

Eighty Twenty Thinking in Traditional and Cloud Environment

80/20 Thinking

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Abstract: In traditional IT environment, there is a constant pressure of cost reduction. Unpredictable demands, rapid changes in technologies, complex IT portfolios and acquisitions, increased business competition, and revenue demands are the main factors which have compelled organizations to look for better alternatives. There is little automation and considerable amount of effort goes into resource provisioning of business processes. Approximately 80 percent of the average CIO's time is spent on non-technical tasks such as cost, quality, and agility of service.

Emergence of cloud computing is a boon for not only large organizations but SMBs also, considering agility, automation, on demand resources, scalability, low capital expense, and utility based billing model. Most of the organizations are inclined towards the use of cloud environment to be more strategic and to gain greater insight into business.

Eighty Twenty Thinking has been applied in a variety of fields ranging from Economics, and Business, to Project Management and Software engineering to fine tune the practices in that field towards improved efficacy. Adoption of cloud models allows leaders and managers to devote relatively more time and effort to business strategy challenges and decision making. In this study, comparison of traditional and cloud environment has been done from the perspective of Eighty Twenty Thinking.

Keywords—80/20 Thinking; Traditional IT Environment; Cloud Computing; Decision making

1. Introduction

Cloud computing is a disruptive and innovative paradigm that delivers services on demand with utility based billing model. According to the definition of NIST, it has three service models namely SaaS, PaaS, and IaaS, and four deployment models viz., public clouds, private cloud, hybrid cloud, and community cloud [1].

How cloud computing is better than the existing model of computing? What are the key differentiators which attracts organizations for cloud adoption even though security is a cause of main concern in cloud environment? How these key differentiators impact the technological, operational approaches to routine practices and eventually make huge difference in organizational level practices and decision making?

There are many existing assessment frameworks and cost comparisons available which try to gather deep insight into the benefits of cloud models compare to conventional model. In this paper, we have compared on premise or traditional IT environment with cloud environment using "80/20 Thinking".

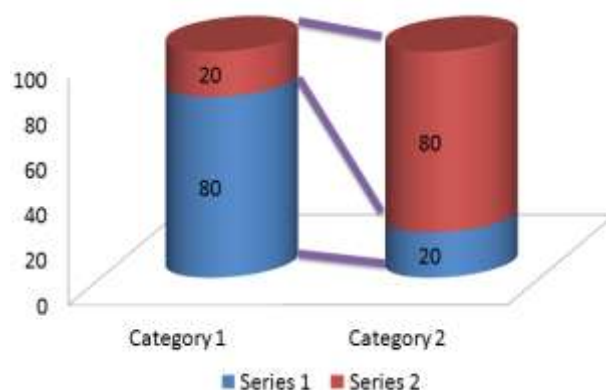


Figure 1: 80/20 Rule

The concept of using an 80/20 Principle to make decision has been around for years. Joseph M. Juran suggested the principle and named it after Italian economist Vilfredo Pareto who observed that concept of disproportion often holds in many areas [2].

The 80/20 Principle states that there is an in-built imbalance between causes and results, effort and reward, and inputs and outputs as shown in Figure. 1. Typically, causes, effort, or inputs are divided into two categories: 1) the majority that have little impact 2) a small minority that have a major, dominant impact [9]. By concentrating on the improvement of majority which has little impact, organizations can gain agility, cost benefits, more profits, and innovative business ideas.

The 80/20 Principle emphasizes that when two sets of data related to causes and results are examined and analyzed then the most expected result is a pattern of imbalance. The imbalance may be 75/25, 80/20, 95/5, or any set of numbers. Conversely, the two numbers in the comparison do not have to add up to 100 [9]. *Precise values of 20 and 80 are not significant; considerable disproportion is the focal point.* There is no mathematical formula about the proportion of 80/20 but many scenarios come very close to this significant inequality.

The 80/20 Principle also emphasizes that whatever the actual level of imbalance, it is likely to exceed prior estimate.

There are two ways to use the 80/20 Principle:



Figure 2: 80/20 Principle [9]

80/20 Thinking requires deep thought about any issue and asks you to make a judgment on whether the 80/20 Principle is working in that area. It does not require you to collect data or actually test the hypothesis as shown in Figure. 2.

Here, we are going to provide perspective of cloud and conventional environment by using 80/20 Thinking. This paper is organized as follows: Section 2 contains a review of related work regarding the application of 80/20 rule in various fields especially in IT industry. Analysis of traditional and cloud environment is introduced in Section 3 considering disjoint factors such as resource utilization, cost transformations, business agility, innovation, and creativity. In Section 4 we conclude this work.

