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Research paper



Enterprise Integration of Employee Onboarding Process Using Zachman Framework

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Abstract

Onboarding is the process of getting newly hired employee to adjust to the social and performance aspects of their new jobs quickly and smoothly. It is important to the organization to maximize the employee retention and productivity and increase their satisfaction and loyalty where it could reduce cost of hiring employee by reducing the turnover rate. Studies have shown there is a requirement to integrate the business process between the enterprise entities to make the onboarding processes run smoothly and effectively. Therefore, the main objective of this study is to analyze the business processes to be integrated in the enterprise organization. Using qualitative methods, interview and document review, analysis was conducted to understand the current onboarding practices and processes in a case study. As a result, this research proposes a business process driven modelling for analysing enterprise integration requirements by using Zachman framework.

Keywords: *Business Process; Employee Onboarding Process; Enterprise Integration; Enterprise Architecture; Zachman Framework.*

1. Introduction

For the working population as a whole, a total of 25% of the entire working population undergoes career transitions each year [1]. In Fortune 500 companies alone, it has been estimated that 500,000 new managers transition into new roles or companies each year. According to [2], many employees decide within their first six months whether to stay or go. For hourly workers, turnover is a major problem in the first 120 days where approximately 50% leave their new jobs [3]. One of the important ways that human resources (HR) department can impact the workforce and effectiveness of organizations is through the strategic use of the process termed *onboarding*.

New employee onboarding is the process through which new hires learn the attitudes, knowledge, skills, and behaviors required to function effectively within an organization. The bottom line is that to the degree that organizations can make new hires feel welcomed into the organization and prepared for their new jobs, the faster they will be able to successfully contribute to the organization's mission [4].

Inefficient onboarding process cause nearly one in three of newly hired employees leave the company before the end of their first year [5], resulting in a negative impact on organizational productivity, workforce stability, and performance. The costs of new-hire turnover also are immediate and significant which involve cost of training, cost of facilities, systems and tools and cost of on-the-job training. Effective onboarding can help them adjusted to the social and performance aspects of their new jobs quickly and smoothly. Research conducted in US federal government, 2005 by the Recruiting Round-table revealed that effective onboarding programs can improve employee performance by up to 11.3% [6].

An effective onboarding of an employee contributes towards the social and performance aspects in the organization. Currently, new employees face challenges in adapting to the new environment due to manual or semi-automation onboarding process [7]. Another challenge is the disperse system which requires the employee to request facilities from one system to another which is time consuming. The challenges of manual or semi automation processes are time-consuming, prone to errors and provide bottlenecks that delayed completion of the entire process [8].

This study proposes a business process driven modelling approach for enterprise integration using the Zachman framework as a guideline to model the integration. Zachman framework is defining the enterprise architecture as a set of descriptive elements, [9] in where the enterprise integration is going to be performed and a business process modelling approach to identify the dependency relationships among human actors and information systems that should be integrated and supported to achieve a fully integrated enterprise.

To accelerate productivity of new employees, the onboarding process must be efficient. However, analyzing and designing the integrated solution for the enterprise would be complex. Hence, the purpose of this paper is to propose an enterprise integration employee onboarding model to provide an automated and integrated solution according to the enterprise structure and operations to overcome the problem of new employees onboarding process.

2. Literature Review

2.1. Employee Onboarding

Onboarding is the time for the organization to deliver organization's goals, culture and environment so the new employee could be integrated well and can contribute quickly and productively. A well designed and automated onboarding process may reduce costs improves productivity and retention due to greater employee

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satisfaction. Referring to [10], one research shows that effective onboarding programs can improve employee retention by 25%. Increasing in retention period means less people to leave the organization. Therefore, it will reduce cost of turnover and time in finding another new employee. Proper onboarding makes employees feel valued and encourage them to grow knowledge and skills which may assist them to realize their full potential. Their improvement in knowledge and skills may then benefit to the organization.

The literatures above show that well-structured onboarding can benefit the organization by increasing the employee engagement and productivity as well as retention period. The well-structured onboarding can be achieved through automation, coordinated and integrated process.

2.2.Enterprise Integration Using Zachman Framework

Enterprise integration is the process of ensuring the interaction between enterprise entities necessary to achieve domain objectives [11]. The aim of this study is to analyze the current business process and how the enterprise entity can interact and integrated to improve the onboarding process. As an enterprise organization, both organizational and technological integration is necessary. However, implementing enterprise integration is extremely complex due to involving different technological, human and organizational elements [12].

