Business Process Reengineering project in Local Governments with ERP

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Abstract—Local Governments use several different IT methods and tools to provide services required. Chosen business processes and software products should certainly provide suitable and reliable applications for long term. Nevertheless, due to the sudden change and improvement of IT Technology, some solutions become obsolete and those should be replaced sooner or later. However, as sustainability is requested in Local Governments, such changes have to be handled carefully. A new Business Process Reengineering, BPR, methodology is being built to support Local Governments-specific IT change and technology management. This paper introduces our methodology applied to an initial Dynamics AX business process implementation project. A mini- Dynamics AX project is defined to complete the so-called Business BluePrint phase of Dynamics AX Methodology. This approach is found to be suitable to support the Local Governments BPR project.

Keywords: Local Government, BPR, ERP, DYNAMICS AX, Technology management.

I. INTRODUCTION

Finding a suitable methodology for proper coordination of business processes and services is an essential goal for Local Governments. Focusing on Business Information Technology, one can find several different approaches, tools and solutions. Usually, there are heterogeneous business platforms, architectures and toolsets can be found parallel for complex Local Government processes. Enterprises, Governments should certainly replace obsolete methods and tools applied with standard and reliable solutions. A possible way for such Organizations to improve services is choosing and implementing a standalone Enterprise Resources Planning, ERP, System. Dynamics AX [1-2], provides full solutions for small, middle and larger sizes of organizations. Multiple examples can be found either for replacing suddenly the entire IT System or for changing it slowly and gradually. However, we cannot either repair business processes which should be replaced sooner or later, nor replace them immediately due to sustainability reasons. On one hand we implement a standalone ERP System that can provide all business functions necessary for Local Governments. On the other hand, existing Government operations should go on successfully as long as the ERP System implemented has not been tested thoroughly. This paper presents the scope (Business Blue Print) of ERP implementation. First, we are implementing Dynamics AX for covering some of the main business functions of a selected Local Government. After testing the functionalities it will be installed and applied.

Dynamics AX, one of the main ERP software in the World was announced in 1998 as IBM Dynamics AX, it was developed by IBM and Damgaard. The developers later merged with Navision Software A/S, the combined company was annexed by Microsoft in 2002 [5]. After Microsoft handled over the product, it becomes a real enterprise resource planning system. The AX modifications is done via using MorphX, X++, AOS, and other technologies. The AX 2012 version uses a new technique for custom modifications; Visual Studio 2010 has to be installed for developing clients.

It supported core business functions, like financials, controlling, human resources, logistics. The software is to assist companies by providing support for sales, customer relationships, inventory, operations, financials and human resources.

Original core functions since Axapta v2.5 [5, 6]:
- General Ledger, composed of ledger, sales tax, currency and fixed assets features
- Bank Management, where cash is received and paid out
- Customer Relationship Management (CRM), where Business Relations (customers, vendors, and leads) are contacted and maintained
- Accounts Receivable, where orders are entered, shipped and invoiced
- Accounts Payable, where purchase orders are issued and goods received into inventory
- Inventory Management, where Inventory is valued and managed
- Master Planning, where purchase and production planning takes place
- Production, where bill of materials is defined and manufacturing is tracked
- Product Builder, where product models are created and maintained
- Human Resources, where employee information is kept
• Project Accounting, where projects are created and tracked primarily from an accounting perspective
• Basic, where data configuration is performed
• Administration Module, where system configuration is performed

The Dynamics AX software consists of four main parts [3,4]:
1. Database Server, a database that stores the Dynamics AX data. This server is a Microsoft SQL server usually.
2. File Server, a folder containing the Dynamics AX application files.
3. Application Object Server(s) (AOS), a service that controls all aspects of Microsoft Dynamics AX's operation. There can be more AOS in case of scalability.
4. Client(s), the actual user interface into Microsoft Dynamics AX. Some of the business logic is programmed in clients, and some are implemented in the Application Object Server.

II. EXISTING BUSINESS PROCESSES FOR LOCAL GOVERNMENT

The main focus is on the Dynamics AX implementation of the Service Directorship (as a standalone company) of a Hungarian City Municipality (Székesfehérvár). The key processes had to be identified first. This directorship manages the public places and publicly owned areas, as well as deals with the public roads, bridges, green areas etc. owned by the City Municipality of Székesfehérvár. In the meantime, the company performs some minor investment project. The functionality of the company is complex, so are the business processes. This company is a fairly big one, according to the publicly owned companies connecting to City municipality of Székesfehérvár.

