

**Framework of Cloud-Based ERP for Malaysian IT Company: Migration of  
Traditional On-Premise ERP to Cloud Based ERP (Microsoft Dynamic 365  
CRM- Sales Module)**

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in partial fulfillment of the requirements for the degree of  
Master of Information Systems  
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## DECLARATION

I hereby declare that this project report is based on my original work except for citation and quotations which have been duly acknowledged. I also declare that it has not been previously and concurrently submitted for any other degree or award at UTAR or other institutions.

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## APPROVAL FOR SUBMISSION

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## **ABSTRACT**

The market for On-Premise ERP is considered as mature as vast majority of companies adopted On-Premise ERP. Implementing On-Premise ERP can bring various kinds of advantages such as greater control, customization, secure for critical company's financial data and so on. Yet, it started to shift to cloud solution as cloud computing becoming the current trend in this technology new era and is an evolutionary of ICT where the application is no longer required to install on the computer. What's more, one of significant on ERP with cloud structure or Cloud-Based ERP is that it tends to reduce the issues imposed by the On-Premise ERP such as reduced upfront cost. A detail overview in both type of ERP- Traditional On-Premise ERP and Cloud-Based ERP will be introduced. This research will include basic concept of ERP and introduce Cloud-Based ERP, overall view on different type of ERP brand in the market as well as the architecture of both type ERP specifically in Microsoft Dynamic AX and Microsoft Dynamic 365. In addition, this paper will identify and classify possible factors that influence the company decision on migration to Cloud-Based. A comparison on both type of ERP system will be established in this research as well. Furthermore, this research conducted interviews with experienced ERP vendors particular in Microsoft Dynamic for validate on the factors collected from secondary sources. At the end of this research, a framework for migrating On-premise ERP to Cloud-Based ERP will be produced and verified it with using a company data.

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# **Chapter 1**

## **INTRODUCTION**

### **1.1 Introduction**

Cloud computing becoming the current trend in this technology new era and is an evolutionary of ICT where the application is no longer require to install on the computer. It tends to change the way of business operation into more advancement, yet, more convenience. Many believe that Cloud will reshape the entire ICT industry as a revolution (Dillon, Wu, & Chang, 2010). What is cloud computing? Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction (Mell & Grance, 2011).

Enterprise Resource Planning system or known as ERP system consider as a complex and essential system that integrate multi complicated business process in the company. ERP system can simply be described as an integrated information system servicing all aspects of the business as it handles transactions, maintains records, provides real-time information and facilitates planning and control (Harwood, 2003). How does the ERP be interrelated with could computing? As the technology become more advancement, cloud computing being promoted in many ways and leading it to become a trend. Cloud computing becoming more popular because of the flexibility it offers by reducing the organization of technical maintenance cost and increase service scalability easily without interfering other service. These abilities of cloud technology offer lot of advantages such as the cost of ERP implementation is significantly reduced by introducing the cloud-based approach (Navaneethakrishnan, 2013). Thus, ERP system has revolution into cloud computing which the structure and technology using cloud computing concept to resolve the problem of on-premise structure faced such as

hardware cost. Apart from that, Cloud ERP is nothing more than hosted ERP on a Cloud provider (Kiadehi & Mohammadi, 2012). Moreover, organizations set up ERP cloud based system aiming at solving the problems of complication faced in the traditional On-Premise ERP (Salleh, Teoh, & Chan, 2012).

## **1.2 Motivation**

The reason behind the choice of targeting the field to ERP is that the system constantly viewed as company core system. The cost spends on the software was relatively high as compared to any other type of software in the market. Besides, the structure of the software is complex as it integrates with all possible business process and transaction. Installation of the software not just going through few step but consider as a project to a company which required different knowledge and skill such as project management especially in ERP system requires not only understanding on ERP architecture but to have a knowledge of business operation that fully understands the company business nature.

Furthermore, cloud computing considers as a new trend in ICT industry and becoming a new computing standard allows users to utilize computing infrastructure over the network. With the new trend and given the cloud architecture provides advantages over the on-premise type of architecture. Nonetheless, ERP system start to revolution its structure into cloud-based has brought up the attention to the ERP community. Such novelty technology of ERP cloud-based is essential to understanding the fundamental of architecture and defining its potentials and limitation.

## **1.3 Problem Statement**

Even though ERP cloud based migration has yet to done in Malaysia due to consider as new in the market. Nonetheless, the problem statement focus on the overall ERP implementation issue. Incorrect implementation resulted the company to lose countless of time and money. Panorama consulting analysis report in 2016 summarize the research into the experiences of customer towards enterprise systems, vendors or consultants, and overall implementation. According to the report done by Panorama

Consulting Solutions (2016), 57% exceeded budget (a slight increase over last year) and 26% on budget (4% decrease from last year).

It also stated that on average organization spend 6.5% of annual revenues on their ERP projects and 57% of projects exceed their initial estimated timeline which is a 48% increase over last year.

Apart from that, the report also shows the level of unsatisfied with the result of 75% of respondents report that they would select their chosen software again if required to start over.

In the current rapid evolution of IT that serve a better improvement to end user in many ways and of course ERP system has been swiftly improved over the period of time. But the questions still at the stake, why still the ERP projects are overly budget and time, causing the company to face a high risk of calling off the project?

#### **1.4 Objectives**

The purpose of this study is to understand various essential issues that could possible directly influence the migration to ERP cloud based process and to construct a framework as a guideline to people that opt for advancement to ERP cloud based. Besides that, the study will focus on the comparing traditional ERP type with the new cloud-based type. Below is the objective that has identified:

1. To investigate the important aspect that the company required to aware during decision of opting for ERP cloud based advancement.
2. To investigate the essential issues that directly affect the migration of ERP cloud based.
3. To compare both structures between traditional ERP type and the cloud-based type in terms of infrastructure, application level, and database level.
4. To construct a framework of ERP system migration from On-premise to Cloud based system.

5. To investigate the impact of the different database structure to the data migrating the process from traditional ERP type to cloud-based type using a simulation prototype.
6. To evaluate the effectiveness of framework against the ERP migration to cloud-based through a simulation.
7. A report of 5-7 pages of conference paper (in conference writing format) is expected.

### **1.5 Research Questions**

After identified the objectives, the research questions should be answered from this research are:

1. What is the important aspect or factor that the company should review before they decided to migrate their ERP to cloud solution?
2. What are the issues or factor that directly affect the process of migration?
3. What are the differences of ERP cloud-based type as compared traditional ERP type?
4. How does the different database structure will impact the data migration process from traditional ERP type to cloud-based type?
5. How does the framework give assistance in the process on the decision of opting for migration and during migration?



## **1.6 Scope of Work**

The research field will focus on the ERP system. The scope of research will be particular emphasis on ERP cloud based system migration process.

The scope of research will further narrow it down to the factor related to the decision on opting for migration and during ERP migration, this research will consolidate all related factor and reconstruct it into a framework. Besides that, the research will use Microsoft Dynamic as the ERP platform for study purpose because Microsoft has both version of traditional ERP platform (a premise based) and new version ERP platform (cloud-based) which recently just launch on 1<sup>st</sup> November 2016 (Wu, 2016). Additionally, a comprehensive review on two type of ERP in terms of their structure and functionality will be showed in a form of table.

Below are the summaries of the scope set for the study:

The scope of the research:

- This research only focuses on Microsoft Dynamic as research ERP platform.
- This research only focuses on the factor related to ERP cloud based system that affects the decision opt for migration and during the migration process.
- This research only focuses on study two type of ERP structure: Traditional ERP platform and cloud-based platform.
- Interview candidate will be the vendor of Microsoft Dynamic, there will be two type of interview candidate: Functionality Consultant and Technical Consultant.

The scope of work

This research will be using few approach to complete the whole study. Below is the list of the approach adopted:

Data Collection using Secondary Source Approach

- Perform a comprehensive literature review.

- Data collection factor influences the ERP migration to cloud-based from secondary sources such as journal article.

#### Qualitative Approach

- The research activity of an interview with ERP expertise in technical and functional from Microsoft Dynamic.
- Collect primary data related to Microsoft Dynamic both type of structure from primary sources of the interview.
- Interview topic will focus on understanding the structure type of new ERP cloud based.
- Interview topic will also include the understanding of different aspect that needs to emphasis when migrating the system to cloud-based.
- Construction of framework based on the secondary data and interview result.

#### Experimental Approach

- An analysis and simulation test against the framework.
- The main simulation activity is to do the migration from one system including the data to another system with following the framework guideline.

### **1.7 Contribution**

At the end of the research, the deliverable of this research will be in form of an academic journal that will publish in UTAR Repository which made accessible to the UTAR community and public. This academic journals served as a research related to ERP cloud computing specifically on framework or road for migration to ERP cloud-based as well as includes information about the ERP cloud computing structure.

The result of the research will be benefited to people who are currently undergoing ERP project migration especially on the cloud-based type and to people that are planning to opt for the advancement of an upgrade to cloud-based type. The result will guide the company's project manager direction of the project that based current happening event.

Besides, the research will help the company to evaluate whether its current ability and situation are fit for upgrade the system structure to cloud based. For instance, cloud-based required extensiveness network bandwidth upgrade, does the company have enough resources to comply it?

Furthermore, the research will help those people who required to get to know the overall idea of ERP system cloud-based and further understanding on the ERP structure specifically Microsoft Dynamic.

## **1.8 Novelty**

There is few of research done on factors affecting ERP implementation in Malaysia with the particularly based traditional type of ERP structure. Yet, none of the study done on ERP cloud based implementation in Malaysia and the system is to consider as very much new in the market because Microsoft just announces the cloud-based type-Microsoft Dynamics 365 available worldwide in 1st November 2016 (Wu, 2016). The outcome will benefit to the company in Malaysia as people can review the research and help them to better decision making on implementing the cloud-based type of ERP system.

## **1.9 Conclusion**

This section has demonstrates that the evolution of ERP system from traditional On-premise ERP to Cloud Based ERP. The new trend of cloud computing has brings much benefit to organization. For example, organization no longer acquired a server and database to manage their data and instead, they can let cloud provider manage their data with paying a month basis fees. Many ERP providers see the potential benefit of cloud computing could bring and start to change their structure to Cloud Based ERP. One of the notable example is the top 3 ERP platform in the market-SAP, Oracle and Microsoft Dynamic has started to shift their structure to cloud based.

Upon the changing, there is a market needs for company to explore and learn the switch of ERP between On-premise to Cloud-Based. Hence, this research aims to study the essential factors influenced the decision of company on migrate from On-premise ERP to Cloud-Based ERP. The research findings could act as a guideline for the companies required to understand and explore the process of migration from On-premise to Cloud based.

### **1.10 Dissertation Structure**

This dissertation is consist of four chapters where chapter 1 discuss about the introduction as well as the background of the study by included the problem statement, research objectives, scope of work and novelty of the research.

Chapter 2 cover a comprehensive literature review on articles, concepts and related researches study. This section includes an overview of On-premise ERP and Cloud-Based ERP, overall view on different type of ERP platform in the market, the architecture of ERP specifically on Microsoft Dynamic platform- Microsoft Dynamic AX and Microsoft Dynamic 365 as well as the functionality on both type of ERP. In additionally, this section has identified and classified possible factors that influence the company decision on migration to Cloud-Based. A comparison on both type of ERP system is established in the end of this section as well.

Chapter 3 discuss about the research methodology of this research with introduces the research methods, methodological strategy, method obtaining data resulted from experiments and tools for conducting the research.

Chapter 4 present the empirical findings on the data resulted from research conducted through qualitative method- interview. The data is used to analyze and justify against the factors that been found in literature review and presented in to several aspects.

Chapter 5 discuss about the suggested migration framework of the On-premise to Cloud-based ERP. Each stage of the framework has included with the step by step user guideline on process execution.

Chapter 6 shows the validation of the framework where the validation process involved using another company to simulate the migration based on the framework constructed in earlier chapter.

Chapter 7 presents the conclusion of overall study and the answers to the research question (RO). This chapter concluded the reflections on the results of this research.

## **Chapter 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

In this chapter, a series of comprehensive literature review which covered on several area for this research. First, this section describe the fundamental concept of ERP and Cloud-Based ERP. This section then proceed with the presentation of the factors associated with the company decision on migration from On-premised to Cloud-based ERP.

A series of literature review covered as the following area:

- Introduction of ERP
- General model of ERP
- Introduction of cloud computing
- General model of cloud computing
- Overview of different platform of ERP brand available in the market
- Overview architecture of both Microsoft Dynamic AX 2012 and Dynamic 365
- Overview the functionality of both Microsoft Dynamic AX 2012 and Dynamic 365
- Factors that classify as benefit of implement Cloud based ERP
- Factors that classify as issues of implement Cloud based ERP
- Summary Table of comparison between Cloud-based ERP and Traditional On-premise ERP
- Visualize bar chart of comparison between Cloud-based ERP and Traditional On-premise ERP

#### **2.2 Understanding of ERP system in current business world**

Information helps a company to better understand their existing operations process. Business process management and decision making are solely depends on

information. The accuracy and the way of information flow leads great influence to company management. Information helps a company to better understand their existing operations process and any incorrect decision making could result in a loss of profit to a company. Hence, the ability to utilize right information at the right time using the right platform can benefit a company's overall process.

Often, silo information or isolated information exists in the multiple systems cross different departments within the company serving same personnel for all business processes. One of the most significant and common example is separation warehousing's inventory barcode system with company's financial system. As a result, finance department is unable to retrieve and access monthly financial reports (e.g. monthly stock report, sales report etc.) from inventory system to complete routine monthly balance sheet report. The fact of un-integrated system amongst organization's business units has made emails platform a common practice of business information to request, update, and share within the organization. Thus, data inconsistency occurs and outdated information resultant in data inaccuracy further complicates a company decision making. Enterprise Resource Planning (ERP) allows information flow within the organization and make information to be transparent and accurate.

ERP system aims to integrate all business processes and functionalities within the organization into a centralize database. As a result, efficiency occurred by eliminating information search and information duplication in different systems. Likewise, integrated ERP system improves data accuracy and consistency between departments. Furthermore, real time information sharing via cloud-based ERP computing enable better decision making in different geographical locations.

### **2.2.1 Current Integration Issue and Benefit of ERP Adoption**

In view of current trend of un-integrated systems amongst Malaysian SMEs/SMIs, integration practices of business processes amongst various systems within the organization could be seen as challenges for top management. One of the most challenging integration issues would be different programming language-based adopted for business application. The situation worsens if all existing systems are

supplied by different vendors, which implied the organization requires spending more time and cost incurred upon customizing the integration between various systems sharing a repository.

Based on a study done by Shang & Seddon (2000), the study have identified various area is benefited from realization of ERP in:

Table 1. Proposed ERP benefits framework

<b>Dimensions</b>	<b>Sub dimensions (21 in total at this stage)</b>
<b>1.Operational</b>	1.1 Cost reduction, 1.2 Cycle time reduction, 1.3 Productivity improvement, 1.4 Quality improvement, 1.5 Customer services improvement
<b>2.Managerial</b>	2.1 Better resource management, 2.2 Improved decision making and planning 2.3 Performance improvement
<b>3.Strategic</b>	3.1 Support business growth 3.2 Support business alliance 3.3 Build business innovations 3.4 Build cost leadership 3.5 Generate product differentiation (including customization) 3.6 Build external linkages (customers and suppliers)
<b>4.IT Infra-structure</b>	4.1 build business flexibility for current and future changes 4.2 IT costs reduction 4.3 Increased IT infrastructure capability
<b>5.Organizational</b>	5.1 Support organizational changes 5.2 Facilitate Business learning 5.3 Empowerment 5.4 Built common visions

Figure 2.1: Proposed ERP benefits framework

Adapted from “A comprehensive framework for classifying the benefits of ERP systems”, by Shang, S., & Seddon, P. B. , 2000, AMCIS 2000 proceedings, 39.

These are Operational, Managerial, Strategic, IT infrastructure and Organizational. In terms of “Operation”, implementation of ERP system led to automation in business processes and result in cycle time reduction, productivity improvement, quality improvement and etc.

While in the aspect of “Managerial”, a centralized database for ERP system extended data analysis capability for better resource management, improved decision making, planning as well as performance.



Better managerial management led to better establishment in business strategy such as support business growth, business alliance and build business innovations.

In addition, integration of respective company's IT infrastructure as a whole enforce a standard operation procedure crossed business units which further add value to business flexibility in adoption changed (i.e. current and future) and reduce IT costs.

Lastly, the author mentioned that having ERP system in organization bring the benefit to an organization as a whole as its integrated and flexibility of the system that facilitating organizational change, business learning, empowering users and built common vision.

### **2.2.2 Limitation of On-premise ERP system**

Despite the benefit of ERP that brings to organization, yet there is still several issue impose in traditional on premise ERP. Especially during implementation, some issue might contribute great influence to the success of system applied in the company business process. Cost has the greatest influence to failure rate of on-premise ERP implementation (Elragal & El Kommos, 2012; Jlelaty & Monzer, 2012; Kiadehi & Mohammadi, 2012; Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2010; Peng & Gala, 2014; Saeed, Juell-Skielse, & Uppström<sup>1</sup>, 2011; Seethamraju, 2015).

Implementation is critical stage where it determine whether the system is applied successful in one company. While time and cost is the crucial factors contributed to the successful implementation ERP. Most organizations are not likely to let the project ERP implementation goes delay in schedule and over their budget. It will viewed as cost burden over any benefits that ERP brings to the organization.

Due to this factor, there is a rising trend of ERP vendors sourcing for alternative cloud-based computing as a mean for long-term survival. The migration to cloud-based ERP has been proven by many researchers (Jlelaty & Monzer, 2012; Kiadehi & Mohammadi, 2012; Kim, Kim, Lee, & Lee, 2009; Klaus, Rosemann, & Gable, 2000; Kumar & Garg, 2012; Peng & Gala, 2014; Rashid, Hossain, & Patrick, 2002; Saeed, Juell-Skielse, & Uppström, 2012; Salleh et al., 2012; Seethamraju, 2015; Wind,

Repschlaeger, & Zarnekow, 2012) that it overcome the most issues faced by the on-premise ERP such as improve mobility, increase scalability, high reliability and so on

### 2.3 What is ERP?

Enterprise Resource Planning system (ERP) is well known for system integration where it combines all business core processes and data into a single repository.

In other words, ERP is a packaged software solutions which provide total and complete solution by integrating all business processes within the organization and allows information flow crossed departments (Davenport, 1998; Klaus et al., 2000; Rashid et al., 2002).

#### 2.3.1 General Model of ERP

Below is the overall diagram that shows ERP integrate all module or department information into one central database:

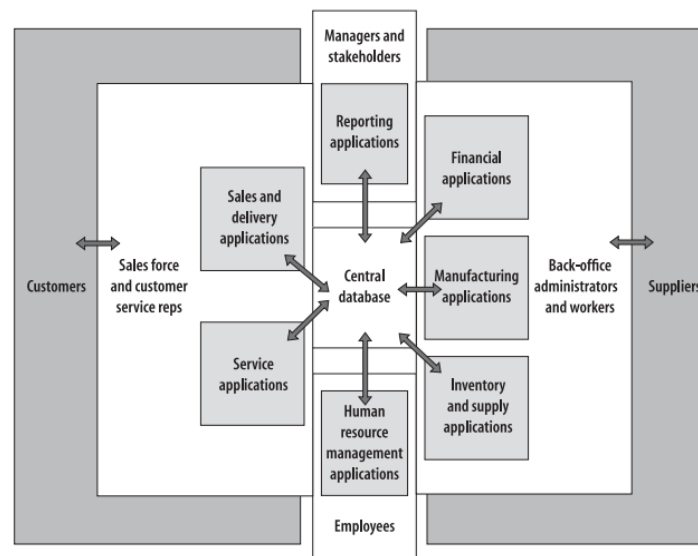


Figure 2.2: General ERP Model

Adapted from “Putting the Enterprise into the Enterprise System”, by Davenport, Thomas, 1998, Harvard Business Review.

Based on the diagram above, ERP helps company by combining or integrate all core business function into one central database and data usage are cross-intersect to each other module. An example, businesses take inputs (resources) in the form of material, people, and equipment, and transform these inputs into goods and services for customers (Monk & Wagner, 2013).

ERP system enables data sharing and data flow in real time, allowing organization enhances management activities as a whole; making organization more adaptable whenever changes is required (Monk & Wagner, 2013). For instance, with centralize database cross business units, top management is capable of identifying specific product(s) performance from periodic sales report prior planning and re-constructing strategic planning for next financial year.

## 2.4 Cloud Based ERP

Why Cloud Based ERP? Cloud computing has become a significant technology trend which enable users to access anywhere using not only personal computer devices but also any mobile devices. Cloud-based systems has become more popular due to its flexibility in infrastructure architecture expansion as its capability in reshaping IT processes and IT marketplaces (Furht, 2010; Navaneethakrishnan, 2013).

### 2.4.1 General Model of Cloud Computing

Below is the diagram explained the overall cloud computing architecture and how user is accessing to cloud:

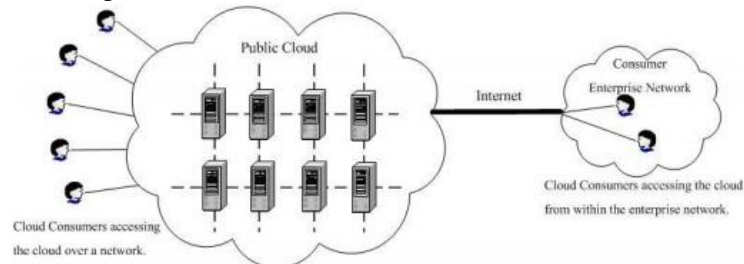


Figure 2.3: General Model of Cloud Computing Architecture

Adapted from “NIST cloud computing reference architecture”, by Liu, F., Tong, J., Mao, J., Bohn, R., Messina, J., Badger, L., & Leaf, D., 2011. NIST special publication, 500, 292.

While there are many academic article suggest different definition, one of common definition proposed by NIST is used widely in Cloud community and it defined that cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction (Mell & Grance, 2011). The main idea behind cloud computing is to allows user to access the application through network. User basically don't not have to own hardware or software, for which these are provided by Cloud Provider.

Generally, there are 3 type of service that provided by Cloud Providers:

#### Software as a Service (SaaS)

The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure (Mell & Grance, 2011). Cloud consumers do not have control over the Cloud infrastructure that often employs a multi-tenancy system architecture, namely, different cloud consumers' applications are organized in a single logical environment on the SaaS cloud to achieve economies of scale and optimization in terms of speed, security, availability, disaster recovery, and maintenance (Dillon et al., 2010).

#### Platform as a Service (PaaS)

The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider (Mell & Grance, 2011). It offers a programmable environment and middleware to support IT application development and deployment in user companies (Dutta, Peng, & Choudhary, 2013).

## Infrastructure as a Service (IaaS)

The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications (Mell & Grance, 2011). Cloud consumers directly use IT infrastructures (processing, storage, networks, and other fundamental computing resources) provided in the IaaS cloud (Dillon et al., 2010).

### **2.4.2 How does it related to ERP?**

The combination of ERP and cloud computing implementation indeed will overcome the implementation cost issue for any organizations' IT framework and infrastructure such as elimination and reduction in the usage of software, hardware, storage, network etc. (Navaneethakrishnan, 2013).

Therefore, cloud-based ERP introduces low upfront setup cost (especially on server) where hosting burden of server will be carried by the cloud providers (Peng & Gala, 2014; Saeed et al., 2012). This result in overall advantages of cost savings, high availability, and easy scalability (Furht, 2010).

## **2.5 Different Type of ERP Platform in Current Market**

There are several famous ERP company that is consider as huge competitor in the ERP industry. The top three ERP companies that are gaining significant market share and competitive advantage in the ERP industry are SAP, Oracle, and Microsoft Dynamic.

### **2.5.1 SAP**

SAP is one of the most famous ERP system in the market which still consider as the market leader in the ERP industry solution. According to Paranoma report 2016, SAP have cover approximately of 26 percent on whole ERP industry which is the highest percentage as compared to Oracle and Microsoft Dynamic.

### **2.5.2 History of SAP**

According to SAP (2006), SAP stand for System Analysis and Program Development, founded in 1972 by 5 former Germany IBM employees which is Wellenreuther, Hopp, Hector, Plattner and Tschira. First product called SAP R/1 was developed in 1973 that is solely for financial accounting system and eventually add several function for handling purchasing, inventory, and invoice verification.

Significant functionality improvement on the system were showed in the product of SAP R/2 and SAP R/3, the product evolve from enable support in mainframe that integrate all business functions and process in real time (SAP R/2) to client server version that the is the form of standard application software enable run in desktop (SAP R/3).

Currently, the latest software that used by many company is called SAP HANA and SAP S/4 HANA. SAP HANA enable the in-memory platform for increase the speed of data analytics in seconds as compared to old version that would require longer time and while the SAP S/4 HANA is cloud based ERP introduced in 2015. Before the SAP S/4 HANA was introduced, the company able getting into cloud computing development through acquisition on the company called SuccessFactor which is fall on the year of 2012. SAP acquired SuccessFactors in 2012, its CEO Lars Dalgaard was appointed to be head of all SAP's cloud properties (Kepes, 2014). With cloud computing technology, SAP S/4 HANA is the new way of using ERP. The system help customers to connect the core of their business through cloud or networking as well as to gain operation efficiency in the same.

### **2.5.3 Oracle**

Oracle is known for its database management and yet their ERP system is consider as a strong player in ERP industry (Oracle, 2016). Oracle ERP is a direct competitor to SAP and Microsoft Dynamic. It has covered an approximately of 16 percent on whole ERP industry (Panorama, 2016) and is second highest in the ERP market ranking.

#### **2.5.4 History of Oracle**

According to Oracle established in 1977 and founded by Ellison, Miner and Oates (Oracle, 2016). The main system they focus at that time is database system which until now they are major database provider in the database industry. Oracle has released the first Oracle ERP called Oracle E-Business Suite in the year of 2000. Oracle E-Business Suite is comprised of over ten product lines, each of them with several modules that are licensed separately (Panorama, 2016).

Over the years, Oracle has expanded its market and gain improvement in its current ERP system through acquisitions. The several acquisition on the major companies are PeopleSoft, JD Edwards, and Siebel. One of the example of ERP improvement through acquisition is that JD Edwards Enterprise One focus on manufacturing industry and is in form of open platform that has now integrate with Oracle E-Business Suite as well as support middleware such as Oracle database (Panorama, 2016).

Furthermore, PeopleSoft specialization in Human Resource Management and Financial Services Module which Oracle making it under Oracle's product line particularly in under Financial and Human Resource Management Module. Taking its best of each system advantage, acquired system such as PeopleSoft Enterprise, JD Edwards, and Siebel CRM has now become one of Oracle ERP product line for serving more variety as well as cover more market share in ERP industry.

#### **2.5.6 Microsoft Dynamic**

Microsoft Dynamic is ERP system and one of product under Microsoft Corporation. Microsoft Dynamic holds approximately of 9 percentage of total market share in ERP industry (Panorama, 2016).

#### **2.5.7 History of Microsoft Dynamic**

Microsoft venture into industry of ERP through several acquisition that is same as of what Oracle do. The history of Microsoft Dynamic can started from the year of 2000. According to (Microsoft, 2000), Microsoft acquired Great Plains in 2000 and

reason of acquire is that Great Plains is a leading mid-market business application software particular served the small and medium companies that this will boost the Microsoft's entry into the business applications market. The product has now named as Microsoft Dynamic GP which still served to current SME Company that needs a simplicity business solution system.

In 2002, Microsoft continue to acquire more company and the acquired company is Navision. Navision is known for integrated software solutions provider served for small and medium companies. The acquisition will bring together the complementary geographic and product strengths of Navision with Microsoft Great Plains Business Solutions, enhancing Microsoft's ability to deliver interconnected .NET business solutions for small and midmarket businesses (Microsoft, 2002). It is now known as Microsoft Dynamic NAV and still served SME companies that required more on customization according to their business process.

One of the main product under Microsoft Dynamic is Microsoft Dynamic AX which formerly known as Axapta. In 2002, Microsoft second time acquire another company called Damgaard which their product is Axapta and Microsoft rebranded Axapta to Dynamics AX prior release the version 4.0 in June 2006 (Luszczak, 2013). While Microsoft Dynamic NAV and GP is targeting on small and medium companies, the Microsoft Dynamic AX is targeted to mid-size to large size companies.

Below is the summary table of 3 ERP platform history:

Platform	Year	Version & Functionality
SAP (Kepes, 2014; SAP, 2016)	1972	Founded by 5 former Germany IBM employees which is Wellenreuther, Hopp, Hector, Plattner and Tschira.
	1973	SAP R/1. Financial accounting system and eventually add several function for handling purchasing, inventory, and invoice verification.
	1981	SAP R/2. Enable support in mainframe that integrate all business functions and process in real time
	1991	SAP R/3. Client server version that the is the form of standard application software enable run in desktop
	Current	SAP HANA and SAP S/4 HANA. SAP HANA enable the in-memory platform for increase the speed of data analytics in seconds as compared to old version that would require



		longer time and while the SAP S/4 HANA is cloud based ERP introduced in 2015.
<b>Oracle</b> (Oracle, 2016; Panorama Consulting Solutions, 2016)	1977	Founded by Ellison, Miner and Oates.
	2000	Oracle E-Business Suite. Financial software system.
	2005	Oracle E-Business Suite. Acquisition on JD Edwards that the Enterprise One focus on manufacturing industry is integrate with Oracle E-Business Suite.
	2005	Oracle E-Business Suite. Acquisition on PeopleSoft specialization in Human Resource Management and Financial Services Module is integrate with Oracle E-Business Suite.
	Current	Oracle E-Business Suite. Consist of SCM, HRM, CRM and so on. Comprised over ten product lines, each of them with several modules that are licensed separately
<b>Microsoft</b> (Luszczak, 2013; Microsoft, 2000, 2002)	2000- Current	First ERP system- Microsoft Dynamic GP. Acquisition on Great Plains that is leading mid-market business application software. Served to current SME Company that needs a simplicity business solution system
	2002- Current	Microsoft Dynamic NAV. Acquisition on Navision that specialize on integrated software provider served for SME. Served SME companies that required more on customization according to their business process.
	2002	Microsoft Dynamic AX. Acquisition on Damgaard which their product called Axapta. Targeted to mid-size to large size companies.
	Current	Microsoft Dynamic 365. Cloud based ERP evolved from Dynamic AX, provides more functionality and flexibility that allows company to purchase certain module instead of purchase whole package of software.

### 2.5.8 Statistic of SAP, Oracle and Microsoft Dynamic

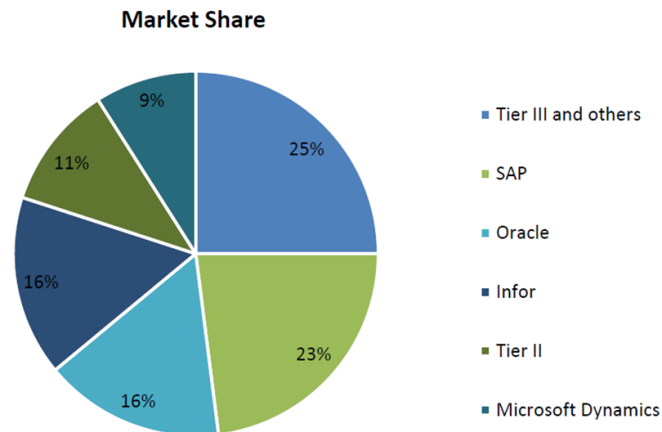


Figure 2.4: Market share of all ERP platform

Adapted from “Clash of The Titans 2016- An Independent Comparison of SAP, Oracle, Microsoft Dynamic and Infor”, Microsoft, 2016. *Link: <http://panorama-consulting.com/resource-center/clash-of-the-titans-2016-sap-vs-oracle-vs-microsoft-dynamics/>*

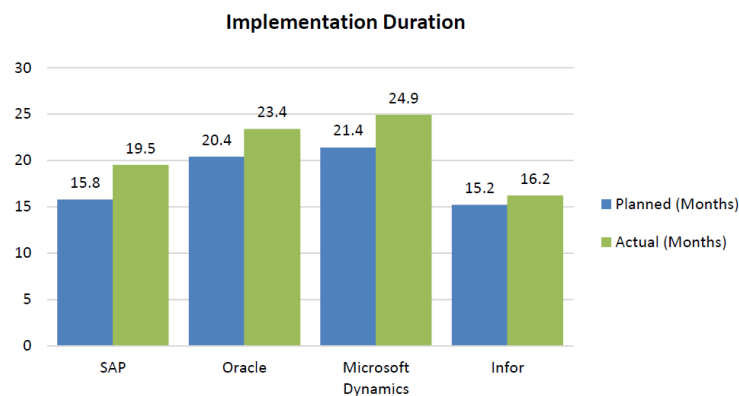


Figure 2.5: Implementation Duration of all ERP platform

Adapted from “Clash of The Titans 2016- An Independent Comparison of SAP, Oracle, Microsoft Dynamic and Infor”, Microsoft, 2016. *Link: <http://panorama-consulting.com/resource-center/clash-of-the-titans-2016-sap-vs-oracle-vs-microsoft-dynamics/>*

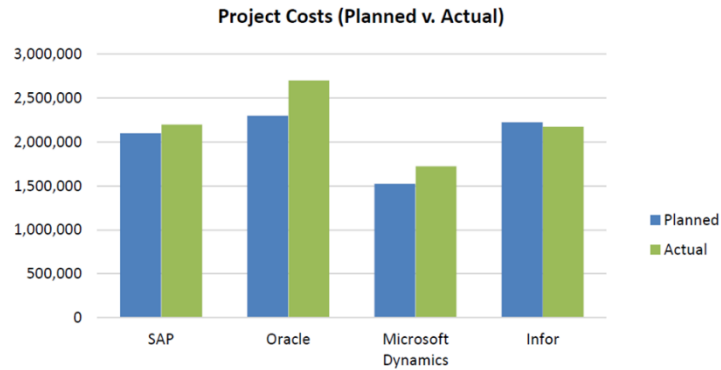


Figure 2.6: Project costs of planned vs actual in all ERP platform

Adapted from: “Clash of The Titans 2016- An Independent Comparison of SAP, Oracle, Microsoft Dynamic and Infor”, Microsoft, 2016. *Link: <http://panorama-consulting.com/resource-center/clash-of-the-titans-2016-sap-vs-oracle-vs-microsoft-dynamics/>*

### 2.5.9 Why Microsoft Dynamic?

Based on the above given, as compared to Microsoft Dynamic has lesser market share percentage as compared to SAP and Oracle. Moreover, Microsoft Dynamic even though takes the longest implementation time as compared to others and yet, Microsoft Dynamic have a lowest cost amongst all ERP brand.

Microsoft Dynamics will continue to expand its appeal among organization looking for a less complex solution than SAP and another advantage of simplicity look and feel of Microsoft’s Windows which is often a criterion purchasing key for smaller organizations that have yet to adopt larger and more complex ERP systems (Kimberling, 2014).

## 2.6 Introduction of Microsoft Dynamic AX

Dynamic AX 2012 is the on premise type of Enterprise Resource Planning solutions under Microsoft Company. Essentially, Microsoft Dynamics AX 2012 is the ERP solution for enterprise as it provides the comprehensive, core functionality (financials, human resources, and operations management) for run efficiently, make smart business decisions, and engage customers on a global scale (Microsoft, 2016b).

In addition, Microsoft Dynamics AX 2012 was designed for mid-sized companies to large companies particular in multi-national companies. Microsoft Dynamics AX is a business management solution system, with user friendly and yet ability to supports the complex business process especially in multinational companies (Luszczak, 2013).

### 2.6.1 Overview of Microsoft Dynamic AX Functionality

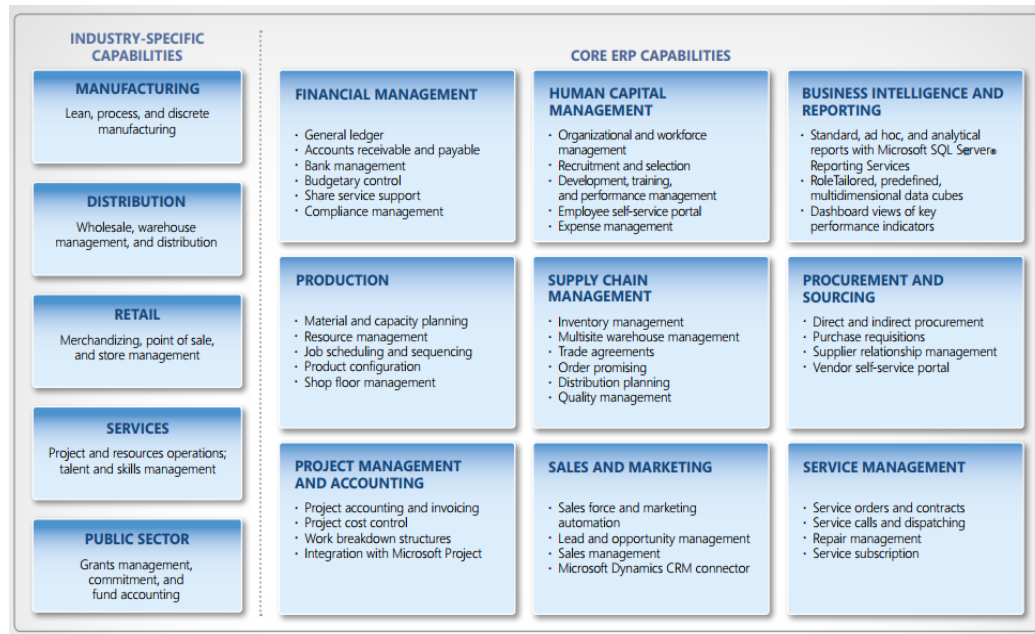


Figure 2.7: Overview Microsoft Dynamic AX functionality

Adapted from: “Microsoft Dynamics AX 2012 brochure”, Microsoft, 2016. *Link:*  
[http://www.lacviet.vn/Documents/Microsoft\\_Dynamics\\_AX\\_2012\\_brochure.pdf](http://www.lacviet.vn/Documents/Microsoft_Dynamics_AX_2012_brochure.pdf)

### 2.6.2 Overall View Architecture of Microsoft Dynamic AX

Microsoft Dynamics AX 2012 applied a 3 tier architecture to support multi complex business structure such as multinational companies. In order to support large implementation with a high number of users, Dynamics AX consequently applies a three-tier architecture (Luszczak, 2013). 3-tier client-server architectures have 3 essential components which is A Client PC, an Application Server and A Database Server (Kambalyal, 2012).

Below is the figure that shows the 3 tier architecture in Dynamics AX:

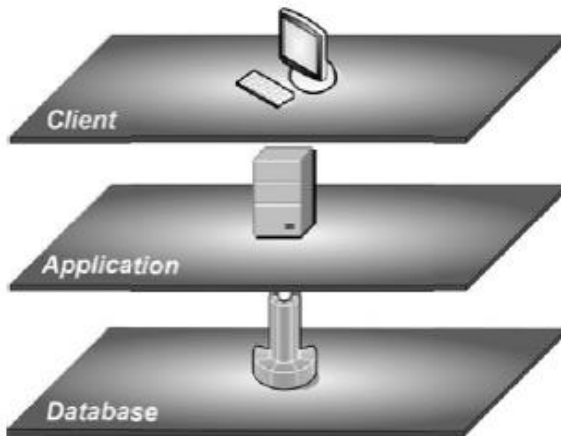


Figure 2.8: 3 tier Dynamic AX's architecture

Adapted from: "Using Microsoft Dynamics AX 2012", by Luszczak, A., 2013,  
Austria: Springer Vieweg.

According to (Luszczak, 2013), data managed in Dynamics AX 2012 are stored in a relational Microsoft SQL Server database. While the application tier contains the business logic of Dynamics AX, executing the code designed in the development environment and it may run on a single Application Object Server (AOS) or on a server cluster. The final tier is the client tier contains the graphical user interface, which is required for processing data input and output.

### 2.6.3 Detailed Architecture of Microsoft Dynamic AX 2012

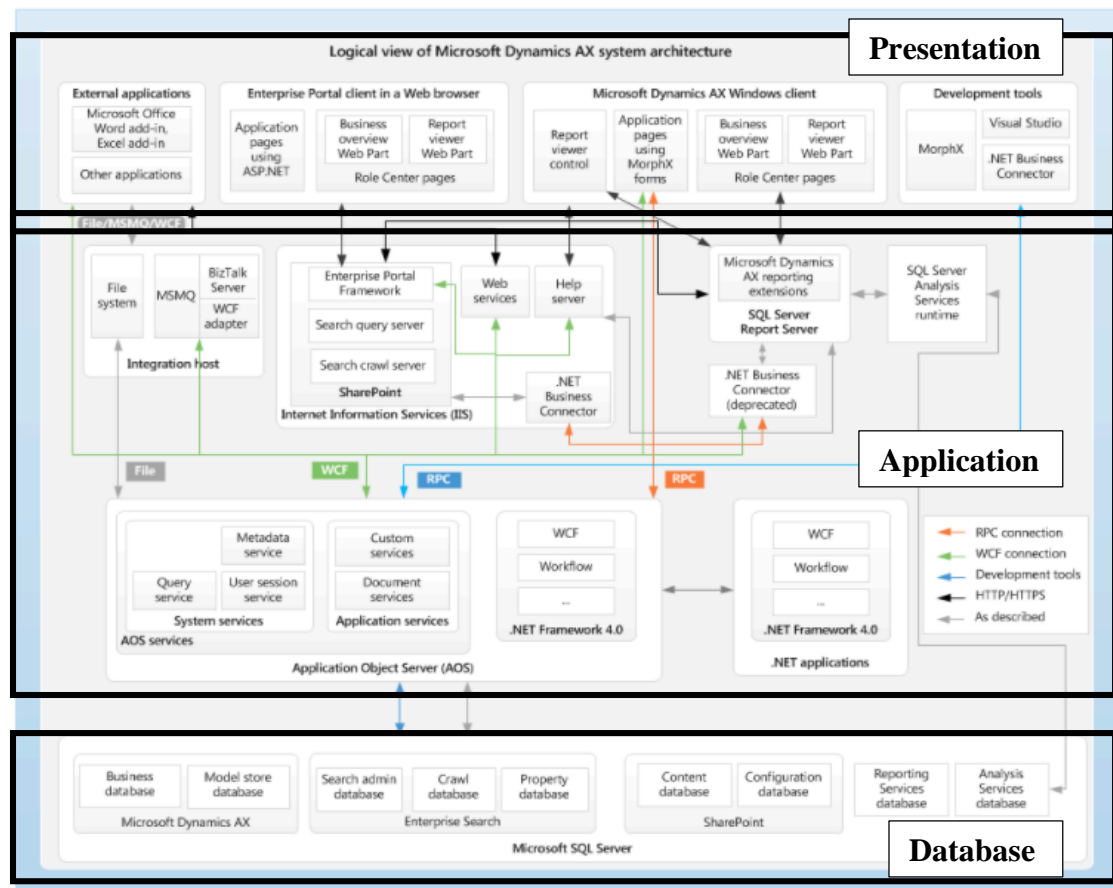


Figure 2.9: Microsoft Dynamic AX 2012 Detailed Architecture

Adapted from "System architecture [AX 2012]", Microsoft, 2016. *Link:*

<https://technet.microsoft.com/en-us/library/dd362112.aspx>

#### Presentation Layer/ Client Tier

The layer that consist of client front end interface such as Microsoft Dynamics AX Windows client, Enterprise Portal client in a Web browser (for only generating reports), Development tools (for developer to develop small function in Dynamic AX) and External applications (application such as excel add-in function is added in Dynamic AX for reporting purpose).

### **Application Layer/ Application Tier**

Application level consist of several component, the most important component are AOS known as Application Object Server which serves the system core services such as user session service, query service and metadata service. Any new deployment for new component to be added in the system that requires any restart to the system, the AOS would represent the final step to restart. Besides, SQL Server Report Server are also consider the important component in application level, this serves as the data extraction and conversion into report form for user to create and view.

### **Database Layer/ Data Tier**

Raw data were store in database layer particularly in Microsoft SQL server. There are several component found in Microsoft SQL Server, one of the most important component is Microsoft Dynamics AX which this component store all transaction data and information about customizations, layers and model data to all the Dynamics AX subsystems.

Other important component is Reporting Services database and Analysis Services database, this two are used in Reporting Services in applications level for query such as OLAP.

## **2.7 Introduction of Microsoft Dynamics 365**

Released in 1st November 2016 worldwide- Microsoft Dynamics 365 is a new combination of CRM and ERP solutions in a cloud service, which allows a more modular approach to purchasing and using business applications (Chorus, 2016). Microsoft Dynamics 365 unifies CRM and ERP capabilities into applications that work seamlessly together across sales, customer service, field service, operations, financials, marketing, and project service automation (Microsoft, 2017b). Dynamics 365 is the new version of Dynamics AX as the Dynamics AX brand has been officially retired by Microsoft, new customers will not be able to buy Dynamics AX 2012 R3 from 1st July 2017 onwards and mainstream support for the final version of Dynamics AX is set to continue until October 2021 (Barrett, 2017).

What is new in Dynamics 365? The main idea of Dynamics 365 is allows companies to start with capacity needed and add on when the business grows. Start with what you need, add applications as your business grows (Microsoft, 2017b). Originally, Microsoft Dynamic AX is focused towards only Multi Company that is in Manufacturing and Supply Chain industry.

As compared to Microsoft Dynamic AX, Microsoft Dynamic 365 not only restricted to Manufacturing and Supply Chain industry but is target to more industry. For example, Microsoft Dynamic 365 for customer services can apply on the company that provide customer service as their core business and Microsoft Dynamic 365 for Project Service Automation is suitable to company that have their business by projects. Dynamics 365 have several module that is separated from each other for allowing companies to choose and select right module for their business.

### 2.7.1 Overview of Microsoft Dynamic 365 Functionality



Figure 2.10: Overview of Microsoft Dynamic 365 Functionality

Adapted from “First Look: Microsoft Dynamics 365 Demo and Overview”, Microsoft, 2017. Link: <https://www.randgroup.com/insights/microsoft-dynamics-365-demo-overview/>



Based on the diagram, these seven modules give businesses the end to end range of apps and means that you don't need to go in and out of different applications (Chorus, 2016). Each of module served a particular business function (Molag, 2016; A. Taylor, 2017):

#### **2.7.1.1 Dynamics 365 for Sales**

Designed to help businesses nurture more sales-ready leads, close more deals faster, and make smarter decisions. There are several main function for sales representative to manage their data more efficiently.

- **Customer tracking**

Sales representative have a record storage for managing their existing customer information and leads information or potential customer information in other words. This function also incorporate with Skype function so that the sales representative can directly call the customer though Skype function within Microsoft Dynamic 365 environment.

- **Sales process management**

This process is to guide sales representative through stage by stage in creating a potential customer records, create sales proposal (this stage sales representative able to invite other sales team member for developing the sales proposal), create sales quotation and closing the deals by create a sales order or sales invoices.

- **Reporting tool**

Microsoft Dynamic 365 provides a business intelligence for visualize the sales data into more meaningful and sales representative can personalize on what type of sales records being show in the dashboard. Microsoft Dynamic 365 also enable user to run a report related to sales data and export into excel for user to do data sorting and so on.

### **2.7.1.2 Dynamics 365 for Customer Service**

Designed to support company's customer by deliver the personalized, consistent customer services across their choice of device and channel-including social media. The core function for customer services module is the Cases function.

- **Cases function**

The Cases that similar to ticket support system for allows customer service representative to have more systematic way to prioritize on the issue need to solve, track how much issue required to solve given a period of time, track where the issues originated (eg. Phone call, website or facebook), whether the customer have other cases, what the customer entitled to what level of membership.

Furthermore, when a case is resolved, the customer service representative able to find similar cases and transfer the solution to particular member for reference. Manager also able to manage the cases by create a list of pending cases and assign team member to work with it as well as control the amount of time to solve a case by setting the Timer Control for remind the team member how much time needed to solve a particular case.

### **2.7.1.3 Dynamics 365 for Finance and Operations**

Combination of financial management, manufacturing and supply chain functions. Basic function and yet core function on most business needed. The module is normally for those business that is in manufacture and supply chain. Below is the several main function provided by Microsoft Dynamics 365 for Finance and Operation:

- **Finance Module**

Similar to Microsoft Dynamic AX, it provides similar function that included Account payable, Account receivable, Budgeting, Cash and bank management, Cost accounting, Fixed assets, General ledger and so on.

- **Operation Module/ Supply chain management**

The provided functions and sub modules are similar to Microsoft Dynamic AX, the function included Cost management, Inventory management, Logistic management, Production planning, Product information management as well as Production control.

- **Procurement and Sales Module**

In the Dynamics 365 for finance and operation, it included procurement and sales module. The module also similar to Microsoft Dynamic AX for their provided function and this two module served main purpose of creating purchase order and create sales order which more in order management. The module are linked to finance module as when a purchase invoice or sales invoice is fulfilled as well as the module is linked to supply chain module as when a purchase order or sales order is fulfilled it will directly affect the level of inventory quantity.

#### **2.7.1.4 Dynamics 365 for Field Service**

A tools helps companies to optimize the operations of support technicians that visit on-site for customer support. There are several function that Microsoft Dynamics 365 provides:

- **Schedule Board**

An interactive schedule management for the manager to track the task by hours, week, days or months and assign the technicians to different task by simple drag and drop into the time table. The schedule board included a map for manager to assign new task to technician that located nearest to customer place which allows management the technician more efficiently through real time viewing on all field technicians and task.

- **Semi-automated scheduling**

Allows the manager to create a new work task in the system by adding the qualification required, duration, location and so on. The function will automatically base on the criterial added by the manager and match against the technician information database for allows manager to select a suitable technician to new task.

- **Mobile application**

The application are installed in the mobile device that carried by the technician, so that they able to track what task is assigned to them, update on what parts have been used on the task and update the status when they start work or once they have done the service. Furthermore, the technician also able to track inventory status through inventory dash board of how many parts they have used on particular work task and what parts need to stock replenish.

#### **2.7.1.5 Dynamic 365 for Project Service Automation**

Specifically for companies to manage their internal project. Optimize resource assignment with matching task and projects to employees based on skills and availability. There are several main function that enable project manager to have better management in their project:

- **Project Finance Planning**

Project manager can enter estimation of project budget included cost and expenses such as labor and material pricing or quote an amount of project price.

- **Resource Management**

Microsoft Dynamic 365 allows project manager to search through employee database and assign the right member into the project. Besides, the system will help to sort the list of employee based on the skill specification entered by project manager. The system also provides a resource utilization table to help project manager to allocate and maximize the resource such as assign the current team member to new task after a task or project is completed.

- **Project Schedule Grant Chart**

An interactive grant chart enable project manager to view the individual project activity and timeline in one glance as well as enable project manager to manage allocate the task and resource to more efficiently through drag and drop the activity in the chart.

- **Mobile application**

Enable project team member able to view a list of project opportunity based on their own skill and knowledge. Apart from that, team member also uses the mobile application for their project schedule through a calendar function and the function allows team member to update the project progress such as time and expenses.

- **Project Progress Dash Board**

The dash board will calculate and re-estimate time completion based on the data that team member update which gives a quick understanding by project manager on evaluate the current project performance.

#### **2.7.1.6 Dynamics 365 for Marketing**

Combine with Adobe Marketing Cloud, Dynamic 365 delivery a web content development for companies requires required front end website specifically for marketing and customer visit. There are several main function that provides a useful tool to marketing user:

- **Email Marketing**

The tools helps organization to create email marketing template and sent out the email on regularly basis to all relevant customer. The email editor allows to user to drag and drop the content. Also, there are many existing template available in Microsoft Dynamic for user to modify and sent the email instantly.

- **Landing Pages**

Landing pages or front webpage that represent the company. Microsoft Dynamic 365 include a webpage developer section for allows marketing team member to create a landing page with simple drag and drop function as well as with additional of enquiry form for potential customer to submit their email for future news notification.

- **Event Management**

Microsoft Dynamic 365 provides business process for guiding the marketing team member on the essential step in planning the event. This included pass management

system that tracks attendance, venue management that tracks the rooms and room layouts, and sponsor management system that track sponsorships for each event.

Furthermore, the system also provides the event portal creation for marketing team member to create a webpage with information of their venue, date, speakers and so on. The event portal allows the self-service registration which allows the attendee to register through the webpage.

## 2.7.2 Overall View Architecture of Microsoft Dynamic 365

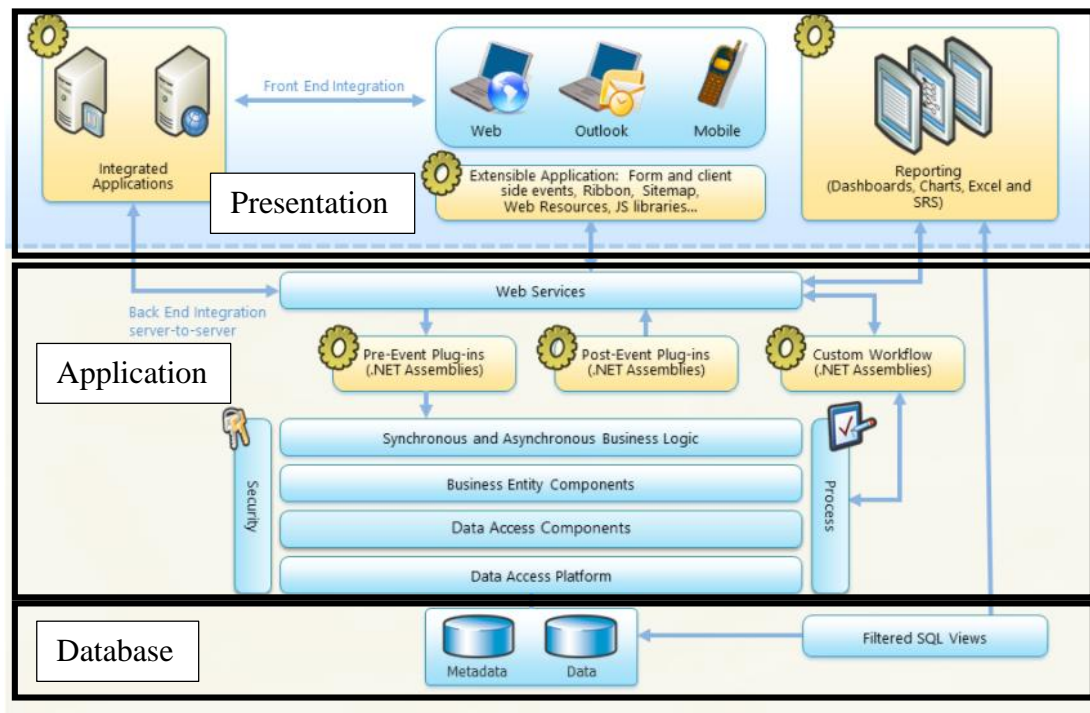


Figure 2.11: Microsoft Dynamic 365 Detailed Architecture

Adapted from: “Extend Microsoft Dynamics 365”, Microsoft, 2016. *Link:*

<https://msdn.microsoft.com/en-us/library/qq327974.aspx>

### Presentation Layer/ Client Tier

Similar to on premise architecture, the layer consist of client front end interface that allows user to access through web browser, mobile and outlook (Microsoft Dynamic 365 synchronize with outlook). Integrated applications or also known as external application such as business application can be integrated into Dynamic 365 that will connect through back end integration server to server.

### **Application Layer/ Application Tier**

The layer consist of several components that support the Microsoft Dynamics 365 process programming model include Web services, business logic and data access. Under web service, there 3 component that the data process go through it and these are Pre-event/ Post-event plugin and custom workflow. These 3 component are designed specifically for business process customization that change the logic of existing standard business process. Pre-event plugin are the code compiled in .Net that will injected into execution before the operation complete and while the post-event plugin function is opposite of pre-event plugin.

Business logic contains the implementation of business logic for Microsoft Dynamics 365 business entities (Microsoft, 2016a). The Business Entity Components part of the platform is responsible for creating domain-specific objects that these objects are created in response to instructions from the Application platform, ultimately from the Microsoft Dynamics standard UI or from customization code (Ibrahim, 2017). While Data Access Components and Data Access Platform are controlling access to the data layer.

### **Database Layer/ Data Tier**

Database layer consist two core component which is Metadata and Data. All the information necessary for Microsoft Dynamics 365 server to operate is stored in the Microsoft Dynamics 365 metadata and this includes information about entities (controls the grid and form layout, and how navigation options are presented), attributes, relationships, and option sets (Microsoft, 2016c). While Data component are storing all raw data such as daily business transaction created by the user.

## **2.8 Important Aspect That the Company Required To Aware During Decision of Opting For Cloud-Based ERP Advancement**

An extensive review of the different articles identified a number of issues and gaps in current ERP and Cloud ERP. Factors gathered based on numerous research articles listed as benefit as well as issues that company might face upon adopting for

cloud-based ERP. Nevertheless, these finalized factor were repeatedly discussed by different researchers in relevant study area particularly in cloud computing, Cloud-based ERP and ERP. Additionally, these factors are discussed and defended by various article such as conference paper and journal publication. Thus, below are the factors discussed in this research paper regarding in opting for cloud-based ERP:

## **2.8.1 Benefit**

### **2.8.1.1 Cost Aspect**

#### **2.8.1.1.1 Low Upfront Investment**

One of the benefit that Cloud-Based ERP can offer is low initial cost. One of the benefits that cloud-Based ERP can offer is low initial cost, due to little investment in hardware, software and technical knowledge. Whereas, traditional On-premise ERP systems require companies high upfront cost of investment in server (Saeed et al., 2011). To further extend, cloud providers have they dedicated IT expertise and server to offers various kind of service either in form of SaaS (Software as a Service), PaaS (Platform as a Service) or IaaS (infrastructure as a Service) depending on the customer of choice. This reduces implementation cost and time needed from external parties or resources.

Besides, cloud providers will host all necessary IT/ERP infrastructure facilities for user companies who does not currently have enough in-house IT personnel to handle the various ERP deployment tasks and additional resources needed to be spent on recruiting new IT experts and/or providing further training to current staff (Peng & Gala, 2014). Therefore, user companies may outsource necessary IT/ERP infrastructure facilities to cloud providers to reduce upfront investment by acquiring new IT expert personnel or training current IT staff to handle these tasks. In other words, cloud computing leads to reduced infrastructure costs as well as reduced upgrades (Marston et al., 2010).

#### **2.8.1.1.2 Low Maintenance Cost**

The significant of cost reduction in Cloud-Based ERP was its IT maintenance cost. IT maintenance cost referred to cost of post implementation (i.e. hardware and



software). The fact that maintenance, upgrades, security and data storage function of the system are managed by the vendor with no more cost than the specified fee for using the system (Alajbegovic, Alexopoulos, & Desalermos, 2013).

Furthermore, company employ Cloud-Based ERP able to reduce the cost of possessing IT personnel or IT expertise on IT infrastructure management. This is because Cloud ERPs offer access to state of the art infrastructure, IT expertise and mobility of service in a viable payment model for company especially SME which usually do not have the resources to absorb the cost for their deployment and maintenance in-house, as opposed to large companies (Johansson, Alajbegovic, Alexopoulos, & Desalermos, 2014). Viable payment model in terms of subscription fees including all related cost such as license and infrastructure maintenance service, which the service are covered and provided by cloud providers.

Guo stressed that the implement Cloud-Based ERP minimize the maintenance task of in-house IT staff, and in the same time, reducing potential cost of IT training and allow internal IT experts to concentrate on more strategically important tasks of the company.

Nevertheless, cost reduction in maintenance effort for cloud-based ERP can support decision for opting cloud-based ERP over traditional on-premise ERP. This brings sustainable IT expenses to the company in a long run. As compared to traditional or on-premise ERP, cloud-based ERP has enabled company with limited financial capability an opportunity to implement ERP system.

#### **2.8.1.2 Technology Aspect**

##### **2.8.1.2.1 Improve mobility**

Access it anywhere, stood the main highlight in Cloud-Based ERP. It allows business to be done anywhere where there is an internet connection, enabling the employees to access their files and application via the web and serve their customer on their filed (Peng & Gala, 2014). Cloud applications can be easily accessed anywhere through web browsers, by using not only PCs but also handheld mobile

devices (such as smart phones and tablet PCs), with no extra customization or hardware cost (Alajbegovic et al., 2013).

Such enhanced ERP mobility allows “business managers to check and update important data in cloud ERPs immediately after the data occurs regardless their locations, and thus ensuring high business efficiency and performance (Peng & Gala, 2014).

On top of that, generate real time reporting anywhere is enable upon using Cloud-based ERP for employees such as sales person who are always needed to present reports such as sales report to potential customer or investor through mobile devices. This could as well bring prime motive to company who decide opt for Cloud-based ERP adoption.

#### **2.8.1.2.2 Increase scalability**

Cloud ERP is scalable on-demand because virtual machine’s storage and compute cycles are shared by users, therefore, enterprises can increase and decrease the number of servers and users quickly (Saeed et al., 2012). Cloud providers can offer much powerful IT infrastructure to host ERP and its ever increasing data (Peng & Gala, 2014).

Cloud ERPs can help companies to deal with irregular demands without making heavy investments in hardware and license fees that would not always be fully used and stressed that this opportunity to respond to irregular demands is a major advantage of the cloud ERP delivery model (Alajbegovic et al., 2013). Irregular demands can be happen to companies that have seasonal business revenue model, companies such as Hershey Company are dealing with peak season of receiving heavy of incoming orders during Year end due to Christmas event.

Moreover, due to the architecture is the form of virtual machine, the database and processor are shared by multiple users, therefore, Cloud ERP vendors can easily increase or decrease the number of servers and users; Whereas, traditional ERP system requires months effort to increase scalability as enterprises need to buy new servers, software and licenses (Saeed et al., 2011). Given the scalability that Cloud-based ERP

offered, it appears to be more attractive and accommodating for the companies dealing with such irregular demands for future growth.

#### **2.8.1.2.3 System continuously enhancement**

Cloud providers enable periodic cloud-based ERP improvements incrementally and constantly by releasing regular system and service packs upgrade/update on designated ERP components (Elragal & El Kommos, 2012; Peng & Gala, 2014).

Cloud-based ERP providers make continuous investments on their infrastructure in order to ensure that their services exploit the best out of the current technology (Alajbegovic et al., 2013). Furthermore, vendors can upgrade systems economically because of the single source codes used in cloud ERP systems (Saeed et al., 2012). Having to said that, cloud providers able to update the system release to all users at one glance through running one time coding of update.

Guo stated that upgrading for on-premise ERP system can be difficult and complicated as the customization functions usually tied to existing platform where much expertise, technical knowledge and infrastructure is required to complete the re-configuration/customization. Hence, this is the main motivation factor encouraging company to opt for cloud-based ERP because of automatic/constant update/upgrade by cloud providers.

#### **2.8.1.2.4 Reliability**

Unpredictable downtime due to hardware issue, software bugs or hacking issue such as denial of attack, could resulting organization to bear huge amount to cost on it due to loss of data.

Nevertheless, Cloud Computing features identical facilities and mirrored transactions instantly. Interrupted services related to hardware and data issues virtually impossible; even if one of these facilities are down, the applications will run on the other site with minimal interruption [6, 7, 10]. With charging the cost of maintenance fees to clients, cloud ERP vendors afford back-up servers and have sufficient server's

volumes to ensure service excellence and product reliability by segregating the cost amongst clients (Saeed et al., 2012).

With on-premise ERP, company may able to recover back with using their existing server backup structure but business is unable to resume instantly. Alternatively, Cloud-based ERP able to provides faster recovery if there is any failure in server. It would consider a motive for the company to move to cloud-based structure as because of cloud provider's ability of providing the fast recovery facility.

## **2.8.2 Issues**

### **2.8.2.1 Security Aspect**

#### **2.8.2.1.1 Lack of control**

One of the biggest concern by client is the security aspect where one's data are placed under vendor supervision and access it over the internet. By placing the data on off-premise, it gave them a sense of "lack of control" over their data. Companies feel extremely insecure to store sensitive and yet confidential data especially the financial data on the cloud and allow cloud vendors to control and process them (Johansson et al., 2014).

This is because information from companies especially large scale companies has greater value and thus the risk involved is greater as well, the customers worry that their data might be stolen or shared with competitors especially financial data (Alajbegovic et al., 2013; Peng & Gala, 2014).

The issue of data protection, data leaking, data sharing and data hacking amongst competitors are the main challenges faced by cloud-based ERP (Peng & Gala, 2014).

As a result, Kumar & Garg (2012) suggest that it would be desirable to provide a closed box execution environment, where the integrity and confidentiality of the data could be verified by its owner. To further mention, larger companies do not like multi-tenancy but rather prefer to have a private cloud with their own dedicated servers,

databases and security or in other words, they want to have their data stored hosted on a private cloud by a vendor they have good relations with (Alajbegovic et al., 2013).

Despite the cloud providers offers high specification of data security and yet, this still gives companies felt insecure to let cloud providers process the data especially sensitivity data such as finance data. As compared to cloud-based ERP, companies such as large scale companies would rather to have on-premise/ traditional ERP serve in closed environment. Large companies most likely have the resources to implement and maintain themselves high security standards for their in-house ERPs, they prefer to opt for the on-premise model (Johansson et al., 2014).

#### **2.8.2.1.2 Privilege Abuse**

The constant threat from hackers or malicious insiders with privileged role (eg. system administrator) is inheriting any outsourced computation models but abused by insiders. This has great impact to the customer's brand, reputation and CRM (Elragal & El Kommos, 2012; Kumar & Garg, 2012). When ERP data are hosted by a third-party cloud providers, companies will have less control on whom (from the vendor side) may access and download their crucial enterprise and customer data. Such issue were more likely to occur with cloud vendors that are smaller in size, using inefficient data protection and monitoring practices, and having higher staff turnover might contribute huge disadvantage to client company (Peng & Gala, 2014).

Apart from that, having the data accessible to others on the web which makes companies to have raises the concern of whether cloud provider have clearly articular specific governance, operational and regulatory guidelines that follow to assure security of data (Parthasarathy, 2013). Compared to on-premise/ traditional EPR, such issue of privilege abuse would be much less obvious in controllable environment.

Therefore, a cloud ERP vendor has to be chosen in such a way that their service-level agreement (SLA) is reviewed so that a complete and standard set of policies has to be framed for users' management, authorization, and authentication and access control (Parthasarathy, 2013). Cloud customers should conduct a comprehensive assessment of access privileges (i.e. stating who will have access to

their data and what level of access they will have) as well as transparency measures (Kumar & Garg, 2012).

### **2.8.2.2 Technology Aspect**

#### **2.8.2.2.1 Limited Customization**

Cloud-Based ERP often offer various technologic benefit and yet, the weakness of Cloud structure is limited customization. It is considered that cloud ERP are standardized systems as everybody use the same software (Saeed et al., 2012). Cloud ERP installations are often fixed and cannot be modified to fully support the business model and activities of an individual company (Alajbegovic et al., 2013). All clients wants to mess-up with ERP systems that's the essence of ERP systems, that's why you host it, for which you can have mail in the cloud because it's just mail but if you want to run your MRP logic which is different for each and every company that's when it becomes difficult (Saeed et al., 2012).

In addition, limited customization ability of cloud ERP as well as confined integration ability with complex legacy systems, were identified as major concerns which are however particularly relevant to large organizations that are more likely to have such needs (Johansson et al., 2014). In reality, companies nature business process are vary from each other regardless they are from the same industry or different industry and yet, this could be draw back for the company that required to change the nature of their business process upon implement Cloud-based ERP.

However, some ERP vendors argued that the level of customization of cloud-based ERP should be viewed as case-to-case basis depending on the type of adopted ERP platform (Jlelaty & Monzer, 2012).

#### **2.8.2.2.2 Unpredictable Performance**

Cloud performance may imposes unpredictable as the users may be sharing computing and I/O resources at any given instance of physical processor (Kumar & Garg, 2012). It is also important to note the importance of internet bandwidth to support Cloud ES adoption and if the internet bandwidth is low or is technically departed, Cloud ES users will faced difficulty (Salleh et al., 2012). The Internet

connection is also very critical while using cloud ERP because it is a performance key of the cloud-based solutions and some users claim that cloud ERP is slower than in-house installations because the Internet gets down sometimes (Saeed et al., 2011).

Moreover, deficient performance of the cloud ERP due to potentially limited speed and reliability of the network as well as due to the extent of the technological proficiency of the software, was also identified as a major concern for companies which demand flawless performance for their “heavy” applications and systems for which since the performance typically decreases as the number of ERP user and the amount of data they transfer and over the internet increases, the concern of problematic performance seems to be more evident for large organizations (Alajbegovic et al., 2013; Jlelaty & Monzer, 2012; Johansson et al., 2014).

#### **2.8.2.2.3 Difficult Integration**

Integration between different systems is vital for company with different operating system across different departments. As such, cloud-based ERP has to be integrated with existing system which it is costly, complex and hard for SME to do (Shuchih Ernest, Kuo-Ming, & Yu-Ching, 2015).

In reality, different information system applications developed by different vendors are using different technologies and platforms (i.e. programming language). As a result, it may not be feasible for cloud vendors modifying ERP system to cope for individual needs (Peng & Gala, 2014). This make migration to cloud-based system an extremely time consuming, costly and risky tasks (Johansson et al., 2014).

Guo also stressed that client companies that have limited control in the cloud will not have sufficient freedom and right (as they do with on-premise ERPs) to customize a cloud ERP and integrate it with other applications. Thus, making companies such as large scale companies to more potential severely be threatened. However, cloud service providers argue that the integration challenges are totally dependent on cloud provider’s IT ability to solve integration issues (Saeed et al., 2012). For which, this will be articulate further in later on this research.

### **2.8.2.3 Vendor Aspect**

#### **2.8.2.3.1 Vendor Lock-In**

The quality of Cloud-Based ERP's service providers can be vary by different platform and different company. Changing to a new cloud ERP provider may not always be easy due to a number reasons (Peng & Gala, 2014):

1. Complication of cloud infrastructure, causes high cost and time-consuming to move ERP data from one cloud provider to another;
2. Certain legal restrictions made by current cloud providers may make it difficult for user companies to retrieve and reallocate their ERP data to a different cloud server either during or at the end of the existing service contract;
3. Changing an existing ERP package will also imply essential changes in many other operational, organizational and managerial aspects.

