

# IT in Both Aspects: Standardized Utility and Strategic Asset

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**Abstract—** Managing IT budgets is an important issue for most CEOs. The issue is that most of them are dealing with how to leverage the business value that is generated by IT, while lowering its budget. There are both pros and cons for either treating IT as standardized utility or as a strategic asset. This paper illustrates the impact of using IT in both contexts. Due to technological advances, firms tend to use IT as a standardized utility and as a strategic asset. However, IT can be a standardized utility and a strategic asset at the same time. Extracting the value out of IT and using IT in business practices can be a source of generating competitive advantage in the global market.

**Keywords:** IT as utility, corporate standardized utility, IT Governance, cloud SLA, IT as strategic asset, IT strategy, incrementalism approach,

## I. INTRODUCTION

THE importance of IT has steadily grown both in private and public organizations. The companies reached a stage where IT is so critical for their businesses as if IT is removed from organizations, many of those will either stop functioning or there will be significant delays on their business operations. As organizations become more and more information-intensive, the cost of IT investments and maintenance has increased. Therefore a lot of attention needs to be paid to get the best value out of existing IT, while also keeping the IT spendings at a reasonable level. This balance between value and cost creates a lot of debating on either to have IT as a standardized utility or a strategic asset. In this paper, we will present analyses that will overview pros and cons on both aspects.

This paper is structured as follows; having IT as standardized utility, having IT as a strategic asset, and in the end there will be presented the conclusions and further directions for research.

When analysing IT as standardized utility, an overview of the evolution of electricity from a fragmented capital asset to a centralized and standardized utility service is presented scoping the similarities and differences with current provision of IT. Further it is presented a framework for having IT as utility including details on infrastructure and pricing models. Next an analysis of current opportunities and problems related to cloud computing and the steps to be followed for a consolidation of having cloud resources as a standardized

utility. Furthermore the impact on IT governance and corporate governance is analyzed.

The third section discusses IT's role on creating competitive advantage and using IT as a strategic asset. First of all the general definition of strategic asset and how IT can be used strategically is presented. Using IT as a supplementary strategic asset and a source of incrementalism approach is also discussed. Finally it is concluded by stating the best practices to use IT as a strategic asset.

## II. IT AS STANDARDIZED UTILITY

What does exactly mean “standardized utility”? The definition given to “standardised” by the English Dictionary published by Princeton University is “brought into conformity with a standard, capable of replacing or changing places with something else; permitting mutual substitution without loss of function or suitability”. Utility is defined as “the quality of being of practical use” or “The ability of a commodity to satisfy needs or wants; the satisfaction experienced by the consumer of that commodity”. This emphasizes that if we look at IT as a standardized utility, it has to satisfy the needs of the consumers, also IT should be commoditized and compliant with an international agreed standard in order for the users to be able to change providers without any loss.

### A. *The Electricity Lesson*

In the first years after the invention of electricity privately owned dynamos became dominant in US economy. In 1907 there were 50.000 private power plants which produced 60% of the electricity consumed in US (Carr 2005). However by the end of 1930 the centralized utilities' share of total US electricity production increased from 40% to 80%. There are deep similarities between evolution of electricity to a standardized utility and current trend of IT. The electrification was complex and unpredictable and changed everything that touched (Carr 2005). Companies were searching for the best way to apply electricity to their business and after figuring this out they faced a new problem called the technological progress and managing old incompatible devices (legacy systems). Also in the first days of electricity the usage of this was very dependent of the dynamos, the power lines and current itself. The same thing happens today in IT as organizations buy their own hardware, hire specialists to create and maintain their own IT infrastructure and architecture and the managers are distracted from business because they need to manage the IT.

Same as the electricity in the last century there are tens of

thousands of private datacentres that are using almost the same equipment and run almost the same programs. The low levels of usage capacity are certified by recent studies conducted by IBM and Gartner which revealed the following: corporate datacentres are using between 10% and 35% of their available processing power, average desktops capacity utilization rate is 5%, between 50% and 60% of companies data storage capacity is wasted (Carr 2005). Furthermore the replication of IT departments with almost same skills from company to company represents an overinvestment in labour. A survey conducted in 2003 in US revealed that 60% of the companies' IT budget is spent on routine support and maintenance functions.

The overcapacity doubled by redundant functionality marks a certain future shift for a centralized supply. Besides the cost savings that will result from the reducing of fix costs and trimming the IT staff another important advantage of moving to a centralized utility supply is the security. Currently the huge number of PC and their associated software is the most important security hole in an organization.

