Enabling cloud-based Human Resource Management System in an organization

1. INTRODUCTION:

1.1 The organization and the problem:

ABC Hospitality based out of Auckland, conducts many high-profile events throughout New Zealand. It takes care of events such as concerts, award ceremonies, sports tournaments and other corporate events. Most of the employees the company employs are contractual workforce. The workforce is highly dynamic; most of the people working with them are on holiday work visa, which is usually of one-year duration, or on a student visa who work usually work part-time for one year or two. This means the contractors join and leave the company throughout the year. Moreover, the company faces a surge in demand of workforce during certain times of the year when most of the events and ceremonies are happening in New Zealand.

Currently, the contractors are connected with the organisation through web page where they can see the available job openings and sign up for them. The log of work hours of contractors is maintained on paper by the duty manager at the site of the event. The payroll is processed by a third party organisation. The fees paid to third party goes very high when the number of payrolls to be processed increases. Due to manual track of work hours it becomes cumbersome in maintaining all the sheets and work hours for each employee especially when an event spans over several days. This also sometimes results in dispute between the company and the workers when disparity in work hours occur.

1.2 Objectives:

The company desires a solution where employees are able to connect with company through an application, the work hours could be logged by the duty manager at the site and the contractors are also able to confirm it from their end. The solution should be able to handle the dynamic workforce and the surge in number of contractors at certain times. This should also enable company's Human Resource (HR) to internally process the payroll of its employees. In this paper the implementation plan and considerations when undertaking such a cloud HR process transformation is analysed by adopting an appropriate process model. Discussion on challenges along with security issues related to data and privacy while implementing such a process is undertaken. Finally a benefit and impact analysis is done for the cloud HRMS solution.

2. Cloud HRMS: the solution

A human resource management system combines process and systems by connecting HR and IT through HR software ("HRMS", 2019). HRMS combined with features of cloud computing such as scalability, elasticity and choice of either pay-per-use or subscription basis payment (Carroll, Merwe & Kotze, 2011) is able to address the company's problem. A cloud HRMS is thus capable of helping enterprises in savings on workforce and investments while also providing high performance and user-convenience. It has features such as collaboration, interoperability and interconnection which are able to address company's problems like better management of contractors and regular workers and conflict handling,

limitation of resources in management and space etc (Wang et al, 2016). It is able to handle various components of HR management such as leave management, benefits management, personal information management (Datta et al, 2012). In this way it makes all time availability of HR services to employees which they can access through internet connected devices such as PCs, laptops, handsets etc; enabling HRs with power of flexibility and scalability.

3. Implementation Plan:

Fehmideh et al (2019) introduces a metamodel for generic cloud migration by classifying different phases and tasks. Paredes-Gualtor et al (2017) proposes a unified adoption framework but does not factor in any change requirements. Cheah and Kasim (2011) presents a cloud service lifecycle consisting of four phases from strategizing, designing, transitioning to operations while incorporating change management. Ziebell et al (2019) presents a cloud adoption model exclusively in context to HR process transformation incorporating elements of iterative, agile and classical models while listing various challenges associated with such HR transformation projects. Configuration of a free process is limited in context of HR cloud due to limitations in technical boundaries, while challenges also lie in documenting current processes and defining target processes (Ziebell et al, 2019).
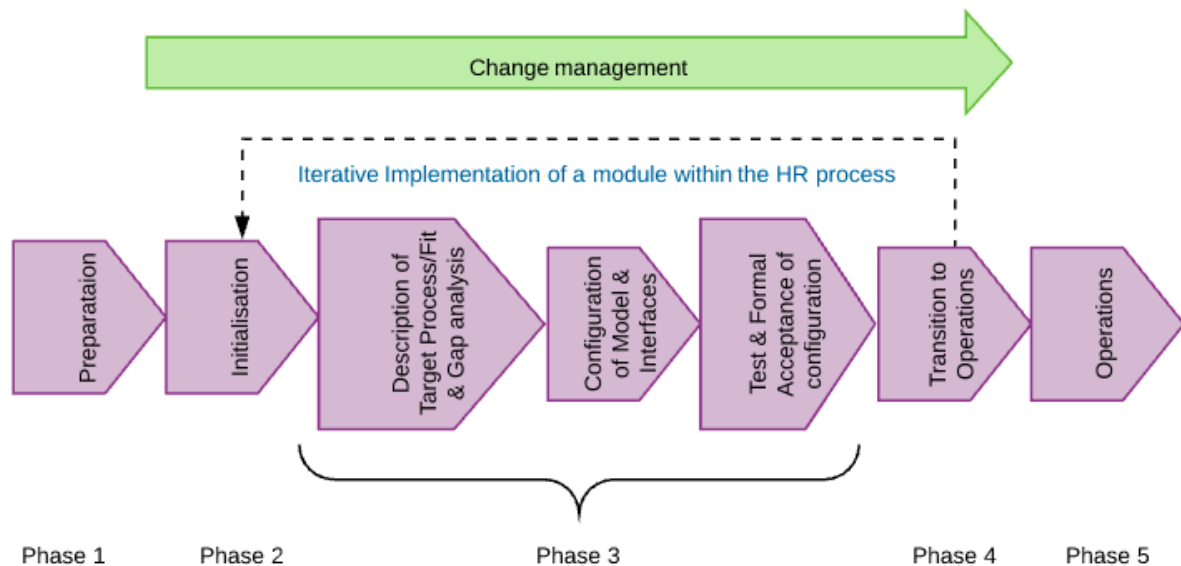
Figure 1. Process Model for HR process IT transformation