Zachman framework is defining the enterprise architecture as a set of descriptive elements, [9] in where the enterprise integration is going to be performed and a business process modelling approach to identify the dependency relationships among human actors and information systems that should be integrated and supported to achieve a fully integrated enterprise.

According to [13], Zachman framework is a great modelling tool to construct an enterprise architecture (EA) that can integrate and align the IT infrastructure and business goals. The enterprise architecture is modelled by five roles or perspectives, and they are represented in each row of the framework as shown in figure 1.

Abstractions (Columns)

The Zachman Framework	DATA *What (Things)*	FUNCTION *How (Process)*	NETWORK *Where (Location)*	PEOPLE *Who (People)*	TIME *When (Time)*	MOTIVATION *Why (Motivation)*
SCOPE (Contextual) *Planner*	List of things important to the business *Entity = Class of business thing*	List of processes the business performs *Function = Class of business process*	List of Locations in which the business operates *Node = Major business location*	List of Organizations Important to the Business *People = Major organizations*	List of Events Significant to the Business *Time = Major business event*	List of Business Goals/Strategies *Ends/Means = Major bus. goal/Critical success factor*
BUSINESS MODEL (Conceptual) *Owner*	Semantic Model *Ent = Business entity* *Rein = Business relationship*	Business Process Model *Proc = Business process* *I/O = Business resources*	Business Logistics System *Node = Business location* *Link = Business linkage*	Work Flow Model *People = Organization unit* *Work = Work product*	Master Schedule *Time = Business event* *Cycle = Business cycle*	Business Plan *End = Business objective* *Means = Business strategy*
SYSTEM MODEL (Logical) *Designer*	Logical Data Model *Ent = Data entity* *Rein = Data relationship*	Application Architecture *Proc = Application function* *I/O = User views*	Distributed System Architecture *Node = I/S function (Processor, Storage, etc.)* *Link = Line characteristics*	Human Interface Architecture *People = Role* *Work = Deliverable*	Processing Structure *Time = System event* *Cycle = Processing cycle*	Business Rule Model *End = Structural assertion* *Means = Action assertion*
TECHNOLOGY MODEL (Physical) *Builder*	Physical Data Model *Ent = Segment/Table, etc.* *Rein = Pointer/Key*	System Design *Proc = Computer function* *I/O = Data elements/ sets*	Technology Architecture *Node = Hardware/ System software* *Link = Line specifications*	Presentation Architecture *People = User* *Work = Screen format*	Control Structure *Time = Execute* *Cycle = Component cycle*	Rule Design *End = Condition* *Means = Action*
DETAILED REPRESENTATIONS (Out-of-Context) *Sub-Contractor*	Data Definition *Ent = Filed* *Rein = Address*	Program *Proc = Language statement* *I/O = Control block*	Network Architecture *Node = Addresses* *Link = Protocols*	Security Architecture *People = Identity* *Work = Job*	Timing Definition *Time = Interrupt* *Cycle = Machine cycle*	Rule Specification *End = Sub-condition* *Means = Step*
FUNCTIONING ENTERPRISE	Actual Business Data	Actual Application Code	Actual Physical Networks	Actual Business Organization	Acutal Business Schedule	Actual Business Strategy

Perspectives (Rows)

Fig. 1: Zachman Framework. Source: [14]

The horizontal dimension (the row) describes the perspectives of those who use the models or descriptions contained in the cells. The vertical dimension (the columns) describes the types of abstractions/ aspects that define area of interest of each perspective. Below table summarize the description of each perspective.

Table 1: Description of Perspective (row) view of the Zachman Framework

Perspective	Description
Scope (Contextual Planner)	The Planner's Perspective. This describes the item or entity that must be considered by the executives level of the organization (top management) to achieve business objectives.
Business Model (Conceptual Owner)	The Owner's Perspective. This describes the models, architectures and descriptions used by the business process owner.
System Model (Logical Designer)	The Designer's Perspective. This describes the models, architectures and descriptions used by people who design what is desirable and what is technically possible.
Technology Model (Physical Builder)	The Builder's Perspective. This describes the models, architectures and descriptions used by people who design and create the actual product.
Detail Representation (Sub Contractor)	Sub Contractor's Perspective. This describes the elements or parts that are included in to support the final product. Its normally refer to modules or components acquired from others.
Functioning (Enterprise)	This row represents the actual deployed or running elements, data, and people of the organization.