Likewise, these are the potential unfavorable reasons for any company or customer that is not satisfy with existing cloud providers and wish to opt for alternative cloud-based provider. Figure 2.12 summarizes the influential factors of company decision on the type of ERP with comparison between Cloud-Based ERP and Traditional On-Premise ERP:



## 2.9 Comparison Factors between Cloud-Based ERP and Traditional On-Premise ERP

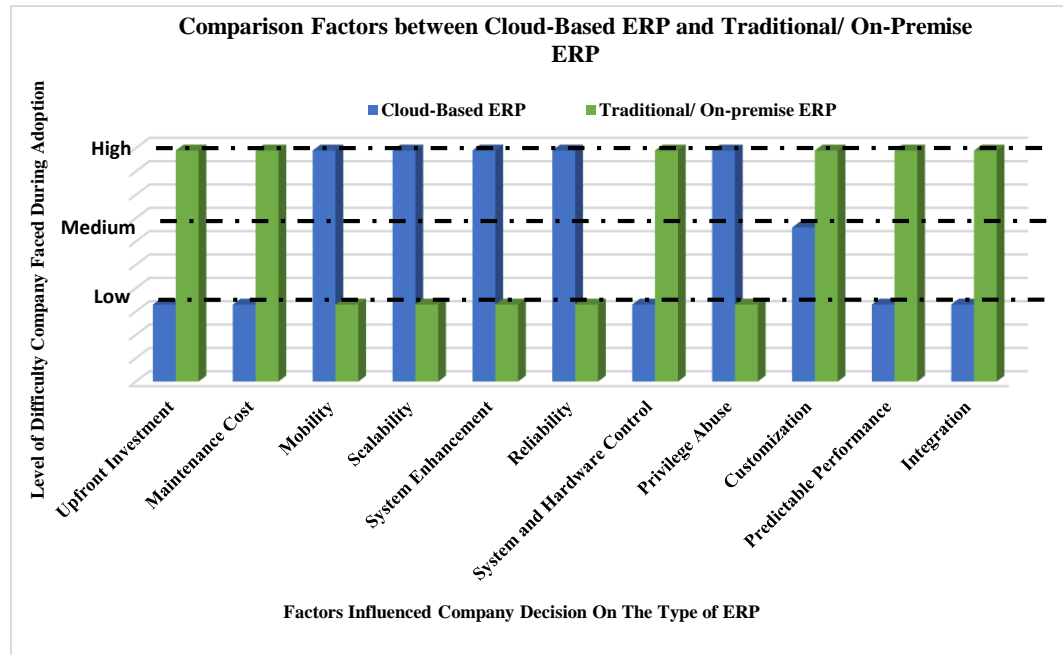


Figure 2.12: Bar Chart of Comparison Factors between Cloud-Based ERP and Traditional/ On-Premise ERP

**Table 2.1: Comparison between Cloud-based ERP and Traditional On-premise ERP**

Table below illustrates the comparison between cloud-based ERP and on-premise or traditional ERP, which contains the essential aspects that company required to ponder when making decision in adopting cloud-based ERP.

Criteria	Cloud-Based ERP	Traditional ERP
<b>Cost</b>		
<b>Upfront Investment</b> (Elragal & El Kommos, 2012; Jlelaty & Monzer, 2012; Kiadehi & Mohammadi, 2012; Marston et al., 2010; Peng & Gala, 2014; Saeed et al., 2011; Seethamraju, 2015)	Low upfront investment. Removed initial setup cost of hardware such as server.	High upfront investment. Company require large capital investment on server acquisition, employ staff, and so on.

<b>Maintenance Cost</b> (Alajbegovic et al., 2013; Elragal & El Kommos, 2012; Jlelaty & Monzer, 2012; Johansson et al., 2014; Kiadehi & Mohammadi, 2012; Peng & Gala, 2014)	Low. Reduce cost on managing the hardware and software such as backup, upgrades, IT training and so on.	High. Company require to do own maintenance and possible require to hire extra IT personnel to manage the hardware and software.
<b>Technology</b>		
<b>Version</b> (Barrett, 2017; Wu, 2016)	Microsoft Dynamic 365. Released globally in November 2016.	Microsoft Dynamic AX 2012 R3. Released in May 2012. Stop release license to new customer in July 2017, support will continue until October 2021.
<b>Mobility</b> (Alajbegovic et al., 2013; Peng & Gala, 2014)	High. Allows business to be done anywhere through handheld mobile devices.	Low. System access is restricted within company area.
<b>Scalability</b> (Alajbegovic et al., 2013; Elragal & El Kommos, 2012; Jlelaty & Monzer, 2012; Saeed et al., 2012)	Fast scalable on-demand.	Slow scalable. Required to investment, setup new server.
<b>Enhancement</b> (Elragal & El Kommos, 2012)	Upgrade is done easily from vendors.	Upgrade required re-configuration/customization.
<b>Reliability</b> (Jlelaty & Monzer, 2012; Kiadehi & Mohammadi, 2012; Kumar & Garg, 2012; Saeed et al., 2012)	High reliable. Downtime can recover faster with using mirror backup server.	Medium. Downtime can be recover depending on the company backup and server structure.
<b>Security</b>		
<b>System and Hardware control</b> (Alajbegovic et al., 2013; Johansson et al., 2014; Kiadehi & Mohammadi, 2012)	Less of control on the hardware and system.	Company have full control on the hardware and system.
<b>Privilege Abuse</b> (Kumar & Garg, 2012; Parthasarathy, 2013;	Expose to vulnerability due to company less control on server and vendor may access and	Less expose vulnerability as the company have full control on the security access.

Peng & Gala, 2014; Seethamraju, 2015)	download their crucial enterprise data.	
<b>Customization</b> (Alajbegovic et al., 2013; Johansson et al., 2014; Saeed et al., 2012)	Medium customization. Some ERP systems is standardize for every company to access and use the system.	Highly customization. Company can do customization according to their business operation structure.
<b>Predictable Performance</b> (Johansson et al., 2014; Kim et al., 2009; Kumar & Garg, 2012; Saeed et al., 2011; Salleh et al., 2012)	Unpredictable performance. Multiple user may be sharing same instance of server processor. Unpredictable internet bandwidth interruption caused by internet provider also affected the user.	Predictable performance. Company can monitor the server performance. User have stable access to the system as the company uses intranet or LAN.
<b>Integration</b> (Johansson et al., 2014; Kiadehi & Mohammadi, 2012; Peng & Gala, 2014; Saeed et al., 2012; Shuchih Ernest et al., 2015)	Difficult integrate. Not feasible for cloud as the system integration required to modify at cloud database level to communicate with local customer server.	Able to integrate. Company can modify the ERP database to communicate with other system's database.

## **Chapter 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The purpose of this chapter is to demonstrate the actions taken in order to achieve all relevant research objectives listed in chapter 1. Particularly, this chapter will present the research method applied in this research with included the research approach, the analysis method of the collected data as well as the ethical consideration during the conduction of this research.

#### **3.2 Research Approach**

Often, qualitative and quantitative methods is often stressed by many research methodology texts (B. Taylor, Sinha, & Ghoshal, 2011). Quantitative research is based on the measurement amount or quantity where the method applicable to the situation that expressed as quantity form; While the quantitative research is based on quality where the method applicable to the situation that concern with quality (Kothari, 2004).

Based on the nature of this research, a mixture of both quantitative and qualitative approach applied on this research, this enable to achieve more data collected for this research analysis. There are several research approach applied in this study and were listed as below:

#### **3.3 Documentary Source**

This research will first start with quantitative research, a preliminary of understands the factors that affect pre-implementation and during implementation through secondary sources from research journals and books. This is to allow the framework to be constructed with using the factors that have been tested before by the previous study.

#### **3.4 Interview**

A qualitative data collection will be used for data collection on both types of ERP structure through interview method of unstructured and open-ended interview question. This is for allows an interviewee to talk about what s/he wishes, not

necessarily what the interviewer wants to know (B. Taylor et al., 2011). Through this way, the researcher can provide focus by sharpening a question for further drill down on getting to more information. The data collected will be included in the framework as well, this will be the essential criterial of pre-implementation of ERP cloud-based system.

### **3.4.1 Interview Guide**

Interview should be conducted with the aim to provide information that is align with the research objectives (Kvale & Brinkmann, 2009). Therefore this suggests that the interview guide is design in the way of collect the necessary data in relevant topic or area whilst keeping a good interaction between the respondent and researcher.

The structure of the interview questions are designed with such as a way that ensuring the interview is leading the respondent to appropriate area or topic for discussion. There are several category has been defined during constructing the interview question for allowing the interview goes align with the research objective without straying away from the topic. The first section of the interview questionnaire will be the self-introduction of the interviewee background and working experience in relevant industry. Followed by the second section of interview questionnaire covered about the architecture comparison of Microsoft Dynamic AX and Dynamic 365. After that, the interview will go into main topic in this research which the third section of the interview questionnaire reveal the important aspect that the company required to aware during decision of opting for cloud-based advancement. Apart from that, the interview will continue discuss about the migration process from traditional On-premise to Cloud based ERP which this will be the fourth section of the interview questionnaire. Lastly the interview will end with a comment for Cloud ERP.

#### **3.4.1.1 Section 1- self introduction**

Basically, this section was to allow the interviewee to explain their working experience and background of current working company. In addition, a simple introduce on Microsoft platform is required from the interviewee in order to start the relevant topic in this interview. These questions aim to gain the understanding of the

interviewee, the company that they worked on, introduce Microsoft platform and current status of Microsoft Dynamic 365 in Malaysia. Below is the relevant question constructed for section 1:

1. Can you please introduce about the company that you are working. Which is the core business, the size and what kind of services do you offer?
2. What kind of ERP models do your company offer? (eg. On-premise, SaaS, IaaS, PaaS)
3. For Microsoft Dynamic, recently has just launched the cloud based version which Microsoft Dynamic 365. Can you briefly introduce Microsoft Dynamic 365?
4. Is it true that the Microsoft Dynamic AX is stop release out the license to new customer? Does your company still consult new customer for Microsoft Dynamic AX?
5. Is there any customer has approached your company about the new Microsoft Dynamic 365? If yes, what type of customer? (eg. SME or large company)
6. Have you deploy any Microsoft Dynamic 365 in any company in Malaysia?

#### **3.4.1.2 Section 2- The architecture comparison of Microsoft Dynamic AX and Dynamic 365**

In this section, the interview will go further on the both Microsoft platform's architecture- Dynamic AX and Dynamic 365. The main purpose of this section is to seek the understanding of the architecture in detailed (in terms of development environment, functionality, and database) by comparing both platform and to discover any new feature offered by Cloud based ERP- Dynamic 365. Below is the relevant question constructed for section 2:

7. Is there any difference in terms of functionality between Microsoft Dynamic AX and Dynamic 365?
8. How about on the development environment? Is there any difference between the two types of software?
9. The SQL database is used in Microsoft Dynamic AX. Does the Dynamic 365 use the same SQL or a new type of database typically for cloud-based?
10. For Dynamic 365, do you host the database itself or Microsoft will host the database?

#### **3.4.1.3 Section 3- Important aspect that the company required to aware during decision of opting for Cloud based advancement.**

The main topic of this research will fall on this section where the factors found using quantitative- Chapter 2 of Literature Review will verify with the interviewee's perception that is based on their experience and knowledge in the ERP field. The interview questionnaire will start asking questions specifically related to Cost Aspect, Technology Aspect, Security Aspect, and Vendor Aspect.

Below is the relevant question constructed for section 3:

11. Theoretically, the cloud based is offer much lower cost than on premise ERP? Does it true? Can you provide the reason and example? (Cost Aspect)
12. About the cost maintenance, does the cloud based user have to pay on the cost maintenance for cloud service provider? (Cost Aspect)
13. Based on the study, cloud based ERP is scalable on-demand for the server and performance. How does Microsoft Dynamic 365 apply it? (Technology Aspect)
14. Using cloud based ERP, the user received continuously update system. Does Microsoft Dynamic 365 also do the same thing to all user including

the user has customization functionality? Does it affect the customization function? If no, why? (Technology Aspect)

15. Speaking on customization, Microsoft Dynamic 365 allows customer to do customization like changing the standard business process logic in the system? For example, customer want to have approval level for procurement manager to approve the purchase order before the purchase order can be confirm and print out. Can Dynamic 365 do it? (Technology Aspect)

16. Besides the customization, how about the integration with customer on premise system? Does Dynamic 365 allow to do that? Can you explain how the system allow to integration? (Technology Aspect)

17. Customer often worry their data especially financial data store in the cloud because it expose to lack of control to the software and hardware. Do you agree on it? Please indicate why you agree or not agree? (Security Aspect)

18. Privilege abuse refer to misuse the administration ID to access the customer database. How does Microsoft Dynamic 365 ensure that issue won't happen? Is there any countermeasure? (Security Aspect)

19. Does cloud base ERP have stable performance? Since the physical database is shared by multiple company. Does the internet bandwidth also influence the performance of system? (Technology Aspect)

20. If the cloud based customer wanted to change vendor, do your company allows to do that? Kindly give an advice if the customer want to change vendor. (Vendor Aspect)

#### **3.4.1.4 Section 4- Migration process from traditional On-premise ERP to Cloud based ERP**

For section 4, the interview proceed to talk about the migration process from On-premise structure to Cloud based structure where the interviewee were asked to give their expert guidance and suggestion to the company who required to migrate their existing On-premise ERP to Cloud based ERP. The interview question covered



about the general process migration from one system to another system, general issue faced during the migration, issue required to concern to the company and the database migration. Below is the relevant question constructed for section 4:

21. Based on your experience, can you explain: what are the appropriate process of doing the migration from one system to another system? Eg. Process: Plan-Development-Internal Testing-User Acceptance Test
22. What are the general issue that you usually faced during the system migration?
23. How you solve it?
24. If existing customer of Microsoft Dynamic AX want to upgrade to Microsoft Dynamic 365, what are the issue they should concern?
25. Besides that, is there any appropriate step for the upgrade or migration?
26. Does customization function done in Microsoft Dynamic AX can directly import to Microsoft Dynamic 365?
27. Prior to the migration, how the database migration is done?

#### **3.4.1.5 Section 5- Conclusion**

In order close the whole interview session, this section aim to seek the interviewee's opinion about the new evolution of Cloud based ERP. Below is the relevant question constructed for section 4:

28. How do you think Cloud ERP is the best solution for SME as well as large companies as compared to on premise ERP?

#### **3.4.2 Interviewing**

The collected of empirical data were come from the interview source which the main tools that were applied in this interview is Skype. This method was chosen as it enable the researcher to have flexibility of reaching out the interviewee as each of them were located in different client site. There was difficult during the process of seeking the permission of conduct the interview with the selected interviewee as they

are constantly busy with the project and some of them were reject to spare out the time specifically for the interview. After some negotiation, the final agreement from the interviewee is through the Skype text communication as this would allow them to answer interview and in the same time working on the project.

### 3.4.3 Informant selection

In order to find the suitable candidates for this research, the researcher have choose the professionals who work in companies specifically provides ERP services to client or also known as ERP vendor company. Furthermore, this research was focused on the Microsoft ERP platform and the chosen interviewee must have a well knowledge and years of experiences in using Microsoft ERP platform.

After several contact and searching, the researcher found 3 of the consultant basically each of them is working under a same company which the detailed information is showed in below table. The chosen interviewee have years of experience on handling different size of companies and companies in various industrial. Based on the background of the interviewee, they able to provide various information related to the topic of this research. Moreover, each of the interviewee have different role in the companies which this allows the researcher to get different aspect of view and information from the interview.

**Table 3.1: The Overview of Interviews Table**

Company	Name	Position	Duration	Date	Type
MicroChannel	Mok Pei Yee	Senior Technical Consultant	110 min	3 <sup>rd</sup> August 2017	Skype
MicroChannel	Manimaran Natesan	Senior Functional Consultant	120 min	4 <sup>th</sup> August 2017	Skype
MicroChannel	Giline Lee	Project Manager	120 min	7 <sup>th</sup> August 2017	Skype

The three respondent worked on the same company which is called MicroChannel or formerly known as Tectura. MicroChannel is a multinational company and originated from Australia where the main service is to provide an ERP solution to their clients. The company consider as a gold partnership with Microsoft as they are providing several of Microsoft business solutions to the customers such as Microsoft Dynamic AX, Microsoft GP, Microsoft NAV and so on. There are over 1000+ employees internationally and over 30+ project team working in MicroChannel Malaysia and Singapore.

The first respondent has worked as technical consultant particular in developing and modifying the Microsoft platform for more than 8 years particular handle projects in Malaysia region. Apart from that, her role constantly involved in handling backend of the system and provides training client for administrating the Microsoft ERP platform which her knowledge and background of the work experiences is much useful for answering the interview question particular in architecture as well as some technical questions.

The second respondent has worked as functional consultant for more than 15 years, involved projects located mainly in Asia region as well as the current project his handled is located at Dubai. His specialty is on supply chain management and manufacture management where he has handled various kinds of project size and in various client's industry. His main role is to provide expert advice as well as software solution to the client which his years of experiences and knowledge would certainly contributed a significant helpful insight to this study.

The third respondent has worked as functional consultant and project manager for more than 13 years, her project also involved main in Asia region and her current project is located at Singapore. Her specialty is on supply chain management and financial accounting management. Her main role is to provide expert advice and handling project team. With her extensive knowledge particularly in project management and providing business solutions to clients definitely brings a deep insight to this research.

### **3.5 Data collection**

Data collection consider a vital key for every research as it is the process of gathering data from the source for answering the research questions (Bryman, 2015). A deep understanding on particular area needed in this research and opinion from ERP expertise plays an important role in solving the questions in this research. Therefore, this research used the qualitative method as the method for data collection.

In addition, this research uses a semi-structured interview type for used to collect the related data which enable a flexibility of the interview structured with planned and having some degree of openness element. The questions may not be asked exactly as the planned and may be asked on questions that is not included in the guideline, however, all the questions will be asked with similar tone to every interviewee (Bryman, 2015). This method enable the researcher interview in the manner of flexible way as the order of the questions will changed for critically follow-up on the interviewee answer as well as to ask for clarification through further prompt more questions. Through this way, this research able to drill down more information and getting to more understand on the research area.

As the part of the data collection, the tools for constructing the interview will be using network communication such as Skype, this is to correspond with the busy schedule of the consultant. Due to the busy schedule of the consultant, the interview unable to done through VoIP or voice over internet protocol. Instead, this research is using the real time text messages as the main communication for allow the consultant to have flexibility in doing their work as each of the consultant is on different client side during the interview was conducted. Despite the interview was conducted in text messaging and yet it does not required any recording tools as the content of the interview will stored in text form on the Skype application and allows easy to retrieved back from the application.

### **3.6 Data Analysis**

Data analysis is a process of involved preparing, organizing the data for analysis, condensing the codes and visualized the data into form of table, discussion

or in figures (Creswell & Poth, 2016). The process of data analysis helps to reveal the gaps and discover any contradictions facts mentioned in previous chapter of literature review on the factors influenced the decision of company to migrate their traditional On-premise to Cloud based ERP.

### **3.6.1 Data Organization**

As suggested by Creswell & Poth (2016), the first step of the data analysis is begin with organize the data into computer files and convert the data to appropriate text sentences. Through this stage, the researcher has organize the data from each interview session into words files particulrly in transcript form. This to allows the researcher to easily perform next step of reading the content from the interview and data coding.

### **3.6.2 Reading and Memoing**

After the data organization, next step is to establish understanding the content of the transcript. Taking notes and memos in the margin of field transcript helps in this initial process of exploring (Creswell & Poth, 2016). In this research, the researcher has highlight the important sentence and put a notes besides the transcript of the interview. This is to allow the researcher to reflect and interpret on what the interviewee said. Furthermore, the researcher able to easily look through multiple forms of evidence to support or contras the factors listed in earlier chapter of literature review.

### **3.6.3 Data coding**

Based on Creswell & Poth (2016), the process of data coding involved describing, classifying and interpreting data into codes and themes. The process of coding involves identify the data evidence and manage into small categories. While the themes is meaning the categories resulted from the data coding process. In this process, the important key statements as well as similar statement stated by different interviewee is highlighted and then categorized in the table format.

The main purpose is to find out the possible factors could affect the decision making of the companies prior to the migration or adoption the Cloud Based ERP. As

such, the interview provided an insight about the importance finding of the factors so that a framework can be developed from it.

### **3.7 Experiments as a methodological strategy**

There are many definitions to define the method of experiment. For this research, the main purpose of the experiment is to demonstrating or confirming what is already anticipated and to examining an accepted idea in a new context (B. Taylor et al., 2011). For this research, the experiments will test against the constructed framework with under a simulation environment where the migration from ERP traditional system to ERP cloud based system will be performed. The experiments will done in Chapter 6 of this research.

### **3.8 Conclusion**

This chapter presented the core aspect of the research where it describe the research methods used in conducting the research. The research methodology focused on the primary source of the researcher gather the data, the way of analyze the data, and narrow the gap between the perception found in literature review and the facts found from the interview to achieve the objective of this research.

This research applied a qualitative research method where the primary activity is interview. The main purpose of using the interview as the main qualitative research is to discover and reveal any essential information related to the factors affect the decision making of companies on migration from On-premise ERP to Cloud based ERP.

Apart from that, the outcome of the interview questionnaire was resulted of using a predefined categories as a guideline for designing and developing the questionnaire. Moreover, this research has identified 3 different role of ERP consultant with anticipating of receiving various aspect of view on particular topic or area. In order to ensure that data was correctly analyzed, the method of data analysis was defined in this chapter as well. The research methodology discussed in this section will therefore leads to the presentation as well as discussion of research findings in the

following chapters of this research paper. Below figure is the summarized the research methodology:

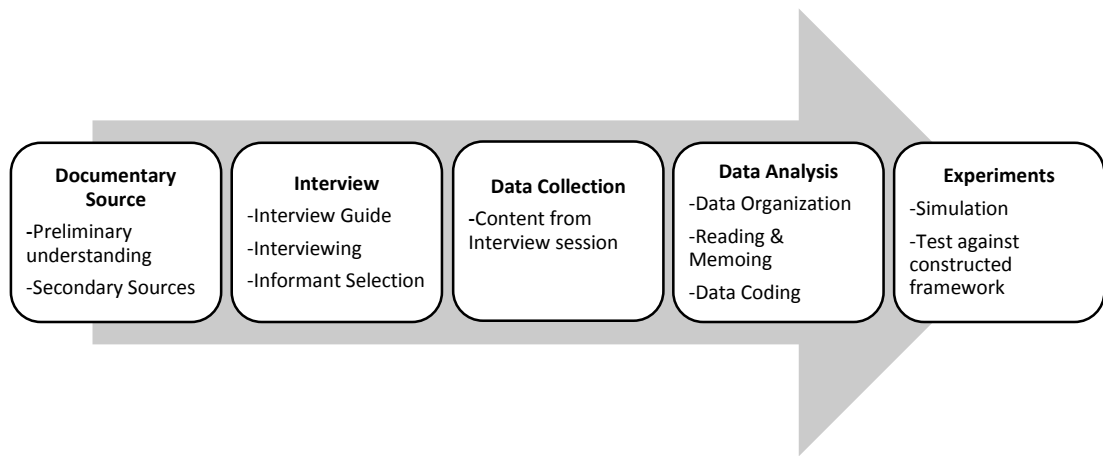


Figure 3.1: Summary Diagram of Research Methodology

## **Chapter 4**

### **EMPIRICAL FINDINGS**

#### **4.1 Introduction**

This chapter presented the empirical data after analyzing the data collected through interviews with our interviewees. The presentation of the empirical findings cover the basic information on the Microsoft Dynamic Platform, the comparison on both the architecture platform as well as the related factors influences the company decision on migrating the traditional On-premise ERP to Cloud based ERP. These factors are related to Cost Aspect, Technology Aspect, Security Aspect, and Vendor Aspect. With the use of interview script (Appendix A.2), empirical finding result is categorized according to several defined aspect that the companies required aware in adopting the Cloud based ERP. Additionally, other factors that mentioned by the interviewees is included in the categories as well.

#### **4.2 Understanding on Microsoft Dynamic AX and Microsoft Dynamic 365**

Microsoft Dynamic 365 is the cloud based ERP and the next version of Microsoft Dynamic AX. Three interviewees were confirmed that none of the company in Malaysia has implemented the Microsoft Dynamic 365 cloud version. Interviewee 1 and 3 stated that current market in Malaysia still not yet ready for the changes as the companies in Malaysia still remain skeptical on the Dynamic 365 cloud version. Apparently, Microsoft Dynamic 365 is not only the cloud version but it considers as On-premise version as well. All three interviewee stated that the Microsoft has launched the On-premise version for allowing the company who wanted to install the software on their own server. However, the interviewee 1 pointed the details of the Dynamic 365 On-premise still not yet expose much information to the vendor side.

##### **4.2.1 The architecture comparison of Microsoft Dynamic AX and Microsoft Dynamic 365**

The 2&3 interviewee was agreed that the functionality of Microsoft Dynamic 365 not much changes as compared Microsoft Dynamic AX and consider the Dynamic 365 is the next version of Dynamic AX. Conversely, the backend structure of Dynamic



365 has made a significant changes on it. As the interviewee 1 and 3 stated that the major changes are that all modification and development were no longer done in the AX Morphx (AX backend development environment) and all the AOT (application object tree) was placed on visual studio. Therefore, there is a new learning required for the developer said by interview 1 and 3.

Apart from that, the user could experience a different UI (User Interface) on using the Dynamic 365. Interviewee 2 and 3 stated that there is a slight difference in terms of the user interface that found in Dynamic 365 where the user will access every form through the web browser and user will experience a new design for the system UI.

Furthermore, there is no changes on using the type of database as both interviewee 1 and 3 stated that the Dynamic 365 will still use the SQL database but interviewee 1 stressed that SQL server will be in the cloud environment.

Interestingly, all three interviewees confirmed that the server is not hosted by their company and instead, the server is hosted by Microsoft Corporation. Interviewee 2 mentioned that the software control is on the vendor side which the modification and development are done on the vendor side. While interviewee 3 further stressed that the server will handle by Microsoft and vendor company will only provide the business solution to the client.

### **4.3 Various Aspect that Company Required to Aware**

#### **4.3.1 Cost Aspect**

##### **4.3.1.1 Upfront Investment**

The low of upfront investment on the server is a benefit mentioned by the interviewee 2 and 3. The interviewee 2 stressed that client may not need to own server infrastructure. While the interviewee 3 further pointed out that because the server is hosted by Microsoft, the cost was reduced as the client does not worry about install server, manage the server and the software. Nevertheless, the interviewee 1 argues that the cost of the subscription for the development server might over run the customer's

budget as there is needed an extra development server for the vendor to do the customization and modification on the system.

#### **4.3.1.2 Cost Maintenance**

Both interviewee 2 and 3 agreed that the cost of maintenance is in the form of fix subscription rate in monthly basis where the server maintenance cost is included in it. Likewise, interviewee 3 said that it is considered a low-cost of maintenance as compared to the company who hosts the server themselves.

### **4.3.2 Technology Aspect**

#### **4.3.2.1 Mobility**

As mentioned by interviewee 2 and 3, the Dynamic 365 cloud based ERP is allowed user to access through different devices and therefore is considered as mobility. Interviewee 2 further pointed that Dynamic 365 has more scope for interfaces where it allows access through different devices. While flexibility in terms of user access devices is mentioned by interviewee 3 meaning that user can access it using any devices as long as they have the web browser to access it.

#### **4.3.2.2 Scalability**

The cloud based ERP is considered as scalable based on the on-demand basis. All interviewees agreed that the cloud based is scalable on-demand. The interviewee 1 pointed that Microsoft allows the client to add on the user license as the client wish. In fact, the interview 2 stated that the Microsoft is hosting the server on the cloud will expect the ever fast increase of users and therefore they have multiple data center to anticipate this scenario. While the interviewee 3 mentioned the server center is allocated around in worldwide, there is plenty of servers to handle the growth of the users.

#### **4.3.2.3 Enhancement**

The interviewee 2 and 3 states that the user of Cloud Based ERP will receive the update patch from the vendor side. However, interviewee 1 unconvinced on the user will receive the update patch cumulative as the Microsoft always emphasized that

their updates shall be installed in a standard application and might not support if the error caused by customization. In addition, both interviewee 2 and 3 mentioned that the work involved in updating the patch is the tedious task as they have to ensure that update patch would not cause any error, especially on the customized system. Both interviewee 2 and 3 further state that the update patch does affect the customization function and therefore they have to migrate all customization first and backup all the customization before installing update patch in the system. Interviewee 2 stated that it required having a detailed step on handling the updating process, this is to avoid any unwanted error happen. She further mentioned that the updating require to done some testing in test server before roll out to live server.

#### **4.3.2.4 Reliability**

Interviewee 1 and 3 agreed that Cloud based ERP able to ensure high reliability with minimum interruption. Interviewee 1 mentioned that the possible of downtime is much low where the server can be easily switched or replace with. She further pointed that the recover can be done quickly by Microsoft. While the interviewee 3 stated that due to Microsoft have multiple data center and numerous of the server, they can easily replace the server through the switching process.

### **4.2.4 Security Aspect**

#### **4.2.4.1 System and Hardware Control**

All interviewee agreed that the system and server are done by Microsoft and vendor side as the client would have less control on the server and system. However, interviewee 2 and 3 disagree that client should impose the concern of lack of control due to data leaking. Interviewee 2 believed that security level is very strong as it is controlled by Microsoft themselves. While the interviewee 3 further stressed that the concern is rather consider as customer side of psychological aspect and the customer shouldn't worry much about it. She said that Microsoft is well-known company, they have own high-end security level and policy management.

#### **4.2.4.2 Privilege Abuse**

Interviewee 2 and 3 mentioned that the Microsoft have their own high-end security management which the case of vulnerability such as data leaking or privilege abuse would be much lesser. However, the detailed of how Microsoft handling the security was not much known by the interviewee 2 and 3.

#### **4.2.5 Technology Aspect**

##### **4.2.5.1 Customization**

All interviewee agreed that the Microsoft Dynamic 365 Cloud based ERP is allowing customization. All interviewee was mentioned that the customization function on the business process can be done easily through modify on the workflow functionality in Dynamic 365. Interviewee 2 further state that the Dynamic 365's customization logic is using the same concept with Dynamic AX, thus, the Dynamic 365 able to manage all kind of customizing. While interview 3 mentioned that workflow functionality in Dynamic 365 can allows the customer to customize according to how they handle the business process.

##### **4.2.5.2 Predictable Performance**

Apparently, all interviewee agreed that the performance can cause by internet bandwidth. Interviewee 3 stressed that performance on the database and server itself have the stable performance, the main issue to performance is the internet bandwidth. However, interviewee 1 mentioned that the location server of Microsoft decided does make the differences of improving the internet bandwidth if the location server was placed nearer to the customer's country. Yet, interviewee 2 said that companies must prepare for upgrade themselves to the latest technologies as the cloud is current technology.

##### **4.2.5.3 Integration**

Integration is can be done on Cloud based ERP as it agreed by the interviewee 2 and 3. Where interviewee 2 mentioned that it is possible and easily be done through configuration on web service and batch service. Interviewee 3 further explained that

the integration required the customer to have a database to act as an interchange center between the Dynamic 365 and the customer system. She said that they will modify the batch functionality in Dynamic 365 to allow data constantly update in batch basis to the Dynamic 365's database.

#### **4.2.6 Vendor Aspect**

##### **4.2.6.1 Vendor Change**

Both interviewee 2 and 3 stated that they allow the customer to change vendor. Interviewee 2 mentioned that all depend on customer decision as it considers as normal commercial practice in ERP industry. While interviewee 3 said that the changes required the existing vendor to establish handover session to the new vendor and consider something unfavorable situation to existing vendor because of the extra task need to be done on handover documentation.

#### **4.2.7 Other Factors**

##### **4.2.7.1 Time constraints**

As mentioned by interviewee 1, the time maybe tight due to unpredicted issues such as error occurred during the deployment to PROD server (Production server) and AOS service (Application Object Server) can't restart. This unpredictable issue caused the schedule might slightly over run.

##### **4.2.7.2 Documentation**

Interviewee 1 stressed the importance of proper documentation is required to be done after user revised the requirements few times as well as on the coding level. This is for the ease of developer to execute the development without any misleading issue.

##### **4.2.7.3 Communication**

Interviewee 2 states that the importance of communication between the client side and the vendor side. He stated that if any side of party misses the update, the interface will lead to problematic. Thus, a cross check meeting between both sides of the party is required to do through the daily short meeting to ensure that the project

progress is updated and issues are discussed. It can be said that a constant communication is required on both sides.

#### 4.2.7.4 User Involvement

Interviewee 3 states that the user involvement is very important in the ERP project. Lack of co-operation from user side is the main issue for the migration project, therefore, this required a constant communication and feedback from the user side in order to ensure that the vendor able to handle the issue on time without any further delay to the whole project schedule.

### 4.3 Conclusion

In conclusion, this chapter shows all the related findings of this research. In order to give an overview of the related findings gathered from the interview, a table has been constructed as below. Some of the column were blank because of:

1. The certain factor is not under the interviewee's expertise or knowledge area.
2. Due to the product is still new, some of the interviewee can't confirm the factor.
3. Other factors section- Extra suggestion given by the interviewees.

**Table 4.1: Overview of different aspect discussed by the interviewees**

Aspect/ Factors	Interviewee 1	Interviewee 2	Interviewee 3
<b>The architecture comparison of Microsoft Dynamic AX and Microsoft Dynamic 365</b>			
Functionality	-	Not much changes.	Not much changes.
Backend structure	Huge changes.	-	Huge changes.
UI (User Interface)	-	Slight changes.	Slight changes.
Server Host	Host by Microsoft.	Host by Microsoft.	Host by Microsoft.

Aspect/ Factors	Interviewee 1	Interviewee 2	Interviewee 3
<b>Cost Aspect</b>			
Upfront Investment	Extra cost involved in subscription fees on development server.	Low upfront cost.	Low upfront cost.
Cost Maintenance	-	Low cost as included in fix subscription rate.	Low cost as included in fix subscription rate.
<b>Technology Aspect</b>			
Mobility	-	High Mobility.	High Mobility.
Scalability	Scalable on-demand.	Scalable on-demand.	Scalable on-demand.
Enhancement	Unconvinced on the update patch cumulative.	User receives constant update patch from vendor.	User receives constant update patch from vendor.
Reliability	High Reliability.	-	High Reliability.
Customization	Customization on Cloud based ERP is allowed.	Customization on Cloud based ERP is allowed.	Customization on Cloud based ERP is allowed.
Predictable Performance	Internet bandwidth is the major issue to cloud based ERP's performance. Location server that Microsoft decide is another factor of performance.	Internet bandwidth is the major issue to cloud based ERP's performance.	Internet bandwidth is the major issue to cloud based ERP's performance.
Integration	-	Integration is can be done on Cloud based ERP.	Integration is can be done on Cloud based ERP.

Aspect/ Factors	Interviewee 1	Interviewee 2	Interviewee 3
<b>Security Aspect</b>			
System and Hardware Control	Control is on vendor and Microsoft.	Control is on vendor and Microsoft. The customer should not concern about the data security.	Control is on vendor and Microsoft. The customer should not concern about the data security.
Privilege Abuse	-	High security is enforced by Microsoft.	High security is enforced by Microsoft.
<b>Vendor Aspect</b>			
Vendor Change	-	Allows customer to change vendor.	Allows customer to change vendor.
<b>Other Factors</b>			
Time constraints	Due to unpredictable issue occurred.	-	-
Documentation	Proper documentation is required.	-	-
Communication	-	Cross check meeting is required.	-
User Involvement	-	-	User involvement is very important in giving feedback.



## **Chapter 5**

### **MIGRATION FRAMEWORK**

#### **5.1 Introduction**

##### **Microsoft Dynamic 365- CRM**

CRM or known as Customer Relationship Management. CRM systems and applications are designed to manage and maintain customer relationships, track engagements and sales, and deliver actionable data (Microsoft, 2017a). The system helps company to improve their business relationships with customers and increase sales growth through consolidate and analyze information on customers, sales and marketing.

The system provides various function such as record customer interactions over email, phone contact or other channels, automate workflow processes such as tasks, calendars and alerts, giving managers or management the functionality of tracking performance and productivity based on the information logged within the system (Rouse, 2014). Specifically, CRM aims at increasing customer satisfaction therefore increasing company's profitability

Fundamental of CRM's Functionality:

Based on Rouse (2014), there are 4 common feature provided by a CRM system:

- Marketing automation- Ability to automate repetitive tasks related to marketing efforts. Eg. Automate in turning a sales lead into a customer, send marketing email to potential customer, assign a sales lead to sales person and so on.
- Sales force automation- Prevent duplicate efforts between a sales person and a customer through automatically tracking all sales order, follow ups and so on.
- Contact center automation- Specifically for customer call center, providing various functionality such as pre-recorded audio that assists in customer problem-solving, log in new case and so on.

- Geolocation technology, or location-based services- using geographic technology based for various purpose such as creating geographic marketing campaigns based on customer physical locations, integrating with GPS for locating sales prospects based on geographic perspective and so on.

### **5.1.2 What Microsoft provides?**

Dynamic 365 delivers the full spectrum of CRM through 5 individual apps:

1. Sales
2. Customer Service
3. Field Service
4. Project Service Automation
5. Marketing

### **5.1.3 Limitation of the research: Why Microsoft Dynamic 365- CRM?**

Reason

As the migration test data (covers Sales module, Procurement module, Incoming and Outgoing warehouse module) taken from a manufacturing company and given initial planning of using the Microsoft Dynamic 365 Operation and Finance which covers all aspect of module normally used by manufacturing. However, Microsoft Dynamic 365 Operation and Finance limit important function that required used in this research such as administration module, data import export interface, customization development and system backend.

Accessing the full functionality requires a purchase on the license, yet, there is a requirement in purchasing the license:

- To purchase license through Microsoft partner or known as Microsoft consultation firm- A requisite of at least 10 licenses is needed so that they can open a project for client.

- To purchase license through official source (Microsoft)- A requisite of linking the genuine company registered domain server is needed before activate the full version. (Refer to below screenshot for more information).

**Why do we ask you to prove that you own the domain?** Because everyone who signs up with an email address on the same domain (say, rob@contoso.com and sara@contoso.com) is grouped together by the domain name. We decide what group each person belongs to by the domain portion of their email addresses (like 'contoso.com'), so people from the same organization can work together. Because they belong to the same group, they can collaborate with each other.

To become the admin for the group, you verify that you own the domain that everyone in your organization is grouped under. If you have the authority to prove domain ownership (by signing in where the domain is managed), it makes sense that you can manage Office 365 services for people using that domain.

After you become the admin, you can also add new users or enforce policies, if you like.

## Overview of the steps

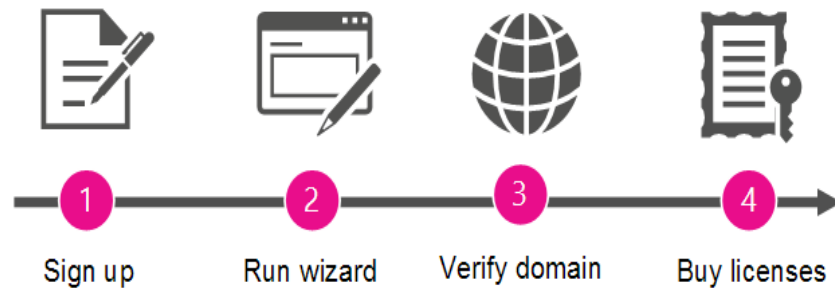


Figure 5.1: Reason of linking the license Microsoft Dynamic 365 to genuine domain server.

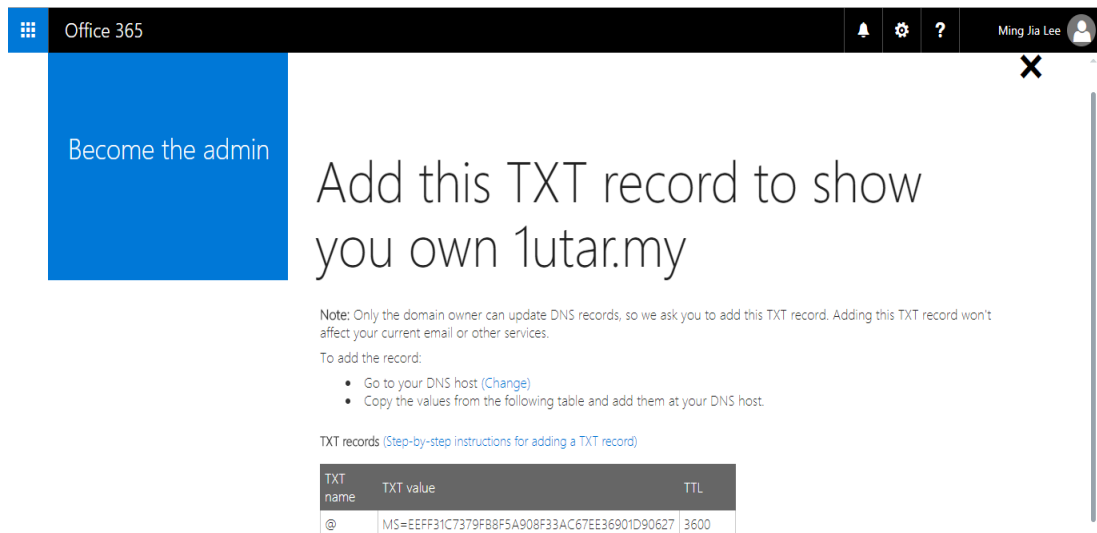


Figure 5.2: Require to add the TXT value to DNS host.

An alternative solution is to use Microsoft Dynamic 365- CRM version, the system allows the accessibility to administration module, data import export interface, customization development and system backend.

The trial version has cover all important functionality that required by this research, but, the trial version allows only for 30 days access and any activation to full license will need to fulfill the requisite stated by Microsoft as per above screenshot.

#### **5.1.4 Choosing Microsoft Dynamic 365 CRM- Sales as migrate simulation**

After several study on the Microsoft Dynamic 365 CRM, the most relevant module to the test company's data is the Microsoft Dynamic 365 CRM- Sales. The Microsoft Dynamic 365 Sales module covers sufficient functionality to simulate the migration process from the On-premise (Microsoft Dynamic AX 2012- sales module) to Cloud based (Microsoft Dynamic 365 CRM- Sales).

#### **5.1.5 Introduction of Microsoft Dynamic 365 CRM Sales Module**

Microsoft Dynamic 365 CRM Sales module consist of several functionalities that assist a company to record and manage sales data. Basic functionalities such as create quotation, sales order, sales invoice, product information and price list. Apart from those basic functionality, Microsoft distinguish its CRM product with other competitors through enhanced its functionality to be more flexibility and coverage wider area.

One of the major selling point is that Microsoft Dynamic 365 CRM enable flexibility access where company's sales person access the system data anywhere and anytime using any mobility devices. Furthermore, each module in the system are no longer independent, instead, Microsoft Dynamic 365 cover wider area by making different module link to each other. For example, user can link customer account in sales module to field service module for tracking any after sales service.

Also, Microsoft Dynamic 365 CRM is tightly integrated with its Office application to the system so that user able to optimize their production without switching between the Microsoft Office and the ERP system. For example, user can

open sales data in Excel, make changes and save the changes back to the system. User also able to edit and sent email marketing to all customer through the ERP system without open 2 application (Outlook and Microsoft Dynamic 365 CRM) in the same time.

Personal activity assistance is one of the Microsoft Dynamic 365 CRM useful functionality where user can manage their task and activity more organized. For example, user can use relationship assistant to send a reminder of closing an opportunity next week or notify other user on any important activity to do.

Additionally, Microsoft Dynamic 365 CRM Sales module provide the guided business processes so that user know which steps to take next to close deals faster. The business processes guidance can be modify and tailor based on the company business operation.

#### **5.1.6 How this research helps organization in terms of ERP migration?**

Nevertheless, most of the typical articles related to migration system were only propose and explain the framework. Moreover, the explanation on the proposed framework were much towards to general idea and lack of detailed information on how to execute the migration. This might lead to impractical for the companies who wish to opt for migration to cloud based system.

The major differences of this research compared to other research article or business article is that the constructed framework encompass a detailed step by step guideline in executing each phase. The details included the checklist need to know before start in every stage, overall flowchart to understands the whole process in that stage, note for company on any information or point required company to aware of as well as the step by step screenshot guideline in executing each subset stage. The design on overall guideline especially on customization and migration stage is rather consider as simpler and easy to learn which are suitable for any company or individual who has less knowledge in programming.

The constructed framework and step by step guideline may not be absolute accurately as certain step in guideline can be vary depending on the factor of the current company system status as well as their business operation. Nonetheless, the framework and the step by step guideline would able to provide adequate information and an overall idea of what needs to be prepared before the migration project start.

## **5.2 Migration Framework**

Figure 5.3 is the suggested framework that constructed for companies as a guideline in execution of migration project. The preliminary idea of framework were formed based on several articles (Alahmari, Zaluska, & De Roure, 2010; Binder, Strodl, & Rauber, 2014; Infosys, 2017; Microsoft, 2017c; Tonnu et al., 2014) that is related to system migration.

Stage 1 or known as the initial preparation migration stage, the key activity involved analysis and understand on the On-premise system structure. According to (Alahmari et al., 2010), the analysis activity provide a high-level system understanding on the legacy system structure (table structure), behavior as well as overall business requirement (customization). A gap analysis will be produced at the end of the stage, the gap report will help to validate the degree of fit and limitations in regard to the current business requirements as well as to determine the most suitable implementation path considering required configuration and customization (Microsoft, 2017c).

Stage 2 or known as Build stage, where development of customization is done on this stage. Main activity is building the process and entities in the Cloud system based on the business functional requirements (Infosys, 2017). The idea of build stage is that build component is used to build the target system from the result that has been generated and refined in the previous stage (Binder et al., 2014). The gap report produced in stage 1 is used as the guideline in the development of customization. Additionally, main purpose of the build stage is to altering the cloud platform functionality to fit to the current business requirements as well as data structure. Thus,

the development of customization required to be done before performing mapping and data migration.

Stage 3 or known as Extraction stage. The idea is taken from (Infosys, 2017) where the process of data extraction is to extract the raw data from on-premise system. The main purpose is to extract out the relevant data that match with certain criteria. For example, Total transaction data dated from 1/1/2016-1/11/2017 is needed to extract out from the system). Before the data extraction starts, there are a few important steps required to be done. For instance, type of interface for data extraction is required to identify, type of table and field is targeted and cutoff date on the transaction data is needed to be decided with the end user.

Stage 4 or known as Import stage. The stage is considered as the core stage in the migration framework, the data extracted at the stage 3 is needed to transform into the data template or supported file format for import into Cloud based system. The data mapping will be required to perform, this is to ensure that all fields and tables are mapped correctly before starting to import into the targeted system (CRMBook, 2017). The data import should be done in 2 phases where parent record or Data master needs to be imported first before the child record import. This is because parent record acts as data reference where the child record or transaction data will refer some of the data from the parent record.

Stage 5 or known as UAT. User Acceptance Test is the final testing process involving end user or client interaction with the project team. This is where the final decision of acceptance or agreement is made by the end user or client regarding the final product (Swati, 2017). The major activities involve listing and testing by case scenario where all possible scenarios are tested against the system. End user or client will then make the decision based on the test results with either agreeing to proceed to go live or delaying the date of go live until a bug is fixed.

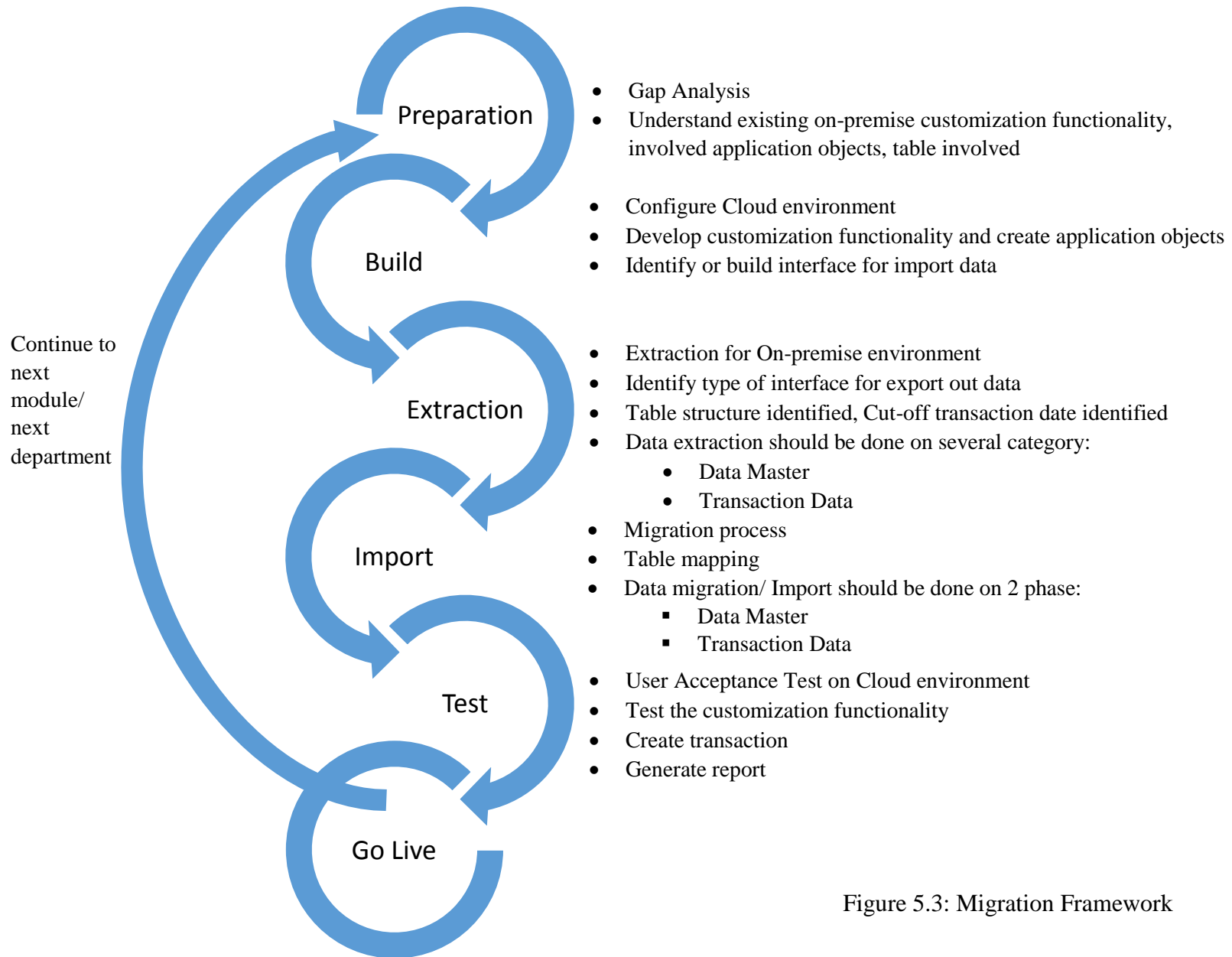


Figure 5.3: Migration Framework



### **5.2.1 Stage 1- Initial stage of Preparation**

Initial stage is the most important part for getting everything ready for a good start ahead. Understanding the existing On-premise environment structure especially in tables, fields, data and customization plays an essential part in migration. On this stage, activities mainly involved listing tables and fields, customization functionality as well as Gap analysis.

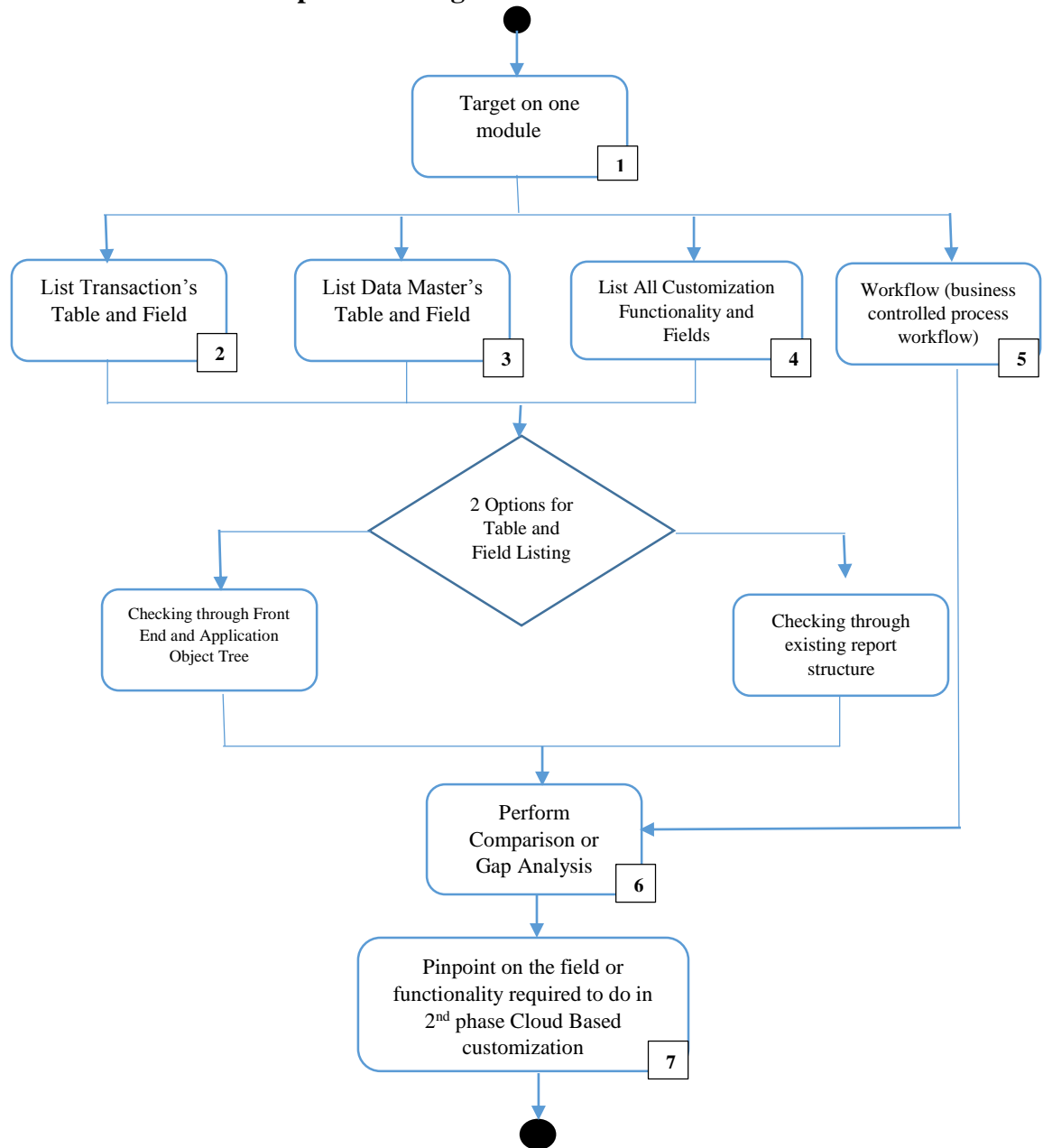
Checklist to do analyze or understand existing on-premise:

- o Product Dimension
- o Table involved:
- o Data Master- Vendor/Customer Data
- o Data Master- Product Information
- o Data Transaction (eg. Sales order, sales invoice)
- o Customization:
- o Customized field
- o Customized functionality
- o Workflow (business controlled process workflow)

Note for company:

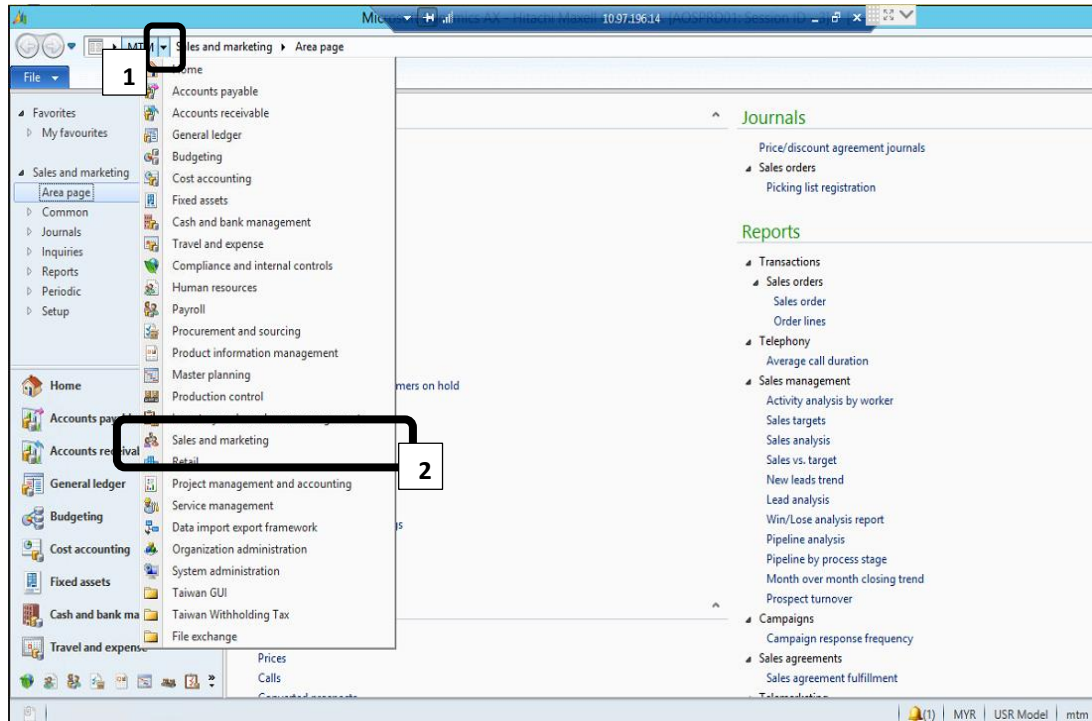
It is important to know that the process for preparation is to conduct finding and aiming on the table and fields involved. Before proceed to any tables and fields finding, a good start for company is from selecting what module that the company wish to migrate first. For this research, the selected module is sales module.

### 5.2.2 Flowchart for Preparation Stage



## Step 1.0 Target on one module

Click on the arrow down button to list all module and select on the particular module. In this case, Sales and Marketing module is chosen.

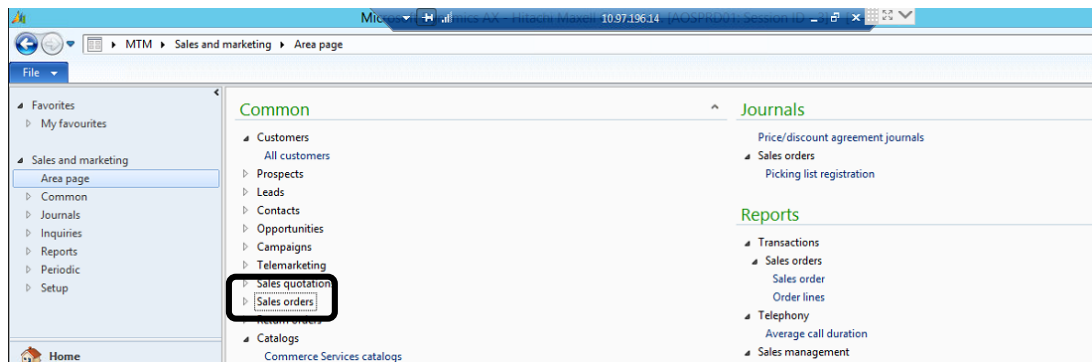


## Step 2.0 List Transaction's Table and Field

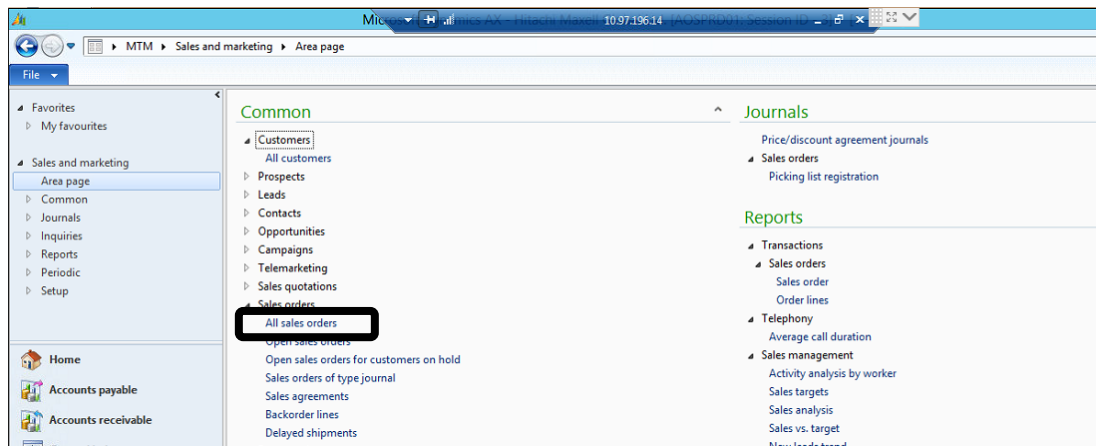
One of the important data type involved in migration process is transaction data.

Transaction data is real time data that is created when particular user performed for fulfill certain business operation. In this case, transaction data for Sales and Marketing Module is Sales Order.

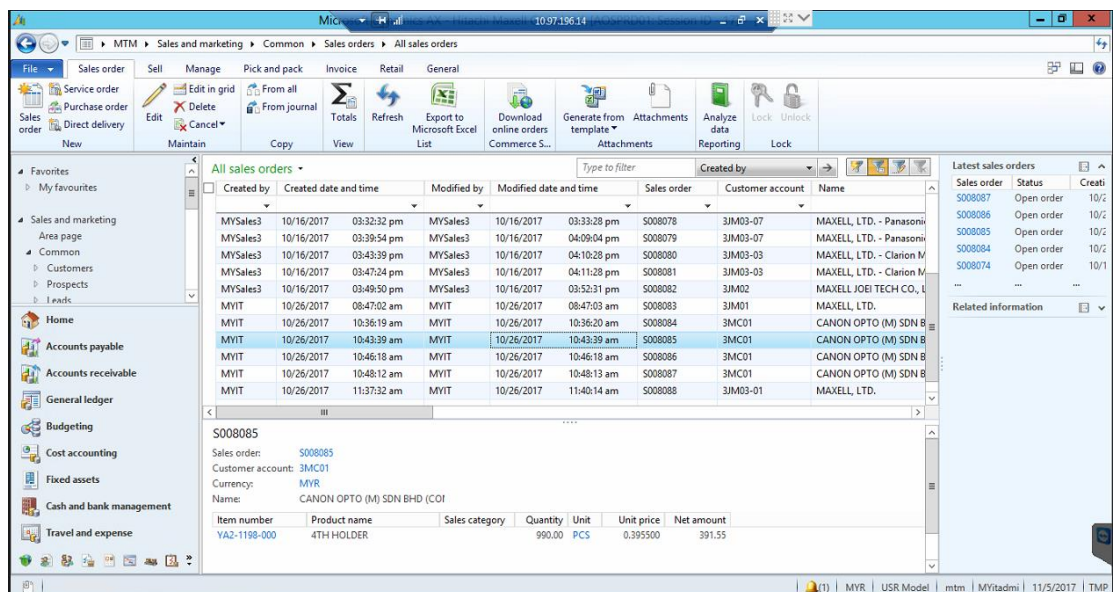
To access sales order transaction, click on Sales Order to expand.



Click on All Sales Order



You can see all the sales order transaction



For listing the tables and fields, there is two option to explore:

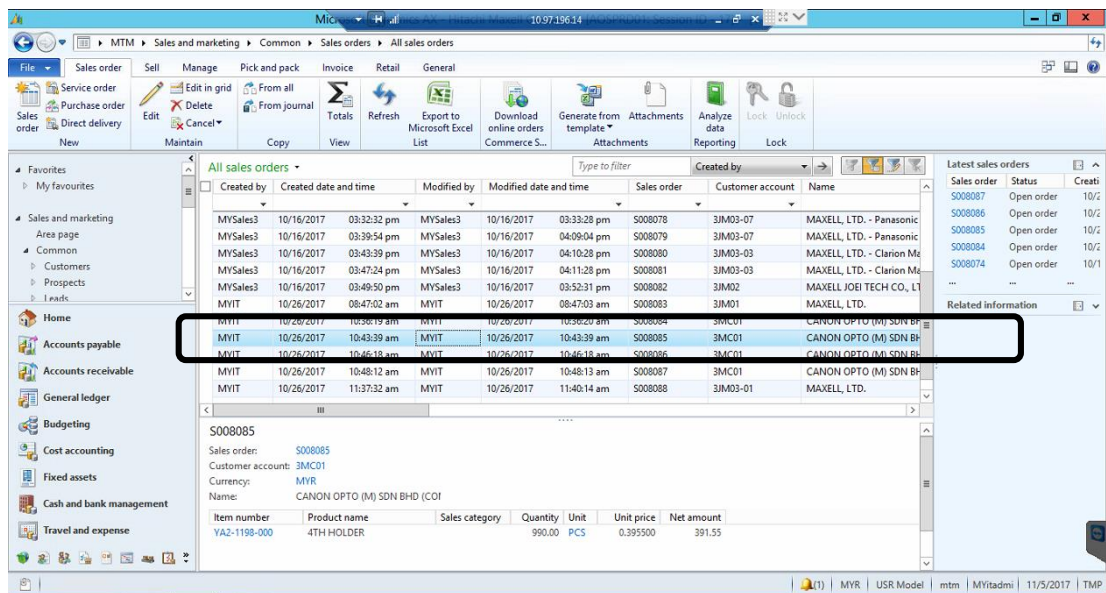
1. Checking through Front End and Application Object Tree
2. Checking through existing report structure (if you have reporting tool software to check through)

### Option 1- Checking through Front End and Application Object Tree

This option does not required any special tool or software to access to the table structure as it access from system front end and system backend, yet, the process is involved lots of steps and time consuming.

## Front end- checking the table and field's name

Double click one of the sales order to access into that particular sales order.



In Dynamic AX 2012 (On-premise), Sales Order are divided into 2 parts:

- Line view (Contains sales order details such as item, quantity, item unit, item price and total amount)
- Header view (Contains sales order customer details such as customer ID, customer name, currency, delivery address, mode of delivery and delivery terms)

Note: make sure that tables and fields located in both Line view and Header view is covered as both contains important data about a sales order, the data will be meaningless if one of the side does not covered. Recommend to identify the fields that have data only.

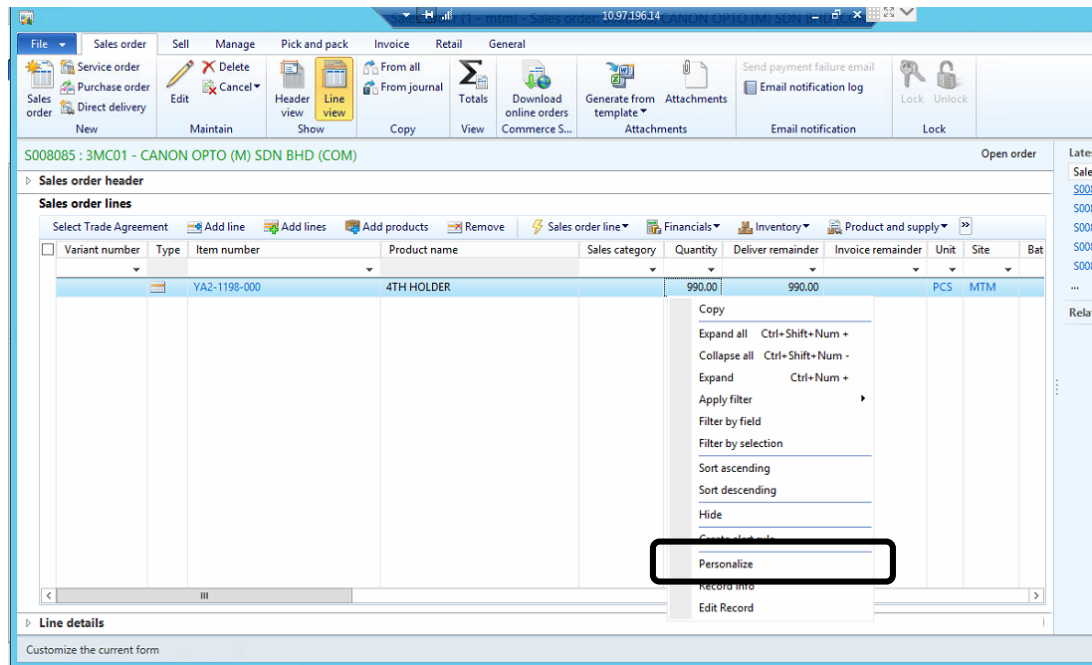
Answer to question: To save time, can the process just identify the tables only and migrate all fields in that table to Cloud Based? The answer is not recommended, this will only bring the process to even more complicate and tedious during the migration process as:

-Unnecessary fields will required to map to new Cloud Based system

-Some fields may not exist in new Cloud Based system, required to customize to create new field in Cloud based system. Otherwise, error of fields not found in

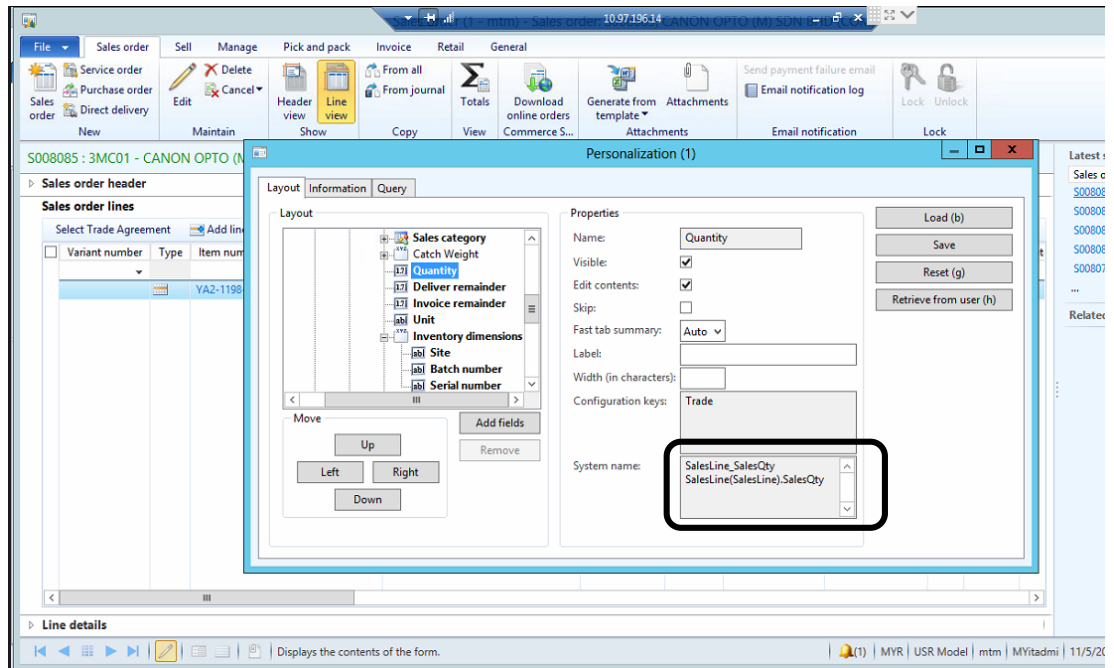
Before list the tables and fields involved, it is important to know what the table and field's name.

