The Impact of IT on the Foundation for Businesses Daily Operation

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1 Background

Most organisations use legal contracts to define and control the exchange of any form with external parties. This is a well established and known practice. The extensive use of IT Information Technology) in daily business operation has eroded some of the foundation which underpins the legal business contracts. An example would be when an IT services is provided from an offshore (low cost) country. Usually the service contract is designed with a certain legal foundation in mind whereas the services are provided form a country with a completely different legal foundation and culture, not really sharing the ”spirit” of the service contract.

The aforementioned situation together with other similar observations have initiated some discussions and efforts to explore what problems are there and how to best resolve those as the implementation of IT will further impact everyday business life as well as the lives of individuals. The ability to craft legally valid and useful business contracts has been a key skill in business life however; in an IT environment this skill will become an even more vital business skill to stay competitive.

This chapter will provide some of the background as to why the foundation for legal business contracts has eroded and highlight some instances which has occurred as an effect of the utilisation of IT systems.

To summarise; digital information systems oftentimes doesn’t support or underpin the intentions in legal business agreements.

2 Reflections and Observations

In order to explore some aspects of the issue put forward in the background above a short review of the digital revolution is in place.

When the personal computer, PC, was invented a real boost to the office automation was brought about. Individuals were handed tools which enabled them to automate previously cumbersome and time consuming tasks, resulting in improved productivity. The original thought was to provide individuals with technical assistance by means of the PC to increase individual’s productivity. As a result of the increasing implementation volumes of PC’s and the diversity of the software tools utilised the cost for the improved productivity for organisation grew out of proportion – the IT bubble burst.

The prospect of what “could be done” with systems of computers (personal, midrange and super computers) was “outnumbered” by the financial facts. It was too costly for organisations to maintain such diverse technology. The business rationale simply wasn’t there to spend so much money for business support functions. The cost efficiency in the business operation just didn’t materialise. The market reacted and an adjustment was required. The advent of cost consolidation through technology consolidation was invented. The concept of outsourcing was coined.

As the capability of the software and the capacity of the computers increased little consideration was given to all the information each individual produced

and its utility to the daily business operation. *The implementation volume of computers has now grown to impede organisations to improve operational efficiency as information vital to the daily operation is scattered across the different systems in the organisation.* In essence this fact is generally hampering the further improvements of the operational business efficiency.

The trend after the IT bubble burst, i.e. the downfall of the IT market in the early 1990s, has been cost consolidation while trying to improve general business operation in order to maintain competitiveness. During this period organisations have realised that the cost and the complexity of consolidating computer systems is prohibitively high. Hence, business effectiveness and efficiency is hampered by limited interoperability of systems and thereby failing to ensure access to information required to run the business operation efficiently. Further, the maintenance and operation of old legacy systems is also too high. Therefore, the demand to improve business operation while keeping the cost down drives the search for other means to gain cost efficient business operation.

It is a safe guess that much of the information generated in any organisation is not in a consolidated state but rather dispersed across the staff members hard discs. The need for automated support to keep track of information and manage information across an organisation is very apparent.

A further observation is; most of the information generated by individual staff members is used, one way or the other, to conduct the daily business operation. Hence, not only the right staff skills but also the right information with the right quality must be available to conduct the daily business effectively and efficiently.

As the outsourcing party is handing over the hardware and software to the service provider all of the information is also handed over, often without the real insight of the consequences. This fact is seldom handled in the business agreement for the provisioning of the IT service and it further necessitates the (software-)tools and procedures to control and manage the information derived in the organisations. This is not only from a daily management perspective but also from a perspective regarding business exchange with external parties as information has started to become a trade item.

The above brief reflection and overview on the digital revolution indicate that the employment of computers has generated some new business obstacles in the form of volumes of information to be managed as well as the control of ownership of the information. Today there are no real implementations of tools to obtain overview and control of digital information across an organisation. This is true for daily execution of the business operation as well as to keep track of corporate knowledge used to maintain and develop the competitive edge.