Based on [14], not all cells information stated above will define formally by the organization. Thus, any information that are not formally described, assumptions made by the people in the organization may be considered.

In order to conduct the study, the Zachman framework, an Enterprise Architecture (EA) was chosen to represent the Enterprise Integration (EI) architecture. Enterprise Integration is a process of integrate business process end-to-end across the enterprise and its strategic partner to support business operation [15]. While Enterprise Architecture (EA) representing the overall view of the environment in where the enterprise integration is going to be performed.

Most of the enterprise integration architecture are describing on how the integration can be implemented, the approach, component required and integration infrastructure. However, integration requirements come from business process needs. Therefore, business process driven methodology is a suitable approach to view the integration in both technology and human perspectives. This is because the onboarding process involves various systems across department, various nature of business and people's role in enterprise.

In several of Enterprise Architecture Framework available, the study chose Zachman Framework due to its comprehensive framework that comprises several views and aspect which covers both technology and human views that should be considered when to implement the enterprise integration.

2.3. Mapping of Integrated Process Against Onboarding Goals

Integrated onboarding solutions provide the ability to track activities and push appropriate requests, reminders and data which greatly accelerates the overall onboarding process and shortens ramp-up time [16]. Disruptions occurring in IT services have negative implications in e-government service delivery implying that the existing e-government implementation and management need improvement [17]. New business process management initiatives should be promoted to all relevant stakeholders such as government agencies, private sectors [18].

Effective integration and interoperability e-government architecture involves integration of components and interoperability of applications and services. However, it is difficult because the huge number of agencies and services [19]. Integration approach for onboarding was proven success in Bristol-Myers Squibb which increase 92% their employees beliefs on productivity after one month on the job [20].

2.4. Modelling Techniques with Zachman Framework Perspectives

This study will use several modelling techniques based on the five perspectives views in Zachman framework as defined in table 2.

Table 2: Process Modelling Task and Techniques

Perspective/row	Description	Task and techniques used
1. Scope	Corresponds to an executive summary for a planner who wants an estimate of the size, cost and functionality of the system.	Identify business unit involve and their core business and activities using use case.
2. Business model	Shows all the business entities and processes and how they interact	Transformed the identified business unit above into a finer granularity model using a business process modelling approach based-on Business Process Modelling Notation (BPMN).
3. System model	Determine the data elements and software functions that represent the business model.	Convert business process modelled into logical data model and application architecture which encapsulate the data required and business logic for integration. This is using UML (Unified Modelling Language) and Entity-Relationship Diagram (ERD) technique.
4.Technology model	Considers the constraints of tools, technology and materials	Identify the components as below using Entity-Relationship Diagram (ERD): Physical data model, (identify database type and data type), System flowchart
5.Detailed representation	The integration part which define the process, approach, method and tools for integration.	Identify the integration component which encompasses system, component, process and data to integrate. This is using integration process flow and integration architecture modelling technique.

The tasks and techniques are used to describe on how the integration can be implemented. However, integration requirements originate from business process needs. Therefore, business process driven methodology is a suitable approach to view the integration in both technology and human perspectives. This is because the onboarding process involves various systems across department, various nature of business and people's role in enterprise. Without a business process driven methodology that comprises both technology and human perspectives, enterprise integration projects are prone to failure [9].

3. Methodology

For this study, qualitative approach is used to get in depth understanding of current onboarding practice and processes. Qualitative research focuses on understanding the business process, application and data involved, therefore these designs give the researcher the opportunity to interact with the individuals or groups with such experiences and explore it through a variety of lenses. These designs enable multiple facets of the phenomenon to be revealed and understood. The researcher analyzed and interpreted the relevant information and entity required to design the model for improving the onboarding process (interpretive).

Multiple data sources were acquired through interview, Standard Operating Procedures (SOP) documents, and observation on current practice and process. It is important to understand the existing business process prior to analysis in order to understand how enterprise integration can be implemented in the organization. Therefore, the case study strategy is used in this research to specifically understanding the process of onboarding in the particular organization. Moreover this process involved multiple departments/units and individuals. Each process owners has their own processes, procedures, solutions and methodology to play their roles in onboarding management.

