

Risk Perception of Migrating Legacy Systems to the Cloud

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Abstract: With the use of Cloud Computing as a method of delivering information infrastructure resources, the enterprise may move legacy applications to the cloud in order to achieve a variety of benefits. There are many ideas in the literature to model the essential elements of migration, all of which have been confirmed through concrete case studies. A variety of reference models have also been identified in addition to these proposals which have been developed with the goal of consolidating the various researches and attempting to extend their applicability. Based on the above, this paper chooses a reference model for migration of legacy systems to the cloud and suggests a framework for estimating the perceived risk score for each legacy system migration. The paper provides a proof of concept on the government sphere to explain the method's applicability. Keyword phrases: cloud computing, legacy networks, migration, comparison model, risk perception.

1. Introduction

In current years, cloud computing (CC) the way in which technical progress (IT) is transmitted has changed and accessed and has created a new environment in which organisations administer their own computing resources to another, where IT is used as a commodity (ISACA, 2012).

According to (Gartner, 2017), The wide use of public cloud services is expressed in the large growth rates of Cloud providers include Amazon Platform Services (AWS, 2017) and Microsoft Azure (Microsoft, 2017), among others. The research surveyed the bulk of 3000 participants and begun that 21 percent of them had Public cloud infrastructure has also been used, while 56 per cent had expected to introduce the cloud by the end of 2017. For all of these organisations, IT modernisation is almost identical with increasing the use of CC.

Migrate from one place to this latest model has the ability to reduce the expense of IT infrastructure, as stated by many writers (Armbrust et al., 2009; Armbrust et al., 2010; Gartner, 2017), mostly related to the use of public clouds. According to (Pahl and Xiong, 2013), the method of deploying digital assets, facilities, IT resources, or cloud-based enterprise structures, in whole or in part, is part of a cloud-based process. When using CC, the number of contracts will be decreased by government agencies and hence irregularities will occur, which will increase efficiency. They should also focus on providing public resources to minimise the organisational contribution to managing the maintenance initiative in order to preserve the network of IT and infrastructure services (Kundra, 2011). Cloud migration may mean maintaining part of the infrastructure of the business. For example, the conventional architecture can be combined with an external cloud solution and network connectivity. The trend of increased use of CC, especially by governmental agencies, will benefit from the process of putting legacy systems in public cloud (guidelines and methods).

The aim of this research is to provide an expansion of the proposed methodology for legacy transformation systems to the cloud. The extension can be validated by proof of principle in the government domain. The following comments are made in this paper:

- Centered on a review of the related study, a method for calculating the possible risk score associated with legacy digital transformation is proposed;
- Describes the evidence of the principle that shows the use of the approach to the field of government.

The rest of this Section shall be subdivided into four sections. Section 2 presents' theoretical principles and Related job and describes the motivation for Identifying the perceived risk of the application of the reference model. Section 3 points out the existing form of evaluation. Section 4 lays out the proof of principle. Finally, Section 5 discusses the findings and future work of this study.

2. Theoretical Concepts And Related Work

Cost Optimization for Dynamic Replication and Migration of Data in Cloud Data Centers: Yaser Mansouri; Adel Nadjaran Toosi; Rajkumar Buyya_2019

Cloud Storage Providers (CSPs) offer geographically data stores providing several storage classes with different prices. An important problem facing by cloud users is how to exploit these storage classes to serve an application with a time-varying workload on its objects at minimum cost. This cost consists of residential cost (i.e., storage, Put and Get costs) and potential migration cost (i.e., network cost). To address this problem, we first propose the optimal offline algorithm that leverages dynamic and linear programming techniques with the assumption of available exact knowledge of workload on objects. Due to the high time complexity of this algorithm and its requirement for a priori knowledge, we propose two online algorithms that make a trade-off

between residential and migration costs and dynamically select storage classes across CSPs. The first online algorithm is deterministic with no need of any knowledge of workload and incurs no more than $2\gamma - 1$ times of the minimum cost obtained by the optimal offline algorithm, where γ is the ratio of the residential cost in the most expensive data store to the cheapest one in either network or storage cost. The second online algorithm is randomized that leverages “Receding Horizon Control” (RHC) technique with the exploitation of available future workload information for w time slots. This algorithm incurs at most $1 + \gamma w$ times the optimal cost. The effectiveness of the proposed algorithms is demonstrated through simulations using a workload synthesized based on characteristics of the Facebook workload. Each CSP also provides API commands to retrieve, store and delete data through network services, which imposes in- and out-network cost on an application. In leading CSPs, in-network cost is free, while out-network cost (network cost for short) is charged and may be different for providers. Data transferring among DCs of a CSP (e.g., Amazon S3) in different regions may be charged at lower rate (henceforth, it is called reduced out-network cost). Table 1 summarizes the prices for different services of three popular CSPs in the US west region, which shows significant price differences among them.

