estimate, but all practical information, all assignments, all feedback and response, All administration around council meetings for example. All that has to do with my work as mentor, and communications on Google.	CS
43	Interviewer	But you have both apps for education and for administration? So there are a few hours a day?	
44	T2	Yes, so much of my work is done online instead of on paper	
45	Interviewer	Are the students aware of that data about them is stored on internet?	
46	T2	Yes, i think so	R, PR
47	Interviewer	And are the parents aware?	
48	T2	Yes they are.	R
49	Interviewer	Do the parents have any saying in this question or is it standard that data is stored this way?	
50	T2	Yes it is standard, All students receives a computer when they start, a chromebook. So everything automatically happens in Google. When the student get their computer they receive a	CK, CS

		contract, and the parents should also read the contract. I know that they know that data is stored in the cloud, but i'm not sure that they know about the consequences that it could have with storing data on the cloud.	
51	Interviewer	If a colleague ask you for access to your folders on stored on the cloud, how would you act? How free do you share data with colleagues?	
52	T2	Very freely, we are a small school, and most teachers teach the same student. We have three different work teams, but these teams work very close and we help eachother out.	MO
53	Interviewer	Do you see and downsides or consequences of working like this?	
54	T2	Yes that could be, you lose control over your data when giving it to someone else, so absolutely, that could be a flaw, you put your trust to someone else	PY
55	Interviewer	If you are insecure whether the information you have is appropriate to upload to the cloud, how do you act?	
56	T2	I've had concerns about this, and then i've emailed our IT department in Stockholm, and hopefully the answer is not too fuzzy, but answers has been "just use common sense". I am rather picky though, so i would prefer answers like "according to this law it is ok".	G, PO, PR
57	Interviewer	How do you assure that the information you upload is correct? For example, if you upload a class list with another teacher, and make some kind of decision based on this list, how do you assure that the name are correct?	
58	T2	I wouldn't upload a class list with names and social security numbers.	PR
59	Interviewer	Is it your judgment that says stop to this or could other teachers to this?	
60	T2	Yes they could, but I've not heard of anyone doing this, there are already a communication way for this.	

61	Interviewer	Can you give some examples of what motivates you in the school to use cloud?.	
62	T2	Most of all it is the demand for documentation and that the information should be available. We have some issues with absence from classes, and cloud is a good tool for ensuring that the students receive the information they should. It also makes the teaching process easier, to share material between me and the students in class.	MO, PE
63	Interviewer	Are you as teachers forced to use cloud services?	
64	T2	We are forced to use SchoolSoft, but not Google Drive. But all teachers get access to Google Apps For education and it is encouraged to be used.	CS
65	Interviewer	Do you think that cloud services has changed the effectiveness of your work?	
66	T2	I think cloud allows one to make more things than before, you can use the web in more ways that before, and make information more available and collaborate between different age groups and collaborate from different geographical locations.	AS
67	Interviewer	What are the pros and cons of using cloud?	
68	T2	The pros I think i've talked about, but one negative side we talked about just the other day was that we overestimated the students computer knowledge. Many of us confirms the student's role in the information society as a consumer instead of a producer of information. And i'd say that's negative when you don't know how to use these kinds of services. And also of course if information is spread in wrong way and the ownership is not clear. Also, it is very unclear, i would like a list: this is how you should work with cloud.	CK, PO, PY
69	Interviewer	Do you know who is the owner when you upload to the cloud?	
70	T2	Yes, when I started working here I signed a contract saying that it is the organisation s (the school) that owns all the information. But also, it is the one creating a folder in Google, as i said before, if some who owns a folder quits, it gets problematic.	PY, CSS

71	Interviewer	So you have a bunch of folders that other are owned by teachers that doesn't work here anymore?	
72	T2	Yes, we do	
73	Interviewer	Are there any plans from your supervisors to deal with this issue or come of guidelines regarding this?	
74	T2	I hope so, we have pointed out this could be a problem, and then we could get an answer like: Yes that could be a problem, we should deal with that. Or and answer like: well she would never do that. So there is a mix between "oh we need a policy" or personal trust.	PO
75	Interviewer	Who is responsible for dealing with these issues?	
76	T2	It is the IT department i Stockholm. And then we have an IT-guy here but this person work just a few hours a week, and doesn't really have much to do with this.	R
77	Interviewer	If you share documents between teachers and this would somehow end up in the hands of student, do you know who is responsible in that situation?	
78	T2	No i don't, it is hard to know especially if we are a lot of people with the same ownership rights.	PY
79	Interviewer	Let's assume that the ownership of the information belongs to Google, how would that change your view on using these services?	
80	T2	Hmm, I think it is like that, so i think i very difficult every time	PY
81	Interviewer	Ah, so you are a bit suspicious?	
82	T2	Yes very, that's why i mostly use SchoolSoft for feedback and results etc.	CS
83	Interviewer	Is it you who are extra conscious about this or is it a general view at this school?	
84	T2	Yes or I think I'm extra skeptical, haha. But i don't think we are so aware of this at this school. I notice that when i raise these	CS

		questions, and says that we need a decision about policies, can we really upload disciplinary actions with students social security number on Google Drive. People might say: "Why would that be a problem". But I really think could be problem. So unfortunately, I must say that the consciousness of issues like these are generally low.	
85	Interviewer	Ok, that was all, thank you	

Interview transcript 3 Teacher

This interview was performed 17 April 2017 by Herman Engström and Henrik Warrol and we will be referred as the interviewer and the interviewee as T3. Duration 37 min.

Row#	Actor	Text	Code
1	Interviewer	What is your position within the school?	
2	T3	I am a teacher in social sciences and history	
3	Interviewer	For how long have you been in this role on this school?	
4	T3	Specifically on this school, four years, recently I have been on parental leave but it has been ten years since I took my teacher exam	
5	Interviewer	For how long have you been working with cloud services within the education system and private?	
6	T3	For four years as a teacher I think I would say and not much private no.	
7	Interviewer	What cloud services have you been using during your time as a teacher?	
8	T3	Primarily Google drive, Google classroom, I would say. If that is a cloud service? Or what do you mean with cloud service?	CS
9	Interviewer	What kind of service, for example, Google drive is one service	
10	T3	Isnt classroom a service within the world of Google?	
11	Interviewer	Yes it is, it is included in Google Apps for education	

12	Interviewer	For how long have you been using these services?	
13	T3	We have gotten strict directions to use Classroom services this year and Google drive we have been using since this school started, which was about four years ago	CS, PO
14	Interviewer	What do you use these services for, could you give some examples?	
15	T3	Yes, I upload schedules, all of my presentations, tasks for the students, the students can hand in their written exams or sources to a verbal presentation or like that. Concerning written exams it is place where I give a formative judgement, I comment in the document where they work and that could be while they are working with the document or when I exam and then they can correct that later on. All of the work is performed on the cloud concerning these types of tasks.	M, AS
16	Interviewer	Ok so, the students are not able to see each others works?	
17	T3	No they are not able to review each others work, only me	AS
18	Interviewer	What kind of information do you upload to the cloud?	
19	T3	Let's see, I upload, one part is my own produced content, but I also link to other sites that I want to them to see, but ok that is nothing that I upload. Let's see if I can figure out what you mean, the student upload what they have produced, and I upload the content that I have produced, that is pretty much it.	AC
20	Interviewer	Do you upload your own private information on the cloud service as well? Like a private folder or is everything school related that is being uploaded?	
21	T3	Depends what you mean? Of course I have private folders on the cloud that have nothing to do with the school cloud service.	CS
22	Interviewer	Yes, but do you have your own private folder on the cloud service that you use here in the school, for example, a private folder for lecture plans etc.	
23	T3	Absolutely yes, the teacher teams have different folders that is just between us teachers, and one of theses folders are called	M, PR,