Based on case study in the largest public university in Malaysia, below are the five identified key entities (process owner) involve in employee onboarding process:

- Registrar (HR) department – to handle forms and enrollment and preparing orientation programs.
- Finance department - to initiate payroll and establish direct deposit /deductions
- University Police – parking permit and space, sticker and transport registration
- Office manager – assign and set up workspace, distribute supplies needed, register attendance system
- IT – allotment of hardware and software, telephone number, network, and application access which required as well as access door authorization, email and application access.

Further data gathering was conducted from them through interview and document analysis. The researcher used semi-structured interview to collect the information. These techniques are used to understand the relevant business process flow, system flow, data, time and location. Besides interview, document analysis was also done to discover further information that might be too technical to explain and any information that might have been overlooked during interviews.

Table 3: Zachman Framework (Row) based on Onboarding Process

Aspect	Description
Scope (Contextual Planner)	Refer to perspective views of top management (executive level) who determine the item or entity in onboarding process.
Business Model (Conceptual Owner)	Refer to perspective views of Department as the process owner related in onboarding system such as Human Resources (HR), Finance and Facility Unit.
System Model (Logical Designer)	Refer to perspective views of system user who implementing the process in the system. E.g.: HR department is using a system called as Staff Resource Management System (STARS) to process the onboarding. This view refers to the user's perspective of the STARS system. They are the one who initiates the business requirements to be developed in the system.
Technology Model (Physical Builder)	Refer to perspective views of Technical Unit of each department above. E.g.: HR is having ICT unit to manage their STARS system. They are the one who develop and maintain the system.
Detail Representation (Sub Contractor)	This view in this case study, refer to as Integration's perspectives. The integration as supporting element to improve the onboarding process.
Functioning (Enterprise)	This perspective is referring to actual implementation of the recommendation proposed.

Table 4: Zachman Framework (Column) based on Onboarding Process

Aspect	**Description**
Data (What)	Data refer to the input and output provided in onboarding system either in a form of physical documents, system or data in database.
Function (How)	Function refer to business process, system process and integration process required in this onboarding system
Network (Where)	Network is more refer to the location of various system related and its connectivity.
People (Who)	People refer to person involve along this onboarding process that which represents each department involved.
Time (When)	This refers to onboarding lifecycle and phases involve starting from pre-boarding until induction training.
Motivation (Why)	Motivation refers to the objectives and goals to achieve in implementing the integration. The goals defined must achieve the onboarding goals.

After data has been collected and analyzed, the study developed an enterprise integration model for employee onboarding using Zachman framework. Table 3 and 4 above describe the definition of row and column in Zachman framework against the case study environment and process scope of the employee onboarding process.

4. Analysis and Findings

Several interview sessions were conducted with interviewees from Human Resource, Finance and IT department. The interviewees are those who are involved directly in employee employment, salary processing, the system analyst and programmers who develop or maintain the related system.

Several documents were analyzed such as operating procedures documents from finance and some information from HR, finance, facility and IT website such as organization chart, staff's role, and department's objectives. Analyzing the documents is another method used to find additional information that might be lacking during interviews.

4.1. Mapping of Data into Zachman Framework (AS-IS)

After gathering all the information, the data is then analyzed to map into the Zachman Framework. Table 5 below shows the AS-IS business process of the onboarding process. The AS-IS framework is required in order to understand the current business process with regards to the integration issues. Currently, there is no integration process for onboarding between HR and IT department. Therefore, the column motivation (why) and row (detailed representation) will be describe in the TO-BE framework.

Table 5: AS-IS framework for Onboarding Process

	Data (What)	Function (How)	Network (Where)	People (Who)	Time (When)	Motivation (Why)
Scope (Top Management)	A1 Enterprise entity	A2 Onboarding process	A3 system Access type and structure	A4 Organization chart of the entity	Onboarding phases	Will be described in the TO-BE framework
Business Model (Business Owner)	B1 Onboarding data flow between entity	B2 Business Process Model and Notation	B3 Network access based on structure and access type	B4 Function of each entity department as process owner	B5 Onboarding cycle and timeline	
System Model (System User)	C1 Entity Relationship Diagram of the system	C2 UML use case on the system function of each entity	C3 Physical location of the system	C4 The roles and the scope of work in the system	C5 Onboarding activities that trigger the phase.	
Technology Model (ICT)	D1 Database structure of which the data is stored	D3 System process flowchart	D3 The components from user level to data level	System access and functions for each roles	D5 Identified manual onboarding process	
Detailed Representation (Integration)	Will be described in the TO-BE framework					