3 Information on Paper Versus Digitally Stored Information

There is information and then there is digital information. This chapter will explore some aspects of the differences which are interesting to and should be recognised by the legal community.

Information on paper needs a human to interpret and act on the information according to tradition, ethics, knowledge, etc. Information on paper usually requires large storage space associated with large human efforts to maintain and to keep current.

A computer can act on information as prescribed by the software without any further human interaction. The amount of information which can be processed by a computer is easily past what any human can process in the same time. The amount of information stored digitally in relation to the required space is still growing with surprisingly high speed.

The effects are all encompassing; "computers decide" and "act" many times faster than any human can. Hence, the volume of information "digested" by a computer is outpacing any human. This is the real reason why organisations use computers to improve efficiency. The generated result from the software manipulation of the digital information may or may not be desired depending upon the quality of the information or outdated algorithms in the software. The computer doesn't know of if the information is erroneous but only knows processing. Hence, the result may be accurate or not. An example known to most individuals would be the year 2000 (Y2K) problem which was a problem generated by the fact that some computerised functions were instructed by software utilising only 2 digits for the denoting the year. Hence, at the turn of the millennium no one could tell what the computers would not do nor was anyone able to tell which computer would malfunction.

Further, organisations depend on the human factor to be loyal to the organisation. This is not a new situation but, as we know, digital information is much easier than information on paper to duplicate. An example would be a system description or manual for a larger system. It usually requires "endless rows of binders" to contain the required information on paper whereas the same information can easily be contained in a few CD's or DVD's. The digitally stored information is also rather easy to duplicate and further use in other types of descriptions. Therefore, the mechanism for managing ownership and protecting the information is different from those used to do so for information on paper.

Hence, in order to conduct large scale business interaction where ownership and usage of digital information is securely controlled requires a national or an international infrastructure to electronically identify individuals or organisations. *An analogy in the "paper world" would be the system of passports for individuals. A similar system is required for the digital world. Most of the currently existing systems do identify a technical device being used and not the individual using it.* This fact opens up a host of opportunities for the hacking community to "spoof" (emulate) the real user and thereby commit fraud and other mischief. The type of infrastructure enabling such electronic identification is far from implemented today. An example would be the music and film industry where copying of copyright protected material is widespread. The same phenomenon is likely to occur in other industries as well as the interaction between organisations start to use digital transfer of information more widely.

In conclusion; the main difference between information on paper and digital information is the speed and volume by which computers can process and manage information as opposed to the human power for processing and

managing information. Also, the capacity for storing, multiplying and distributing digital information via means of computers is vastly outperforming any paper based system. The former fact drives the demand for new mechanisms in the "digital world" for managing, legally and technically, the ownership of the digital information.

4 IT as a Means to Improve Business Efficiency

Most computerised systems were and are aimed at automation of certain functions in an organisation. While the volume of these systems has increased over the years the diversity of computer systems and lack of interoperability of the systems create "bottle-necks" in the business flow. It is also quite the norm to have, in larger organisations, similar systems performing similar or the same type of tasks which, from an overarching business perspective, is far from sound business practice. The missing link is an overarching business view on the utilisation of computerised systems.

While computers make possible new services some of which was previously too cumbersome to perform or not possible to do. It must also be noted, as more and more functions are automated, still with the efficiency argument, the volume of information generated by computers is vastly past what any human can digest and act upon. Consequently, in order to maintain the efficiency argument organisations use still further computers to manage the information flow, in effect creating systems of systems thus, creating further complexity. Should an overarching business view be adopted by organisations the overall investment in IT would likely be focused towards the "bottle-necks" in order to ensure effective and cost efficient flow of information to enable best possible business operation.

As office automation has gained widespread implementation, by means of PC's and the Internet, most staff members in organisations store the information they generate and obtain on their own hard disc as well as exchange the information amongst each other. Oftentimes this information is essential or business critical. Hence, organisations have a much dispersed, unstructured information base of limited access to parties within the organisation. From a corporate knowledge point-of-view this fact constitutes a large potential for business efficiency improvement.