		"Klassguiden", there you can add if you have certain specifications for different classes and like that. For example, some students that work with each other and some do not maybe one student have health issue, but very important is that the medical journal is not on the drive or any folder but maybe some required adaptations. So you can easily check if someone requires extra time or separate room etc then you can see it in the Google drive folder. Then it is between the teacher that are affected by any of these conditions. But the whole team of teachers also have folders that are between teacher and the board, for example how should the school progress and meeting protocol. So everything is up there in the cloud, so in reality we do not use pen and paper that much, yes.	CS, PR
24	Interviewer	Have you gotten any type of education on how to use the cloud service that you use?	
25	T3	Yes a little bit from our last IT guy	CE
26	Interviewer	Ok, but that is it? No external courses or anything like that?	
27	T3	No, no	
28	Interviewer	Ok, but what did you learn? Was it more technical know-how or more what you should upload etc?	
29	T3	Yes exactly, partly that discussion, before when used Google Drive it was ok to put the result of the exam in the comment section to the student, for example, you got A on this. But then we got direction to not to do so, because it was not completely secure and now we have another system where we enter results and attendance of the students. So we changed all of the results and attendance to a new system because of security reasons.	PO, CK
30	Interviewer	Whatis sensitive information for you?	
31	T3	Sensitive information is, I am think there is different layers of this. One student do not want the other students to see what he or she have written, unless we have talked about it. But pretty often the students want me make these types of work anonymously, in that case I print it out or sometimes copy and paste into another document, but the main purpose not to refer	PR, CK

		to a certain student. That is one layer of that, also they do not want to show other students results etc. There is also other layers, for example, the student should not know what we teachers speak about a certain class or a student group, about how they feel etc. But then we have the student care and they have their own secrecy towards us. For example if a student have medical condition and the student do not want the teachers to know then the teachers do not get that information. The student care have their own internal systems but I think they work more with pen and paper. The students also have to fill in an agreement if it is okay if they have a picture of them or not, because on School Soft you can have picture of yourself. In my opinion it is who can access what information and I am not sharing information with everyone.	
32	Interviewer	With the IT guy in mind, he has not said anything about what you can upload?	
33	T3	I know that someone here at the school read a paper from the teacher's magazine club and said that the students are not allowed to watch Youtube during lectures or even have links to Youtube. I do not understand it but then I have not heard more about it so nobody cares about it since Youtube is a helpful educational tool. For me it is more important what is being shown than for example, the videos should not be harmful, racist etc. I am not sure what you are after when speaking of sensitive information	CK, CE
34	Interviewer	It is part of the question, since it is a wide term and very subjective	
35	T3	I stick to the general terms, for example, values, never write anything harmful or expose someone	CK
36	Interviewer	So it is more up each one of you, what they assume is ok to upload	
37	T3	I am not 100 % where you want to go but, for example, if a teacher want to upload picture from their vacation then it is just weird there are rules that are exactly the same. But there is no framework or regulations if I find a picture and use it in my	PO

		work to make it look funnier, there we have no clue about what to do. But there are rules how you should act and the students react quickly if a teacher is weird	
38	Interviewer	We touched upon it before, but did you get any kind of guidelines or alike from your employer how to use the cloud service?	
39	T3	No, but they were pretty strict with, that every student should get their own computer and work one-to-one, and you have to do so. So it is not ok to not to work with the cloud, it was a requirement, so you could not just use pen and paper all the time. We usually have discussion how utilize this service in a proper way, how to hand out results etc, should you enforce some students to learn certain presentation forms and sometimes they record videos and podcasts. Then material is uploaded and then you need to keep it for yourself if the material contains information about the students.	CS, AC
40	Interviewer	During council meeting with the students and sometimes their parents. Then you are taking notes and you want to digitise this information, how would you perform that task?	
41	T3	When I am in a meeting with other people, I do not like to type on my computer I rather use pen and paper. Then I conclude what has been said and send it to the parents if the student is under 18. But then I also have a folder which is called my class but have not uploaded that much to that folder yet. But there might be other teachers that have all of their information and notes on the cloud	PR
42	Interviewer	If the information that you have stored on the cloud, suddenly become inaccessible, how do you handle that situation?	
43	T3	Then it is a crisis, for example, I had a lecture and then the internet turned off and it was gone for two hours and when I realised that it will not come back this lesson I will not be able to have my lecture. I am relying on these things to work since I am teaching in social sciences and we look at world incidents that is easier to analyse with internet and cloud. So, I do not print anything if there is not any certain needs from the students.	R, CS, CK

44	Interviewer	For cloud services to disappear have happened in the past and a lot of data was lost, so this is certainly an issue	
45	T3	Yes this is very problematic, since I have a responsibility to have every they have made etc. Should someone cut our cloud service out, it would mean a lot of trouble. But I also like pen and paper, so when I am judging exams I also have a physical folder with information about results etc. It would also complicates the lectures and not only for me but others as well.	R
46	Interviewer	How much time and effort do you spend on cloud services?	
47	T3	Time and effort, yes, yes sometimes it requires a lot of effort when I need to remember different passwords, sometimes I have the same password but you should not have that but I do. But I cannot put too much time on that. Let's say at least six hours per day	PE
48	Interviewer	These six hours are they included in your working hours or outside?	
49	T3	Included, but around six hours	
50	Interviewer	Are the students aware that information about the is being stored about them at an external provider?	
51	T3	Yes, I think so, it is my perception at least. They know that everything is happening on the cloud, I think they would be surprised if any information about them was not stored. But it is pretty weird and generation shift. The students use their phones all the time and their lives are so open and it is not weird that picture from a family gathering and the weekend party are together. Maybe a bit borderless	PR, AC, AS
52	Interviewer	There are students here that are under 18, do their parents know?	
53	T3	Absolutely, about three years ago it was common that students filmed with a hidden camera in the classroom, when they used different application. Then we had some trouble with the parents and discussion. Sometimes we have students with hidden identity where the parents say no to make their child's	PR, R,

		photo publicly. Then we had to become extremely strict and now we have zero tolerance for mobile phones in the classrooms. So, if you pick up your mobile phone you will get thrown out. I do not like it but it is necessary.	
54	Interviewer	Do the parents know that the results are stored on the cloud?	
55	T3	SchoolSoft that we have takes care of the results and not Google Drive. But of course in Google drive we still have comments. But SchoolSoft have the final result and bit more comments and the parents have access to their child's account until they become 18 years old. But SchoolSoft is automatically closed for the parents when the child becomes 18. So the parents know from the start that they are invited to these kind of services. What parents react on are pictures but also gossip videos etc but that is something we work against.	CS, AS, PR
56	Interviewer	For example if a colleague asks you to share your Google Drive folder, how would you respond?	
57	T3	We share a lot between each other, like planning and schedules, so I would probably say yes and share it.	PR, AS, PY
58	Interviewer	If you are unsure if a certain type of information that you want to upload, how do you handle that situation?	
59	T3	I would probably ask the principal since that person is responsible for the school	AC, R
60	Interviewer	Do you think that the principal have the knowledge to answer a question like that?	
61	T3	Not necessarily, but still responsible and then have to take the consequences. But at the there is not much knowledge about this area right now, as a small school we change principal all the time, during the four last years we have had four different principals. They have reacted differently concerning these cloud questions I would say. They have a position where they are responsible. If they say something and I think differently then I would look it up and come back to them. Because the principal also have bosses within the organisation because somewhere in	CK, R,

