

# Applying Agile Approach in ERP Implementation

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## Summary

Enterprise Resource Planning (ERP) systems are enterprise wide systems which, integrate and automate all of company's business processes. It has been widely reported that a large number of ERP implementations fail to meet expectations, over time and over budget. Implementation approach is the important factor that affects the success of ERP implementation. This paper summarized the most two common ERP implementation approach (Agile implementation approach and Big bang implementation approach), differentiate between them and reporting a hybrid approach to avoid the disadvantages for these approaches.

### Key words:

*Agile process, ERP life cycle, ERP implementation approaches, Legacy system, Software Engineering*

## 1. Introduction

ERP systems are large and modular information systems that cover companies' business processes such as Sales, Production, Logistic, and Financial. ERP has two important features firstly, it facilitates a causal connection between a visual model of business processes and the software implementation of those processes, and secondly they ensure a level of integration, data integrity and security, which is not easily achievable with multiple software platforms [1]. The first two stages of ERP life cycle, Planning and Package selection. Once these stages are Complete, the implementation stage begins and generally takes much longer than the first two stages combined. This stage can take months or even years so this stage is so important and the success of ERP is based on the success of this stage and the choice of implementation approach. There is a variation in failure rates for ERP implementation which lies in the definition of failure. Where one author only defines failure when the whole project is terminated, the other author defines failure when the objectives of the project are not reached within time and/or budget [2]. There are different implementation methodologies but the most two common approaches are:

- (i) Big bang implementation approach.
- (ii) Agile implementation approach.

Each approach has advantages and disadvantages so this paper focused on how to solve these disadvantages by proposing a hybrid approach between agile approach and big bang approach.

## 2. ERP Life Cycle

ERP life cycle consists from 4 stages as shown in Fig.1 which the first two stages are planning and package selection and the last two stages are implementation and maintenance. Planning phase is the one during which managers must question the need for a new ERP system while selecting the general information system approach that will best address the critical business challenges and improve the organizational strategy. This decision phase includes the definition of system requirement, its goals and benefits. In package selection phase which consists of the product selection that best fits the requirements of the organization. Factors such as price, training and maintenance services are analyzed and the contractual agreement is defined and it's also important to make an analysis of the return on investment of the selected product. In the implementation phase, the implementation strategy for ERP is selected, customization and adaption of the ERP package acquired according to the needs of the organization. Once a system is implemented it must be maintained because malfunctions have to be corrected and general systems improvements have to be made [3].

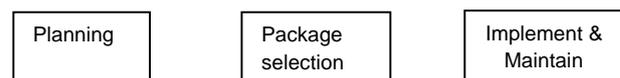


Fig. 1 ERP life cycle

## 3. ERP Implementation Approaches

It's important to realize that installation and implementation are two different concepts. Installation is the mechanics of changing from one software package to another while keeping problems at a minimum. Implementation is the methods a company uses to achieve their goals by transforming the way they carry out operations. With implementation, software is the tool that is used to achieve this objective. Implementation insures that the software is not only installed, but also meets operational and strategic goal. A successful installation is no guarantee that the ERP system will achieve company goals over a sustained period of time [4]. The success of

ERP is based on choosing the implementation approach and also implementation project costs and risks are also dependent on the implementation approach chosen by the organization [5]. The most two common implementation approaches are big bang implementation approach and agile implementation approach. In the big bang implementation approach, the implementation process is divided into distinct phases which are executed in strict order, without a possibility of ever failing back to a previous phase or stage and it is too expensive to undo the changes ERP brings to company. So the big bang approach could be called waterfall approach. In agile methodology, on the other hand, are iterative and incremental in their nature, focusing on delivering functional whole through smaller chunks of functionality over a series of relatively short development cycles. So the agile approach could be called phased approach or incremental approach [6].

### 3.1 Big Bang Implementation Approach

With big bang implementation approach the switch between using legacy system and using the new system happens at one single date, the so called instant changeover of the system. Everybody starts to use the new system at the same date and the legacy system will not be used

