



The control model of security in the deployment of ERP systems

Setare Yaghubi*, Nasser Modiri**

*student, Department of computer, Zanjan Branch, Islamic Azad University, Zanjan, Iran
setareyaghubi@yahoo.com

**Assoc. Prof, Department of computer, Zanjan Branch, Islamic Azad University, Zanjan, Iran
nassermodiri@yahoo.com

Abstract- Systems ERP software packages are vast and its implementation is facing with many complexity and challenges. The successful implementation of ERP in an organization depends on many factors. The successful implementation of ERP in an organization depends on many factors. This is very important in case of ERP systems due to the specific nature and affect all processes and activities of the organization. With the development of Web-based software to Smart invasions need to improve security during the implementation process there is. In this study reviews key success factors in ERP systems implementation methodologies and factors are discussed, and an approach to improve security during critical phases of implementation are proposed.

[yaghubi S, Modiri M. **The control model of security in the deployment of ERP systems**. Nat Sci 2022; 20(5);40-48]. ISSN 1545-0740 (print); ISSN 2375-7167 (online). <http://www.sciencepub.net/nature>. 6. doi:[10.7537/marsnsj200522.06](https://doi.org/10.7537/marsnsj200522.06).

Keywords: methodologies implementation of systems ERP, ERP Security Control, CSF, AIM, ASAP

1. Introduction

Enterprise Resource Planning (ERP) systems are becoming one of today's most widespread IT solutions. The primary functions of ERP are the integration of all the enterprises subsystems and business functions, i.e [1].

ERP systems are extensive software packages, That are created to support the development of integrated information in different parts of the organization such as manufacturing, financial, human resources. Cost of implementation this system is very high and it needs longer time for preparation

One of the most important in the implementation of great information is using, an approach and methodology in developing and implementing. The importance of this issue on ERP systems due to the specific nature and affect all processes and activities of the organization is very high.

Many studies and recommend of recommenders expressed the importance of improving software security analysis in the cycle software development rather than detection and removal it then generated, and given the widespread application of web-based software ERP, become more aggressive as well as a clever fraud, security software has become more important.

Section 2 of this paper examines important factors for successful implementation of ERP systems in turn, Section 3 discusses the methodology

important in the deployment of ERP systems, In Section 4, we propose a method for managing security in the deployment process.

2. critical success factors of ERP systems

Implementing an ERP system is not an inexpensive or risk-free venture. In fact, 65% of executives believe that ERP systems have at least a moderate chance of hurting their businesses because of the potential for implementation problems . It is therefore worthwhile to examine the factors that, to a great extent, determine whether the implementation will be successful. Numerous authors have identified a variety of factors that can be considered to be critical to the success of an ERP implementation [2]. The most prominent of these are described below.

2.1 Top Management Support/Commitment

Top management support was consistently identified as the most important and crucial success factor in ERP system implementation projects.

Welti (1999) suggested that active top management is important to provide enough resources, fast decisions, and support the acceptance of the project throughout the company. Jarrar, et al. (2000) pointed out that the top management support and commitment does not end with initiation and facilitation, but must extend to the full implementation of an ERP system [3].

2.2 Clear understanding of strategic goals

ERP implementations require that key people throughout the organization create a clear,

compelling vision of how the company should operate in order to satisfy customers, empower employees, and facilitate suppliers for the next three to five

years. There must also be clear definitions of goals, expectations, and deliverables. Finally, the organization must carefully define why the ERP system is being implemented and what critical business needs the system will address [2].

2.3 Extensive education and training

Education and training refers to the process of providing management and employees with the logic and overall concepts of ERP system. Thus, people can have a better understanding of how their jobs are related to other functional areas within the company. The user is the people who produce results and should be held accountable for making the system perform to expectations [4].

Not surprisingly, when respondents were asked to indicate the degree of importance of each training factor the responding companies gave the highest importance. Yet, one of the major challenges that the study of has brought out was running out of the budget. Documenting the training process and measuring training performance were also given a low importance [5].

2.4 A great implementation team

According to Welti the availability, expertise, quality and composition of project teams were the most important HR requirements for success. Additionally, he suggested that the composition of project teams with skilful and competent project team members will directly influence the output of the project [5].