To access the table and field's name, right click on the particular fields → Personalize



On Personalization screen, it showed the particular fields is under what tables and as what name.

Note: on the text box it showed “SalesLine(SalesLine).SalesQty”. Table name will usually place before “.”, in this case the table name is SalesLine. While the field name will usually place after “.”, in this case the field name is SalesQty.



Repeat the process of identify the table and field's name by checking all the fields that contains data.

After that, you should be able to list all the table and field involved as showed in below:

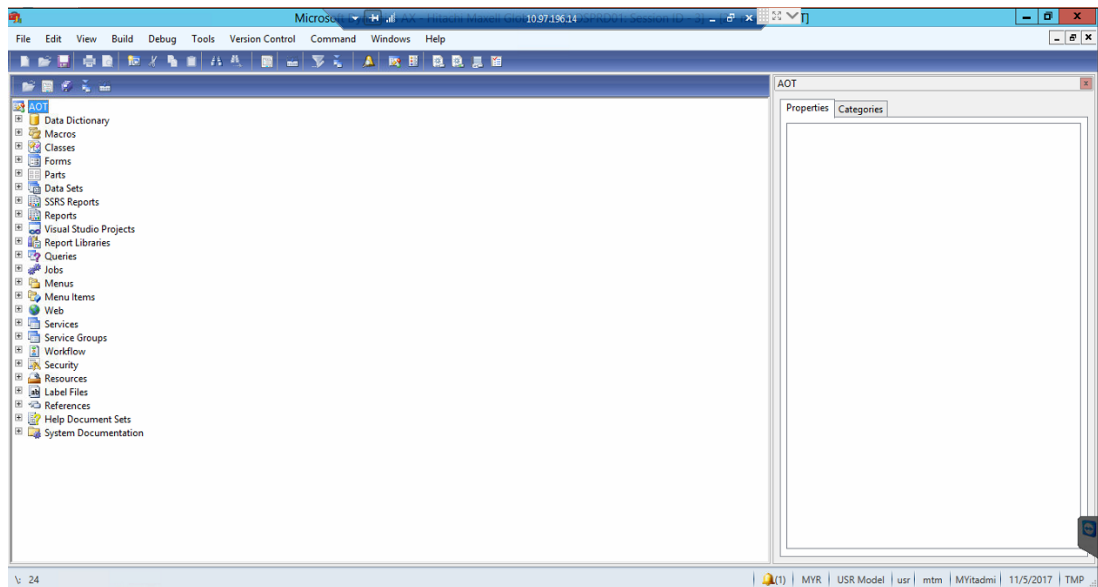
Analysis stage.xlsx - Excel													
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW Load Test Team													
Clipboard Font Alignment Number Styles Cells Editing													
B9													
A B C D E F G H I J K L M N													
1	Table Name	Sales Order Transaction											
2	Parent Table:	SalesTable											
3	Child Table:	SalesLine											
4		EcoResProductTranslation											
5													
6	createdDateTime	CustAccount	SalesName	SalesId	ItemId	Name	Name (product specification)	SalesUnit	SalesQty	dVDate	ReceiptDateRequested	SalesPrice	LineAmount deliveredInC
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
Table Involved-Item Master Table Involved-Customer Master Table Involved-Transaction Data													

## Backend/ Application Object Tree- checking the relationship between the tables

It is common that several tables was found during the checking. To know relationship between the tables, it required to check from the system backend also known as Application Object Tree.

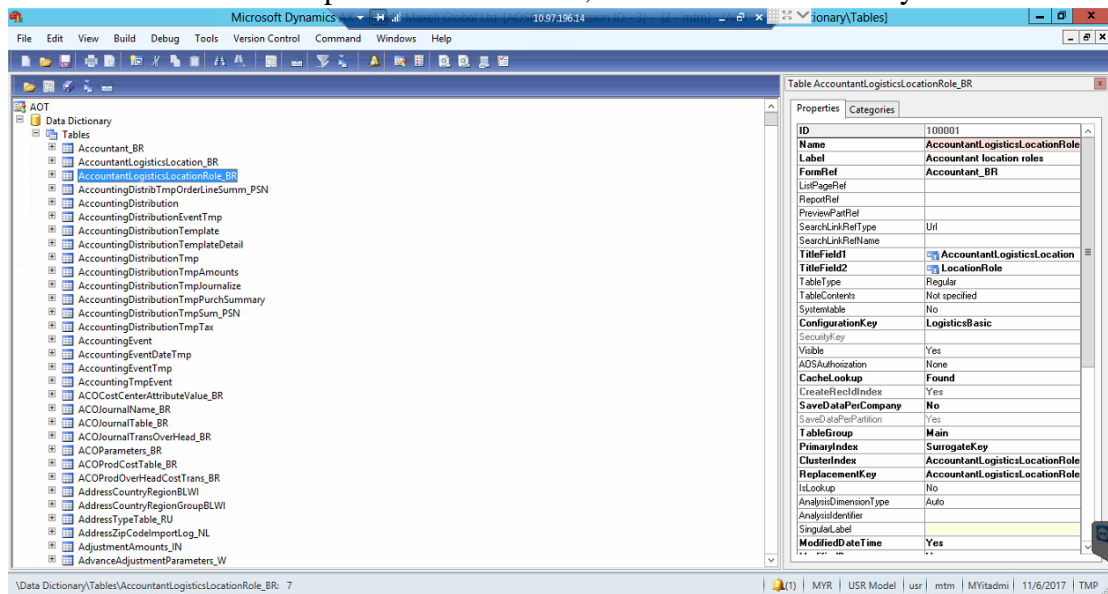
Answer to Question: why the relationship between tables is important to identify in this stage? It is important as it will be used in extraction stage where the required data will be extracted out from the system into one sheet based on the linkage between the tables.

To access the backend/ AOT level, shortcut key = ctrl + c. Below is the AOT:

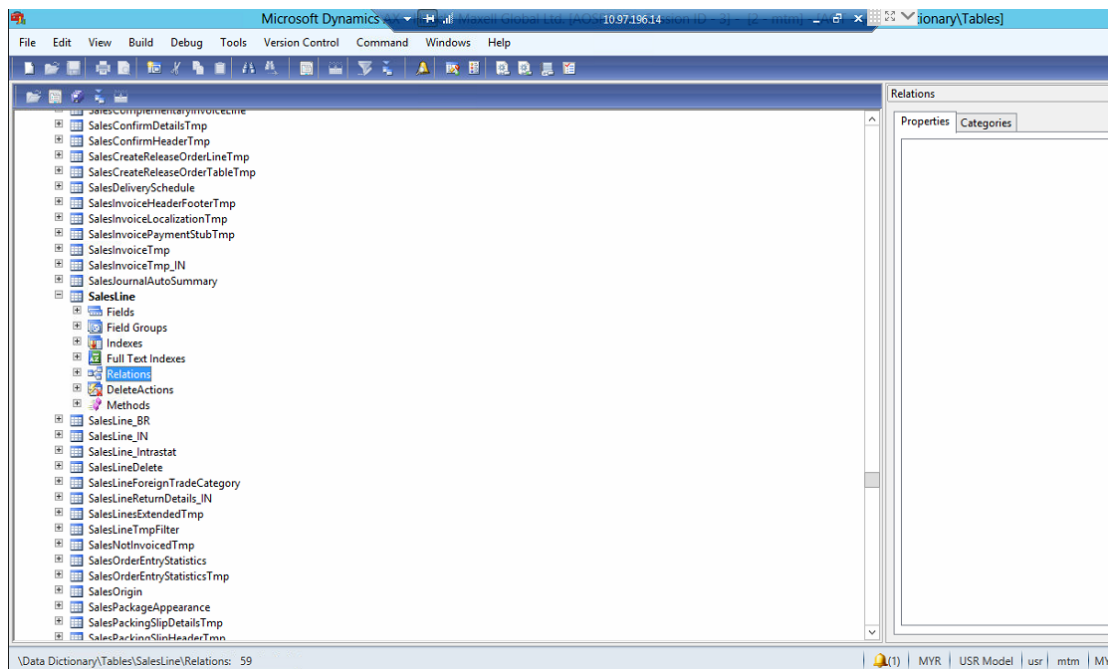




To access the relationship between the tables, click on Data Dictionary → Tables

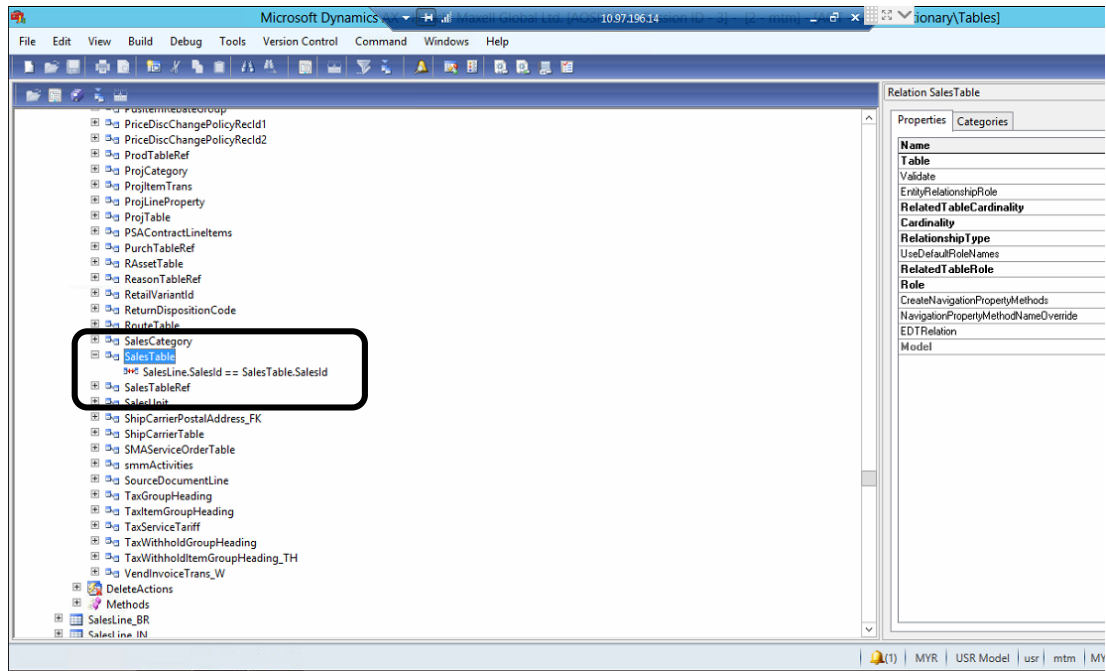


Search on the particular table → expand it → expand the Relation. In this case, it is required to find out the relationship between SalesTable and SalesLine.



After expand, it will shows a list of table linked to SalesLine table. SalesTable is found under the list, click to show the relationship.

Note: SalesLine.SalesId = SalesTables.SalesId this meaning that the primary key to link both table is the SalesId field.



Repeat the step to identify other table's relationship.

After identify, list the table relationship as per below:

The screenshot shows an Excel spreadsheet titled 'Analysis stage.xlsx'. The spreadsheet lists table relationships. The first three rows are highlighted with a black box:

Table Name	Sales Order Transaction	Table Relationship
Parent Table:	SalesTable	
Child Table:	SalesLine	SalesTable.SalesId
	EcoResProductTranslation	InventTable.Product, SalesTable.ItemId

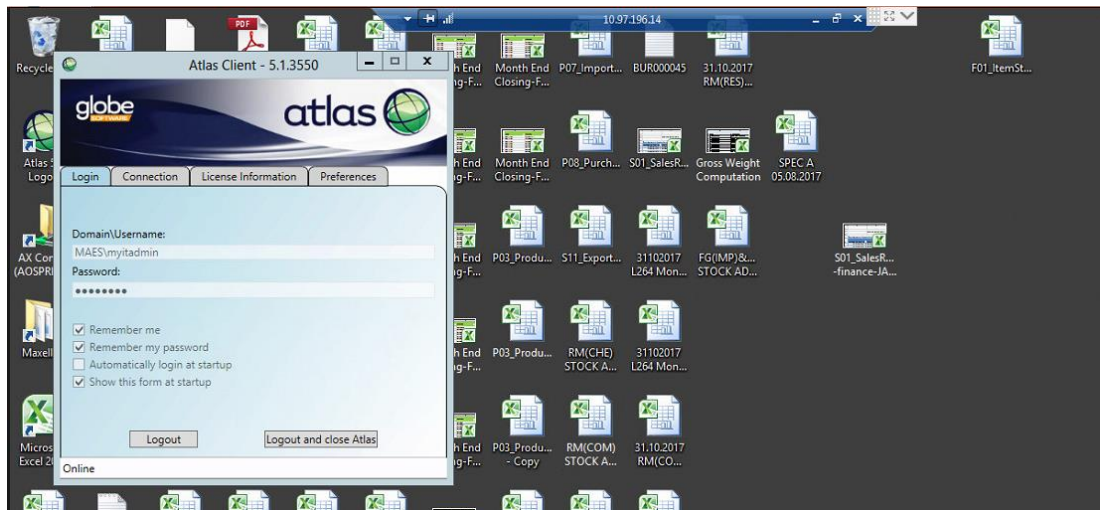
The rest of the spreadsheet contains various fields and data, including 'createdDate', 'CustAccount', 'SalesLine', 'SalesTable', 'Name (product specification)', 'SalesUnit', 'SalesQty', 'divDate', 'ReceiptDateRequested', 'SalesPrice', 'LineAmount', and 'deliveredIntc'.

## Option 2- Checking through existing report structure

This option will be much simplify as compared to option 1, however, this will required reporting tools or software such as Atlas to find out the table and field's name.

Note: Atlas is a reporting tool that extracted out from the database and insert into excel file, if the company have developed or have existing report structure. It will be much convenient for the process of finding out the table and field's name as the existing report structure contains the table and field's name as well as the relationship between the tables.

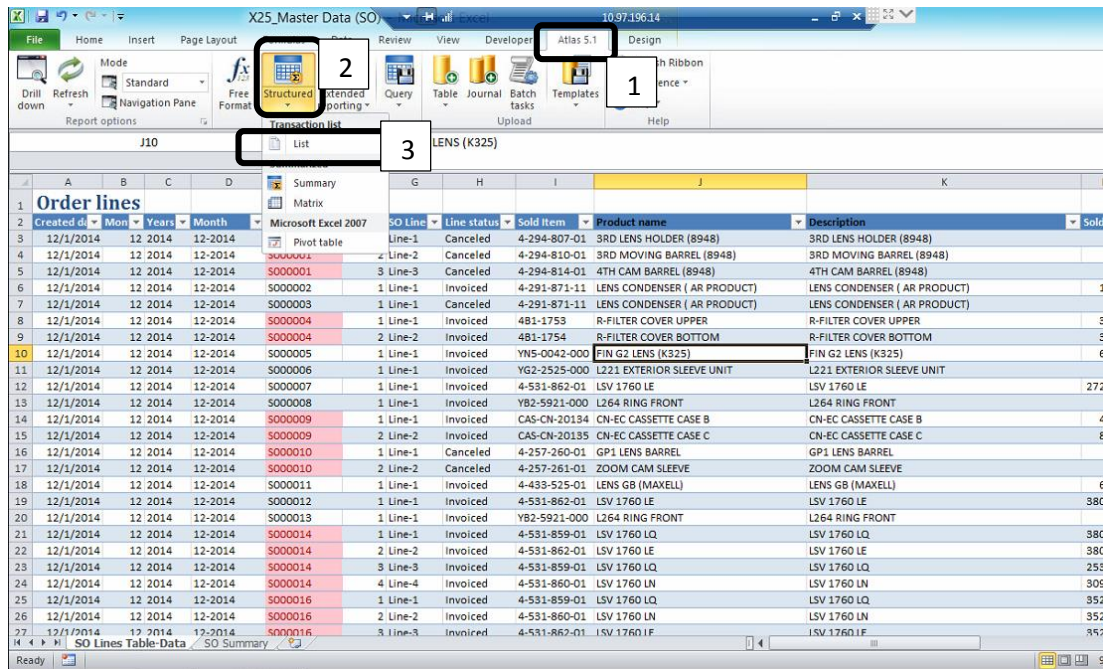
To use Atlas, make sure that the application is already login.



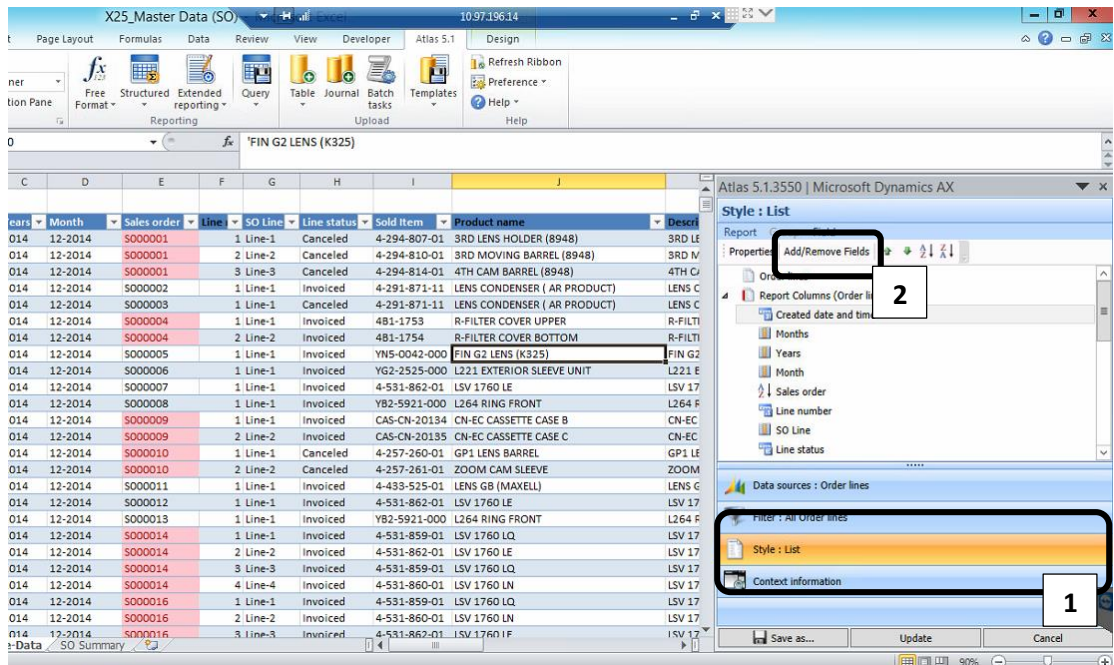
Select and open the existing report (Atlas report is in excel file format). Below is example of existing sales order report:

Created id	Mon	Year	Month	Sales order	Line	SO Line	Line status	Sold item	Product name	Description	Sold	Sum So	Display Su
1	12/1/2014	12	2014	12-2014	S000001	1	Line-1	Canceled	4-294-807-01	3RD LENS HOLDER (B948)	1	1	
2	12/1/2014	12	2014	12-2014	S000001	2	Line-2	Canceled	4-294-810-01	3RD MOVING BARREL (B948)	1	2	
3	12/1/2014	12	2014	12-2014	S000001	3	Line-3	Canceled	4-294-814-01	4TH CAM BARREL (B948)	1	3	
4	12/1/2014	12	2014	12-2014	S000002	1	Line-1	Invoiced	4-291-871-11	LENS CONDENSER ( AR PRODUCT)	1397	1397	
5	12/1/2014	12	2014	12-2014	S000003	1	Line-1	Canceled	4-291-871-11	LENS CONDENSER ( AR PRODUCT)	503	503	
6	12/1/2014	12	2014	12-2014	S000004	1	Line-1	Invoiced	481-1753	R-FILTER COVER UPPER	3000	3000	
7	12/1/2014	12	2014	12-2014	S000004	2	Line-2	Invoiced	481-1754	R-FILTER COVER BOTTOM	3000	6000	
8	12/1/2014	12	2014	12-2014	S000005	1	Line-1	Invoiced	YN5-0042-000	FIN G2 LENS (K325)	6091	6091	
9	12/1/2014	12	2014	12-2014	S000006	1	Line-1	Invoiced	YG2-2525-000	L221 EXTERIOR SLEEVE UNIT	48	48	
10	12/1/2014	12	2014	12-2014	S000007	1	Line-1	Invoiced	4-531-862-01	LSV 1760 LE	272703	272703	
11	12/1/2014	12	2014	12-2014	S000008	1	Line-1	Invoiced	YB2-5921-000	L264 RING FRONT	217	217	
12	12/1/2014	12	2014	12-2014	S000009	1	Line-1	Invoiced	CAS-CN-20134	CN-EC CASSETTE CASE B	4264	4264	
13	12/1/2014	12	2014	12-2014	S000009	2	Line-2	Invoiced	CAS-CN-20135	CN-EC CASSETTE CASE C	8283	12547	
14	12/1/2014	12	2014	12-2014	S000010	1	Line-1	Canceled	4-257-260-01	GP1 LENS BARREL	100	100	
15	12/1/2014	12	2014	12-2014	S000010	2	Line-2	Canceled	4-257-261-01	ZOOM CAM SLEEVE	67	167	
16	12/1/2014	12	2014	12-2014	S000011	1	Line-1	Invoiced	4-433-525-01	LENS GB (MAXELL)	6864	6864	
17	12/1/2014	12	2014	12-2014	S000012	1	Line-1	Invoiced	4-531-862-01	LSV 1760 LE	380160	380160	
18	12/1/2014	12	2014	12-2014	S000013	1	Line-1	Invoiced	YB2-5921-000	L264 RING FRONT	30	30	
19	12/1/2014	12	2014	12-2014	S000014	1	Line-1	Invoiced	4-531-859-01	LSV 1760 LQ	380160	380160	
20	12/1/2014	12	2014	12-2014	S000014	2	Line-2	Invoiced	4-531-862-01	LSV 1760 LE	380160	760320	
21	12/1/2014	12	2014	12-2014	S000014	3	Line-3	Invoiced	4-531-859-01	LSV 1760 LQ	253440	1013760	
22	12/1/2014	12	2014	12-2014	S000014	4	Line-4	Invoiced	4-531-860-01	LSV 1760 LN	309760	1332520	
23	12/1/2014	12	2014	12-2014	S000016	1	Line-1	Invoiced	4-531-859-01	LSV 1760 LQ	352000	352000	
24	12/1/2014	12	2014	12-2014	S000016	2	Line-2	Invoiced	4-531-860-01	LSV 1760 LN	352000	704000	
25	12/1/2014	12	2014	12-2014	S000016	3	Line-3	Invoiced	4-531-862-01	LSV 1760 LF	1056000	1056000	

To access into the report structure, click Atlas 5.1 tab → Structured → List

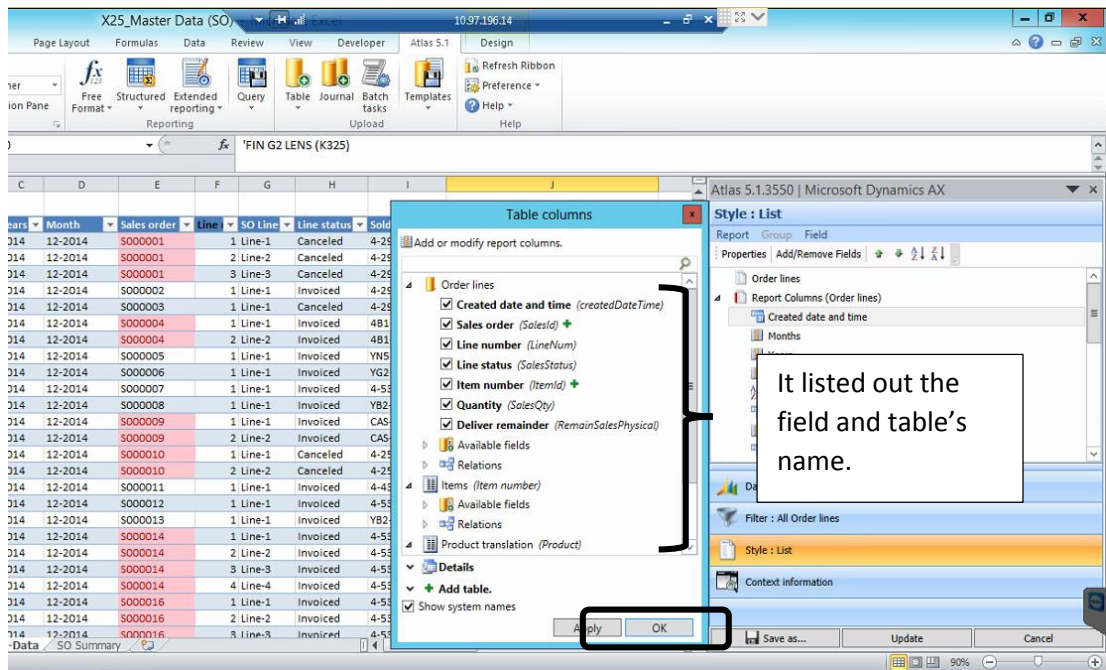


Click on Style: List and click on Add/Remove Fields



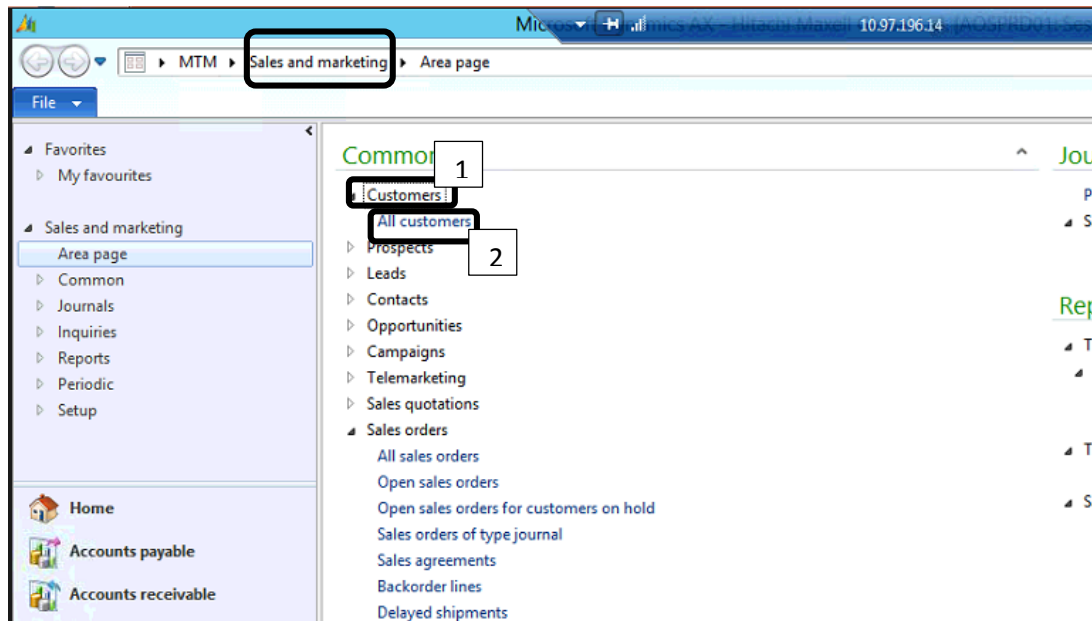


It will show the text box beside it. Inside the text box, it shows all related field and table's name. Make sure to tick on shows system name.



### Step 3.0 List Data Master's Table and Field

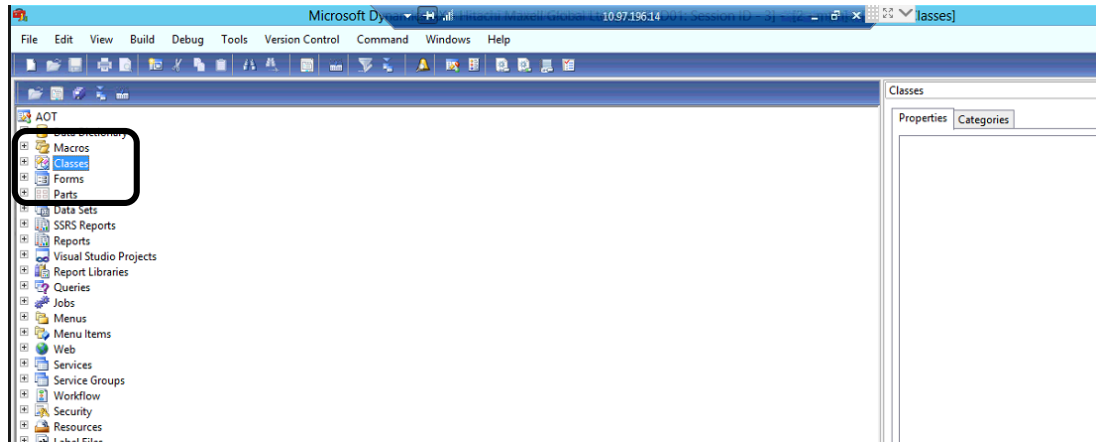
The step for listing the data master's table and field is similar to Steps 2. The only difference is the access to data master such as customer data is Sales and marketing module → Customers → All customers



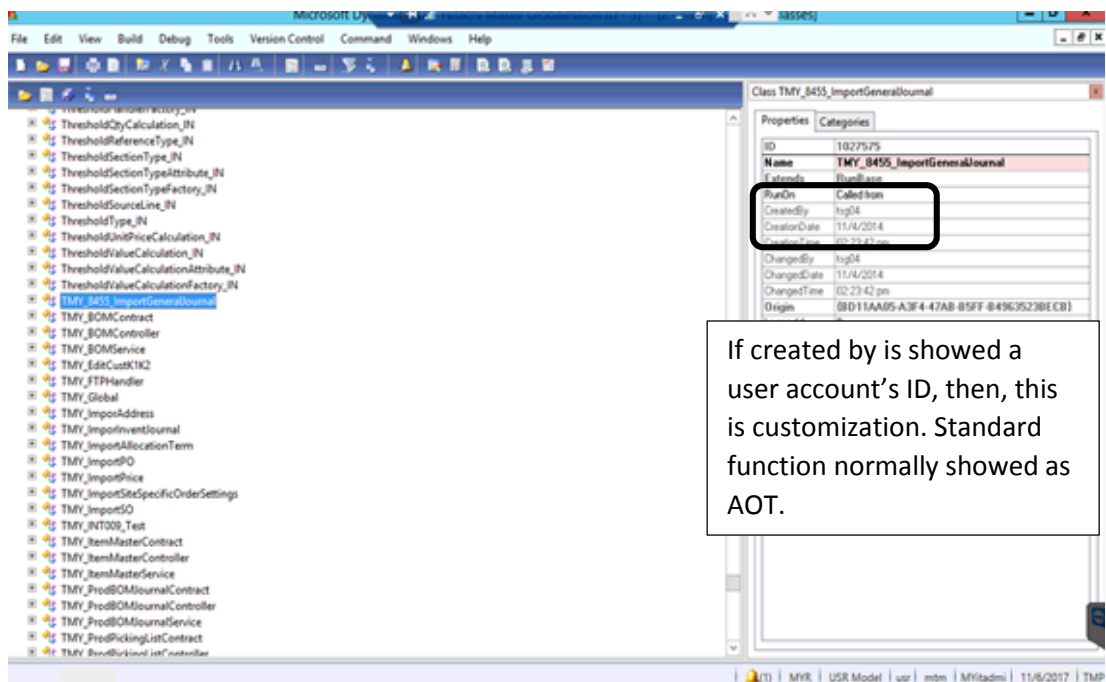
#### Step 4.0 List All Customization Functionality and Fields

To check whether that particular module have customization functionality, one way is to check in system backend/ AOT.

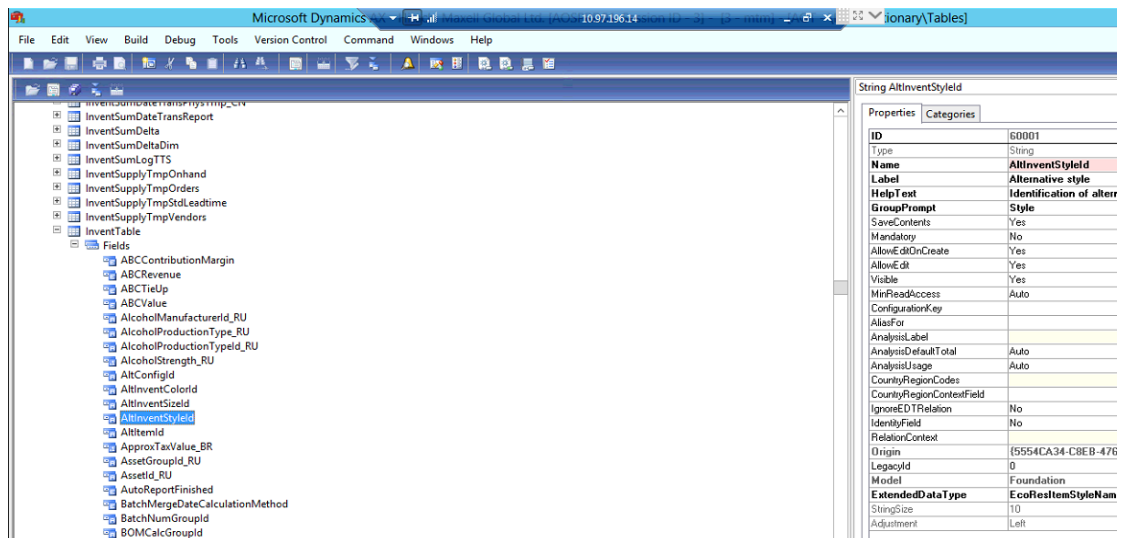
For checking the functionality, access to AOT → Classes



Note: For normal practice, the developer will usually put certain format on naming the functionality for easy identification. However, this may vary from company to company. Another way to identify whether the function is customization is through checking the properties of the function.



For customization field, the step is similar to checking the customization functionality. The only difference is access from Data Dictionary → Tables → selected table → fields.

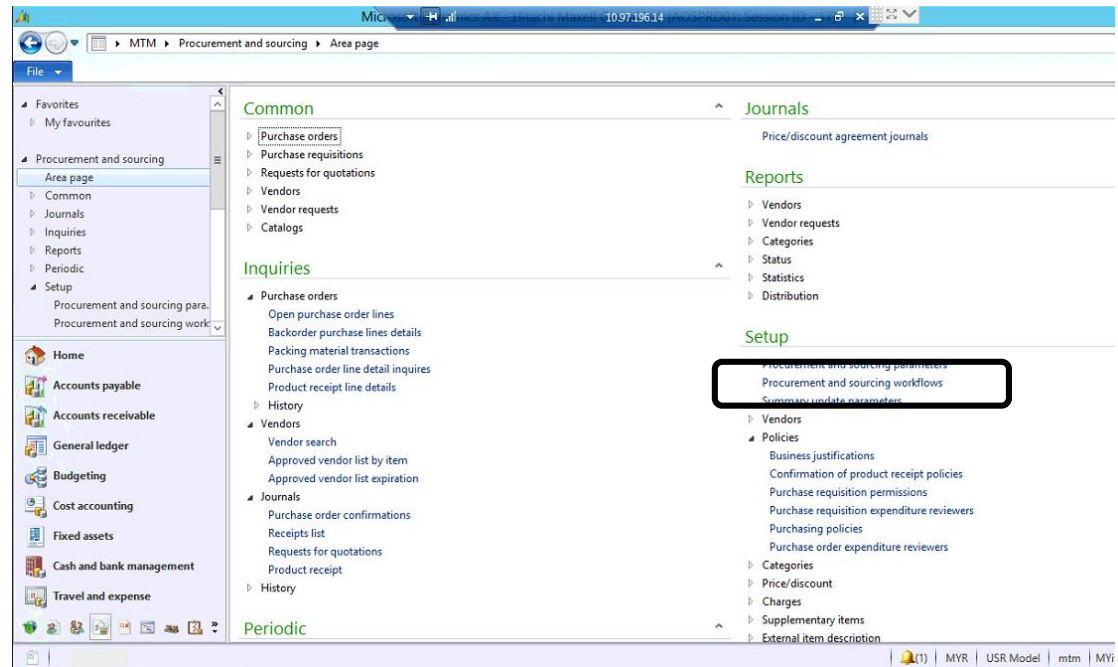


## Step 5.0 Workflow (business controlled process workflow)

Workflow is created to make sure the user create and post the transaction according to business operation process. Workflow also consider as customize function as it created based one company operation process.

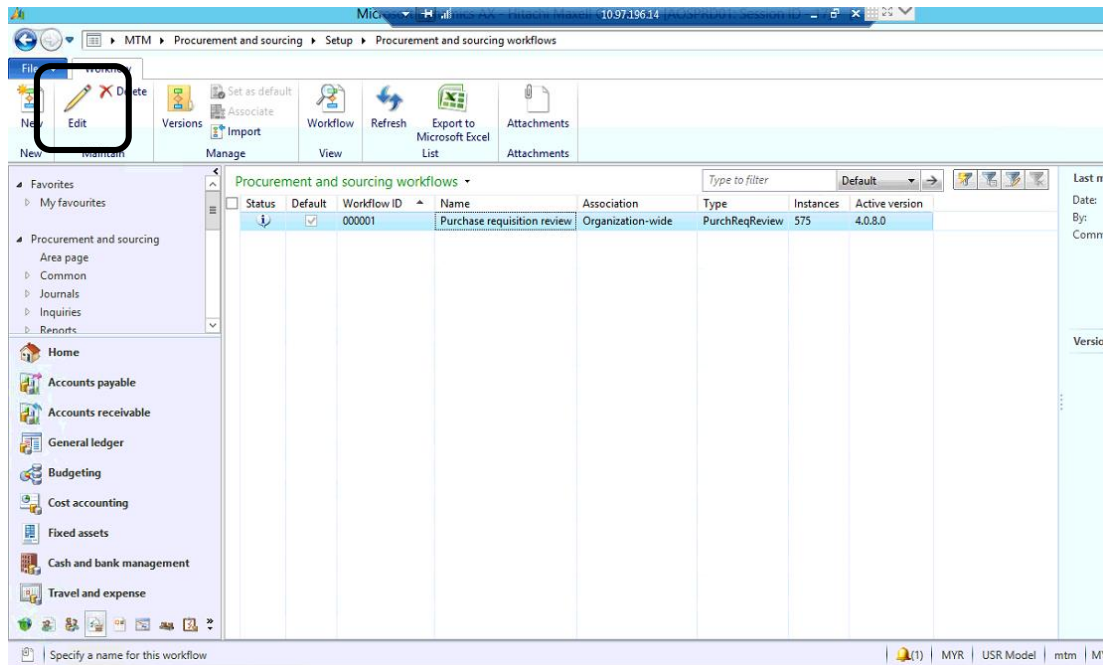
Note: Workflow might not exist in certain module as the process of posting transaction may not require to control by workflow. To show the example of workflow, the procurement and sourcing module is selected.

Go to Setup → Procurement and sourcing workflows

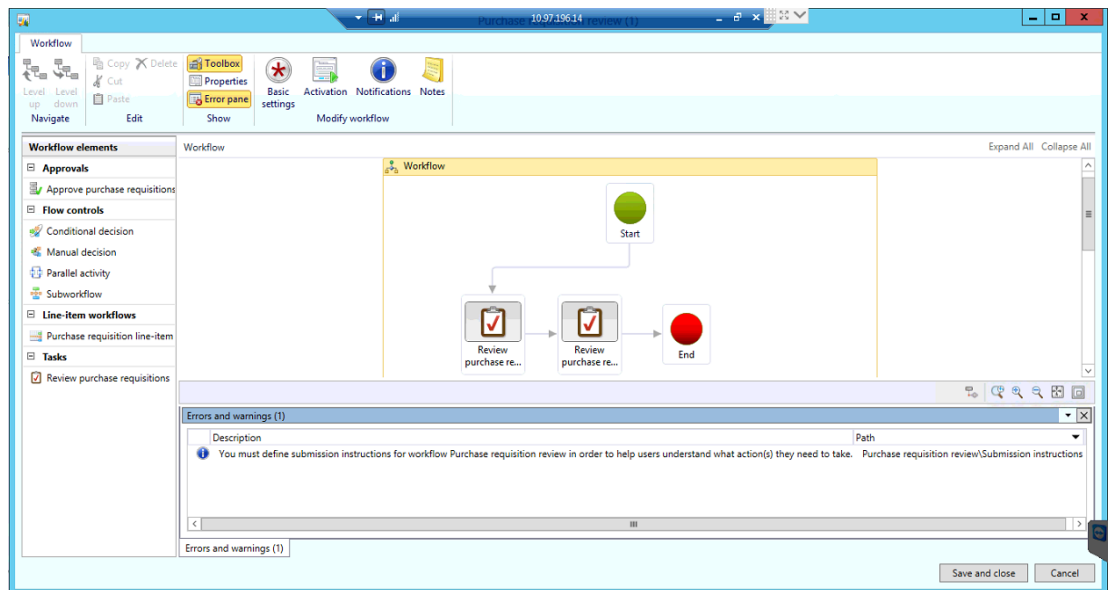




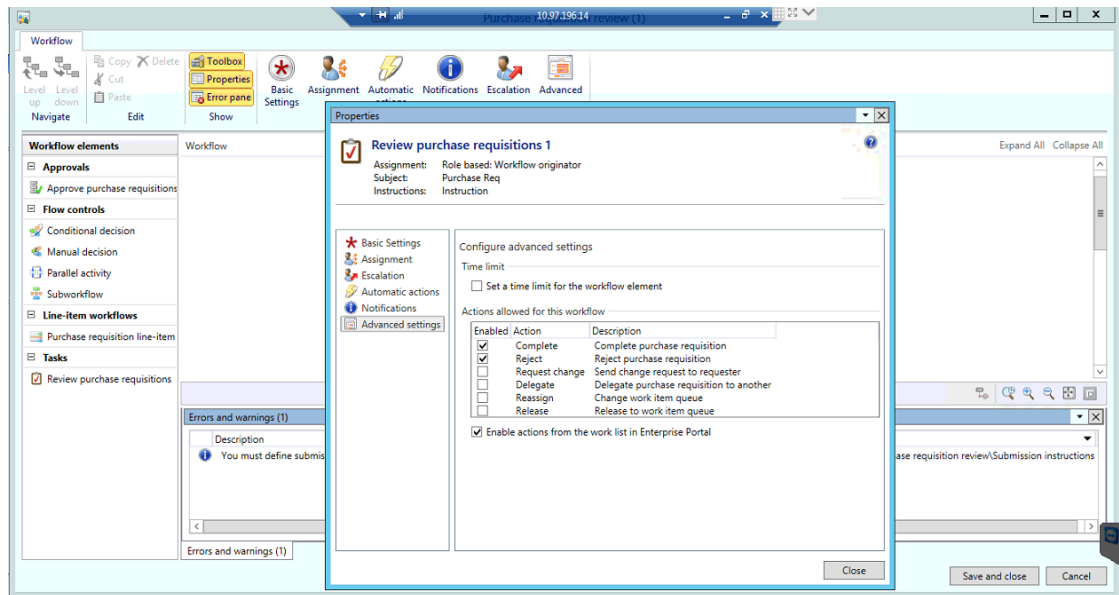
Click on edit



This screen showed the overview workflow:



To understand the how each of node work in the workflow, click on each of the node  
→ properties. The properties will shows the details action on each of the node.



### Step 6.0 Perform Comparison or Gap Analysis

This step involve performing comparison of fields between Dynamic AX 2012 (On-premise) and Dynamic 365 (Cloud based). This is to find out which fields is required to customize and configure in Cloud based system before proceed to data migration.

**Table 5.1: Gap Analysis**

Microsoft Dynamic AX 2012 Field	Descriptions	Microsoft Dynamic 365 Ability
<b>Item Master</b>		
Item Number	Item Number or Identification	Yes
Item Group ID	Item Group	Yes (insert on item parent hierarchy field)
Item Name	Item Name	Yes
Item Unit	Item Unit(kg, pcs, tons)	Yes
Item Price	Item Price	Yes
Price Currency	Price Currency	Yes
CostCenter	Product Dimension by Cost Center	No, required for customization to insert new field
Segment	Product Dimension by Segment	No, required for customization to insert new field

PL Group	Product Dimension by PL Group	No, required for customization to insert new field
<b>Customer Data</b>		
Customer Account Number/ Id	Customer Identification	Yes
Customer Name	Customer Name	Yes
Customer Group	Customer Group(eg. Local, International, Inter Company)	Yes (insert in Parent account)
Customer Business Number	Customer Business Number	No, required for customization to insert new field
Customer GST Number	Customer Registered GST Number	No, required for customization to insert new field
Customer GST Verification Date	Customer GST Verification Date	No, required for customization to insert new field
Customer Address	Customer Address	Yes
Customer Currency	Customer Billing Currency	Yes
Customer Payment Term	Customer Payment Term (eg. 60 days or 30 days)	Yes
Customer Invoice Account	Customer Invoice Account	Yes
Customer Delivery Term	Customer Delivery Term	Yes (insert in freight terms) *Required little customization adding value in the field
Customer Mode of Delivery	Customer Mode of Delivery	Yes (insert in Shipping Method) *Required little customization adding value in the field
Customer Tax Group	Customer Eligible for Tax	Yes (insert in Tax exempt-yes/no)
<b>Transaction Data</b>		
Sales Order Number	Sales Order Number	Yes (Auto generated by system, if client wants the old system SO number, can

		include in SO description field)
Customer Account	Customer Account	Yes (insert in Potential Customer)
Item ID	Item Identification	Yes
Item Name	Item Name	Yes
Item Unit	Item Unit	Yes
Sales Quantity	Sales Order Quantity	Yes
Delivery Date	Actual Delivery Date	Yes (insert in Date fulfill)
Request Receipt Date	Customer Request Receipt Date	Yes (insert in Request Date)
Sales Line Amount	Sales Order Line Amount	No (system can auto generate by calculating price x quantity)
Delivery Term	Delivery Term	Yes (insert in freight terms) *Required little customization adding value in the field
Mode of Delivery	Mode of Delivery	Yes (insert in shipping method) *Required little customization adding value in the field
Currency	Currency	Yes
<b>Customized Business Logic</b>		
Workflow	Recall Sales Order	No, required for customization.
Business Rule	Product Dimension rule	No, required for customization to define the dimension rule.

### Step 7.0 Pinpoint on the field or functionality required to do in 2nd phase Cloud Based customization

From the step 6's table, take note of the field or functionality that not existed in cloud based environment. This will required to start to do customization on next phase.

### **5.3 Stage 2- Second Stage of Build**

Building stage where configuration as well as customization comes in this part. The output of Gap analysis conducted in preparation stage plays important part in this build stage as it will be the guideline on what to develop. In this stage is about taking the planning convert into action where the main goal of this stage is to fulfill the functional requirement or the gap listed in the first stage of preparation.

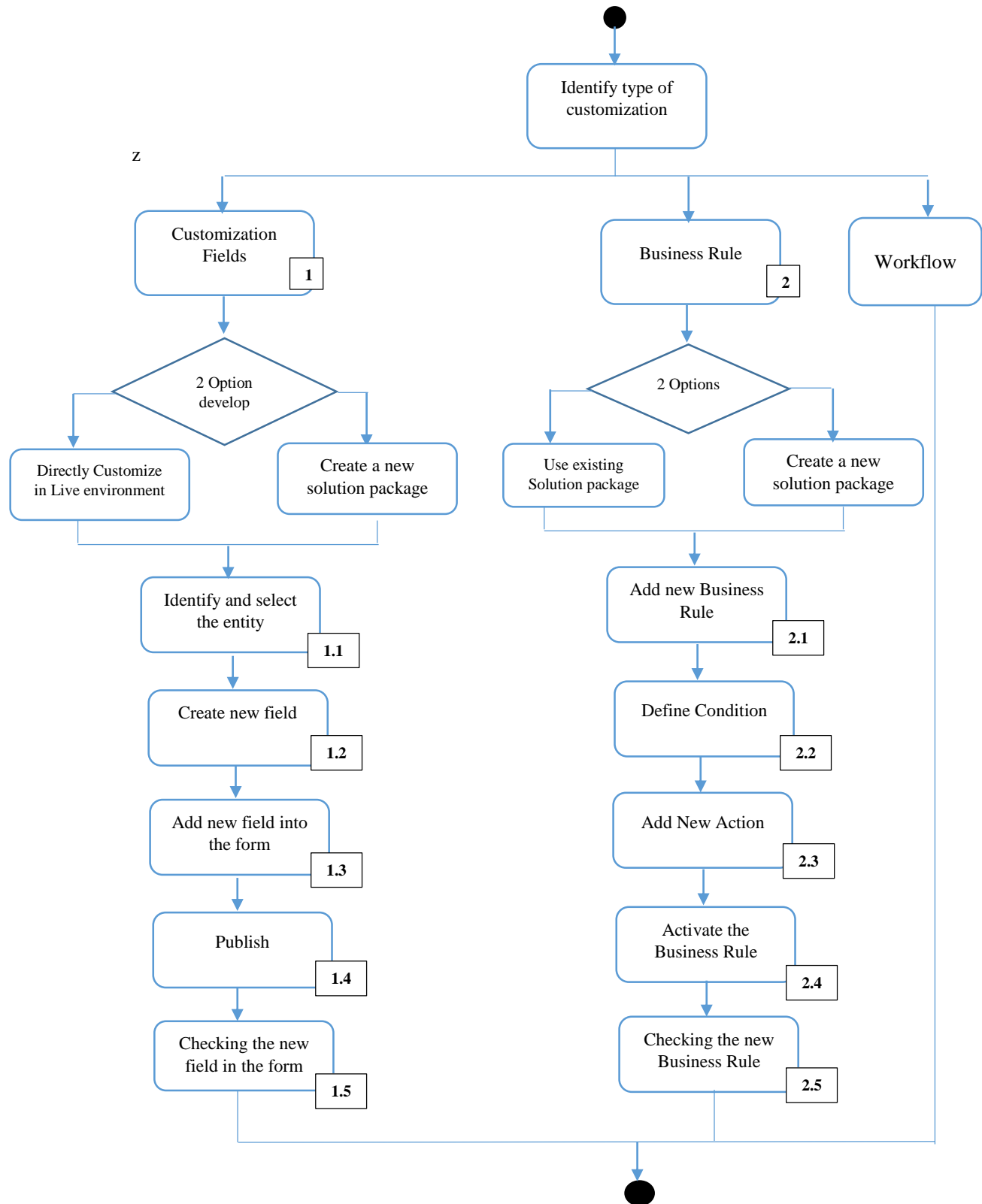
Checklist to do on development:

- Customization:
- Customization field
- Customization functionality
- Workflow (business controlled process workflow)

Note for company:

This chapter will cover about the basic customization that company or individual can undergo easily without any pre-requisition of other knowledge or skill (eg. programming language). However, if there is any customization functionality is being identified in the earlier stage of preparation and required to develop using coding, this is suggested that to find a Microsoft partner or related consultant firm to develop the customization. For this research, the customization will shows on assessing the backend of the system, understand what is entities, how to identify which form involved, add new the field, configure the field and create the workflow into the posting process.

### 5.3.1 Flowchart for Build Stage



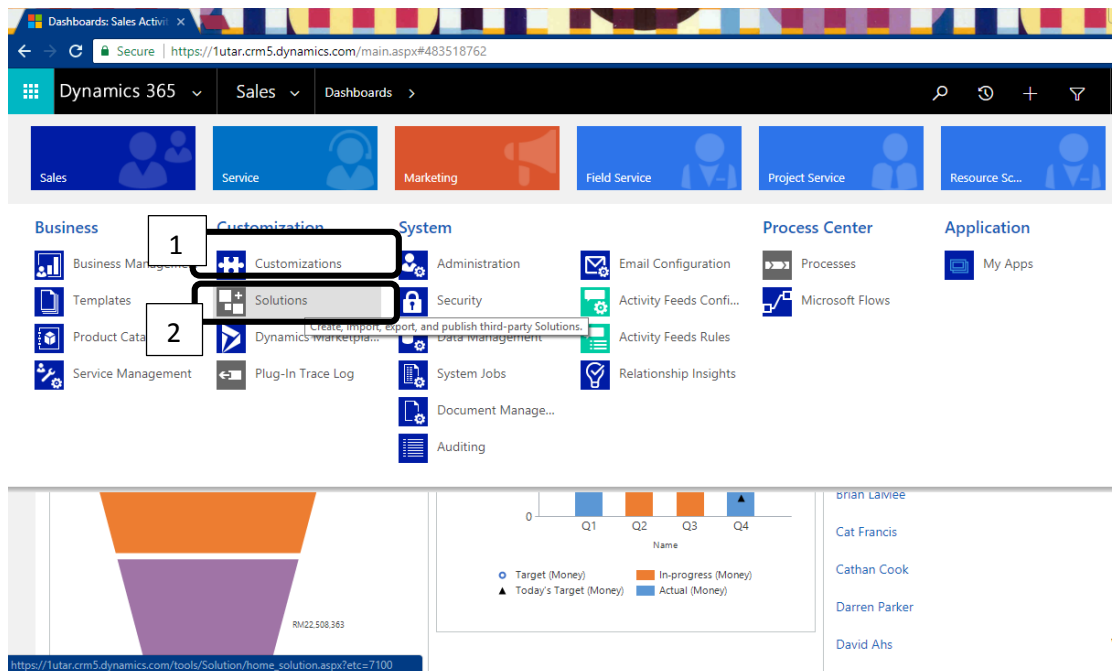
## Step 1.0 Customization Fields

Before start any customization, there is two options for company or individual to develop customization.

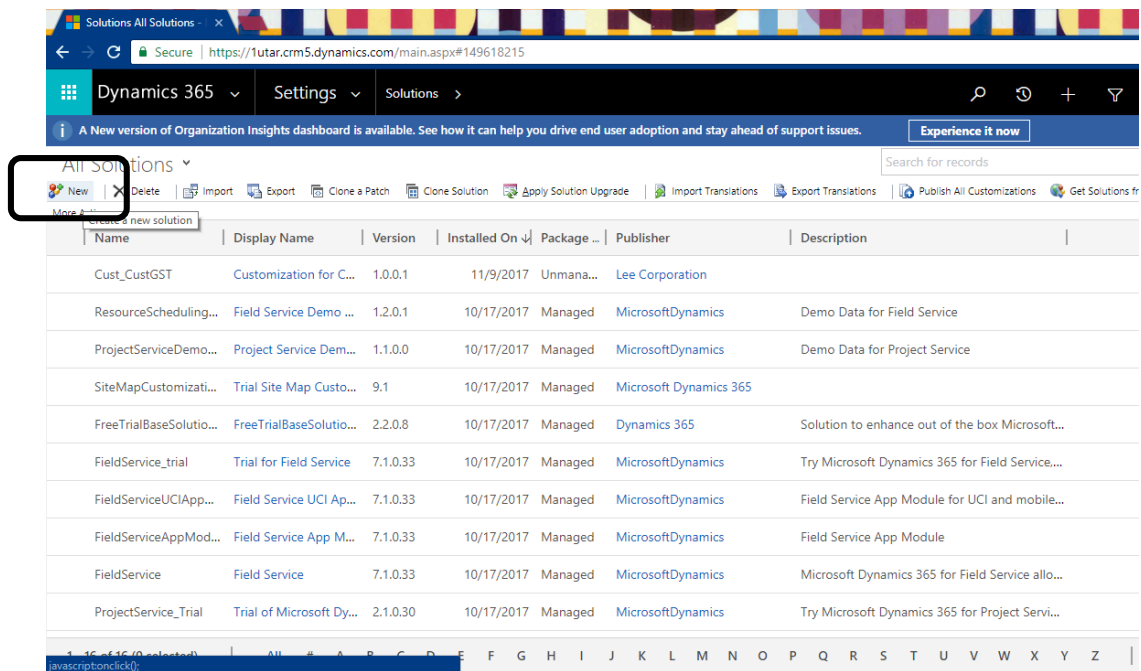
1. Directly customize on the system, not require any deployment.
2. Create a solution package and deploy into the system when development is done.

Note: It is recommended for company or individual to create a solution package, develop the customization within the package and deploy the package into live environment. Creating solution package have several benefit:

- Ability to back up the customization by export out the solution package.
- The development within solution package will not affect the live environment.
- Developer can choose an appropriate date to deploy the solution package into live environment when the development is done.
- Developer can use the solution package to apply in other environment or system.



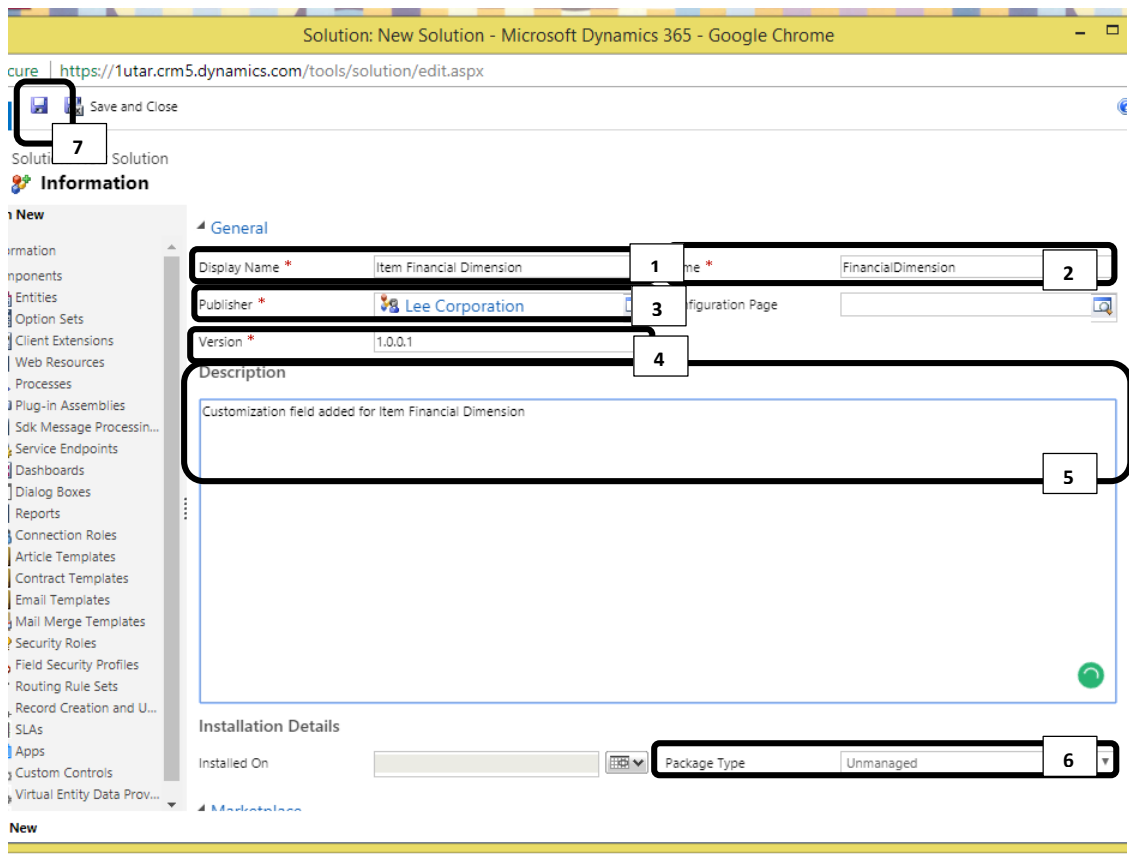
To create a new solution, go to Settings → Solutions → click New button



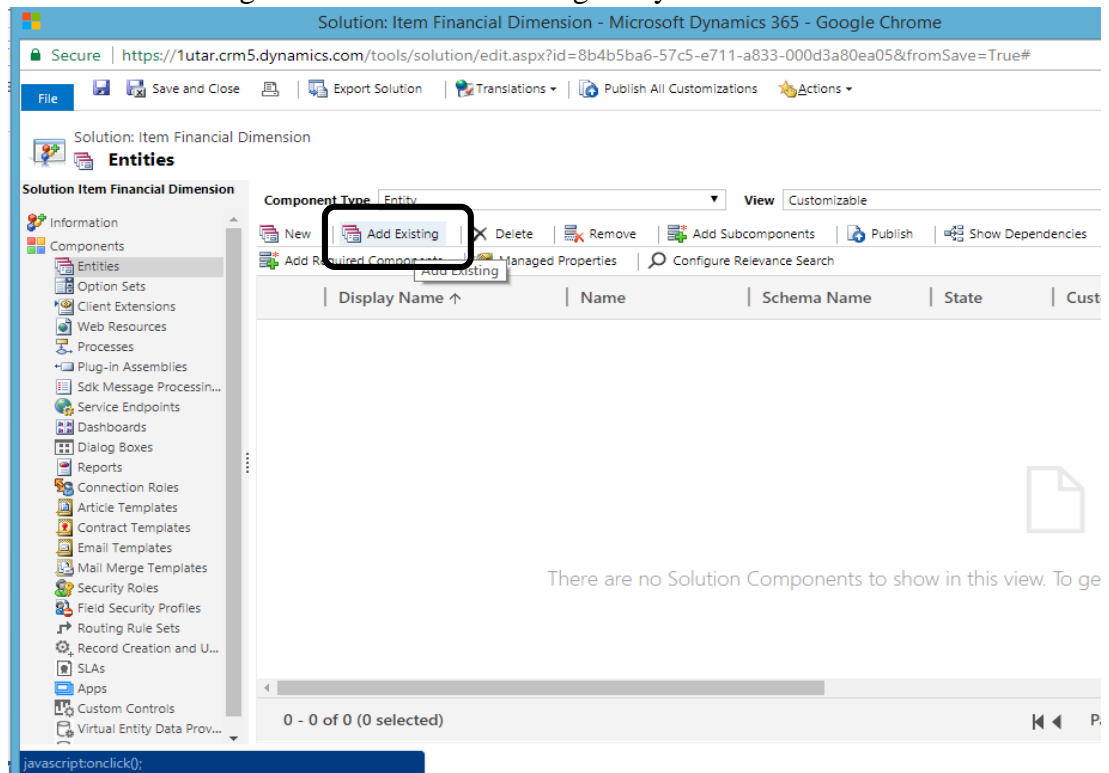
System will prompt out a window, there is several column required to fill up:

1. Define the solution display name.
2. Define the solution system name (without any space).
3. Publisher (Select the existing or create new publisher. The purpose is to identify the developer who publish the customization into the live environment.)
4. Version, give a numeric format on it.
5. Description, give a brief description on the package.
6. Package type, you can choose either unmanaged or managed. Unmanaged means the developer still can modify the solution package in anytime, managed means the solution package is the final version and cannot modify further by any developer in anytime.
7. Click Save button.



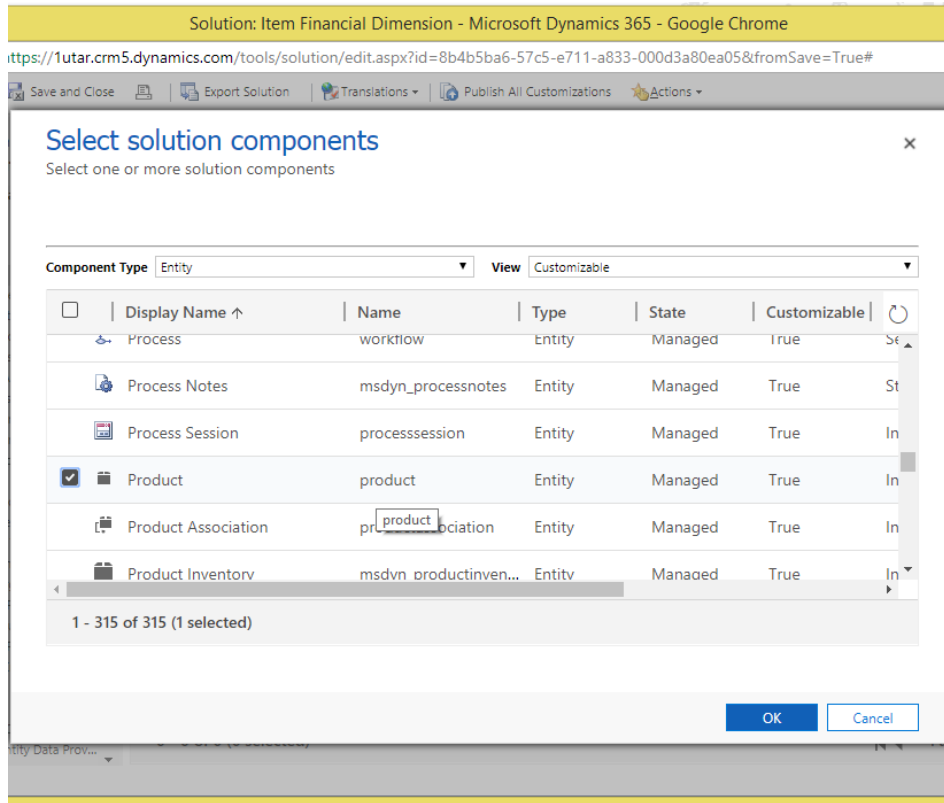


Click Add Existing button to add the existing entity.

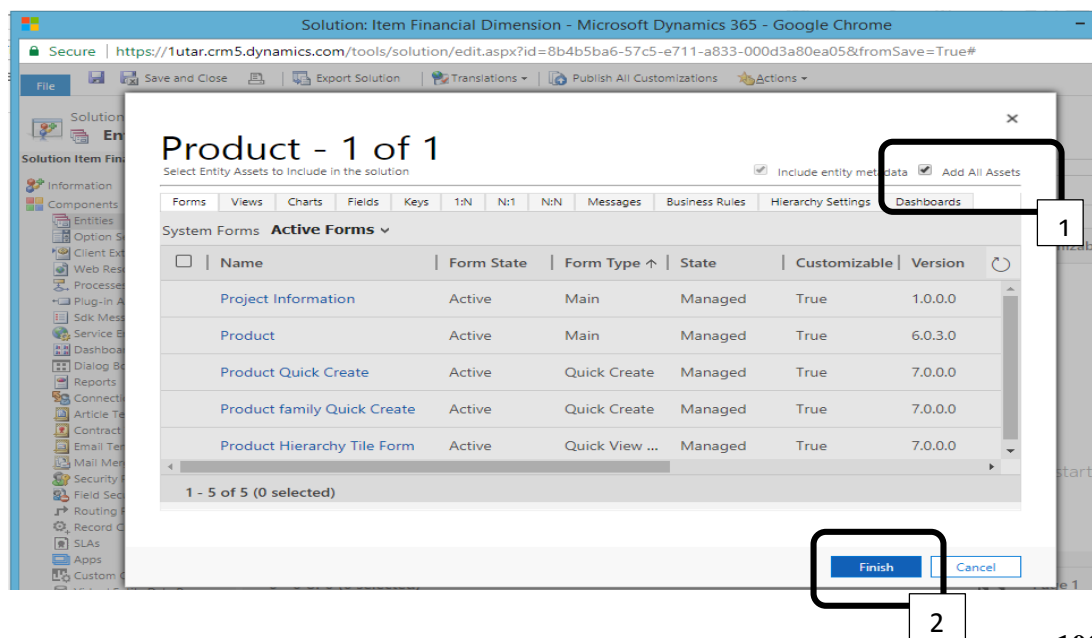


## Step 1.1 Identify and Select Entity

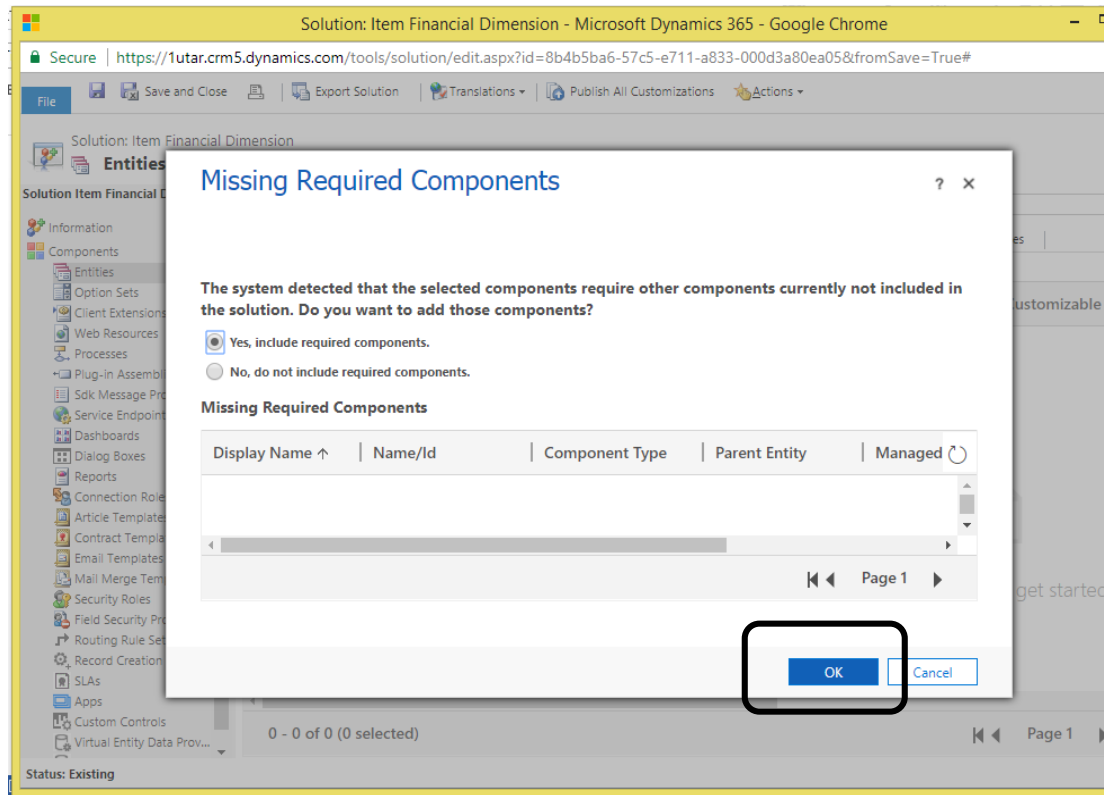
Choose which entity that you wish to customize. If you are not sure to choose which entity, please refer to Identify the entity name (page- 115).