The most important obstacle for utility computing is that the suppliers do not take the responsibility for delivering all the IT requirements of a company, so the problem is not a technical one but rather an attitudinal one. Organizations will shift only after the reliability, stability and benefits of IT utilities have been clearly grounded.

The utility model requires also a transfer of ownership of the assets from dispersed datacentres to consolidated central structures that deliver utilities. However this process can take more years but with advantages such as virtualization, cloud computing and web services now can be built large integrated systems from previously incompatible components. Moreover adding the speed allowed by fibre-optic communication networks fragmented hardware and software systems can be assembled into a single, flexible infrastructure that more organizations can share and adapt it to their specific needs. The immediate positive results will be the better balancing of demand load, increased capacity utilization and expansion of the economy of scale.

The difference between the electricity and IT is the software which is incorporated in the IT and is regulated by IPR laws. But if in the electricity case the applications have to be delivered physically (bulbs, motors, etc.) in the IT case the software can be run remotely by the utility suppliers. Even the applications that are customized for a single customer can be provided remotely, the only devices that still need to be on-site with the end users are for input and output.

### *B. IT Utility Model*

The IT Utility Model and the commoditisation of IT is a major topic of debate in both research and industry worlds. The creation of this model will standardize and regulate IT in order to be traded. The commoditization should conduct to lower prices as due to the competition on the Global Exchange Market suppliers will drop their profit margins in order to

acquire more clients. An important impediment in delivering IT as utility is the lack of a pricing framework that will allow IT resources to be standardized, commoditized and traded similar with other utilities such as electricity, gas or telecommunications (Coombes et al. 2005).

Pagden claims that a "combination of utility computing and utility pricing" will have as result "minimising total IT cost expenditures and maximising IT resource usage" and the utility computing is a technical solution while utility pricing is a financial solution (Coombes et al. 2005). Furthermore he presents utility computing as a process in which resource consumption is based on exploitation rather than actual hardware ownership. However the utility computing should sustain the alignment of business processes with IT and the way such services are delivered.

The results presented by IBM in this field consist of three components:

- Utility Business Service (UBS)
- Utility Resource Management Service (URMS)
- Resource Control

The advantage of this utility framework is dynamical alignment with business processes by adjustment of infrastructure corresponding to different business metrics such as contracts, SLA managements and subscriptions. Gartner presents this style of delivering computing as "Real-time infrastructure" that allows companies to run their business processes and applications requirements using pools of resources.

Gartner's Infrastructure Utility Maturity Model: (Coombes et al. 2005)

- 1) Concentrated – centralization, standardization
- 2) Consolidated – rationalization, security, automation
- 3) Virtualized – virtualization, portability
- 4) Automated – business –orientated services interface
- 5) Extended – the business automation platform

There are some key technology areas that evolve from this maturity model such as centralization, virtualization, automation and billing. The rationalization of infrastructure for reducing costs and preference for Service-Oriented Architecture to deliver business agility are trends scoped from Gartner analysis. Furthermore Gartner claim that "The objectives of an IT utility cannot be achieved without intense standardisation, though the exact set of standards may differ between competing providers". If we compare with the electricity customers are able to compare service offerings and costs because the utility is standardized and the measuring unit of all the providers is KWh.

However it is clear that the barriers for standardization cannot be eliminated by the service providers themselves but needs to be regulated by the government. In the end, a customer needs to be able to buy a resource that can be dispersed across multiple providers' infrastructures but this

fact is made invisible to the end customer and is presented as a black box model.

Pagden claims for pricing utility computing that a supplier should bill a customer based on resource utilization. However in the most complex externalization deals the charging is still based on the physical entities involved (Coombes et al. 2005).

Service Unit is a pricing model that takes into account not only the infrastructure hardware (storage or servers) but the Service Level Agreements for enterprise applications. The ideal IT Service Unit is quite complex and is composed of many metrics leaving some questions unanswered. For example: "What computing resources should be metered and charged for? How, without defined standards, does a customer/business purchasing IT from an IT Service Provider know what elements of the infrastructure they should be paying for on a pay-per-use basis?" (Coombes et al. 2005)

The technological evolution involving virtualisation, automation, SOA and cloud computing will permit an IT infrastructure to supply business related services. The advantages revealed by analysing the traditional utility market are that when a resource is commoditized the clients are able not only to choose the best pricing option most suitable for them but also embrace the freedom to compare and move between providers when needed. But the ease of choice and move from one provider to another is the main problem of the having the IT as utility. A sustainable framework is critical for the delivering of IT services on a pay-per-use basis. This framework should be composed from:

- Customers
- IT Service Providers
- Information and Communications Technology Grid
- ICT Exchange
- ICT Broker
- Regulators

#### *C. Cloud Computing A Step Further to Consolidation*

For computing resource allocation in Clouds, besides functional requirements there are also non-functional requirements such as reliability, application execution time and availability which are part of SLAs and are very important for the desiderate of delivering computing as utility as those regulate the quality of the service.