2.5 Excellent project management

Project Management coordinates the use of skills and knowledge. Furthermore it monitors the progress and the achievement of objectives of the according ERP project. The formal project implementation plan defines milestones like project activities, personnel planning on activities and organizes the ERP project process. The implementation of an ERP system is a complex project which involves a possibility of occurrence of unexpected events. Therefore the management of risk is needed to minimise the impact of unplanned incidents by identifying potential risks before negative consequences occur [6].

2.6 Project champion

Project sponsor commitment is critical to drive consensus and to oversee the entire life cycle of implementation. Someone should be placed in charge and the project leader should "champion" the project throughout the organization [7].

The project champion should be a high-level executive sponsor who has the power to set goals and

legitimize change. Project champion work as an advocate for the system who is unswerving in promoting the benefits of the new system. It refers to an individual, not always a senior manager, who consistently advocates the benefits of the ERP system. The success of technological innovation has often been related to the presence of a champion who performs the crucial functions of transformational leadership, facilitation, and marketing the project to the users. This champion usually owns the role of change champion for the project life and understands both the technology and business context [8].

2.7 Business plan and vision

Additionally, a clear business plan and vision to steer the direction of the project is needed throughout the ERP life cycle. A business plan that outlines proposed strategic and tangible benefits, resources, costs, risks and timeline is critical [7].

3. Methods of deployment ERP systems

One of the main points that exist in implementation of large information systems, utilizing an approach and methodology of development and implementation of system. The importance of this in ERP system is the nature of ERP systems and impacted all processes and activities of the organization.

Methodologies are one of the most important factors for successful implementation of ERP systems is considered. Methodologies are one of the most important factors for successful implementation of ERP systems is considered. Therefore, the selection of appropriate software and make the necessary arrangements to implement necessary methodology for the implementation of ERP in an organization to creating.

3.1 Methodology ASAP

In 1996, SAP introduced the Accelerated SAP (ASAP) implementation methodology with the goal of speeding up SAP implementation projects. ASAP was advocated to enable new customers to utilize the experience and expertise gleaned from thousands of implementations worldwide [9].

ASAP methodology has five phases that is a comprehensive and rich approach and, significantly reducing the overall cost and quality of the work is done at a high level [10]. In this method there are support from project management, member of team, external consultants and technical consultants, business process [10]. and a great tool for small and medium businesses [11]. Project management is a critical factor in the implementation of ERP systems, is provided by the ASAP. Good project management, especially in the process of designing, testing and end user training are important factors in successful implementation by SAP in the most organizations [4]. ASAP is a fast and flexible methods [10,11,12].

Figure 1 shows the phases in ASAP methodology.