4.2. The Onboarding Process

Based on the findings, most of the onboarding process systems are in silos. Systems involved during employment are the Staff Management System, Financial System, Phoneline System, Barrier Parking System, Company Email System, Staff Card System and E-Vehicle System as shown in Figure 2 below. There are six business process involved in the onboarding system:

1. Offering Process – process to prepare the offer letter by gathering information required, preparing documents required and follow up new employee's response.
2. Report Duty process – Preparing task and documents required to welcoming the new employees. Inform the office assigned to locate the new employee.
3. Personal File Management Process – managing personal file by ensuring all the details have been endorsed and approved, arrange file located in physical store.
4. Salary Management Process – processing new employee's salary by verify the details and bank account.
5. New employee's Evaluation Process: mind transformation program to enhance competency and evaluate new employee's performance at least after 6 months.
6. New employee's Facilities Management Process: to manage all facilities entitled to the user such as email, phone, Desktop/ PC, parking sticker, parker lot, smart card and stationeries.

Figure 2 below shows the departments, processes and modules involved for a new employee onboarding process. Currently, it takes weeks to complete all the processes for the new employee as all the processes are done in silos with no integrated system.

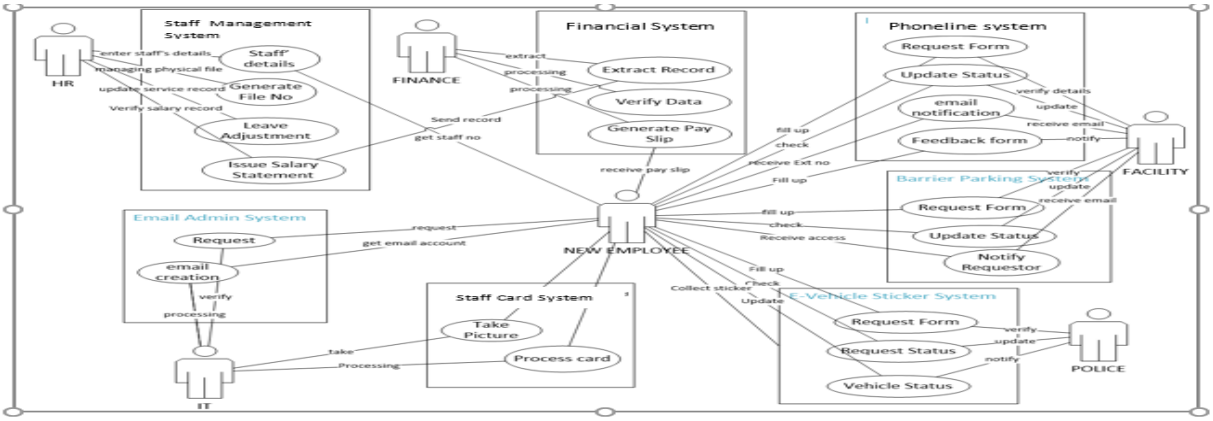

Fig. 2: New employee onboarding business process

4.3. Mapping of Data into Zachman Framework (TO-BE) with enterprise integration for onboarding process

In order to propose an enterprise integration, the researcher used the same framework and named it as To-Be framework to visualize the changes (Table 6). This framework shows the findings and result after some analyzation and recommendation for integration to improve the onboarding system. In the To-Be framework, there is an additional entity involved which is Integration in the Detailed Representation perspective of the Zachman Framework. Integration is a unit that is responsible to develop and manage the integration process between systems in the organization so that the separate entity and processes can be connected to deliver single onboarding process seamlessly.

Integration process is a process of managing data or application integration between multiple systems involved to ensure all the relevant data is share or exchanging through trusted, authorized and systematic system. The integration process will query the relevant data only and send automatically to other system which required those information so that all the processing can be done without required any manual interruption.

For the Technology Model, the database structure may have to change in term of data type or size when to integrate with other system or system may provide another table for integration as a staging table before the system itself extract it into the actual table. This scenario may occur when 2 system having 2 different data type i.e. varchar and integer. The target system normally can change their data type so that the quality is even or integration system may help to transform the data type in transition between source and target database.