Bandwidth Provisioning for Virtual Machine Migration in Cloud: Strategy and Application: UttamMandal;PulakChowdhury;MassimoTornatore;Charles U. Martel;Biswanath Mukherjee_2018

Physical resources are highly virtualized in today’s datacenter-based cloud-computing networks. Servers, for example, are virtualized as Virtual Machines (VMs). Through abstraction of physical resources, server virtualization enables migration of VMs over the interconnecting network. VM migration can be used for load balancing, energy conservation, disaster protection, etc. Migration of a VM involves iterative memory copy and network re-configuration. Memory states are transferred in multiple phases to keep the VM alive during the migration process, with a small downtime for switchover. Significant network resources are consumed during this process. Migration also results in undesirable performance impacts. Suboptimal network bandwidth assignment, inaccurate pre-copy iterations, and high end-to-end network delay in wide-area networks (WAN) can exacerbate the performance degradation. In this study, we devise strategies to find suitable bandwidth and pre-copy iteration count to optimize different performance metrics of VM migration over a WAN. First, we formulate models to measure network resource consumption, migration duration, and migration downtime. Then, we propose a strategy to determine appropriate migration bandwidth and number of pre-copy iterations, and perform numerical experiments in multiple cloud environments with large number of migration requests. Results show that our approach consumes less network resources when compared with maximum and minimum-bandwidth provisioning strategies while using an order of magnitude less bandwidth than maximum bandwidth strategy. It also achieves significantly lower migration duration than minimum-bandwidth scheme.

An Energy-Efficient VM Prediction and Migration Framework for Overcommitted Clouds: MehیارDabbagh;BechirHamdaoui;MohsenGuizani;Ammar Rayes_2018

We propose an integrated, energy-efficient, resource allocation framework for overcommitted clouds. The framework makes great energy savings by 1) minimizing Physical Machine (PM) overload occurrences via VM resource usage monitoring and prediction, and 2) reducing the number of active PMs via efficient VM migration and placement. Using real Google data consisting of a 29-day traces collected from a cluster containing more than 12K PMs, we show that our proposed framework outperforms existing overload avoidance techniques and prior VM migration strategies by reducing the number of unpredicted overloads, minimizing migration overhead, increasing resource utilization, and reducing cloud energy consumption. Recent studies indicate that datacenter servers operate, most of the time, at between 10% and 50% of their maximal utilizations. These same studies, on the other hand, also show that servers that are kept ON but are idle or lightly utilized consume significant amounts of energy, due to the fact that an idle ON server consumes more than 50% of its peak power [3, 4]. It can therefore be concluded that in order to minimize energy consumption of datacenters, one needs to consolidate cloud workloads into as few servers as possible. Upon receiving a client request, the cloud scheduler creates a virtual machine (VM), allocates to it the exact amounts of CPU and memory resources requested by the client, and assigns it to one of the cluster’s physical machines (PMs). In current cloud resource allocation methods, these allocated resources are reserved for the entire lifetime of the VM and are released only when the VM completes. A key question, constituting the basis for our work motivation, that arises now is to see whether the VMs do utilize their requested/reserved resources fully, and if not, what percentage of the reserved resources is actually being utilized by the VMs.

2.1. CharacterizationModel

Many publications analyse how a half-group of legacy cloud apps can be structured. The Cloud RMM model (Jamshidi et al., 2013) categorises 23 articles on transfer to the cloud and offers a guide to researching these studies. The model is made up of four processes, one task force each. At the end of each phase, an indicator is also given of the devices generated in the model.

This model merely consolidates the tasks and objects described in the 23 studies reviewed in the systematic analysis of the Commission’s literature (Jamshidi et al., 2013). It is unquestionable that each approach and task is essential and important.