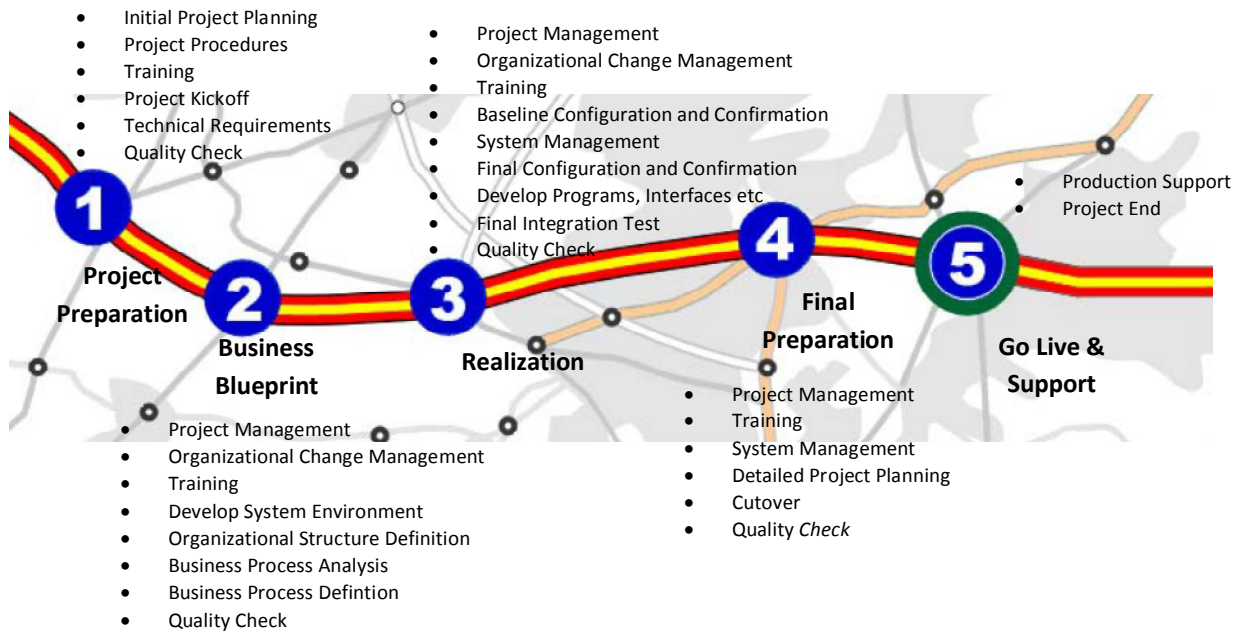


Figure 1: phases in ASAP methodology [13]

Phase I - Project Preparation

In this phase is done the preparation of elementary tasks of project [14]. Also in this step preparation of project charter, create Structure and organization of project review and refine the plan and implementing strategy implementation solutions, creating work teams and assign tasks, create plan and detailed action plan , defining technical requirements , initial meetings for bing project identification process model for doing , modeling and analysis of project requirements and determine organization of project , etc Is performed [13].

Phase II - Business BluePrint

Review, identify and design business processes in different fields is done via a standard procedure at this stage. In additional review and modeling of the business objectives and existing structures that are done [15]. In this phase after modeling current processes of organization, achieve to step modeling the future state of organization after changes [11].

Phase III – Realization

In this phase, tasks such Training project team, initial configuration of the system and receive confirmation, changes in basic ERP software has become an appropriate ERP solution to customize by means defined, creating and testing necessary interfaces, creating reporting Tools and testing them, testing integrity of the system is performed. Also in this phase program for transition is regulated [11,13].

Phase IV - Final Preparation

This phase allocated final preparation and review the plans projects. In this phase, system administration and user training, final testing of the system, applies the modifications and changes, transfer data from old systems to new systems is performed [11,13].

Phase V: Go Live & Support

Preparation and review launching System, correcting errors, preparing plans and schedules of timing and supporting its and activities of closing project in the final phase will be performed [11,13].

3.2 Methodology AIM

AIM is Oracle’s full lifecycle approach for implementing Oracle Applications. This methodology involves defining the activities, work processes, standards, procedures and practices, that detail of it described in six different sections with Milestone set guide and valuation activities relative to each other and define the main activities for the speedy implementation of projects and activities are complementary choice. In order to successfully implement this methodology, first action is required, and the resources needed to do and the resource needed for accomplish a specific project are recognized, and secondly, to do all of the activities, provides a patterns for the outputs . The main advantage of this methodology is that business requirements are defined early in the project and

during implementation Consider placed. One of the major disadvantages of this methodology, its complexity [10]. Framework that are including elements such as steps, processes and tasks. AIM has a very wide scope, in this field investment of firms, sectors and there is a group of branches [16]. Figure 2 shows the phases in AIM methodology.