The SLA templates are following general SLA formats and include elements such as name of SLA attributes, measurement metrics and attribute values (Maurer et al. 2010).

The main problem in cloud computing market is that the customers and the providers have different definitions for the computing resources. These are described using non-standardized attributes such as CPU cores, processor type execution time, inbound bandwidth, outbound bandwidth, etc. Because of the differences in communication of the demand and supply there are a lot of SLAs in the market and the matching of a buyer and seller is not a trivial matching anymore.

One solution can be the use of standard static SLA templates where consumers and providers agree before the computing resource trade. However the changes introduced for example by technological evolutions are not handled by this scenario. So in this case the usage of an adaptive SLA mapping that can easily react to change by introducing one or more new attributes in the mapping can be a viable solution.

#### *D. IT Governance Perspective*

Governance provides competitive advantage by identifying the "utility" and "innovation" components of IT. As Deloitte paper states at its most basic level, IT is a utility and good governance means differentiating the utility elements (must have) of IT from the innovative components (essential for competitive advantage) in order to achieve top line value (Deloitte 2010). The spending on IT projects are increasing and there have been revealed many IT failures because the systems bought were never used because they did not fit the business' needs. As a general line most IT investment look good on paper but in reality few deliver their total potential value. This is because they operate in silos and are not taken into account by business strategies.

In order to be cost efficient, a business should wait for an application to be tested and best practices standards set. Using the standardization and centralization the IT can align with business strategy for cost reduction. By moving to a centralized IT model an airline managed to save 75 million Euro in just two years and the pace of change has been sped up. Flexibility and clarity for the business change process were the other advantages of the move.

The management of utilities from a shared service centre allowed a direct relation between business and IT. Here IT operates as a cost centre that serves several departments and divisions and often there is no exchange of money for service.

### III. IT AS A STRATEGIC ASSET

Strategic assets are set of goods, tangible or intangible, which is generated by the firm and which have become essential to develop competitive advantage in the market. For instance, bookstores that become cafes using their ample premise advantage, and concert halls that become seats of conferences can be some examples of strategic assets.

Strategic assets are necessary conditions for competitive advantage. However, managing strategic assets might be challenging. They require financial management since they require additional funding. Firms must adopt suitable governance structures in order to manage with cost and performance that their strategic assets effect.

Strategic assets provide the firm with a source of steady stream of income so that it gains a sustained competitive advantage over its competitors (Kochhar 1993). Firms are required to translate the value of strategic assets to economic income. Therefore, on one hand, managers should focus on exploitation of already controlled assets to obtain economic income. On the other hand, they should additionally focus on strategic expenditures that lead to the accumulation of value.

One common feature underlying the various descriptions of strategic assets is their firm-specific nature. Barney (Barney 1991) proposed that, in addition to being valuable, strategic assets should possess the key attributes of being rare, imperfectly imitable, and nonsubstitutable. Similarly, Dierickx and Cool (Dierickx et al. 1989) argued that these assets are nontradable, nonimitable, and nonsubstitutable.

A firm succeeds by developing strategies that cultivate its unique core competencies (Prahalad et al. 1990) or build on its dominant logic (Grant 1988). That is, for superior performance, these strategies exploit a firm's strategic assets. The conditions of imperfect mobility and imperfect tradability imply that no other user exists which can realize the same level of rents from the strategic assets as the current firm (Chi 1994). Moreover, the greater the value of certain assets to that firm, the higher is their degree of firm-specificity (Amit et al. 1993). Thus, a firm with a sustained competitive advantage gains value through the possession of rent-generating specific asset.

On the other hand, when thinking IT as a strategic asset it is important to understand firm's strategy regarding technology and how it affects the firm's corporate strategy. Only by these understandings IT can act as a catalyst for the creation of strategic differentiation (Steward 2003).

IT can be a strategic asset due to its effect on organizational units inside firms. IT enables these units to use new possibilities and options. Therefore, it can be used to generate innovations through business operations. Companies that see and act on these possibilities before their competitors will continue to differentiate themselves in the marketplace and reap economic rewards. Technology continues to advance rapidly just as mentioned in Moore's law. Significant business opportunities continue to occur. Due to the advances in IT, new business opportunities are available technology and business wise.