2.2. EvaluationModel

The study (Gholami et al., 2016) offers a comprehensive review of emerging CC migration approaches from a process modelling and the point of view of software development techniques. The authors propose an evaluation model to compare existing approaches, outlining their tools, similarities and differences. The

methodology used by the researchers differs from other similar works because It stresses the feature of the cloud migration phase in order to clarify the core tasks of the initiative, and issues have been answered during this transition. According to their report, none of the studies analysed offers an in-depth discussion of the possible migration features and practices and It has also failed to provide valuable awareness of how these methods work in practise.

In addition, the Paper provides for a detailed analysis of existing methods by way of an evaluation model that covers twenty-eight parameters separated into two dimensions. That is, eleven general standards and seventeen unique cloud storage criteria. The proposed structure has been disconnected from Literature analysis and online questionnaire sample of 104 cloud computing academics and experts. (Gholami et al., 2016).

As a concern for future work, (Gholami et al., 2016) recognises that There is a huge amount of data migration study that is currently fragmented and fractured and indicates that a standard reference model needs to be developed with a view to grieving previous studies.

ReferenceModel

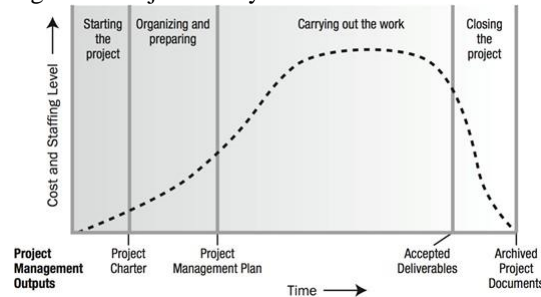
According to (Fettke and Loos, 2003), the reference model is a conceptual construction that can be used as a model for the implementation of information systems. Reference models are often referred to as uniform models, structured models or simple models. In fact of using reference templates, they must be tailored to the specification of a particular domain. Study sets specific targets for the evaluation of reference models. Among them is the analytical viewpoint from which we mention two methods that apply to the object of this research: case study and survey.

Recent analyses (Gholami et al., 2017) indicate a challenge in the core processes, artefacts, queries and primary instructions to the transfer of current applications into the cloud (Gholami et al., 2016) and Working to describe. The findings have been tested empirically in order to improve reliability by evaluating expert opinions.

The authors have developed a cloud-based model of migration based on a detailed qualitative study of current literacy constructs. Quantitative research also tested the validity and robustness of the model. and Domain Expert qualitative feedback. The resulting comparison model summaries are shown in Figure 3. In order to make the view transparent, the definition shows only the key elements, without subdivisions and information flows between operations into smaller tasks. Section 4 offers the strongest description of the full vision of the strategic and design phases.

While this guide model was drawn up from the literature and evaluated using a survey of CC experts, the authors do not confirm its general applicability. In comparison, they argue that there is no universal dominance or application over all cloud transformation scenarios and that the methods must therefore be tailored to the particular characteristics of the application domain. Legacy Systems Migration Viewed as an IT Project

Figure 1: Project life cycle as defined on PMBOK (PMI, 2013).



Any legacy system migration to the cloud can be viewed as a separate project, as outlined in the Project Management Body of Knowledge.(PMBOK)(PMI, 2013): It is a temporary project that creates a special product: an obsolete computer half-grained to the cloud. PMBOK defines the life cycle of a project as a series of steps, typically sequentially linked, that the project is going through. Figure 1 illustrates the general essence of the life cycle of the project and the sum of costs and personnel required at each stage of the life cycle. According to the PMBOK, the general form of the life cycle has the following properties, among others:

- Staff and expense ratios are minimal at the start, hit optimum value as the project is running, and decline rapidly as the project is finalised. Figure 1 indicates this trend.

Risks and uncertainty are higher at the outset of the project. These variables decline over the life of the project as decisions are taken and supplies are approved, as seen in Figure 2.

- The opportunity to control the final characteristics of the project component, without having a major cost effect, is higher at the outset of the project and declines as the project continues to its completion. Figure 2 highlights the notion that change costs and bug fixes typically escalate dramatically as the project is nearing completion.

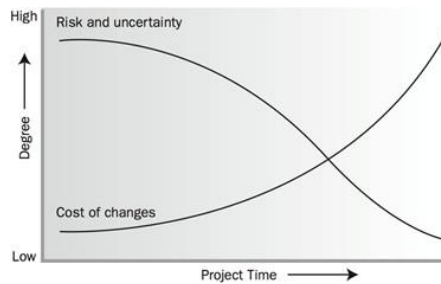


Figure 2: Project risks and cost of changes through the time (PMI, 2013).