		the organisation there probably is a person that knows about these questions.	
62	Interviewer	Is there any type of information that you could think of that you are not allowed to upload to the cloud?	
63	T3	I think like, who can access the information, but you are more directed to if there is a danger who has access but me and my colleagues think that these activities are still under locked doors. So, if I create a document in Google Drive and share with one colleague then I think it is only me and her and that maybe could be problematic. That is how I see it, but it could also be a question about if I even should but it down to text. Then it could, if a student have shared something with me that is personal and if I by law do not have to report it then I would never write it down. Same thing I would never write down gossip about a colleague or such. Just like in normal life, some things you do now write down. But people should think it as small cloud and not one big cloud	AS, PR, CSS
64	Interviewer	How do you ensure that the information that you upload is correct?	
65	T3	I do not really know, if there is something that I am unsure of, I look it up, and it is part of my profession to be correct and there is little mistakes in that concern.	AS
66	Interviewer	Could you give some examples that motivates you to use cloud services? What has been the driving factor to continue?	
67	T3	Yes, the first principal thought it was the future, the right way to work and a lot of positives and why not use this in our favor. That we should feel modern and up-to-date. At the start the student got very nice Mac computers but now they get less expensive hardware but then it was a perception that this school is cutting edge, working with computers etc.	M
68	Interviewer	We touched upon this before but are you enforced to use cloud services in your work?	
69	T3	Yes	

70	Interviewer	Before you started with cloud services, how did you work with the same tasks? Have something changed?	
71	T3	Before you handed in your assignments on paper and you got your comments on the paper or verbal. Yes, the first school that I worked on you had to roll in the TV if you wanted to show something which resulted in less variety in the lecture and more work to do it more fun.	PE
72	Interviewer	Do you think cloud services has been successful, have it done your profession "easier"?	
73	T3	I think it is successful, some people think that I exaggerate, but you still need your pedagogical skills and thoughts you cannot just have a lot of computer stuff going on. I like its fantastic, but now when we are talking about it, I think are we doing it correctly? But still nobody have said anything.	PE, CK
74	Interviewer	You spend about six hours on cloud, but you still prefer using cloud compare to before?	
75	T3	Yes I do	
76	Interviewer	But the general work effort, have it increased?	
78	T3	There it is a bit problematic to compare, since I worked on a more practical school before and now it is more theoretical. It is pretty different how you guide a lecture, class size etc. But the work effort here is a lot more compared to the practical. In general I am pretty comfortable with cloud services, since everything in one place instead of piles and piles of paper. It was a lot more common to lose a paper then it is now.	PE
79	Interviewer	What is your thoughts concerning the ownership of the information that is stored on the cloud?	
80	T3	I know that I agreed to something that say that everything that I produced belongs to the organisation. But I am not so interested in that kind of stuff. The stuff that I create I will use again and if someone else want to use it is ok. But if I had to start paying for it could change, but it still would not be my problem.	PY

81	Interviewer	But what we are looking for is what is your thoughts and action that Google can access information that you upload	
82	T3	Well, since I have not uploaded that in my opinion is sensitive information. So I think, but maybe the Klassguide might be something but I dont think so.	PR
83	Interviewer	Do you upload results or comments or thoughts about students on the cloud?	
84	T3	No not really comments on their progress, but it is possible people do it.	PR
85	Interviewer	Ok, so no directions on that matter either?	
86	T3	That the thing with the different principals, and right now no.	
87	Interviewer	How have the guidelines been between different principals?	
88	T3	As I said before, you should not but results on the drive which was stated maybe about two years ago, and some of my colleagues did not work with us then so they are not aware of that situation. But I changed my workflow and the important clear text result into School Soft.	CS, PR
89	Interviewer	That is pretty much it, if you have nothing to add, we really thank you for your time!	
90	T3	Thank you!	

Appendix 3 Interview IT-professional

Interview transcript 1 IT-professional

This interview was performed 18 April 2017 by Herman Engström and Henrik Warrol and we will be referred as the interviewer and the interviewee as IT1. Duration 32 min.

#	Actor	Text	Code
1	Interviewer	Is it okay if we record the interview and your name will not be demonstrated in the thesis unless you want to.	
2	IT1	Yes, ok.	
3	Interviewer	What responsibility do you have and what is your position?	
4	IT1	I am hired as IKT-teacher at the Municipality in Lomma and my main responsibility is to administrate G suits, which is Google and that manage that cloud. So I work with my IT colleagues at the municipality and with that said I am not working at a school.	CS
5	Interviewer	So you work for and at Lomma municipality?	
6	IT1	Yes, exactly, so I am the spider in the web here. I am also in contact with IKT-teacher at the schools.	
7	Interviewer	For how long have you been at the this position?	
8	IT1	Since January 2016 and since 2013 I have been working with cloud services with a certain school in Malmö, where i am IKT responsible. And I have been working with Google Apps as a cloud service since 2009.	
9	Interviewer	Would you say that cloud services entered the school atmosphere in 2009?	
10	IT1	Yes, then you started one-to-one, before that it was useless to use cloud services. But it is pretty unfair to say that, since myself I have not been working with just that in 2009 but my school that I work with have been digitalised since way back. But then they had thin clients, but the students worked with a web-portal which they have used for quite some time.	CS
11	Interviewer	Are they still using this web-portal?	

12	IT1	Yes, they use it to mediate school material and cross-checking material. My school have the idea to have the same software and material all over the country.	PE
13	Interviewer	Who have access to the cloud service, teacher, student etc?	
14	IT1	Yes, since I have been working with two different organisation, you will get two different answers	AS
15	Interviewer	Perfect	
16	IT1	The educational activities in Lomma Municipality which is called UKS, so the management got access to Google Apps, since we want the colleagues to have the system, else it will be hard to cooperate. The school that I am responsible for everybody within the school have access Google Apps for education purposes. But at the head office for the school, they have access to it but do not use it actively. But they also use Microsoft exchange and Outlook solution, word etc. But they also work citrix web desktop, and my school used that before where you logged in on a web desktop and there you will find all the material.	AS, CS
17	Interviewer	What is sensitive data according to you?	
18	IT1	Sensitive data, is information that can refer to the laws, for example discrimination, PUL, health and social life, according to law. You cannot really exemplify, because then it becomes unclear, you need to stick to the laws that we have. It is also the policies that we have here, for instance, you do not write anything about that in text that can be saved somewhere in the cloud services. And very important that this kind of information is not suppose to be send by email, which people tend to do. No matter who the provider of the cloud service is. I have been working with both Google and Office 365 and the people who think it is okay to send that type of material have always been wrong.	PR, CSS, PO, CS
19	Interviewer	Do you see any problems with the accessibility that cloud services grant, for example, use it from home, share folders etc	
20	IT1	As a security question and not as a lack of accessibility	
21	Interviewer	security	