Furthermore, IT has created utilities such as enhanced communication. Enhancements in communication technology have led companies to improve their networks. Nowadays, many opportunities for business-practice innovations extend beyond the walls of the enterprise to include relationships with other companies (Steward 2003). Due to technological possibilities, it is practical for companies to think in terms of opportunities to build long-term relationships with other companies possessing complementary assets and capabilities (Steward 2003).

IT can deliver greater value in coordinating and complementing the resources and digital assets of the organization. Many leading global businesses are increasingly harnessing IT to enhance efficiency and profitability. Companies worldwide are trying to understand how best to digitalize their operations and transform their businesses into information-intensive businesses. The awareness of exploiting the strategic potential of IT to compete in the market is growing. Now it is a very traditional maturity curve that you start using IT to cut costs, to automate the financial

transactions of the firm and when you have those, you then look to use IT in a more strategic and customer service sort of way.

IT is an enabler for firms to compete in the global arena so that they can scale up their operations, not just to grow but to grow without losing control, without exposing themselves to excessive risk. IT can partially address such issues. Business processes can be embedded into IT and that enables a company to scale up readily.

Firms need to take a more strategic view of IT as an asset that complements the other strategic assets in the firm, and increases the overall value of their asset pool. For example, as firms globalize they are going to have human capital located in multiple countries. If they are looking at innovation, the people who can innovate are a scarce resource and there are likely to be pockets of them in different countries. So firms will be faced with certain important decisions to make with regards to innovation. You would not want to try and pull these people into one place. Often you may want to leave them where they are because they are sources of local knowledge and diverse sources of ideas. But this is where technology comes in by enabling you to give them a way to interact, share ideas, not just the people who are innovating, but also to link them to people who have to do with the production, marketing and so on. You can see that as you become more and more geographically dispersed that technology is needed to coordinate and complement your other strategic assets.

Using IT as a strategic asset is reflected in a firm's ability to use IT to constantly drive performance. Firms that are capable of using IT this effectively are able to respond to new customer demands in a timely manner. They are able to present a single face to their customers. If they are in a new market, they are able to produce business success rapidly. And finally they are able to integrate new acquisitions rapidly.

#### *A. IT as a Supplementary Strategic Asset*

Firms can use IT to gain a competitive edge only by digitizing their business models. Extracting value from IT requires innovations in business practices (Steward 2003). Companies that invest in IT without considering the necessary organizational changes will think that IT does not matter and IT investments are unnecessary. However, while investing in IT, companies must change their practices for exploiting the new capacities of their strategic assets.

The differentiation that IT brings to companies is not the IT itself, but the new business opportunities it brings. Only by seeing this differentiation, IT can get over of being accepted as a commodity.

The companies that did not understand this differentiation saw IT as a whole solution package that is enough as it is to bring competitive advantage. Rather than focusing on the enormous challenge of innovating in business practices and creating the discipline required to generate economic value from these innovations, companies were convinced that purchasing a whole solution package would deliver the

required value (Steward 2003). Only these companies that insert IT into their businesses without using the capabilities of IT to change business practices and create new capabilities will continue to destroy IT's economic value (Steward 2003). This can be a reason why companies that spend less on IT are seen more successful. However, these are companies that use IT only as commodity. It is not only a commodity. In order to expect more from IT, one must consider how IT brings out new business practices (Steward 2003). Differentiation in the marketplace will then come together with the business practices that IT enables.

### *B. IT as an Incrementalism Source*

The strategic impact of IT investments comes from the cumulative effect of sustained initiatives to innovate business practices in the near term (Steward 2003). However, strategic differentiation emerges in long-term. The strategic impact of IT comes from the ability to continually innovate around its evolving capabilities. In other words, far from settling down into a dominant design or architecture, IT has crashed through several generations of architectures and continues to generate new ones (Steward 2003). Therefore, this leads to an incrementalism approach. Coupled with a strategy that is focused on short-term wins and long-term goals, this new incrementalism approach is a source of competitive advantage.

Survival today requires speed and innovation and greater adoption of IT (Steward 2003). This short-term incrementalism approach requires sufficient level of enterprise agility and IT is the source of agility when it is used together with proper IT governance structures.

IT can be replicated rapidly but not that quickly when the incrementalism approach is used. By using this approach firms deepen their organizational support for new business opportunities and prevent potential competition. Even as competitors adopt their practices, the firm using the incrementalism approach will always focus on the next wave of innovations, which gives them a significant advantage (Steward 2003). From this point of view, IT is a strategic asset in a way that it gives the ability to continually innovate around its evolving capabilities.