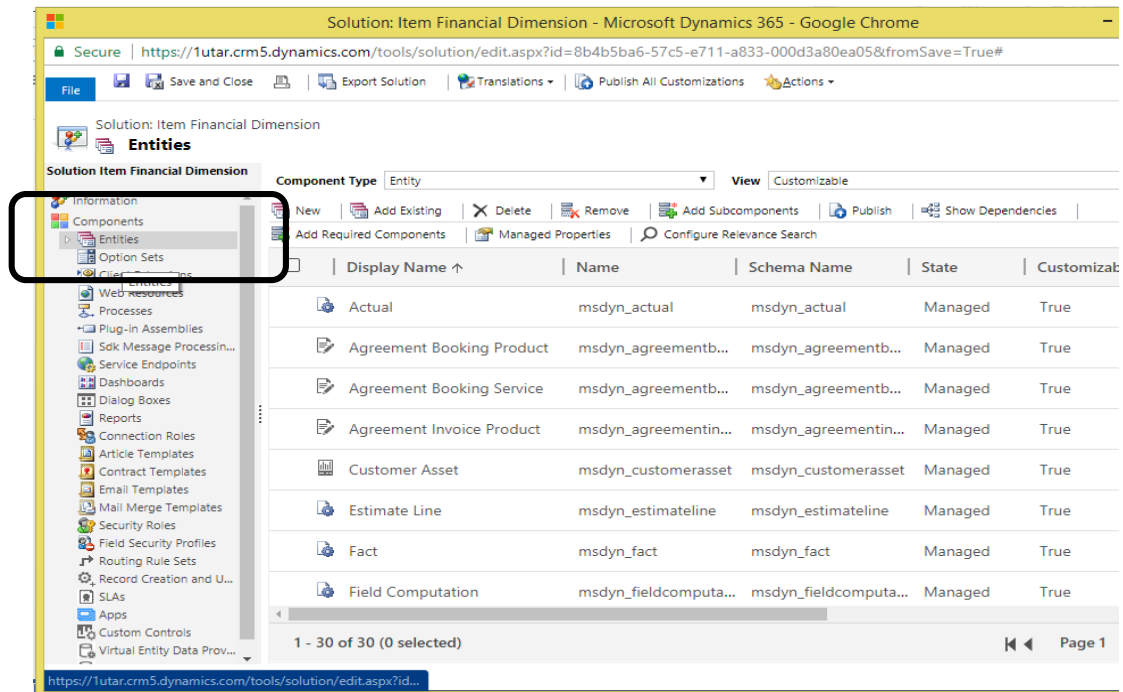
If you not sure which component that you wish to modify, you can always to tick Add All Assets to add all component under the entity of Product:



This page is to warn if there is any component is missing when selecting certain component in previous page. In this case, there is no component is missing as Add All Asset is tick in previous page. Click Ok to proceed to next page.



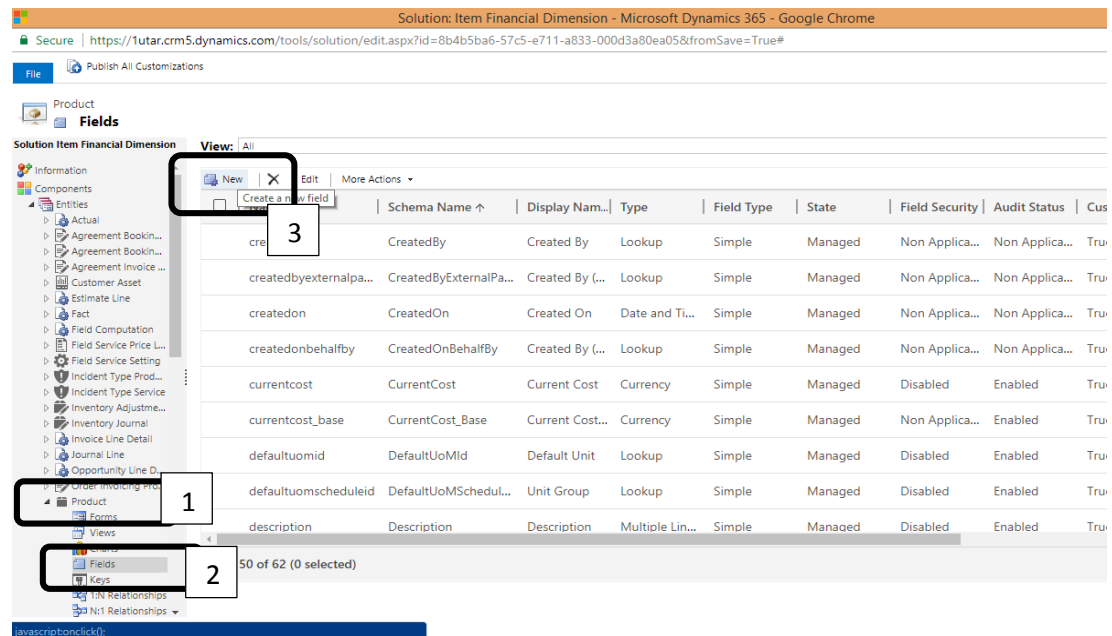
The system done import the related entities into the solution package. Expand the Entities.



## Step 1.2 Create new Field

Search the related entity and expand. In this case, Product entity is required to customize.

1. Click and expand the Product
2. Click Fields
3. Click New button to create new fields



The system prompt a new windows. On the page, there is several column require to define:

1. Display name- Define a name for the new field
2. Name- Define a system name for the new field
3. Field requirement- there is several option for you to choose from:
  - a. Optional- user can either to fill in or not to fill in.
  - b. Business recommend- system will prompt a message to recommend user to fill in, user can ignore it.
  - c. Business required- system will enforce user to fill in.
4. Field security- this option is used to control which user can access and modify the field.
5. Auditing- this option is used to trace which user and when the data is being modify on the field.
6. Description- key in the description for the new field.
7. Data type- choose the type of data in the field.
8. Field type- choose either simple (store data) or calculated (data will be calculated according to formula).
9. Format- choose the data format to show in the field.
10. Maximum Length- restrict how many character can be enter in the field.
11. IME Mode- this option is relevant if there is special character such as Chinese character. Default value should leave as auto.

Field: New for Product - Google Chrome

Working on solution: Item Financial Dimension

General

Schema

Display Name \* MTM Segment

Name \* new\_DefaultDimension\_MTMSegment

Field Security ☐ Enable ☒ Disable

Auditing \* ☒ Enable ☐ Disable

Field Requirement \* Business Recommended

Searchable

Description

Appears in global filter in interactive experience ☐ Sortable in interactive experience dashboard ☐

For information about how to interact with entities and programmatically, see the [Microsoft Dynamics 365 SDK](#)

Type

Data Type \* Single Line of Text

Field Type \* Simple

Format \* Text

Maximum Length \* 100

IME Mode \* auto

In this case, field is required user to select several value instead of allow user to type value in the field. To allow the user to have several value to choose from, follow below choice:

1. Data Type = Option Set
2. Field Type = Simple
3. Use Existing Option Set = No
4. Default Value = Unassigned Value
5. To add the value, click on the Add button.
6. Label = enter the value
7. Value = no required to enter, leave as default
8. Description = enter the value description

Repeat the step 5-8 if more value require to add in the list.

Field: New for Product - Google Chrome

crm5.dynamics.com/tools/systemcustomization/attributes/manageAttribute.aspx?appSolutionId=%7b8b485ba6-57c5-e711-a833-000d3a80ea05%7d&entityId=%7baaf9be65-10c2-415d-8c1...

Working on solution: Item Financial Dimension

General

Description

Appears in global filter in interactive experience ☐ Sortable in interactive experience dashboard ☐

For information about how to interact with entities and fields programmatically, see the [Microsoft Dynamics 365 SDK](#)

Type

Data Type \* Option Set

Field Type \* Simple

Use Existing Option Set ☐ Yes ☒ No

Default Value Unassigned Value

Options

Label \* 455

Value \* 100,000,000

Description Optical lens

Color #0000ff

6

7

8

5

Click Save and Close button.

Field: New for Product - Google Chrome

Secure https://1tutar.crm5.dynamics.com/tools/systemcustomization/attributes/manageAttribute.aspx?appSolutionId=%7b8b485ba6-57c5-e711-a833-000d3a80ea05%7d&entityId=%7b...

File Save and Close

Field New for Product

Common

Information

Business Rules

General

Description

Appears in global filter in interactive experience ☐ Sortable in interactive experience dashboard ☐

For information about how to interact with entities and fields programmatically, see the [Microsoft Dynamics 365 SDK](#)

Type

Data Type \* Option Set

Field Type \* Simple

Use Existing Option Set ☐ Yes ☒ No

Default Value Unassigned Value

Options

Label \* 455

Value \* 100,000,000

Description Optical lens

Color #0000ff

javascriptonclick();

## Step 1.2.1 Checking on the new added field

Click on the View and choose custom.

**Solution Item Financial Dimension - Fields**

**View:** All, Custom (selected), Customizable

Name	Schema Name	Display Name	Type	Field Type	State	Field Security	Audit Status	Is Customizable
createdby	CreatedBy	Created By	Lookup	Simple	Managed	Non Applica...	Non Applica...	True
createdbyexternalpa...	CreatedByExternalPa...	Created By (...)	Lookup	Simple	Managed	Non Applica...	Non Applica...	True
createdon	CreatedOn	Created On	Date and Ti...	Simple	Managed	Non Applica...	Non Applica...	True
createdonbehalfby	CreatedOnBehalfBy	Created By (...)	Lookup	Simple	Managed	Non Applica...	Non Applica...	True
currentcost	CurrentCost	Current Cost	Currency	Simple	Managed	Disabled	Enabled	True
currentcost_base	CurrentCost_Base	Current Cost...	Currency	Simple	Managed	Non Applica...	Enabled	True
defaultuomid	DefaultUoMId	Default Unit	Lookup	Simple	Managed	Disabled	Enabled	True
defaultuomscheduleid	DefaultUoMSchedul...	Unit Group	Lookup	Simple	Managed	Disabled	Enabled	True
description	Description	Description	Multiple Lin...	Simple	Managed	Disabled	Enabled	True

1 - 50 of 64 (0 selected)

Status: Existing

These are new created customized field for the company.

**Solution Item Financial Dimension - Fields**

**View:** Custom

New X Edit More Actions

Name	Schema Name	Display Name	Type	Field Type	State
<input checked="" type="checkbox"/> new_defaultdimension_mtmsegment	new_DefaultDimensi...	MTM Segment	Option Set	Simple	Unmanaged
<input checked="" type="checkbox"/> new_defaultdimension_mtmplgroup	new_DefaultDimensi...	MTM PL Group	Option Set	Simple	Unmanaged
<input checked="" type="checkbox"/> new_defaultdimension_mtmcostcenter	new_DefaultDimensi...	MTM Cost Center	Option Set	Simple	Unmanaged
msdyn_upccode	msdyn_UPCCode	UPC Code	Single Line ...	Simple	Managed
msdyn_transactioncategory	msdyn_TransactionC...	Transaction Category	Lookup	Simple	Managed
msdyn_taxable	msdyn_Taxable	Taxable	Two Options	Simple	Managed
msdyn_purchasename	msdyn_PurchaseNa...	Purchase Name	Single Line ...	Simple	Managed
msdyn_fieldserviceproducttype	msdyn_FieldServiceP...	Field Service Product Type	Option Set	Simple	Managed
msdyn defaultvendor	msdyn DefaultVendor	Default Vendor	Lookup	Simple	Managed

1 - 10 of 10 (3 selected)

Status: Existing



### Step 1.3 Add new field into the Form

Under the entity Product, click on the form and select the form that the new field need to display.

Note: if you not sure which form to refer, please refer to Identify the entity name and form name (page- 115).

Name	Form State	Form Type	State	Customizable	Version	Description
Product Information	Active	Main	Managed	True	1.0.0.0	Shows the product details page for Product Information.
Product	Active	Main	Managed	True	6.0.3.0	A form for this refreshed entity.
Product Quick Create	Active	Quick Create	Managed	True	7.0.0.0	Default quick create form for Product.
Product family Quick Create	Active	Quick Create	Managed	True	7.0.0.0	Default quick create form for Product family.
Product Hierarchy Tile Form	Active	Quick View ...	Managed	True	7.0.0.0	This is the product hierarchy definition.

To add the new field, click on Filter and select Custom Fields.

Form: Product

Field Explorer

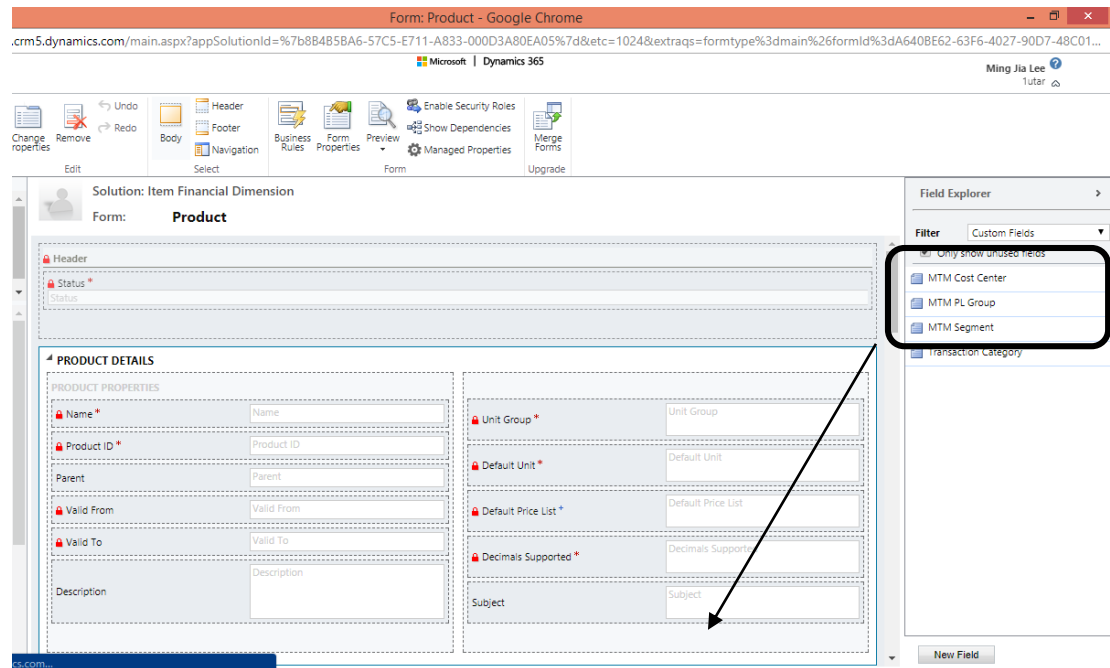
Filter: All Fields

Only show fields that are:

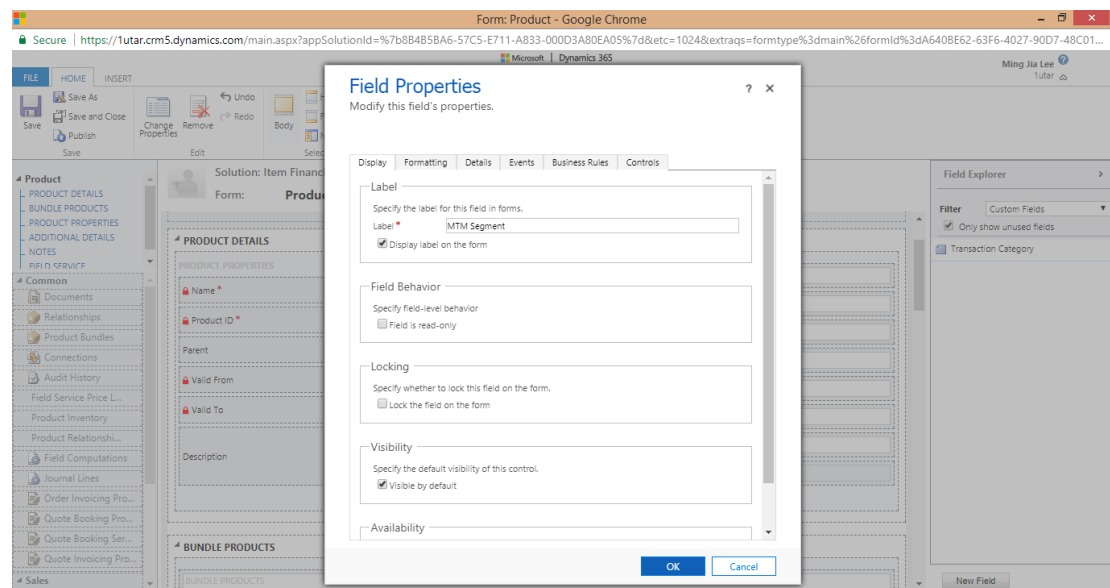
- Custom Fields
- Created By
- Created By (Delegate)
- Created By (External Party)
- Created On
- Currency
- Current Cost
- Current Cost (Base)
- Exchange Rate
- Is Kit
- List Price
- List Price (Base)
- Modified By
- Modified By (Delegate)
- Modified By (External Party)
- Modified On

New Field

System will shows the customization field. Click, drag and drop the field from the list onto the form.



Double click on the field, you can change the field size and other formatting through the Field Properties.



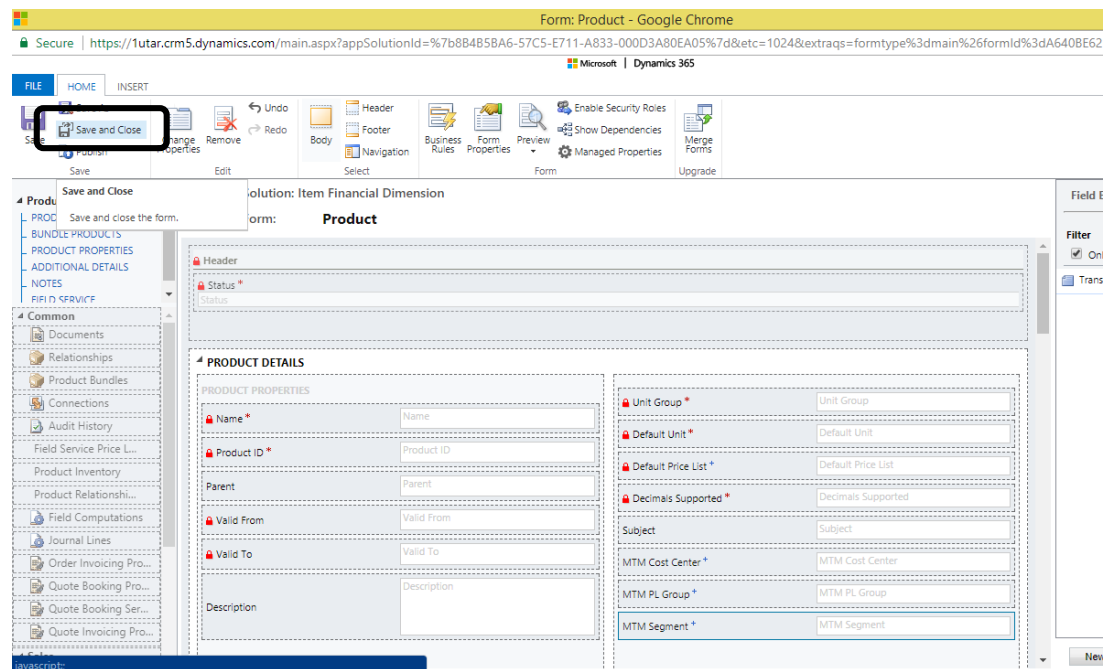
To preview the form, click on Preview button → Desktop Client → Create Form

The screenshot shows the Microsoft Dynamics 365 'Form: Product' editor. The 'Preview' button in the top ribbon is highlighted with a black box. A tooltip for the 'Create Form' button is visible, stating: "Preview how this form will look after it is published. This is what will be displayed when a user creates a new record." The main area shows the 'Product' form layout with sections like 'PRODUCT DETAILS' and 'PRODUCT PROPERTIES'.

Below is the preview of the form when the user enter new data, the new field can be seen as below:

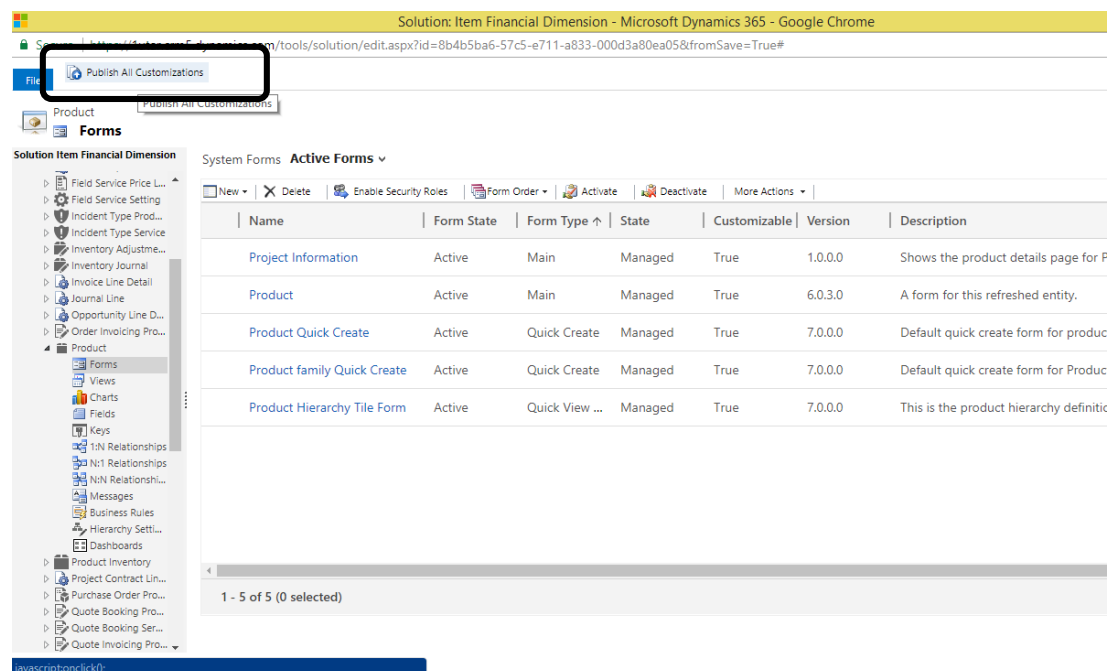
The screenshot shows the Microsoft Dynamics 365 'Form: Product' preview. The form is titled 'New Product' and shows the 'PRODUCT DETAILS' section. The 'MTM Cost Center' field is highlighted with a black box. The form also includes sections for 'FIELD SERVICE' and 'GENERAL'.

Click Save and Close when all field is done added.



## Step 1.4 Publish

Click Publish All Customization to publish all customization within the solution package into Live environment. This is optional, you can choose not to publish the package into Live environment.



The system will show the message publishing customization. After the message is disappear, click close to exist the solution page.

The screenshot shows the 'Solution Item Financial Dimension' in Microsoft Dynamics 365. The left sidebar lists various components, with 'Forms' selected under the 'Product' entity. The main pane displays a table of 'System Forms' for 'Active Forms'. A yellow box highlights the message 'Publishing customizations...' which appears over the table.

Name	Form State	Form Type	State	Customizable	Version	Description
Project Information	Active	Main	Managed	True	1.0.0.0	Shows the product details page for Product
Product	Active	Main	Managed	True	0.3.0	A form for this refreshed entity.
Product Quick Create	Active	Quick Create	Managed	True	0.0.0	Default quick create form for product.
Product family Quick Create	Active	Quick Create	Managed	True	0.0.0	Default quick create form for Product
Product Hierarchy Tile Form	Active	Tile	Managed	True	0.0.0	This is the product hierarchy definition

### Step 1.5 Checking on the new added field in the form

To check back whether the field is exist in the Live environment, click the page that you have insert the new field. In this case, the new field is located at the product form. To go to product form, double click one of the item.

The screenshot shows the 'Products' page in Microsoft Dynamics 365. The page displays a list of products under the heading 'All Products, Families & Bundles'. A black box highlights the product 'Southridge Laptop15.4W M1...' which is in an 'Active' state.

Name	Product ID	Hierarchy Path	Valid From	Valid To	Status	Product Struct...
Southridge Video Roundtabl...	045321				Under Revisi...	Product
Southridge Laptop15.4W M1...	5637146264				Active	Product
Southridge Laptop8.9 E0890	5637146268				Active	Product
Southridge Laptop19W X1980	5637146272				Active	Product
Southridge Laptop15 M1501	5637146276				Active	Product
Southridge Laptop12 M1201	5637146280				Active	Product
Southridge Laptop16 M1601	5637146284				Active	Product
WWI Laptop19W X0196	5637146288				Active	Product

The field is showing on the form.

Product: Southridge Laptop15.4W M1548

Status: Active

Warning: A default price list has not been set.

Field	Value
Product ID	5637146264
Family Hierarchy	
Valid From	
Valid To	
Description	
*Default Price List	
*Decimals Supported	2
Subject	
*MTM Cost Center	
*MTM PL Group	
*MTM Segment	

PRODUCT PROPERTIES

Active

This show that the value setting in the field is correct after several attempt of key in value:

Product: Southridge Laptop15.4W M1548

Status: Active

Warning: A default price list has not been set.

Field	Value
Product ID	5637146264
Family Hierarchy	
Valid From	
Valid To	
Description	
*Default Price List	
*Decimals Supported	2
Subject	
*MTM Cost Center	11000
*MTM PL Group	OGL
*MTM Segment	455

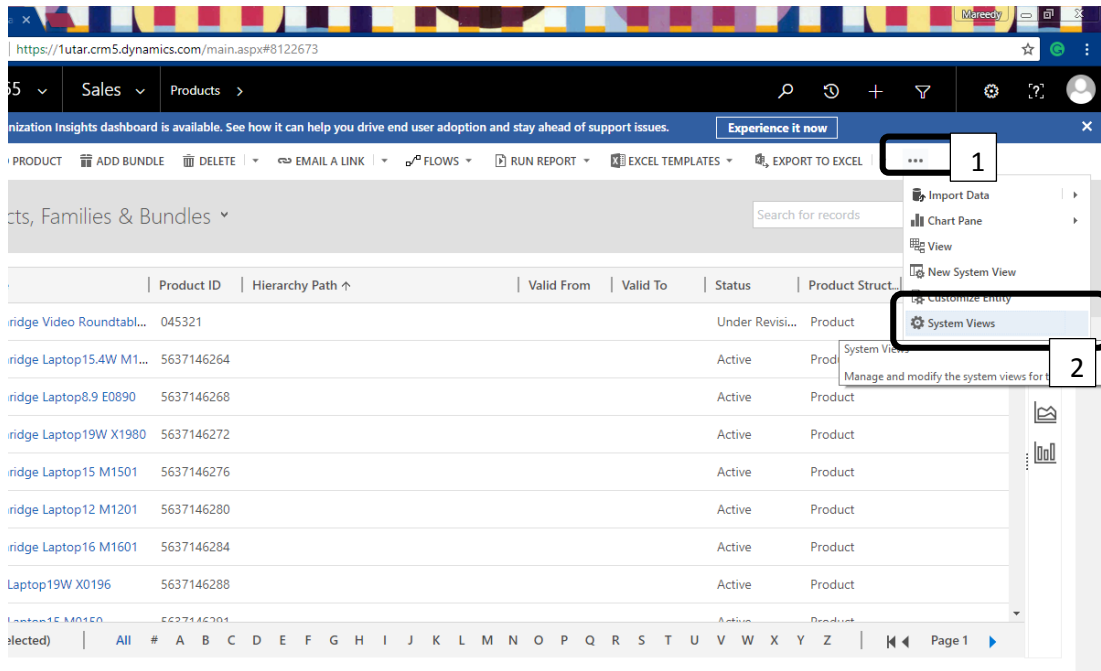
PRODUCT PROPERTIES

Active

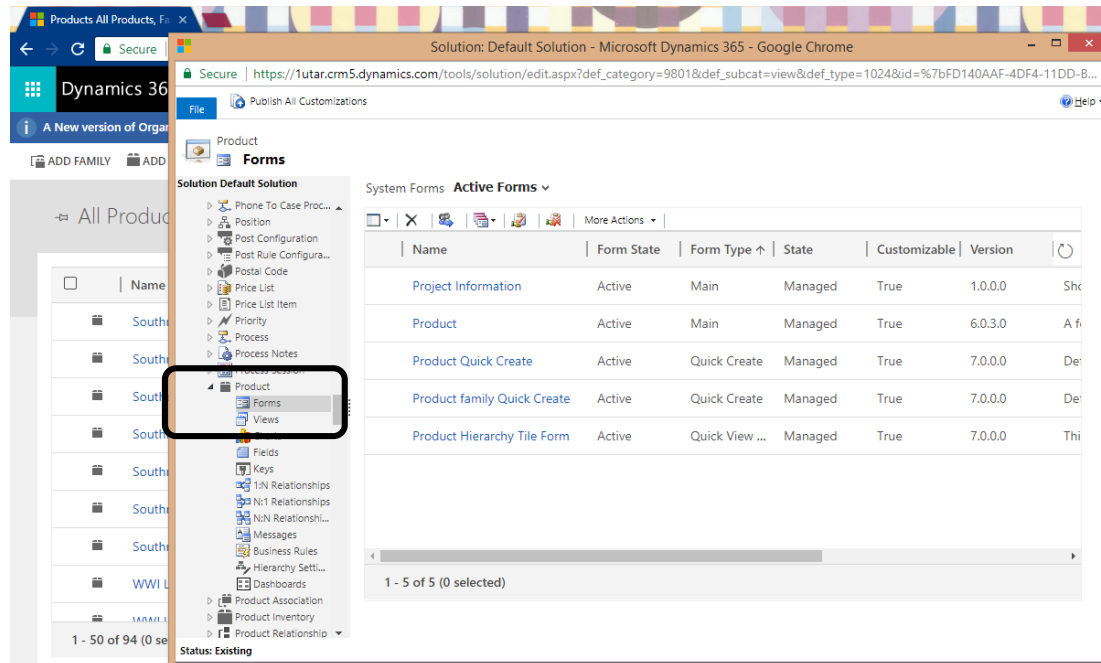
unsaved changes

## Identify the entity name and form name

To identify the name of this entity, go to the page that you wish to develop and click on System Views.

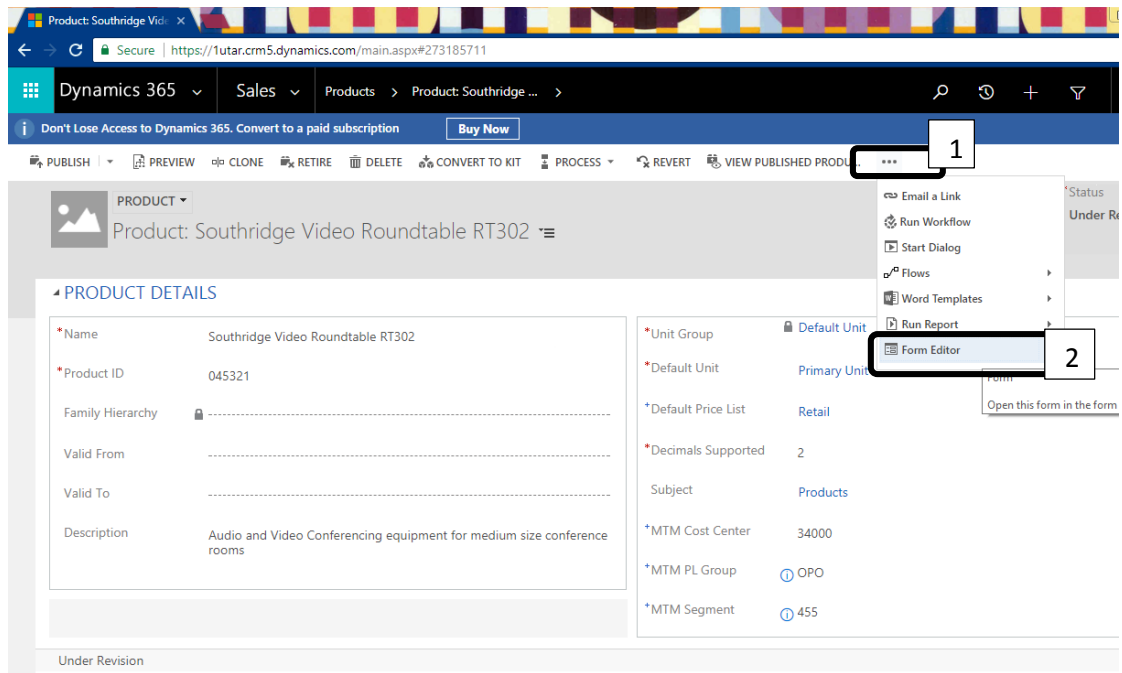


System will show the name of the entity as below:

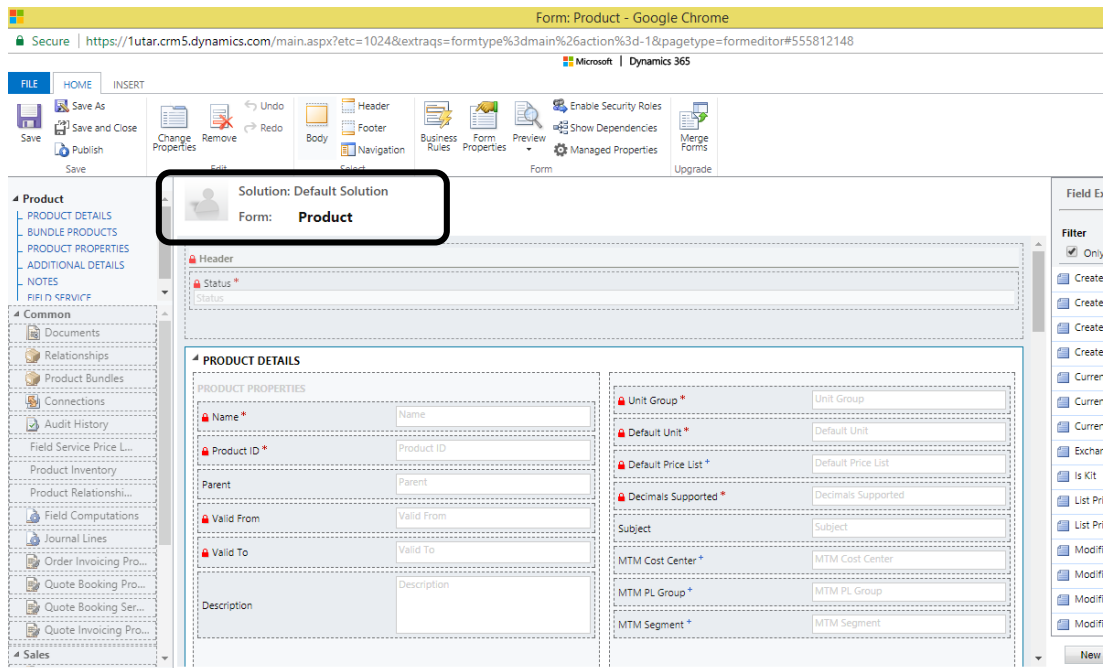


To check the form name

Enter the page that you wish to check. Click on Form Editor.



The form name displayed as below:





## Step 2.0 Business Rule Implication

Business rule in Dynamic 365 gives company to have options to customize the process of input data in the system according to own business process. Basically, business rule customization applies in particular field where company can set certain rule to restrict or control what value should the user input in the field.

In this research, there is a business requirement to control the way of financial dimension set in company's product. A set of dimension rule is defined to avoid user to insert wrong dimension. The purpose of define a financial dimension rule in product is to allows management to identify easily which production department's product have a high demand or distribute the cost according to ratio set on each department.

**Table 5.2: The Dimension Rule Set By The Company**

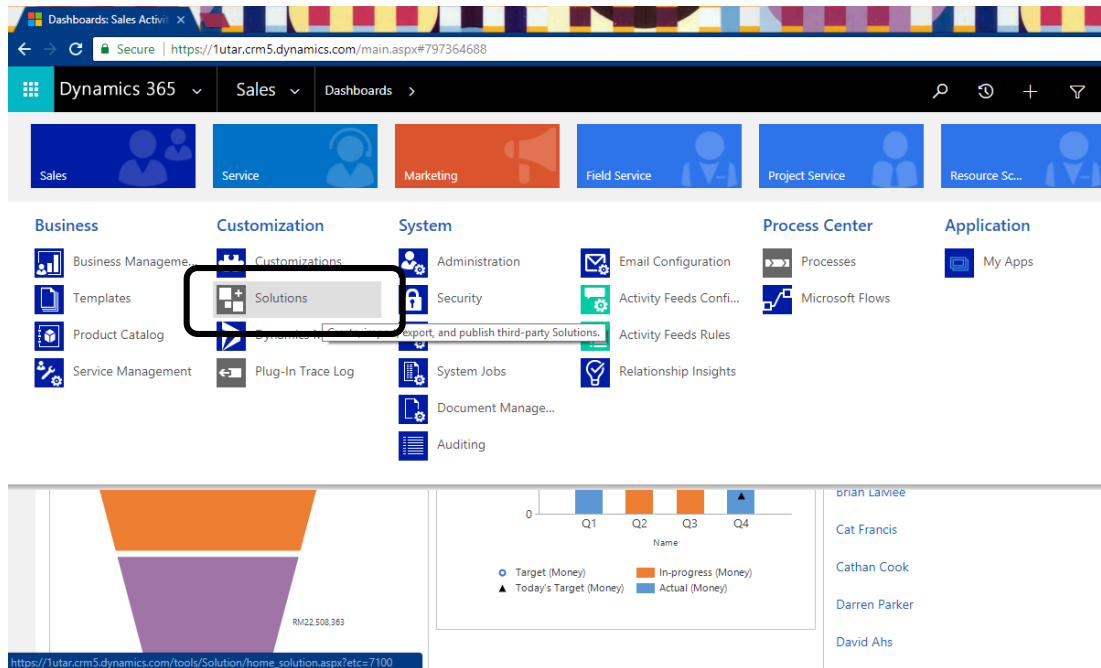
Cost center		P/L Group	Segment	Cost center		P/L Group	Segment
10000	IMP	IMP	450	32000	OPTO-OMC	OMC	455
11000	IMP - General			32100	OPTO-OMC IM Barrel		
11100	IMP - IM			32200	OPTO-OMC IM OPTICAL		
11200	IMP - Secondary Process (2P)			32300	OPTO-OMC Assembly		
11300	IMP - Secondary Process (LXNUPT)			33000	OPTO-OPL	OPL	
11400	IMP - Assembly Process			33100	OPTO-OPL IM Barrel		
17000	IMP-PE			33200	OPTO-OPL IM OPTICAL		
18000	IMP-QA			33300	OPTO-OPL Assembly		
19000	IMP-SGA			34000	OPTO-OPO	OPO	
20000	MLD - Toolroom			34100	OPTO-Phase 9		
21000	MLD - General	34300		OPTO-OPO Assembly			
21100	MLD - Design	34800		OPTO-OPO QA	OGL		
21200	MLD - Fabrication	35000		OPTO-Glass Lens (OGL)			
21300	MLD - Assembly	37000		OPTO-PE	OPT		
21400	MLD - Maintenance	37100		OPTO-Machine Maintenance			
27000	MLD-PE	37200		OPTO-Plant Engineering			
28000	MLD-MQC	38000		OPTO-QA			
29000	MLD-SGA	39000		OPTO-SGA			
30000	OPTO	OPT	455				
31000	OPTO-General						
31200	OPTO - IM General						
31300	OPTO - Assembly General						

Take an example from the table, a set of valid financial dimension would be 11000-IMP-450. It would be consider as incorrect if the dimension is set as 11000-OPT-455.

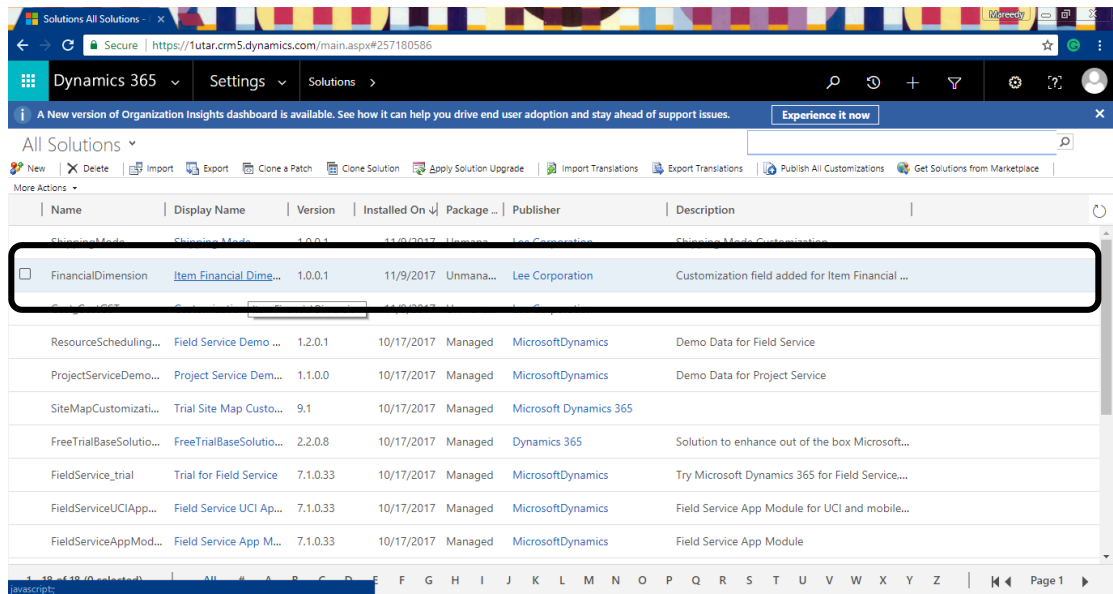
To apply these rule in the Dynamic 365, the best way is to utilize the business rule customization. Below is the step of setup the business rule based on the company's financial dimension:

Go to Sales → Settings → Solutions

Note: there is two to access to the backend- 1. Customizations, 2. Solutions. It is recommend that to use solutions instead of customization as you can backup all the customization by export out as a solution package.

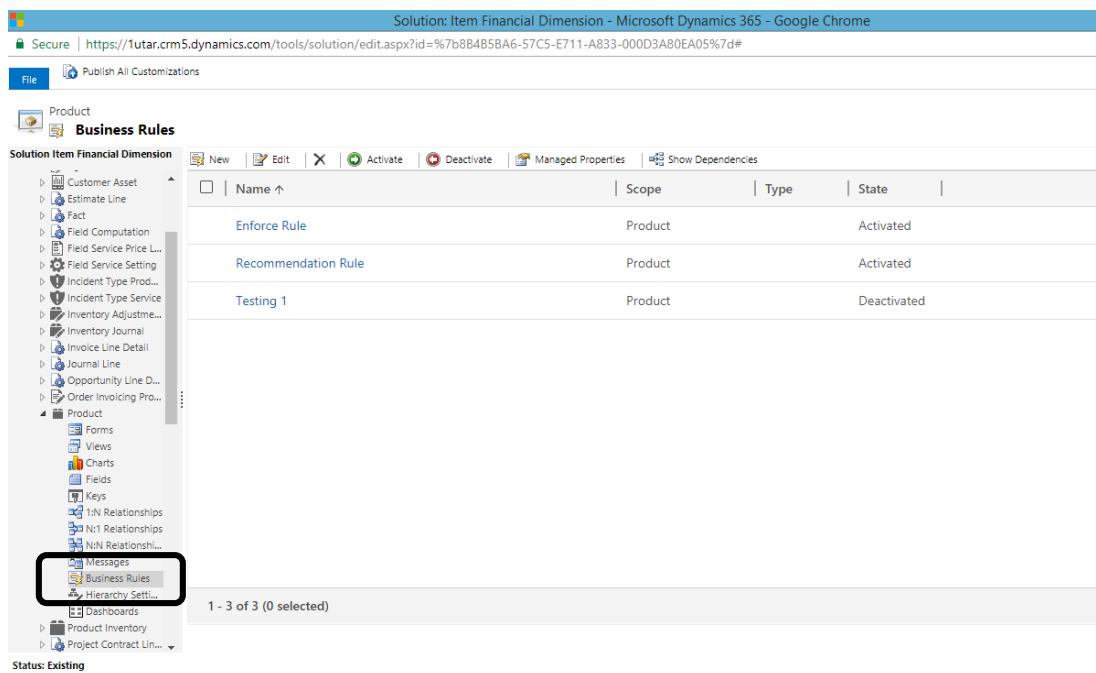


Create a new solution or select existing solutions. In this case, the business rule will be created in existing solution as there is an existing solution about the financial dimension.



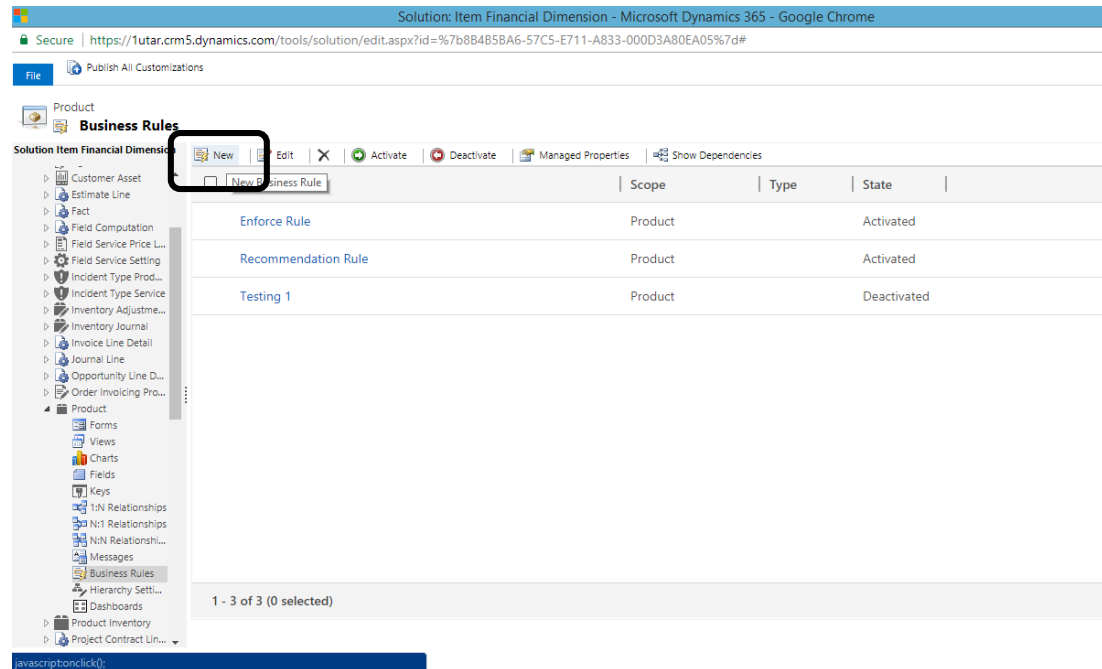
Go to Entities → Product → Business rule

Note: depending on what entity that you want to develop. In this case, the financial dimension rule required to develop is located in product entity.



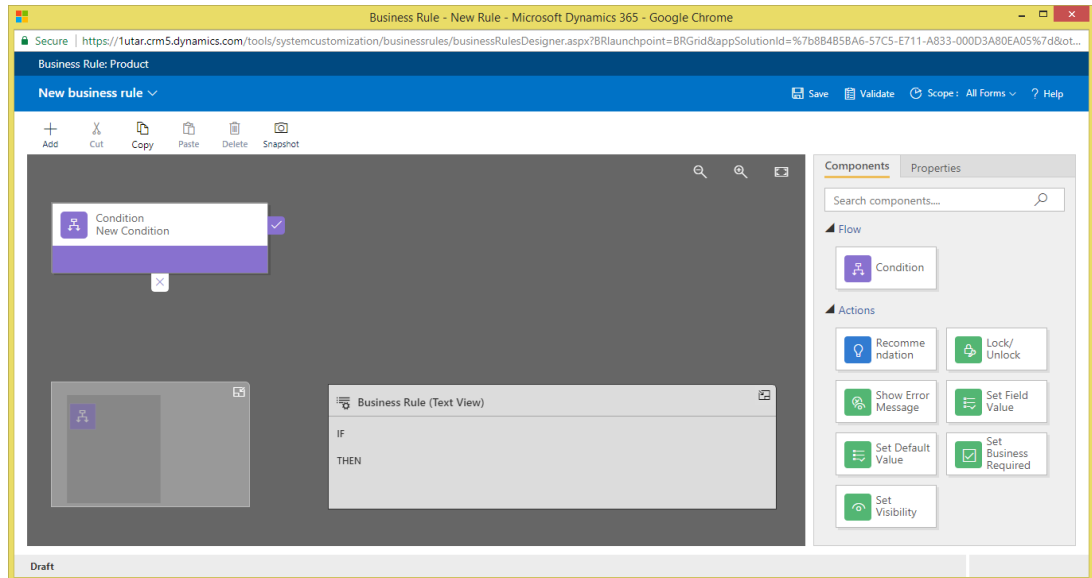
## Step 2.1 Create New Business Rule

Click on New button to create new.



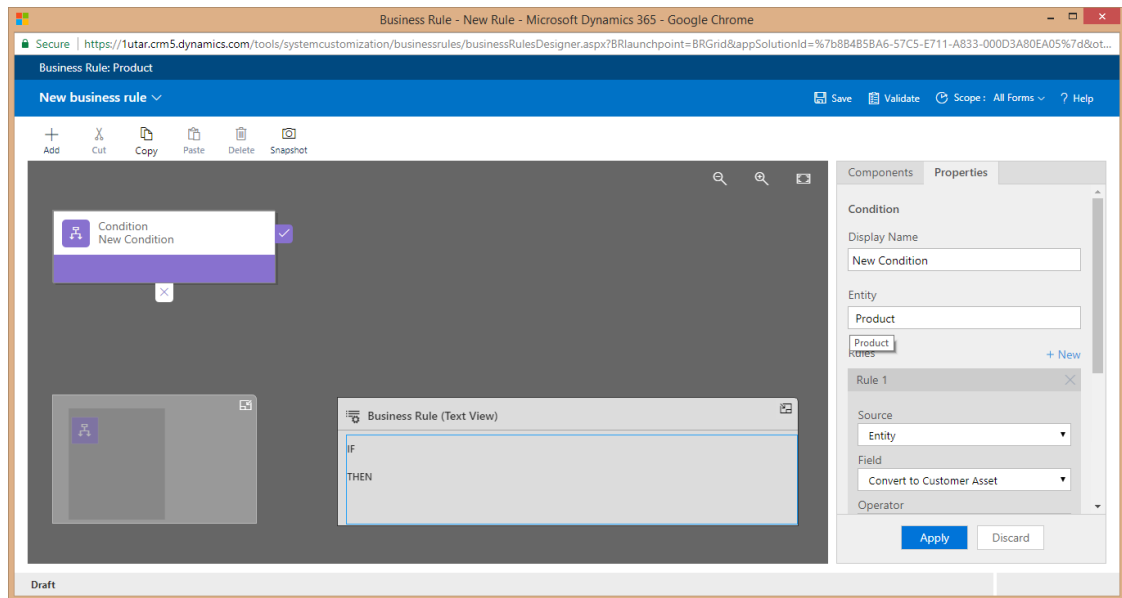
System will prompt out a new web page showing the editor page, there is several components required to know:

1. Condition – any rule will always start from a condition.
2. Recommendation – a field will prompt a recommendation message to show what value is recommend to insert.
3. Shows Error Message – an error message will prompt on the field if certain condition could not meet.
4. Set Default Value – set a default value to show in the field.
5. Set Visibility – if certain condition is meet, the field can show in the user screen or hide from the user screen.
6. Lock/ Unlock – if certain condition is meet, the field can be lock to block user to key in or unlock for user to key in.
7. Set Field Value – field can be automatically set a certain value.
8. Set business required – the field become compulsory to fill in when certain condition is met.

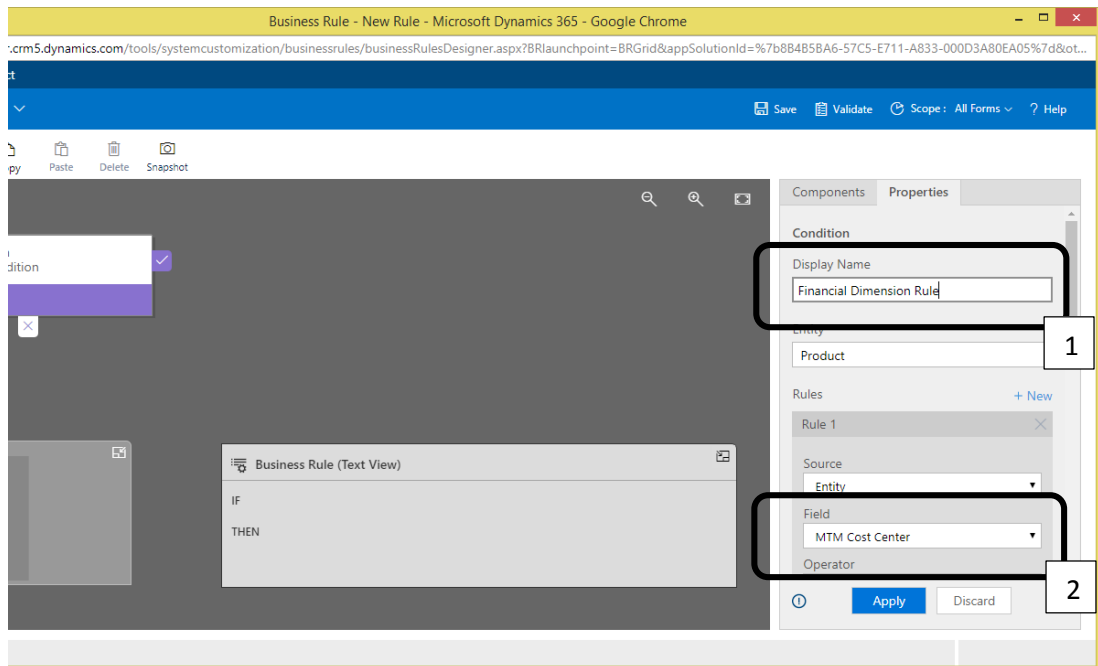


## Step 2.2 Define Condition

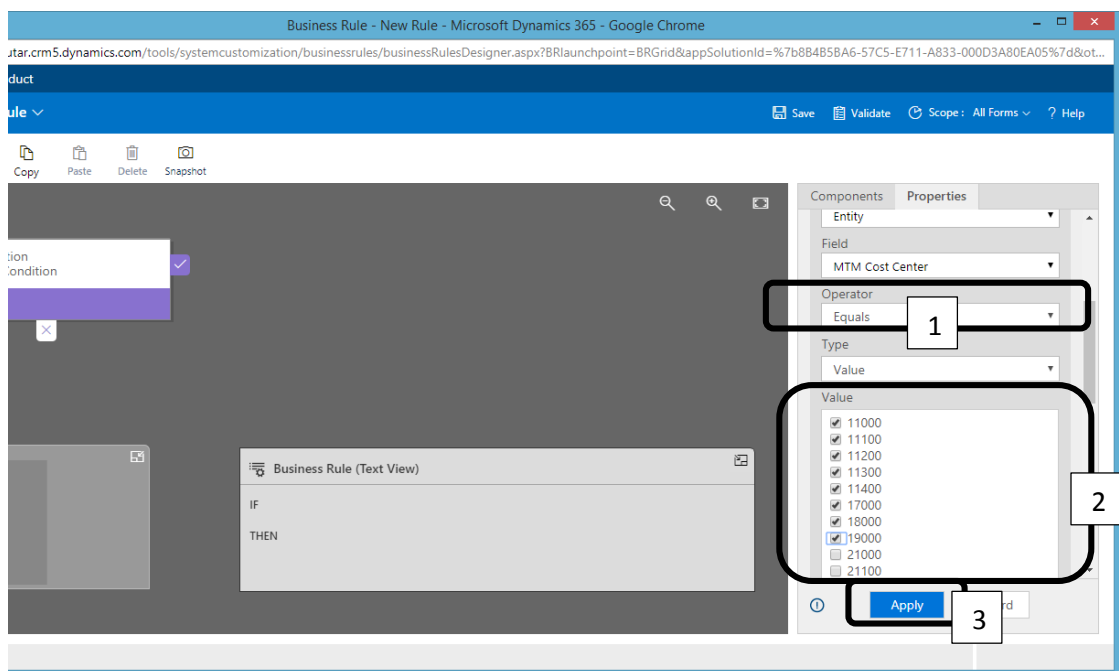
To define new rule, click on condition box.



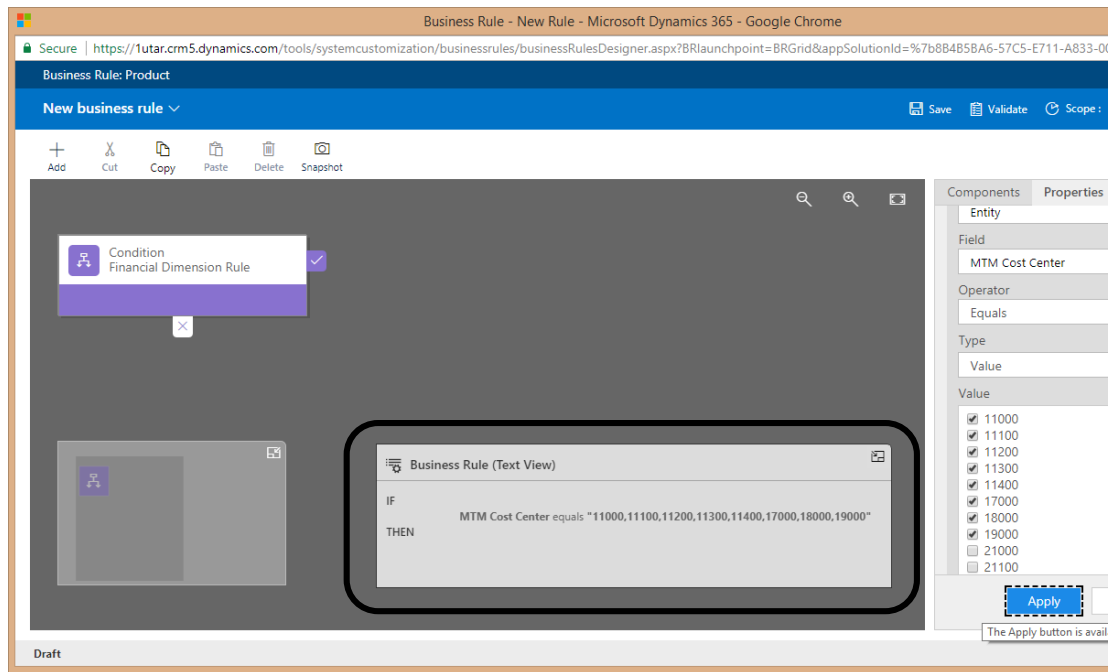
1. Define a name for this condition
2. Select a field



1. Operator can set as Equals or not equals or etc. In this case, the operator is selected as Equals.
2. Select the required value.
3. Click Apply button.

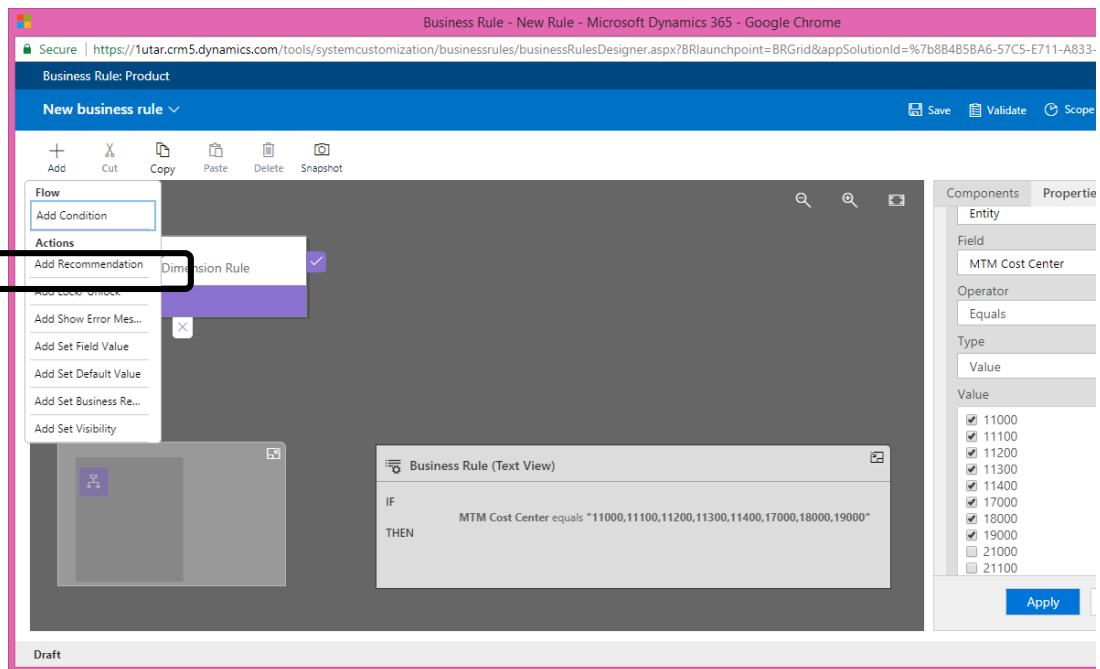


After click Apply button, the business rule windows will shows the basic programming condition in below:

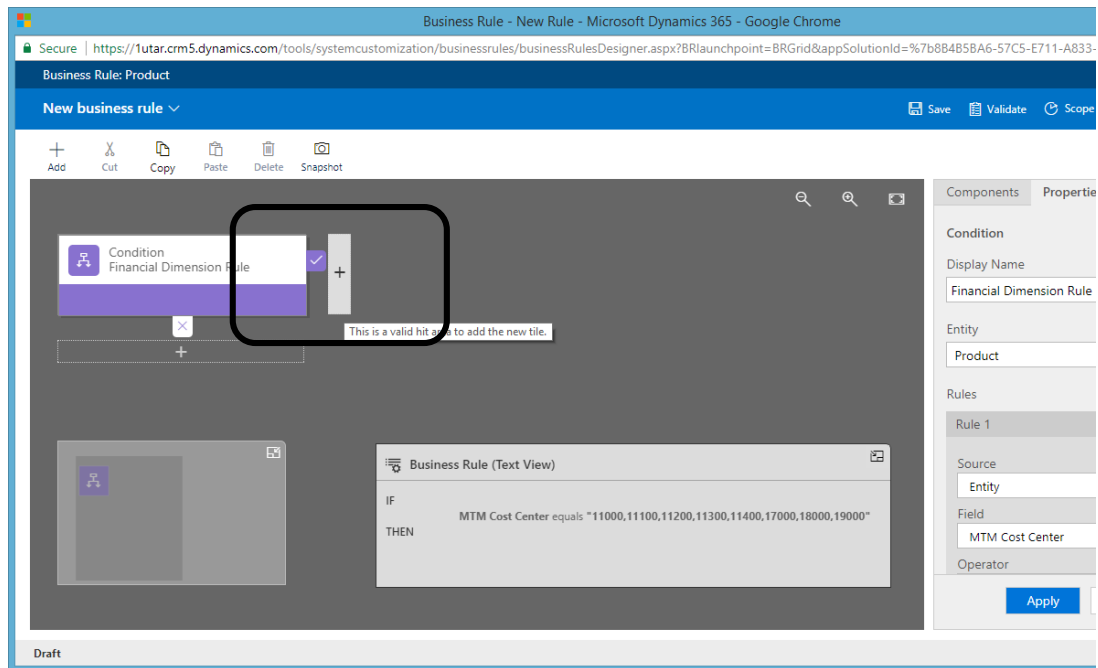


### Step 2.3 Add New Action

To add new action, click on Add button. This case, required to add new recommendation in the field.

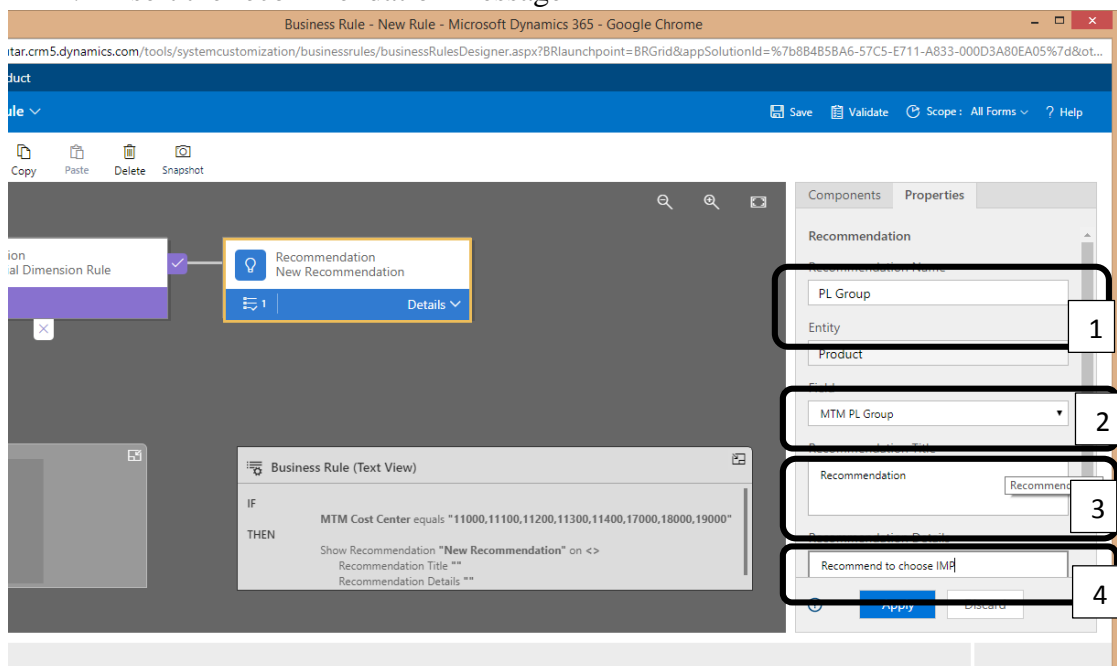


You can either add beside the “√” or “X”. In this case, the “If condition” is true then the next action should be add beside the “√”.



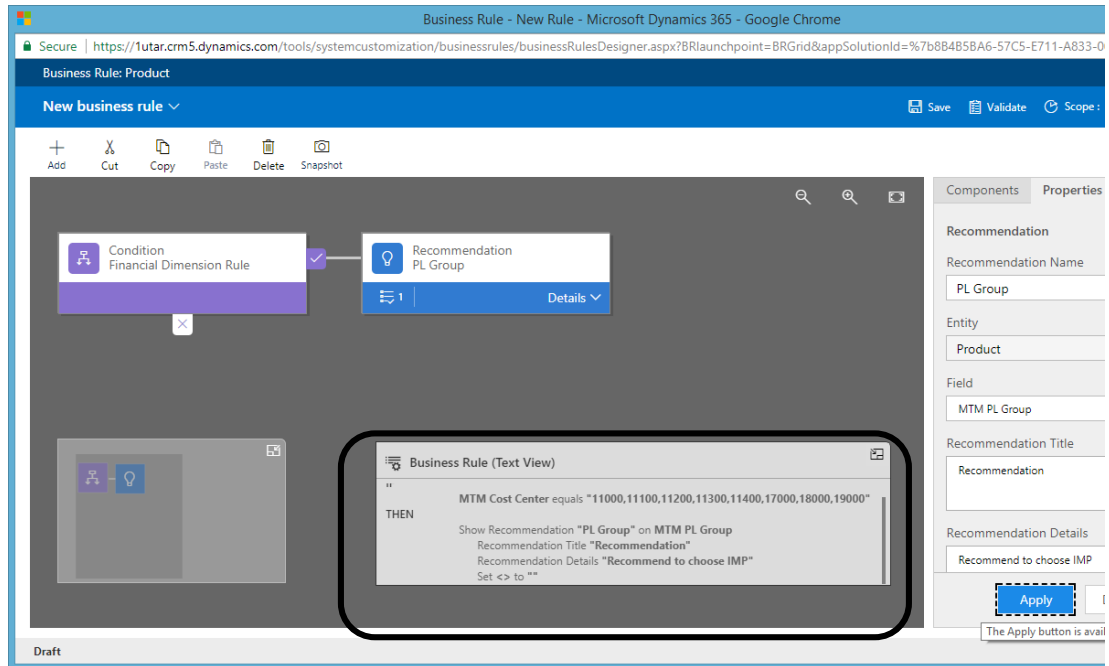
The box of recommendation is appeared:

1. Name the recommendation
2. Select the field for appearing the recommendation message
3. Name the recommendation title
4. Insert the recommendation message

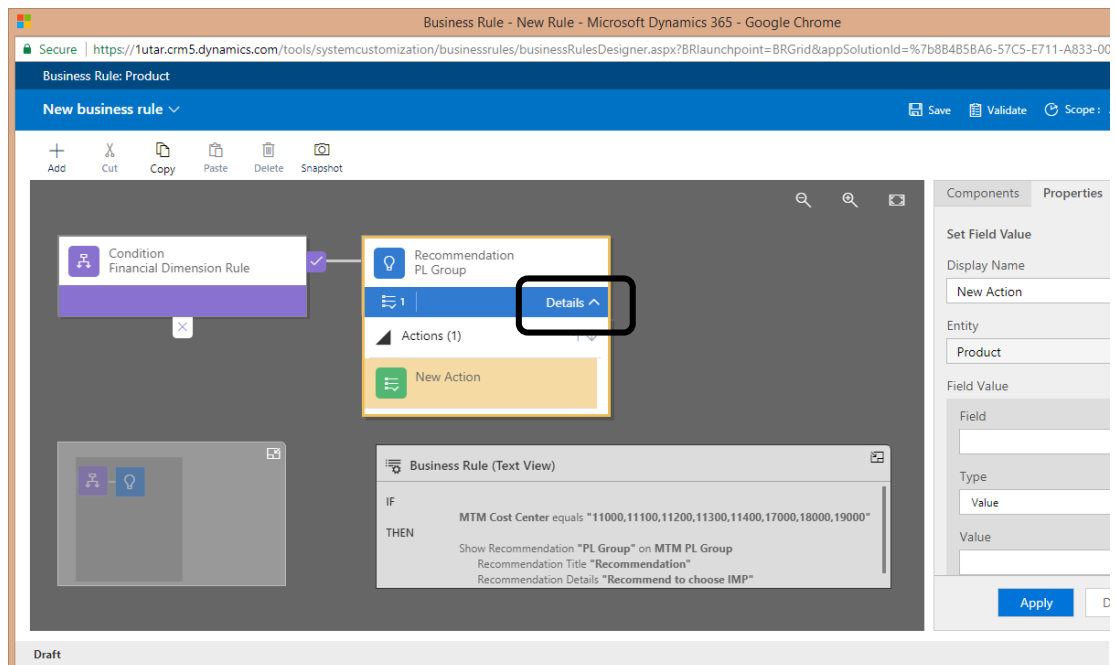




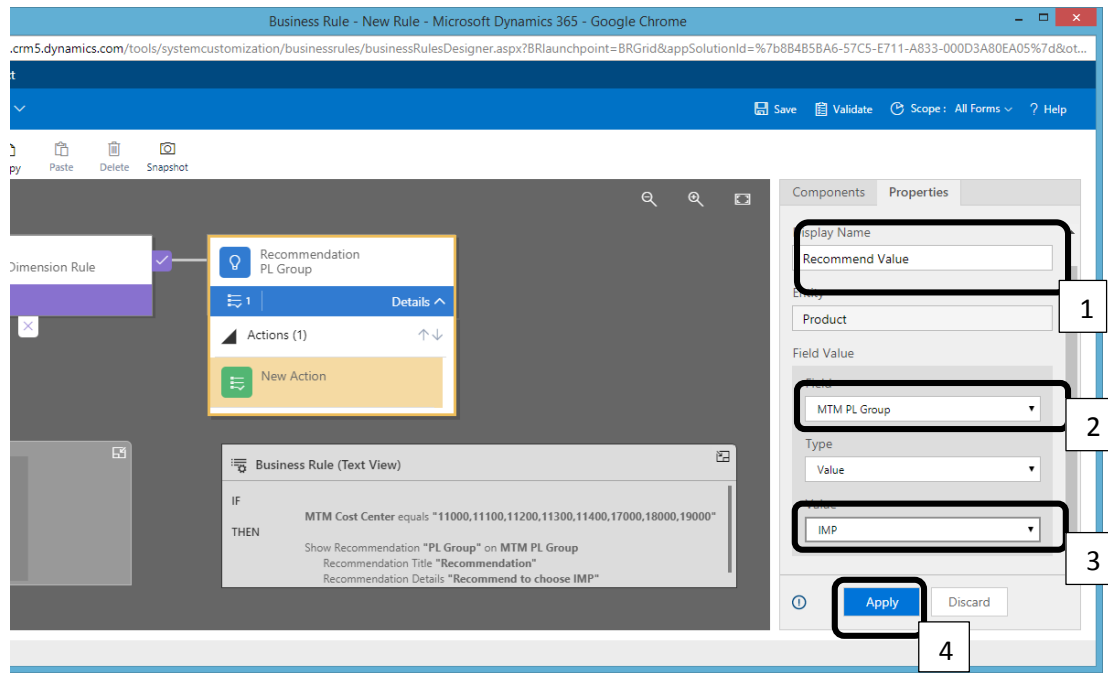
Click Apply button. System will auto generate the basic programming condition as below:



Click on details. You can select what the action should done in recommendation.