22	IT1	Yes, there is a risk and it is included in the risk analysis that we do. To show, what is the material that we create and are there any risks if this material/information get out of our control. In case of this would happen, how counter it? Together with audits, we can do reports to be able to see exactly how many documents are shared outside the domain, what happens to documents that are shared outside the domain? This is possible both in email and cloud.	PR, PE, PR
23	Interviewer	Does this happens in reality that you do different reports and audits?	
24	IT1	Yes, depending on the tools that you have access to. Most of the tools do have a price but it is definitely worth it if you are accused by paralegals for breaking against GDPR or PUL. In Sweden we think differently, and cloud services was not created in Sweden, they are based in the US. In the US they have extremely high demands to have an overview what is really happening in the cloud and even block function to avoid incidents from happening. In Sweden we have higher individual legal rights but in US they have extremely high demand that certain incidents cannot happen. Their focus is different from Sweden, where Sweden is more focused on the integrity of the individual but in US incidents concerning pornographic material and alike is extremly forbidden. Which increases the demand on the cloud providers, that the users of the cloud service must be able to control their cloud service. Which we do not do in Sweden, we focus mostly on the individual and incidents concerning PUL.	PE, CSS, G
25	Interviewer	Who is responsible in case of data leakage, hackers etc	
26	IT1	That is the person who is responsible for the personal data, which is the board, in this it is each board in the public sector and in private sector it is also the board. It is still difficult since, two factors become important, one, the person responsible for the personal data cannot be one person but at the same time they usually want it to be only one person.	R
27	Interviewer	Are there any improvement on its way?	
28	IT1	GDPR says that it should be a data protection group, and the personal protection group that we have now will slowly become outdated and will be replaced by the data protection group. It says that it does not	G, PR, R

		even have to people people within the organisation that should be responsible. It can be an external source. But that is not the one that is responsible only to help out so each board for each sector is still the responsible. For instance, in social activities it is the social board that is responsible and the people there. In the end it is the board.	
29	Interviewer	For example, if a teacher upload a file which they are not suppose to, is it the teacher fault or someone else?	
30	IT1	Both, the board needs assure that policies are in place and instructions has been made but still as a person you are not allowed do anything wrong. However, there are differences in how much wrong a person have done, and if you have done something wrong then your employment is at risk. But a person cannot be arrested by GDPR or something like that. And it is not easy to charge the board either since they have not done anything wrong. There we have a high uncertainty since no laws are in place and cases are needed and paralegals will see what happens in reality.	R, PO, G, CSS
31	Interviewer	Who is the owner of the information once it is uploaded to the cloud service?	
32	IT1	The owner of the information is the organisation, so it is not your documents it is the organisation . You do it on order of your employer. With that said, Google never becomes the owner of the information that is uploaded. That is one of the most strictest agreements that we have with them. If they do something wrong which can happen, and then we have the agreement, so we can sue them according to the contract.	PY, CS, CSS,
33	Interviewer	How do you assure that the teacher use the cloud service safely, do you have any policies or alike	
34	IT1	Documentation, education, policy and continues education within the area. This will increase since GDPR is starting to take action. Here in Lomma we have three IKT-teacher and ten developers that work with IKT and IKT-teacher have started to get them into the thought process of GDPR and legal activities.	PO, G
35	Interviewer	What is your motivation to use a cloud services within schools?	

36	IT1	You are not locked to a certain hardware, some have PC other have Mac, students have Ipad and also chromebooks. If you want to access on the move you can do that. Linked with that you have economic factor, instead of buying licenses to locally installed software that in most cases are more expensive and slower. So there is a lot of positive aspects.	M, AS
37	Interviewer	You would say that cloud as a service is the future	
38	IT1	Yes that my next point, it is not only in schools, these services are everywhere, in that case people should start learning how they work. Before you said on your CV that you had skill in Word and Excel to get a job. I think it is the same thing here, instead it is about the functionality, now you will say on your CV "I can work with sheets" no matter the application, "I can create texts" no matter the application, you are after the function not the application.	
39	Interviewer	Do you think you have to reduce security to get better accessibility and usability?	
40	IT1	For instance, at the school that I am responsible for, they had thin clients across the walls, where you could book different meetings and alike. It was a thin Linux machine and you could access it through the web to read information that was available at the web portal. There tools was not that flexible as we wished. Then we saw that Google had a services like this that we wanted and it was for free. The point of building a in-house web portal was that it was free and not cost anything, you own everything and can change what you like. We decided to go over to Google since it would not cost anything extra and the functionality would increase. And this allowed us to become more digitised since the students got own computers and therefore, the accessibility increased and more task become digital instead of just the portal. Here in Lomma we were early with the digitisation and the students got their own Ipad which increased the possibilities what you could do with the technology.	CS, AS
41	Interviewer	What it looks like, Google have become the leader in school related tools, is there any drawback with this in your opinion?	

42	IT1	If their service would cost anything, it would become a problem but since it is free, they do not have any competitors in this field. Problems occur for the other companies that must offer a free software, you cannot enter this market without offering it for free. For instance, Microsoft offered their Office 365 for a cost to student but they realised that we cannot charge this since nobody will use, and thereby offering it for free to students and teacher. Not even offering for a low price works, you need to offer it for free. An example what Microsoft did during the 90s, when their OS got pirated on a extreme level in Asia, they did nothing, instead waiting three years when they released a newer version where the charged a license fee. Everybody used their OS and now they were forced to pay. This is the idea of Google, that later on these users will use them on a business and these tools are good enough to use in a company that they can charge for it. Exactly what Microsoft and other have done.	CS, PE
43	Interviewer	Do you know if Google uses the information in some kind of marketing?	
44	IT1	Not according to the agreement.	CS, CSS
45	Interviewer	Do you have any policies how teacher and students how they are supposedly to use the cloud service?	
46	IT1	Oh yes, as I said before when we talked about sensitive data. The difference between them should be crystal clear for the for everyone in both organisations.	PO, PR
47	Interviewer	If you are newly employed you get a paper in your hand that state the policies?	
48	IT1	I do not for 100 % but I know in Lomma, they are working on it since it should be a part of the process for using cloud services and GDPR which makes it even more clear. At on of the schools there is a manual for the employees where they can look up different rules and policies. I think they also have introduction days, where you get educated as an employee on how to use the cloud service in your work.	PR, CS