A. Business Processes in General

Let us take a look at the Business Processes in general. Microsoft Axapta Financial Management consists of several individually packaged offerings [7]:
• Microsoft Axapta Financials I and Financials II
• Electronic Banking
• Fixed Assets

Financials I includes General Ledger as shown in Fig.1., Bank Management, Accounts Receivable and Accounts Payable functionality.

Fixed Assets allows you to manage the entire lifecycle of your fixed assets, Fig.2.

Financials II includes inter-company accounting, multiple company consolidation capabilities, account allocations, cash-flow forecasting, and electronic banking, an add-on to Bank Management is available that supports the import and export of payment files to financial institutions in several countries Fig.3.
inventory levels and purchase lead times are taken into consideration in production planning. The result is more reliable planning of purchase, production and transfer orders, which optimizes your production flow and helps ensure on-time delivery to customers, as in Fig.4.

Fig.4. Master scheduling

Action messages suggest changes to purchase and production orders based on changing requirements, helping you to optimize inventory levels and improve production flow. Additionally, future messages provide notification of the earliest possible delivery date so that you can quickly take action on sales orders to maintain customer satisfaction. Increase the efficiency and accuracy of planning with time fences that help ensure that procedures are carried out at the right time [11] according to your manufacturing policies.

The idea to build industry specific content for reuse purposes is not limited to Dynamics AX. Other reference content can be found for example on the homepage of the American Productivity and Quality Center APQC [10]. Developed by APQC and member companies is intended as an open standard to facilitate process management and benchmarking regardless of industry, size, or geography. The PCF organizes operating and management processes into 12 enterprise-level categories, 62 process groups and over 1500 processes and associated activities. The PCF and associated measures and benchmark surveys are available for download at no charge at www.apqc.org.

B. Identifying the processes which need modification

The following major processes need some modification before implementing in Dynamics AX:

1. Handling of contracts
2. Storno invoices
3. Processes for inner orders

These processes were handled by the former software, but with the invention of Dynamics AX they had to be modified. This modification is done by external consultants with the aid of the professionals of the directorship.

III. BUSINESS PROCESS RE-ENGINEERING

In order to overcome the needs of BPR which remarkably require a long process [12, 13], Dynamics AX has developed an implementation methodology to speed-up the whole process by instantly implementing principals which has been underlined by Dynamics AX business process recipes. Dynamics AX as a major ERP developer providing a considerable solid collaborated system has came up with an instant process to simplify its implementation. Sure Step methodology is a comprehensive solution which is capable to handle continuous change by optimizing time, quality and efficient use of resources Fig.5.

Fig.5. Microsoft Dynamics Sure Step Methodology [8]

Main components of Sure Step

- Roadmap

Roadmap is consist of project plan, detailed description on what to do, how to do, why doing it and ultimately underline the level of urgency of each individual processes. In here, detailed project management and individual roles of each business component are clearly identified and finalized.

Five stages of the Roadmap are:

Project Preparation

In this phase, project leader or key executives will define clear project objectives and the whole decision making mechanism. Documentation plays an extremely important role in this phase; every predicted or
unpredicted tasks and events will be documented as well as uncompleted tasks which require more attention. Both internal and external issues need to be documented as well.

**Business Blueprint**

In this phase scope of the Dynamics AX implementation is clearly decided and defined. Selection of business module or function which need to be implemented and all business requirements are detailed and documented as Business Blueprint. There are various

Another critical activity described in this phase of implementation is Project Management which includes:

- Conduct meeting for project team and committee meeting
- General project management
- Describe any issues related to business change management realization

This is the phase where the actual Dynamics AX is installed and configured. The configuration consists of two steps:

**Baseline configuration**

At this step, the company requires to clearly identify, plan, schedule and monitor the Dynamics AX configuration including monitoring and testing the whole installation process.

**Final configuration**

At this step, project manager is checking the status of system, completeness and readiness of the system by conducting independent quality audit both internally and externally.

**Final Preparation**

The aim of this phase is final preparation of Dynamics AX system before going live in real production area. Included in this phase are testing, end user training, overall system management and finalizing company readiness to go live. All the processes during this phase will be monitored by project manager. Also in this phase, the system will be handed over to the individual user who will actually run the system in day-by-day basis. Those users will be prepared by providing adequate training specifically design for their job.

Manuals and user documentation are also prepared to help the end user in operating the new system as well as disaster recovery plans are prepared and implemented.

**Go Live & Support**

This is the phase where the whole system goes live in production processes and will be supported by Dynamics AX experts who will analyze the system performance and monitor thoroughly the progress of all activities.