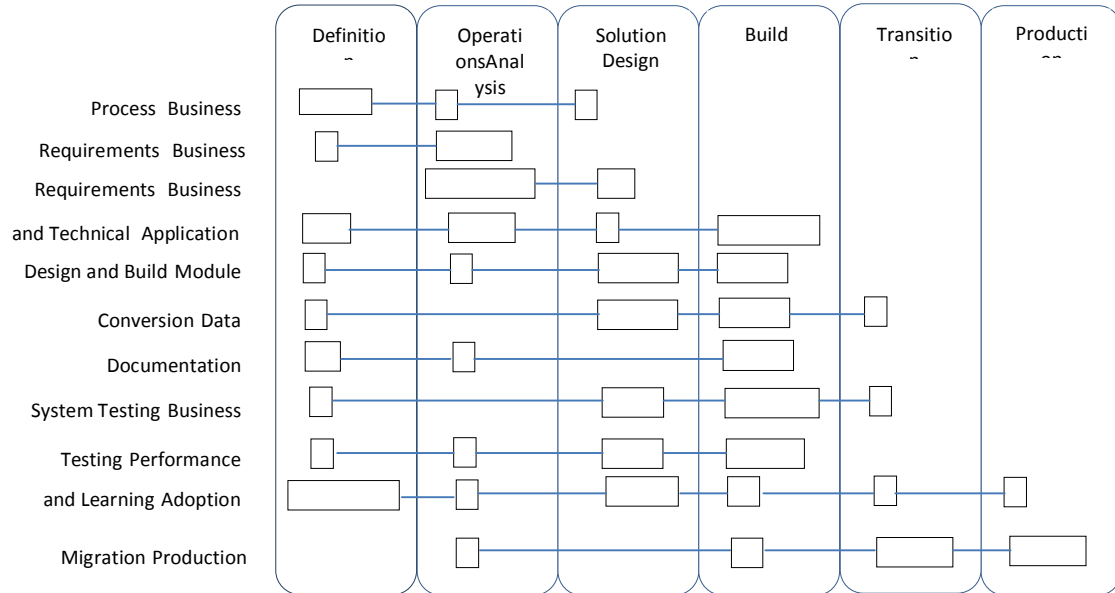


Figure 2: phases of the AIM methodology [16]

Phase I: Definition

In this phase, the employer and Contractor working together for planning process, review the resources and constraints, project scope and organization of operational teams [16,17].

Phase II: Operations Analysis

In this phase, the project team will move towards collecting work processes which can be extract different current work step with standard applications ERP. Also, decide on the future organization of work processes are performed at this stage [16,17].

Phase III: Solution Design

The purpose of this phase detailed design new solution for the business needs and organization. Also based on organization's needs and if it is optional, it can be added selection other features can be added in solution. In this phase based on decisions of phase II provided solutions for conforming current work processes with standard process ERP [16,17].

Phase IV: Build

Coding and testing all areas of custom software, conforming software application in the organization, conversion data and design user interfaces is formed

in this phase. effective testing and System testing is done in this phase. The purpose of this phase is to formulate and provide detailed requirements for computer applications and present a solution [16,17].

Phase V: Transition

At this stage programs are made in previous phase the implemented operationally in organization and the data in the system before being transferred to the new systems and its weaknesses, is amended as. In this phase, the current business processes and ERP applications are working parallel. In other words application programs are tested in a real environment [16,17].

Phase VI: Production

The final delivery of the new system at last phase of this methodology and the beginning of system support cycle has been done. Improvement and steps of measurement to be carried out at this stage [16,17].

4. Controlling security in ERP systems

Software has security problems, and software patches security and firewall solution to keep your security software updated. Today, produce massive of software. But at the same time, little progress has

not been able to close the security gap. Simply specify that the method of production and development must be fundamental changes to improve the process.

Since ERP systems with resources and information on the organization and sometimes outside agencies interact ,as a result, information security, and set limits for access to this information is important. Since the different layers vary in different organizations and what types of information and data volume also varies. When implementing ERP systems, organizations must have a strategy in place to control access to systems and data should be considered.

There are security problems at any level of ERP systems, these aspects in three categories: network layer, presentation layer, the application layer can be

divided, that include business processes, internal interfaces, and databases. Security aspects in ERP systems, including policies and security management, user authentication, separation of duties, access permissions, time limits, and entry is tracked and database security [18].

Many of studies and recommend of recommenders is expressed the importance of improving software security cycle (SDLC), rather than detecting and removing them from the production and wide distribution .According to the ASAP and AIM there are not any process control and security over deployment process ERP systems. In this paper, we propose the following 7 factors for security management. Figure 3 shows the Proposed factors for improving security.