49	Interviewer	Do parents and students know that an external cloud service provider save information about them?	
50	IT1	Yes, it is the same type of information folders and will be handed out, explaining why we have chosen these services and so on and also which services are available. Also how the data is handled by this service, this is a typical thing when doing a RSA and presenting this.	AC
51	Interviewer	Do you know where Google saves your data and if there any legal complications? Or does it even matter?	
52	IT1	According to the agreements it will not matter. Not even Google know where their data is being stored. The data is saved with such redundancy and if I remember correctly I think it is five data warehouses around the globe where the data is stored. So even if one data warehouse is blown to pieces it will be saved somewhere else.	CS.
53	Interviewer	Knowing this, do you think there are any risks with this type of architecture?	
54	IT1	Back to the contract and agreement, all the data is encrypted at their hard drives even all data that sent from one place to another is encrypted. So there is no risk, for integrity crime since the data is not accessible. Only the person that log in with their account can view the data. Just as any other system, the person who is the admin can of course change passwords for a user and then log in as that user but it does not matter. Which of course is against the agreement and contract and you will probably be fired directly. For instance, people who have a server in their basement usually do not encrypt their data and most people can read it in plain text, and to crack the local password on local computer takes about 20 seconds. It is a general consensus amongst service people that Google have better security solution than most in-house constructions.	CS, CSS, PR
55	Interviewer	Schools are now putting their trust in google and you never know what happens with Google, for instance, bankruptcy	
56	IT1	It goes both ways, first you need to compare and lets say that all the schools of Sweden start using Google software then you reduce the risk greatly I would say. Then if you compare have all of the data in-house, then how high is the risk that the hard drive becomes obsolete	CS, PR

		and the backup as well? It risk is probably much higher than Google data warehouses goes under.	
57	Interviewer	We do not have much more to say, do you have anything to add?	
58	IT1	My recommendation to other is to buy tools that you can use and monitor your own cloud service. We have a tool called General Audit tool, it can vacuum all the information that exists and the developers of this tool is located on Ireland so they are under the regulations of the EU. Where all the data is encrypted on their servers, and they do not have access to my data, only me. Yet again it is important to fulfil all the requirements.	PE, CSS
59	Interviewer	Does Google offer tools like that?	
60	IT1	Yes yes, they also have implemented report tools, in some cases are very detailed, however they are time limited and only have logs 6 months back and other stuff that they do not show. But Google do not have GUI for all the information that they are collecting and not reports for everything. Comparisons is not possible with Google as it is with General Audit tool.	CS, PE
61	Interviewer	Do you use Google Apps to store any sensitive data at all?	
62	IT1	No not to this date	CS, PR
63	Interviewer	What tool do you use then?	
64	IT1	Informento in Lomma and probably some information in Extens but I am unsure. The only person who writes sensitive information is the nurse at the school and she have her own journal system for that, rest is written on paper, if at all. I think, it is possible that the teacher for students with certains needs, saves her data on a USB separately from everything else that later on is locked in.	PR
65	Interviewer	Could you say that it is pretty clear between teacher what is sensitive information and what is not?	
66	IT1	Yes, in my opinion and in the organisations where I have been active it is pretty clear. Now I am very close with my school and they are	PO, PR, CS

Row#	Actor	Text	Code
		very aware of what is sensitive and what is not. We have people educating to become a part of the data protection group.	
67	Interviewer	But there could be cases where, people upload their whole organisation to the cloud? Since more and more schools are becoming users of the cloud	
68	IT1	There is always a risk of that, it is the same thing if you have printer that works for everyone at the office or school, if you print something that might be confidential then and you are not waiting at the printer for it. Then there it is, demonstrated for all the people who come across it.	PR
69	Interviewer	Thank you a lot for the information and take care	
70	IT1	Thank you	

Interview transcript 2 IT-professional

This interview was performed 18 April 2017 by Herman Engström and Henrik Warrol and we will be referred as the interviewer and the interviewee as IT2. Duration 22 min.

Row#	Actor	Text	Code
1	Interviewer	Is it okay if we record the interview and your name will not be in the thesis unless you want to.	
2	IT2	Yes, ok	
3	Interviewer	We will start off with some basic question then some more in-depth questions	
4	IT2	Ok I hope I can answer, since we have a shared responsibility surrounding this area but I hope I can answer.	
5	Interviewer	What responsibilities and what is your position right now?	
6	IT2	My title is quality and development officer and in that responsibility includes everything that has to do with quality assurance within the organisation, which we work systematically with. Until just recently I am not responsible for systems and system development. It was only a few months back since I stop working with that, since we try to define the role more clearly within the organisation. But since have had	

		that role for quite some time I believe I have pretty good insights in that world.	
7	Interviewer	What cloud services do you use at your school?	
8	IT2	The most important cloud service that we use is Google Apps for education. Partly we use it ourselves with our calendar, drive and documents etc. Then our students use it, they recieve Google accounts and then a in-house developed teaching platform. Where the platform is a cloud service in itself but it is also integrated with Google. These are the primary services that we use.	CS
9	Interviewer	So the teacher primarily use Google Apps and your own in-house developed platform?	
10	IT2	Yes, they do not even have access to Word and excel. Our mission is to completely go over to Google Apps. The actors that still have access to Microsoft applications are --- We have a variety of different position within our organisation such as economy, that are excel based roles and also our cooperation with different municipalities requires some Microsoft applications --- these roles.	CS, CSS, G
11	IT2	I can also say that, many of our other tools are also cloud based, for instance, our HR tool which my colleagues can access from anywhere, mobile etc. A lot of economy tools are cloud based.	CS
12	Interviewer	What kind of data do you store in the cloud, is it sensitive somehow?	
13	IT2	Yes, depends what perspective you have, right now, we store most of our information in the cloud. Our perception is together with IT experts is that the information that we store in Google Apps in secure compared to our old system when we had a in-house system. However, there are some information that you are not allowed to store, for instance, about students and their relations. Therefore, we also have qurators, special teachers and nurses have a tool that is not cloud based, that information is only accessible from a specific computer.	CS, PR, PO, AS,

14	Interviewer	You have separated these type of systems?	
15	IT2	Exactly	
16	Interviewer	Do you see any problems with the accessibility that cloud services provide?	
17	IT2	I would like to say, right now, I only pros with a cloud service but maybe not only pros but a few cons. The accessibility increases enormously, the possibility to cooperate between colleagues is fantastics and allow people to be in the same folder/document. Where you can comment and stuff like that, it is also very good for teaching since the teacher can directly change in their document write comments etc. From that perspective I only pros. Cons with a cloud service is, Google, these folders that the teacher share it can become quite chaotic in the document structure. In a old fashioned server it is usually have an IT admin that creates the structure and allow privileges. In Google it can become a bit anarchy, where the teacher can create maps as they wish.	AS, CS, MO,
18	Interviewer	Does all the teacher have the same privileges?	
19	IT2	The idea of Google is that everybody should participate and there should be no hierarchy. But we have seen it is a bit naive with some kind of admin it become chaotic. So what we have done within the framework of Google drive, we created a super user that created a folder hierarchy and provided overall privileges. It is possible to go around this and fix the problem that we had with chaos	CS; PY, CSS
20	Interviewer	Have this solution been successful?	
21	IT2	Yes, somewhat, but it is still possible to create folders outside the folder hierarchy. We cannot completely stop people from doing that. But so far it is ok.	PY
22	Interviewer	Who is responsible for a possible data leakage or files extracted from a unknown source?	