Based on the reviewed models an efficient cloud adoption process model should enable better planning and strategizing, subsequent transitioning of the solution into operations while also incorporating change management through some kind of iteration. Considering these factors, Figure 1 shows the process model that could be adopted for undertaking this project thereby implementing it in five different phases which are further described below:

3.1 Phase 1: *Preparation*

This phase involves clearly identifying the objectives of the project and presenting a business case of the problem (Cheah and Kasim, 2011). The objectives are already

mentioned above and a business case based on intangible indicators provided by company's HR such as better workforce management, performance management etc are included. An analysis of Total Cost of Ownership (TCO) is also done for estimating the operation cost, maintenance cost and the cost of owning. TCO is an important analysis tool to understand the value of transitioning into cloud (Hamad & Fayoumi, 2018). Factors that come into play while considering TCO for cloud solutions are cost of electricity, internet charges, labour cost, cost of deployment, service provider charges, additional hardware resources (if required), while also factoring in indirect costs (Hosseini Shirvani, Rahmani, & Sahafi, 2017; Hamad & Fayoumi, 2018).

Indirect costs could be due to potential downtime or potential delay in implementing the project in time. The TCO for cloud solution is compared with TCO_i associated with the legacy system where additional costs like hardware maintenance, cabling, outsourcing payroll process are taken into consideration. If the TCO thus obtained is less than TCO_i, it is beneficial for the organisation to adopt cloud solution. Both intangible and tangible benefits of adopting a cloud HRMS should be considered when presenting a business case (Farah, 2015). To achieve cost savings public cloud-based solution involving pay per usage model is proposed. Further, it is made sure that HR department works closely with the IT department to come up with an optimal solution.

3.2 Phase 2: *Initialisation*

In this initialisation stage, more stakeholders other than HRs are identified (Ziebell et al, 2019); those who will be affected by the process but are not involved actively in the transformation project such as regular and contractual employees. Thereafter, service design process is undertaken which leads to the definition of system architecture and model in the form of Service Design Package (Cheah and Kasim, 2011). Acceptance criteria and policies and processes are well defined and included in the package which acts as a reference for subsequent stages.
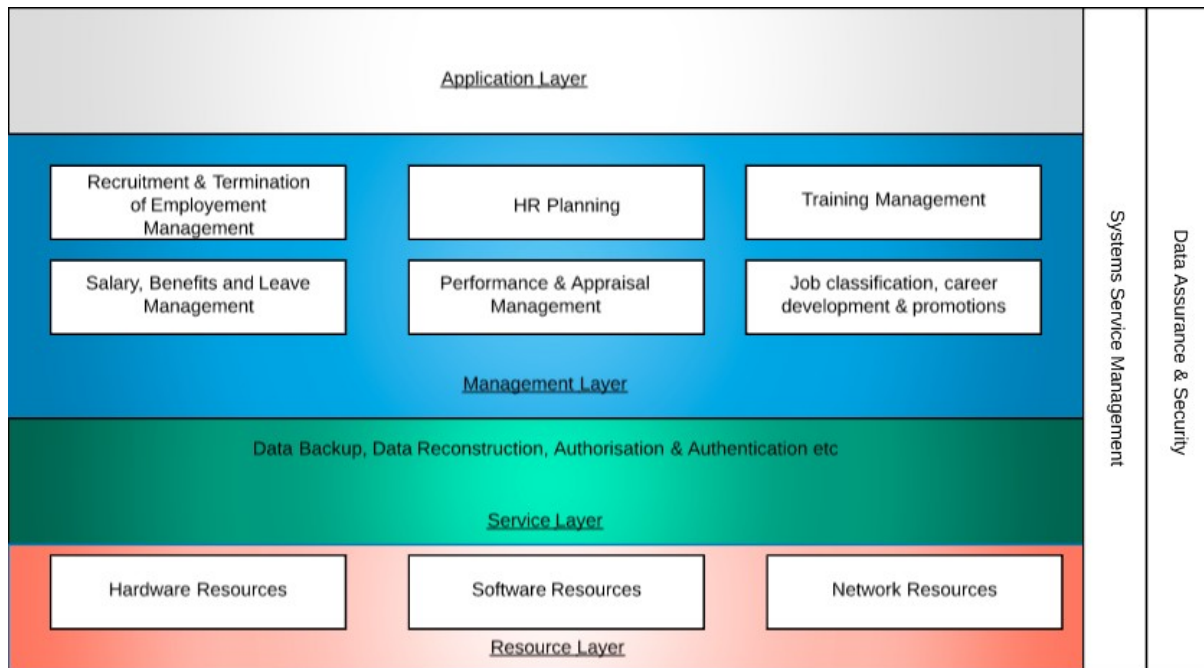
Figure 2. Layered architecture of the cloud HRMS