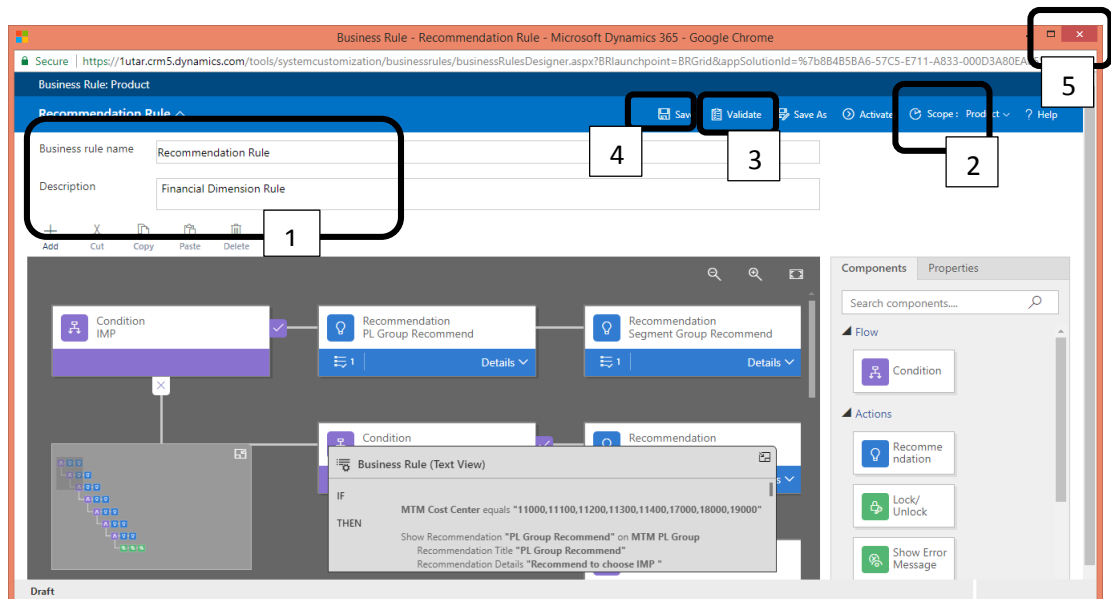
1. Define the name for the action
2. Choose the field
3. Select what value should show
4. Click Apply button



If there is additional condition, repeat all the step as shown in above.

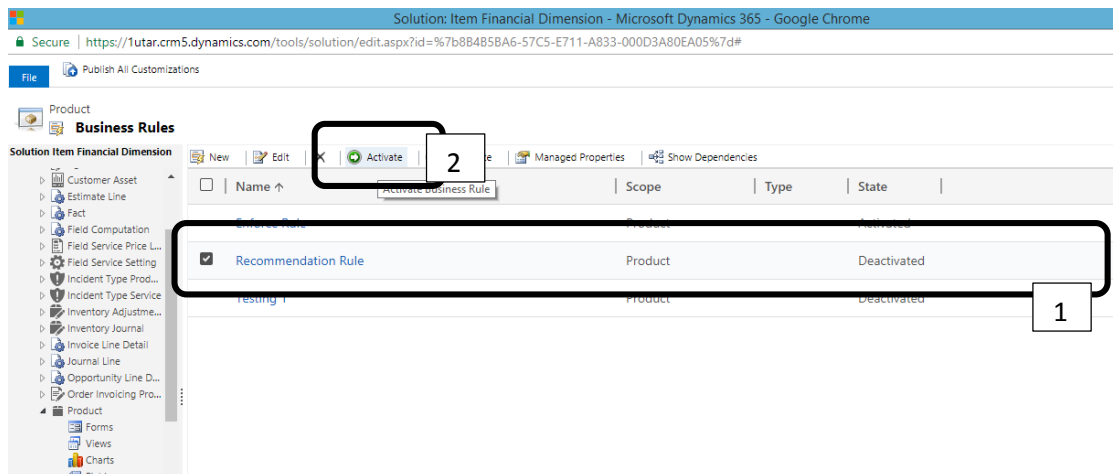
After all the condition,

1. Rename the business rule to suitable name
2. Scope: choose apply the business rule on certain form.
3. Click Validate
4. Once the Validate is successful, click Save
5. Once done save, click close to close the windows

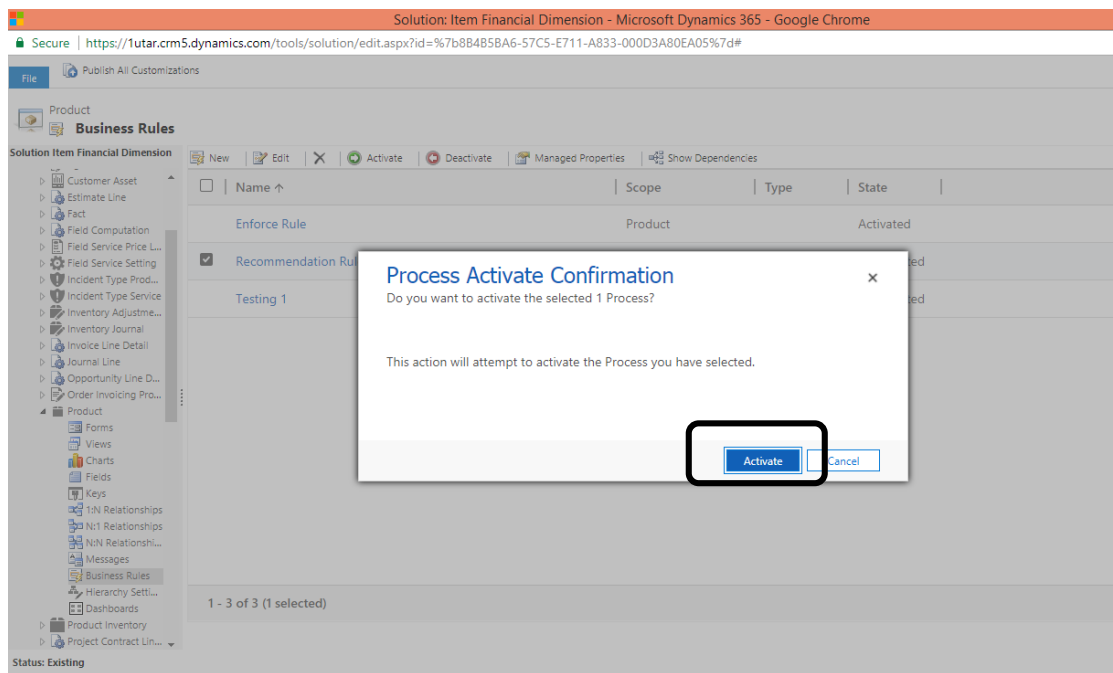


## Step 2.4 Activate the Business Rule

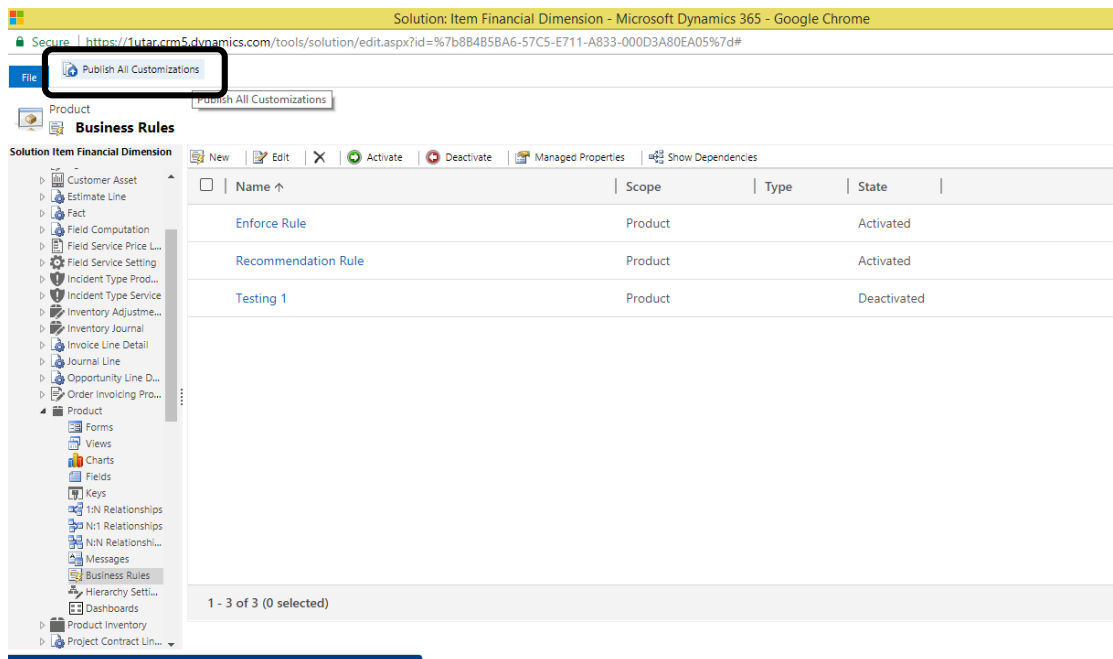
Select the newly created and activate it.



Click Activate to confirm the activation.



Once activated, click on publish all customization button to publish the solution into live environment.



## Step 2.5 Checking the new Business Rule

To check back, you can check to the form where you applies the business rule. For this case, the business rule is applied on product form. The recommendation windows is prompt when field is selected as below:

The screenshot shows the Dynamics 365 interface for a product form. The browser address bar indicates the URL is <https://1utar.cm5.dynamics.com/main.aspx#826560773>. The navigation bar shows 'Dynamics 365' and 'Sales'. The breadcrumb trail is 'Products > Product: Southridge ...'. A message bar at the top states: 'A New version of Organization Insights dashboard is available. See how it can help you drive end user adoption and stay ahead of support issues. Experience it now'. The main form is titled 'PRODUCT' and 'Product: Southridge Video Roundtable RT302'. The status is 'Under Revision'. The form contains several fields: 'Product ID' (045321), 'Family Hierarchy' (locked), 'Valid From', 'Valid To', and 'Description' (Audio and Video Conferencing equipment for medium size conference rooms). On the right, there are fields for 'Default Price List' (Retail), 'Decimals Supported' (2), 'Subject' (Products), 'MTM Cost Center' (34000), and 'MTM PL Group' (OPO). A 'PL Group Recommend' dialog box is open, prompting the user to 'Recommend to choose OPO' with 'Apply' and 'Dismiss' buttons. Below the dialog, the 'OPO' value is visible. The 'PRODUCT PROPERTIES' section is also visible at the bottom.

Field	Value
Product ID	045321
Family Hierarchy	Locked
Valid From	
Valid To	
Description	Audio and Video Conferencing equipment for medium size conference rooms
Default Price List	Retail
Decimals Supported	2
Subject	Products
MTM Cost Center	34000
MTM PL Group	OPO

**PL Group Recommend**  
Recommend to choose OPO  
[Apply] [Dismiss]  
OPO

## 5.4 Stage 3- Extraction

Extraction stage is where targeted data will export out from On-premise environment. There are several type of interface available for export out the data which this will cover in the chapter. Furthermore, data extraction should be done in 2 category- 1. Master Data 2. Transaction Data. Master Data represents the non-duplicate and as a reference data to supports transactional processes in the system, Customer Account is an example of Master Data. While Transactional Data represents the duplicate and as a record data in business daily operation, Sales order is an example of Transactional Data.

Checklist to do on extraction:

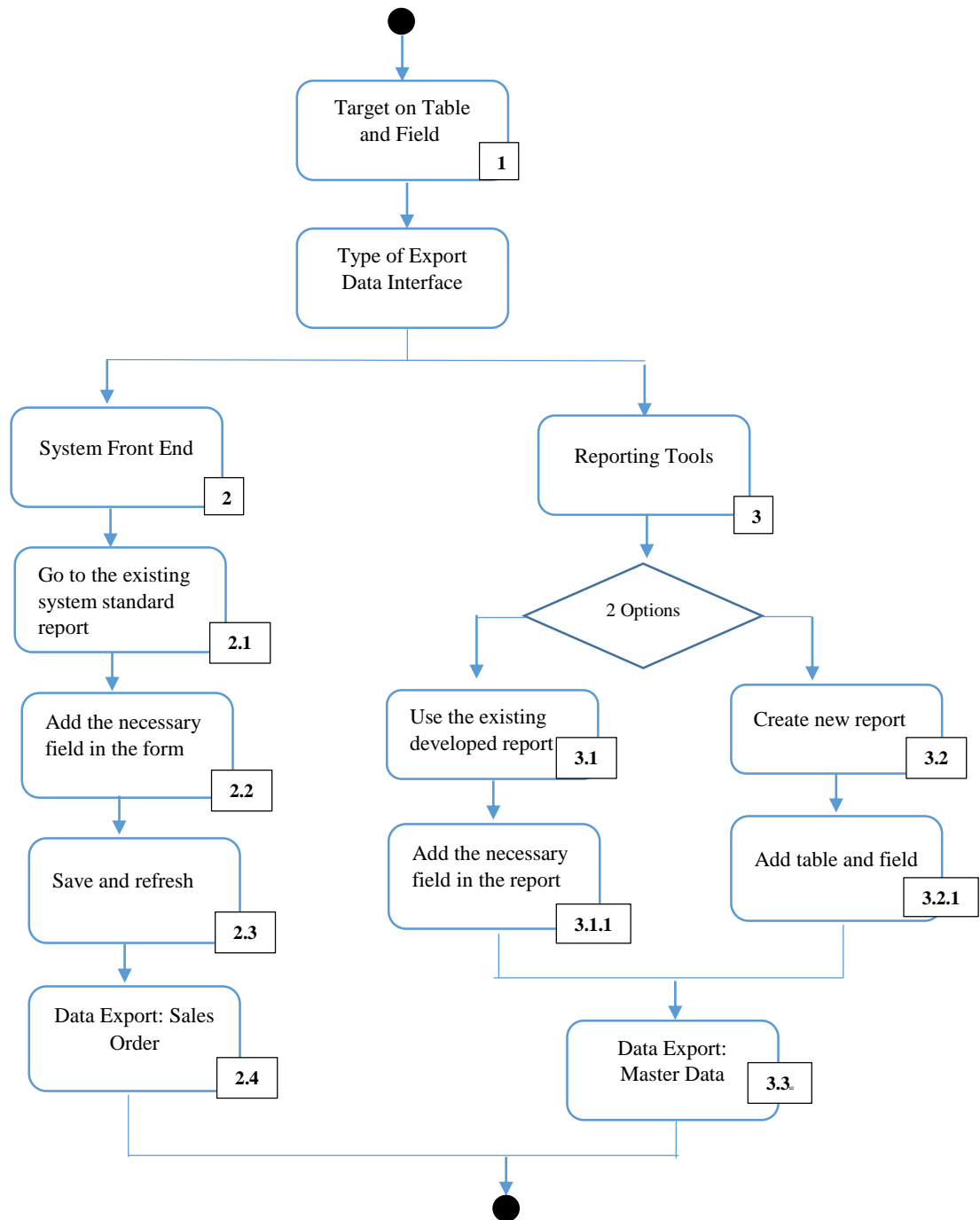
- Targeting Table and Field for:
- Master Data and Transactional Data
- Type of interface for export data
- Cut-off date for export data
- Data export:
- Master Data
- Transactional Data

Note for company:

It is essential for company to decide the cut-off date for data extraction especially on transactional data. Once the cut-off date is decided, user must not enter new data in the On-premise system during the cut-off date to avoid any data is overlooked during the migration. Cut-off date is normally done on non-working day, this is to avoid user accidentally key in new data in On-premise system and to lower down the impact of system down time to the daily business operation.

Moreover, please double confirm with the key user on the data especially on the field before decided to export out the data. This is to ensure that all necessary data is exported from On-premise system and migrate into Cloud based system.

#### 5.4.1 Flowchart for Extraction Stage



## Step 1.0 Target on Field and Table

List all the field and table for export out the data. Since the list of field and table have been identify in stage 1, you may use back the list for prioritize which field or table to export out.

For this research, the data will be export out is Sales data. And here is example for the list of identified table and field.

Master Data- Item/ product information

Tables Involved

Table Name	Parent Table	Child Table	Table Relationship
InventTable	InventItemGroupItem	InventTable.ItemId	InventTable.ItemId
EcoResProductTranslation	InventTable.Product	InventTable.ItemId	InventTable.ItemId
InventTableModule	InventTable.ItemId	InventTable.ItemId	InventTable.ItemId
PriceDescTable	InventTable.ItemId	InventTable.ItemId	InventTable.ItemId

Table Relationship

Field

ItemId	DefaultDimension_MTMPLGroup	DefaultDimension_MTMCostCenter	DefaultDimension_MTMSegment	ItemGroupid	Name	UnitId	ItemRelation (Item Code)	Am
--------	-----------------------------	--------------------------------	-----------------------------	-------------	------	--------	--------------------------	----



## Master Data- Customer information

Analysis stage.xlsx - Excel

FILEHOMEINSERTPAGE LAYOUTFORMULASDATAREVIEWVIEWLoad TestTeam

Calibri11A<sup>+</sup>A<sup>-</sup>

BBIU

Font

Wrap Text

General

Conditional Formatting

Format as Table

Cell Styles

Insert

Delete

Format

AutoSum

Fill

Sort & Filter

Find & Select

Editing

Clipboard

Font

Alignment

Number

Styles

Cells

P8

DivTerm

A	B	C	D	E	F	G	H	I	J	K	L	M	
1	Table Name	Customer Master	Table Relationship										
2	Parent Table:	CustTable											
3	Child Table:	DirPartyTable	CustTable.Party										
4		DirPartyPostalAddressView	DirPartyTable.Name										
5		LogisticsElectronicAddress	DirPartyTable.PrimaryAddressLocation										
6													
8	AccountNum	Name	CustGroup	BRNumber	GSTNumber	GSTVerificationDate	LocationName	Address	locationRoles	Description	Locator	Type	Curr
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													

Table Involved-Item Master

Table Involved-Customer Master

Table Involved-Transaction Data

...

COUNT: 2

100%

## Transaction Data- Sales order

Analysis stage.xlsx - Excel

FILEHOMEINSERTPAGE LAYOUTFORMULASDATAREVIEWVIEWLoad TestTeam

Calibri11A<sup>+</sup>

BBIU

Font

Wrap Text

General

Conditional Formatting

Styles

Cell Styles

InsertDeleteFormat

Cells

AutoSumFillClear

Editing

Sort & Find & Filter & Select

R9

X✓✗fx

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Table Name	Sales Order Transaction		Table Relationship										
2	Parent Table:	SalesTable												
3	Child Table:	SalesLine		SalesTable.SalesId										
4		EcoResProductTranslation		InventTable.Product, SalesTable.ItemId										
5														
6	createdDateTime	CustAccount	SalesName	SalesId	ItemId	Name	Name (product specification)	SalesUnit	SalesQty	dlvDate	ReceiptDateRequested	SalesPrice	LineAmount	deliveredIntc
7														
8														
9														
10														
11														
12														
13														
14														
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16														
17														
18														
19														
20														
21														
22														

Table Involved-Item Master

Table Involved-Customer Master

Table Involved-Transaction Data

## Type of Export Data Interface

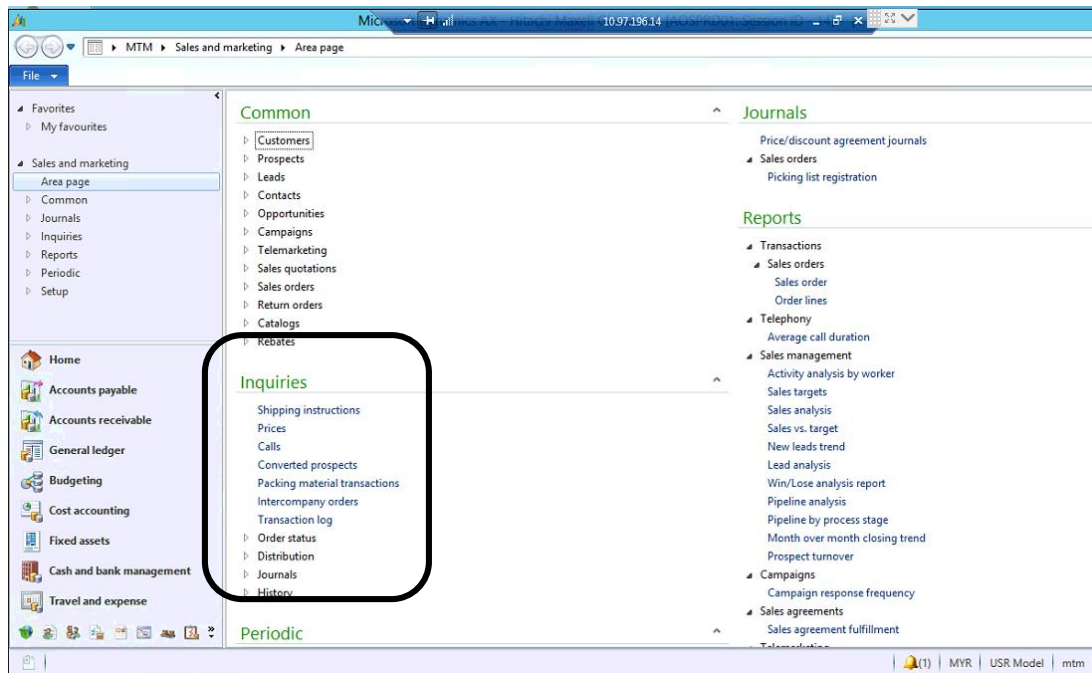
There are two type of export data interface:

Answer to Question: Why not using SQL interface to export out the data? Yes, company or individual can export the data using SQL if the company familiar with the SQL interface and command of joining multiple table and field. However, for company required simple and fast process of extraction, it is recommend company to use either System Front End or Reporting Tools.

## Step 2.0 System Front End

In Microsoft Dynamic AX 2012 (On-premise), there is existing standard reporting located at Enquiry. The report's field can be personalized based on own requirement and the data can be sorted out. The process is relative easy and fast as the existing structure is available for export out the data, company or individual do not need to spent time in joining table and field.

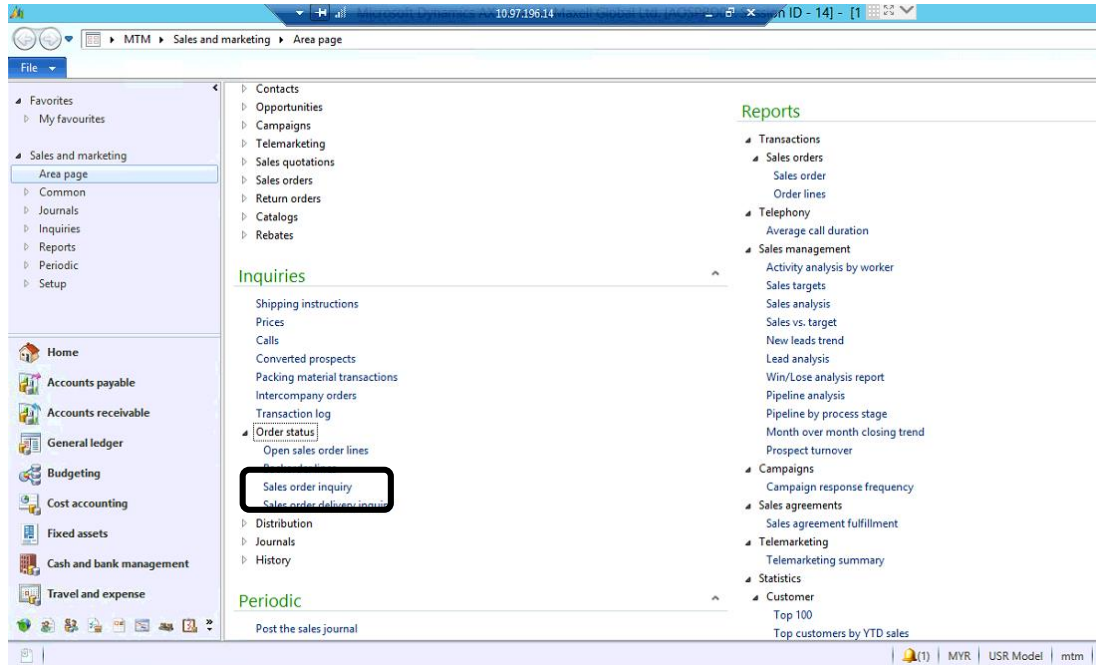
Under Inquiries, there are several standard report available to generate:



## Step 2.1 Go to the existing system standard report

In this case, the sales order transaction data is available under the Inquiries.

Go to Inquiries → Order status → Sales order inquiry



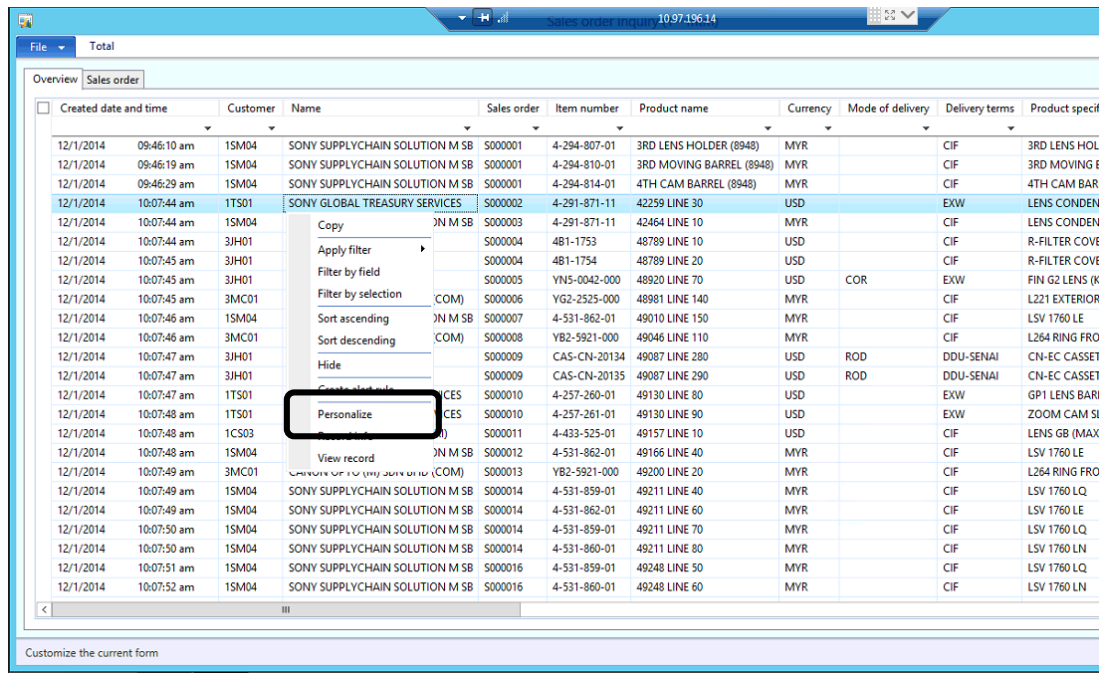
This is the report form contains all the sales order field. Before extract the data, you can double confirm with the key user to ensure that the necessary field about the sales order is located in here.

The screenshot shows the SAP Sales order inquiry report. The report is displayed in a table format with the following columns: Created date and time, Customer, Name, Sales order, Item number, Product name, Currency, Mode of delivery, Delivery terms, and Product specification. The data is filtered by the date 12/1/2014. The report shows a list of sales orders for various customers, including SONY SUPPLYCHAIN SOLUTION M SB, HITACHI MAXELL LTD, CANON OPTO (M) SDN BHD (COM), SONY GLOBAL TREASURY SERVICES, and SONY DIGITAL PRODUCT (WUXI).

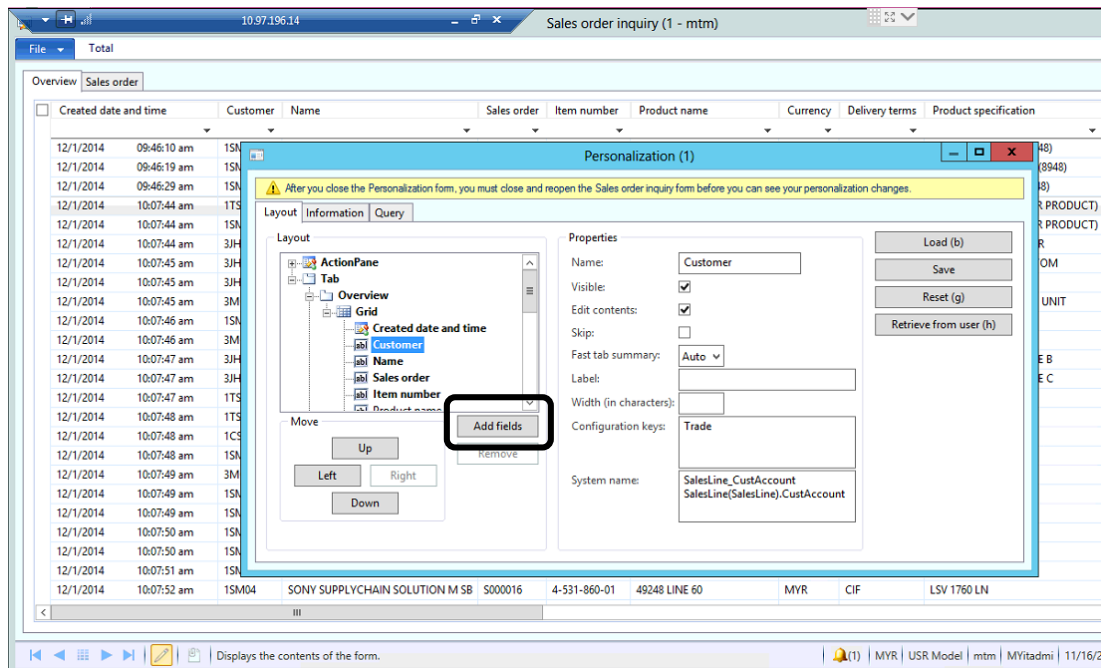
Created date and time	Customer	Name	Sales order	Item number	Product name	Currency	Mode of delivery	Delivery terms	Product specification
12/1/2014 09:46:10 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000001	4-294-807-01	3RD LENS HOLDER (8948)	MYR		CIF	3RD LENS HOLDER (8948)
12/1/2014 09:46:19 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000001	4-294-810-01	3RD MOVING BARREL (8948)	MYR		CIF	3RD MOVING BARREL (8948)
12/1/2014 09:46:29 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000001	4-294-814-01	4TH CAM BARREL (8948)	MYR		CIF	4TH CAM BARREL (8948)
12/1/2014 10:07:44 am	ITS01	SONY GLOBAL TREASURY SERVICES	S000002	4-291-871-11	42259 LINE 30	USD		EXW	LENS CONDENSER ( AR PRODUCT)
12/1/2014 10:07:44 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000003	4-291-871-11	42464 LINE 10	MYR		CIF	LENS CONDENSER ( AR PRODUCT)
12/1/2014 10:07:44 am	3IH01	HITACHI MAXELL LTD	S000004	481-1753	48789 LINE 10	USD		CIF	R-FILTER COVER UPPER
12/1/2014 10:07:45 am	3IH01	HITACHI MAXELL LTD	S000004	481-1754	48789 LINE 20	USD		CIF	R-FILTER COVER BOTTOM
12/1/2014 10:07:45 am	3IH01	HITACHI MAXELL LTD	S000005	YNS-0042-000	48920 LINE 70	USD	COR	EXW	FIN G2 LENS (K325)
12/1/2014 10:07:45 am	3MC01	CANON OPTO (M) SDN BHD (COM)	S000006	YG2-2525-000	48981 LINE 140	MYR		CIF	L221 EXTERIOR SLEEVE UNIT
12/1/2014 10:07:46 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000007	4-531-862-01	49010 LINE 150	MYR		CIF	LSV 1760 LE
12/1/2014 10:07:46 am	3MC01	CANON OPTO (M) SDN BHD (COM)	S000008	YB2-5921-000	49046 LINE 110	MYR		CIF	L264 RING FRONT
12/1/2014 10:07:47 am	3IH01	HITACHI MAXELL LTD	S000009	CAS-CN-20134	49087 LINE 280	USD	ROD	DDU-SENAI	CN-EC CASSETTE CASE B
12/1/2014 10:07:47 am	3IH01	HITACHI MAXELL LTD	S000009	CAS-CN-20135	49087 LINE 290	USD	ROD	DDU-SENAI	CN-EC CASSETTE CASE C
12/1/2014 10:07:47 am	ITS01	SONY GLOBAL TREASURY SERVICES	S000010	4-257-260-01	49130 LINE 80	USD		EXW	GPI LENS BARREL
12/1/2014 10:07:48 am	ITS01	SONY GLOBAL TREASURY SERVICES	S000010	4-257-261-01	49130 LINE 90	USD		EXW	ZOOM CAM SLEEVE
12/1/2014 10:07:48 am	1CS03	SONY DIGITAL PRODUCT (WUXI)	S000011	4-433-525-01	49157 LINE 10	USD		CIF	LENS GB (MAXELL)
12/1/2014 10:07:48 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000012	4-531-862-01	49166 LINE 40	MYR		CIF	LSV 1760 LE
12/1/2014 10:07:49 am	3MC01	CANON OPTO (M) SDN BHD (COM)	S000013	YB2-5921-000	49200 LINE 20	CIF		CIF	L264 RING FRONT
12/1/2014 10:07:49 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000014	4-531-859-01	49211 LINE 40	MYR		CIF	LSV 1760 LQ
12/1/2014 10:07:49 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000014	4-531-862-01	49211 LINE 60	MYR		CIF	LSV 1760 LE
12/1/2014 10:07:50 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000014	4-531-859-01	49211 LINE 70	MYR		CIF	LSV 1760 LQ
12/1/2014 10:07:50 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000014	4-531-860-01	49211 LINE 80	MYR		CIF	LSV 1760 LN
12/1/2014 10:07:51 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000016	4-531-859-01	49248 LINE 50	MYR		CIF	LSV 1760 LQ
12/1/2014 10:07:52 am	ISM04	SONY SUPPLYCHAIN SOLUTION M SB	S000016	4-531-860-01	49248 LINE 60	MYR		CIF	LSV 1760 LN

## Step 2.2 Add the necessary field in the form

If certain field user found out that is not located in here, you can right click on the form → Personalize

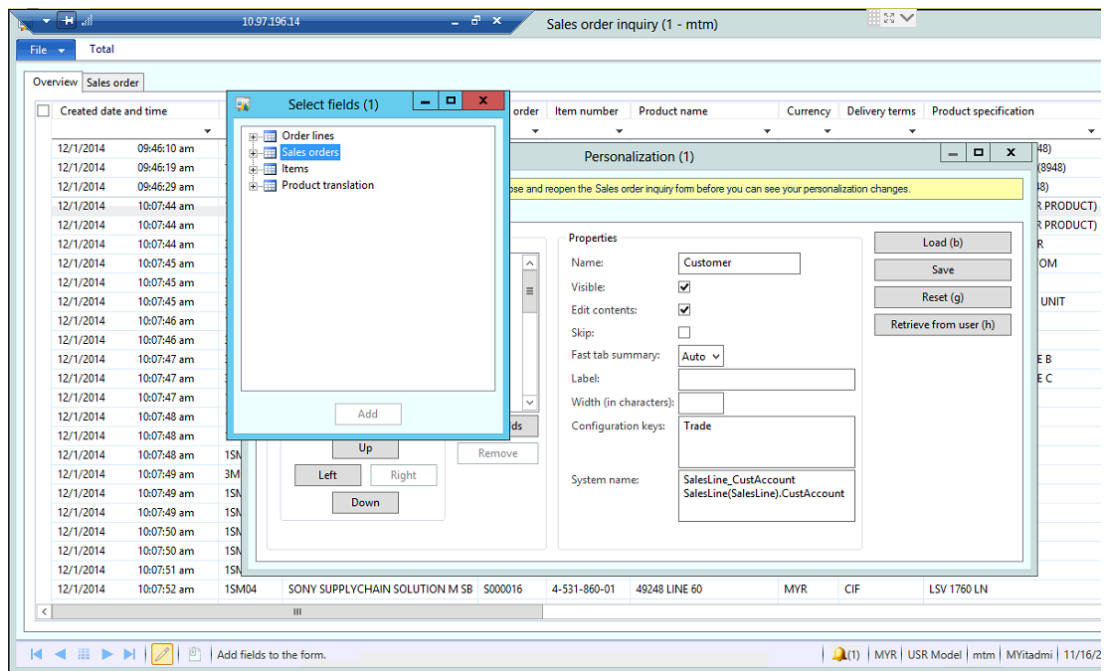


Given the scenario, user found out the mode of delivery field is missing. To add mode of delivery field, click on Add field button.

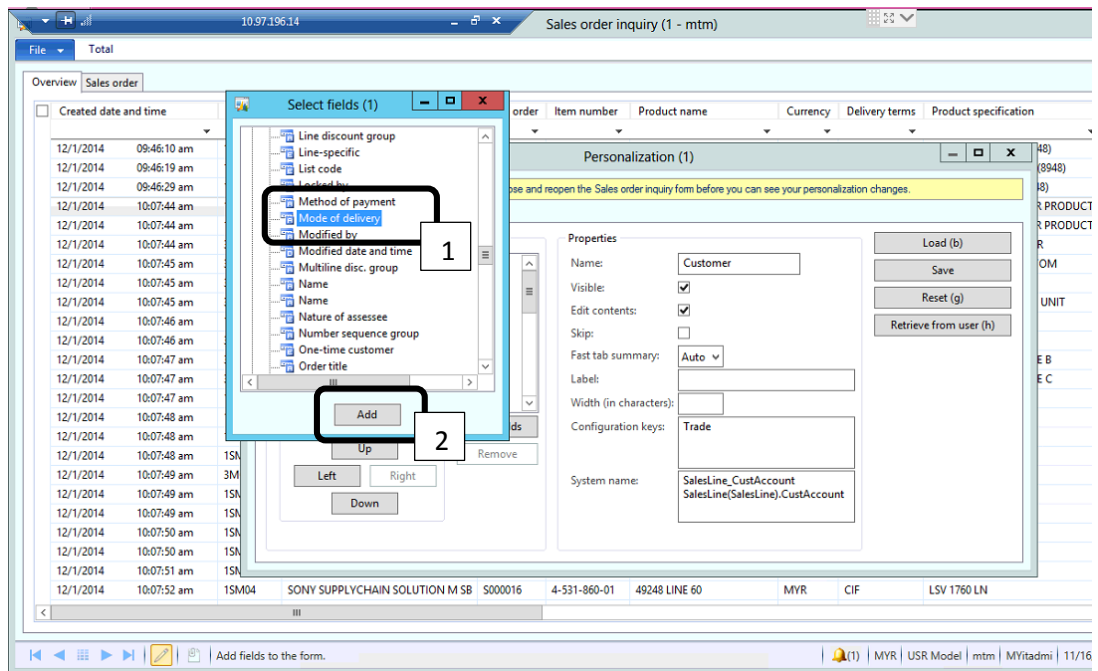


Mode of delivery is located in Sales orders Table.

Note: If you are not sure which table, you can refer to the list of table and field identified in Stage 1.

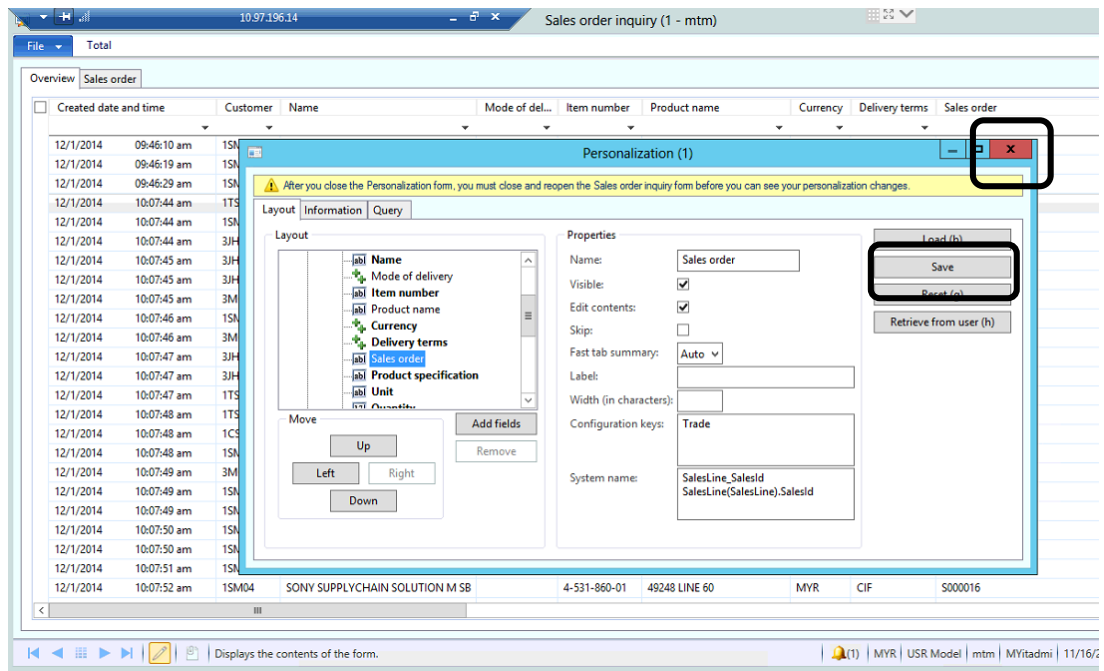


Expand the Sales table → click on Mode of delivery → Click on Add button



### Step 2.3 Save and refresh

Click Save button and Close button. Press F5 to refresh all data.



### Step 2.4 Export Data (Sales order)

To export data out especially on transaction data, it is important to company to conduct in non-working day for avoid any unnecessary event happen.

Exporting the transaction data required to do some sorting in the data to sort the unnecessary data.

Note: Transaction data is consider biggest data as multiple transactions is done on daily basis. Instead of move all transaction to cloud based system, company required to sort out or exclude out the transaction with status completed. This is because the transaction is consider as close transaction and does not required to do further action in the system. It is not necessary to move the close transaction to new cloud based system as it serve no purpose to user for conducting further posting in the new cloud based system and it carries large portion of memory which taking space up in the database very fast.

To sort the transaction data, you can type the status in the column.

In this case, the sales order is required in migration is with the open status. Type Open in the column and press enter.

The screenshot shows the SAP Sales order inquiry (1 - mtm) interface. The 'Line status' dropdown menu is highlighted, showing 'open' as the selected option. The table below lists various sales orders with their respective dates, amounts, and statuses.

Delivery date	Requested receipt date	Unit price	Net amount	Customer requisition	Line status	Delivered	Deliver remainder	Picked	Remarks
8/18/2016	8/18/2016	2,750.000000	2,750.00		Open order		1.00		
8/18/2016	8/18/2016	2,300.000000	2,300.00		Open order		1.00		
8/18/2016	8/18/2016	2,030.000000	2,030.00		Open order		1.00		
9/21/2016	9/21/2016	6,000.000000	6,000.00		Open order		1.00		
3/2/2017	3/2/2017	0.051100	51.10		Open order		1,000.00		
3/2/2017	3/2/2017	0.051100	51.10		Open order		1,000.00		
12/16/2016	12/16/2016	0.349200	2,212.53		Open order		6,336.00		
12/16/2016	12/16/2016	0.399600	3,740.26		Open order		9,360.00		
12/16/2016	12/16/2016	0.399600	1,870.13		Open order		4,680.00		
12/16/2016	12/16/2016	0.413800	7,746.34		Open order	9,360.00	9,360.00		
3/10/2017	3/10/2017	21,226.500000	21,226.50		Open order		1.00		
2/1/2017	2/1/2017	2,000.000000	4,000.00		Open order		2.00		
6/30/2017	6/30/2017	186,160.000000	186,160.00		Open order		1.00		
6/30/2017	6/30/2017	380,000.000000	380,000.00		Open order		1.00		
6/30/2017	6/30/2017	124,720.000000	124,720.00		Open order		1.00		
6/30/2017	6/30/2017	41,976.000000	41,976.00		Open order		1.00		
6/30/2017	6/30/2017	45,718.000000	45,718.00		Open order		1.00		
6/30/2017	6/30/2017	48,906.000000	48,906.00		Open order		1.00		
6/30/2017	6/30/2017	50,440.000000	50,440.00		Open order		1.00		
3/6/2017	3/6/2017	0.020400	15.71		Open order	660.00	110.00		
3/6/2017	3/6/2017	0.020400	15.71		Open order	660.00	110.00		
3/6/2017	3/6/2017	0.016400	18.37		Open order	960.00	160.00		
3/6/2017	3/6/2017	0.016600	18.13		Open order	936.00	156.00		
4/18/2017	4/18/2017	0.399600	935.06		Open order		2,340.00		

If there is lots of old sales order (eg. open sales order with more than one year), you may discuss with the user whether required to move to new cloud based system. If it is agree by user of exclude out the old sales order, you can further sort the Sales order data start from certain date.

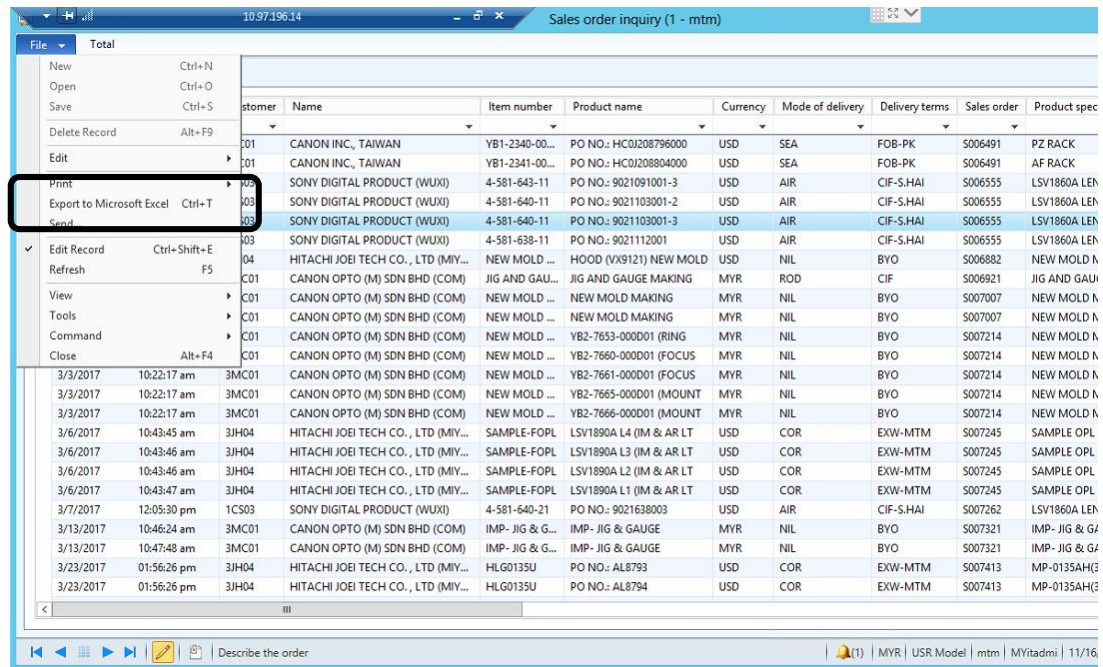
The screenshot shows the SAP Sales order inquiry (1 - mtm) interface with a filter for 'Created date and time' set to '>10/1/2016'. The table below lists sales orders created after this date, including details like customer, item number, product name, currency, and delivery terms.

Created date and time	Customer	Name	Item number	Product name	Currency	Mode of delivery	Delivery terms	Sales order	Product specifi
12/5/2016 02:21:59 pm	1TC01	CANON INC., TAIWAN	YB1-2340-00...	PO NO.: HC0208796000	USD	SEA	FOB-PK	S006491	PZ RACK
12/14/2016 12:25:08 pm	1CS03	SONY DIGITAL PRODUCT (WUXI)	4-581-643-11	PO NO.: HC0208804000	USD	SEA	FOB-PK	S006491	AF RACK
12/14/2016 12:25:09 pm	1CS03	SONY DIGITAL PRODUCT (WUXI)	4-581-640-11	PO NO.: 9021091001-3	USD	AIR	CIF-S.HAI	S006555	LSV1860A LENS
12/14/2016 12:25:10 pm	1CS03	SONY DIGITAL PRODUCT (WUXI)	4-581-640-11	PO NO.: 9021103001-2	USD	AIR	CIF-S.HAI	S006555	LSV1860A LENS
12/14/2016 12:25:10 pm	1CS03	SONY DIGITAL PRODUCT (WUXI)	4-581-638-11	PO NO.: 9021112001	USD	AIR	CIF-S.HAI	S006555	LSV1860A LENS

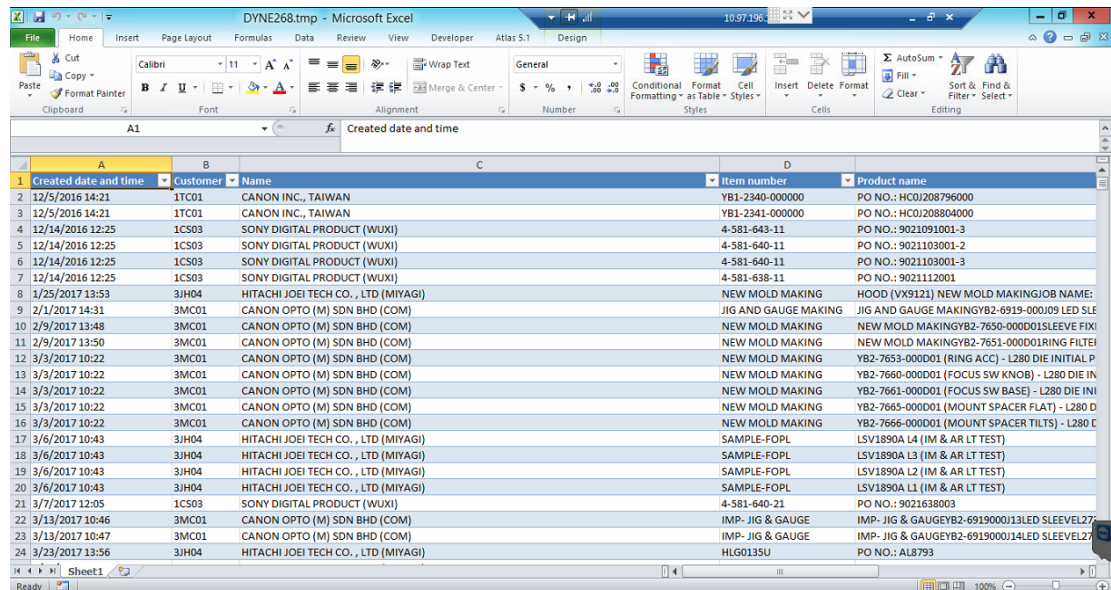


Once confirm the report will show all sales order with open status.

To export the data, click on File → Export to Microsoft Excel.



The exported data should be in the form of excel format as below. Save the excel file for next stage of migration.





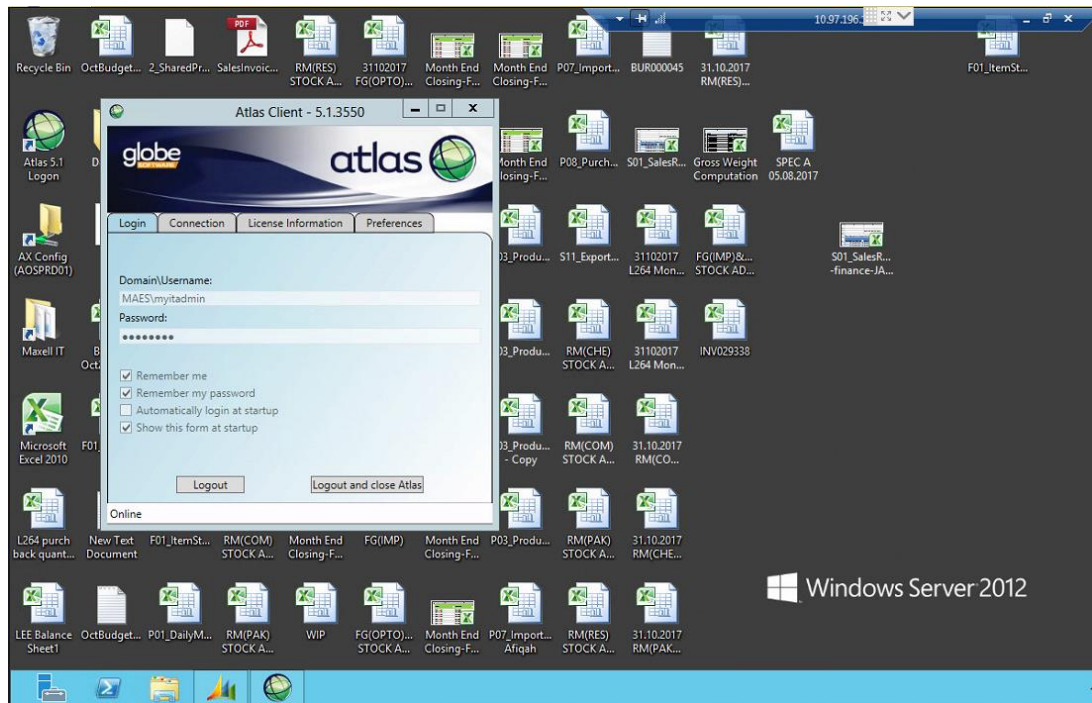
### Step 3.0 Reporting Tool

Reporting tool can be vary for company. In this case, the company uses the Atlas Reporting Tool to extract data for user.

There is 2 options for extraction the data reporting tool: 1. Use existing developed report and add field for any field missing. 2. Create a new report.

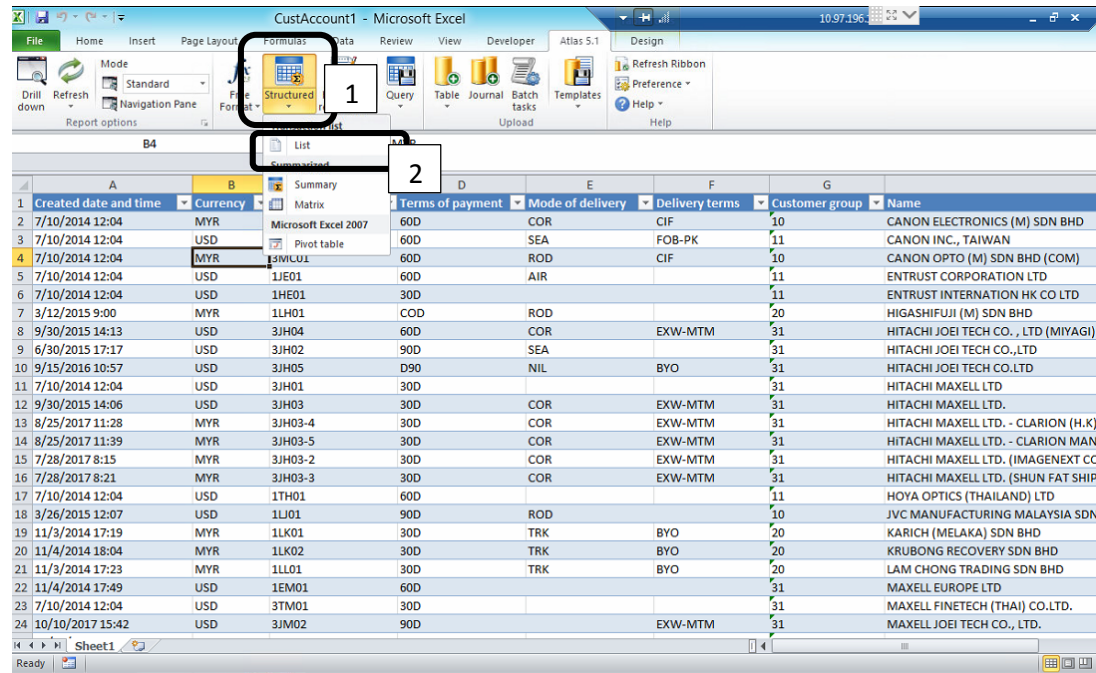
### Step 3.1 Use the existing developed report

Make sure the software is login before access the report



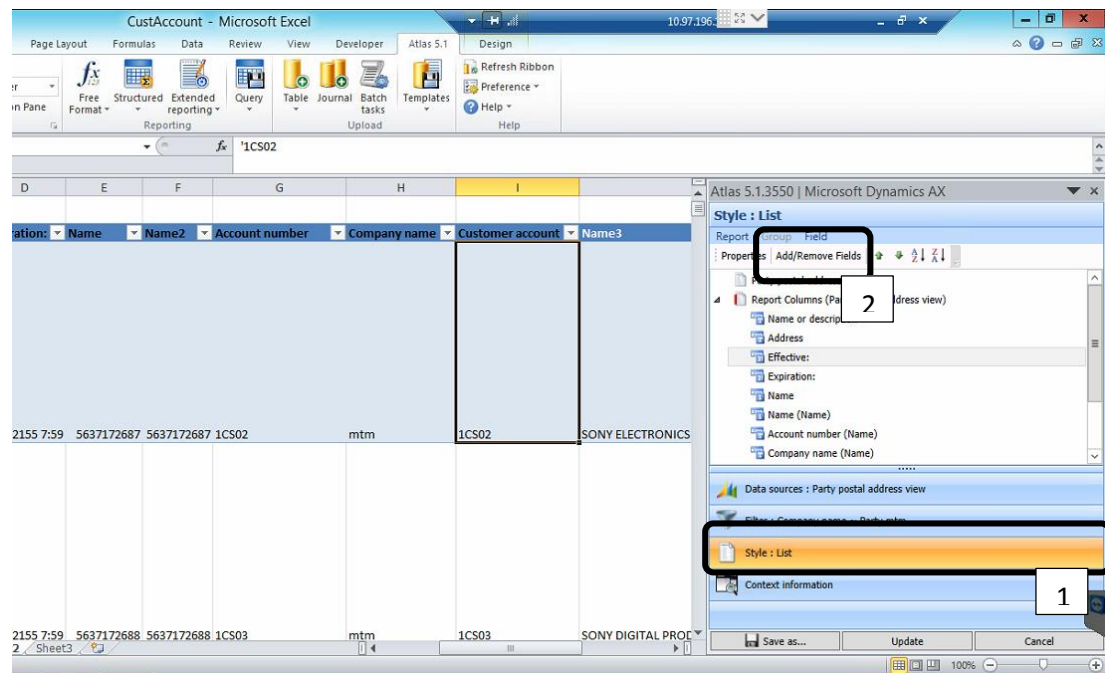
### Step 3.1.1 Add the necessary field in the report

Open existing report → Atlas 5.1 tab → click Structure → List



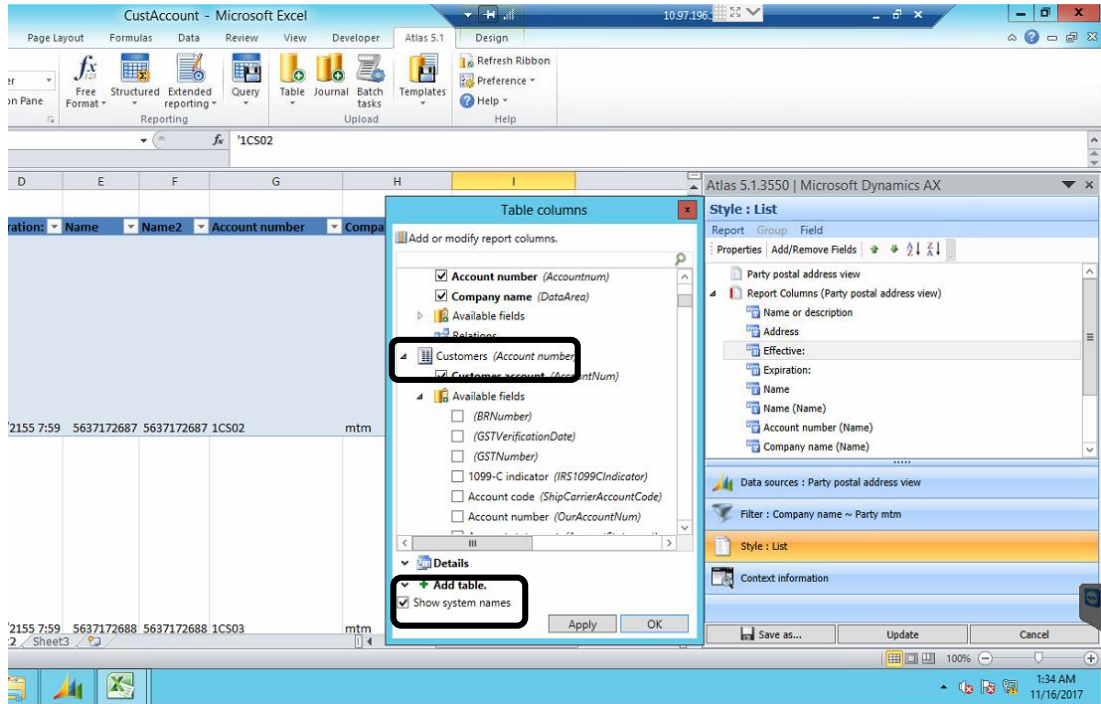
In this case, the currency for customer report is missing. To add the field:

Click on the List → Click on Add/Remove Fields

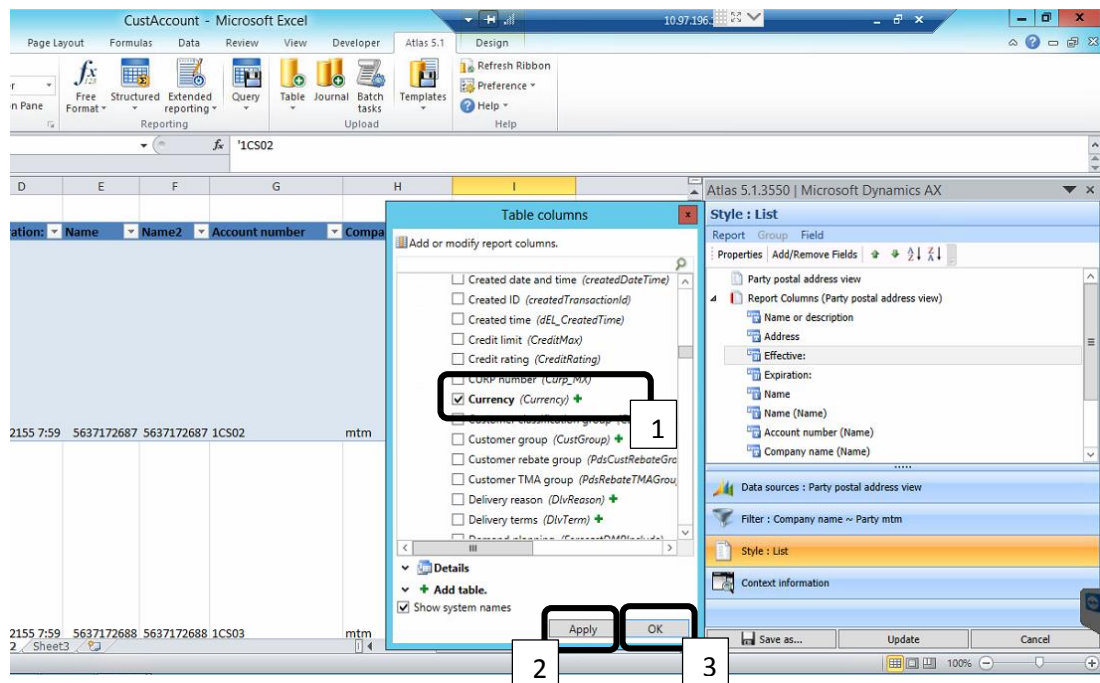


Located the Customer table and expand Available Fields. Make sure to tick the Shows system name for easy identification.

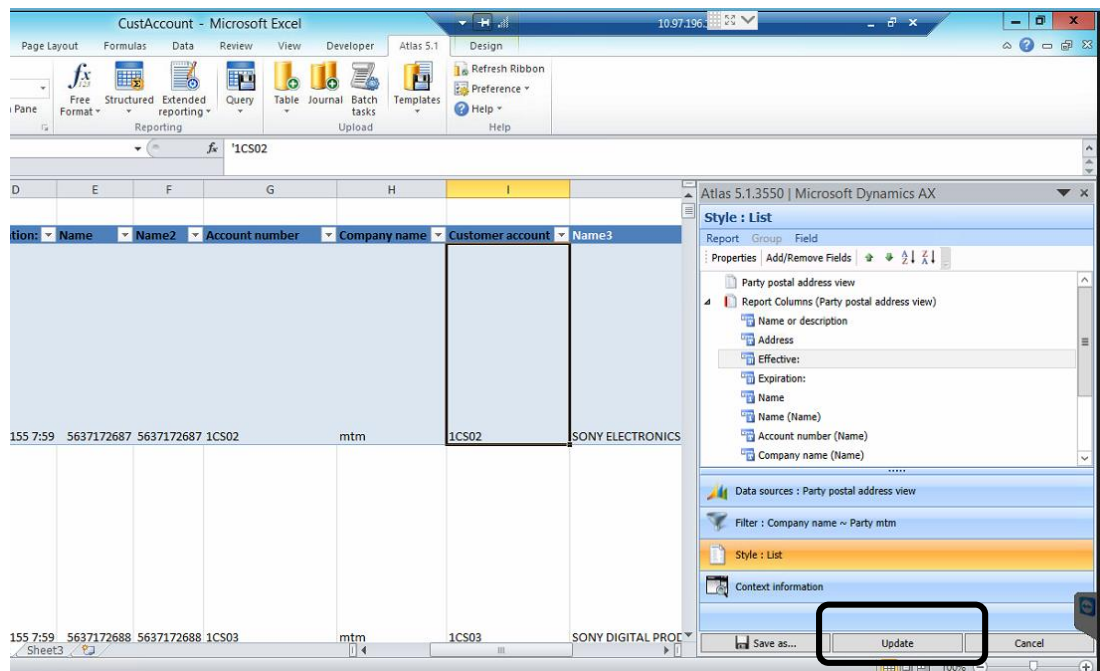
Note: If you are not sure which table involved, always refer to the list of Table and Field identified in stage 1.



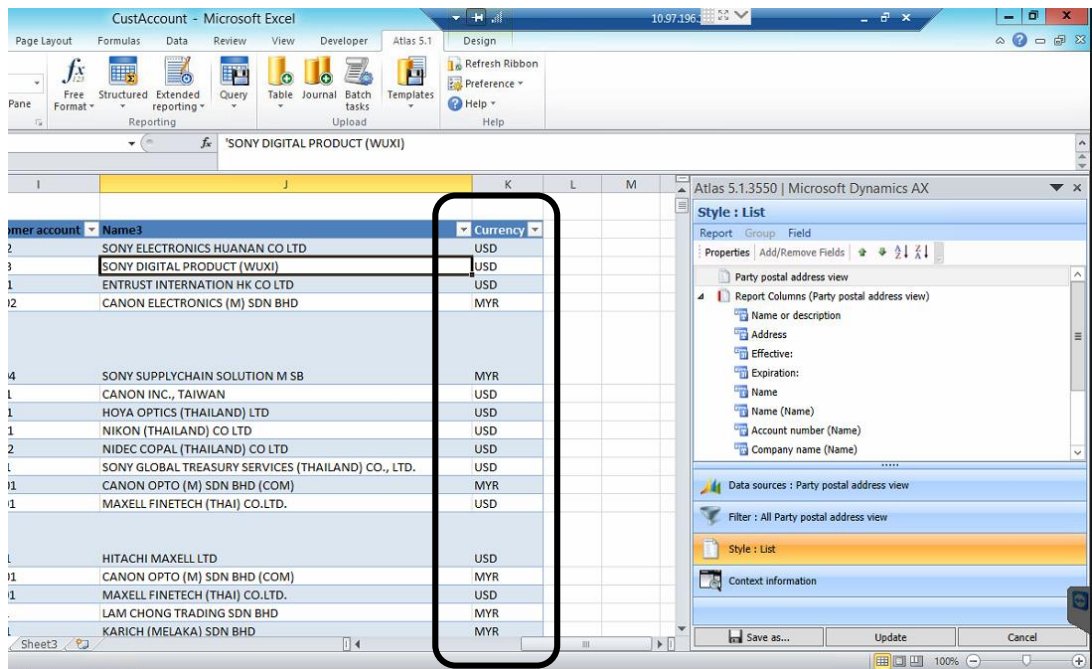
1. Tick on the field required to add
2. Click on Apply button and Ok button



Click Update button to insert new field.



Notice the new field is inserted. Repeat the step above if there is new field required to add.