Different system use different term or code to describe the data. Instead of data type, integration also may transform the data into different term to reduce the system to change the existing code use. Example, to transform from "Female" to "F". The data size also has to be considered during integration analysis. Insufficient data size may cause the data to be truncated.

The integration system is able to integrate data or applications between 2 systems even both systems have disparate platform and database type. The integration system able to connect to different database by using JDBC or ODBC technology. JDBC and ODBC allows connection to various type of database by the same application/ system.

According to [21] on what best practice for onboarding, any efforts to provide the information, materials and experiences will help the new employee to learn that they need to know to adjust successfully.

Integration process will manage data integration between multiple systems involved by automatically query the information and send to relevant system based on rule and time that will be determined. The integration process able to reduce redundant multiple entry data by the employee for each facilities request.

Table 6: Zachman Framework with enterprise integration for onboarding process

Perspectives	Data	Function	Network	People	Time	Motivation
Scope	A1 Integration entity	A2 Integration process	A3 as per as-is	A4 Organization chart for integration unit	A5 as per as-is	A6 current business goals
Business Model	B1 DFD when integration implemented	B2 BPMN when integration implemented	B3 as per as-is	B4 Function of integration	B5 Improvement on onboarding cycle and timeline	B6 Process efficiency
System Model	C1 as per as-is	C2 UML diagram	C3 Additional system access- integration and onboarding portal	C4 Roles and scope of work of the integration	C5 Improvement on onboarding event trigger	C6 Effectiveness
Technology Model	D1 Integration various DB type	D2 Integration in system process	D3 Component for onboard portal	D4 as per-as-is	D5 Manual to automation through integration	D6 Technology supported and readiness
Detailed Representation (integration)	E1 Scope of data to integrate	E2 Integration function and development process	E3 Enterprise Integration Architecture	E4 Entity involvement in integration	E5 Integration schedule	E6 Onboarding goals
Functioning	Actual Implementation					

4.4. Implementing Enterprise Integration to the Onboarding Process

Four modules have been identified as integration process which are: Staff Module, Salary Module, Email and Smart Card Module. The function of these modules are to query employee information, salary, smart card and email details so that the information can be integrated to other system that need those information. This process is able to reduce the burden of new employee to make a request on every system separately in a new working environment by integrating the information to the relevant entity during acceptance; the preparation can be done earlier and completed upon the new employee's arrival.

Enterprise integration is an act of connecting, often disparate, subsystem into a single process that functions as one so that the data contained in each becomes part of a larger. Integration is considered one of the most significant ways to change the onboarding process. The main goal of this integration is to prevent manual data entry and redundancy, and automate the manual system to improve the effectiveness of the onboarding management.

Most companies develop many in-house system and heterogeneous platform. Some of the systems are legacy systems that resist to change. The challenge is not only to integrate many disparate systems, but also to integrate many systems that could change at any moment. Thus, integration developed must flexible enough to accommodate and adapt with various system behavior.

There are three types of integration; data, process and application integration. Based on the system architecture two approaches can be used which is data integration or application integration. The process integration may use for integration between recruitment system to onboard system because the process is interrelated.

With To-Be framework, the motivation cell is able to be identified based on the goals of achieving integration as the it offers organization a greater capacity to share information across organizational boundaries and better decision to make based on more complete data. Based on the data also, the organization able to discover patterns and interactions for future direction or enhancement.

5. Conclusion

Successful onboarding encompasses proper planned collaborative effort of various departments or process owner, personnel, management and services across campus to work together seamlessly to welcome new employees. This can be achieved through enterprise integration which integrates several silos and independent subsystems info single system that will function as one. However, implementing enterprise integration is complex process because involve a lot of peoples across department and business process. Therefore, a model or an architecture is useful to have as a basis to give better understanding to the organization before the actual integration is implemented.

Hence, this research proposes a business process driven modelling for analysing enterprise integration requirements by using Zachman framework which provides a complete understanding about the onboarding process and its impact to the organization, department, employee and system. The recommended onboarding model provides a framework for the organization to implement the enterprise integration to improve the onboarding process for maximizing employee productivity, engagement, and retention.

Theoretically, this research able to prove that transformation from manual to auto and from silo to integrated system will give significant impact to improve onboarding process. This whole transformational process in building an enterprise integration will increase quality of service and data, seamless process between subsystem and eliminate resource intensive that able to create positive onboarding experience.