3.2.1   Cloud HRMS architecture:

The architecture of the cloud HRMS is then taken into account following the cloud architecture proposed by ISO:IEC 17789:2014 based on cloud computing functional components (International Standards Organization & International Electrotechnical Commission, 2014). Chen & Ni (2013) and (Navimipour et al, 2015) presents two independent architectures for a cloud HRMS. Based on these architectures; the adopted cloud HRMS architecture is shown in figure 2 which shows a layered architecture with four layers namely:

a) Application Layer
b) Management Layer
c) Service Layer
d) Resource Layer

Application Layer or User layer provides access for end users to the cloud HRMS through devices (Chen & Ni, 2013). Management Layer consists of HR managing components (further implemented as modules) and efficiently provides requested services to the user. Service Layer handles administrative, business and service capabilities (International Standards Organization & International Electrotechnical Commission, 2014). Resource Layer contains software resources, hardware resources, network resources (Jafari et al, 2015) and has two subcomponents – virtual resource component and physical resource component (Chan & Ni, 2013).

3.3   Phase 3: *Implementation*

The implementation of modules is carried out in the priority order defined in the previous phase. This phase is undertaken in an iterative manner so that the new process

requirements matches effectively with the existing standard process. In the first iteration, the modules and their processes should be presented with the target of matching the defined processes in the cloud and documented. The documentation is then presented and consent is obtained from works council, IT and data security and architecture. The target processes are evaluated against the acceptance criteria from SDP which is followed by change requests collection and configuration testing by business unit. In the second iteration, on the basis of change requests in first iteration the documentation of adjusted cloud HR process is carried out.

If the adjusted cloud HR process has changed fundamentally or need of new interfaces arises then a new presentation to works council, IT and data security and architecture is required. The changes are then configured inside the cloud HRMS followed by configuration testing by the business unit. Depending on the change requirements further iteration in a similar manner could be undertaken however, by now the module to be implemented should be complete and only minor changes should be required. The documentation should be transferred to the IT operations and existing data migration and legacy system shut down should be undertaken. The iterations lead to an improved implementation of modules based on the previous tests and results. It also leads to more accurate duration of the project implementation with limiting the iterations to three phases which acts as a clear guidance as confirmed by various project managers (Ziebell et al, 2019).

3.4   Phase 4: *Transition to Operations*

The modules are now introduced in live environment. The modules may work independently but when all of them are working together they are able to fully expose the potential of the cloud HRMS. An optimal timing is necessary for module introduction and Ziebell et al (2019) recommends introducing simpler modules and restricting the circle for the intended user to get familiar with the new process and the new technology. The module manager should handle the demand management allowing the business unit to be more independent from the IT department. In the previous iteration the knowledge transfer was already happening to the module manager and this transfer could now be widened by scheduling other module training.

3.5   Phase 5: *Operations*

Debois (2011) proposes DevOps strategy which accompanies operations phase to be a part of the project. The DevOps process ensures smooth transition and helps operations to learn from the project team's experiences. Templates for standard service management are proposed by ITIL which could be applied to HRMS cloud solution which serves as the base for operation and emergence of following action fields:

- Change requests: Due to evolving business policies and change in regulations change requests could arise (Cheah and Kasim, 2011). Additionally, any backlog of change requests arising from previous phases that were not implemented are addressed now. The evaluation of effort in implementing these changes is done within a timeframe, keeping in mind they do not cause any side effect between modular interfaces.

- Support: Ziebell et al (2019) state that systems and supporting tools are strong facilitators of the whole process of implementation as well as the success of operations. To improve the system acceptance and to minimise the queries ending up with the project teams or module mangers a helpdesk should be enabled to support the users at first level. A list of FAQs containing common questions that arises during the project phase can be used.

- Updates or upgrades: Updates or upgrades are introduced in the cloud HRMS in case of possible deviation of the system from normal operations (Cheah and Kasim, 2011). Need of such updates and upgrades could also arise to introduce new features, enhance security. Before applying any updates or upgrades it should be tested which processes will be affected so that unnecessary implication on other process doesn't happen and HR process manager should consulted and informed of implications of any such update.