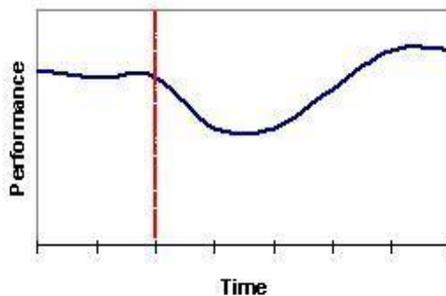


Fig. 2 System performance

anymore from that moment on. The big bang adoption type is too risky because there are fewer learning opportunities incorporate in the approach. Once the management has decided to use the Big bang method and supports the changes which are needed for this, the real changing process can start. This process exist of several steps: prepare management, converting the system, releasing parts of ERP system and training the future users. When all the steps are taken, the legacy system will be turned down then the ERP system can be loaded and then will be released. Once the new ERP is released there is no turning back. After introducing the ERP, there usually is a so called initial dip phenomenon which happens because the users are struggling with the new ERP and with the connection to their daily work and the system So what you

can see in Fig. 2 is that after the red line, which represents the big bang, the organizational performance goes to a bottom value, which takes a while, and after that it will increase again. This catch-up period needs to be planned, to be able to deal with these problems and difficulties. The total process for big bang ERP implementation modeled in the process-data model is shown in Fig. 3. In this model there are separate parts. (the grey boxes) from the management preparation and the concerned activities), to the next step that can be taken once there is agreement. This next step is the converting of the system with all the sub activities included and the outcomes of these activities at the right next to the grey box. The prepared management report makes it possible to make the planning. Once the system is converted the release of parts of the system (third grey box) can get started, and after this the next step (the last grey box) is the user preparation which is executed by the human resources department. The outcome of this is the buffer and the trained users list. When the users are trained a report of the user training is made, which is required for the final implementation of the ERP system [7].

### 3.2 Agile Implementation Approach

With agile approach, the implementation is done in an incremental or phased way. The main promise for agile implementation methodology is to avoid pitfalls and problems associated with big bang implementation approach. Agile is based on the simplicity, to move fast and to deliver operating functionality of the software as fast as possible, starting with the components that are most important for your business. Agile implementation consists from two phases: Baseline and Sprint realization [8] as shown in Fig. 4.

#### (i) Baseline

This phase consists from four steps:

- 1) Project preparation in which elements such as roles, responsibilities, documentation standards and hardware requirements are discussed.
- 2) Envision process workshops in which all operating processes and process dependant conditions such as master data, conversions, security, authorizations, and interfaces are carefully identified. On the basis of the outcomes, this will be translated into a solid foundation for the entire project.
- 3) Function baseline system, in which based on standard ERP software. As SAP implementation team first make an

inventory of whether project accelerator such as SAP best practices and Fast track services can be used.