The researchers suggest for future study to analyze further the system details, other interdependent business processes and business challenges that may affect the successful of the integration. The resistance to change or improve business process sometimes may cause the integration fail or require longer time to implement.

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References

[1] Rollag, K., Parise, S., & Cross, R. (2005), Getting new hires up to speed quickly. MIT Sloan Management Review, 46, 2005, pp. 35-41.

[2] Walters, C. (2010), Employee onboarding boosts retention, improves productivity. Retrieved from HR.Works,Inc: http://www.hrworks-inc.com/topics-in-hr/articles/7-recruiting/307-employee-onboarding-boosts-retention-improves-productivity

[3] Krauss, A. D. (2010), Onboarding the hourly workforce. Poster presented at the Society for Industrial and Organizational Psychology (SIOP), Atlanta, GA.

[4] Bauer, T. N. (2011), Onboarding new employees: Maximizing success. SHRM Foundation's Effective Practice Guideline Series. SHRM.

[5] Saratoga. Best practices for retaining new employees: new approaches to effective onboarding. PricewaterhouseCoopers. www.globalbestpractices.com, 2008. Retrieved from http://docplayer.net/7390719-Saratoga-and-global-best-practices-best-practices-for-retaining-new-employees-new-approaches-to-effective-onboarding-introduction-1.html

[6] Hamilton, B. A. (2008), Getting On Board: A Model for Integrating and Engaging New Employees. USA: Partnership for Public Service.

[7] Stroud, J. Servicenow. (2016, March). Retrieved from How Service Management Transforms Employee Onboarding: https://servicematters.servicenow.com/how-service-management-transforms-employee-onboarding/

[8] Martin, K., & Saba, J. (2008), All Aboard: Effective Onboarding Techniques and Strategies. Aberdeen Group.

[9] Espadas, J., Romero, D., Concha, D., & Molina, A. (2008), Using the Zachman Framework to achieve Enterprise Integration based-on Business Process Driven Modelling. CIDYT - ITESM Campus Monterrey, Monterrey, Mexico, pp. 283-293.

[10] LaShawn, T. (2007), On-boarding: Maximizing Productivity and Retention. PM Boulevard.

[11] ISO 19439. (2006). ISO.org. Retrieved from Enterprise integration Framework for enterprise modelling: https://www.iso.org/obp/ui/#iso:std:iso:19439:ed-1:v1:en

[12] Ricaldo, C., Campos, C., & Grangel, R. (2001), References Architecture for Enterprise Integration. The Journal of System and Software, pp. 175-191.

[13] Noqueira, J. M., Romero, D., Espadas, J., & Molina, A. (2013, Feb) Information Interoperability and Networking: Theory and Apllications. *Enterprise Informations System, 7*(1), 100-132.

[14] Frankel, D. S., Mukerji, J., Owen, M., Rosen, M., & Mark, R. (2003, Sep), The Zachman Framework and the OMG's Model Driven Architectur. *Business Process Trends*,

[15] Lee, J., Siau, K., & Hong, S. (2003), Enterprise Integration with ERP and EAI. *Communication of the ACM, 46*(2), pp. 54-60.

[16] Taleo Research. (2006), *Onboarding: Speeding the Way to Productivity*. U.S: Taleo Research,

[17] Abdullah, N.A, Md Noor, N.L Ibrahim, E.N.M. (2016), Contributing factors to e-government service disruptions, Transforming Government: people, process and polciy, Vol 10: issue 1.pp120-138.

[18] Arshad, N.H, Salleh, S.S., Syed Aris, S.R, Janom, N, Mastuki,N. (2013), Micro sourcing Strategic Framework for Low Income Group, IJACSA, Vol4.No.6.

[19] Sedek, K.A. Omar, M.A, Sulaiman S. (2014), A Hybrid Architecture for One-Stop E-Governemnt Portal Integration and Interoperability, , 8th Malaysian Software Enginering Conference.

[20] Bauer, D. T. (2007), *Onboarding new employees: Maximizing success*. VA: SHRM foundation.

[21] Klein, H. J., & Heuser, A. E (2008), The learning of socialization content: A framework for researching orientating practices. (C. R. Wanberg, Ed.) *Research in Personnel and Human Resource Management, 27*, 279-336.