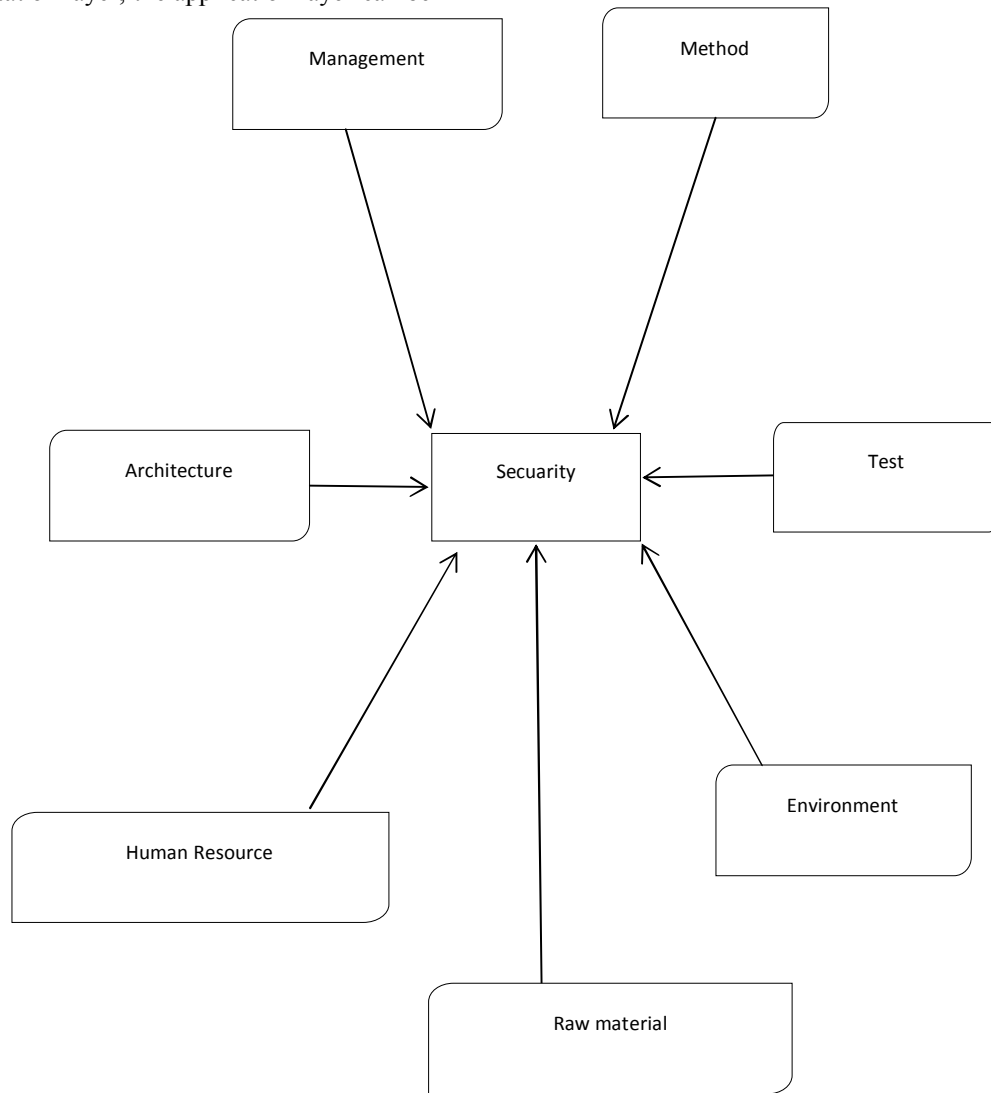


Figure 3: Proposed factors for improving security

Management- One of important factor in securing the ERP systems, is management factor. Manager must be able to identify security risks and disclosures and I have completed supervision over security tasks. He should have sufficient knowledge about ERP system security.

Method- Another factor establishing securing is methods that are used in the establishment of ERP system. There should be strategies in the establishing methods of ERP security for controlling access to the information system There should be access control file and log out. Proper security mechanisms must be used in security and threats are modeling.

Environment- One of the most important factors in the security context of software. Secure software context should be in the network, environment, software, databases and related hardware.

Raw materials- For the raw materials that need to be worked on. Knowing should be about the security issues, security risks and danger. Other word, should be cognition determine requirements of security, providing evidence and determine all matters relating to the security aspects.

Human resource- Human resource must have adequate experience in security and IT security team is involved from the early stages of design.

Tests of security- ERP system should be evaluated in terms of safety inspections. All aspects of system security fully described in a phase after implementation again examined and assessed.

Architecture- Architecture is one of the most important factors in architecture securing ERP system. If software architecture is designed to correct security gaps, ERP system will be resolved. Architecting is in database and environment software architecture.

Given that the methodology of ERP systems to improve safety during any process is not considered In this paper, the AIM methodology for enhancing security during the deployment process, we offer the following approach:

Phase 1 – Definition

In the early stages of the methodology, the security team of experienced and familiar with security issues is determined precisely by the team's current performance and safety of the structure is known and weaknesses in the current system and determine the list of security threats and security requirements based on them fully determined requirements of security and also security control strategy is determined.

Phase 2- Operation analysis

Determined based on the requirements definition phase, requirements gathering and modeling threats to the future development of the model is done.

Phase. 3 - Design Solutions

In this phase, the design model of access control, security architecture, application design, database design, security and platform security, is implemented.

Phase 4 - Build

In this stage the security implementation in the programming environment, architecture, database and software context development is done, and also and security parameters of program and databases is implemented.