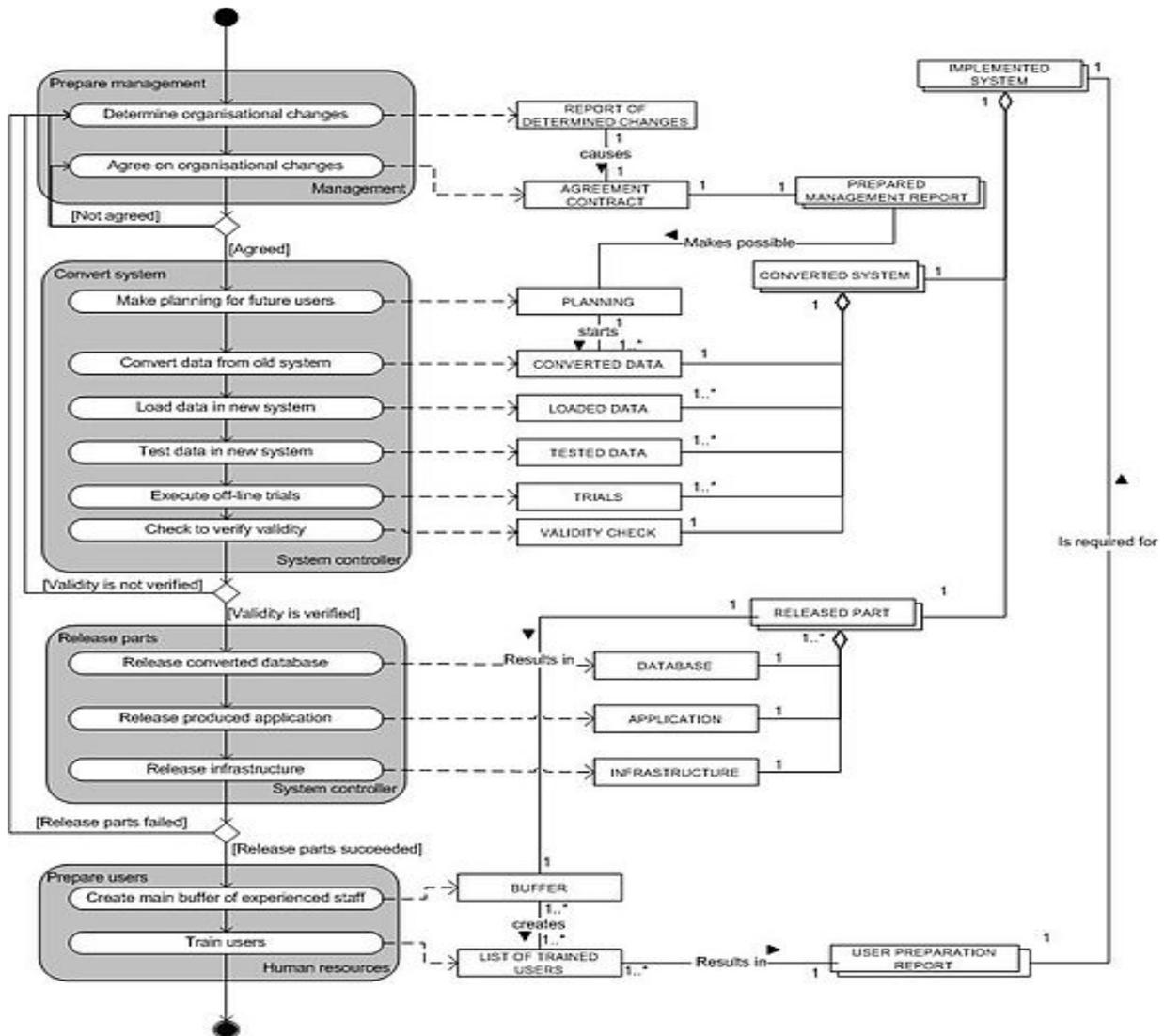


Fig 3. Big bang implementation approach process

4) Evaluation phase, in this phase the business determines the priority of the additional requirements and functionalities the so-called Delta list, in order of business value. Then the implementation team estimates the effort that will be required to realize this and determines the planning of the sprints for the system components to be supplied.

(ii) Sprint Realization

This phase consists from five steps:

1) Sprint planning meetings at the start of the sprint, the target for the sprint is defined and together with the process owner and the implementation team.

2) Delta realization in which the implementation team realizes the delta requirements and also includes testing and documentation.

3) Daily status meetings, the progress of the project is recorded and any obstacles the team encounter are discussed

4) Sprint demo session, during this phased users and IT can immediately determine whether the processes developed meet the set requirements.

5) Sprint review will also be held to see what can be improved in the following sprint [8].