2. Related Work

In the modern economy, 80/20 Thinking was quickly extended to quality control, stating that most defects in production are the result of a small percentage of the causes of all defects [10]. This is generally defined as —the vital few and the trivial many || or —the vital few and the useful many.

The 80/20 Thinking is still a strong mechanism, constantly used in quality control of projects from various areas, including the IT field. In the recent years, 80/20 Thinking was mostly applied on errors rather than features because it was observed that 80 percent of errors are generated by the 20 percent of the detected bugs, so a small proportion causes most of the errors.

For a principle so widely observed and applied, its application in the IT field is still in its infant stages. It was the goal of this paper to apply 80/20 Thinking to the comparison of traditional IT environment and cloud environment to provide better insight into the efficiency factor of specific environment.

3. 80/20 Thinking in Traditional And Cloud Environment

Application of the 80/20 Thinking implies: look for the short cut, rather than lot of efforts; celebrate exceptional productivity, rather than raising average efforts; exercise control over resources with the least possible effort; strive for excellence in few things; delegate or outsource as much as possible to experts and only do the thing you are best at doing. 80/20 Thinking requires, and with practice enables us to spot the few really important things that are happening. To engage in 80/20 Thinking, we must constantly ask ourselves: what is the 20 per cent that is leading to 80 per cent [9]? 80/20 Thinking is used to change behavior and to concentrate on the most important 20 per cent. 80/20 Thinking is working when it multiplies effectiveness. Action resulting from 80/20 Thinking should lead to get much more from much less.

Let's use 80/20 Thinking with respect to disjoint factors such as Resource utilization, Cost transformation, and Business Agility, Creativity and Innovation in traditional IT environment and in cloud environment.

A. Resource Utilization

In traditional IT environment, infrastructure sprawl and under-utilized resources require IT departments to channel 70-80 percent of their budget and efforts into acquisition, installation, configuration, and maintenance which leaves little scope for innovation; hence lot of money and resources are wasted.

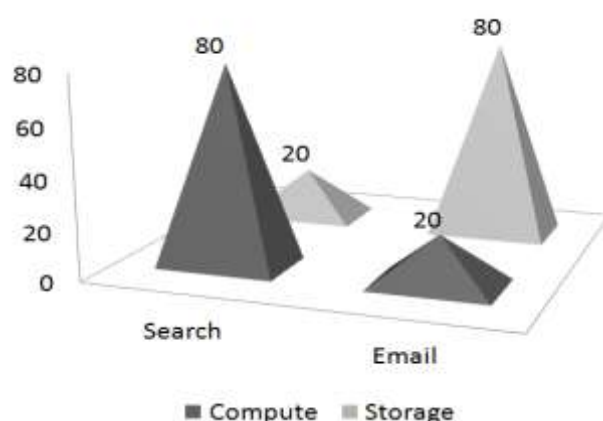


Figure 3: Resource utilization by different applications

IT resources compute, storage, and I/O are usually bought in package: a server has certain amount of computing power, storage, and I/O (e.g., networking or disk access). Utilization of resources varies according to type of workloads as shown in Figure. 3. Some applications such as meteorology programs, search, and scientific applications demands a lot of computation and use a lot of CPU but relatively little storage or I/O [5]. Some applications require large volumes of data and dedicate most of their processing time to I/O and manipulation of data is deemed data-intensive [6]. Some workloads like email tend to use a lot of storage but little CPU as depicted in Figure. 3.

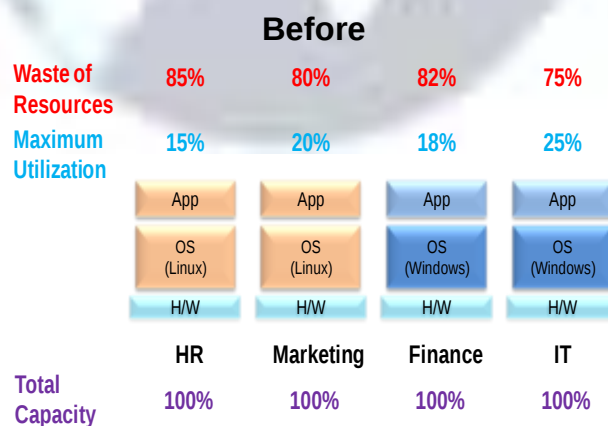


Figure 4: Resource utilization in traditional IT environment

Capacity planning is the process of determining the production capacity needed by an organization to meet changing demands for its products [7]. While it is possible to adjust capacity for compute or data intensive application by buying servers optimized for CPU or storage, this solution addresses the issue only to a limited degree because it will reduce flexibility and may not be economically viable from a capacity perspective. This 80/20 variability will lead to resources going under-utilized waste of money.