### *C. Best Practices to Use IT Strategically*

In today's digital economy, if IT is not an asset, it is a liability (Jeanne 2009). To transform IT from a liability to an asset, management must continually pursue three activities:

First of all IT must not fail to meet business needs due to lack of accountability and improper decision-making. Without proper IT governance structures, firms still continue to focus on resources on tactical systems instead of using IT as a basis for doing business in today's digital economy (Jeanne 2009). Firms that transformed IT to be a strategic asset, have addressed their legacy problems by providing both a clear vision for how IT will support business operations and a well-understood funding model focused on delivering that

vision (Jeanne 2009).

Secondly, after building the necessary IT governance structure, building a digital platform that is a coherent set of standardized, IT-enabled, business processes along with supporting infrastructure, application and data is necessary. A digital platform is capable of standardizing and automating organizational processes, thereby increasing reliability, decreasing operational cost, and ensuring quality (Jeanne 2009).

Standardized usage of IT enables the IT organization to emphasize on new business opportunities and innovations. Strassman also argues that with standards in place, IT can concentrate on what is value enhancing for the enterprise to reveal firms characteristics and allow it to share information with customers and suppliers (Steward 2003).

For most business opportunities, the benefits of customization would be overwhelmed by the cost of isolation (Carr 2003). However, using IT as a utility reduces the cost of operations that in return allows low cost offerings of customized services. And in that case, customization can also be a source of differentiation in the global market when it comes together with customer demand.

Finally exploiting the platform for profit and growth is what creates the return on investment. Driving value out of the platform is a big challenge though. To cash in on your platform, you will be changing individual roles, organizational structures, and the organizational culture (Jeanne 2009). This is a fundamental business challenge and thus, a major leadership challenge.

In global companies that see IT as an asset and use it strategically, IT is typically being managed to achieve scale, responsiveness, and innovation. These leading companies often establish shared services. They establish centers of excellence and value managers to maximize the business value of IT. Shared services help to consolidate common IT services and offer them flexibly in a service catalogue with transparent pricing to the users. Centers of excellence pool the IT specialists within the organization physically or virtually to leverage and share their expertise enterprise wide for process and service innovation. Value managers manage the relationships with the business and play the dual role of consolidating the voices of the field and also representing the corporate IT in deploying or enforcing policies. These units work together under the direction of an overall IT leadership.

Some firms make IT a strategic asset and follow some common practices around using technology. These firms are able to outperform their competitors. Firms that are above average on IT spending, may or may not have higher profit margins compared to their market competitors. If so, this is a good evidence that making proper investments on IT pays off and it is even more advantageous when competitors are investing less and improperly on IT.

Another key area is in helping to generate new revenue streams through new products and services that are IT enabled. In all this, responsiveness to the business is the key,

and most importantly, good governance processes are crucially required within the organization, so that the right people are involved in making critical investments and prioritization decisions for IT and business.

#### IV. CONCLUSION

After huge investments into in-house datacentres, companies may have to shut them down because of the shift to computing utility and the savings offered by this. When buying computing as standardized utility, besides reducing the fixed costs and lowering the threat of technological obsolescence, managers can concentrate more on running the business instead of solving problems related to IT. Also with this shift organization will avoid having IT overcapacity and overinvestment in the specialized labour. The current IT utility model will evolve and present a reliable framework which will be credible and trusted by both providers and consumers. The adaptive SLA mapping for cloud computing trading is a good example of a viable existing solution.

On the other hand, by through strategic in-house use of IT, firms can gain competitive advantage instead of buying standardized solutions available for everyone. These firms that want to make IT a strategic asset need a clear vision, strong leadership, and a significant change management effort. It can be difficult to distinguish these firms' use of IT from their outstanding business management. Indeed, a characteristic of these firms is that IT is at the heart of highly effective management. IT is the platform and scaffolding for delivering world-class operations and strategically focused management decision making (Kochhar 1993). While being source of improving cost savings and efficiencies, IT is also used to create incremental improvements of organizational structure, products, and services. Finally, firms should also focus on the creation of strategic advantage through extending competitive scope, partnerships, the changing of the rules of competition, and the provision of new IT-based services to extend the customer value proposition (Steward 2003).

Either approach will not solve all problems related to IT. There are success and failure stories for both approaches. However, organizations should take into account both models and put some effort in identifying what IT resources are really strategic assets and what should be outsourced or bought as standardized utility.

The pressure on IT budgets are steadily increasing and the alternatives for organizations to outsource computing services at a lower cost than producing "in-house" are becoming more and more tempting.

The solution will be involving all the parties that deal with IT and try to create a balance between keeping some parts of IT as a strategic asset for realizing competitive advantage but also lowering the cost where IT can be externalized and bought as standardized utility.

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