23	IT2	It is the IT officer and the IT department. This is something that we need to be more aware of than we currently are when working with Google. Since in a traditional server you can of course have problem with people sending documents that they are not allowed to but in Google you are able to just share documents. Theoretically there is a variety of different possibilities for data leakage and alike. I would say that Google is working with this and try to simplify and increase the control.	CS, CSS. PR,
24	Interviewer	Have you made any demands on the IT officer that he is responsible if something would happen even though a teacher made the mistake or act.	
25	IT2	Ah ok I maybe misunderstood the question, the IT officer is responsible for having a secure system where we address possible exploits and such. If someone have ignored these measures and that person have gotten information about this then it is the person that have done it responsible.	R, CSS, PR,
26	Interviewer	Who is the owner of the documents that you upload on the cloud?	
27	IT2	Our policy is that our organisation owns all the documents, if you have private documents then you are not supposed to use our server. We also have a policy concerning work documents but currently working towards something but when you are done with it you are supposed to upload it our cloud server. It is important since to build up a good structure value, for instance, teacher creating lecture plans test etc. We want that information into our organisation and become useful for others.	PO, PY
28	Interviewer	The server that you are talking about, is it your own server that where you have implemented Google Apps or is it completely Google's servers?	
29	IT2	It is Google servers, that is one of the perks by having Google since we do not have to have our own servers. The Swedish computer authority have a lot of concerns about Google Apps and such. As far as I know, with the new agreements and	CS, CSS

		contracts they can assure that the data is stored within EU and their regulations. Which have been really important.	
30	Interviewer	How do you assure that the teacher and principals use the safest way possible to upload documents?	
31	IT2	Good question, the only thing we can do is to have routines and instructions which we have done. From that we have to trust that people follow this instructions and routines and we have not seen anything that this is not the case.	PO, CSS
32	Interviewer	If you are a newly hired employee, do you get a document with instructions and routines?	
33	IT2	There are some instructions on our intranet,	CS
34	Interviewer	What is your motivation to use cloud services?	
33	IT2	At least two driving factors, one, to be able to work anywhere and not be bound to a certain location and not be dependant on any kind of tools. In our organisation we want to be able to access the tools that we require to do our work whatever the location. There are different solutions for this compared to using a traditional server, where you need VPNs and such. Secondly, we needed a flexible solution which is secure, what do we want to do in our organisation? We are working with education and that is what we are suppose to be good at and not information security and such. So we decided to let them to what they are good at and we stick to education. We have hired security experts to help us out, since I do not know anything about security at the Google data warehouse. So we can trust them.	M, AS, PR, CS, PE
34	Interviewer	Are the students and parents aware of that information is being stored about them at an external cloud services provider?	
35	IT2	Yes they are, they are aware that we use Google but I cannot say for sure how that information is distributed to them.	PR
36	Interviewer	They are okay with this, or has there been any conflicts?	

37	IT2	Nothing what I know, but at the same we started to use Google Apps in 2014 but also that same year we introduced a one-to-one solution. We hand out a chromebook(a laptop) to every student, so they cannot store anything on them but they can access the cloud (Google Apps). Our domain is built upon Google so to say. Anyway, no complaints yet concerning this topic.	CS, AS
38	Interviewer	Ok, last question, do you know where your information is stored once it is uploaded or do you know if it is within EU?	
39	IT2	What we know and what we have to rely on is that the information is stored within EU, and our contract with Google. But where within EU I cannot say, but if I have understood it correctly without being a expert on security. Google do not save documents in its whole, so the files are spread between different servers across EU and this increases the security, however exactly where everything is stored I cannot say.	PR, CSS, CS
40	Interviewer	Do you what Google can do with this information? Is it possible for them to use for marketing purposes?	
41	IT2	This have been specified in this GAFE which is a contract used for schools and it says that Google cannot use the information for marketing purposes. I mean it is also a matter of trust and it would not be very good for Google if any activities like this really happened.	CS, CSS, PY, PR
42	Interviewer	Ok that was it, thank you for your time	

Appendix 4 Interview principal

Interview transcript 1 principal
This interview was performed 18 April 2017 by Herman Engström and Henrik Warrol and we will be referred as the interviewer and the interviewee as P1. Duration 54 min.

Row#	Actor	Text	Code
1	Interviewer	What is your position?	
2	P1	Principal	
3	Interviewer	For how long have been working as a principal?	
4	P1	Three years	
5	Interviewer	For how long have you been working with cloud services?	
6	P1	These three years, and increasingly. The students do not always have the IT knowledge that is required to hand in their assignments. But anyway around three years.	CK
7	Interviewer	Have you used it privately as well?	
8	P1	No my first got in contact with it here at the school and where I learned it.	CK
9	Interviewer	What cloud services do you use here?	
10	P1	Google Drive, primarily in the school administration, where we share documents and write together. We also use Fronter for some assignments and results. But we can also use for some communication between different teacher groups.	CS
11	Interviewer	Do the students use Google as well?	
12	P1	Yes we use GAFE, and there have been discussion concerning the security. For example, sensitive information we take through Fronter and mail, well that is not the most secure service either. But I think their somewhat of a consensus what you upload and not upload. But documents concerning work and lectures then you can take it through a cloud service such as Google drive.	CS

13	Interviewer	Is it up to the teachers what they can upload?	
14	P1	I think when the information is concerning a specific student, for example personal number and healthcare information another system for that called Asynja. Asynja is very restricted where only a few can read and edit. This system is part of national healthcare system and we use a part of it.	CS, PR
15	Interviewer	What kind of information do you upload?	
16	P1	Student information, teacher communication with the students. For example, course evaluations and teacher groups evaluations, then you send out an anonymous survey, then you get pretty bad response. If we send it to their student email, we get ok response, if we do it with pen and paper you almost get 100 % response. There we have a problem with reward, what do the student gain from doing a survey, and it can be pretty hard to determine what is the difference between a 1 and 3.	CS
17	Interviewer	Do you share folders on the cloud, between teachers and principals etc.	
18	P1	Yes, we do, we have equality plans, and other student plans and crisis plans. It works like a archive, where you can do you work. Then we have Fronter and soon Its Learning, but it has the same functionality. The points with starting to use Its Learning, it can help use to do individual study plans, it is more live where the responsible teacher can fill in after a lecture if the student reached her or his goals. The assignments the students hand in can be saved, whereby, a portfolio is created. There is plans where it can help the student to build a own study plan of the the accessible material. But the study programs can deny the communication, like other programs to such as Per Capita. Bit more technical issues.	CS
19	Interviewer	Do you see any problems that the teachers can share any folder they want?	
20	P1	There is a risk when we have many different systems, then the teachers use the system that they think is most comfortable because they maybe use it outside of work or I have already saved a lot of documents on another place so I rather continue	CS, CK

		there. Then maybe someone want to take matter into own hands and to their own thing but we are supposed to use Its learning in start of august then we will have a full covering system. But then we will have Google docs because many have their Google emails.	
21	Interviewer	Will you completely leave Google Drive?	
22	P1	Probably yes, but I think other employees will continue using Google Drive. There is so many simple functions, for example, easy access to Youtube, and other social, just drag it in. I cannot think that these functionalities are prepared in Its Learning. So if you want to do a open lecture or a presentation then you could use Google. But Its Learning have said that you can connect Google Docs with Its Learning. You cannot input but output because you need to login in into Its Learning, but anyway Google will probably stick around after the It is Learning release.	CS, CK
23	Interviewer	Have you gotten any education how to use cloud services?	
24	P1	Considering Its Learning they have said that they will send people here and teach us. We have had some education with Google docs or GAFE, since all thea should be on the same track. It is in our interest that the teacher handle tasks accordingly since we do not want the teacher to ask themself "what do I do for this class". For example, different deadlines, it is important that all the teacher are under the same roof.	CK, CS
25	Interviewer	Have the students gotten any education, on how to use cloud services?	
26	P1	No, the only thing I know is that the teacher show them how to login and here is your account. Then the teacher adds that student to the contact group so that teacher can communicate with the students. But yes, it is up to the teacher to spread that knowledge, that maybe should be a board question instead. But it is quite naturally that the teacher show the students how they want it etc, maybe it is right I do not know	CK, R
27	Interviewer	Is it up to the teacher to teach or do the board force them?	