Staff in other areas of the organisation has a hard time to exploit the information to further the competitive edge of the organisation. A conceptual construct would be to arrange a "digital company library" in which the relevant information would be stored for further utilisation throughout the organisation. The cost for such a "library" would likely be rather low cost as compared to the collective cost for "scouting around for information" or "re-inventing the wheel".

The overall business interest for the executives in organisations is to maintain or improve substantial value (book keeping value) in the organisation. Given the above observations it seems to be a plausible approach to bring further cost efficiency improvements by consolidating the information resources and

thereby gain common understanding in the organisation. System interoperability would then be driven from the required information flow to best support the business operation.

Therefore; it is not the system as such but the information the systems manipulates as well as the ease of flow of information which is of interest to the overall business operation. Hence, consolidation and improvement in the quality of the information as well as common understanding of the information is what provides real business effectiveness and efficiency.

5 Information Security – Why?

The investment in computer systems is mostly made based upon the rationale of improved business efficiency. Thus, should the information contained in the systems not be available or erroneous the efficiency calculations deteriorate quite rapidly. Note, it is really the information which is required to be available but the businesses mostly talk about systems availability. Hence, the need to ensure information availability by means of computer system stability is apparent.

A drawback of computerised systems is the possibility for individuals to hack systems. Hacking systems is the concept of utilising unintended means to operate the system in ways it was not designed for. The reason why individuals does hack systems varies but the effect is the same: limited system availability, malfunction, copied (stolen) or destroyed information. All these activities can be categorised as mischief or criminal activities. However, all effects will be at the expense of the information or system owners. The most apparent cost is naturally to put the system back in operation again. Other cost may include regenerate the information lost or corrupted.

The obvious conclusion is; the system owners should also take protective measures into account when deciding upon calculation of improved business efficiency and make sure the measures are implemented. Unfortunately, it is seldom the case.

The widespread effects of virus attacks has probably not evaded anyone but the effect of being subjected to “uninvited guests” can cause even further harm as the systems are seldom set-up such that mischief activities are easily detectable and traceable. It is probably rather safe to say that this type of activity will likely grow as more value lies in the information contained in the systems. Thus, system owners need to consider how to protect their information assets.

A good start to handle the above problem would probably be to structure the information and classify it according to business criticality. This way the business managers would gain an overview of the corporate knowledge which would serve as a solid foundation for crafting business contracts understanding exactly what information is involved and how to manage access and distribution of the information. Today there does exist methodologies, for example the MEHARI methodology (a French security management method factoring in business processes and security processes), which classifies systems according to business criticality which has gained some spread of application whereas

information classification is only, normally, utilised in regulated industries or in the public sector (defence, police, etc)

A further driver towards information infrastructures is the fact that from 1st of January of 2005 the new regulation, International Financial Reporting System (IFRS), on financial reporting has defined the concept of; – "value in use" – which directly affects the balance sheet. In essence the "value in use" means that business need to assign a financial value to the information resources, digital or based upon paper, used to operate the business on a yearly basis and thereby including the value of the information in the balance sheet. Hence, business owners and the Chief Executive Officers, CEO's, need soon to pay keen interest to what information they have in the organisation and how to value it in order to keep the balance sheet in order.

Thus, staff members in organisations act upon digital information generated, contained and manipulated in computer systems. Information has become, de facto, the core of what organisation use to operate the business. Information is, according to the new regulation IFRS, required to be assigned a financial value which affects the balance sheet and thereby giving information a strong influence on the financial substance value (book keeping value) of any organisation.

6 "Digital Litter" in Cyberspace

Business life is an arena with strong global competition. Understanding what your competitor is about and doing is of paramount importance. In military terms it is called espionage or intelligence.

Most organisations have their own Internet homepage recognising the Internet as a marketing channel. In fact as the speed by which an Internet homepage is updated is recognised as a sign of an active and forward going organisation no matter what industry the organisation is active in. Often video clips, presentation material and other bits and pieces of information are passed to the public trough the Internet homepage.