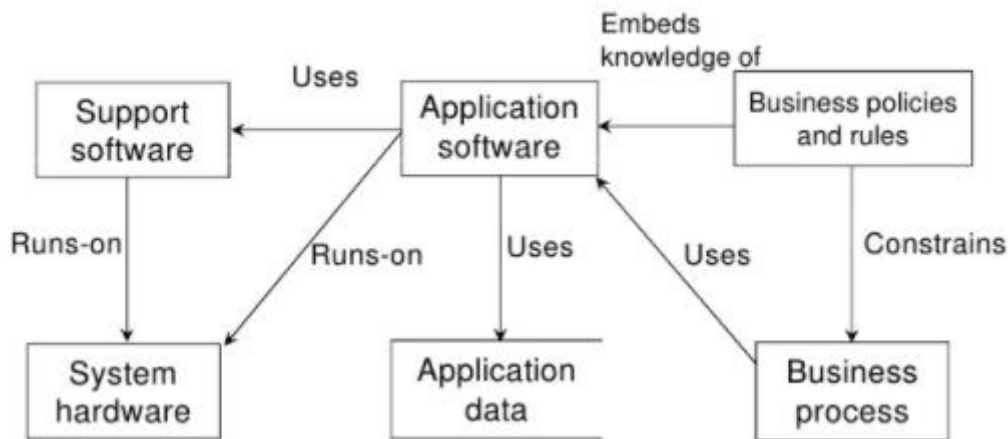


Figure 3: Key elements of Legacy to Cloud migration Reference Model proposed by (Gholami et al., 2017).

3. Reference Model Evaluation

The previous section introduced some of the concepts and classifications of migration models and addressed three of them a characterization model that pooled processes, actions and artefacts referred to in 23 proposals published between 2010 and 2013; the assessment model that evaluated 43 papers written between 2009 and 2015 on the basis of 28 applicable criteria; and a comparison model. (Gholami et al., 2017) selected as the basis for this study, as set out in the aggregation of 78 proposals published between 2008 and 2015. The chosen comparison model is split into three stages : Strategy, Build and En-capable, as seen in Figure 3. The phase of the Strategy is responsible for collecting accurate details on the migration system (technical information, or-organizational context) and An effective migration plan should be drawn up on the basis of the criteria for relocation. The Implementation process uses the information and ar-facts generated during the Plan phase and is responsible for selecting one or more CC providers and also for deciding on the new architecture that the legacy system would have on the cloud. The process triggered is a real migration process. It includes the implementation and development of integraters of legacy computer code adaptations. Initialization of the CC resources defined during the design, testing and execution phase of the migrated system when needed. The effort required for performing the third phase is potentially more than that used in the first two phases, as shown in Figure 1. This is because the first step, while the third is largely performed, is largely analytical. In this context, implementation requires both the creation of modifications and, where necessary, new integrations and cloud service configuration.

An early evaluation of migration risks should therefore be included before the Let process is under way. The assessment could indicate an improved perception of the risk (e.g., half-ration of additional costs and time) for a given device as opposed to the others and thereby provide an objective measure of comparison. It is possible to rank the systems that will be migrated and to set up an order of execution that gives preference to systems with less perceived risk, thereby raising the success rate and trust of the enterprise in the migration process. In order to provide an analytical and early assessment of the possible risks of conversion of each legacy cloud system using the Reference Model, the following protocol has been established: in each of the two initial phases (Plan and Design), Activities that better represent the key points of each legacy device conversion to the cloud must be selected. Some activities have the role of simply gathering and aggregating information, while others have limitations, judgments or characteristics that are inherent to the system and the entity and thus have the ability to do so.

Each of the roles in the second group should be selected It should be remembered that different application environments have different sets of activities that help to quantify the probability of relocation of existing applications to the cloud domain.