28	P1	There is a lot of people that have not been close to GAFE, but this have also engaged teacher to use cloud outside of work	CK
29	Interviewer	What is sensitive information according to you?	
30	P1	When you are starting to connect, expressions like if someone have difficulties reading and writing or maybe some languages problems connect to a personal number and maybe a name. Name can become pretty unique, for example, immigrants and languages students they can become identified by only using their name. Then we use initials and the six first numbers in the personal number. But considering healthcare information it is Asynja that is used.	PR
31	Interviewer	Is there is consensus between the teachers what sensitive information is? Have you said anything to them, what they should watch out for?	
32	P1	I think that everybody knows that, when we start talking about something that could be harmful for a student, then we have qualified information concerning that. But, also results, you do not hand a list with the results. There are teacher that use student judgement that allows the students to judge themself, even there some think it is delicate to hand out concerning the students assignments. So that you have to decode and then you take a copy of that then you hand it out. Unidentified, because students can become offended by this act since they thought that they were only handing the assignment to the teacher. So I think the teacher have pretty high level of professionalism.	PR
33	Interviewer	When you started using GAFE and other cloud services, did you get the rules and regulations how to use it?	
34	P1	I have only be a here for a little while, then we got some regulations, for example, who you should invite and who not, some guidelines. It becomes problematic if its open, I mean it is up to everyone to take responsibility. Comparing to my last workplace, is it ok to be in a Facebook group and be friend with students? Can you share your INstagram? From that perspective you need to look at the relation between teacher and student. In that mist when sharing documents, if the sharing of the have a	PO, CS

		work related purpose then it is ok. But probably some information have been handed out to the teachers.	
35	Interviewer	Have the Swedish School Authority said anything, how to handle cloud services?	
36	P1	No nothing, it is very bad, the principals are responsible and you have ethical rules but of course are very open but still very responsible to go too far. But I wish this could be more clear.	G, R
37	Interviewer	How do you ensure that the teacher do not upload information to the cloud that is not adequate? So they do not upload information that is not allowed to be uploaded.	
38	P1	No we do not ensure that, I only hope that everybody understand where the limit is drawn what you can upload. I could never control everything that is being uploaded, no. You have somewhat woken the bear (me), no but we have professionalism that is required from the teacher. When they started here they signed a contract about professional secrecy which include not to expose students identity or that could harm them. So I hope all the teacher have a limit and I feel pretty secure with that.	AC, CS, CSS
39	Interviewer	Let's say you had a meeting and you are taking notes with some possible sensitive information. How do you digitalise it, do you remove something or just upload it etc?	
40	P1	Notes from a meeting and alike, is either on paper or just locally on my computer or I share it with other teachers through email. But then again if someone want to access any information they can access it, there is nothing that is 100 % secure. But information concerning student special needs can sometimes be good if more are aware of it since teacher can adapt to them.	PR
41	Interviewer	If the information on the cloud is no longer accessible, how do you handle that situation?	
42	P1	Good question, I do not know, I think when I use that type of service, for example, sending an email, there is no guarantee that my email will reach its destination and something wrong might happen along the way. What is responsible for my email not finding its destination? But if something wrong happens, for	AC, R

		example, like a folder that you share with the teacher, and that folder is filled with junk, and then I am responsible for that folder, what should I do, I did not fill the folder with junk?	
43	Interviewer	When we are touching upon that subject, we might as well ask it now. Something has happened with your cloud service, and maybe some data is leaking to people who should not get this information, and you are unsure of who is responsible. Who responsible in such situation?	
44	P1	The best would probably to check the logs but if someone can hack our folders that are pretty good and can probably hide their tracks. But I am really afraid of the day when someone implement some malicious software into our organisation.	AC, AS
45	Interviewer	Ok but, if two teachers are having a conversation through email or sharing files on the cloud and somehow that information gets into the wrong hands, who is responsible?	
46	P1	In the end probably the one who shared it, but I think they will accuse the board. But in such cases we are in the wild, we do not know, we cannot accuse anyone but then they will say, then you should not use it. But then again cloud services enables easy communication to the students and they want all of their information to their smart phone. Then you need to question you to weigh accessibility, security and usefulness. I mean both teacher and students can misuse this, and this might not happen so maybe it is worth it. Everybody must have these problems. I feeling that I am fleeing from your question and it horrid but I do not know what to say, what do the other say?	R, CS, AS
47	Interviewer	They say pretty much the same thing. Next question, how much time do you and the teacher spend on cloud services on a daily basis?	
48	P1	We do some protocols and agendas, a couple of hours a week I think. Maybe the teacher use it a bit more than I do since they take care of assignments that are handed in through GAFE.	CS
49	Interviewer	The daily work of the teachers, do they perform it in the cloud?	

50	P1	A part of it yes, we are not cutting edge here but, most of our Swedish teacher are pretty digitalised, so they let the students work a lot with the cloud. GAFE and such lets the teacher exam how much the student have worked on the document and what time they handed it in. That information tells the teacher their ambition.	CS
51	Interviewer	How much time does cloud services require from the lectures? Sharing documents between teacher and students etc	
52	P1	I do not think they spend that much, but considering that a high school teacher have between 5 - 6 courses and cloud services should not require too much of their time. In the start of course they maybe spend more time to get the student up to pace, and in the end not so much. Maybe 5 % of their, I mean they are just upload different plans and checking assignments.	P, CS
53	Interviewer	Ok, other schools that we have spoken with, have their whole education process in Google Drive	
54	P1	For me it is still important to have the interaction between student and teacher, because then we have a chance to create relations which you do not do through own assignments and such. But still it is hard for me to imagine that you could spend more time on cloud services, maybe 10 % at most. I want to hear how they think and argument and reflect, if they sit at home writing I do not know if it is them or someone else.	PE
55	Interviewer	Are the students aware that information is stored about them at an external cloud provider?	
56	P1	The stuff that they have produced and feedback on that, so they should understand that the information is open for others. But I think there is no personal number or complete names, I mean do a search on your own name, then you find a lot of information, who you are married to etc. So I think they should be pretty well informed. They have probably searched my name and all the teachers.	PO, PR
57	Interviewer	Well more if like some kind of incident occurs, and then the student say I do not want you to save that kind of information about me or something like that	

58	P1	That could happen, for example, if a student have been caught for plagiarism and then the teacher send feedback on that, and somewhere the teacher needs to write this is wrong and some link to that. Of course that student would be worried that information about that case is stored somewhere but that teacher do not send that information to everybody.	PR
59	Interviewer	Of course but if you had some documents leaking out, and the student can see this, what happens then?	
60	P1	That would be really awkward but that could probably happen. I mean there is probably a lot of leaks that we have no control of, but yes I do not know, it is hard. Therefore, it is important for everyone to think if this is ok to upload or not even though if it is only me and one other person or should I use my email.	CS, PR
61	Interviewer	But you also have students that are under 18, do their parents know that information about their child is being stored?	
62	P1	Yes they do, everybody that get IKT hardware needs to sign a contract that we use different education platforms etc. They also sign in with their name and some password. They use the same password everywhere like 0000, 123, they are not aware of the consequences.	CS, CSS, AS
63	Interviewer	Have the Swedish computer authority said anything about regulations or rules etc?	
64	P1	Then we have PUL, they are very stringent, there is a law that say how you should use personal information. If they would do a inspection when we have done something wrong, then it is over. Would there be school that could handle such an inspection? I mean there is always someone that is doing something wrong, maybe copy pasting some personal number or such, if you connect name with personal number then you are screwed. But then again we have Per Capita that take care of this information.	G, PR, CS
65	Interviewer	But then if you have not gotten information from your board, what should you do?	