Phase 5 – Transition

Due to ERP systems should be evaluated in terms of security and inspection. All aspects of system security fully described in a later phase of the implementation will be reviewed and evaluated again. Thus the security evaluation phase before entering the real world environment. Security testing is done in a real environment. And security weaknesses can be removal.

Phase 6 – Production

In this phase errors and security flaws in the final product will be completed.

Figure 4 shows the Proposed model the production process security in ERP implementation stages.

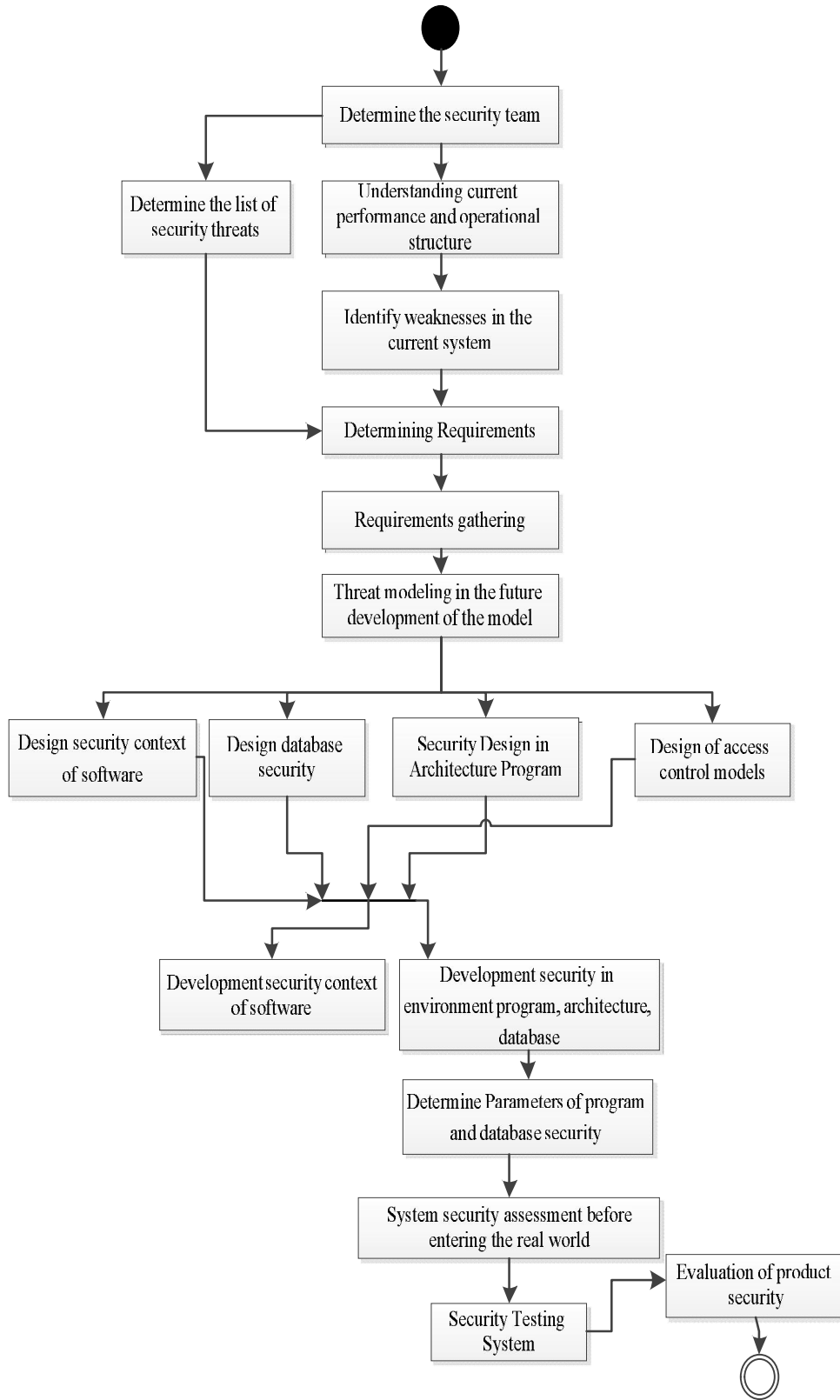


Figure 4 : the Proposed model the production process security in ERP implementation stages

5. Conclusion

ERP is a software solution beneficial to integrate enterprise resources. Also ERP implementation of integrated admissions processes for the rapid exchange of information between the various sectors and provides. One of the important factors for successful ERP implementation methodologies systems is. During the initial stages of the implementation of security controls can be detected and corrected errors and security flaws are. This system will reduce the cost of managing security. Due to security control is one of the characteristics of the main security control, quality control, thus security of controls in the during, implementation will enhance the quality of products.