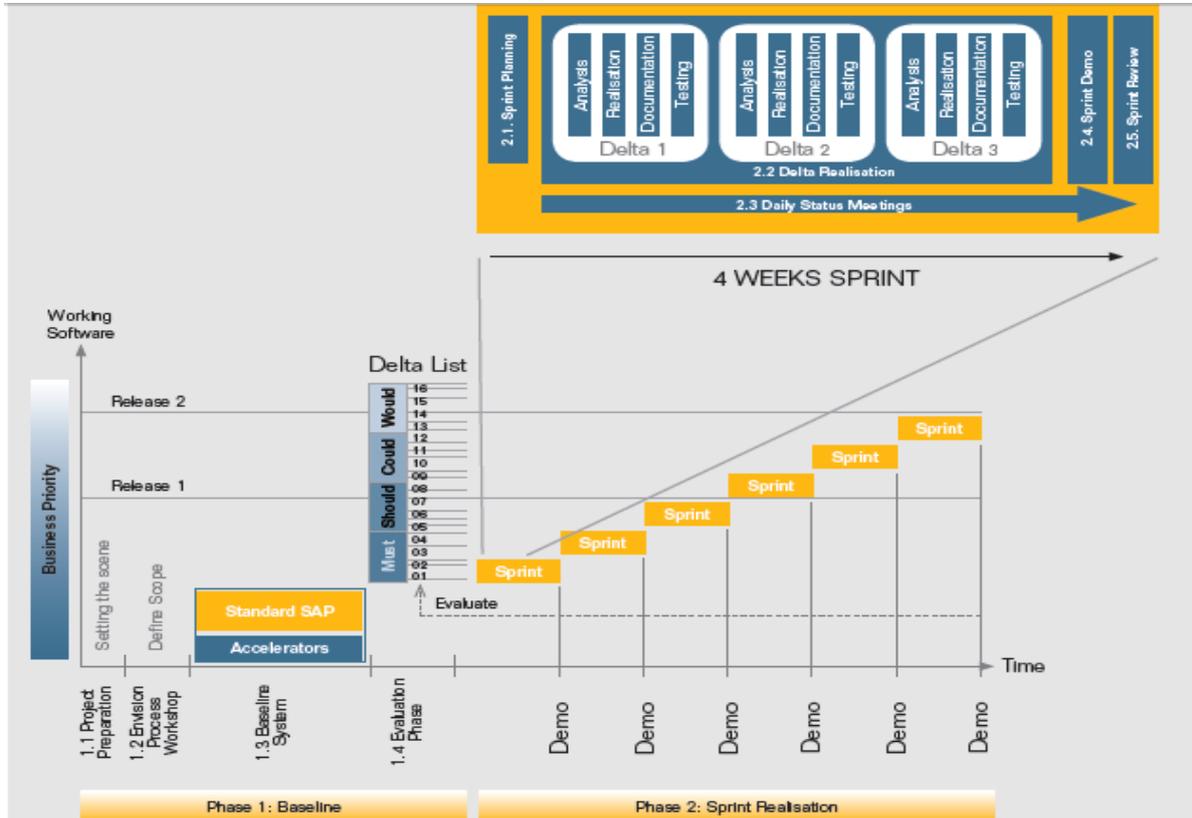


Fig 4. Agile implementation approach

Table 1: Big bang approach VS. Agile approach

Big bang	Agile or Phased
No need for temporary interfaces	Heavy use of temporary interface
Huge peak resources may be required	Peak resource requirements are low and more
The risk of total system failure may be higher	Low risk
Legacy system can't be returned	Legacy system can be returned
Personnel have fewer hands-on opportunities to gain knowledge	Personnel gain knowledge in each iteration
No going back	Can return back and make the required changes
Users Feedbacks in last phase	Users Feedbacks in each iteration
Time between development and use is large	Time between development and use is reduced
Project managers can't show that it works until the system is entirely installed	Project manager can demonstrate a working system. Because the work is broken into small portions
It's better to be implemented in small companies	It's better to be implemented in large companies
Fewer resources will be available in particular module	Resource can be devoted to a particular module
Limited need to maintain legacy system	Need to maintain and revise legacy software
Smaller duration to install	Longer duration to install
It's too cost to return back for change	It's not cost to return back for change

### 4. Big bang Approach VS. Agile Approach

Table 1 shows the difference between big bang and agile implementation approach.

### 5. Proposed Approach

According to the disadvantages in big bang and agile ERP implementation approach, we need to propose a new methodology to avoid these disadvantages. For agile as shown in table I, the main disadvantage is the need for a huge amount of interfaces that will lead to high cost and the second is that the implementation may take a long time. Interface programs are common in their use for the phased approach. These interface programs required to bridge the gap between legacy ERP system and the new ERP system until the new ERP system becomes fully functional. A good example is whether the financial modules go live on the new ERP software while the inventory module still remains active on the legacy ERP system. Through the use of interface and conversion programs, the financial activity

that occurs in the inventory modules is exported to the new financial system in a format that can be understood by the new ERP system.

Financial functionality are usually implemented before distribution and manufacturing functions [10]. For Big bang implementation, the main disadvantage is that the need for a huge resources and falling back is too expensive. The proposed approach is a hybrid between agile and big bang approach. Hybrid approach is incremental like agile approach but instead of implementing one module by module, the implementation will be cycle by cycle or implement a subset of modules incrementally. Also hybrid approach is sequential like big bang approach but sequential in each cycle not all in one cycle and not to go live for or all modules at the same time. To implement this proposal we need to make a dependency diagram for ERP modules. The dependency diagram shows the relation between modules and the inputs for each module and the outputs for each module as shown in Fig. 5.