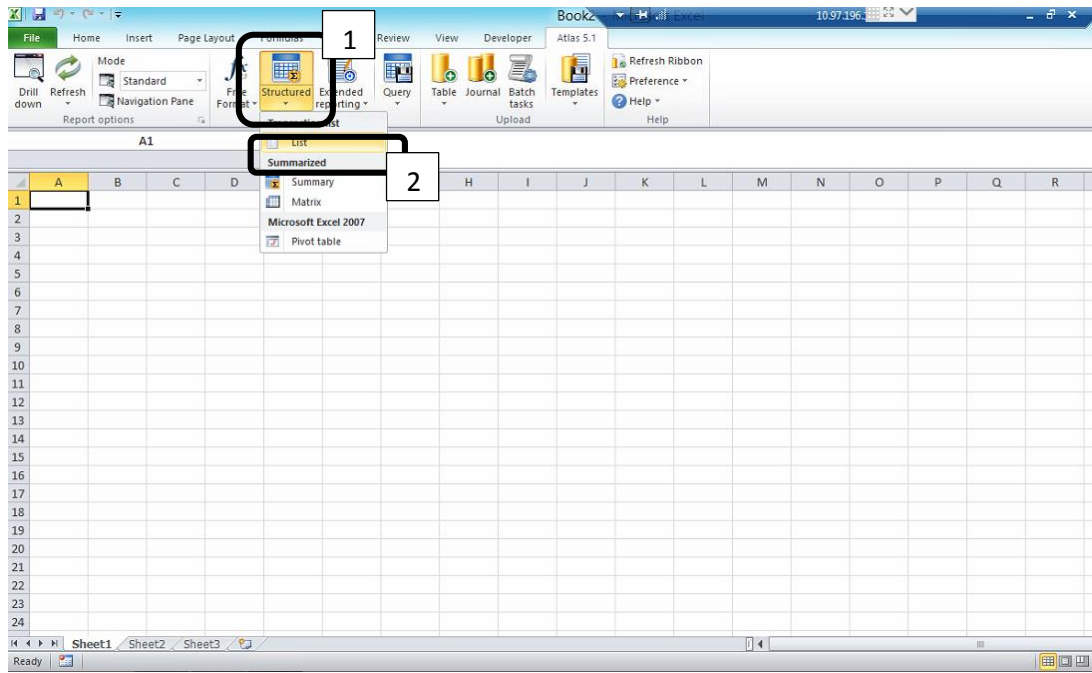


Once it done, save it for next stage of migration.

### Step 3.2 Create new report

Open a new excel file.

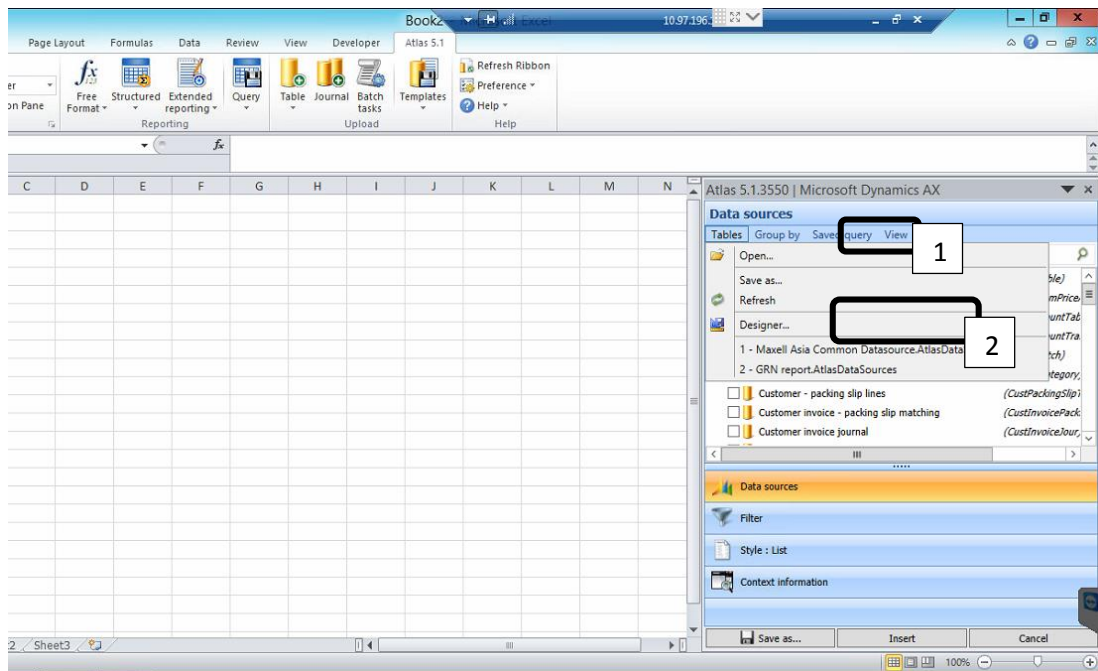
Atlas 5.1 tab → click Structure → List



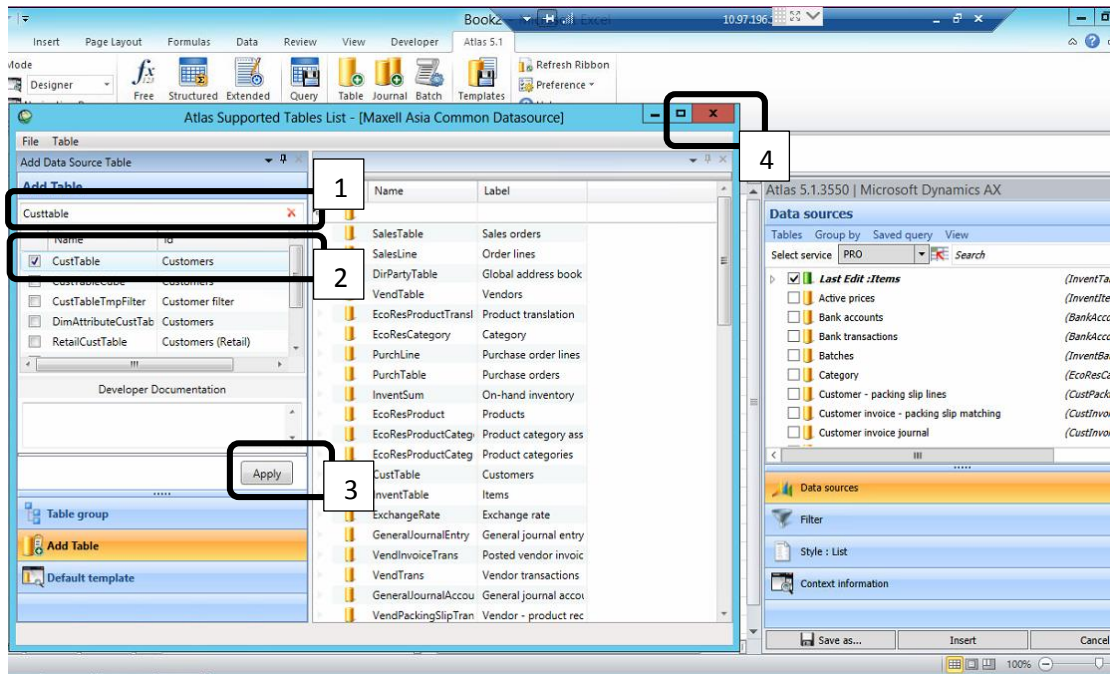


### Step 3.2.1 Add table and field

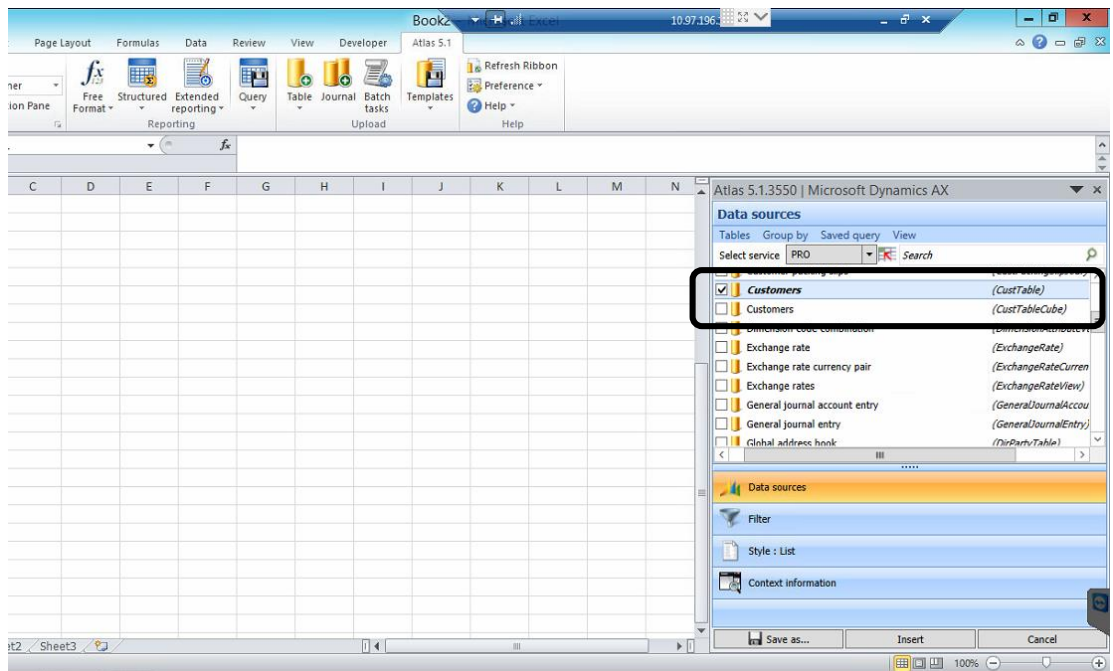
Click Tables → Designer



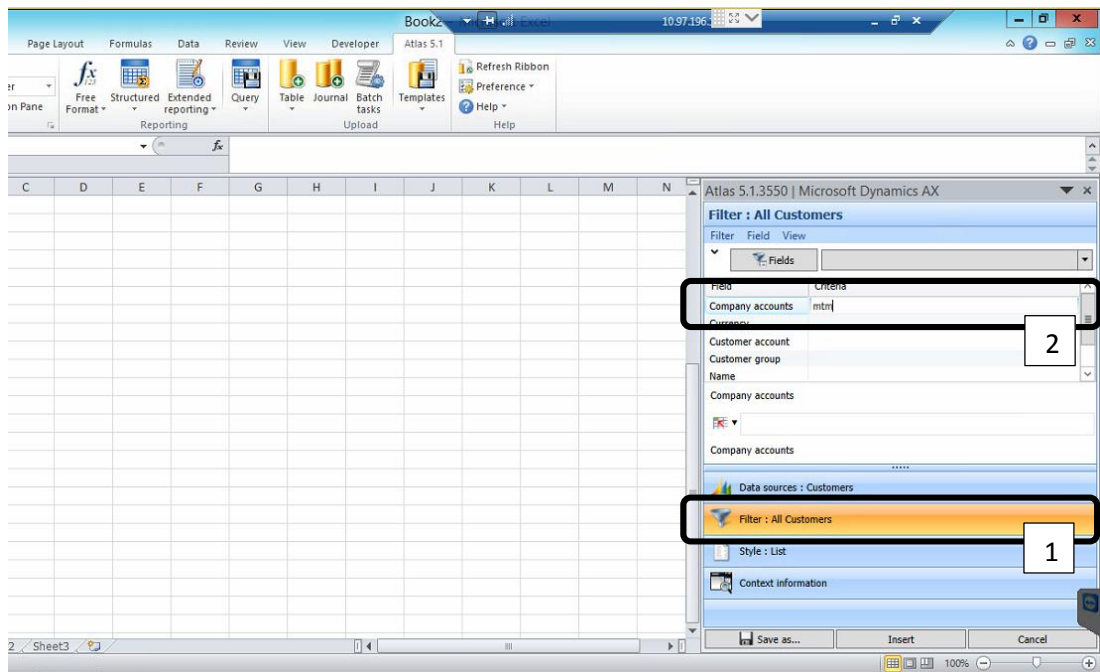
1. Type the table that you want to add in the column and press Enter. (Always refer to the List of table and field for the table name)
2. Tick on the table
3. Click Apply button
4. Click Close



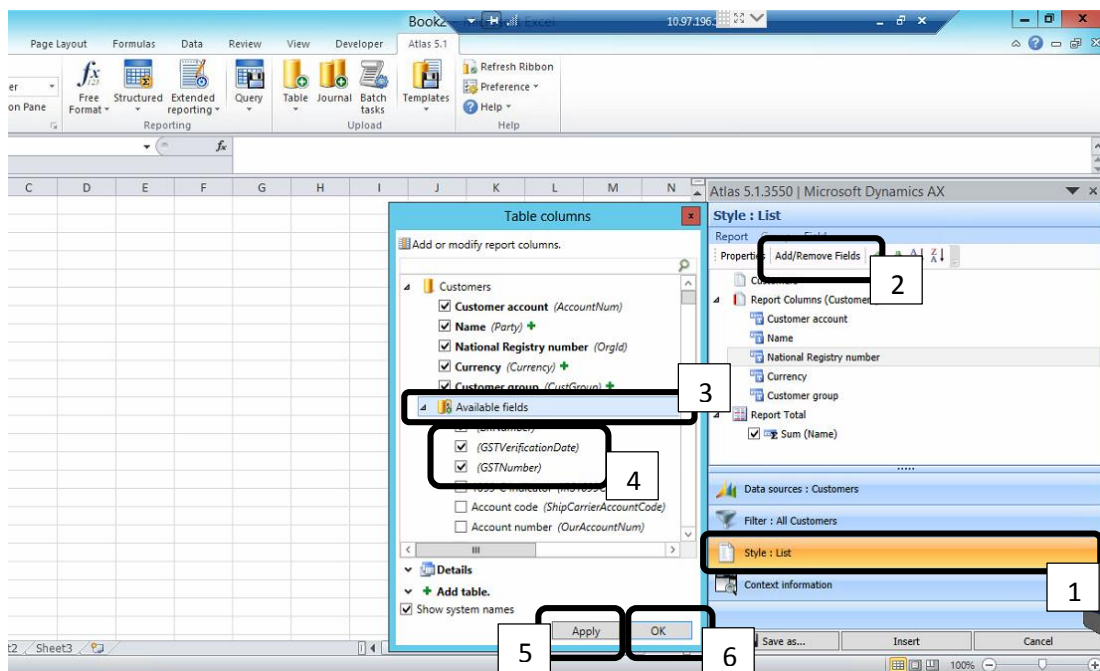
From the list, find and tick the newly added table.



If the system is shared by multiple company- Click on Filter, filter the data by Company accounts. Type in the name of company in the column.

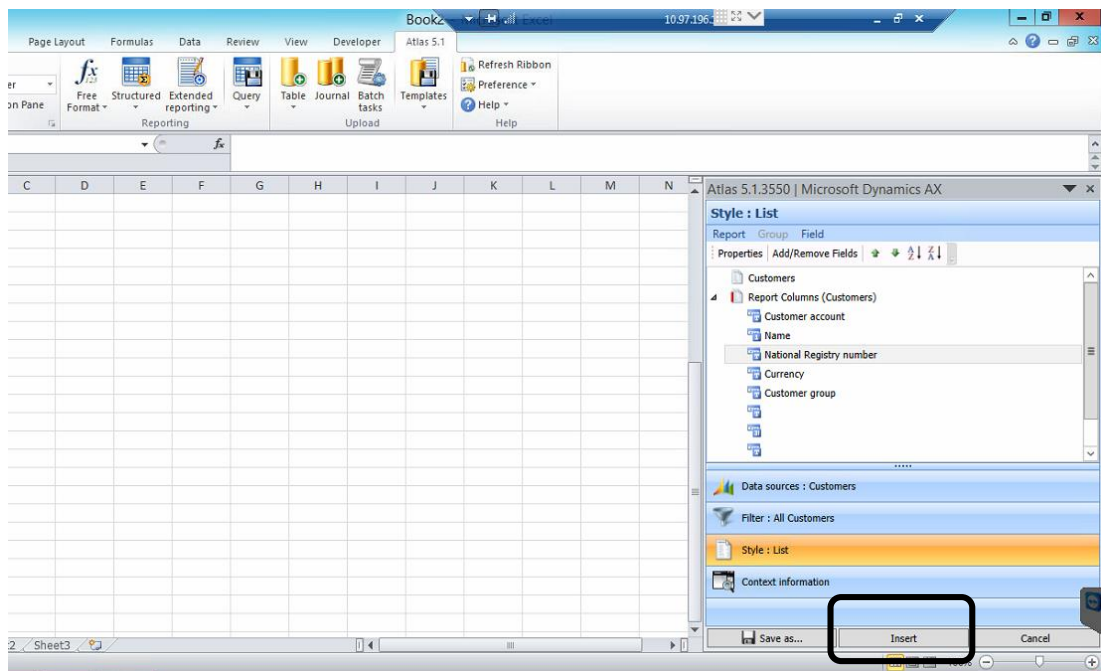


1. Click on Style: List
2. Click on Add/Remove Fields
3. Expand the Available fields to add other field
4. Click Apply button
5. Click Ok button

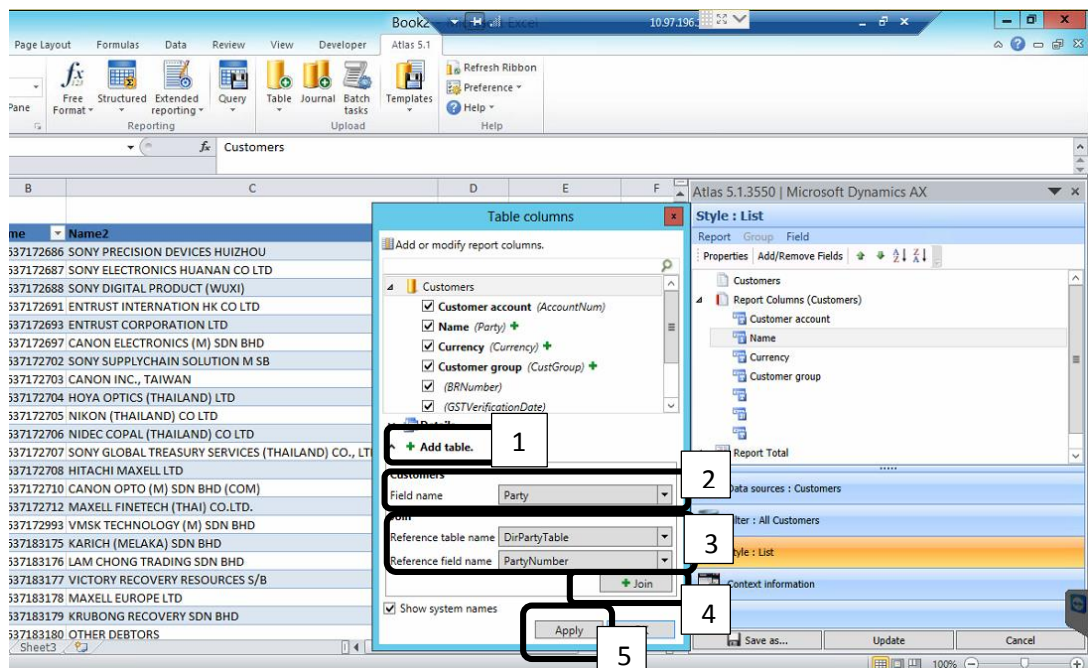




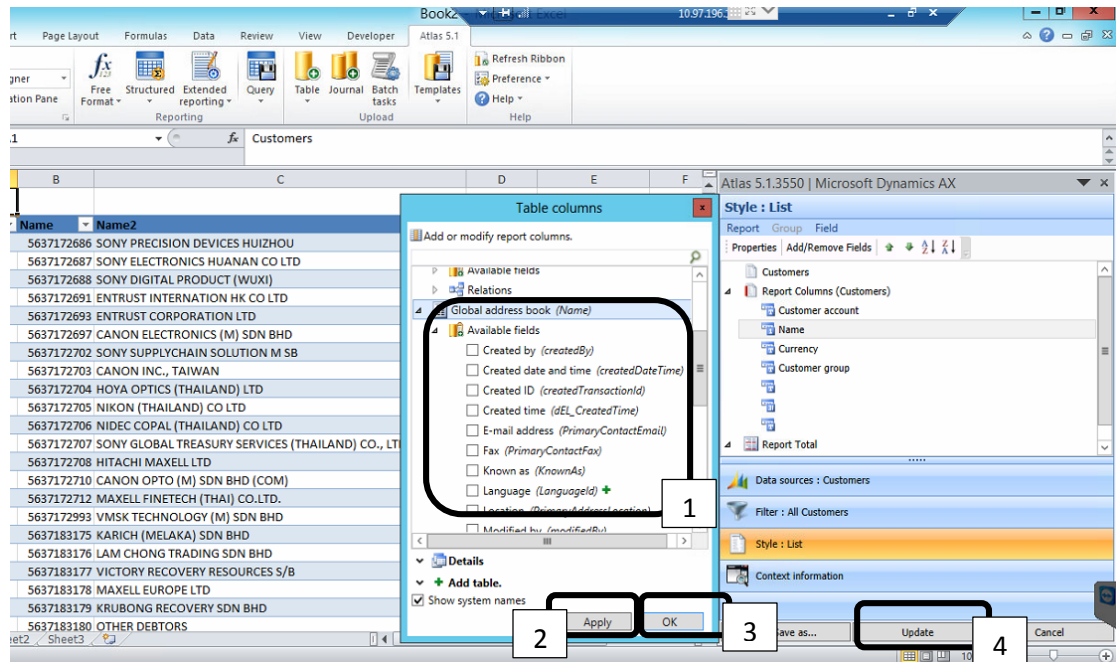
Click Insert to add the table and field in the excel sheet.



1. To join other table, click on Add table.
2. Choose the primary key field. (If you not sure the relationship between tables, refer back stage 1- Backend/ Application Object Tree- checking the relationship between the tables).
3. Fill in the join table name and fill in the field name
4. Click on Join button.
5. Click Apply button

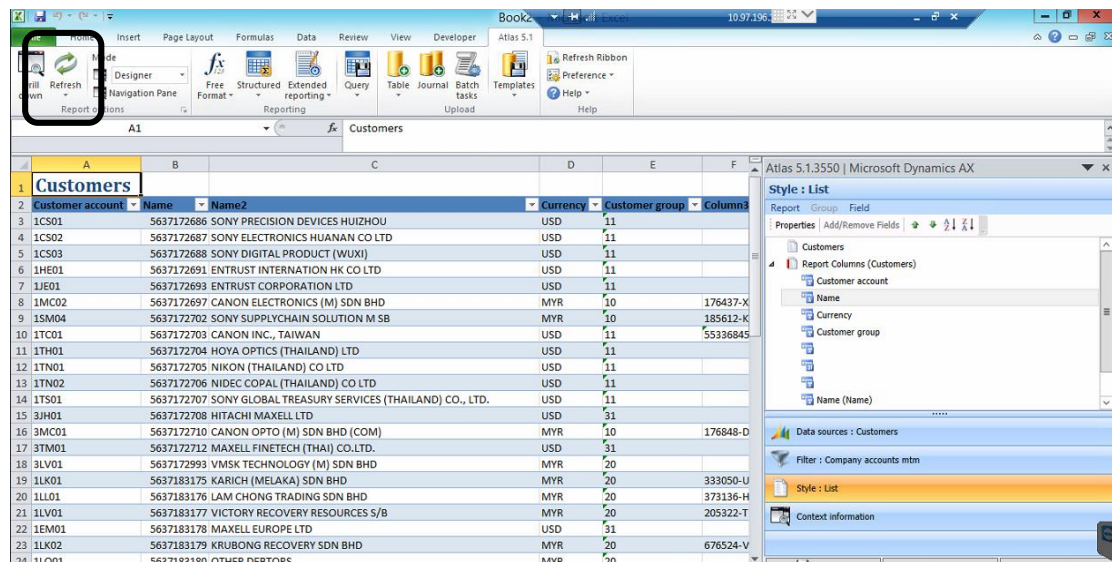


1. Once the table is joined, choose the field that required to add
2. Click Apply button
3. Click Ok button
4. Click Update button to add new field



### Step 3.3 Data Export: Master Data

Click refresh button to make sure all related data is downloaded from the database.



Save the file for next stage of migration.

## 5.5 Stage 4- Import

Import stage is consider simple, yet, important as this stage is the core part of migration data process. In Microsoft Dynamic 365-CRM, the process of data import has been simplify for company or individual to perform much faster and easier. As compared to On-premise version (Microsoft Dynamic AX 2012), certain functionality has been automate in Cloud based version (Microsoft Dynamic 365). For example, data mapping no longer required to map in data source before import, system will automatically detect and prompt out a window to request for field mapping during the data import process.

Checklist to do on import:

- Table mapping
- Data Import:
- Master Data
- Transactional Data
- Template for Data Import

Note for company:

Even though the data import process has been simplified, however, there are several significant criterial require to know before start the import stage:

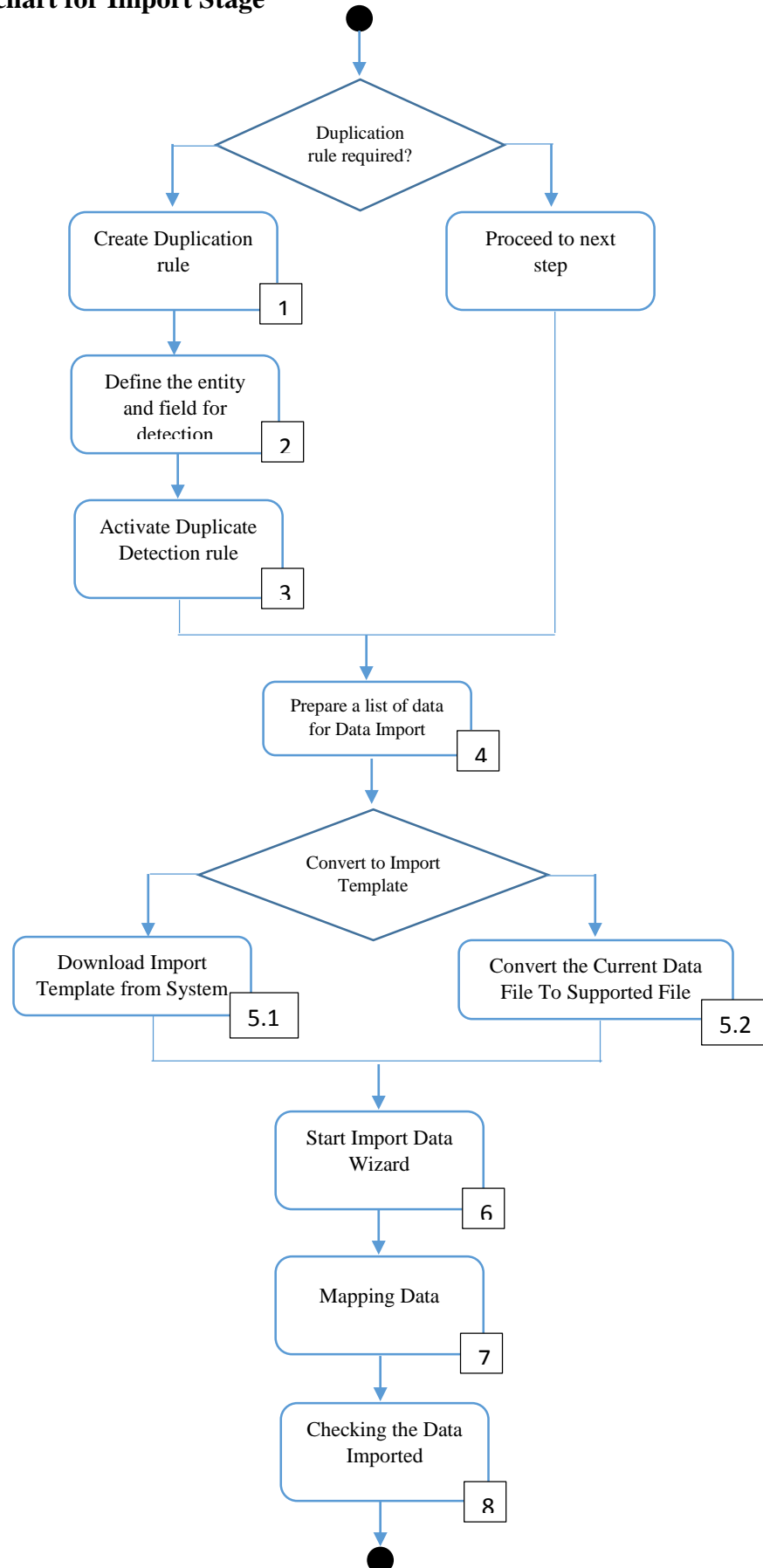
-Check carefully for the total field required to import, ensure that all the important data and field is insert into one import template. This is because the import data interface in data management does not support update on one field, instead, it will update all the field in that table.

-Make sure that duplicate detection rules is activated (status- Published) before the import data start. This to avoid any duplication data is created during import data.

-Fully understand on the each fields in Cloud based system (Microsoft Dynamic 365-CRM) before import. This is important during the data mapping, fields from On-premise system is required to match correctly to Cloud based system.

-Well aware on the numbers of fields with criterial of compulsory in Cloud based system (Microsoft Dynamic 365-CRM) and ensure that those fields is mapped with the current On-premise system data. Data import will fail if the compulsory field did not mapped during import.

### 5.5.1 Flowchart for Import Stage



## Step 1.0 Create Duplicate Detection Rules

Go to Settings → Data Management → Duplicate Detection Rules

The screenshot shows the Dynamics 365 Data Management settings page. The navigation bar at the top includes 'Dynamics 365', 'Settings', and 'Data Management'. The main heading is 'Data Management'. Below this, there is a section titled 'What would you like to do?' with several options. The 'Duplicate Detection Rules' option is highlighted with a red box. The other options include 'Duplicate Detection Settings', 'Duplicate Detection Jobs', 'Data Maps', 'Templates for Data Import', 'Add Ready-to-Use Business Processes', 'Export Field Translations', 'Similar Records Suggestions Settings', 'Bulk Record Deletion', 'Imports', 'Sample Data', 'Data Encryption', and 'Import Field Translations'.

Click on New button

The screenshot shows the Dynamics 365 Duplicate Detection Rules page. The navigation bar at the top includes 'Dynamics 365', 'Settings', and 'Data Management'. Below this, there is a section titled 'Duplicate Detection Rules'. The 'New' button is highlighted with a red box. The page displays a table of existing rules, including columns for 'Entity Type', 'Status Reason', 'Base Record Type', 'Matching Record Type', 'Created By', and 'Modified On'. The table lists several rules, such as 'Accounts with the same Account Name' and 'Accounts with the same e-mail address', all of which are currently 'Unpublished'.

Entity Type	Status Reason	Base Record Type	Matching Record Type	Created By	Modified On
Accounts with the same Account Name	Unpublished	Account	Account	---	11/19/2017 9:01 PM
Accounts with the same e-mail address	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Accounts with the same phone number	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Accounts with the same website	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Contacts with the same business phone number	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Contacts with the same e-mail address	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Contacts with the same first name and last name	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Leads with the same e-mail address	Unpublished	Lead	Lead	SYSTEM	10/17/2017 5:27 PM
Social profiles with same full name and social ch...	Published	Social Profile	Social Profile	SYSTEM	10/17/2017 5:18 PM

## Step 2.0 Define the entity and field for detection

1. Name- Define the name for the duplicate rule
2. Description- Enter additional information in the description column
3. Base Record Type- Choose the main entity that need to apply the duplicate detection
4. Matching Record Type- Choose other possible entity that required to compare against the base record. (Choose the same entity if you want to check the record within the same entity).

Duplicate Detection Rule: New Duplicate Detection Rule - Microsoft Dynamics 365 - Google Chrome

Rule: New Duplicate Detection Rule

**General**

Name \* Account with the same Account Number 1 Status Reason \* Unpublished

Description

Check Duplication On Account Number 2

Duplicate Detection Rule Criteria

Base Record Type \* Account 3 Matching Record Type \* Account 4

Case-sensitive ☐ Exclude inactive matching records ☐

Field	Criteria	No. of Characters	Ignore Blank Values
Account Number	Exact Match		<input checked="" type="checkbox"/>

5. Case-sensitive- Tick if the detection rule require to be case sensitive
6. Exclude inactive matching records- Tick if the detection rule require to exclude the inactive record

Duplicate Detection Rule Criteria

Base Record Type \* Account Matching Record Type \* Account

Case-sensitive ☐ 5 Exclude inactive matching records ☐ 6

Field	Criteria	No. of Characters	Ignore Blank Values
Account Number	Exact Match		<input checked="" type="checkbox"/>

7. Field- Choose the field that required to apply duplication rule.
8. Criterial- Choose either Exact Match (exactly match with the record), First Characters (match only the first character of the record) or Last Characters (match only the last character of the record).
9. No. of Characters- Enter on the number of characters need to compare.
10. Ignore Blank Values- Tick to ignore blank value record.

**Duplicate Detection Rule Criteria**

Base Record Type \*  Matching Record Type \*

Case-sensitive ☐ Exclude inactive matching records ☐

Clear

Field	Criteria	No. of Characters	Ignore Blank Values
<input type="text" value="Account Number"/> <a href="#">Select</a>	<a href="#">Exact Match</a>		<input checked="" type="checkbox"/>

7 8 9 10

Click Save and Close button after key in all information.

Duplicate Detection Rule: Account with the same Account Number - Microsoft Dynamics 365 - Google Chrome

Secure: Only Admins can access this page. [Save and Close](#) [Publish](#) [Actions](#)

[Save and Close](#)

Duplicate Detection Rule: Account with the same Account Number

**Information**

**Duplicate Detection Rule: ...** **General**

**Name \***  **Status Reason \***

**Description**

Check Duplication On Account Number

**Duplicate Detection Rule Criteria**

Base Record Type \*  Matching Record Type \*

Case-sensitive ☐ Exclude inactive matching records ☐

Clear

Field	Criteria	No. of Characters	Ignore Blank Values
<input type="text" value="Account Number"/> <a href="#">Select</a>	<a href="#">Exact Match</a>		<input checked="" type="checkbox"/>

javascriptonclick();



### Step 3.0 Activate Duplicate Detection rule

Select and click Publish button to activate the duplication rule.

1

2

Rule Name	Status Reason	Base Record Type	Matching Record Type	Created By	Modified On
Accounts with the same Account Number	Unpublished	Account	Account	Ming Jia Lee	11/19/2017 9:08 PM
Accounts with the same Account Name	Unpublished	Account	Account	---	11/19/2017 9:01 PM
Accounts with the same e-mail address	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Accounts with the same phone number	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Accounts with the same website	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Contacts with the same business phone number	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Contacts with the same e-mail address	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Contacts with the same first name and last name	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Leads with the same e-mail address	Unpublished	Lead	Lead	SYSTEM	10/17/2017 5:27 PM
Social profiles with same full name and social ch...	Published	Social Profile	Social Profile	SYSTEM	10/17/2017 5:18 PM

1 - 10 of 10 (1 selected)

Make sure the status is published before you proceed to do import data

1

2

Rule Name	Status Reason	Base Record Type	Matching Record Type	Created By	Modified On
Accounts with the same Account Number	Published	Account	Account	Ming Jia Lee	11/19/2017 9:09 PM
Accounts with the same Account Name	Unpublished	Account	Account	---	11/19/2017 9:01 PM
Accounts with the same e-mail address	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Accounts with the same phone number	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Accounts with the same website	Unpublished	Account	Account	SYSTEM	10/17/2017 5:27 PM
Contacts with the same business phone number	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Contacts with the same e-mail address	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Contacts with the same first name and last name	Unpublished	Contact	Contact	SYSTEM	10/17/2017 5:48 PM
Leads with the same e-mail address	Unpublished	Lead	Lead	SYSTEM	10/17/2017 5:27 PM
Social profiles with same full name and social ch...	Published	Social Profile	Social Profile	SYSTEM	10/17/2017 5:18 PM

1 - 10 of 10 (0 selected)

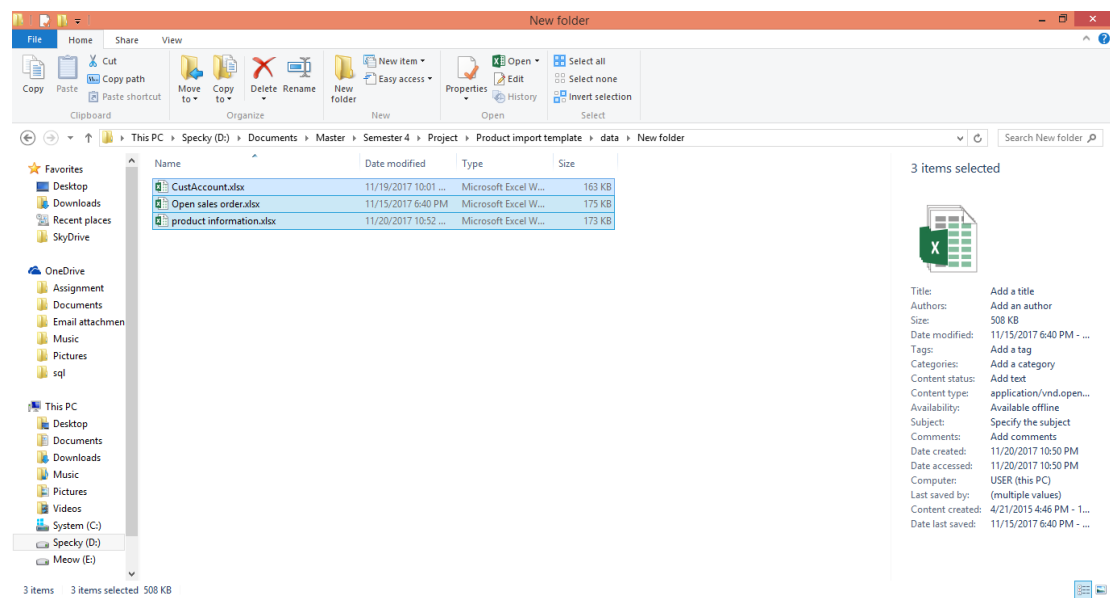
## Step 4.0 Prepare a list of data for Data Import

There are 2 type of Data need to import:

- Master Data
- Transactional Data

Note: The import will execute in several time based on the number of type of data available. For example, there are 3 type of data, therefore, required to import 3 times.

In this case Master Data for Sales module will be Product Information and Customer Account. For Transactional Data will be the Sales Order.



## Step 5.0 Convert to Import Template

There are 2 ways to convert data into import template:

- Download Import Template from System (This will required to manually copy and paste the data from the extracted file to the template, this will reduce the error on field mapping)
- Convert The Current Data File To Supported File Format (This will required to convert the current extracted file to the supported file format, however, this will increase the possibility of mapping the wrong field)

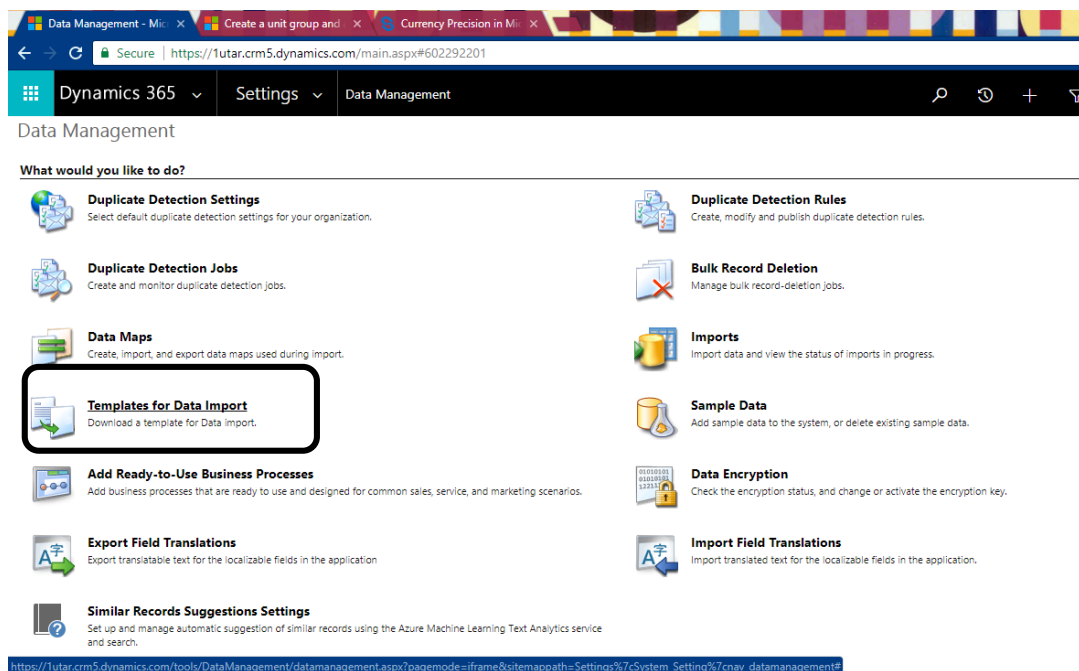
## Step 5.1 Download Import Template from System

Using the import template required the effort copy and paste the data into the template. During import the process, the system will automatically detect the template and directly map the data into an entity as well as into the field. Therefore, it will fasten the import process as it skip the process of select and mapping the field.

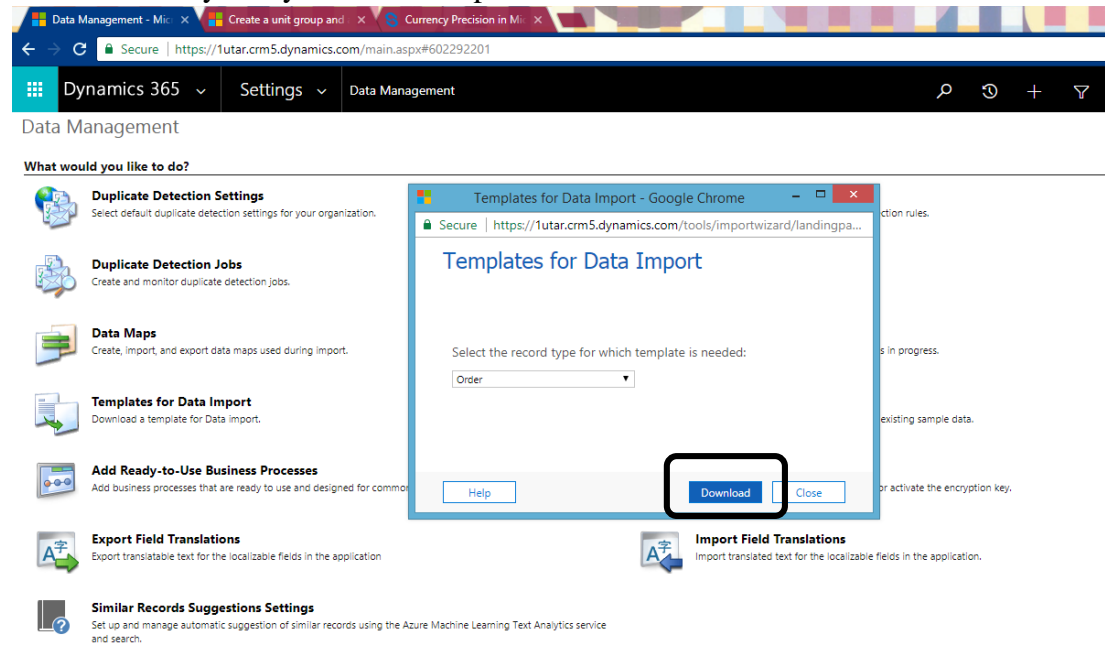
Answer to Question: If there is one field required to create in Cloud based system but overlooked during the customization. Can the mapped data be import first, and once the field is created then only import that particular field's data? Answer is not advisable to do import on field by field.

This is because when each import process is executed, all fields in particular table will be update regardless whether the fields is mapped or not mapped with the data. However, the current import interface in Microsoft Dynamic 365-CRM is supported on creating new field during the data mapping process. You can create new field on the spot when system is unable to detect or map the field in the template.

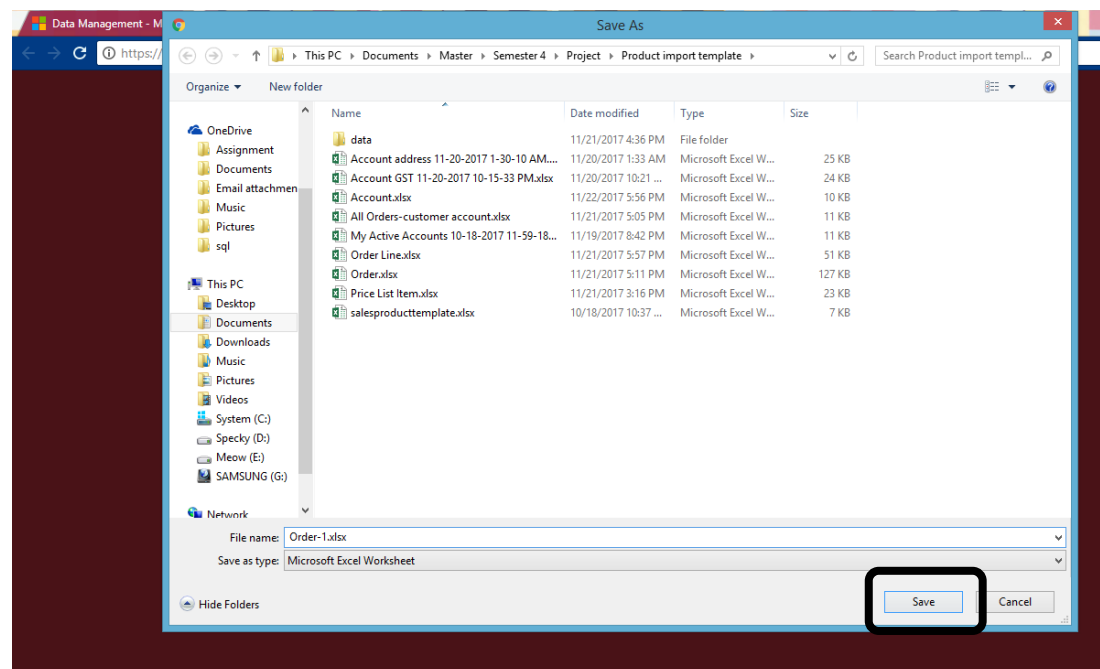
To download import template, go to Settings → Data Management → Templates for Data Import.



Select the entity that you wish to import data and click Download button.



Click to save the copy.



Open the file, copy and paste all data into the template. Save it for next step of import.

**Note:** Make sure all compulsory field is filled with data.

	Q	R	S	T	
1	Shipping Method	Freight Terms	Ship To	Bill To Contact Name	Payment
2	SEA	FOB-PK	Address		600
3	AIR	CIF-S.HAI	Address		600
4	AIR	CIF-S.HAI	Address		600
5	COR	EXW-MTM	Address		600
6	AIR	CIF-S.HAI	Address		600
7	ROD	CIF	Address		600
8	ROD	EXW-MTM	Address		600
9	ROD	EXW-MTM	Address		600
10	ROD	EXW-MTM	Address		600
11	ROD	EXW-MTM	Address		600
12	ROD	EXW-MTM	Address		600
13	ROD	EXW-MTM	Address		600
14	ROD	EXW-MTM	Address		600
15	ROD	EXW-MTM	Address		600
16	ROD	EXW-MTM	Address		600
17	ROD	EXW-MTM	Address		600
18	ROD	EXW-MTM	Address		600
19	ROD	EXW-MTM	Address		600
20	ROD	EXW-MTM	Address		600
21	ROD	EXW-MTM	Address		600

## Step 5.2 Convert The Current Data File To Supported File Format

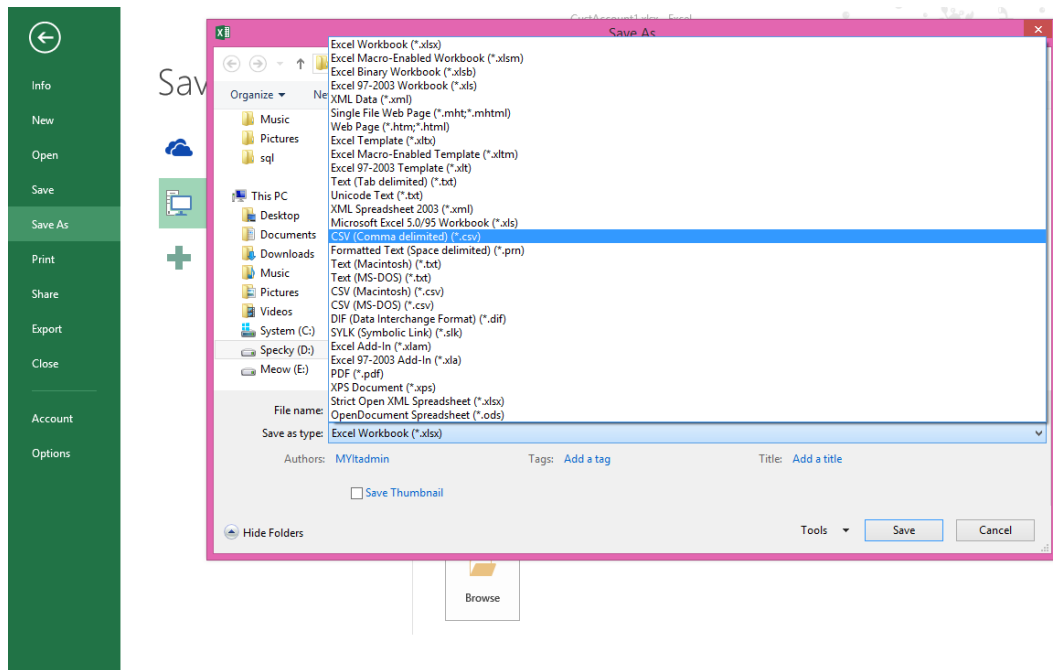
To convert data into import template, there are several file format that Microsoft

Dynamic 365-CRM supported:

- XML Spreadsheet 2003 (.xml)
- .csv
- .txt
- .xlsx
- .zip

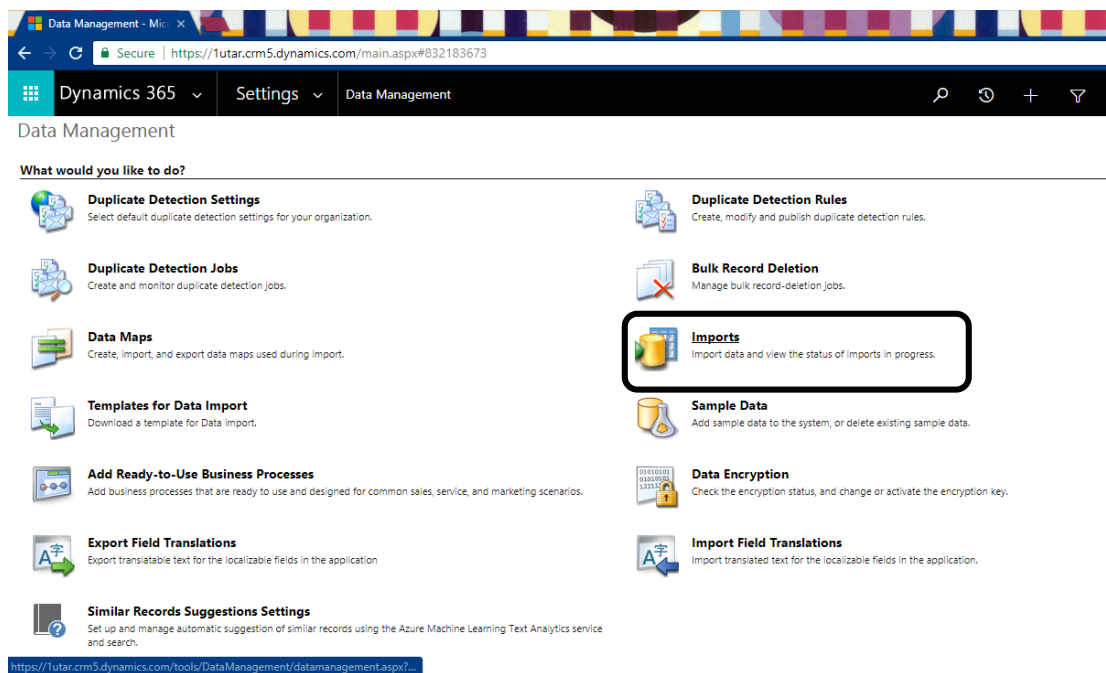
The maximum file size allowed is 8mb, except .zip where it reached to 32mb.

Convert the current data to the supported file format, click on Save As on the excel sheet and choose the desired file format that you want.

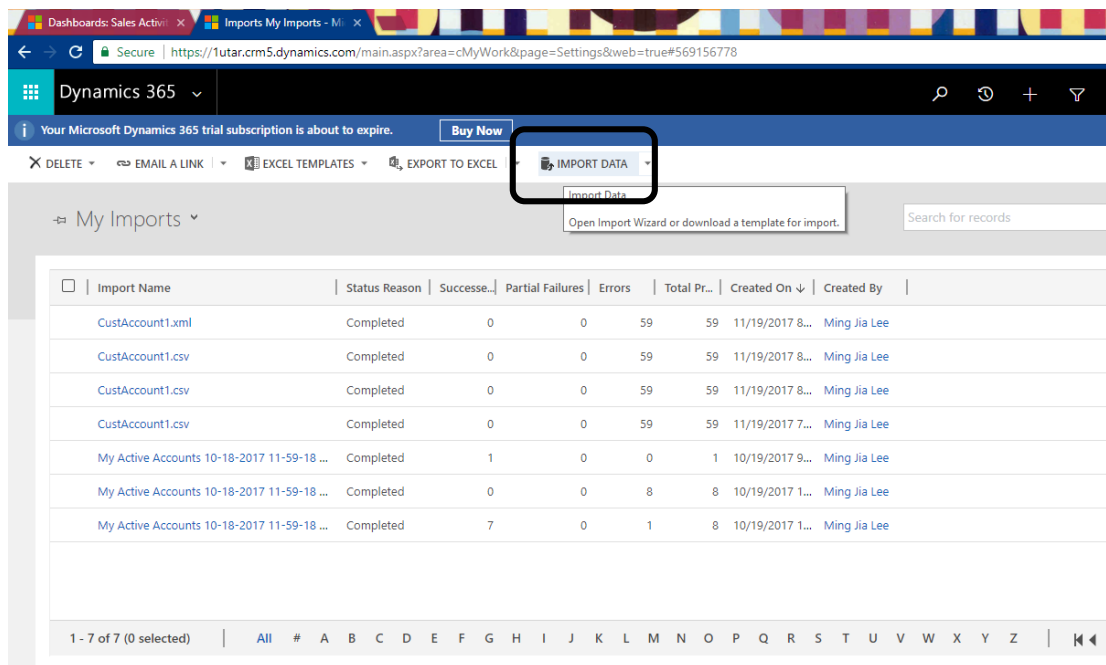


## Step 6.0 Start Import Data Wizard

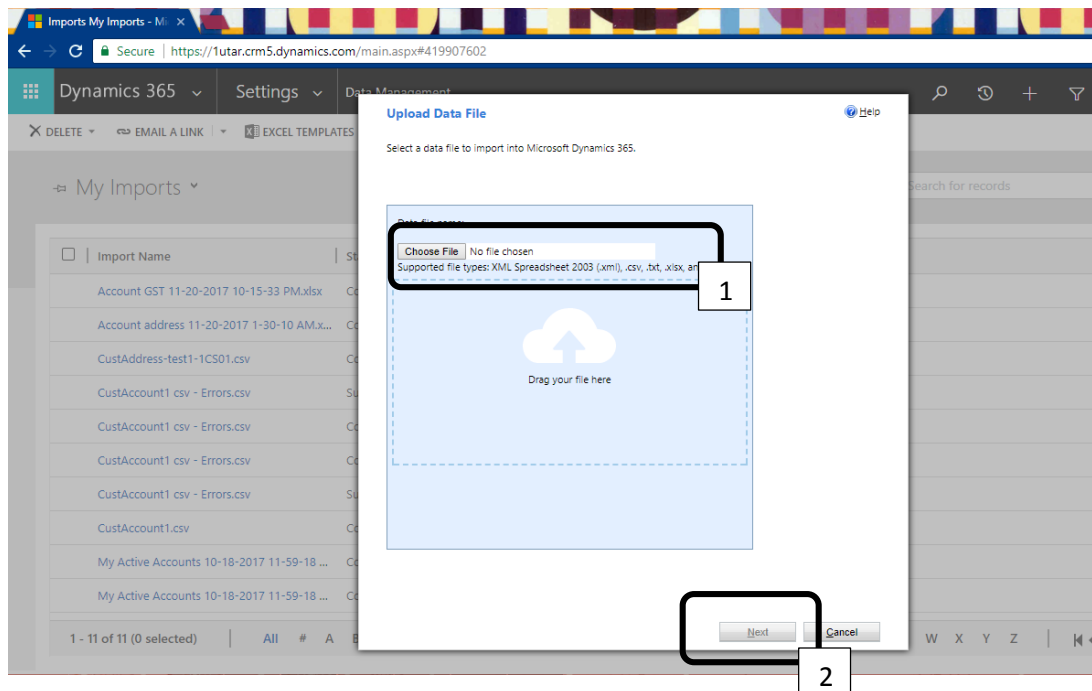
Go to Settings → Data Management → Imports



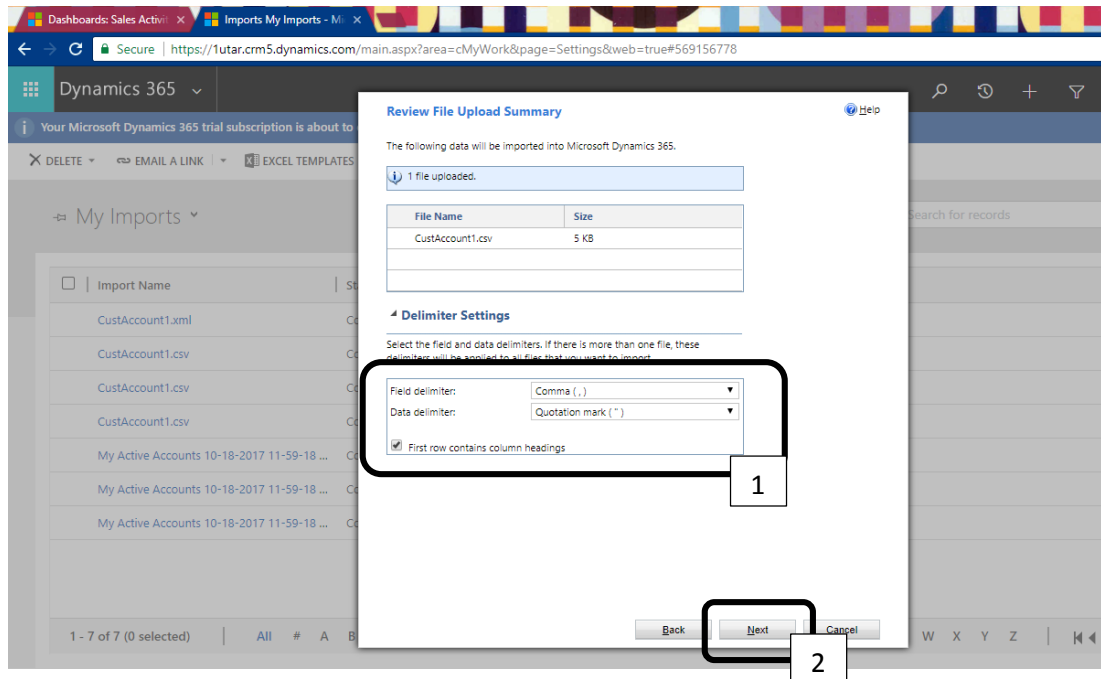
## Click on Import Data Button



## Insert the data for import and click Next button



If the file format is .csv, make sure the value in Delimiter settings is correct and click Next button.



### Step 7.0 Mapping Data

Before start any data import, make sure table mapping is done for reference. Note: You may found that there are 2 table existed in cloud-based system for one data type. For example, Sales order data are separate into two table- Sales order header (contains general sales information such as customer account) and Sales order line (contains sales order detailed information such as product and price).

**Table 5.3: Data Mapping**

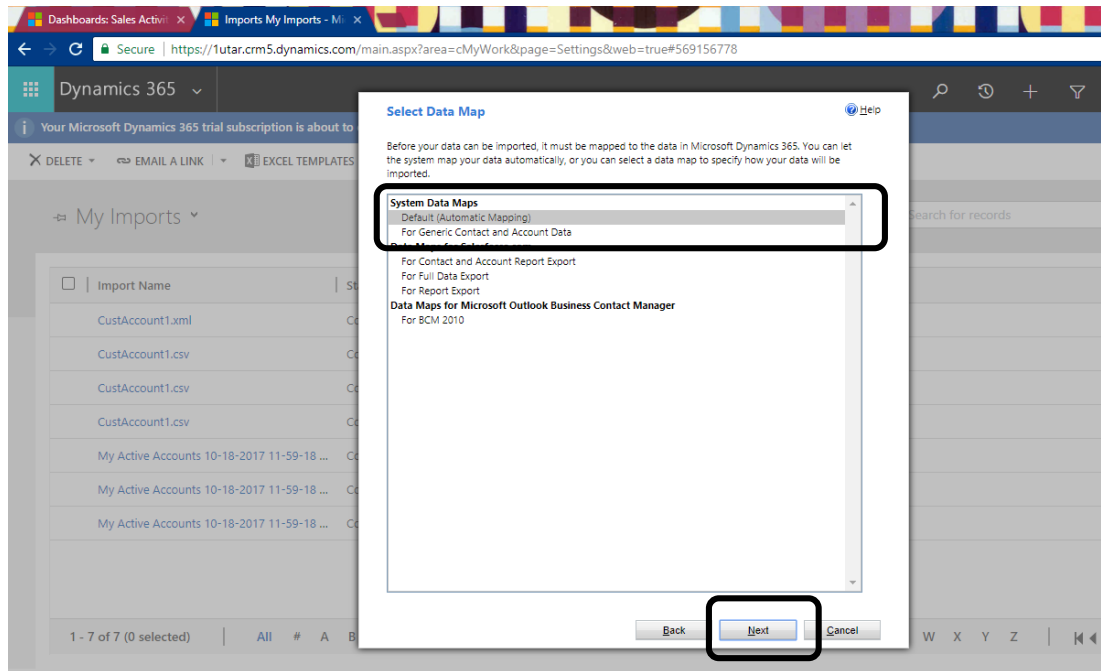
Microsoft Dynamic AX 2012 Field	Microsoft Dynamic 365 Field
<b>Item Master</b>	
Item Number	Order Table- Product ID
Item Group ID	Order Table- Parent (change default map to product ID)
Item Name	Order Table- Name
Item Unit	Order Table- Unit Group, Default Unit (need to create PCS unit in the system)
CostCenter	Order Table- MTM Cost Center
Segment	Order Table- MTM Segment
PL Group	Order Table- MTM PL Group
<b>Item Price Master</b>	



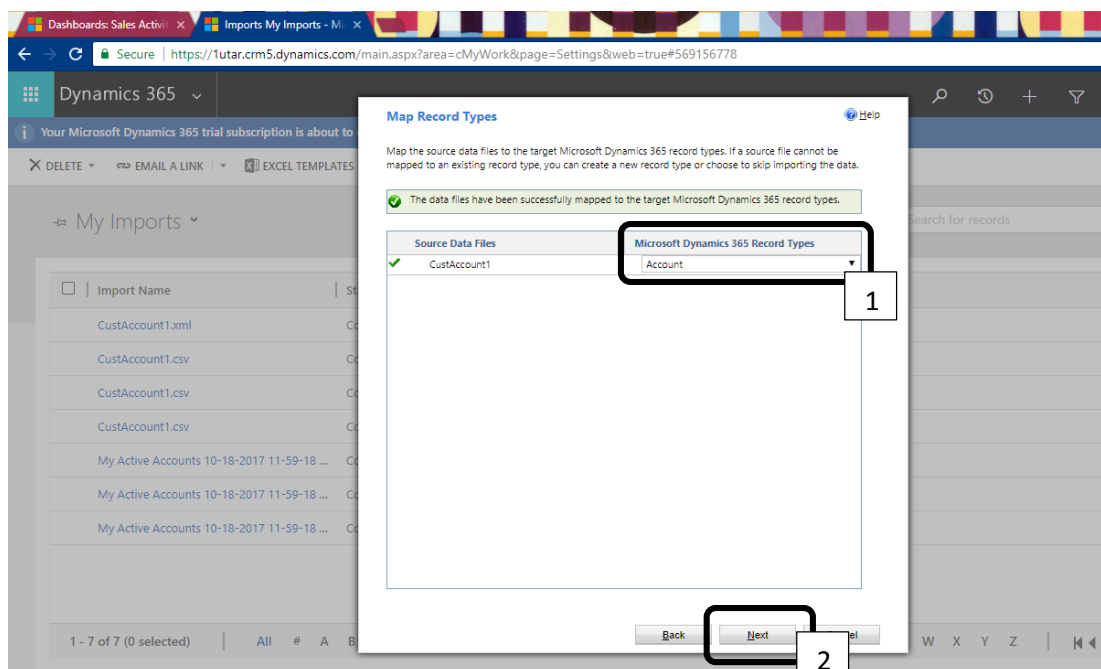
Item Number	Price List Item Table- Product ID
Item Unit	Price List Item Table- Unit
Item Price	Price List Item Table- Amount
Price Currency	Price List Item Table- Price List (need to create in system in Price List)
<b>Customer Data</b>	
Customer Account Number/ Id	Account Table- Account Number
Customer Name	Account Table- Account Name
Customer Group	Account Table- Parent Account
Customer Business Number	Account Table- Customer Business Number
Customer GST Number	Account Table- GST Number
Customer GST Verification Date	Account Table- GST Verification Date
Customer Address	Account Table- Address 1: Street 1
Customer Delivery Term	Account Table- Freight Term
Customer Mode of Delivery	Account Table- Shipping Method
Customer Payment Term	Account Table- Payment Terms
Customer Currency	Account Table- Currency
<b>Transaction Data- Sales order</b>	
Sales Order Number	Order Table- Name
Customer Account	Order Table- Customer (change default map to customer ID)
Request Delivery Date	Order Table- Requested Delivery
Delivery Term	Order Table- Freight Terms
Mode of Delivery	Order Table- Shipping Method
Currency	Order Table- Price List
Customer Requisition	Order Table- Description
<b>Transaction Data- Sales order lines</b>	
Sales Order Number	Order Line Table- Order (change default map to name)
Item ID	Order Line Table- Product (change default map to product ID)
Item Unit	Order Line Table- Unit
Sales Quantity	Order Line Table- Amount
Sales Line Amount	Order Line Table- Not require to map as system will auto calculate the price and quantity.

Make sure the selection is Default (Automatic Mapping) and click Next button.

By choosing this, system will automatically base on the source file and map to the table that you require to import to.

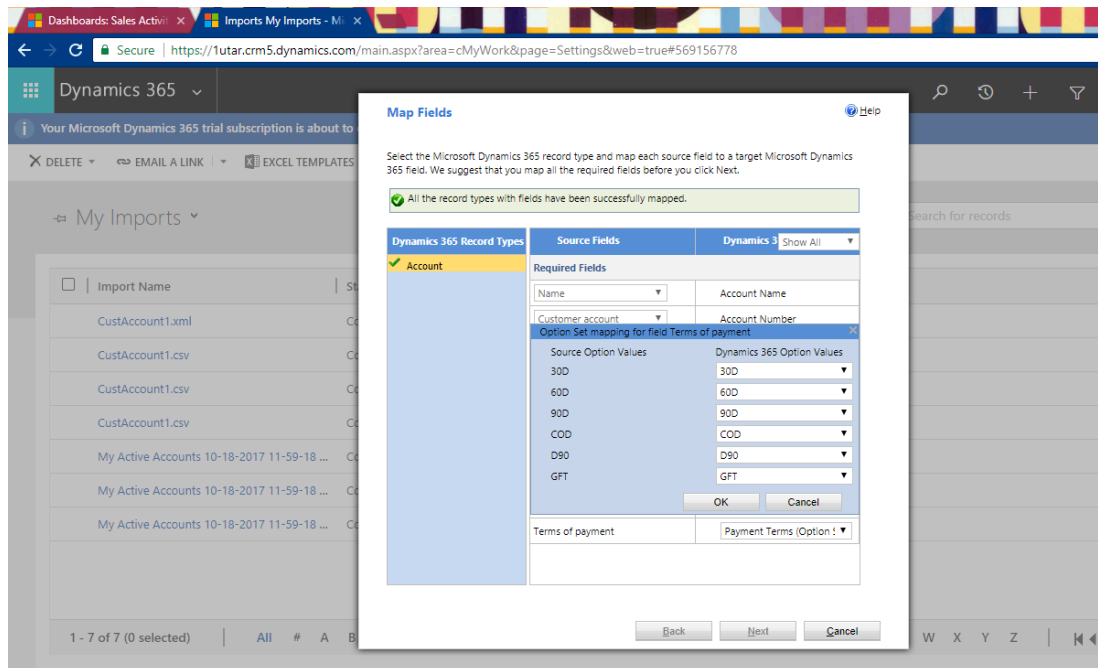


Select the target record or entity name that need to map and click Next button.

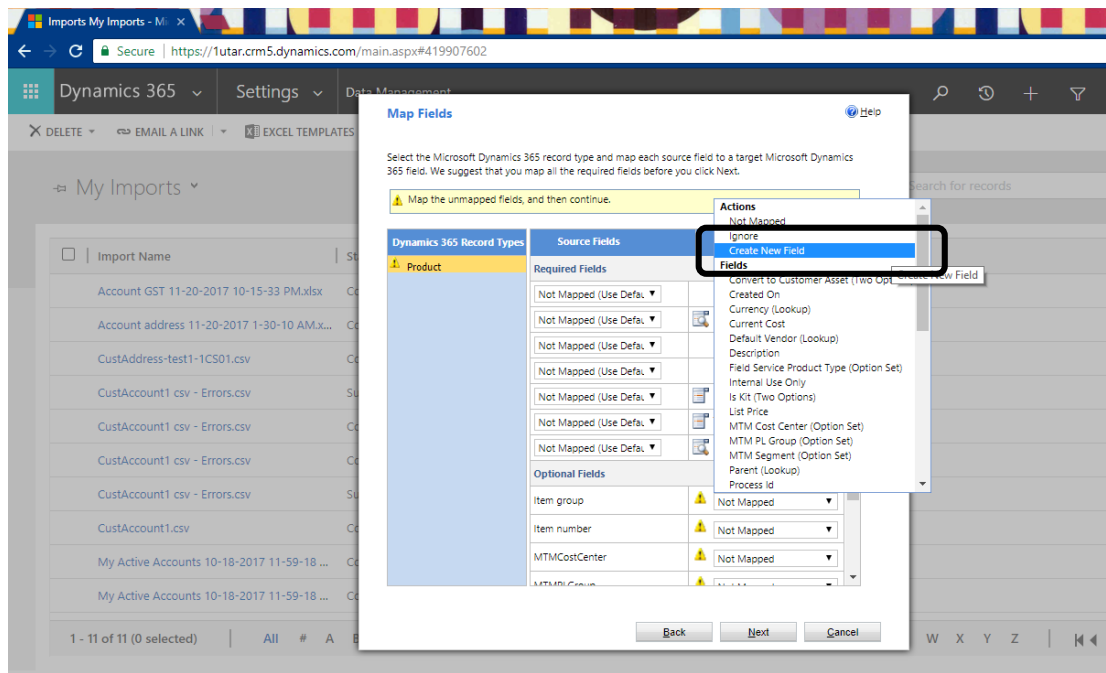


Click and select the field.