After determining the set of calculation tasks, it is important to identify the weights that each task would have relative to the other array tasks. After determining the set of calculation tasks, it is important to identify the weights that each task would have relative to the other array tasks. The evaluation function defined is in the following format:

$$EvF(Pl, De) = \frac{Pl + De}{2} \tag{1}$$

$$Pl = \frac{\sum_{i=1}^n VP_{li} WP_{li}}{\sum_{i=1}^n WP_{li}} \tag{2}$$

$$De = \frac{\sum_{j=1}^n VD_{ej} WD_{ej}}{\sum_{j=1}^n WD_{ej}} \tag{3}$$

- P_l – Plan Phase Evaluation Indicator.
- D_e – Design Phase Evaluation Indicator.
- VP_{li} – Risk perception rate for task i of the Plan Phase evaluation set.
- WP_{li} – Weight of task i in Plan Phase evaluation set.
- VD_{ej} – Risk perception rate for task j of Design Phase evaluation set.
- WD_{ej} – Weight of task j in Design Phase evaluation Set

The function defined in (1) considers that both phases have the same relative importance on calculating the score of perceived migration risks. But specific circumstances could be considered on another evaluation function that balance the phases differently.

After choosing the set of assessment tasks for each process and the weight of each phase, they must be evaluated. Note that the work needed for each assignment must be done as described in the Reference ModelAt the end of the execution of each process, and subsequently at the end of the execution of all activities of that phase, the evaluation procedure shall be carried out. This is critical because it is crucial to know each method at an acceptable level of depth in order to carry out a more reliable assessment, and this cannot be achieved by doing just the tasks set out in the evaluation. As a consequence, after the completion of each period of work, it is important to review each assignment that is part of the assessment package. The proposal is to use a scale of 5 values for potential risk, indicating 1 – Extreme Risk, 2 – Moderate Risk, 3 – Average Risk, 4 – Certain Risk and 5 – Minimal Risk. In order to promote the choice and assessment of each method, the 5 levels of the scale can also be specified textually for each task. This must only be achieved once and only for the tasks that are part of the assessment package.

Table 1: Plan Phase evaluation task set.

Task	Weight
Analyze migration cost	3
Identify dependencies	3
Select migration scenario	1

After the scale has been identified and the plan process has been completed, the assessment will begin by defining, for each task in the evaluation package, the perceived risk level associated with the topic of the task in relation to legacy migration and the measurement of the Plan Phase Evaluation Indicator, Pl, as stated in (2). The same should be done for the Design Phase by calculating the Design Phase Evaluation Indicator, De, as described in the Design Phase Evaluation Indicator (3). After the calculation of the two metrics, the perceived risk score of transferring the legacy system to the cloud can be calculated as described above(1). After evaluating the technique of optimisation for each system to be migrated, a classification can be developed that indicates, amongst others, which systems should first be migrated, which systems have higher assessment values (higher perceived risk scores). This strategy is supported by (Reza Bazi et al. 2017), which notes that a pilot project at the beginning of the migration process should be chosen. Systems with lower assessment values will undergo a further analysis to determine whether improvement of the assessment tasks leading to a low assessment is feasible. And, sadly, it is extremely important to recognise a greater sense of risk as this cannot be changed in systems of low value for assessment. They can also be used to categorise processes on a previously defined risk scale by the use of evaluation feature values for system rankings. For this purpose, the evaluation thresholds may be defined. For eg, it may be decided that the effects of the assessment feature, which are below or equal to a certain threshold T1, mean that the system should have its migration decision reanalyzed. Another example is when the value calculated by the analytical solution is above the limit T1, but the value of one variable (Pl or De) is below the limit T2. The threshold values can be defined by using a certain value of the Likert scale used, but they can also be defined by the history of the evaluations already carried out and the result of those migrations taken into account. Since there is no tradition of evaluations, it is recommended that the core value of the scale be used as the thresholds T1 and T2 and modified as soon as new values are determined from the real migrations.

4. Proof Of Concept

The proof of concept in this section offers an overview of the operations selected and describes the weights that best apply to the risk perception evaluation of a limited number of legacy systems in the government domain.

4.1 PlanPhase

For the Plan phase, we selected the tasks and define the weights shown in the Table 1. The reasons why the tasks were selected are the following:

Analyze migration costs-This operation results in an assessment of migration costs. Cost is aligned with

the initiative taken to transfer the legacy to the cloud, as well as the cost of maintaining the programme after half a package. If the cost of resettlement increases, the awareness of risks for the whole transfer process is also rising. On the other hand, a low-cost migration approach would be a good candidate to check the migration process and Get acquainted with both the method and the manufacturer to which the device will be transferred. If the migration expense of running the computer in the cloud infrastructure would not impact the economy compared to the current cost, this could suggest a method that would not benefit from the cloud if there were no value aggregation through other means, such as the use of intrinsic cloud characteristics (e.g. self-scalability, higher availability) (Gholami et al., 2017). According to (Gholami et al., 2017), the goals of the Analyze Background Activity (which is an aggregate of the Analyze migration costs and other tasks) are cost estimates and risk reduction.