Additionally, X86 computers are designed to run just one operating system and application at a time as shown in Figure. 4. As a result, even small data centers have to deploy many servers, each operating at just 5 percent to 15 percent of capacity—highly inefficient by any standard [8]. This is the approximate 20 percent of area where 80 percent of efforts must be focused.

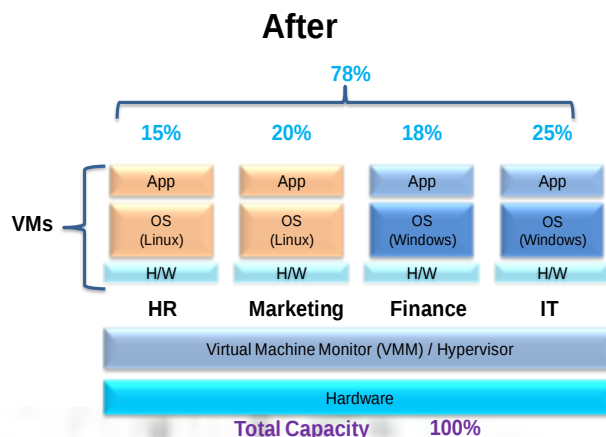


Figure 5: Resource utilization in cloud / virtualized environment

Application of the 80/20 Thinking implies that major improvements are always possible, by doing things differently and by doing less. It also indicates that the most inefficient area has the chance of improvement and by doing it more efficiency can be achieved. Here, 80 percent of underutilized resources can be used with the use of virtualization. Virtualization run multiple operating systems and applications on a single computer and consolidates hardware to get vastly higher productivity from fewer servers [8].

Virtualization is one of the most effective ways to reduce IT expenses while boosting resource utilization efficiency and agility. It is important to recognize that cloud services are often but not always utilized in conjunction with, and enabled by, virtualization technologies [11].

Virtualization enables up to 80 percent greater utilization of every server as shown in Figure. 5. and reductions in hardware requirements by a ratio of 10:1 or better [8]. Action resulting from 80/20 Thinking should lead to get much more from much less. It is working when it multiplies effectiveness. Here 20% effort in virtualization management leads to 80% of resource utilization.

B. Cost Transformation

Cost reduction is an expensive business. Identify the areas that have the greatest cost-reduction potential and concentrate 80 percent of efforts there. Internal complexity has huge hidden costs. Identify the areas (perhaps only 20 per cent of the whole business) that have the greatest cost-reduction potential. Concentrate 80 per cent of your efforts. Here, Data center cost components such as facilities, equipments, staffing, and fail over sites can cost immensely. As per study by Microsoft, 100,000-server data-center has an 80 percent lower total cost of ownership (TCO) compared to a 1,000-server data-center [4].

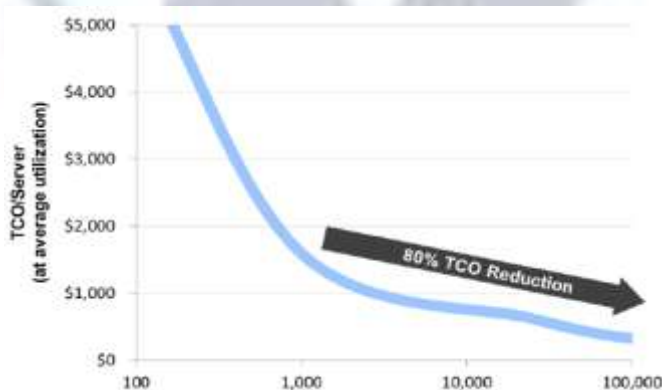


Figure 6: TCO reduction in cloud environment [4]

Hence it is an easier decision to choose whether to build in house data center or to use public cloud services where economies of scale can be achieved and hence TCO reduction can be achieved up to 80 percent as shown in Figure. 6.

Cloud environment improves the ability to reduce large capital expenditures, reduces risk of investing in less productive assets, moves management focus to optimizing operating costs for better profitability. 80 percent of TCO reduction can be utilized in innovative efforts to grow existing revenue streams, quickly adapt to market opportunities to transcend, and to create a better image for an organization.

C. Business Agility, Creativity, and Innovation

One implication of the 80/20 theory is that successful organizations operate where it is possible for them to generate the highest revenues with the least effort [9]. The 80/20 Thinking suggests that your strategy is not correct. If you make most of your money out of a small part of your activity, you should turn your focus upside down and concentrate your efforts on multiplying this small part. 80 percent of the profits are result of most innovative efforts in the organizations which has only 20 percent of shares. Ask, what are the major time sinks that you can cut out, where are the 80 per cent of the time delays and costs in your current processes that you could target; and understand how to address them?

