

# E-Business Requirements For Flexibility And Implementation Enterprise System: A Review

Rizgar R. Zebari, Subhi R. M. Zeebaree, Karwan Jacksi, Hanan M. Shukur

**Abstract:** Enterprise systems have a clear role in the market processes, especially e-business systems which play basic role in the world today, with presence of technological evolution many recent technologies appeared which can serve e-business trend such as Internet of Things (IoT), cloud computing and virtual marketplace engineering, which facilitate general enterprise system e-business and e-commerce jobs such as: (buying products in easy way, rapid service delivery to the clients, online responding to the customers' requests with effective cost, etc), but with rapid marketplace changing and turbulent environment and increasing pressure from stake-holders, it is crucial key for companies to be implemented with high flexibility for competitive issues. These enterprises have to react to these unpredictable changes and provide appropriate services to the customers with minimum cost and time without needing to rebuild the entire system from the start, i.e. this can lead to more time and budget consumption which is needed to rebuild the system to adequate to the environment demands/requirements. Therefore, the companies should consider flexibility factor during implementing their system, because there are various client demands should not be delayed or postponed for another time. This paper is devoted to putting forward the e-business system requirements. hence to implement flexible enterprise system model that organizations entail to take them into account to gain adaptive system. so to minimize the time and cost at the same time and competing with the other enterprise systems in an effective way in term of the cost and time.

**Index Terms:** Cloud Computing, E-business, Enterprise System, Internet of Things, Management System, Performance Measurement, WWW.

## 1. INTRODUCTION

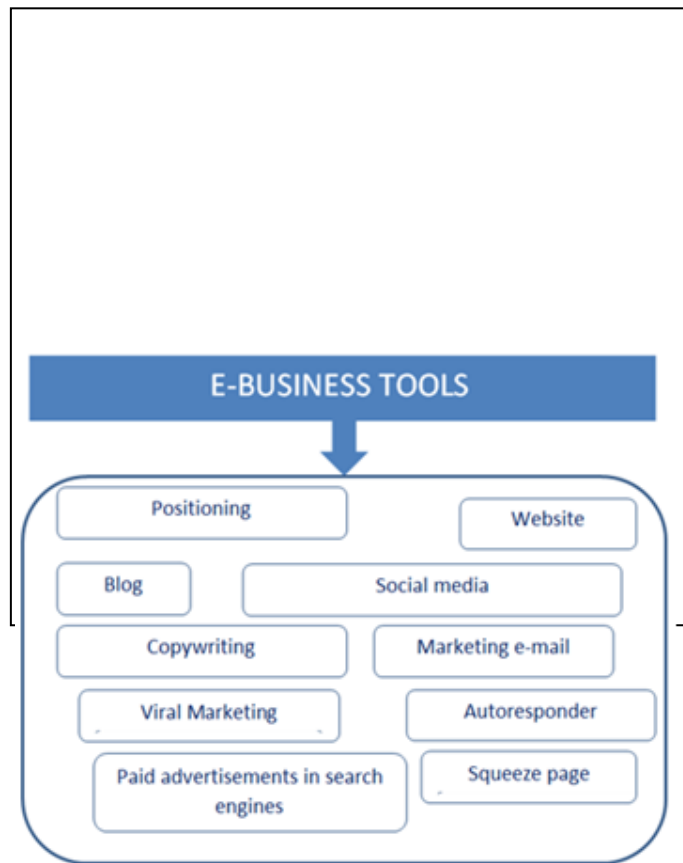
E-Business (electronic business) is a term which used to define or describe a business management method via the Internet using a set of tools and IT technology. E-business encompasses e-government, e-society, e-learning, e-commerce, e-enterprise and more. These electronic businesses facilitate the company processes consisting of buying and selling products, online services; sharing information; online advertising and more [1]. Any business done by using Internet technology to enhance productivity will be defined as E-Business. E-Business term was coined by IBM, in October 1996. It has become popular because of growing and common use of the internet and communication technologies (ICT), which have a noticeable effect on the organizations' administrations, businesses and processes in view of easy delivery of commodities and services to the customers electronically [2].

It has benefits for firms by giving chances to compete and react to the unpredictable environment and marketplace changing and it has a main role in the world's economy with more flexibility and efficiency which help the firms to enhance competitiveness [3]. E-business modeled as short-term and dynamic relationships between suppliers and consumers dominate [4]. Generally, the enterprise system concept embraces several kinds of business systems. the most common systems are supply chain management (SCM),

enterprise resource planning (ERP), and customer relationship management (CRM) [5]. Center procedures and information stream across business functions is done by integration those systems. Also, offered on a module basis (manufacturing, finance, inventory, purchase, sales, and human resources) [6], [7]. E-business correlated with ICT and World Wide Web to improve variety activities such as company's processes [8]. The processes can be classified into three main categories: production processes (payments); client processes (customers' requests processing) and administration processes (video-conferencing, sharing information). There are many kinds of E-Business based on the type of marketplaces: business to client (B2C), client to client (C2C), client to business (C2B), business to business (B2B), government to government (G2G), citizen to government (C2G), government to citizen (G2C), intra-business (which is organization unit to organization unit), and exchange to exchange (E2E) [9], [10]. When companies planning to investment on enterprise information system (EIS) some implications should consider for example, cost required for implementation, time needed for general EIS data and processes, capabilities required for configuring and implementing systems and risks of deployment. The way companies deal with EIS implementation process risks is a main key for the project success or failure [11], [12]. despite of e-business engineering researchers interested in design mechanisms and economic model, they also have a great concern in IT. With technological evolution many recent technologies appeared which can serve e-business trend such as the Internet of Things (IoT) [13], cloud computing and virtual marketplace engineering [14]. In the last two decades' researchers have expressed an attention in Service-oriented computing (SOC) development, this led to advance IoT and cloud computing [15]. Therefore, it considers as main support of e-business development [16], [17]. Enterprise system can be adaptive if it is capable to rearrange its sub-systems, or its sub-systems are able of self-organization in a modular system structure in which the sub-systems are actively capable of communication with each other [18], [19]