As discussed earlier computers are superior in digesting information to what any human can, consequently today there are tools available to just about anyone by which to search for and collect information over the Internet. Compilation of information from many different resources or over time enables overview of trends and or patterns. This possibility was previously only available to large governmental organisations. Over time it is thus possible for just about anyone, organisation or individual, to compile vast amounts of information and make their own interpretations of the overview or detailed picture of the object studied.

For this reason, traces of your whereabouts, behaviour, attempts are rather easy for anyone to compile and analyse. This fact in combination with context knowledge or industry knowledge furnish a situation where not very much information is required to understand what the object of study is about, general knowledge level and business intentions. This concept is known and utilised in the police and defence sectors whereas today it is available to anyone.

Also, the opportunities inherent in the digital computer systems available to almost any one with the required skills – unauthorised penetration of computer systems presents a more severe threat. That is, with hacking knowledge, just about any information resource (any computer) connected to the Internet is available to the knowledgeable hacker and a potential target. Very well organised organisations with high level of awareness makes it more difficult for hackers to penetrate however, the human factor usually leaves a "door open" for those individuals or organisations with less honourable intentions.

Summing up; organisations as well as individuals should try to manage their information in order to maintain a competitive edge and preserve their respective integrity.

7 Outsourcing as a Means to Consolidation of Cost of Business Operation

The IT outsourcing business really started when President Clinton came into office in the early nineties in the US. President Clinton wanted to improve the public sector under the phrase; "commercial best practices in the public sector. The commercial best IT practices were the means by which the US public sector should be improved. The objective was to improve service quality while lowering the cost for the IT operation. The idea was to hand over the task of providing an IT service to someone who could prove a certain level of expertise in operating the IT in such a way that the cost for the service would become lower over time while improving the services quality. As this concept was developed further actors in the private sector also saw the benefit of gaining cost reductions. Thus the concept started to spread across to other market segments. As the concept brings about cost reductions the outsourcing nowadays usually also involve financial arrangements to have the service provider take ownership of the hardware and software.

Outsourcing is an Anglo-Saxian term spread globally. What it really means is allowing another party to handle a task for you at a financial charge you agree upon. In essence this is the fundamental principle of business. The concept of outsourcing IT services can be seen as a sound market reaction to something that was getting overly burdensome financially for organisations. Handing the task over to someone who has developed an expertise in the area makes sense as long as the buying party ensure certain knowledge as to what and how to procure the required service. The latter is vital to obtain satisfactory services which support the business operation. What you ask for is not always what you get – a knowledgeable and competent buyer usually gets what he wants.

What the outsourcer often forgets is when outsourcing the technical infrastructure most if not all information used to execute the daily business operation is contained in the technical infrastructure. The ownership of the technical is handed over to another party. Hence, the handling of the information is in the hands of someone else than the owner, who is accountable, for the information. Unfortunately, the fact that the information is also handed over the service provider is seldom reflected in the service contract. Also, as off-

shoring is now a growing aspect of outsourcing services delivery, i.e. move the operation to low cost countries from which the services can be provided to an even lower cost. Often the countries to where the services operation is moved have a different culture and legal system. An item to consider when accepting, as the owner of the information, the moving of both information and service provisioning to low cost countries are; who should have access to the information? It is usually not required to have access to the information, in plain text, in order to operate a service.

Here is a large potential for improvement in a couple of aspects. Firstly, the buying party should ensure full control over the information contained in the systems handed over to the services provider. Preferably, the information ownership is managed through paragraphs in the business contract text also identifying relevant metrics. Secondly, the owner of the information should enable the development of an information infrastructure – "the digital company library". Thereby the owner would know the requirements to place upon a services provider for handling of components of the information infrastructure. Hence, technical consolidation should really be information consolidation which in turn would visualise the real business utility of the current systems used to execute the daily business as well as discover the true value of the information, as indicated in IFRS, to the organisation and its business.

To summarize, sound reactions on market anomalies developed the concept of outsourcing. Should you consider procuring IT services make sure you know what you want to procure and ensure you get it the way you want it. Make sure that you understand any potential side effects from the outsourcing.