Authors:

Setare Yaghubi*, Nasser Modiri**

*student, Department of computer, Zanjan Branch, Islamic Azad University, Zanjan, Iran
setareyaghubi@yahoo.com

**Assoc. Prof, Department of computer, Zanjan Branch, Islamic Azad University, Zanjan, Iran
nassermodiri@yahoo.com

6. References

- [1]. Papaioannou E, Sarmaniotis C, Assimakopoulos C, Georgiadis C. K., A successful deployment of an ERP system: A case study of a small Greek company, 2011, 8th International Conference on Enterprise Systems, Accounting and Logistics.
- [2]. Umble J, Haft R, Michael Umble M, Enterprise resource planning: Implementation procedures and critical success factors, *European Journal of Operational Research* 146 (2003)241–257.
- [3]. Fui-Hoon Nah F, Janet Lee-Shang Lau, Critical factors for successful implementation of enterprise systems, *Business Process Management Journal*, 2001, Vol. 7 No. 3.
- [4]. Elmezziane K, Elmezziane M, Enterprise Resources Planning Systems Implementation Success In China, *Business and Management Review*, 2012, Vol. 1(12).
- [5]. Kronbichler A, Ostermann H, Staudinger R, A Review of Critical Success Factors for ERP-Projects, *The Open Information Systems Journal*,2009, Vol.3.
- [6]. Zhang L, Lee M. K.O, Zhang Z, Banerjee P, Critical Success Factors of Enterprise Resource Planning Systems Implementation Success in China, 36th Hawaii International Conference on System Sciences, 2003.
- [7]. MEHTA A, A Study on Critical Success Factors for Successful ERP Implementation at Indian SMEs, 2010.
- [8]. Al-Mashari M, Zairi M, Al-Mudimigh A, ERP Implementation: An Integrative Methodology, RP—ECBPM/0012, 2010.
- [9]. Esteves J, Pastor J, ANALYSIS OF CRITICAL SUCCESS FACTORS RELEVANCE ALONG SAP IMPLEMENTATION PHASES, Seventh Americas Conference on Information Systems, 2001.
- [10]. Manojlov D, MiroslavLutovac, IMPACT OF METHODOLOGY IN THE SUCCESS OF ENTERPRISE RESOURCE PLANNING (ERP) IMPLEMENTATION, INFORMATION TECHNOLOGIES IN MANAGEMENT,2012, pp.886-891.
- [11]. Esteves J, Joan Pastor A, A FRAMEWORK TO ANALYSE MOST CRITICAL WORK PACKAGES IN ERP IMPLEMENTATION PROJECTS, International Conference on Enterprise Information Systems, 2002.
- [12]. Litan D, Apostu A, Copcea L, Teohari M, Technologies for Development of the Information Systems: from ERP to e-Government, *INTERNATIONAL JOURNAL OF APPLIED MATHEMATICS AND INFORMATICS*, vol. 5, 2011, pp.137.
- [13]. ASAP91 SAP Implementation ASAP91, R/3 System Release 46C 04/05/2001.
- [14]. Momoh A, Roy R, Shehab E, A Work Breakdown Structure for Implementing and Costing an ERP Project, *Communications of the IBIMA*, Vol.6, 2008, pp.94-95.
- [15]. A.Elragal, and M.El Kommos,“ In-House versus In-Cloud ERP Systems: A Comparative Study,” *Journal of Enterprise Resource Planning Studies*, Vol. 2012, pp.5-7 , 2012.
- [16]. APPLICATION IMPLEMENTATION METHOD HANDBOOK, August, 1999, Part Number A75149-01
- [17]. Liu C, Sally Chen L.S, APPLICATIONS OF RFID TECHNOLOGY TO IMPROVE

PRODUCTION EFFICIENCY FOR
INTEGRATED-CIRCUIT ASSEMBLY
HOUSES, 19th International Conference on
Production Research.

- [18]. She W, Thuraisingham B, Security for
Enterprise Resource Planning Systems,
Information Systems Security, 16:152–163,
2007, pp.157-158.

1/12/2022