66	P1	Yes, but then you get a flow of information that nobody reads. For example we always have a start PM for every new employe with rules and information about how you should work etc. Then we refer to the teacher groups, that help each other.	R, PR
67	Interviewer	How do you handle a situation where a teacher ask you if they are allowed to upload this type of documents or something like that?	
68	P1	Then I say, if you uninitialize it as long you cannot refer to a specific student it is pretty much do whatever you want.	PR
69	Interviewer	Do you have any written policies or rules for the teachers?	
70	P1	No nothing specific or written down	PO
71	Interviewer	Is it up to the teachers and their judgement?	
72	P1	Yes, then again, is there something that could hurt the student then you should not upload it, then we have other systems.	R, PR
73	Interviewer	Are there any clear rules what happens if a teacher upload something they should not?	
74	P1	I have a hard time thinking that any teacher should do it, because we do not write about students rather more assignments to students and what they hand in. So nothing sensitive there. But still it is up to the teacher.	R
75	Interviewer	Could you give some examples that motivated you to use cloud services?	
78	P1	Yes, when you want to share information quickly, and when many actors need to work with the same material, then it is invincible. For instance, if I mail a word document then everybody save that version and when I get that version back it is named something else and something that I wrote in the first place is there. So, it is very good that you can write in the same document. Also, that you can be logged in at the same time.	PR, CS, M
79	Interviewer	Who took the initiative to start using cloud services?	

80	P1	Probably the board, the people who have used it here have been using it for a while. The other guy that you met in the corridor was one the guys that started it here at this school, maybe 3 - 4 years ago.	CS
81	Interviewer	These initiative are locally at the school and not made by the municipality?	
82	P1	GAFE was one directive from the municipality and to work with that along side with Fronter since Fronter had some issues. Fronter did not have the accessibility that our students require. Bring your own device is a natural move for the students.	G, CS
83	Interviewer	Are the teacher forced to use cloud services?	
84	P1	I could hire a classical teacher that only use pen and paper but I think there is a curiosity amongst the teacher, for instance I could this function at home or such. For example to book meeting that app you can use everywhere.	
85	Interviewer	Ok but neither you or the other board members have said to the teacher that you must use GAFE?	
86	P1	No, rather if a teacher find an app they want to use they can do that but also the students, so it is up to them	R
87	Interviewer	So if a teach find a app they want to use in their course, could they bring in that app without asking for permission?	
88	P1	If we want to use it for the whole school then we would like to inspect and understand what it is. Then we are pretty control and put it to work. A part of the school have Ipads, so if one find a very good app and it cost a little then we can give that app to everyone because then it updates wirelessly. So all services that can help out with writing, hearing and reading, then we just push it out.	PR, AS
89	Interviewer	Yes, but you never know what kind of information these application collect, is of some concern or how do you handle such situation?	

90	P1	Then it is better that we understand what it is, then we buy an official license and it is implemented into the students devices, then you avoid separate login by each student. So it is positive if we can implement the apps to every device.	CS
91	Interviewer	How did you work before using cloud services?	
92	P1	I think we used a lot of email and used the possibilities that we had. I still use post it labels and have them on the wall because it can have its function.	CS
93	Interviewer	Any pros and cons if you compare to before? Are you more efficient now? Are the teachers more effective?	
94	P1	I think the teacher are more effective now, but at the same time we have knowledge that needs to be learned and then something else needs to be removed. As I said before we maybe need to give this topic more time in the first grade so they can be better later on. So the more informed we become, the narrower our scope become.	PE
95	Interviewer	Have the work effort increase due to cloud services?	
96	P1	I think so, the teacher say that they cannot make the deadlines.	PE
97	Interviewer	Have cloud service lighten their workload?	
98	P1	I think so yes, for example, before when we needed to control plagiarism, then you needed to trust yourself as a teacher because we had no automatic control as we have now. So before the teacher had to check up some literature if they felt a hand in from a student had plagiarism. Now you can use Urkund and take 50 million articles under an hour.	PE
99	Interviewer	Depending on your contract with Google, who is the owner of the information that is uploaded to Google drive?	
100	P1	That is interesting, because when you login on any website, then you click a window, and the text in those windows probably say that all the ownership of the information belongs to someone else than me. I mean I cannot even delete my Facebook account.	PY, CSS
101	Interviewer	So you do not have some type of contract with Google?	

102	P1	No what I have seen, and Google is a profitable company and they are probably interested that more and more people to start using their services. But I have never seen a contract and I mean everybody should understand that if you upload information about yourself it will probably never disappear.	CSS, PY
103	Interviewer	Do you have any plans to fix this issue?	
104	P1	No, I do not even know where to start, and that actually scares me a bit that we do not own the information and the question itself. At my level and teacher level. In my opinion it is good if the right information spread its good but if information about my opinion spreads it is not as good, for example, political aspects.	G, R
105	Interviewer	But that does not change your opinion about using Google services?	
106	P1	No I think the pros overweigh the cons and maybe I have to regret it later later.	CS
107	Interviewer	What would you prefer accessibility over security and vice versa?	
108	P1	That balance is difficult, if we have a high level of integrity about what we upload, then I think the question is solved but if we start compromising the integrity then it is not good.	CS
109	Interviewer	What are your thoughts on that information may be stored outside Sweden where other laws apply?	
110	P1	Then I trust my board that they would never buy such a system. I can never imagine that they would buy a system where they do not own the student information. For example, Its Learning is a Danish company and they probably have their servers in Denmark, but I am pretty sure the contracts say that we own the information. So I think that contract is solid enough	G, CS, PY
111	Interviewer	You do not feel that you would need a contract like that for Google as well?	

112	P1	Yes we probably should, buy if we have high professionalism and integrity I do not think it will be a problem. But if we lower our standards then we are in trouble. Somewhat bad answer but yes.	R
113	Interviewer	No worries but you might still be in the situation where you do not know what your teacher upload or who have access etc. I mean the school might gain twenty teacher and even more students.	
114	P1	That is delicate, I mean what one teacher could do or a student could do, is hard to protect against. Even if we had written rules who would follow them? Then we have consequences of that since we cannot punish students. Responsibility under freedom. We have laws in Sweden concerning freedom of speech and other laws that protect people from attacks and they are also used in the internet world. There have been cases in the school world but nothing really happens. But it is a subject that is on the agenda all the time, for example, teacher ask can I upload this class list? No you cannot connect personal number and name, even given name and surname.	AS, R, CS
115	Interviewer	So the safety net is the professionalism of the teachers?	
116	P1	Yes	
117	Interviewer	I think that is it, thank you for you time	
118	P1	Thank you	

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