8 Information Quality

The scenario described above where individuals in an organisation have their information stored on their respective hard disc is only too common. Such a situation indicates that there are many variations of the same piece of information quite possibly causing duplication of efforts, misunderstandings, errors, rework and so on. From an overall business perspective this is way too costly an operational mode.

The lack of a coordinated information overview generates limited re-utilisation of obtained knowledge. Hence, the "continuous reinvention of the wheel" is in operation. *Also, should the organisation have an information infrastructure available – the digital company library – and have the processes and procedures in place to maintain and keep current the information; a much faster innovation and development pace would be possible at lower investment rates.* This mechanism is an ever increasing important capability in an organisation subject to market competition. Further it is noted that common understanding of terminology provides basis for improved dialogue and communication within the organisation and to external parties.

Conclusion: Information quality means less "scouting around for the latest information" hence, no uncertainty and more precise decisions which in turn

means less cost spent for achieving results. More productive time for staff members – in essence: improved effectiveness and efficiency.

9 Summary and Conclusions

The main difference between information on paper and digital information is the speed and volume by which computers can process and manage information as opposed to the human capability for processing and managing information. Also, the capacity for storing, multiplying and distributing digital information via means of computers is vastly outperforming any system based on paper. The former fact drives the demand for new mechanisms for managing, legally and technically, the ownership of the digital information.

Digital information systems oftentimes doesn't support or underpin the intentions in legal business agreements. The primary reason for this fact is the technology focus the IT industry has had so far in the evolution of the industry. Therefore, little attention has been paid, so far, to the information contained in the computers even though it is what matters for the daily business operation. The digital revolution and the employment of computers has generated some unprecedented business efficiency improvements while some new obstacles in the form of volumes of information to be managed as well as the control of ownership has arisen.

The implementation volume of computers has now grown to impede organisations to improve operational efficiency as information vital to the daily operation is scattered across the different systems in the organisation. In essence, the IT industry needs to develop concepts to consolidate information across any organisations to make further progress in efficient use of the technology to support business operations.

As the volume of computer systems are increasing the critical mass for complete digital exchange between organisations (and individuals) is becoming a reality. Hence digital information is about to become a trade item.

The effects are all encompassing; "computers decide" and "act" many times faster than any human can. Hence, the volume of information "digested" by a computer is outpacing any human. The generated result from the software manipulation of the digital information may or may not be desired depending upon the quality of the information or outdated algorithms in the software. The computer doesn't know of if the information is erroneous but only knows processing

For this reason, traces of an organisation or individual's whereabouts, behaviour and attempts are rather easy for anyone to compile and analyse. This fact in combination with context knowledge or industry knowledge furnish a situation where not very much information is required to understand what the object of study is about, general knowledge level and business intentions. This concept is known and utilised in the police and defence sectors but today it is available to anyone. Organisations as well as individuals should try to manage the distribution of their business information or information about themselves in order to maintain a competitive edge and to preserve their integrity.

Information quality means less "scouting around for the latest information" hence, no uncertainty and more precise decisions which in turn means less cost spent for achieving results. More productive time for staff members – in essence: improved effectiveness and efficiency.

It is not the computer system as such but the information the systems manipulates (and the business value of that information) which is of interest to the overall business operation. Hence, information consolidation and improvement in access to relevant information is what matters to the business. The creation of – the digital company library – is a concept which would further facilitate enhancement of business efficiency.

A sound reaction on market anomalies developed the concept of outsourcing but when procuring IT services make sure you know what services you want to procure and ensure you get it the way you want it. Have yourself convinced you understand any potential side effects from the outsourcing.

As the outsourcing party is handing over the ownership of the hardware and software to the service provider all of the information is also handed over, often without the real insight of the consequences. This fact is seldom handled in the business agreement for the provisioning of the IT service and it further necessitates the tools to control and manage the information derived in the organisations. As a consequence, when the outsourcing party is conducting their business they operate on information contained in systems someone else owns. The owner of the systems can place the systems anywhere on the globe. The cultural differences may impart consequences which are not controlled legally in the service agreement.