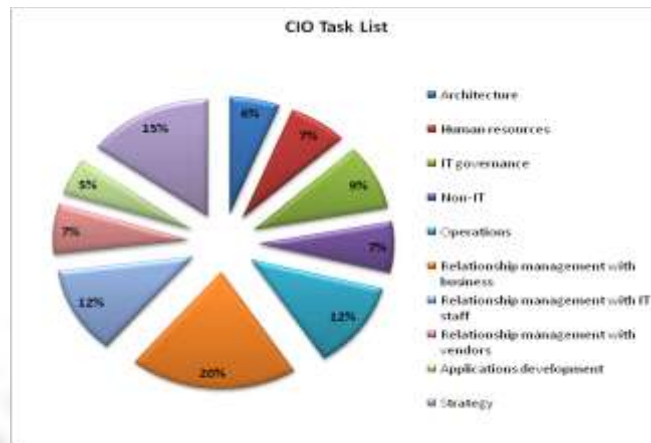


Figure 7: CIO Task List dominated by Non IT work

According to SIM survey as shown in Figure 7, on average, Technical work - architecture, operations, and software development consumes 23 percent of CIOs' time and 77 percent (nearly 80 percent) on non-technical stuff which can be efficiently used by engaging them directly in IT [3]. It not only helps them to sharp their technical knowledge but also helps them to establish themselves as business leaders. Adoption of cloud models allows leaders and managers to devote relatively more time and effort to business strategy challenges and decision making; major improvements are always possible, by doing things differently and by doing less. Innovation is the name of the game: it is absolutely crucial to future competitive advantage. We tend to think that innovation is difficult, but with creative use of the 80/20 Thinking, innovation can be both easy and fun!

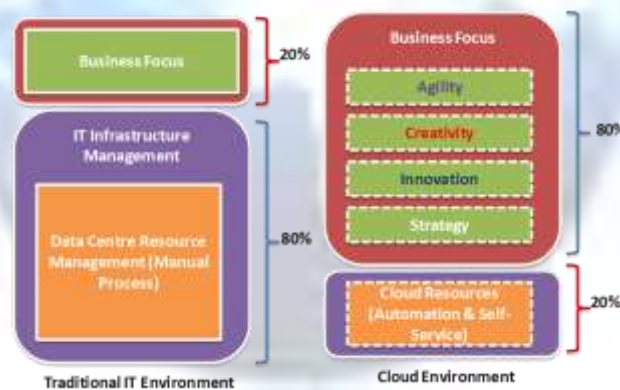


Figure 8. 80/20 Thinking of traditional and cloud environment

In traditional environment, 80 percent of the time remains invested in data center resource management or IT infrastructure management considering various activities mentioned in above figure. The key here is to focus on 80 percent of efforts which are given in IT infrastructure management; by improving that, it is possible to increase business value. Delegating or outsourcing most of those tasks to cloud service providers who are expert in that can not only save your time and energy but also gives you vital time to focus on the innovation part of the applications or business as shown in Figure. 7.

Hence, cloud computing can deliver lower IT costs and increased efficiencies, but it also provides new opportunities to drive business growth. Some organizations are using the cloud model to create new lines of business by partnering with external providers. Cloud environment shortens IT provisioning time significantly and improves process efficiency through standardization. It also allows the ramping up or down of IT activity to follow business intensity, thereby aligning closer to real demand. Cloud can drive disruptive change in service model; it enables entry into a new market space or customer segment and creates a differentiated technology platform. Customer benefits can improve based on best-of-breed ecosystem.

Cloud computing paradigm offers capabilities that hold the potential to deliver business values than traditional IT environment. Elasticity, shared resources, and rapid resource provisioning time for existing and new applications lead to greater business agility.

4. Conclusion

In this paper, we have applied 80/20 Thinking to traditional and cloud environment. According to overall analysis, Resource utilization, Cost reduction, and Agility, Innovation and Business focus are the perhaps represents individual 20% areas where 80 percent of efforts can be concentrated for more business values. Cloud environment allows 80 percent efforts of organizations to focus on main business objectives and hence efficient resource allocation can be done to solve business problems and implementing innovative ideas which are hardly possible in traditional IT environment. High availability and scalability makes it easier for organizations to overcome IT bottlenecks. It enables to get access to the IT services that were too costly in traditional IT environment. Infrastructure can be managed by cloud service providers who are expert in that area and organizations can focus on innovative business applications which are their expert area.

Logical next step can be application of 80/20 Analysis in traditional IT and cloud environment to establish the precise relationship between causes/input/effort and results/outputs/rewards.

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