**Dynamics AX’s tools**

There are various tools provided by Dynamics AX to help company to “implement effectively and cost efficiently”. Some of the packages listed below are used for configuration of business processes.

**Dynamics AX’s services and training**

Dynamics AX services and training includes all training, consultation and support service.

BPR and Sure Step methodology are built for a similar purpose that is as a method to implement a new system, however, they are based on completely different approaches. While BPR requires deep analysis on the existing system as well as the new system, Sure Step methodology is mainly ignoring the current system. Sure Step methodology main concern is to prevent companies from developing their own “reengineering” whilst thousands of other companies worldwide had already done so. By providing what so called “the best business practice”, Dynamics AX expects no more time and resource wastage during its system implementation and all negative effects can be minimized. Even though both BPR and Sure Step methodology system interact differently, the main concept of Sure Step methodology is still based on BPR. By using Sure Step methodology, company is no longer need its own major BPR, however some minor issues throughout Sure Step methodology implementation are still require adjustment or reengineering in some sort.

IV. ERP WITH DYNAMICS AX FOR A PUBLICLY OWNED COMPANY

The implementation of Dynamics AX was made by the Sure Step methodology timeline, according to the specific issues of the organization.

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consultants with the aid of the professionals of the directorship.

A BPR approach method as described in Bancroft [6], consist of the following steps: choosing a process, understand it to the extend needed, redesign it, implement the change. Not just the three processes needed a redesign, but the connecting regulations should be replaced as well. A BPR intervention is not merely the adaptation of a Dynamics AX system or the business processes of an organization, it implies changes in the way of doing business as well as on the structure and culture of an organization; it is changing the way of working of an organization and the process-oriented vision that organization needs to integrate. In essence, understanding the existing business processes is one of the key elements in ERP implementations. Implementing an ERP system involves reengineering the existing business processes to the best business process standard. ERP systems are built on best practices that are followed in the industry domain.

Microsoft Dynamics AX software is a solution for a middle sized business, which seeks to gain control over operations by increasing visibility into the supply chain, automating key production processes, tracking compliance. Service Directorship of a Hungarian City Municipality needed complete support for:

- Managing sales, production, and purchase orders including bill of materials for accurate allocation of raw materials to products
- Material requirements planning for multilevel production processes
- Visibility and reporting on materials and inventory across the production chain preventing material shortages
- Administering after-sales support including warranty and service contracts
- Tracking and reporting on regulatory compliance – and on progress against industry key performance indicators (KPIs) or benchmarks

**Handling of contracts:** this change was necessary, because Dynamics AX's structure is stricter than the old version. The order has to be the following, and it should not be modified:
1. contract
2. act of acceptance
3. invoice
4. transfer

These changes lead to a lot of changes in the work processes of the organization as well.

**Accounting:** The former system, used by the organization, could adapt a storno invoice easily. Dynamics AX this process had to be modified, because a stricter way of handling invoices was introduced.

**Controlling, inner orders:** Controlling provides you with information for management decision-making. If facilitates co-ordination, monitoring and optimization of all process in an organization. This publicly owned organization had to change a lot of inner regulations because of the different way of processes. A plan and track overhead cost within the specific structure of the organization is much more different from the previous model. Within the process of report profitability by product line, division, or other internal measurement, Dynamics AX uses a different way. The organization had to change the process of Cost Center Accounting, Activity Based Accounting, Internal Orders, Product Costing, and Profitability Analysis.

**VI. Conclusions**

Initial tests and analyses meet our expectations. The new ERP System, however, not only supported our existing business processes, but it gradually formed and changed business approaches. The Dynamics AX project had been defined contained the following 3 redefined business processes:

A. Handling of contracts
B. Storno invoices
C. Processes for inner orders

After completing their tests, the other defined business processes are should be included. According to our initial tests in the Dynamics AX Test Environment, the various different business processes of our Local Government introduced in the previous paragraphs, can be successfully handled by the new ERP System implemented. Certainly, the entire tests of business and technical processes will reinforce the initial successes or refer to some neglecting solutions that can be added further on. Hopefully, as soon as we will have a standalone ERP System, due to its flexibility, new business functions can be simply added later on. A new Business Process Reengineering methodology is being built to support Local Governments-specific IT change and technology management. This paper introduces our methodology applied to an initial Dynamics AX business process implementation project. A mini-Dynamics AX project is defined to complete the so-called Business Blueprint phase of Dynamics AX ASAP Methodology. Simple user interfaces definitely support several applications in pedagogical sciences such as e-learning, mobile-learning, etc. [8,9]
REFERENCES