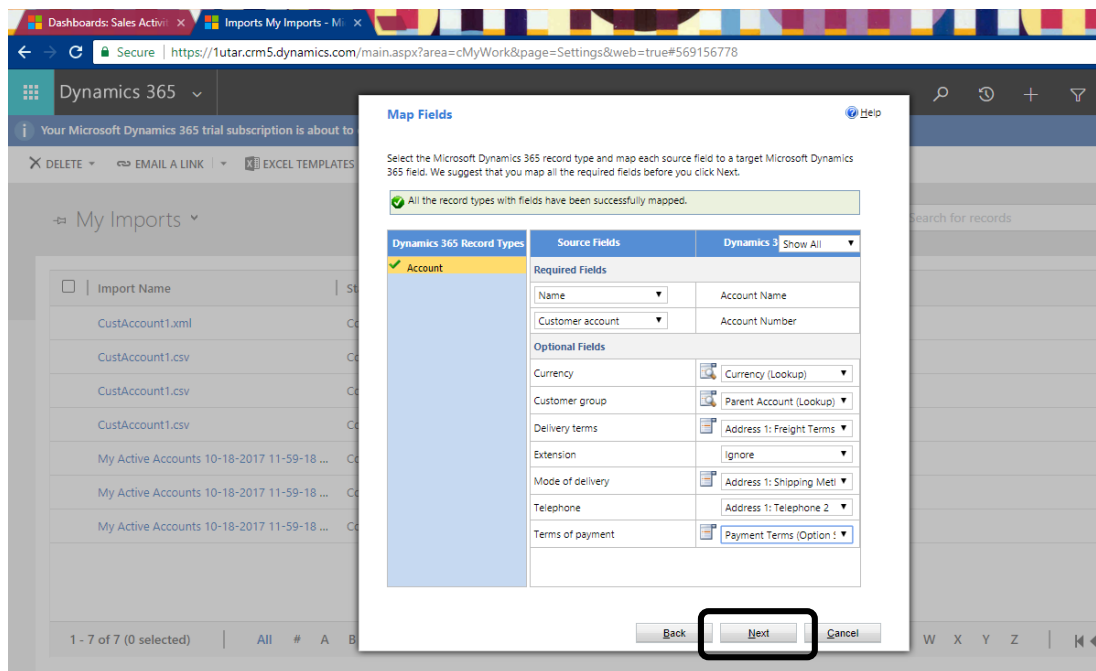
System will automatically create the field value for field options based on the source file as show in below:



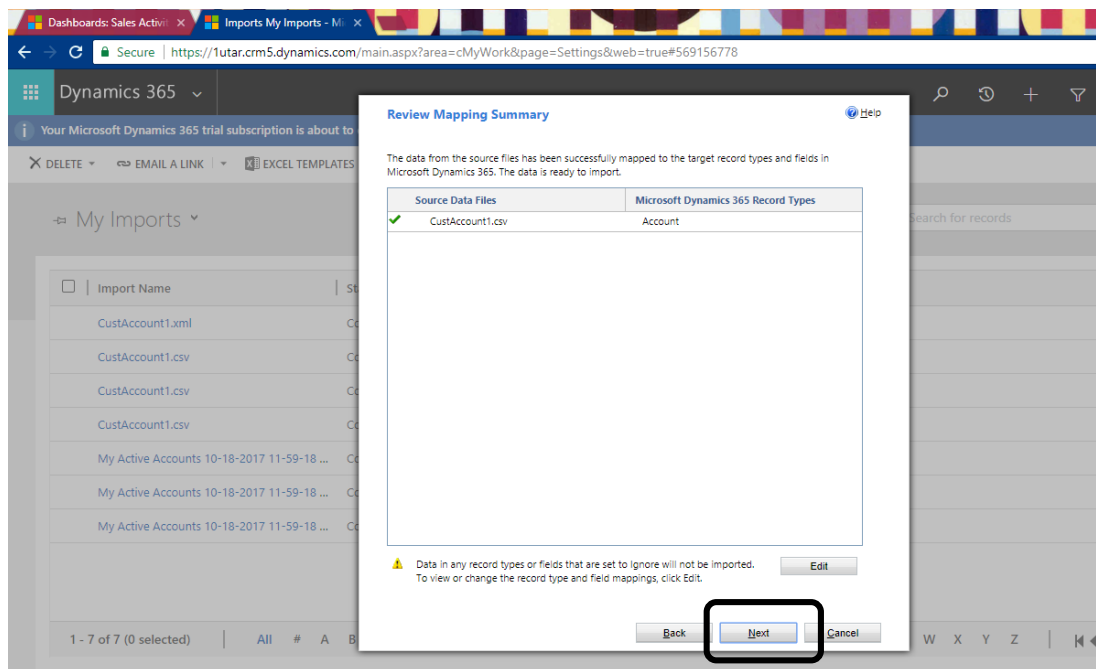
You can create new field on the spot in Microsoft Dynamic 365-CRM if there is no field available to select to.



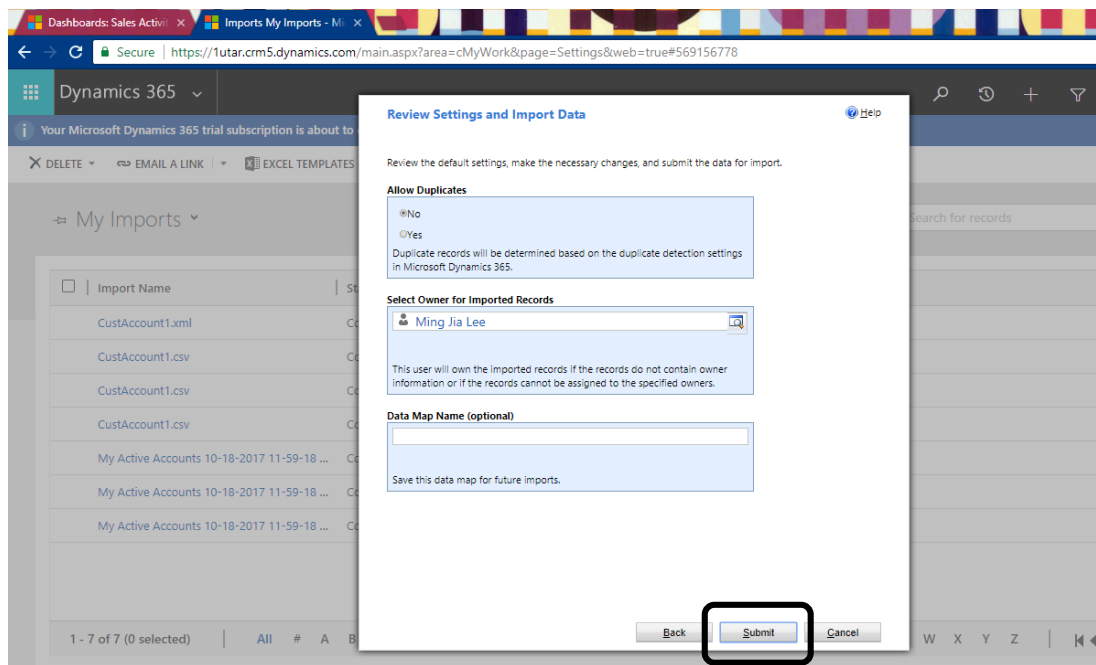
Once all field is mapped, click Next button to continue next stage.



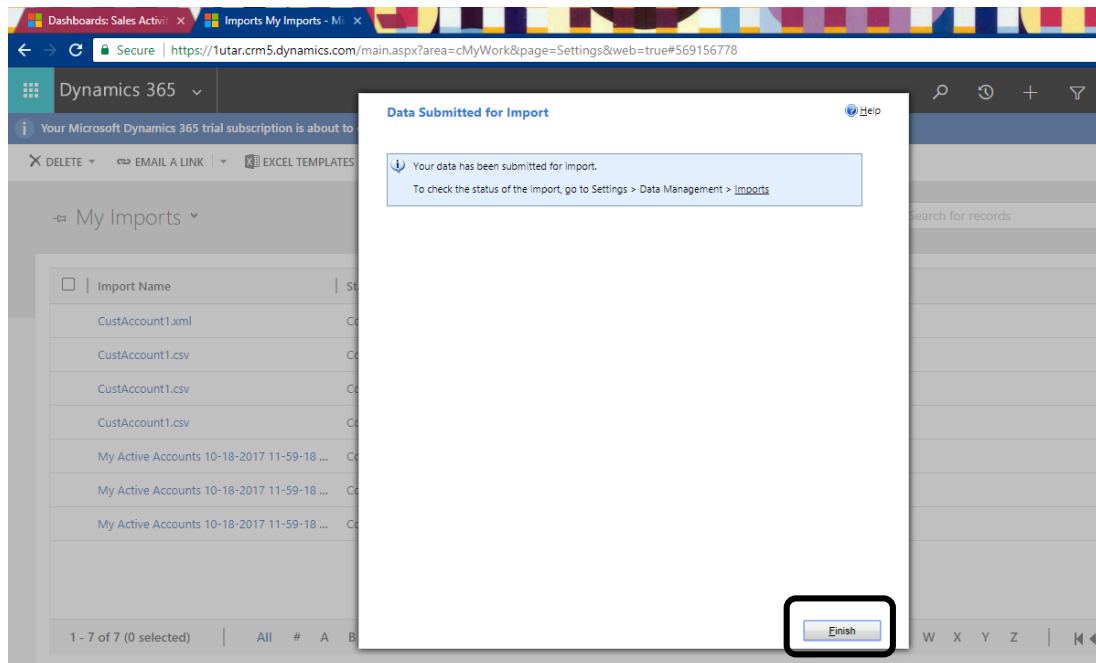
Click Next button to confirm the data mapping.



Click Submit button to start the data import process.



Click Finish button to exit the import wizard.



Wait for few minute and enter F5 to refresh the screen.

After the import is complete, the status will show as Completed and numbers of errors records and successful import records. You can click inside to check the error if there is numbers of error indicate.

Import Name	Status Reason	Successes	Partial Failures	Errors	Total Pr...	Created On	Created By
CustAccount1.csv	Completed	55	0	4	59	11/19/2017 8...	Ming Jia Lee
My Active Accounts 10-18-2017 11-59-18 ...	Completed	1	0	0	1	10/19/2017 9...	Ming Jia Lee
My Active Accounts 10-18-2017 11-59-18 ...	Completed	0	0	8	8	10/19/2017 1...	Ming Jia Lee
My Active Accounts 10-18-2017 11-59-18 ...	Completed	7	0	1	8	10/19/2017 1...	Ming Jia Lee

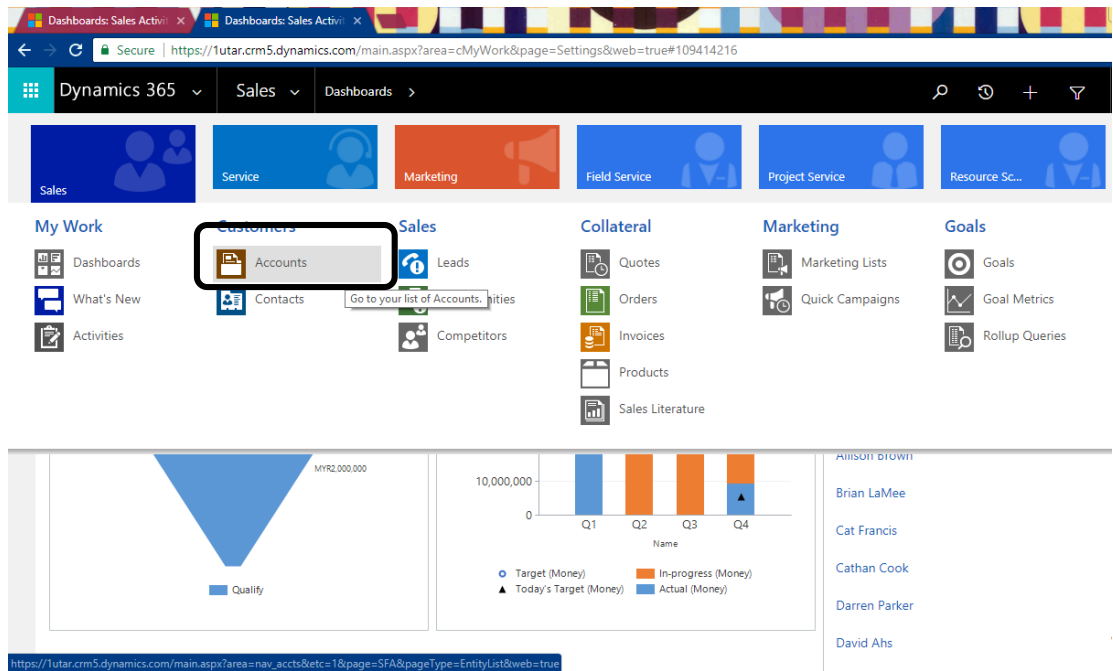
Click on Failures to see the reason of fail import.

Seq.	Log Phase	Description	Column Heading	Column
1	Import Cr...	A record was not created or updated because a duplicate of the current record already exists.		
2	Import Cr...	A record was not created or updated because a duplicate of the current record already exists.		
3	Import Cr...	A record was not created or updated because a duplicate of the current record already exists.		
4	Import Cr...	A record was not created or updated because a duplicate of the current record already exists.		

For this case, the reason of error is due to duplicated record is detected while import.

## Step 8.0 Checking the Imported Data

After the data is imported, you can check through the system. Depending the module that you have imported. In this case, the customer account is imported. The access to customer account is Sales → Accounts.



Note that all imported data is showed in here. You may click inside and check all the data.

The screenshot shows the Dynamics 365 Accounts list view. The table displays the following data:

Account Name	Account Number	Currency	Description
CANON ELECTRONICS (M) SDN BHD	1MC02	Ringgit Malay...	
CANON INC., TAIWAN	1TC01	US Dollar	
CANON OPTO (M) SDN BHD (COM)	3MC01	Ringgit Malay...	
ENTRUST CORPORATION LTD	1JE01	US Dollar	
ENTRUST INTERNATION HK CO LTD	1HE01	US Dollar	
HIGASHIFUJI (M) SDN BHD	1LH01	Ringgit Malay...	
HITACHI JOEI TECH CO., LTD (MIYAGI)	3JH04	US Dollar	
HITACHI JOEI TECH CO.,LTD	3JH02	US Dollar	
HITACHI JOEI TECH CO.LTD	3JH05	US Dollar	
HITACHI MAXELL LTD	3JH01	US Dollar	

The table shows 10 records out of 67 total records. The bottom of the screenshot shows the URL: [https://tutar.crm5.dynamics.com/\\_rosd/homepage.aspx?etlc=18&pageid=frame&stemapath=5FA%7CCustomers%7Cnav\\_accounts](https://tutar.crm5.dynamics.com/_rosd/homepage.aspx?etlc=18&pageid=frame&stemapath=5FA%7CCustomers%7Cnav_accounts)

## **5.6 Stage 5- User Acceptance Test**

User Acceptance Test or known as UAT is the stage where all customization functionalities and migrated data will be tested by the key users. This stage represented user or client's decision to determine the status on the migration project- accepted or not accepted. The major role involved in this stage will be the key users or the end users who perform the daily business operation in the system.

There are many software testing methods available in the online resource which involved very detailed steps in performing and some were included the risk management inside. Nevertheless, a complex software testing method is appropriate when the development team is emphasize heavily on the testing part and apply in each development stage.

For this migration project, the customization development is not main component to determine the successfulness of the system and the main component for ERP system migration is the data. Thus, testing part will be cover a simple, comprehensive and understandable for company or individual to carry out easily the UAT stage.

Based on (Swati, 2017), the UAT encompass 3 phases:

1. Test Plan
2. UAT Design
3. UAT Test Execution

### **5.6.1 Test Plan**

A test plan consist of a set of information that is documented into a plan for executing the testing accordingly. Furthermore, a test plan should reflects to the entire project testing schedule and approach. The format of test plan documentation can be vary from systems depending on the scope that the developer and client is covered, however, the baseline of the test plan should include:

- Scope



- Schedule
- Responsible Role
- Result

#### **5.6.1.1 Scope**

Scope is used to define the area that will be cover in the testing plan. As mentioned earlier in this stage, the component of the testing will be include:

- Migrated Data- User will check through the migrated data whether all related data is available in the Cloud based system.

The test should include the number of records imported into the system, the accuracy of field mapping and comparison on the migrated records to sources.

- Customization Functionalities- User will test the customized functionality created in the Cloud based system.

Test should include customized field, business process and workflow.

- Transaction Posting- User will perform a business operation transaction posting in the Cloud based system.

Test should include create and post on sales order, item information and customer account.

#### **5.6.1.2 Schedule**

For on-going project such as migration project, the time manner are much essential for the project team to follow for ensure that the project will not overrun. Same goes to testing stage, a schedule is required to produce to ensure that each defined test scenario is covered. Below is the example of proposed schedule.

**Table 5.4: Proposed Schedule**

Milestone	Date
Test Plan Development	24/11/17-26/11/17
<b>UAT Design</b>	
Discussion with User	27/11/17-28/11/17
Scenario Creation	28/11/17-30/11/17
Verify Scenario with User	1/12/17
<b>UAT Test Execution</b>	
Scenario Test	4/12/17-7/12/17
Record Test Result	4/12/17-7/12/17
Analyse the Result	8/12/17-/10/12/17
Final Decision on the Project's Status	11/12/17

#### **5.6.1.3 Responsible Role**

Responsible role is used to clearly define the responsibility of each member in the project. The main intention of defining the responsible role is to ensure that workload is equally distribute to each member. Below is the example of Responsible Role:

**Table 5.5: Responsible Role**

<b>Responsible Name/ Role</b>	<b>Deliverable Item</b>
Project Manager	Test Plan
Project Team/ Key User	List of Test Cases
Key User	Test Cases Execution
Project Team	Record Test Cases Result
Project Manager/ Key User/ Client	Analyse Test Cases Result
Project Manager/ Key User/ Client	Decision on Project Status- Go Live or Postpone

#### **5.6.1.4 Result**

Result is where the end result produced from the Test Cases, however, there is no particular criterial to specify the when the system test should end. According to (Black, 2008), an exit criteria used to address the issue of when and how the testing part has comes to the end. Also, exist criteria is used to define the conditions that

required to fulfilled before concluded all testing in the UAT phase. Below is an example of exit criteria:

Testing will end when:

- No changes (design/code/features), except to address system test defects, occurred during the testing period
- No crash, halt, unexpected termination or other stoppage of processing has occurred on the system during the testing period.
- The client or key user agrees that the bug found during the testing period will not affect the major daily transaction posting in the system.
- The client or key user agrees that the execution of Test Cases is adequately covered most of the possible scenario happened in daily business operations.
- The client or key user or the project team has executed all the planned tests against the system.
- The project team member has checked that all bug found during testing period are either closed, deferred, bring forward to next phase or any appropriate approval by authorized person.
- The project manager holds a UAT Phase Exit Meeting and agreed by all relevant client or key user that the phase is completed.

### **5.6.2 UAT Design**

Acceptance criteria is required to gather from the key users, those gathered criteria are used in creating the testing template or known as test cases. A test cases consist of different scenario possible happened in the daily system operation. The purpose of creating test case is used to identify any possible of error or bug appear in the customized functionality under different circumstances.

Apart from that, test cases is the document on recording the test results or any defect mechanism and used in next phase for further decision on determine on handling the bug. Below is the example of test cases for migration data.

**Table 5.6: Test Cases For Migration Data**

No.	Acceptance Requirement	Critical		Test Result		Comments
		Yes	No	Accept	Reject	
1.	Ability to create Sales order	●				Sales order can be created successfully.
2.	Transactional Data- Sales order is available from 1/10/16-current	●				All transaction dated from 1/10/16-current is available in the system
3.	Master Data- 25 Customer accounts is available in the system	●				All customer accounts is available in the system.
4.	Master Data- All 100 product information is available in the system	●				All information is available in the system
5.	Master Data- All 100 product price information is available in the system	●				All product is available in the system.
6.	Customization field- Customer Business Registration Number able to key in and change the number.		●			Able to key in and change the number after the customer account is created.
7.	Customization field- Customer GST Registration Number able to key in and change the number	●				Able to key in and change the number after the customer account is created.
8.	Customization field- product dimension able to key in and change the information	●				3 field is able to key in and change the information after the product is posted.
9.	Business rule enforcement- product dimension rule is enforce during key in the dimension	●				Error. The dimension is showing different business rule.

10.	Workflow rule- able to convert the sales order status from completed to new	●				Error. The workflow not effective against the sales order status with submitted.
11.	Change product information in sales order with submitted status		●			Product information in sales can change in submitted.

### 5.6.3 UAT Test Execution

This phase is where the testing is happens. All the test cases were performed by the key users and the result is recorded after the testing. Usually UAT happens in a room setup for the key users, project manager, project team and the relevant representative for performing the testing throughout the phase.

Once the tests is performed and result is recorded, the Acceptance Decision is need for the key users or client to make. Based on the test case document, the decision will decide the project status whether the current system is suitable for Go-live or to postpone it.

The decision would be either to:

- Postpone the Go-live date to solve the bug first.
- Leave the bug as it.
- Consider as enhancement stage in future.

During the decision making process, the project manager is required to involve for further rectify whether the current issue is the major obstacle affecting the schedule of Go-live date. The involvement of project manager is essential as wise recommendation required to give and negotiation is required to done between the key users or client, this is to lower down the possibility of postpone the system Go-live date as the postpone Go-live decision would be unfavorable situation to the whole project team.

## **5.7 Conclusion:**

A framework has been constructed in this chapter where there are 6 stages involved in the framework and these are:

Stage 1- Preparation

Stage 2- Build

Stage 3- Extraction

Stage 4- Import

Stage 5- Test

Each stages is further drill down into a flowchart to shows a detailed process view on the execution. Apart from that, a checklist is formed at the beginning of each stage to show pre-requisite item or activity must be fulfilled before start the stage. Several “note for company” is included in each stage as well, this is to provide useful tips before executing the process.

The constructed framework will bring to next chapter (Chapter 6) for verification where each stage is verify against different type of data.

## **Chapter 6**

### **Verification on Framework**

#### **6.1 Introduction**

The verification process are used in the act of testing and reviewing the constructed migration framework. Conducting a verification process towards the framework required a standard company data that is using On-premise ERP system. The targeted company is called Maxell Asia (Singapore) Pte Ltd, a wholesale company particularly distribute on electronical components, optical components and communication equipment. The company is currently using Microsoft Dynamic AX 2012 (On-premise). Due to privacy and confidential issues, the sample data is allowed to be taken from the TST environment and financial transaction such as sales invoice is prohibited to access.

There are several type of data has been taken from the company's system and these are:

**- Master data:**

- Item/ Product information
- Customer accounts
- Item price

**- Transactional data:**

- Sales order

**Verification:**

## 6.2 Product Information

**Table 6.2: Verification- Product Information**

No.	Stage	Result
<b>Preparation Stage</b>		
1.	Target on one module	Sales module
2.	List Transaction's Table and Field	<p>Options for identify table listing- Check through Front End and Application Object Tree</p> <p>Result-</p> <p><b>Parent Table:</b> InventTable</p> <p><b>Child Table:</b> InventItemGroupItem EcoResProductTranslation InventTableModule</p> <p><b>Primary Key:</b> ItemId, Product</p> <p><b>Field:</b> Item ID ProductName UnitId Department Division ItemGroup BrandClassification BtoBorCClassification GoodType</p>
4.	List All Customization Functionality and Fields	<p>Options for identify customization- Check through Front End and Application Object Tree</p> <p>Result-</p> <p><b>Customization field:</b></p> <ul style="list-style-type: none"> <li>• Department</li> <li>• Division</li> <li>• Product Group</li> <li>• Brand Classification</li> <li>• BtoB or C Classification</li> <li>• Good Type</li> </ul>
5.	Workflow (business controlled process workflow)	No workflow existed in the On-premise module. Refer to Figure 6.1.



6.	Perform Comparison or Gap Analysis	Result refer to 6.2.1 Gap Analysis.
7.	Pinpoint on the field or functionality required to do in 2 <sup>nd</sup> phase Cloud Based customization	List of field require to customize: <ul style="list-style-type: none"> <li>• Department</li> <li>• Division</li> <li>• Product Group</li> <li>• Brand Classification</li> <li>• BtoB or C Classification</li> <li>• Good Type</li> </ul>
<b>Build Stage</b>		
1.	Customization Fields	Options for develop- Create a new solution package
1.1	Identify and select the entity	Entity name- Product entity
1.2	Create new field	New field created: <ul style="list-style-type: none"> <li>• Department</li> <li>• Division</li> <li>• Product Group</li> <li>• Brand</li> <li>• B2B or B2C</li> <li>• Good Type</li> </ul>
1.3	Add new field into the form	Form name: Product Customization placed under form sub-section: Product Details
1.4	Publish	Package solution
1.5	Checking the new field in the form	Go to Sales → Collateral → Product  All field is visible under the Product Form.
2.	Business Rule	No business rule can be created as this require user to provide the business process logic.
3.	Workflow	No workflow existed in the On-premise module. Refer to Figure 6.1.
<b>Extraction Stage</b>		
1.	Target on Table and Field	<b>Parent Table:</b> InventTable <b>Child Table:</b> InventItemGroupItem EcoResProductTranslation InventTableModule <b>Field:</b> Itemid ProductName UnitId

		Department Division Product Group Brand Classification BtoB or C Classification
2.	Type of Export Data Interface	Using Reporting Tools to extract data.
3.	Reporting Tools	Since there is no existing developed report, there using 2 <sup>nd</sup> option- Create new report
3.2	Create new report	Open a new excel file
3.2.1	Add table and field	Adding the table and field as below: <b>Parent Table:</b> InventTable <b>Child Table:</b> InventItemGroupItem EcoResProductTranslation InventTableModule <b>Field:</b> Item Number Product Name Unit Id Department Division Product Group Brand Classification BtoB or C Classification Good Type
3.3	Data Export	Generate the data. Refer to Figure 6.2.
<b>Import Stage</b>		
1.	Create Duplication Rule	Create duplication detection on data import.
2.	Define the entity and field for detection	Duplication rule Rule applied on field: Product ID Duplication found when Product ID Criteria: Exact Match
3.	Activate Duplicate Detection rule	
4.	Prepare a list of data for Data Import	Product Information File Data.
5.	Convert to Import Template	Use the second option of convert the current data file to supported file.
5.2	Convert the current data file to supported file	Convert the current data into .csv file format.
6.	Start Import Data Wizard	Upload .csv file into the import wizard page.

7.	Mapping Data	Refer to Table 6.2.2 Data Mapping.	
8.	Checking the Data Imported	Checking criteria: Create a report to check against the extracted on-premise data.	
<b>UAT</b>			
1.	Test Plan		
1.1	Scope	<p><b>Migrated Data:</b> Compare the total record in On-premise with the total record Cloud-based.</p> <p>Total record On-premise = 237 records Total record Cloud-based = 237 records</p> <p><b>Customization Field:</b> Insert the value or change the value in the field.</p> <ul style="list-style-type: none"> <li>• Department</li> <li>• Division</li> <li>• Product Group</li> <li>• Brand</li> <li>• B2B or B2C</li> <li>• Good Type</li> </ul> <p><b>Transaction Posting:</b> Create new product information.</p>	
1.2	Schedule	<b>Milestone</b>	<b>Date</b>
		Test Plan Development	24/11/17-26/11/17
		<b>UAT Design</b>	
		Discussion with User	27/11/17-28/11/17
		Scenario Creation	28/11/17-30/11/17
		Verify Scenario with User	1/12/17
		<b>UAT Test Execution</b>	
		Scenario Test	4/12/17-7/12/17
		Record Test Result	4/12/17-7/12/17
		Analyse the Result	8/12/17-10/12/17
		Final Decision on the Project's Status	11/12/17
1.3	Responsible Role	<b>Responsible Name/ Role</b>	<b>Deliverable Item</b>

		Project Manager	Test Plan
		Project Team/ Key User	List of Test Cases
		Key User	Test Cases Execution
		Project Team	Record Test Cases Result
		Project Manager/ Key User/ Client	Analyse Test Cases Result
		Project Manager/ Key User/ Client	Decision on Project Status- Go Live or Postpone
1.4	Result (Exit Criteria)	<p>Criteria to stop the test when:</p> <ul style="list-style-type: none"> <li>•No changes (design/code/features), except to address system test defects, occurred during the testing period</li> <li>•No crash, halt, unexpected termination or other stoppage of processing has occurred on the system during the testing period.</li> <li>•The client or key user agrees that the bug found during the testing period will not affect the major daily transaction posting in the system.</li> <li>•The client or key user agrees that the execution of Test Cases is adequately covered most of the possible scenario happened in daily business operations.</li> <li>•The client or key user or the project team has executed all the planned tests against the system.</li> <li>•The project team member has checked that all bug found during testing period are either closed, deferred, bring forward to next phase or any appropriate approval by authorized person.</li> <li>•The project manager holds a UAT Phase Exit Meeting and agreed by all relevant client or key user that the phase is completed.</li> </ul>	

2.0	UAT Design	Refer to table 6.2.3 for the
3.0	UAT Test Execution	Decision of Go-live will depends on the key user and client.

**Table: 6.2.1 Gap Analysis- Product Information**

<b>Microsoft Dynamic AX 2012 Field</b>	<b>Descriptions</b>	<b>Microsoft Dynamic 365 Ability</b>
<b>Item Master</b>		
Item Number	Item Number or Identification	Yes
Item Name	Item Name	Yes
Item Unit	Item Unit(kg, pcs, tons)	Yes
Price Currency	Price Currency	Yes
Department	Product Dimension by Department	No, required for customization to insert new field.
Division	Product Dimension by Division	No, required for customization to insert new field.
Product Group	Product Dimension by Product Group	No, required for customization to insert new field.
Brand Classification	Product Brand	No, required for customization to insert new field.
BtoB or C Classification	Product Selling Type	No, required for customization to insert new field.

**Table 6.2.2: Data Mapping- Product Information**

<b>Microsoft Dynamic AX 2012 Field</b>	<b>Microsoft Dynamic 365 Field</b>
<b>Item Master</b>	
Item Number	Order Table- Product ID
Product Group	Order Table- Parent (change default map to product ID)
Product Name	Order Table- Name
Unit Id	Order Table- Unit Group, Default Unit (need to create PCS unit in the system)
Department	Order Table- Department
Division	Order Table- Division
Brand Classification	Order Table- Brand

BtoB or CClassification	Order Table- B2B or B2C
Good Type	Order Table- Good Type

**Table 6.2.3: Test Cases- Product Information**

To list as many as possible test cases may require key user involvement, below is some of the basic test scenario:

No.	Acceptance Requirement	Critical		Test Result		Comments
		Yes	No	Accept	Reject	
1.	Compare the total record in On-premise with the total record Cloud-based.	●				Total record On-premise = 237 records  Total record Cloud-based = 237 records
2.	Insert the value or change the value in the Customization Field.  •Department •Division •Product Group •Brand •B2B or B2C •Good Type	●				All field is working as per stated.
3.	Change existing product information	●				Change some value and click save.
4.	Create new product information	●				New product-testing was created.

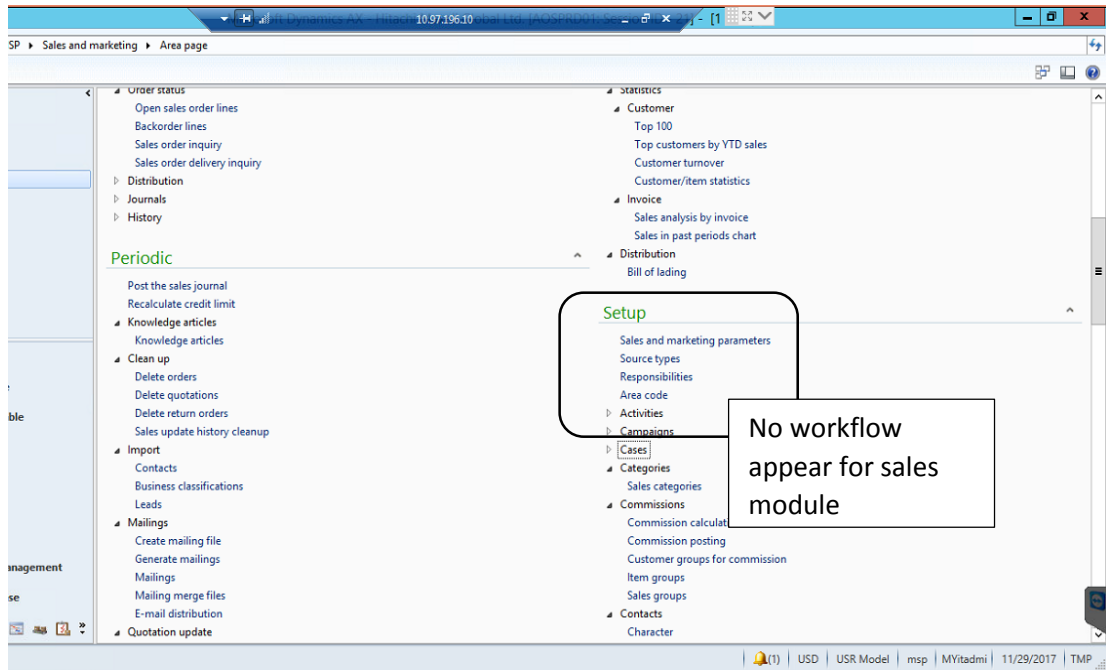


Figure 6.1: No workflow appear in the module

Item number	Product name	BtoB or C	Goods type	MSPDepartment	MSPDivision	MSPProduct	Unit	Brand Classification	Item group
12135004	E-240GX EM(S)	BtoC	PP	Z-Non	SG	10220	Pcs	MAXELL	Video
12135001	E-120GX EM(S)	BtoC	PP	Z-Non	SG	10220	Pcs	MAXELL	Video
12135002	E-180GX EM(S)	BtoC	PP	Z-Non	SG	10220	Pcs	MAXELL	Video
12430004	DVM60SE(C)X	BtoC	PP	Z-Non	SG	10220	Pcs	MAXELL	Video
12414001	DVM60SE(C)X	BtoC	PP	Z-Non	SG	10220	Pcs	MAXELL	Video
22967000	DDS-3 24GB 155M C5708A	BtoB	MP	Z-Non	SG	10231	PCS	HP	HS4
22967100	DDS-4 40GB 155M C5718A	BtoB	MP	Sales	SG	10231	PCS	HP	HS4
22937400	HS-4/150S HP M C5718A	BtoB	MP	Z-Non	SG	10231	PCS	HP	HS4
22967200	HS-4/170S HP R C8010A	BtoB	MP	Z-Non	ZZ	10231	PCS	HP	HS4
22937600	HS-4/CL HP M C5709A	BtoB	MP	Z-Non	SG	10231	PCS	HP	HS4
22937200	HS-4/120S HP M C5707A	BtoB	MP	Z-Non	ZZ	10231	PCS	HP	HS4
22937300	HS-4/125S HP M C5708A	BtoB	MP	Z-Non	SG	10231	PCS	HP	HS4
22920200	HS-4/150S XJ B	BtoB	MP	Z-Non	SG	10231	Pcs	MAXELL	HS4
22920300	HS-4/170S XJ B	BtoB	MP	Z-Non	SG	10231	Pcs	MAXELL	HS4
22937500	HS-4/170S HP M C8010A	BtoB	MP	Z-Non	SG	10231	Pcs	HP	HS4
24900200	DAT/CL2 HP M C8015A-T	BtoB	MP	Z-Non	SG	10231	Pcs	HP	HS4
22937700	DAT160 HP M C8011A	BtoB	MP	Z-Non	SG	10231	Pcs	HP	HS4
22959900	DAT160 IBM C 23R5635	BtoB	MP	Z-Non	SG	10231	Pcs	IBM	HS4
22962900	DAT/CL2 HP M C8015A	BtoB	MP	Z-Non	SG	10231	PCS	HP	HS4

Figure 6.2: Product Information data extracted from the system

### 6.3 Customer Accounts

**Table 6.3: Verification- Customer Accounts**

No.	Stage	Result
<b>Preparation Stage</b>		
1.	Target on one module	Sales module
2.	List Transaction's Table and Field	Options for identify table listing- Check through Front End and Application Object Tree  Result- <b>Parent Table:</b> CustTable <b>Child Table:</b> LogisticsElectronicAdd DirPartyPostalAddressView DirPartyTable <b>Primary Key:</b> Customer Account <b>Field:</b> Customer Account Name Customer Group Address Country/Region Terms of Payment Credit Limit Mode of Delivery Delivery Terms
4.	List All Customization Functionality and Fields	Options for identify customization- Check through Front End and Application Object Tree  Result- <b>Customization field:</b> <ul style="list-style-type: none"> <li>Country/ Region</li> </ul>
5.	Workflow (business controlled process workflow)	No workflow existed in the On-premise module. Refer to Figure 6.1.
6.	Perform Comparison or Gap Analysis	Result refer to 6.3.1 Gap Analysis.
7.	Pinpoint on the field or functionality required to do in 2 <sup>nd</sup> phase Cloud Based customization	List of field require to customize: <ul style="list-style-type: none"> <li>Country/ Region</li> </ul>
<b>Build Stage</b>		



1.	Customization Fields	Options for develop- Create a new solution package
1.1	Identify and select the entity	Entity name- Account entity
1.2	Create new field	New field created: <ul style="list-style-type: none"> <li>Country/ Region</li> </ul>
1.3	Add new field into the form	Form name: Account Customization placed under form sub-section: Details (Company Profile)
1.4	Publish	Package solution
1.5	Checking the new field in the form	Go to Sales → Customer → Account  All field is visible under the Product Form.
2.	Business Rule	No business rule can be created as this require user to provide the business process logic.
3.	Workflow	No workflow existed in the On-premise module. Refer to Figure 6.1.
<b>Extraction Stage</b>		
1.	Target on Table and Field	<b>Parent Table:</b> CustTable <b>Child Table:</b> LogisticsElectronicAdd DirPartyPostalAddressView DirPartyTable <b>Primary Key:</b> Customer Account <b>Field:</b> Customer Account Name Customer Group Address Country/Region Terms of Payment Credit Limit Mode of Delivery Delivery Terms
2.	Type of Export Data Interface	Using Reporting Tools to extract data.
3.	Reporting Tools	Since there is no existing developed report, there using 2 <sup>nd</sup> option- Create new report
3.2	Create new report	Open a new excel file
3.2.1	Add table and field	Adding the table and field as below: <b>Parent Table:</b> CustTable <b>Child Table:</b>

		LogisticsElectronicAdd DirPartyPostalAddressView DirPartyTable <b>Primary Key:</b> Customer Account <b>Field:</b> Customer Account Name Customer Group Address Country/Region Terms of Payment Credit Limit Mode of Delivery Delivery Terms
3.3	Data Export	Generate the data. Refer to Figure 6.3.
<b>Import Stage</b>		
1.	Create Duplication Rule	Create duplication detection on data import.
2.	Define the entity and field for detection	Duplication rule Rule applied on field: Customer Name Duplication found when Customer Name Criteria: Exact Match
3.	Activate Duplicate Detection rule	
4.	Prepare a list of data for Data Import	Customer Accounts File Data.
5.	Convert to Import Template	Use the second option of convert the current data file to supported file.
5.2	Convert the current data file to supported file	Convert the current data into .csv file format.
6.	Start Import Data Wizard	Upload .csv file into the import wizard page.
7.	Mapping Data	Refer to 6.3.2 Data Mapping.
8.	Checking the Data Imported	Checking criteria: Total record On-premise = 229 records Total record Cloud-based = 229 records  Create a report to check against the extracted on-premise data.
<b>UAT</b>		
1.	Test Plan	
1.1	Scope	<b>Migrated Data:</b> Compare the total record in On-premise with the total record Cloud-based.

		<p>Total record On-premise = 229 records Total record Cloud-based = 229 records</p> <p><b>Customization Field:</b> Insert the value or change the value in the field.</p> <ul style="list-style-type: none"> <li>Country/ Region</li> </ul> <p><b>Transaction Posting:</b> Create new customer account.</p>	
1.2	Schedule	<b>Milestone</b>	<b>Date</b>
		Test Plan Development	24/11/17- 26/11/17
		<b>UAT Design</b>	
		Discussion with User	27/11/17- 28/11/17
		Scenario Creation	28/11/17- 30/11/17
		Verify Scenario with User	1/12/17
		<b>UAT Test Execution</b>	
		Scenario Test	4/12/17- 7/12/17
		Record Test Result	4/12/17- 7/12/17
		Analyse the Result	8/12/17- /10/12/17
		Final Decision on the Project's Status	11/12/17
1.3	Responsible Role	<b>Responsible Name/ Role</b>	<b>Deliverable Item</b>
		Project Manager	Test Plan
		Project Team/ Key User	List of Test Cases
		Key User	Test Cases Execution
		Project Team	Record Test Cases Result
		Project Manager/ Key User/ Client	Analyse Test Cases Result
1.4	Result (Exit Criteria)	<p>Criteria to stop the test when:</p> <ul style="list-style-type: none"> <li>No changes (design/code/features), except to address system test defects, occurred during the testing period</li> </ul>	

		<ul style="list-style-type: none"> <li>•No crash, halt, unexpected termination or other stoppage of processing has occurred on the system during the testing period.</li> <li>•The client or key user agrees that the bug found during the testing period will not affect the major daily transaction posting in the system.</li> <li>•The client or key user agrees that the execution of Test Cases is adequately covered most of the possible scenario happened in daily business operations.</li> <li>•The client or key user or the project team has executed all the planned tests against the system.</li> <li>•The project team member has checked that all bug found during testing period are either closed, deferred, bring forward to next phase or any appropriate approval by authorized person.</li> <li>•The project manager holds a UAT Phase Exit Meeting and agreed by all relevant client or key user that the phase is completed.</li> </ul>
2.0	UAT Design	Refer to table 6.3.3 for the test cases.
3.0	UAT Test Execution	Decision of Go-live will depends on the key user and client.

**Table 6.3.1: Gap Analysis- Customer Accounts**

<b>Microsoft Dynamic AX 2012 Field</b>	<b>Descriptions</b>	<b>Microsoft Dynamic 365 Ability</b>
<b>Customer Data</b>		
Customer Account Number/ Id	Customer Identification	Yes
Customer Name	Customer Name	Yes
Customer Group	Customer Group(eg. Local, International, Inter Company)	Yes (insert in Parent account)
Country/ Region	Customer Country/ Region	No, required for customization to insert

		new field under Company Profile.
Customer Delivery Term	Customer Delivery Term	Yes (insert in freight terms) *Required little customization adding value in the field
Customer Mode of Delivery	Customer Mode of Delivery	Yes (insert in Shipping Method) *Required little customization adding value in the field
Customer Payment Term	Customer Payment Term (eg. 60 days or 30 days)	Yes
Customer Currency	Customer Billing Currency	Yes
Customer Address	Customer Address	Yes
Customer Contact	Customer Contact Number	Yes
Credit Limit	Customer Credit Limit	Yes (insert in Billing section)

**Table 6.3.2: Data Mapping- Customer Accounts**

<b>Microsoft Dynamic AX 2012 Field</b>	<b>Descriptions</b>
<b>Customer Data</b>	
Customer Account Number/ Id	Account Table- Account Number
Customer Name	Account Table- Account Name
Customer Group	Account Table- Parent Account
Country/ Region	Account Table- Country/ Region
Customer Delivery Term	Account Table- Address 1: Freight Terms
Customer Mode of Delivery	Account Table- Address 1: Shipping Method
Customer Payment Term	Account Table- Payment Terms
Customer Contact	Account Table- Main Phone
Customer Currency	Account Table- Currency (change default map to currency code)
Customer Address	Account Table- Address 1: Street 1
Credit Limit	Account Table- Credit Limit

**Table 6.3.3: Test Cases- Customer Accounts**

To list as many as possible test cases may require key user involvement, below is some of the basic test scenario:

No.	Acceptance Requirement	Critical		Test Result		Comments
		Yes	No	Accept	Reject	
1.	Compare the total record in On-premise with the total record Cloud-based.	●				Total record On-premise = 229 records  Total record Cloud-based = 229 records
2.	Insert the value or change the value in the Customization Field.  •Country/ Region	●				The field is working as per stated.
3.	Change existing Customer account.	●				Change some value in payment term and click save.
4.	Create new customer account	●				New customer account-testing was created.

Customer account	Name	Customer group	Address
NTR-H0004	HITACHI DATA SYSTEMS PTE LTD	NonTrade	300 BEACH ROAD, LEVEL 28 THE CONCOURSESINGAPORE 199555
CHG-H0001	HITACHI ASIA LTD.	HITACHI	7 TAMPINES GRANDE, #08-01 HITACHI SQUARE, SINGAPORE 528736
CHG-H0002	HITACHI AUSTRALIA PTY LTD.	HITACHI	SUITE 801, LEVEL 8, 123 EPPING RD, NORTH RYDE, NSW 2113 AUSTRALIA
CHG-H0003	HITACHI ELECTRONIC PRODUCTS (MALAYSIA) SDN. BHD.	HITACHI	NO.12 JALAN KEMAJUAN BANGI INDUSTRIAL ESTATE, BANDAR BARU BANGI, 43650 SELANGOR MALAYSIA
CHG-H0004	HITACHI HOME ELECTRONICS ASIA (S) PTE. LTD.	HITACHI	438A ALEXANDRA ROAD #01-01/02/03, ALEXANDRA TECHNOPARK, SINGAPORE 119967
CHG-H0005	JOHNSON CONTROLS HITACHI AIR CONDITIONING MALAYSIA SDN. BHD.	HITACHI	NO. 10 JALAN KEMAJUAN, BANGI INDUSTRIAL ESTATE, 43650 BANDAR BARU BANGI, SELANGOR DARUL E
CHG-H0006	HITACHI LIVING SYSTEMS, LTD	HITACHI	6-29 SHIN-OGAWAMACHI, SHINJUKU-KU, TOKYO JAPAN
CHG-H0007	HITACHI DATA SYSTEMS PTE LTD	HITACHI	300 BEACH ROAD, LEVEL 28, THE CONCOURSE, SINGAPORE 199555
CMG-H0001	MAXELL ASIA, LTD	MAXELL	UNIT NOS. 03B-06, 13/FNO. 909, CHEUNG SHA WAN ROADCHEUNG SHA WAN, KOWLOONHONG KONG
CMG-M0001	MAXELL CORPORATION OF AMERICA	MAXELL	3 GARRET MOUNTAIN PLAZA 3RD FLOOR, SUITE #300 WOODLAND PARK NJ07424, U.S.A
CMG-M0002	MAXELL EUROPE LIMITED	MAXELL	WHITEBROOK PARK LOWER COOKHAM ROAD, MAIDENHEAD BERKSHIRE SL6 8YA, UNITED KINGDOM
CMG-M0003	MAXELL TAIWAN LTD.	MAXELL	14F NO.111, SUNG CHIANG ROAD, TAIPEI TAIWAN
CMG-M0004	MAXELL (SHANGHAI) TRADING CO., LTD.	MAXELL	ROOM 1801, NO.336, XI ZANG RD (M) HUANG PU DISTRICT, SHANGHAI 200001 CHINA
CMG-M0005	MAXELL TOHSHIN (MALAYSIA) SDN BHD	MAXELL	LOT 1 BATU BARENDAM, FREE TRADE ZONE PHASE III, BATU BARENDAM 75350, MALACCA MALAYSIA
CTL-A0001	A&T AUDIO VISUAL PTE LTD	TradeLoc	30 KALLANG PUDDING ROAD, #04-06 VALIANT IND.BLDG, SINGAPORE 349312
CTL-A0002	AVNET ASIA PTE LTD	TradeLoc	151 LORONG CHUAN, #06-03 NEW TECH PARK, SINGAPORE 556741
CTL-A0003	ALPHATEC PTE LTD	TradeLoc	8 ADMIRALTY STREET, #05-12/13 ADMIRAX BUILDING, SINGAPORE 757438
CTL-B0001	BEECONOMIC SINGAPORE PTE LTD	TradeLoc	T/A GROUPON SINGAPORE, 1 MARITIME SQUARE, SINGAPORE 099253
CTL-B0002	BOEING SINGAPORE TRAINING & FLIGHT SERVICES PTE LTD	TradeLoc	30 CHANGI NORTH RISE #01-01, SINGAPORE 498780

**Figure 6.3: Customer Account data extracted from the system**

## 6.4 Item Price

**Table 6.4: Verification- Item Price**

No.	Stage	Result
<b>Preparation Stage</b>		
1.	Target on one module	Sales module
2.	List Transaction's Table and Field	Options for identify table listing- Check through Front End and Application Object Tree  Result- <b>Parent Table:</b> InventTableModule <b>Child Table:</b> InventItemPrice <b>Primary Key:</b> Item Number <b>Field:</b> Item Number Item Unit Item Price Price Currency
4.	List All Customization Functionality and Fields	Options for identify customization- Check through Front End and Application Object Tree  Result- <ul style="list-style-type: none"> <li>No Customization field</li> </ul>
5.	Workflow (business controlled process workflow)	No workflow existed in the On-premise module. Refer to Figure 6.1.
6.	Perform Comparison or Gap Analysis	Result refer to 6.4.1 Gap Analysis.
7.	Pinpoint on the field or functionality required to do in 2 <sup>nd</sup> phase Cloud Based customization	List of field require to customize: <ul style="list-style-type: none"> <li>No customization field</li> </ul>
<b>Build Stage</b>		
1.	Customization Fields	No customization field
1.1	Identify and select the entity	
1.2	Create new field	
1.3	Add new field into the form	
1.4	Publish	

1.5	Checking the new field in the form	
2.	Business Rule	No business rule can be created as this require user to provide the business process logic.
3.	Workflow	No workflow existed in the On-premise module. Refer to Figure 6.1.
<b>Extraction Stage</b>		
1.	Target on Table and Field	<b>Parent Table:</b> InventTableModule <b>Child Table:</b> InventItemPrice <b>Primary Key:</b> Item Number <b>Field:</b> Item Number Item Unit Item Price Price Currency
2.	Type of Export Data Interface	Using Reporting Tools to extract data.
3.	Reporting Tools	Since there is no existing developed report, there using 2 <sup>nd</sup> option- Create new report
3.2	Create new report	Open a new excel file
3.2.1	Add table and field	Adding the table and field as below: <b>Parent Table:</b> InventTableModule <b>Child Table:</b> InventItemPrice <b>Primary Key:</b> Item Number <b>Field:</b> Item Number Item Unit Item Price Price Currency
3.3	Data Export	Generate the data. Refer to Figure 6.4.
<b>Import Stage</b>		
1.	Create Duplication Rule	
2.	Define the entity and field for detection	Duplication rule Rule applied on field: Item Number Duplication found when Customer Name Criteria: Exact Match



3.	Activate Duplicate Detection rule		
4.	Prepare a list of data for Data Import	Item Price File Data.	
5.	Convert to Import Template	Use the second option of convert the current data file to supported file.	
5.2	Convert the current data file to supported file	Convert the current data into .csv file format.	
6.	Start Import Data Wizard	Upload .csv file into the import wizard page.	
7.	Mapping Data	Refer to 6.4.2 Data Mapping.	
8.	Checking the Data Imported	Checking criteria:  Create a report to check against the extracted on-premise data.	
1.	Test Plan		
1.1	Scope	<b>Migrated Data:</b> Compare the total record in On-premise with the total record Cloud-based.  Total record On-premise = 237 records Total record Cloud-based = 237 records  <b>Transaction Posting:</b> Create new customer account.	
1.2	Schedule	<b>Milestone</b>	<b>Date</b>
		Test Plan Development	24/11/17-26/11/17
		<b>UAT Design</b>	
		Discussion with User	27/11/17-28/11/17
		Scenario Creation	28/11/17-30/11/17
		Verify Scenario with User	1/12/17
		<b>UAT Test Execution</b>	
		Scenario Test	4/12/17-7/12/17
		Record Test Result	4/12/17-7/12/17
		Analyse the Result	8/12/17-10/12/17
		Final Decision on the Project's Status	11/12/17

1.3	Responsible Role	<b>Responsible Name/ Role</b>	<b>Deliverable Item</b>
		Project Manager	Test Plan
		Project Team/ Key User	List of Test Cases
		Key User	Test Cases Execution
		Project Team	Record Test Cases Result
		Project Manager/ Key User/ Client	Analyse Test Cases Result
1.4	Result (Exit Criteria)	<p>Criteria to stop the test when:</p> <ul style="list-style-type: none"> <li>•No changes (design/code/features), except to address system test defects, occurred during the testing period</li> <li>•No crash, halt, unexpected termination or other stoppage of processing has occurred on the system during the testing period.</li> <li>•The client or key user agrees that the bug found during the testing period will not affect the major daily transaction posting in the system.</li> <li>•The client or key user agrees that the execution of Test Cases is adequately covered most of the possible scenario happened in daily business operations.</li> <li>•The client or key user or the project team has executed all the planned tests against the system.</li> <li>•The project team member has checked that all bug found during testing period are either closed, deferred, bring forward to next phase or any appropriate approval by authorized person.</li> <li>•The project manager holds a UAT Phase Exit Meeting and agreed by all relevant client or key user that the phase is completed.</li> </ul>	
2.0	UAT Design	Refer to table 6.4.3 for the test cases.	

3.0	UAT Test Execution	Decision of Go-live will depends on the key user and client.
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Figure 6.4: Item Price data extracted from the system

Table 6.4.1: Gap Analysis- Item Price

Microsoft Dynamic AX 2012 Field	Descriptions	Microsoft Dynamic 365 Ability
<b>Item Master</b>		
Item Number	Item Number or Identification	Yes
Item Unit	Item Unit(kg, pcs, tons)	Yes
Item Price	Item Selling Price	Yes
Price Currency	Price Currency	Yes, is the lookup field to price list, need to change the currency to “Retail-USD” if USD.

Table 6.4.2: Data Mapping- Item Price

Microsoft Dynamic AX 2012 Field	Descriptions
<b>Item Master</b>	
Item Number	Price List Item Table- Product ID
Item Unit	Price List Item Table- Unit
Item Price	Price List Item Table - Amount
Price Currency	Price List Item Table - Price List

**Table 6.4.3: Test Cases- Item Price**

To list as many as possible test cases may require key user involvement, below is some of the basic test scenario:

No.	Acceptance Requirement	Critical		Test Result		Comments
		Yes	No	Accept	Reject	
1.	Compare the total record in On-premise with the total record Cloud-based.	●				Total record On-premise = 237 records  Total record Cloud-based = 237 records
3.	Change existing price amount.	●				Change some value in price and click save.
4.	Create new price.	●				New price for Item Test was created under Price List- “Retail-USD”.

## 6.5 Sales Order

**Table 6.5: Verification- Sales Order**

No.	Stage	Result
<b>Preparation Stage</b>		
1.	Target on one module	Sales module
2.	List Transaction's Table and Field	Options for identify table listing- Check through Front End and Application Object Tree  Result- <b>Parent Table:</b> SalesTable <b>Child Table:</b> SalesLine <b>Primary Key:</b> Sales Order Number <b>Field:</b> Sales Order Number Customer Account Request Delivery Date Delivery Term Mode of Delivery Payment term Customer Requisition Reference Number Item Number Sales Quantity Item Unit
4.	List All Customization Functionality and Fields	Options for identify customization- Check through Front End and Application Object Tree  Result- <ul style="list-style-type: none"> <li>• Customer Requisition</li> <li>• Reference Number</li> </ul>
5.	Workflow (business controlled process workflow)	No workflow existed in the On-premise module. Refer to Figure 6.1.
6.	Perform Comparison or Gap Analysis	Result refer to 6.5.1 Gap Analysis.
7.	Pinpoint on the field or functionality required to do in 2 <sup>nd</sup> phase Cloud Based customization	List of field require to customize: <ul style="list-style-type: none"> <li>• Customer Requisition</li> <li>• Reference Number</li> </ul>
<b>Build Stage</b>		

1.	Customization Fields	Options for develop- Create a new solution package
1.1	Identify and select the entity	Entity name- Sales Order
1.2	Create new field	New field created: <ul style="list-style-type: none"> <li>• Customer Requisition</li> <li>• Reference Number</li> </ul>
1.3	Add new field into the form	Form name: Order Customization placed under form sub-section: Summary and Sales Information
1.4	Publish	Package solution
1.5	Checking the new field in the form	Go to Sales → Collateral → Order  All field is visible under the Order Form.
2.	Business Rule	No business rule can be created as this require user to provide the business process logic.
3.	Workflow	No workflow existed in the On-premise module. Refer to Figure 6.1.
<b>Extraction Stage</b>		
1.	Target on Table and Field	<b>Parent Table:</b> SalesTable <b>Child Table:</b> SalesLine <b>Primary Key:</b> Sales Order Number <b>Field:</b> Sales Order Number Customer Account Request Delivery Date Delivery Term Mode of Delivery Payment term Customer Requisition Reference Number Item Number Sales Quantity Item Unit
2.	Type of Export Data Interface	Since there is standard sales order report available, using System Front End to export out.
2.1	Go to the existing system standard report	
2.2	Add the necessary field in the form	Adding the field as below:

		<b>Field:</b> Sales Order Number Customer Account Request Delivery Date Delivery Term Mode of Delivery Payment term Customer Requisition Reference Number Item Number Sales Quantity Item Unit
2.3	Data Export	Generate the data. Refer to Figure 6.5.
<b>Import Stage</b>		
1.	Create Duplication Rule	Create duplication detection on data import.
2.	Define the entity and field for detection	Duplication rule Rule applied on field: Name Duplication found when Name Criteria: Exact Match
3.	Activate Duplicate Detection rule	
4.	Prepare a list of data for Data Import	Product Information File Data.
5.	Convert to Import Template	Use the second option of convert the current data file to supported file.
5.2	Convert the current data file to supported file	Convert the current data into .csv file format.
6.	Start Import Data Wizard	Upload .csv file into the import wizard page.
7.	Mapping Data	Refer to 6.5.2 Data Mapping.
8.	Checking the Data Imported	Checking criteria: Create a report to check against the extracted on-premise data.
<b>UAT</b>		
1.	Test Plan	
1.1	Scope	<b>Migrated Data:</b> Compare the total record in On-premise with the total record Cloud-based.  Total record On-premise = 6 records Total record Cloud-based = 6 records  <b>Customization Field:</b> Insert the value or change the value in the field.

		<ul style="list-style-type: none"> <li>• Customer Requisition</li> <li>• Reference Number</li> </ul> <b>Transaction Posting:</b> Create new sales order.	
1.2	Schedule	<b>Milestone</b>	<b>Date</b>
		Test Plan Development	24/11/17- 26/11/17
		<b>UAT Design</b>	
		Discussion with User	27/11/17- 28/11/17
		Scenario Creation	28/11/17- 30/11/17
		Verify Scenario with User	1/12/17
		<b>UAT Test Execution</b>	
		Scenario Test	4/12/17- 7/12/17
		Record Test Result	4/12/17- 7/12/17
		Analyse the Result	8/12/17- /10/12/17
		Final Decision on the Project's Status	11/12/17
1.3	Responsible Role	<b>Responsible Name/ Role</b>	<b>Deliverable Item</b>
		Project Manager	Test Plan
		Project Team/ Key User	List of Test Cases
		Key User	Test Cases Execution
		Project Team	Record Test Cases Result
		Project Manager/ Key User/ Client	Analyse Test Cases Result
1.4	Result (Exit Criteria)	<p>Criteria to stop the test when:</p> <ul style="list-style-type: none"> <li>•No changes (design/code/features), except to address system test defects, occurred during the testing period</li> <li>•No crash, halt, unexpected termination or other stoppage of processing has</li> </ul>	



		<p>occurred on the system during the testing period.</p> <ul style="list-style-type: none"> <li>•The client or key user agrees that the bug found during the testing period will not affect the major daily transaction posting in the system.</li> <li>•The client or key user agrees that the execution of Test Cases is adequately covered most of the possible scenario happened in daily business operations.</li> <li>•The client or key user or the project team has executed all the planned tests against the system.</li> <li>•The project team member has checked that all bug found during testing period are either closed, deferred, bring forward to next phase or any appropriate approval by authorized person.</li> <li>•The project manager holds a UAT Phase Exit Meeting and agreed by all relevant client or key user that the phase is completed.</li> </ul>	
2.0	UAT Design	Refer to Table 6.5.3 for the test cases.	
3.0	UAT Test Execution	Decision of Go-live will depends on the key user and client.	

Customer Name	Sales order	Item number	Unit	Quantity	Requested receipt date	Customer requisition	Reference number	Payment	Delivery	Mode of delivery
CTO-J0002 JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000280	58732341	PCS	1,200.00	11/6/2017	2020632	PO0000277	D90	Courier	DAP
CTO-J0002 JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000281	58732231	PCS	2,000.00	12/6/2017	1054669	PO0000278	D90	Courier	DAP
CTO-J0002 JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000282	58732238	PCS	1,000.00	12/14/2017	2019235	PO0000279	D90	Courier	DAP
CTO-J0002 JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000283	58732239	PCS	1,000.00	12/14/2017	2019236	PO0000280	D90	Courier	DAP
CTO-J0002 JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000284	58732231	PCS	1,000.00	12/22/2017	1058075	PO0000281	D90	Courier	DAP
CTL-P0001 PIONEER ELECTRONICS ASIA CENTRE PTE.LTD.	SO0000288	58732116	PCS	110,880.00	11/28/2017	DI # 398582	PO0000285	D75	Trk	DOU

Figure 6.5: Sales Order data extracted from the system

Table 6.5.1: Gap Analysis- Sales Order

Microsoft Dynamic AX 2012 Field	Descriptions	Microsoft Dynamic 365 Ability
Transaction Data		
Sales Order Number	Sales Order Number	Yes (Auto generated by system, if client wants the old system SO number, can include in SO description field)
Customer Account	Customer Account	Yes (insert in Potential Customer)
Item ID	Item Identification	Yes
Item Name	Item Name	Yes
Item Unit	Item Unit	Yes
Sales Quantity	Sales Order Quantity	Yes
Delivery Date	Actual Delivery Date	Yes (insert in Date fulfill)
Request Delivery Date	Customer Request Delivery Date	Yes (insert in Request Date)
Sales Line Amount	Sales Order Line Amount	No (system can auto generate by calculating price x quantity)
Delivery Term	Delivery Term	Yes (insert in freight terms) *Required little customization adding value in the field
Mode of Delivery	Mode of Delivery	Yes (insert in shipping method) *Required little

		customization adding value in the field
Currency	Currency	Yes
Customer Requisition	Customer Requisition Number	No, required for customization to insert new field.
Reference Number	Reference Number	No, required for customization to insert new field.

**Table 6.5.2: Data Mapping- Sales Order**

Microsoft Dynamic AX 2012 Field	Descriptions
<b>Transaction Data- Sales order</b>	
Sales Order Number	Order Table- Name
Customer Account	Order Table- Customer (change default map to customer ID)
Request Delivery Date	Order Table- Requested Delivery
Delivery Term	Order Table- Freight Terms
Mode of Delivery	Order Table- Shipping Method
Currency	Order Table- Price List
Customer Requisition	Order Table- Customer Requisition
Reference Number	Order Table- Reference Number
<b>Transaction Data- Sales order lines</b>	
Sales Order Number	Order Line Table- Order (change default map to name)
Item ID	Order Line Table- Product (change default map to product ID)
Item Unit	Order Line Table- Unit
Sales Quantity	Order Line Table- Amount

**Table 6.5.3: Test Cases- Sales Order**

To list as many as possible test cases may require key user involvement, below is some of the basic test scenario:

No.	Acceptance Requirement	Critical		Test Result		Comments
		Yes	No	Accept	Reject	
1.	Compare the total record in On-premise with the total record Cloud-based.	●				Total record On-premise = 6 records

						Total record Cloud-based = 6 records
2.	Insert the value or change the value in the Customization Field. <ul style="list-style-type: none"> <li>• Customer Requisition</li> <li>• Reference Number</li> </ul>	●				All field is working as per stated.
3.	Change existing Sales order information.	●				Value can be change on the sales order with the status “Active”.
4.	Create new Sales order.	●				New sales order name testing is created.

#### 6.5.4 Report Comparison- Sales Order

Transaction data impose an important part in verification where in business world, end user normally generate the report from the transaction data. To verify against the data, the report is created in Cloud based system where the field in the report is follow exactly with the field appear in the raw data file (The file that extracted out from the on-premise system). The purpose is to ensure that data appear in the Cloud-based system should be similar to the data in the on-premise.

MSP-Salesorder.xlsx - Excel

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	A	B	C	D	E	F	G	H	I	J	K	L
	Customer	Name	Sales order	Item number	Unit	Quantity	Requested receipt date	Customer requisition	Reference number	Payment	Delivery terms	Mode of delivery
2	CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000280	58732241	PCS	1,200.00	11/6/2017	2020632	PO0000277	D90	Courier	DAP
3	CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000281	58732231	PCS	2,000.00	12/6/2017	1054669	PO0000278	D90	Courier	DAP
4	CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000282	58732238	PCS	1,000.00	12/14/2017	2019235	PO0000279	D90	Courier	DAP
5	CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000283	58732239	PCS	1,000.00	12/14/2017	2019236	PO0000280	D90	Courier	DAP
6	CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	SO0000284	58732231	PCS	1,000.00	12/22/2017	1058075	PO0000281	D90	Courier	DAP
7	CTL-P0001	PIONEER ELECTRONICS ASIA CENTRE PTE.LTD.	SO0000288	58732116	PCS	110,880.00	11/28/2017	DI # 398582	PO0000285	D75	Trk	DDU
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Figure 6.6: Raw data extracted from the Sales order

List of Sales order report.xlsx - Excel

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Payment Terms

Account Number (Customer)	Customer	Order ID	Name	Product ID (Existing Product)	Name (Existing Product)	Unit	Quantity	Requested Delivery Date	Customer Requisition	Reference Number	Payment Terms	Shipping Method	Freight Terms
CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01000-NOH9K3	SO0000280	58732241	J2V-3 LENS ASSY (LY10731-003A)	PCS	1,200.00000	11/6/2017	2020632	PO0000277	D90	Courier	DAP
CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01001-H6D8Y8	SO0000281	58732231	LENS ASSY (LY10731-001B)	PCS	2,000.00000	12/6/2017	1054669	PO0000278	D90	Courier	DAP
CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01002-W0B6G9	SO0000282	31228018	LR03(GD)2B CX (F) B	PCS	1,000.00000	12/14/2017	2019235	PO0000279	D90	Courier	DAP
CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01003-F0L4H9	SO0000283	22937400	HS-4/150S HP M C5718A	PCS	1,000.00000	12/14/2017	2019236	PO0000280	D90	Courier	DAP
CTO-J0002	JVCKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01004-W1Z6N6	SO0000284	58732231	LENS ASSY (LY10731-001B)	PCS	1,000.00000	12/22/2017	1058075	PO0000281	D90	Courier	DAP
CTL-P0001	PIONEER ELECTRONICS ASIA CENTRE	ORD-01005-D1T9P1	SO0000288	58732116	MP-0150AH	PCS	110,880.00000	11/28/2017	DI # 398582	PO0000285	D75	Trk	DDU

READY

Figure 6.7: Sales report generated from the Cloud-based system

## **6.6 Conclusion:**

There are several limitation found during the verification process.

As the migration framework is included customization part where key user involvement is significant for understanding the current business operation and process. However, the company's person in charge who allows the data to be taken as sample is mostly handling the IT operation and much less knowledge in current business operation and process. As a result, customization on business rule and workflow unable to develop due to no other key user willing to volunteer in explaining of the current business operation and process.

Same goes to UAT part where key user involvement is important for verify the imported data in the system. Due to mentioned issue, the UAT stage is unable to verify as there is no key user involvement in the stage.

Therefore, this can conclude that the key person or PIC involved in migration project should have certain knowledge in current business operation and process for effectively act as an intermediary to translate the information appropriately between end users and the migration project team.

## **Chapter 7**

### **DISCUSSION AND CONCLUSIONS**

#### **7.1 Introduction**

This chapter covers the following topics:

- Discussion of the research outcomes on research objectives and research question
  - Objective 1, Research Question 1
  - Objective 2, Research Question 2
  - Objective 3, Research Question 3
  - Objective 4, Research Question 4
  - Objective 5, Research Question 5
  - Objective 6
  - Objective 7
- Conclusion

#### **7.2 Discussion of the research outcomes**

Cloud computing has become one of the fastest growing technology in IT industry. Despite of the emergence popularity of cloud computing, cloud based ERP systems have emerged as an alternative to the traditional on-premise ERP. As compared to on-premise ERP, cloud based ERP system offers better solution to companies with benefits such as low maintenance cost as their underlying infrastructure are handled by cloud based vendor with subscription basis.

Cloud based ERP possess many of the benefits and limitations, this study seek to review and identify the various aspect of factor influencing cloud based ERP by category it into benefits and issues. For this purpose, this study have conducted interviews with ERP vendors particularly in Microsoft ERP system to rectify whether the listed factors is applied in Microsoft ERP system. Below is the summary table of the interview outcomes by comparing with the literature review:



**Table 7.1: Summary of the Interview Outcome**

Below table is the summary table of the discussion about the Cloud based ERP:

Aspect/ Factors	Literature Review	Empirical Findings
<b>Cost Aspect</b>		
Upfront Investment	Low upfront cost.	Low upfront cost.
Cost of Maintenance	Low cost of maintenance.	Low cost of maintenance.
<b>Technology Aspect</b>		
Mobility	High Mobility.	High Mobility.
Scalability	Scalable on-demand.	Scalable on-demand.
Enhancement	User receives constant update patch from vendor	User receives constant update patch from vendor
Reliability	High Reliability.	High Reliability.
Aspect/ Factors	Literature Review	Empirical Findings
<b>Security Aspect</b>		
System and Hardware Control	Companies feel extremely insecure of lack of control.	Companies should not feel insecure as appropriate security measurement is done.
Privilege Abuse	High possibility of expose to security vulnerability.	Low possibility of expose to security vulnerability.
<b>Technology Aspect</b>		

Customization	Limited customization.	High customization.
Predictable Performance	Internet bandwidth is issue major issue to performance.	Internet bandwidth is issue major issue to performance.
Integration	Integration is hard to be done.	Integration is can be done easily.
<b>Vendor Aspect</b>		
Vendor Change	Vendor lock-in, hard to change.	Vendor can be easily, depend on customer decision.

Justification on the contradict result showed in above table:

Based on the table, several factors shows contradict result in interview findings. Nevertheless, those factors stated by various articles were based on different ERP software which the nature of these ERP software may not be applied to Microsoft ERP system.