4. Challenges and Security issues in adopting cloud technology:

4.1 Configuring HR processes: Configuration of a free process is limited in context of HR cloud due to limitations in technical boundaries while challenges also lies in documenting current processes and defining target processes (Ziebell et al, 2019). In order to address the configuration challenges posed, appropriate process model was adopted for systematic implementation of the cloud project.

4.2 Audit Risks and Regulatory Concerns: Employees' data in an organisation is subject to auditing by government authorities to check if the visa requirements of the employees are met, taxes are deducted, working conditions are fulfilled etc. Auditing on a public cloud might disrupt and compromise the security of data of other companies that uses the same public cloud. Location of data geographically on a cloud also comes into play (Farah, 2015) which could prevent auditor's access to the data. To address the challenge posed by the auditing authorities, an accredited service provider should be subscribed to, who meets the regulations regarding the handling and auditing of data in New Zealand.

4.3 Security and Data Storage Risks: Security of data is always paramount especially when it comes to sensitive data pertaining to employees' personal information, company's hiring goals and practices, performance metrices, salary information, onboarding and retention policies. Such data if made available to competitor's organisation may cause huge damage. Ahmed & Litchfield (2018) and Gupta & Kumar (2013) in their research on taxonomy of cloud security mentions different ways a cloud system is susceptible to security risks. As data is travelling between cloud and the organisation it becomes susceptible to interception. The organisation should thus try to understand how the data from the service provider is cryptographically secured and if it meets the requirements around the privacy of data.

In order to avoid security lapses the cloud HRMS application and data should be first assessed by the cloud provider, if it is ready for the cloud. Initially less sensitive and less private data should be moved to the cloud (Farah, 2015) before moving rest of the data. The data security requirements of the organisation should be conveyed to the cloud service provider in a clear manner. While considering cloud service providers the

organisation should look for providers which are compliant with cloud security frameworks or standards such as ISO/IEC or COBIT. In order to mitigate the human factors associated with cloud security (Ahmed & Litchfield, 2018) the organisation should consider training or educating its employees on implications of security breach and how to prevent such exposure to threats. Cloud service providers should also take it as their responsibility to educate the customers on how they should prevent possible security breaches. A representative from Fusion Networks, which is a cloud service provider in NZ, mentioned the only security breach their client faced was because of the client's naïve mistake. This could have possibly been prevented if the client was educated on security aspects of the cloud.

__Figure 3. Simplified use case diagram of cloud HRMS__

5. Benefit & Impact Analysis:

Figure 3. shows a use case diagram representing the interaction of actors with the cloud HRMS. In the legacy system employers are alerted through emails in case a new job is available which sometimes were delivered late. In order to apply for jobs they have to login on the website and apply there. With cloud HRMS, they will be able to receive instantaneous notifications through the application and apply directly for the available jobs. They will also

be able to access their personal information on the application and upload any changes in work visas, licenses etc. Through company's handheld devices at the location of the event the workers will be able log in their work hours simply by clicking against their names and capturing a screenshot of their faces. This will alleviate the need for duty managers to maintain and manage manual time sheets for employees working at the event, this way they will be able to direct their energy in conducting the event more successfully. This is a big issue when longer shifts occur and workers are coming in multiple shifts and there is change in duty managers as well.

The employees will also be able to manage leaves through the application and access pay slips for each week within the app as opposed to accessing them on the emails sent by the third-party each week. The company will also be able to process the payroll of the employees internally rather than using third-party thus achieving cost savings. Currently the company HRs have to inform the employees of decisions on the email and wait for them to respond (if required) through the web portal. With easier access to the cloud HRMS on mobile phones, tablets and the ability to receive notifications through the app and respond to them will lead to reduced time in decision making and planning. Surely the introduction of cloud HRMS will thus lead to enhancement in productivity. This could be analysed in two ways – saving in work hours thereby cost savings or increased customer satisfaction. Even if the work hours committed is kept same; better planning, decision making and dedicating resources towards conducting an event translates into increased customer satisfaction which is a very critical factor especially in a hospitality business.

6. Conclusion & Future research:

This article shows how a cloud-based HRMS could be implemented in the organisation by following a process model and analysing the architecture of the cloud HRMS based on industry standard framework. The possible challenges faced during the implementation are mentioned and ways to overcome them are addressed while also addressing the security risks. The objectives are addressed and as the company plans to expand outside of NZ it could scale its current cloud HRMS to meet those demands. The system is also able to handle both contractors and regular employees and the flexibility with workforce registration during a high demand. Further, HR Analytics and Business Intelligence can be incorporated in the cloud HRMS for better decision making and future planning for the HR.

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