Identify dependencies - This practice has the effect of determining which other local structures and components of the device being analyzed are expected to operate properly on the cloud after migration. For this mission, it is possible to define which other structures will have to be transferred to the cloud beforehand. In the case of a virtual cloud, even where the dependents had not yet shifted, the bandwidth of the network between the local networks and the cloud will have to be measured and considered. According to (RezaBazi et al., 2017), This is a vital aspect to remember, as existing applications have been built on older platforms than the new version provided by cloud providers. The goal of recovering awareness of the implementation of legacy (activity which aggregates Identify- ing dependencies task) is Understand legacy system dependencies (Gholami et al., 2017).

Pick migration scenario-On the basis of the characteristics of the legacy system and also on the basis of the amount of effort to be spent on migration, the migration type can be chosen from five alternatives. (Andrikopoulos et al., 2013; Gholami et al., 2016). Type V migration, for example, is a type associated with a low probability of failure when com-walled with other types since it is focused on transferring the whole device stack to the cloud. Thus the choice of scenario may be specifically related to the type of danger that is acknowledged. This is not the same as suggesting that a low-risk scenario is also a choice that would offer the greatest benefit (cost savings, improved availability) since for example, scenario V could make the application of elasticity expensive (Andrikopou- los et al., 2013). The goals of the Identify Plan (Activity that Aggregates Pick Migration Scenario Task) are Project Control and Avoidance of Risk (Gho- lami et al., 2017).

Table 2: Design phase evaluation task set.

Task	Weight
Negotiate with cloud provider	3
Train	1
Identify incompatibilities	1

4.2 DesignPhase

FortheDesignphase,weselectedthetasksanddefine the weights shown in the Table2.

Negotiatewithcloudprovider-This mission is crucial since only one or more cloud vendors are available to deliver cloud resources to support converted applications after its implementation. If one has not yet employed a vendor at the time of relocation to a specific legacy system, this may prolong migration or trigger rework. Note that even after the provider has already been hired And certain legacy applications have been migrated to the cloud, it is possible that the deal may be concluded, or perhaps that the delivery of the service is not sufficient., and that the organisation has decided to replace the provider before the end of the contract.

Training - This role is responsible for the development and management of the required expertise to facilitate the design, operation and monitoring of CC services.

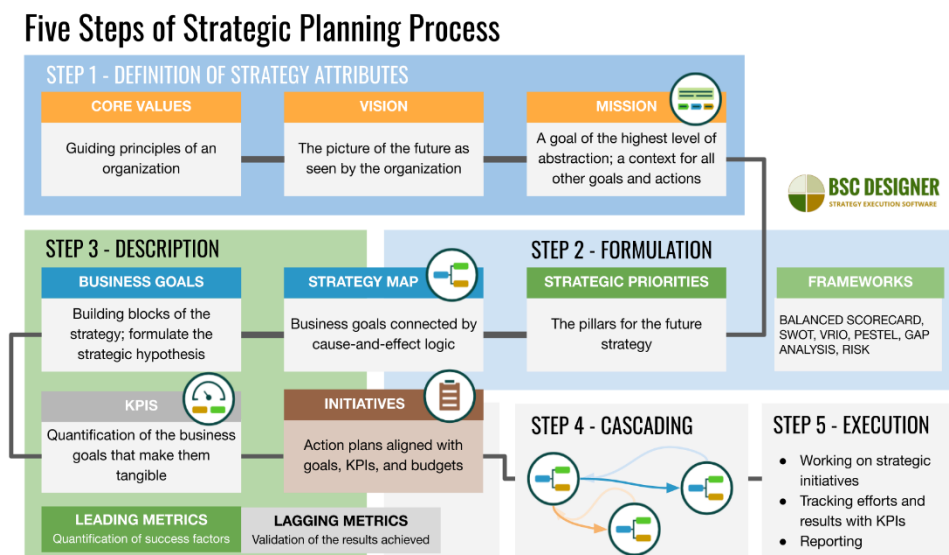


Figure 4: Reference Model’s Plan phase with visual indicative of task evaluation set



Figure 5: Reference Model's Design phase with visual indicative of task evaluation set.