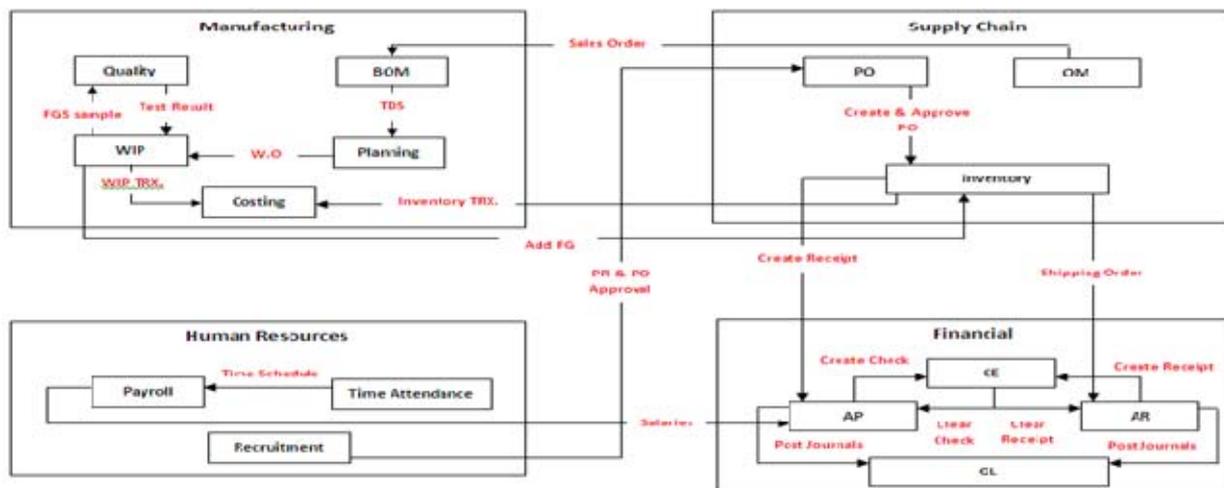


Fig 5. ERP dependency diagram

### 6. How Hybrid Approach is Working

According to the ERP dependency diagram, we used it to show how ERP implementation could be hybrid as shown in Fig 6. Fig 6 shows how hybrid approach combines between sequential and incremental implementation in the same time. Sequential is shown in implementing the related sub modules from some modules and going live at the same time per cycle according to the priorities of requirements. For example the first cycle is procure to pay that includes recruitment from human resource module, purchasing from logistic module, payable and general ledger from financial module. The second cycle is order to

cash which includes order management from logistic module, receivable from financial module and also general ledger but it's implemented in the first cycle. Incremental is shown in going live at different dates for each cycle like 1<sup>st</sup> live date for procure to pay cycle, 2<sup>nd</sup> live date for order to cash cycle, 3<sup>rd</sup> for manufacturing cycle and so on. The advantages for hybrid approach are:

- 1) The huge amount of interface programs which should be used in phased approach will be decreased too much because the related sub modules are implemented together at the same live date.

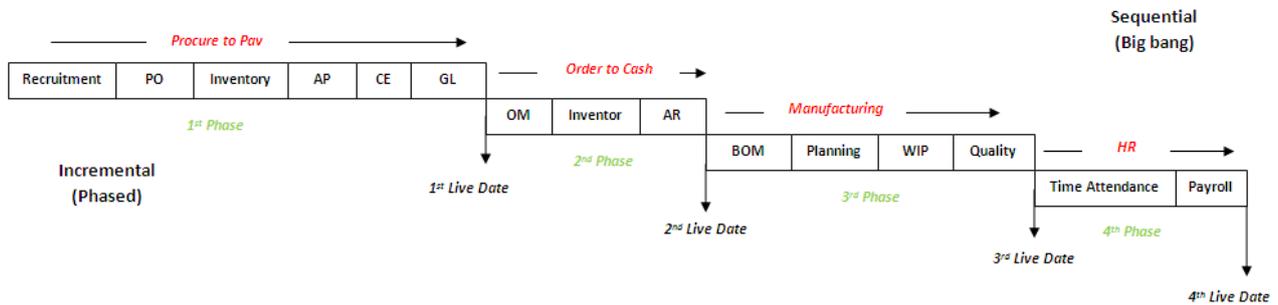


Fig 6. Hybrid ERP implementation approach

- 2) The cost will be decreased because the amounts of interface programs are decreased.
- 3) The implementation time will not be long not like phased or agile approach.
- 4) Hybrid approach will not need for a huge amount of resources as big bang approach, because implementation will be done in cycles or phases.
- 5) Hybrid approach will allow going back not like big bang and also will affect the cost of the implementation.

## 7. Conclusion

It has been widely reported that a large number of ERP implementation fail to meet expectations, over time and over budget. So this paper introduced two common implementation approach, big bang approach and agile approach. According to the disadvantages for those approaches this paper also introduced a new implementation approach that combines between agile approach and big bang approach to solve disadvantages in agile approach and big bang approach like using a huge amount of interface programs, using a huge amount of resources, cost and risk. To implement this methodology, we needed to make ERP dependency diagram to show the inputs for each module and the outputs from each module and based on the dependency diagram we could show the hybrid approach and how this approach can be worked.

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