One of the noticeable contradict result can be seen in technology aspect. Based on the literature review, the authors (Alajbegovic et al., 2013; Saeed et al., 2012) draw the conclusion of low in customization is based on different type of ERP and these ERP system were mentioned in their article:

- Alajbegovic et al., 2013- formed the conclusion based on softone software and IAS ERP system.
- Saeed et al., 2012- formed the conclusion based on Agresso, Netsuite E-business, Jeeves, SAP, Kontakt ERP system.

Same goes to integration, the authors (Johansson et al., 2014; Peng & Gala, 2014; Shuchih Ernest et al., 2015) draw the conclusion of integration is difficult perform in cloud based system. However, these were formed based on different type

of ERP and does not applied to the Microsoft ERP system context where the Microsoft Cloud based ERP is easily be done through configuration on web service and batch service to allow data constantly update in batch basis to the Cloud based ERP's database. Below is the different ERP system mentioned in their article:

- Johansson et al., 2014- formed the conclusion based on softone software and IAS ERP system.
- Peng & Gala, 2014- the real name of the interviewee's firm and their ERP system is disguised for confidentiality purposes.
- Shuchih Ernest et al., 2015- the real name of the interviewee's firm and their ERP system is disguised for confidentiality purposes.

For the vendor aspect, the author (Peng & Gala, 2014) stated that changing to a new cloud ERP provider may not always be easy due to (1) Complicated cloud infrastructure (2) Certain legal restrictions (3) Changing an existing ERP package imply changes operational, organizational and managerial aspects. However, this does not apply to Microsoft ERP system. Based on interview findings, the only cloud architecture provider is from Microsoft Corporation and the vendor or consulting firm will only provide the business solution to the client. Therefore, changing vendor does not affect the cloud architecture itself.

In terms of security aspect particular in System and Hardware Control factor and Privilege Abuse. The authors (Alajbegovic et al., 2013; Johansson et al., 2014; Peng & Gala, 2014; Elragal & El Kommos, 2012; Kumar & Garg, 2012) were conclude based on end user perspective as well as other Cloud system perspective. However, based on the interview findings, it conclude that user should not be worry on the security as Microsoft Corporation is a well know huge IT company should have a strong foundation in terms of security aspect. Below is some of the ERP system used by the author:

- Elragal & El Kommos, 2012- formed the conclusion based on ECC 6.0 and Business ByDesign ERP system.

### **7.3 Discussion of the Research Objective:**

In many existing research has listed the factors influencing cloud based ERP system implementation without having to include the detailed part of how migration process is required to be done. As mentioned in chapter 1, there are several research objectives and research were formed. Overall, the following research objectives have been achieved:

#### **7.3.1 Objective 1:**

To investigate the important aspect that the company required to aware during decision of opting for ERP cloud based advancement.

#### **Research Question 1:**

What is the important aspect or factor that the company should review before they decided to migrate their ERP to cloud solution?

The finding from literature review chapter 2 and interview session chapter 4 has conclude that there are several aspect of factor that company should acknowledge before decided to migrate their ERP to cloud solution.

1. Cost Aspect
  - Upfront Investment

In terms of cost aspect, cloud based ERP impose lower initial cost as compared to on-premise ERP. Initial cost were regards to cost of investment in server where on-premise ERP requires companies high upfront cost of investment in server. Whereas, cloud based ERP vendor will host all necessary IT/ERP infrastructure facilities for user companies who does not currently have enough in-house IT personnel to handle hardware, software and technical issue; (Alajbegovic et al., 2013; Elragal & El Kommos, 2012; Jlelaty & Monzer, 2012; Johansson et al., 2014; Kiadehi & Mohammadi, 2012; Peng & Gala, 2014; Seethamraju, 2015).

Based on the finding from interview (Chapter 4), the fact of initial low cost were consistent with the interviewee's opinion where client may not need to own a server infrastructure. This is because of all server is hosted by Microsoft, client will

only require to pay monthly fix subscription fees to Microsoft. However, there is one matter that company required to aware on the extra cost will incur on subscription to development server for the first few months. This is due to vendor require an extra server to do the development. Nevertheless, the initial cost on overall still consider as low and fixed with subscription basis, company do not spend high cost in owning a server infrastructure.

- Maintenance Cost

Low in maintenance cost is another significant of cost reduction in Cloud-Based ERP. IT maintenance cost was pointed to the cost on managing the hardware and software after the system was implemented. The maintenances task are managed by the vendor with fix rate charges of viable payment model, this has minimum IT internal staff effort involved in extra task and thus allows them to concentrate on more strategically important task of the company (Alajbegovic et al., 2013; Kiadehi & Mohammadi, 2012; Peng & Gala, 2014).

Based on the interview data found in this study, all interviewees agreed that the maintenance cost will be low as the client required to pay fix monthly basis subscription fees to Microsoft which the fees is included the cost of maintenances.

#### Cost Aspect Conclusion

From above literature review and interview findings, company who concern with cost can exploit the benefit that cloud ERP adoption emerges. By migrating their On-premise ERP system to Cloud based ERP, large consumption cost such as upfront investment and maintenance cost can be significantly reduce. This would be important aspect that brings impact to small size companies as cost aspect is the main concern when involving system adoption.

## 2. Technology Aspect

- Mobility

Literature review shows that mobility is high in using Cloud based ERP as it allows business to be done anywhere through web browsers, by using any mobile

devices with no extra customization or hardware cost (Alajbegovic et al., 2013; Peng & Gala, 2014).

Based on the interview findings, the interviewees agreed the statement that using Cloud based ERP does improve the mobility access to the system where it allowed user to access through different devices whenever they have web browser application for accessing.

- Scalability

Because of cloud ERP have huge capacity of virtual machine's storage as well as compute cycles resides by the vendor. Cloud ERP providers can help companies to deals with irregular demands without making heavy investments in hardware by easily increase or decrease the number of servers and users (Alajbegovic et al., 2013; Peng & Gala, 2014; Saeed et al., 2012).

From the interview findings, cloud based is scalable on-demand as multiple data center allocated around in worldwide to anticipate the scenario of ever fast increase user usages.

- Enhancement

Regular upgrades on specific ERP component will be released by cloud providers for enable Cloud based ERP improving in incrementally and constantly for ensuring their service exploit the best out of the current technology (Alajbegovic et al., 2013; Elragal & El Kommos, 2012; Peng & Gala, 2014).

From the interview findings, Cloud based ERP system used by the client will receives the update from the vendor side. This would still consider an advantage as compared to On-premise ERP.

- Reliability

As mentioned in literature review, the Cloud based ERP have high reliability where the facilities are identical and transactions are mirrored which making interruption of service related to hardware problems or data issues virtually impossible and if one of these facilities goes down, the applications will run on the other site with

minimal interruption (Jlelaty & Monzer, 2012; Kiadehi & Mohammadi, 2012; Kumar & Garg, 2012).

Due to the fact that Microsoft have multiple data center and numerous of the server, the switching server process would be more easily to replace the error server (mentioned in interview findings). Therefore interviewees agreed that Cloud based ERP able to ensure high ability with minimum interruption.

- Customization

Limited customization as mentioned in literature review where cloud ERP are often fixed and standardized systems as everybody use the same software (Alajbegovic et al., 2013; Saeed et al., 2012)

The interview findings found that all interviewees were disagree that the fact of limited customization is allow in Cloud based ERP. They further pointed that the customization function on the business process can be done easily through modify on the workflow functionality in Dynamic 365 Cloud based ERP. The customization logic in Dynamic 365 is using the same logic with Dynamic AX therefore Dynamic 365 can able to manage all kind of customizing.

- Performance

The deficient performance of the cloud ERP due to potentially limited speed and reliability of the network was also identified as a major concern for companies that demand flawless performance for their “heavy” applications and systems (Jlelaty & Monzer, 2012; Johansson et al., 2014).

Nevertheless, from the interview findings shows all interviewee are agree the fact that the internet bandwidth is major issue to Cloud based ERP which this is also mentioned in the literature review. In addition, that the location server of Microsoft decided does make the differences of improving the internet bandwidth if the location server was placed nearer to the customer’s country. Furthermore, they was suggest that companies must upgrade themselves to the latest technology for ensure the performance is stable.

- Integration

From the literature review, Cloud based ERP integrated with existing system is consider as costly, extremely time consuming, complex, dangerous task and hard for companies to do that (Johansson et al., 2014; Peng & Gala, 2014; Shuchih Ernest et al., 2015).

From the interview findings found that integration is possible and easily done through configuration on web service and batch service to allow data constantly update in batch basis to the Cloud based ERP's database.

- Technology Aspect Conclusion

According to literature review and interview findings, there are several benefits that companies can gain from adopting the cloud based ERP. These benefits are improve mobility access to the system anywhere with using any mobile devices, increase scalability where cloud ERP providers can easily increase the number of servers and users based on client's demand, system is continuously enhancement by cloud ERP providers to ensure their services exploit the best out of the current technology, high reliability of cloud based ERP making interrupted services related to hardware and data issues to the lowest possibility due to cloud provider have multiple data center and numerous of the server for easily switching between the servers.

Meanwhile, there are several factor in technology aspect that companies should alert on the cloud based ERP. Performance is noteworthy to highlight as both literature review and interview findings point out that the deficient performance of cloud ERP is due to potentially limited speed of the internet bandwidth. Apart from that, the limited customization and hard integration mentioned in literature review should totally depends on IT capability of the existing cloud provider to solve these issues as interview findings state that the current cloud based ERP product (MS Dynamic 365) have none of the issue when involving customization and integration.



### 3. Security Aspect

#### ○ System and Hardware Control

Companies feel extremely insecure to store sensitive data especially the financial data store on the cloud and allow cloud vendors to control and process them, they worry that their data whether will be fully protected or might be stolen and shared with competitors (Alajbegovic et al., 2013; Johansson et al., 2014; Peng & Gala, 2014).

Interviewee 2 and 3 were argue that client should not feel insecure to store sensitive data due to security issue as Microsoft have strong security level and policy management, they would consider the client shouldn't worry much about the security. The factors would consider a benefit to the client rather than consider as an issue.

#### ○ Privilege Abuse

The threat from outside hacker or malicious insider with a privileged role (eg. A system administrator) is inherent to any outsourced computation model and abuse by insiders could impact to the customer's brand, reputation, or directly damage the customer (Elragal & El Kommos, 2012; Kumar & Garg, 2012).

This statement was disagree by the interviewees where client should not be worry on the issue. This is because Microsoft is well established corporation which have their own high-end security management.

#### ○ Security Aspect Conclusion

As proposed by literature review, cloud based ERP impose greater risk in terms of security aspect as the access to the system is through network. However, interview findings state that reputable cloud providers can actually provide exceptionally high security measures which the issue should not be concerned by the client. Nevertheless, companies with greater conservative mentality should review in this aspect with the potential cloud provider for more detail information.

### 4. Vendor Aspect

According to literature review from (Peng & Gala, 2014), changing to a new cloud ERP provider may not always be easy due to a number reasons due to: (1) Under

the complicated cloud infrastructure, it can be very costly and time-consuming for moving ERP data from one cloud provider to another; (2) Certain legal restrictions made by current cloud providers may make it difficult for user companies to retrieve and reallocate their ERP data to a different cloud server either during or at the end of the existing service contract; (3) Changing an existing ERP package will also imply essential changes in many other operational, organizational and managerial aspects.

However, from the interview finding state that they allow customer to change vendor. The interviewee further mentioned that the decision is on customer and would consider as normal commercial practice in ERP industry. Yet, it will be unfavorable situation to existing vendor because of the extra task need to be done on handover documentation. Furthermore, the statement mentioned in literature review does not apply to Microsoft Cloud structure as the cloud ERP server provider is all under Microsoft Corp and the only differences is the vendor provide the service particularly on customization, therefore, changing will be not an issue to customer as it consider shifting the service instead of reallocate their ERP data.

- Vendor Aspect Conclusion

In terms of vendor aspect, companies should review the vendor lock-in factor when selecting cloud provider. While literature review state that changing to a new cloud ERP provider may not always be easy due to complication of cloud infrastructure, certain legal restrictions and changing imply changes to organization management aspect. Nonetheless, the quality of cloud based ERP's service providers are vary depending on different cloud ERP platform and different cloud providers as the interview findings further point that the structure of Microsoft Dynamics 365 does not apply the restriction of vendor lock in. Therefore companies should examine carefully on the cloud provider terms and conditions before draw to the final decision on cloud provider selection.

### **7.3.1 Objective 2:**

To investigate the essential issues that directly affect the migration of ERP cloud based.

## **Research Question 2:**

What are the issues or factor that directly affect the process of migration?

There are several factors were mentioned in the interview findings (Chapter 4), and these are the vendor perspective point of view when handling ERP migration project:

### **1. Time constraints**

The interviewee mentioned that the time maybe tight due to unpredicted issues such as error occurred during the deployment to PROD server (Production server) and AOS service (Application Object Server) can't restart. This unpredictable issue caused the schedule might slightly over run.

### **2. Documentation**

The interview finding state that the importance of proper documentation is required to be done after user revised the requirements few times as well as on the coding level. This is for the ease of developer to execute the development without any misleading issue. Improper documentation will lead to the developer spent much time in understanding the whole requirement.

### **3. Communication**

From the interview finding, the interviewee states that an outdated information/ lack of communication could lead to issue in the project and if any side of party (vendor or client) misses the update, the interface will lead to problematic. Thus, a cross check meeting between both sides of the party required to do through the daily short meeting to ensure that the project progress is updated and issues are discussed.

### **4. User Involvement**

Lack of user feedback could delay the whole project schedule. Therefore this this required a constant communication and feedback from the user side in order to ensure that the vendor able to handle the issue on time without any further delay to the whole project schedule.

Whereas, there are several factors encountered during the simulation cloud migration (chapter 6 & 7) and these are:

#### 5. Business Requirement Findings

Understanding the existing business process or business rule is essential to migration system as users must be able to perform core business processes after the migration. It plays an important part during customization stage where it will fit the current system process to the business process. The cloud based system must not only support the existing business processes performed by on-premise system, yet, it must meet user expectations for enhanced system. It will be meaningless to user to use the system if the ERP migration process is only involved pure data transfer and without develop the business process or rule inside the Cloud based ERP. From the perspective of user, aside from being able to perform report generation from the pool of data, performing transaction according to business process is much important as well. This is how the company recording transaction according to daily business process.

#### 6. Data Structure Findings

Understanding the data structure plays important part in extraction stage as well as in import stage. Without knowing the exact table and fields to be extracted out from on-premise and map it to the cloud based system will directly affect the extraction stage and import stage. If the project team do not have clue on targeting what table and field that needed to extracted out from on-premise, it will not only unable to proceed to the import stage, but, it affects the whole project schedule. Furthermore, if the project team unable to map the table and field correctly during the import stage, system will keep prompt error and blocking the data import into the system. Therefore, a well understanding on data structure in both on-premise and cloud based system leads to lesser possible of delay progress of proceed to next stage and lesser time consuming in finding the root cause of the error found in import stage.

#### 7. System's Customization Functionality

Customization functionality do not function correctly after data migration is another factor that affect the migration progress. A typical issue found in migration

project when developer have their distinct development server or environment for development. The issue will affect the migration project to finish if mission-critical customization is not function well after data migration. Possible reason is the developer did not perform test and debug well prior to application deployment into the system. This must ensure that all customization logic is verify with the end user and test thoroughly the application deployment.

### **7.3.3 Objective 3:**

To compare both structures between traditional ERP type and the cloud-based type in terms of infrastructure, application level, and database level.

#### **Research Question 3:**

What are the differences of ERP cloud-based type as compared traditional ERP type?

In the literature review (Chapter 2), a comprehensive review has covered in chapter on the architecture of Microsoft Dynamic AX (On-premise) and Microsoft Dynamic 365 (Cloud based ERP). Apart from that, further understanding on the both platform were compiled from interview on the ERP consultants.

In terms of physical infrastructure, both share a very much different infrastructure where:

Microsoft Dynamic AX- To own the system, company requires to purchase server and build own infrastructure. However, on-premise offers flexibility as company are fully own the system and the server infrastructure which this gives company have full control on the system as well data. The infrastructure is located within company premise.

Microsoft Dynamic 365- To own the system, company requires to pay a fixed month subscription fees basis to cloud provider. Generally, cloud provider offer Software as a Service (SaaS) type where company does not requires manage the server, database and system as the cloud provider will cover the maintenance in all aspect. The infrastructure is located at cloud provider. An interesting findings found in

interview session that server will handle by Microsoft and vendor company will only provide the business solution to the client.

In terms of overall architecture, both share a similar structure where:

Both architecture consist of 3 layer which is 1. Presentation Layer, 2. Application Layer, 3. Database Layer:

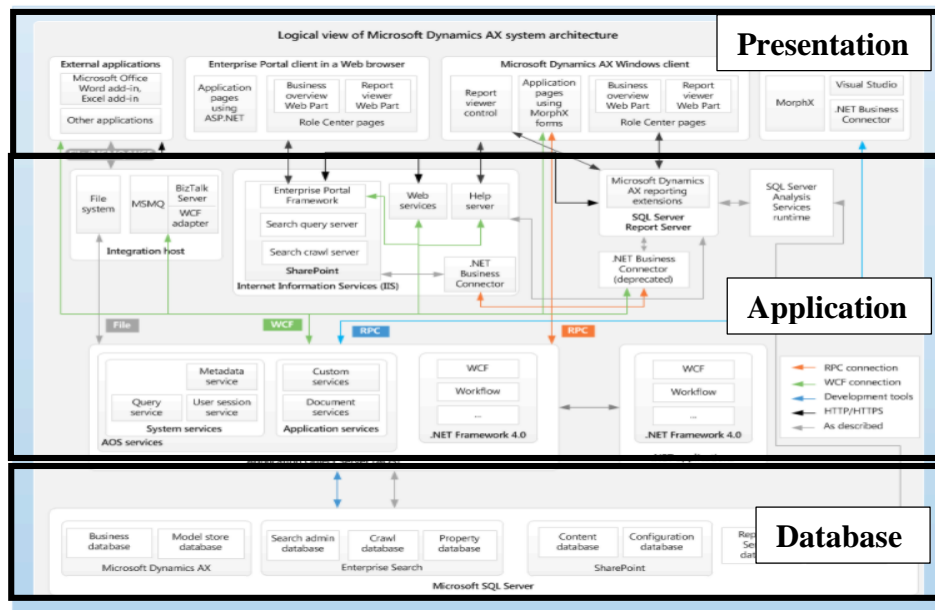


Figure 7.1: Microsoft Dynamic AX 2012 Detailed Architecture

Adapted from “System architecture [AX 2012]”, Microsoft, 2016. [Link: https://technet.microsoft.com/en-us/library/dd362112.aspx](https://technet.microsoft.com/en-us/library/dd362112.aspx)

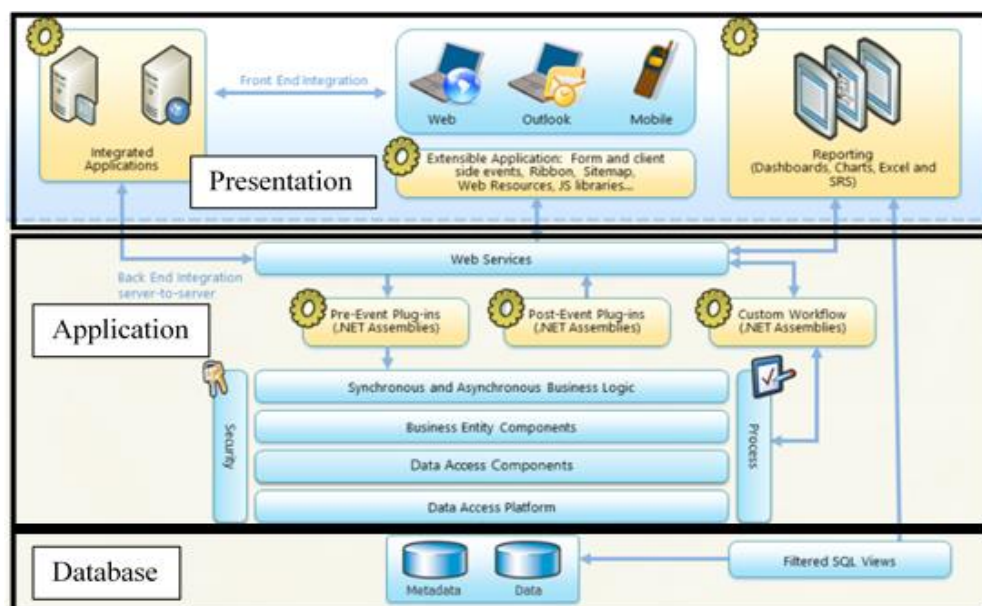


Figure 7.2: Microsoft Dynamic 365 Detailed Architecture  
Adapted from: “Extend Microsoft Dynamics 365”, Microsoft, 2016. *Link:*  
<https://msdn.microsoft.com/en-us/library/gg327974.aspx>

Under of each layer, both have differences in presentation layer/ front end:

Interview findings found that user may experience a different UI (User Interface) on using the Dynamic 365. Moreover, user will access every form through the web browser and user will experience a new design for the system UI.

Apart from that, both have differences in application layer/ backend:

Based on interview findings, the backend structure of Dynamic 365 has made a significant changes on it. The major changes are that all modification and development were no longer done in the AX Morphx (AX backend development environment) and all the AOT (application object tree) was placed on visual studio.

Lastly, in terms of database type, both still share the same database type:

This was confirmed by the interviewees that there is no changes on using the type of database as Dynamic 365 will still use the SQL database but SQL server will be in the cloud environment.

#### **7.3.4 Objective 4:**

To investigate the impact of the different database structure to the data migrating the process from traditional ERP type to cloud-based type using a simulation prototype.

#### **Research Question 4:**

How does the different database structure will impact the data migration process from traditional ERP type to cloud-based type?

From the result of empirical finding (interview) found out that the database type were using the same of SQL database. After conducted the second part of simulation, the database type have gave no or less impact to the data migration process. This is because:

System using data import export interface to extract and insert the data. Furthermore, exported data file is using a compatible format which is in Excel format and data import file have huge range of supported file format such as .xml, .csv, .txt, .xlsx and .zip.

The only difference is the data structure specifically in table and field which the data can't directly export from on-premise and import into the cloud based system. This require to conduct a detailed data mapping before the data migration process is start. This is because the name of table and field as well as the relationship between different tables in on-premise system does not necessary similar with cloud based system.

Moreover, every company have its own unique business process which most of the system contains some of the customization. Therefore, there is still have some difference between on-premise and cloud based system in terms of the customization field.

#### **7.3.5 Objective 5:**

To construct a framework of ERP system migration- from On-premise to Cloud based system.

#### **Research Question 5:**

How does the framework give assistance in the process on the decision of opting for migration and during migration?

Below figure is the suggested framework that constructed for companies as a guideline in execution of migration project. The preliminary idea of framework were formed based on several articles (Binder et al., 2014; Infosys, 2017; Microsoft, 2017c; Tonnu et al., 2014) that related system migration.



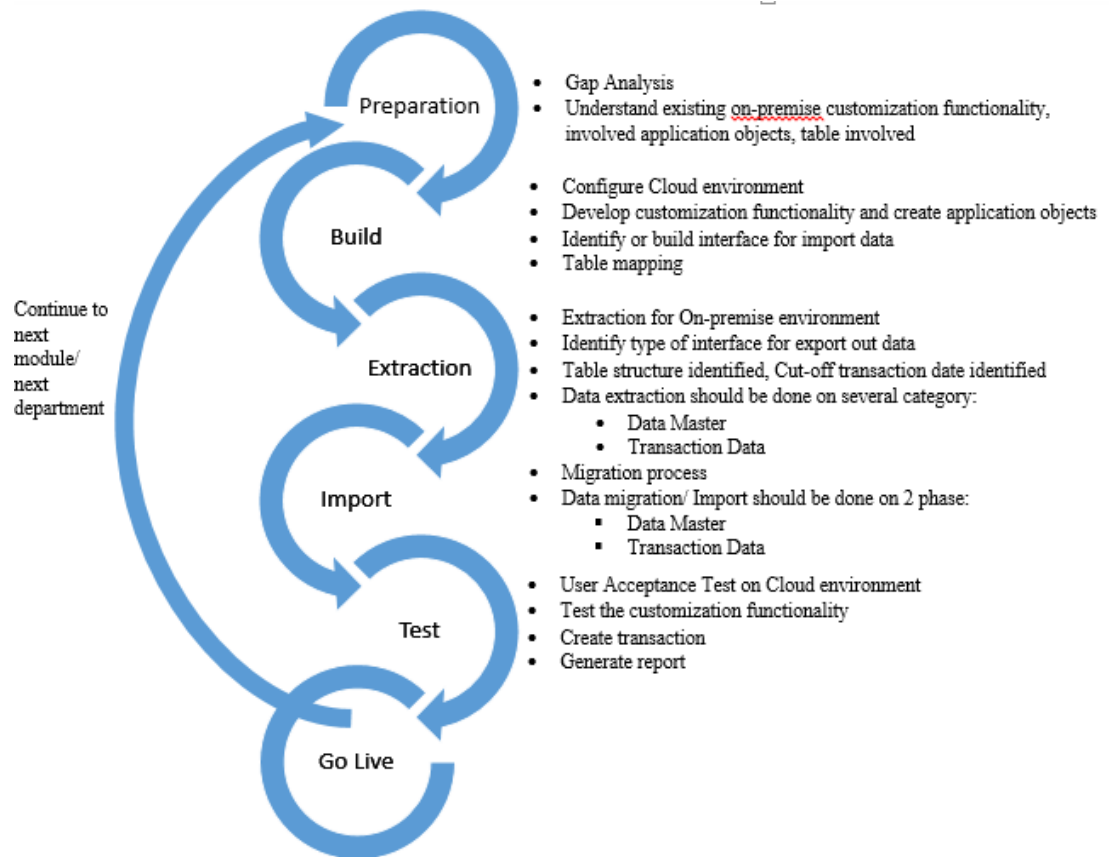


Figure 5.3 : *Migration Framework*

The framework give user an overall idea of how a migration to should be done. The framework particular aims to guide user in perform migration from on-premise to cloud based system.

Apart from that, constructed framework encompass a detailed step by step guideline in executing each phase. The details included the checklist need to know before start in every stage, overall flowchart to understands the whole process in that stage, note for company on any information or point required company to aware of as well as the step by step screenshot guideline in executing each subset stage. The design on overall guideline especially on customization and migration stage is rather consider as simpler and easy to learn which are suitable for any company or individual who has less knowledge in programming.

Without the framework guideline, company might lost direction on the executing the framework, which leads to improper planning in terms of resources

allocation and schedule arrangement. Besides, possible expose to different issue appear during the migration process as user unable to anticipate any issue happen during the migration. For example, in stage 1 of preparation shows the project team should target and list out all relevant table and field in on-premise. Without the proper preparation on target and listing the table and field at the beginning, the project team will find clueless and difficulty on which table and field should be extracted out. As a result, the project team only found out there is redundancy of unnecessary field is extracted out when doing data mapping which leads to time consuming in filtering out the unnecessary field through comparing one by one to the field available in the cloud based system.

#### **7.3.6 Objective 6:**

To evaluate the effectiveness of framework against the ERP migration to cloud-based through a simulation.

Based on Chapter 7, a verification on framework is done using a valid company's data. The process of each stage is verified against the difference type of data and these data are:

- **Master data:**

- Item/ Product information
- Customer accounts
- Item price

- **Transactional data:**

- Sales order

During verification on each stage, a table is created to record down the result of verification and below is the some of the example of the record on verification process:

**Table 7.2: Verification on Sales Order**

No.	Stage	Result
<b>Preparation Stage</b>		
1.	Target on one module	Sales module
2.	List Transaction's Table and Field	Options for identify table listing- Check through Front End and Application Object Tree  Result- <b>Parent Table:</b> SalesTable <b>Child Table:</b> SalesLine <b>Primary Key:</b> Sales Order Number <b>Field:</b> Sales Order Number Customer Account Request Delivery Date Delivery Term Mode of Delivery Payment term Customer Requisition Reference Number Item Number Sales Quantity Item Unit
4.	List All Customization Functionality and Fields	Options for identify customization- Check through Front End and Application Object Tree  Result- <ul style="list-style-type: none"> <li>• Customer Requisition</li> <li>• Reference Number</li> </ul>
5.	Workflow (business controlled process workflow)	No workflow existed in the On-premise module.
6.	Perform Comparison or Gap Analysis	Result refer to 7.2 Gap Analysis.
7.	Pinpoint on the field or functionality required to do in 2 <sup>nd</sup> phase Cloud Based customization	List of field require to customize: <ul style="list-style-type: none"> <li>• Customer Requisition</li> <li>• Reference Number</li> </ul>
<b>Build Stage</b>		

1.	Customization Fields	Options for develop- Create a new solution package
1.1	Identify and select the entity	Entity name- Sales Order
1.2	Create new field	New field created: <ul style="list-style-type: none"> <li>• Customer Requisition</li> <li>• Reference Number</li> </ul>
1.3	Add new field into the form	Form name: Order Customization placed under form sub-section: Summary and Sales Information
1.4	Publish	Package solution
1.5	Checking the new field in the form	Go to Sales → Collateral → Order  All field is visible under the Order Form.
2.	Business Rule	No business rule can be created as this require user to provide the business process logic.
3.	Workflow	No workflow existed in the On-premise module.

**Table 7.3: Gap Analysis**

<b>Microsoft Dynamic AX 2012 Field</b>	<b>Descriptions</b>	<b>Microsoft Dynamic 365 Ability</b>
<b>Transaction Data</b>		
Sales Order Number	Sales Order Number	Yes (Auto generated by system, if client wants the old system SO number, can include in SO description field)
Customer Account	Customer Account	Yes (insert in Potential Customer)
Item ID	Item Identification	Yes
Item Name	Item Name	Yes
Item Unit	Item Unit	Yes
Sales Quantity	Sales Order Quantity	Yes
Delivery Date	Actual Delivery Date	Yes (insert in Date fulfill)
Request Delivery Date	Customer Request Delivery Date	Yes (insert in Request Date)
Sales Line Amount	Sales Order Line Amount	No (system can auto generate by calculating price x quantity)
Delivery Term	Delivery Term	Yes (insert in freight terms) *Required little

		customization adding value in the field
Mode of Delivery	Mode of Delivery	Yes (insert in shipping method) *Required little customization adding value in the field

**Table 7.4: Data Mapping**

Microsoft Dynamic AX 2012 Field	Descriptions
<b>Transaction Data- Sales order</b>	
Sales Order Number	Order Table- Name
Customer Account	Order Table- Customer (change default map to customer ID)
Request Delivery Date	Order Table- Requested Delivery
Delivery Term	Order Table- Freight Terms
Mode of Delivery	Order Table- Shipping Method
Currency	Order Table- Price List
Customer Requisition	Order Table- Customer Requisition
Reference Number	Order Table- Reference Number
<b>Transaction Data- Sales order lines</b>	
Sales Order Number	Order Line Table- Order (change default map to name)
Item ID	Order Line Table- Product (change default map to product ID)
Item Unit	Order Line Table- Unit
Sales Quantity	Order Line Table- Amount

### Test Cases:

To list as many as possible test cases may require key user involvement, below is some of the basic test scenario.

**Table 7.5: Test Cases**

No.	Acceptance Requirement	Critical		Test Result		Comments
		Yes	No	Accept	Reject	
1.	Compare the total record in On-premise with the total record Cloud-based.	●				Total record On-premise = 6 records  Total record Cloud-based = 6 records

2.	Insert the value or change the value in the Customization Field.  <ul style="list-style-type: none"> <li>Customer Requisition</li> <li>Reference Number</li> </ul>	●				All field is working as per stated.
3.	Change existing Sales order information.	●				Value can be change on the sales order with the status “Active”.
4.	Create new Sales order.	●				New sales order name testing is created.

At the end of the verification, there is a need to perform a report comparison between the on-premise and cloud based system. The transaction data report- sales order is used in the comparison. The reason of using transaction data report is that the data is consider as the final core data that linked to multiple master data and user will normally generate report from the transaction data. The field and data is criterial in the comparison, this is to ensure all data and field is inserted correctly. Below is the screenshot from the sales order report:

Customer	Name	Sales order	Item number	Unit	Quantity	Requested receipt date	Customer requisition	Reference number	Payment	Delivery terms	Mode of delivery
CTO-J0002	JVKENWOOD ELECTRONICS (THAILAND) CO., LTD.	S00000280	58732241	PCS	1,200.00	11/6/2017	2020632	P00000277	D90	Courier	DAP
CTO-J0002	JVKENWOOD ELECTRONICS (THAILAND) CO., LTD.	S00000281	58732231	PCS	2,000.00	12/6/2017	1054669	P00000278	D90	Courier	DAP
CTO-J0002	JVKENWOOD ELECTRONICS (THAILAND) CO., LTD.	S00000282	58732238	PCS	1,000.00	12/14/2017	2019235	P00000279	D90	Courier	DAP
CTO-J0002	JVKENWOOD ELECTRONICS (THAILAND) CO., LTD.	S00000283	58732239	PCS	1,000.00	12/14/2017	2019236	P00000280	D90	Courier	DAP
CTO-J0002	JVKENWOOD ELECTRONICS (THAILAND) CO., LTD.	S00000284	58732231	PCS	1,000.00	12/22/2017	1058075	P00000281	D90	Courier	DAP
CTL-P0001	PIONEER ELECTRONICS ASIA CENTRE PTE.LTD.	S00000288	58732116	PCS	110,880.00	11/28/2017	DI # 398582	P00000285	D75	Trk	DDU

Figure 7.1: Sales order report produced from On-premise ERP

Account Number (Customer)	Customer	Order ID	Name	Product ID (Existing Product)	Name (Existing Product)	Unit	Quantity	Requested Delivery Date	Customer Requisition	Reference Number	Payment Terms	Shipping Method	Freight Terms
CTO-0002	JYKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01000-NH9K3	S00000280	S8732241	J2V-3 LENS ASSY (LY10731-003A)	PCS	1,200.00000	11/6/2017	2020632	PO0000277	D90	Courier	DAP
CTO-0002	JYKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01001-H50878	S00000281	S8732231	LENS ASSY (LY10731-001B)	PCS	2,000.00000	12/6/2017	1054669	PO0000278	D90	Courier	DAP
CTO-0002	JYKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01002-W08629	S00000282	S1228018	LR03(GD)28 CX (F) B	PCS	1,000.00000	12/14/2017	2019235	PO0000279	D90	Courier	DAP
CTO-0002	JYKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01003-F0L49	S00000283	S2937400	HS-4/1505 HP M CS718A	PCS	1,000.00000	12/14/2017	2019236	PO0000280	D90	Courier	DAP
CTO-0002	JYKENWOOD ELECTRONICS (THAILAND) CO., LTD.	ORD-01004-W128N6	S00000284	S8732231	LENS ASSY (LY10731-001B)	PCS	1,000.00000	12/22/2017	1058075	PO0000281	D90	Courier	DAP
CTL-P0001	PIONEER ELECTRONICS (THAILAND) CO., LTD.	ORD-01005-D179P1	S00000288	S8732116	MP-0150AH	PCS	110,880.00000	11/28/2017	DI # 398582	PO0000285	D75	Trk	DDU

Figure 7.2: Sales order report produced from Cloud based ERP

### 7.3.7 Objective 7:

A report of 5-7 pages of conference paper (in conference writing format) is expected.

Refer to appendix B, A conference paper has been produced with the titled “Next Era Of Enterprise Resource Planning System- Review on Traditional On-Premise ERP versus Cloud-Based ERP: Factors Influence Decision on Migration to Cloud-Based ERP for Malaysian SMEs/SMIs”. The paper has been accepted by a conference event named IEEE Conference on Systems, Process and Control (ICSPCS 2017).

## 7.4 Conclusion

Cloud Based ERP has been proven by many researcher that it is consider as beneficial for organization as compared to On-premise ERP. Because of the Cloud Based ERP is much new in the current market especially in Malaysia, there have been much doubt for company to decide for migrating their On-premise ERP to Cloud based ERP. Therefore, there is a need for conduct an investigation and study on the area of the different aspect that company need to know during the decision of opting the Cloud based ERP. There are several research objective and research question was developed in this research as a guideline in conducting the investigation. Hence, this research can conclude that this paper has fulfilled several research objective and research question.

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## Appendix A

## **Appendix A**

### **A.1. Interview Guide**

#### **Introduction**

1. Can you please introduce about the company that you are working. Which is the core business, the size and what kind of services do you offer?
2. What kind of ERP models do your company offer? (eg. On-premise, SaaS, IaaS, PaaS)
3. For Microsoft Dynamic, recently has just launched the cloud based version which Microsoft Dynamic 365. Can you briefly introduce Microsoft Dynamic 365?
4. Is it true that the Microsoft Dynamic AX is stop release out the license to new customer? Does your company still consult new customer for Microsoft Dynamic AX?
5. Is there any customer has approached your company about the new Microsoft Dynamic 365? If yes, what type of customer? (eg. SME or large company)
6. Have you deploy any Microsoft Dynamic 365 in any company in Malaysia?

#### **The architecture comparison of Microsoft Dynamic AX and Dynamic 365**

7. Is there any different in terms of functionality between Microsoft Dynamic AX and Dynamic 365?
8. How about on the development environment? Is there any different between the two types of software?
9. The SQL database is used in Microsoft Dynamic AX. Does the Dynamic 365 is uses the same SQL or a new type of database typically for cloud-based?
10. For Dynamic 365, do you host the database itself or Microsoft will host the database?

#### **Important aspect that the company required to aware during decision of opting for cloud-based ERP advancement**

11. Theoretically, the cloud based is offer much lower cost than on premise ERP? Does it true? Can you provides the reason and example?
12. About the cost maintenance, does the cloud based user have to pay on the cost maintenance for cloud service provider?
13. Based on the study, cloud based ERP is scalable on-demand for the server and performance. How does Microsoft Dynamic 365 apply it?
14. Using cloud based ERP, the user received continuously update system. Does Microsoft Dynamic 365 also done the same thing to all user including the user

has customization functionality? Does it affect the customization function? If no, why?

15. Speaking on customization, Microsoft Dynamic 365 allows customer to do customization like changing the standard business process logic in the system? For example, customer want to have approval level for procurement manager to approve the purchase order before the purchase order can be confirm and print out. Can Dynamic 365 do it?
16. Besides the customization, how about the integration with customer on premise system? Does Dynamic 365 allow to do that? Can you explain how the system allow to integration?
17. Customer often worry their data especially financial data store in the cloud because it expose to lack of control to the software and hardware. Do you agree on it? Please indicate why you agree or not agree?
18. Privilege abuse refer to misuse the administration ID to access the customer database. How does Microsoft Dynamic 365 ensure that issue won't happen? Is there any countermeasure?
19. Does cloud base ERP have stable performance? Since the physical database is shared by multiple company. Does the internet bandwidth also influence the performance of system?
20. If the cloud based customer wanted to change vendor, do your company allows to do that? Kindly give an advice if the customer want to change vendor.

#### **Migration process from On-premise to Cloud based**

21. Based on your experience, can you explain: what are the appropriate process of doing the migration from one system to another system? Eg. Process: Plan-Development-Internal Testing-User Acceptance Test
22. What are the general issue that you usually faced during the system migration?
23. How you solve it?
24. If existing customer of Microsoft Dynamic AX want to upgrade to Microsoft Dynamic 365, what are the issue they should concern?
25. Besides that, is there any appropriate step for the upgrade or migration?
26. Does customization function done in Microsoft Dynamic AX can directly import to Microsoft Dynamic 365?
27. Prior to the migration, how the database migration is done?

#### **Conclusion**

28. How do you think Cloud ERP is the best solution for SME as well as large companies as compared to on premise ERP?



## A.2. Interview Transcript

### A.2.1 Interview 1 Transcript

Interviewer: Lee Ming Jia

3<sup>rd</sup> Aug 2017

Interviewee: Mok Pei Yee

110 min

L = Lee Ming Jia

M = Mok Pei Yee

Name	Conversation	Notes
L:	Can you please introduce about the company that you are working. Which is the core business, the size and what kind of services do you offer?	
M:	You want to know about the vendor or end user environment?	
L:	Just about yourself, you currently work on.	
M:	Ok, I have been working as AX Technical Consultant/Developer for about 8 years. Have experiences in customizing AX functionalities and reports for AX2009 and AX2012. Able to do AX2012 installations and configuration such as SQL Server, domain controller, SSRS reports server, SSAS, AX, SharePoint portal. Have joined MicroChannel Malaysia Operations Sdn. Bhd. - MCS (formerly known as Tectura Malaysia Sdn Bhd). For almost 2 years. Worked as AX Developer in the project implementation team. MCS is a vendor environment company where they provide services and consultation for ERP systems (AX & NAV), Dynamics CRM and also providing post-implementation support. In addition to that, we also provide training sessions depending on customer's request.	
L:	Ok thanks for introduce. Have you touch anything on Dynamic 365?	
M:	So far, there is no Dynamics 365 project in either Malaysia or Singapore. But so far, MCS Australia have 1 or 2 projects involving Dynamics 365. Only able to learn about Dynamics 365 platform and	None of the company implemented in Malaysia.

	knowledge from the online videos provided in Microsoft Learning Portal. Since Malaysia users a bit skeptical about the stability of the AX cloud version, most of them will want to wait for the on-premise version instead. For Malaysia, most probably MCS will be offering Dynamics 365 on-premise to new customers	Malaysia's company still prefer On-premise compared to Cloud based.
L:	You mean install dynamics 365 in their own company?	
M:	Yes. Exactly, that is the version of On-premise. Due to the existing platform still very new, I also not too sure how is Dynamics 365 on-premise will be.	
L:	Oh I see, I heard that dynamic 365 on cloud, the server is dealing by Microsoft right?	
M:	Yes, if using cloud version, all the things is controlled by Microsoft.	Architecture of Microsoft Dynamic 365 handled by Microsoft
L:	I see I see. Is there any approval required from Microsoft if let say you want to implement something into the system?	
M:	From what I know is, customization still can be done by vendors or customer themselves in the DEV server, then can deploy it to the PROD server but the steps maybe different from current AX2009 and AX2012 practices. Microsoft will charge for those on-cloud servers	Extra charges for the development server.
L:	You mean that besides Microsoft charge to client, they will charge certain fees to vendor also?	
M:	Let say the customer have 4 servers (SQL Server, PROD, DEV and UAT). So customers need to pay for the hosting services for those 4 servers. So after the project implementation is completed and DEV & UAT might not need be needed anymore, so they can request to off those servers n no need pay for the subscriptions fees. If vendor done the customization in customer server, so of course vendor will not get charged	

L:	If haven't then vendor side need pay as well?	
M:	Unless the vendor done the customization in their own company cloud server which Microsoft also be charging for the cloud services subscription. Those subscription is to use the Azure services and considered into the license category, so it's all bear by customers. With this kind of charges, so some companies afraid it will over their budget.	Cost on the subscription for the development server might over run the customer's budget.
L:	Yes, but I thought the server cost is all included in customer license fees?	
M:	Those costing part I am not sure as it will in the sales person's task.	
L:	Alright. I understand that. Is it true that the Microsoft Dynamic AX is stop release out the license to new customer? Does your company still consult new customer for Microsoft Dynamic AX?	
M:	Yes, heard the rumors earlier that Microsoft will stop selling AX2012 license to new customer but I don't know when they will start doing so for any new customer, sales person will offer them the Dynamics 365 On-premise since Microsoft has announced to launch it by July.	The vendor start to offer the Dynamic 365 platform to new customer.
L:	Ok, is there any different in terms of functionality between Microsoft Dynamic AX and Dynamic 365?	
M:	Yes there is, some of the functionality has been re-organized in 365. So functional consultant will take up some time to learn those things again. However, I unable to provide how does the differences between the functionality of Dynamic AX and the 365 as I focus on technical part.	
L:	Understand on that, how about on the development environment? Is there any different between the two types of software?	
M:	For the technical side, it's a big change for developers. The development platform has been changed from AX Morphx to Visual Studio. Any	Big change on deployment as all the deployment is

	code development needed to be done inside Visual Studio and additional few steps in deploying the customized package to PROD environment too. For me it's a major change and beginning of learning the thing again.	done on visual studio instead of Microsoft AX Morphx.
L:	Wow, you mean all done in visual studio?	
M:	Yes.	
L:	The code language does it still use X++?	
M:	Yes, still in X++.	
L:	The SQL database is used in Microsoft Dynamic AX. Does the Dynamic 365 uses the same SQL or a new type of database typically for cloud-based?	
M:	Still SQL server but server is in cloud environment.	
L:	<p>Alright.</p> <p>Using cloud based ERP, the user received continuously update system. Does Microsoft Dynamic 365 also done the same thing to all user including the user has customization functionality? Does it affect the customization function? If no, why?</p>	
M:	Hmmm, the update patch part I don't know about Microsoft planning. But so far, I never heard Microsoft will install the hotfix or cumulative updates for customer especially those with customization done as Microsoft always emphasized that their updates shall be installed in a standard AX application and any errors occurred might due to the customizations done and they will not support to solve those issues.	Microsoft will not support any updates error occur in the traditional On-premise- the Microsoft Dynamic AX.
L:	Wow, from what I found in MS, they say it will not affect the customization. But now I heard like MS is not going to support the errors if anything is happen. Quite contrast from what MS mentioned in their flyer.	
M:	It same as the current AX2012. Whenever we installed any hotfix and CU, if the things doesn't	

	work, we will consult Microsoft. They always said to install the hotfix in a standard AX environment. If error, means the errors caused by customization done. If in standard AX still got error, then send the screenshot to them n then they will arrange time to remote in to check on the issue	
L:	Oh, so is the vendor install the hotfix and CU?	
M:	For the cloud version, I don't know as the platform still very new to Malaysia and Singapore.	
L:	Oh, I see. What you mention the install the hotfix in a standard AX environment is apply to Dynamic 365 as well?	
M:	Sorry, I don't know as I never implement 365 so far.	
L:	Alright it's ok. Speaking on customization, Microsoft Dynamic 365 allows customer to do customization like changing the standard business process logic in the system? For example, customer want to have approval level for procurement manager to approve the purchase order before the purchase order can be confirm and print out.  Can Dynamic 365 do it?	
M:	Yes. For the approval, in AX it's called workflow. In AX2012, the workflow can be done, so I think 365 should be having the same features too.	Customization on Cloud version is allow.
L:	Besides the customization, how about the integration with customer on premise system?	
M:	Sorry, I don't know about this, never read anything on those part.	
L:	Alright its ok. For the scalability, cloud based ERP is scalable on-demand for the server and performance. How does Microsoft Dynamic 365 apply it?	
M:	Yes, the Microsoft allows client to add on the user license whenever the client want to do so.	Scalability.

L:	I see. How about reliability? Does the Microsoft Dynamic 365 will face the issue of downtime server?	
M:	Since Microsoft have multiple server and multiple data center, I think the possibility of downtime is very much low. As the server can easily be switch or replace with. Even if there is downtime, the recovery will be done quickly by Microsoft.	Reliability.
L:	Ok. Does cloud base ERP have stable performance? Since the physical database is shared by multiple company. Does the internet bandwidth also influence the performance of system?	
M:	Yes, it is supposedly to have a more stable performance as the internet bandwidth does influence the system performance but what if the internet bandwidth of the customer country is not so good? Microsoft have few sites of the data center, so it does make differences on which site they decided to allocate the servers at.	Internet bandwidth does the great influence to the system performance and the location of the server is another factors of influences the performance.
L:	Oh, I see. Based on your experience, can you explain: what are the appropriate process of doing the migration from one system to another system? Eg. Process: Plan-Development-Internal Testing-User Acceptance Test	
M:	You mean migrating from an existing system to a new system?	
L:	Yes, in general.	
M:	<p>1) Must have a meeting with the key users and the project team to come out with a blue print</p> <p>2) Plan on the requirement based on the user request</p> <p>3) Development process and testing by project team consultant</p>	General step of migration.

	<p>4) Released the development for key user testing and improvement</p> <p>5) UAT session and sign off</p> <p>6) Deployment to PROD</p>	
L:	What are the general issue that you usually faced during the system migration?	
M:	<p>Time constraints, as there might be unpredicted issue occurred during the deployment process. Also, no proper documents done after user revised the requirements few times</p>	Time factors due to unpredicted issue and no proper user requirement documents done.
L:	Any technical issue?	
M:	Technical - might have unsolved errors occurred during compilation and have to solve them no matter what. Normally only can do deployment at night time.	
L:	What kind technical issue, can give some example?	
M:	<p>Unexpected errors occurred even though there was none when deployed to UAT server, sometimes cannot restart the AOS services. And one more is the code merging, very hard to determine which code to be merged without proper comments.</p>	Technical issue
L:	Oh I see. If existing customer of Microsoft Dynamic AX want to upgrade to Microsoft Dynamic 365, what are the issue they should concern?	
M:	Maybe data migration, because I'm not sure whether the table structures got change again or not.	Concern on table structures in cloud based is different from the On-premise.
L:	Does customization function done in Microsoft Dynamic AX can directly import to Microsoft Dynamic 365?	

M:	It depends, it could be.	
L:	For customization function you say it depends, can you briefly explain on what situation is allow for customization function migrate directly to dynamic 365?	
M:	Because there is no project involved in Malaysia and Singapore, therefore I couldn't exactly explain how the thing is work.	
L:	Alright. To wrap out everything, what is your opinion about the Dynamic 365- Is it the best solution for SME and large company as compared to on-premise ERP?	
M:	In terms of Dynamic 365 cloud based version, I think the current Malaysia market still have some doubt on it. That is why the Microsoft also launch the on-premise version of Dynamic 365 which is similar to cloud based version, the only difference is the software installed on the client side.	Current Malaysia market still doubt with the capability of the cloud version.
L:	Ok, that is all. Thanks you for your time in attending this interview. Your opinion helps very much in my research.	
M:	Ok, thanks.	

### A.2.2 Interview 2 Transcript

Interviewer: Lee Ming Jia

4<sup>th</sup> Aug 2017

Interviewee: Manimaran Natesan

120 min

L = Lee Ming Jia

M = Manimaran Natesan

Name	Conversation	Notes
L:	Can you please introduce about the company that you are working. Which is the core business, the size and what kind of services do you offer?	



M:	This is Mani working in Tectura (known as Micro Channel) Malaysia and Singapore, core business for my company is IT service and Tectura is multinational company which has more than 1000+ employee all over world in Singapore about 30 + team. Mostly we offer service: Dynamics AX, NAV, LS Retail and so on.	
L:	Oh, I see. In terms of Dynamic 365. Do you know what kind of ERP models do your company offer? (eg. On-premise, SaaS, IaaS, PaaS)	
M:	Basically Dynamic 365 designed to work in cloud basis.	
L:	Ok, is it true that the Microsoft Dynamic AX is stop release out the license to new customer? Does your company still consult new customer for Microsoft Dynamic AX? This is because of the new release of Dynamic 365.	
M:	Dynamics AX never stop release out the license. Dynamics AX 365 is next version as a general software industries practice, just old version license will not sell that it.	
L:	You mean if any new customer approach, the company will introduce the Dynamic 365 instead of Dynamic AX?	
M:	Yes.	
L:	Understand on that.	
M:	For correction, Dynamics AX and Dynamics 365 is not much different. Just that, Dynamics AX next version is Dynamics 365.	
L:	Ok, is there any customer has approached your company about the new Microsoft Dynamic 365? If yes, what type of customer? (eg. SME or large company)	
M:	All kind of customer approached to implement Dynamics 365, it fit for SME-Large.	Cloud based ERP fit for all size of company.

L:	Ok, talking about the Dynamic 365. Is there any different in terms of functionality between Microsoft Dynamic AX and Dynamic 365?	
M:	In General - it is most on user experience - user will access every forms in web, apart from few fine-tuned functionalities it is exactly same as Dynamics AX 2012 - R3 functionalities but very much change in technical and architecture aspects. Dynamics AX 365 able to interface through web it makes more stable and more scope for interfaces.	Different in user experience in terms of user interface. Same functionality but much different in technical and architecture aspect.
L:	You mean stable and more scope for interfaces is access through different devices?	
M:	Yes.	
L:	Alright, do you host the database itself or Microsoft will host the database?	
M:	Microsoft but control is our side.	
L:	Oh I see, so Microsoft got charge any cost on vendor side?	
M:	Yes, use basis.	
L:	Can give more details? How much they charge?	
M:	That I am not sure, we have to check from business.	
L:	Alright is ok, from what I heard, Microsoft is charging license per user which this has included the server cost, server maintenance and so on. Is that true?	
M:	Yes.	
L:	Or do the customer have to get extra server for DEV, TMP, and PROD?	
M:	However it is commercial we have to keep check with update release from Microsoft, it is purely on sales call.	

L:	Understand on that. Theoretically, the cloud based is offer much lower cost than on premise ERP, in your opinion do you agree on that?	
M:	Yes, because we may not build own server infra.	Reduce cost in upfront investment.
L:	Beside server infra, anything else that you consider Dynamic 365 is reducing the cost?	
M:	Other will be normal.	
L:	Alright.	
M:	Basically sales question will be answered mostly by Sales team. I am Functional and implementation consultant.	
L:	Ok, I understand that let's talk about the customization function. Using cloud based ERP, the user received continuously update system. Does Microsoft Dynamic 365 also done the same thing to all user including the user has customization functionality? Does it affect the customization function?	
M:	Microsoft using layer concept hence there will not any change in customization logic. Dynamics AX 365 able to manage all kind of customizing.	Customization
L:	You mean even the Microsoft release the update patch and not affecting the existing customization function?	
M:	We have to migrate all the customizations.	Enhancement process
L:	What do you mean by migrate all the customization?	
M:	We have to create same kind of tables and functionalities in Dynamics 365 as well before migrate the customization. After that only install update patch.	

L:	So you basically migrate all customization first before the update patch is installed?	
M:	Yes.	
L:	Wow that is a lot of work.	
M:	Yes, that is standard migration task which we cannot avoid. We also do re-engineering such as change some customizing to become better in next version.	
L:	So all this is done on your vendor side? Not Microsoft? I mean the migration and install update patch.	
M:	All from vendor side.	
L:	I see. Speaking on customization, Microsoft Dynamic 365 allows customer to do customization like changing the standard business process logic in the system? For example, customer want to have approval level for procurement manager to approve the purchase order before the purchase order can be confirm and print out. Can Dynamic 365 do it?	
M:	Yes. With using workflow functionality.	Customization is allow.
L:	The logic just same as dynamic AX? The work process function also included in the Dynamic 365 as well?	
M:	Yes.	
L:	Alright. Besides the customization, how about the integration with customer on premise system? Does Dynamic 365 allow to do that? Can you explain how the system allow to integration?	
M:	Yes, possible and it can easily done.	Cloud based ERP for Dynamic 365 is possible to integrate.

L:	You can give some overall idea if you have any idea on that how they integrate and so on?	
M:	<p>Interface between Dynamics AX 365 to other device can be configure through web service and Batch service.</p> <p>Services - Enable you to expose business logic written in X++ as a service to be consumed by other applications. Within Microsoft Dynamics AX, you can create, customize, and publish services.</p> <p>Document services - A specific implementation of services in which the Microsoft Dynamics AX business logic is exposed through document services.</p> <p>Consume Web services - In Microsoft Dynamics AX, you can consume external Web services from your X++ code.</p>	
L:	You mean utilize the batch service and web service to constantly upload and download the data between the two systems?	
M:	Yes.	
L:	Alright. Customer often worry their data especially financial data store in the cloud because it expose to lack of control to the software and hardware. Do you agree on it?	
M:	Not like that, it same as data stored in server. Furthermore, the cloud storage is controlled by Microsoft themselves. I believe that security level is very strong in there.	Security level is strong.
L:	Ok, you have any idea of how Microsoft control their security in managing cloud server?	
M:	No, I do not have idea, however, there are document is there. Have to go through.	
L:	Is ok. Does the Dynamic 365 able to increase their database size on demand?	

M:	Yes. In fact, the Microsoft is host the server on cloud will expect this kind scenario happened. Therefore they have multiple data center to anticipate this scenario.	Scalability.
L:	Ok. In your opinion, does cloud base ERP have stable performance? Since the physical database is shared by multiple company. Does the internet bandwidth also influence the performance of system?	
M:	Internet bandwidth is influence. However this is next way of technology, companies must be upgrade themselves in latest technologies as cloud is current technology.	Internet bandwidth is major factors to performance stability.
L:	Alright, understand on that. If the cloud based customer wanted to change vendor, do your company allows to do that? Kindly give an advice if the customer want to change vendor.	
M:	Yes, we can change vendor, if the current vendor service is not satisfy or want to give other. That is normal commercial practice.	Vendor is changeable.
L:	Oh that was surprisingly, I thought your company are not encourage to change vendor?	
M:	In general, if vendor wants to continue and alter themselves as per need but still depends customer decisions.	
L:	Even the customer want to totally change the vendor company to other company, your company also allows to do that?	
M:	All is customer decision.	
L:	Alright. Based on your experience, can you explain: what are the appropriate process of doing the migration from one system to another system? Eg. Process: Plan-Development-Internal Testing-User Acceptance Test	

M:	<p>List all the standard and customize functionalities in current Dynamics AX- &gt; revalue all the customize and check how can alter and modify -&gt; then technical will estimate all the task-&gt; functional team estimate -&gt;</p> <p>UAT-&gt;parallel live -&gt; LIVE</p>	Cloud based migration process.
L:	Wow, thanks for the details. What are the general issue that you usually faced during the system migration?	
M:	Must be continually need to do cross-team meetings, if team A miss team B updates, interface will lead issue. This is one and only issue need to fix and carefully. All other will become in line.	Cross check meeting is required.
L:	You mean team A and team B is within vendor side or both vendor side and customer side?	
M:	<p>Cross-functional Team should be (Vendor + Customer side + purchase + Inventory + Finance + Production + Quality +etc.)</p> <p>there should be two type of cross-functional team</p> <p>1. Key members - focuses on common decision</p> <p>2. Key actual users- focuses on practical issues and problems.</p>	Details of cross team.
L:	So vendor side the key member will be functional and technical team?	
M:	Yes.	
L:	Alright.	
M:	Meeting time should be short and meaningful but everyday must.	Daily short meeting is required.
L:	For both vendor and customer side?	
M:	Yes, everyone just tell what they are doing and need to inform other team and what is the approval and common value on that.	Constant communication is required.

L:	You mean that everything need to have constant communication between both parties?	
M:	Yes, must be 20 min in daily basis.	
L:	I see I see. If existing customer of Microsoft Dynamic AX want to upgrade to Microsoft Dynamic 365, what are the issue they should concern?	
M:	It same, cross functional communication is very important.	Communication is the key.
L:	Besides that, is there any appropriate step for the upgrade or migration?	
M:	Yes, Dynamics AX 365 release the blueprint for this. Available for partner source and customer. I think you can found from online source.	
L:	Alright. Does customization function done in Microsoft Dynamic AX can directly import to Microsoft Dynamic 365?	
M:	No, we need technical task to do that. Not just direct import.	Required technical modification before migrate the customization function.
L:	So you mean required to modify and recreate the customization before migrate to new environment?	
M:	Yes.	
L:	Alright, to summarize up the whole interview  How do you think Cloud ERP is the best solution for SME as well as large companies as compared to on premise ERP?	
M:	Cloud ERP is very best and suit for SME and Large. That is the reason Microsoft choose this technology and this is real next level of technology.	Cloud based ERP is suited for all size of company.



L:	You would prefer to recommend to cloud ERP or recommend On-premise ERP?	
M:	Both are have positive and negative points. However, cloud has more positive points.	Cloud based have more advantage compare to On-premise.
L:	Alright that is all from my interview. Thank you very much mani.	
M:	Sure Lee.	

### A.2.2 Interview 3 Transcript

Interviewer: Lee Ming Jia

7th Aug 2017

Interviewee: Giline Lee

120 min

L = Lee Ming Jia

G = Giline Lee

Name	Conversation	Notes
L:	Can you say some word about you and your current company that you are working on? For example, core business, the size and what kind of services do you offer?	
G:	Hi, I'm Giline. My current company is called Micro Channel previous known as Tectura. The core business is providing ERP solution to customer, there are more than 30+ of team project in both Malaysia and Singapore. I think is around 200++ employees based in Malaysia and Singapore.	

L:	I see. What kind of ERP models do your company offer? (eg. On-premise, SaaS, IaaS, PaaS)	
G:	Yes. Majority is On-premise but Microsoft just launch the cloud based version of Dynamic AX. If not mistaken is called Dynamic 365.	
L:	Speaking of Microsoft Dynamic 365, can you briefly introduce Microsoft Dynamic 365?	
G:	Well, like I said. The Microsoft 365 is just a cloud version of Dynamic AX. There is <b>nothing much changes in functionality</b> , only <b>huge changes is the backend structure of the software</b> . For the <b>user interface</b> , yes, there might have some brand new <b>interface experience in</b> there but overall the functionality is not much change as compared to AX.	No changes in functionality. Difference is on user interface and backend structure.
L:	Oh I see. So you mean that the functionality between Microsoft Dynamic AX and Dynamic 365 is still the same?	
G:	Exactly. You can still see the basic functionality of AX in 365 version. But 365 version has more flexibility on it.	
L:	What you mean of Microsoft Dynamic 365 more flexibility on it? Can elaborate more?	
G:	<b>The 365 version is access through on the internet, the flexibility is on the user access devices.</b> This mean that user can access it using any devices as	Flexibility of access the system

	long as they have web browser to access it. To add on, the Microsoft allows customer to purchase by module instead of whole software package. That is also one of selling point of 365 version.	and software module offered.
L:	Wow. The Microsoft allows customer to buy certain module, not the whole software package? Even if the customer want to use financial module only but don't other module like SCM, can customer do that?	
G:	Yes, definitely. This is why the cloud mean for the flexibility. Microsoft allow customer to plug in and unplug the module whenever they want to.	
L:	Ok, understand on that. You mentioned that there is huge change in backend structure. Can you elaborate more on that?	
G:	Backend structure like the application structure of the AX and 365 is totally a different things. The AOT is no longer in access through the AX system and instead AOT was placed on visual studio. This is most of our developer headaches on. They have to start to learn from the beginning on that.	AOT = application object tree.  All development is moved to visual studio.
L:	You mean all the backend development moved to visual studio?	
G:	Yes. If I not mistaken, the application service like AOT service are all in web service. Because all need to handle as cloud, so of course the web service is play the main role in here.	Application service all in web service form.

L:	I see. How about the database? Is there any changes on the database structure?	
G:	I think database not much change, still using SQL database.	Database structure no changes.
L:	I see. Talking about the database, do you host the database itself or Microsoft will host the database?	
G:	No, we don't host any database for client. But the Microsoft will do.	
L:	Oh, you mean that Microsoft will do the hosting?	
G:	Yes. All server is handled by Microsoft, our side just providing the business solution to client only.	
L:	Oh, understand on that. Is it true that the Microsoft Dynamic AX is stop release out the license to new customer? Does your company still consult new customer for Microsoft Dynamic AX?	
G:	From what I know, our current sales person will stop promote AX to new client and start introduce the 365 to the client. But I think Microsoft won't stop the licensing for AX because they need to take in the consideration of existing AX user.	Start to promote Dynamic 365.
L:	Oh, ok. Is there any customer has approached your company about the new Microsoft Dynamic 365? If yes, what type of customer? (eg. SME or large company)	

G:	That is sales side matter. I'm sure that our sales person will promote the new 365 for any client approach us. The 365 is design to suit for small to large size company.	Cloud based is suitable for small to large size company.
L:	Ok, understand. Have you deploy any Microsoft Dynamic 365 in any company in Malaysia?	
G:	So far, none in Malaysia and Singapore. Our main brand in Australia, yes. I heard they already implement the 365 cloud version for client. I think that the market still haven't ready for the changes, it will take some time to accept the cloud version. But my company will offer to the 365 On-premise version to the new customer who want to install the software on their server.	
L:	I see. From what I know the cloud based is offer much lower cost than on premise ERP? Does it true? Can you provides the reason and example?	
G:	Yes. Indeed it is cost saving, because of the server is host by Microsoft. Client does not worry of install server, manage the server and the software.	Low upfront investment
L:	Speaking of manage the server, does the cloud based user have to pay on the cost maintenance for cloud service provider?	
G:	No. from what I know, Microsoft will charge certain fix rate fees to client with included the cost maintenance fees insides. Client just need to pay a fix rate fees to Microsoft. And therefore is quite	Low in cost maintenance as fix rate of

	low in maintenance cost for the client as compared to the client who host the server themselves.	subscription fees charge to client.
L:	Cloud based ERP is scalable on-demand for the server and performance. How does Microsoft Dynamic 365 apply it?	
G:	Like what I mentioned earlier on, the flexibility is the selling point of the 365 version. Besides of allowing client to plug in and unplug the module, Microsoft allows client to add more user license to fit their business growth. The server center is allocated around in worldwide, therefore there is plenty of server to handle the growth of the users.	Scalable on-demand.
L:	So the server center is allocated around in worldwide meaning client access the server located randomly in worldwide as well?	
G:	No. Microsoft will assigned the nearest location of the server center to client's country. For example, if Malaysia client want to implement the 365 cloud version, then Microsoft will assigned the nearest location of server center which is located at Singapore.	Assigned the nearest location based on the client's country
L:	Oh, the nearest server center is at Singapore?	
G:	Yes. So far that is what I know. Other location of the server, I not too sure.	
L:	Oh, I see. Alright. Using cloud based ERP, the user received continuously update system. Does Microsoft Dynamic 365 also done the same thing	

	to all user including the user has customization functionality? Does it affect the customization function? If no, why?	
G:	This one is required our vendor side to handle and ensure that the update patch doesn't affect our customization. If let say, there is new release patch from Microsoft, then we have to inform the customer about it. After that, we have schedule a time, normally will be weekend or non-working hour to do the migration of the customization, backup and update the patch.	Enhancement process.
L:	Wow, that is involve lots of works.	
G:	Yes. This is what we normally do, to ensure that our client business daily process will not affected because of the faulty from the system.	
L:	So the update patch does brings certain affect to customization?	.
G:	<p>It depends on how well the project team handle.</p> <p>Based on the way I handle, I usually emphasis to my team on backup first before any update or modification on live environment. We normally will do some testing test server before roll out to live environment. If let say the update patch cause the issue on customization, then our technical consultant have to conduct investigation on it. If still not solve, then we have to let Microsoft to involved into the issue that we facing. Sometimes</p>	<p>Enhancement process.</p> <p>Update is affect the customization.</p>

	the update does affect the customization but this is something unavoidable.	
L:	I see. Speaking on customization, Microsoft Dynamic 365 allows customer to do customization like changing the standard business process logic in the system? For example, customer want to have approval level for procurement manager to approve the purchase order before the purchase order can be confirm and print out. Can Dynamic 365 do it?	
G:	Yes. The 365 customization can be done on workflow that is same with AX. It can allows customer to customize according to how they handle the business process.	Customization is allows in Cloud Based ERP.
L:	Besides the customization, how about the integration with customer on premise system? Does Dynamic 365 allow to do that? Can you explain how the system allow to integration?	
G:	Well. That required the customer to have a database to act as an interchange center between the 365 and the system. Our side is to modify the batch functionality to allow data constantly update in batch basis to our 365 database. It can be done and is not something complicated task.	
L:	Alright. Customer often worry their data especially financial data store in the cloud because it expose to lack of control to the software and hardware. Do	



	you agree on it? Please indicate why you agree or not agree?	
G:	No. This is on the customer side of psychological aspect. The true is Microsoft is well known company and of course have their own high end security level and policy management which I think they are very well take good care in security. Customer shouldn't worry much about it.	Security is not an issue to cloud based.
L:	Privilege abuse refer to misuse the administration ID to access the customer database. How does Microsoft Dynamic 365 ensure that issue won't happen? Is there any countermeasure?	
G:	Again, they have their own policy and security level for handling the client data. Since this is Microsoft side of handling, I couldn't give much details on how they control the security.	
L:	Alright, understand on that. Does cloud base ERP have stable performance? Since the physical database is shared by multiple company. Does the internet bandwidth also influence the performance of system?	
G:	Yes. Indeed. The internet bandwidth does affect the performance of the system. Overall the Microsoft is capable to increase the servers to handle huge users, I think is performance on database and server itself have the stable performance. Just that the issues will be on internet	Internet bandwidth is the major issue to the performance of the system.

	bandwidth. If the internet is slow, the user will experience the slow responsive on the screen.	
L:	I see. How about reliability? Does Microsoft will face the downtime server?	
G:	Like I mentioned before, Microsoft have multiple server center located around the world and numerous of server, they can easily replace the server through switching process.	Reliability.
L:	Oh I see. If the cloud based customer wanted to change vendor, do your company allows to do that? Kindly give an advice if the customer want to change vendor.	
G:	Yes. We allow customer to change the vendor. If the customer are not satisfied on current vendor, customer can always change. Just that we have to establish the handover session with the new vendor that is not good for us as we have to do extra task on the handover documentation.	Vendor changeable.
L:	I see. Based on your experience, can you explain: what are the appropriate process of doing the migration from one system to another system? Eg. Process: Plan-Development-Internal Testing-User Acceptance Test.	
G:	1. We need to establish a preliminary meeting with the user. Understand on the existing old system especially on the customization part.	DEV = Development Environment, TST = test

	<p>2. We do some study and investigation in the existing system based on point mentioned in the preliminary meeting.</p> <p>3. We need to separate the task into two team that is technical and functional for them to estimate the time and effort in doing this.</p> <p>4. We will start to do modification on the new system in order to fit the client business process.</p> <p>5. After that we migrate the data phase by phase, module by module.</p> <p>6. Then lastly our customer need to do testing.</p> <p>Basically, the process of moving from DEV environment to TST environment to UAT environment to PROD environment.</p>	<p>Environment,</p> <p>UAT = User Acceptance Test,</p> <p>PROD = Production environment.</p>
L:	What are the general issue that you usually faced during the system migration?	
G:	The lack of co-operation from user side is the main issue we faced in the system migration. This required to have constant communication and feedback from the user side in order to ensure that we able to handle the issue on time without any further delay to our whole project schedule.	Lack of user co-operation.
L:	If existing customer of Microsoft Dynamic AX want to upgrade to Microsoft Dynamic 365, what are the issue they should concern?	
G:	I think if from client side, they have to aware on the internet bandwidth. And most importantly,	Internet bandwidth and

	actively involved with the project team to ensure that the information is clear and transparent.	actively involved in project.
L:	Does customization function done in Microsoft Dynamic AX can directly import to Microsoft Dynamic 365?	
G:	No. We cannot do that. Because of the both backend structure is different from each other. We have to let the technical consultant do study on the existing customization function before develop similar customization function in 365.	
L:	Alright. To end this interview, last question: How do you think Cloud ERP is the best solution for SME as well as large companies as compared to on premise ERP?	
G:	Yes. Definitely is suitable to all sizes of company. That is the reason Microsoft want to launch new version of Dynamic 365. This is the new technology of what the world is talking right now.	

## Appendix B