Higher preparation needs will suggest a higher risk for handling the conversion project of a legacy system. According to (Reza Bazi et al., 2017) the organisations must expand their awareness of the cloud as a means of ensuring a good launch. The purpose of Choose Cloud Provider (an operation that incorporates both Negoti-Ate with the cloud provider and Train tasks) is to determine the right providers that fulfil migration criteria (Gholami et al., 2017).

Identifying incompatibilities - This task is responsible for defining the incompatibility between the legacy system and the selection of CC services defined in the design process as required to run the system after cloud migration. These incompatibilities would require special efforts to be resolved. The purpose of the operation Determining incompatibilities is to quantify commitment and expense to overcome incompatibilities (Gholami et al., 2017).

The above reasons for the inspired task segment for the governoral domain are listed in a detailed view of the Comparison Model phases in Figures 4 and 5. The statistics show how each major factor is related to each other. Each main component was combined with a colour which covers the key element events. In addition, there is a strong indication for the activities that form part of the evaluation kit (three colour smileys).

Table 3: Rating of risk perception associated with tasks on evaluation set (shaded lines:Plan phase; white lines:Design phase).

Task	Weight	Rate	Reason
Analyze migration cost	3	5	Low complexity system and low estimated migration cost.
Identify dependencies	3	4	System that has almost no dependency.
Select migration scenario	1	4	Scenario type V, lift and shift.
Negotiate with cloud provider	3	4	Providers selected.
Train	1	2	High necessity of training. No experience on CC.
Identify incompatibilities	1	5	No incompatibilities found.

4.3 UseCase

In order to show the applicability of the approach, we have picked a legacy infrastructure used by a government organisation that has decided to transfer its legacy systems to the cloud. The legacy technology is called the Civic Cloud which offers up-to-date information on the Internet, information on educational and health institutions around the country and data on medicines approved by the proper government body. While the device has a cloud on its name, it works on the local networks.

The platform consists of a collection of loosely interconnected web services that can be used by developers and companies to add value to their applications. For in-position, a smartphone application may be created and released that Automatically captures the patient's location and shows that the health institution is closest to the person. The device was developed using the Java language supported by the Spring MVC platform. It runs on the JBOSS EAP application server, sharing processing resources with other legacy systems. Oracle is the archive management system (Oracle, 2017).

As the infrastructure is freely accessible, any developer can create an application that makes calls to its services and uses the data generated. If one of these programmes becomes a killer programme, with hundreds or thousands of transactions every hour, There is a possibility that the computer system will become inadequate due to lack of elasticity.

We also partnered with the framework team responsible for developing the Cloud Migration Reference Model. After

carrying out the work suggested for the initial phases, the timetable and the plan, we applied the method set out in Section 3, using the tasks and weights set out in Section 4.

The team expressed their perception that the framework was a strong one to be the first legacy to be immigrated by this government agency. This is demonstrated by the low number of integrations with other obsolete applications and the low complexity and scale of the system code.

The team then evaluated the risk tolerance for each task in the measurement collection in both phases. The values can be viewed in Table 3, along with the key justification why the ranking was justified.

Using the weights defined on tables 1 and 2, and applying equations (2), (3) and (1), we have: $PI = 4.43$, $De = 3.80$ and $EvF = 4.11$. The calculated value of EvF is rates given by the team (table 3) the score of risk perception to migrate legacy system

Civic Cloud to the cloud with the use of Reference Model. As suggested on Section 3, T_1 and T_2 are defined to be 3.0. Since EvF , PI and De are higher than these thresholds, this indicates a low risk perception for this system migration.

5. Conclusions and Future Work

This article addressed a software migration technology analysis, compared three hypothesised migration models and selected a model for legacy cloud migration schemes. Based on the standards, a framework has been built to compute the perceived risk score for cloud-transferred applications. In conjunction with proof of concept in the main government, method initiatives are defined. The proposed technique can be used to assess cloud migration programmes, offering a chance to consider migration threat prior to migration. The aim of the study's future work is to apply the methodology towards other mechanisms of government and to collect data in various scenarios. These results may also be investigated through a survey conducted by different government agencies to improve and validate the mechanism.

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