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## 2 LITERATURE REVIEW



Producing high-quality products with lowest possible price is not enough; because the enterprises should react to unknown future requirements, therefore, enterprise system must flexible with conceptual design to respond to the volatile market [20]. Brzozowska and Bubel [4], presented e-business tools which can be used to develop e-business strategies, proposing that depending on the specificity of a given e-business the selection of e-business tools that can be used by an entrepreneur will be done. Creating a strategy which can be an appropriate strategy to support the competitiveness of the enterprise, in addition, to win as many customers as possible and gain profit, the enterprises operating with the help of the internet must keep a business plan aimed, these tools are illustrated in Fig. 1. The website is now the fastest and the best tool which is used by an enterprise to present services to the customers, it is an easy instrument used by most of the

companies nowadays. The blog is another tool which has a crucial role in providing the interaction between a firm and its clients; it also runs by financial institutions for financial issues. Positioning is a search engine, effective and cheap tool this is because the customers often have to click the first few links appeared in the search engine to search for information or a product online. Another most popular tool is social media; it facilitates presenting enterprise products and services for customers like Instagram, Facebook, Twitter, Google+ or YouTube. E-mail marketing is the cheapest e-marketing tool which establishes a communication with clients using e-mail, an important features of e-mail marketing constituted in: measurability (number of e-mails have been sent, read, and what interested whom), immediacy (messages can send and receive instantly), scalability (e-mail can be sent to huge number of receptions) and savings (in view of cost e-mail done electronically without any papers). Another tool is Squeeze page which is a simple page and free of advertisements and unnecessary contents which take your attention away; this page captures the e-mail address of the visitor to the page, it is used for selling information products, computer software, and e-books. Google AdWords is another important system can be employed for paid advertising which can display in search engine working with Google browser, the advertisement is created by an entrepreneur with keywords (these keywords are related to its profile) then a sponsored link is showed in the Google search engine results and on partner websites. It leads to direct redirection to the firm's website and a payment system which is depended on clicking on an ad. As a result, integrated e-business with appropriate tools designed for selling products and keeping a good relationship with customers have an obvious effect on e-business strategy's building. Govindaraju and Rajesri [21], focused on developing a conceptual framework for effective ES implementation with high profitability and advantages. Incorporating the project and the post-project phases of enterprise system implementation with the organization's competitive strategy in which the new system is running to get full benefits of information system applications and projects. Supporting a good understanding of how ES implementation can be administrated to bring the benefits for the implementing organizations, so to get a long-term and successful project defining implementation stages and outcomes should be considered.

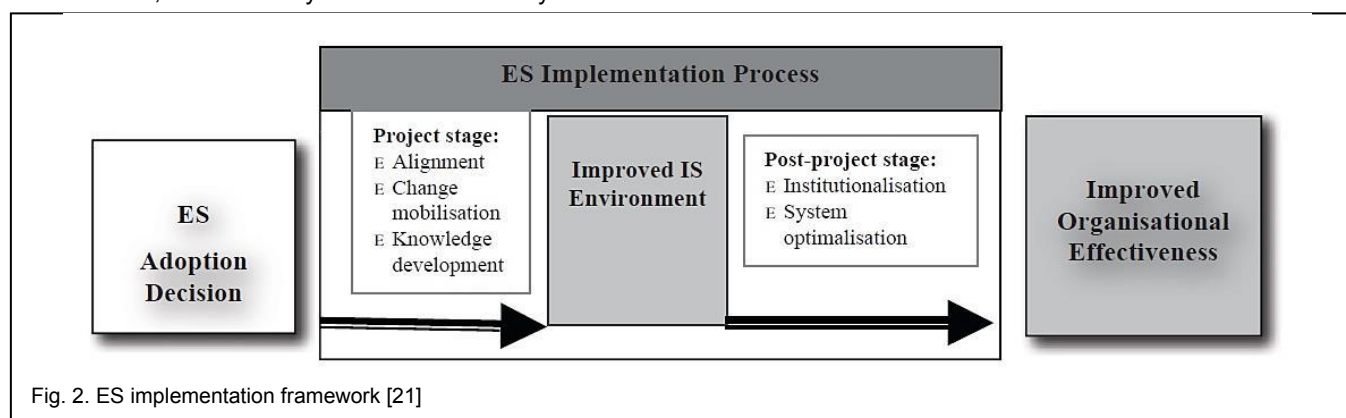


Fig. 2. ES implementation framework [21]

The ES aims to develop a new IS environment with organizational structure and operations. For effective ES implementation as the researcher proposed, there are three main components which are considered essential for integrating information technology and the organization: Arrangement of the three components of the strategic triangle: business, organization and the technology, undertaking of employees and support of stakeholders, ability/mastery by employees. The shared adaptation of the organization, technology, and business operations is system adaption which can be considered the core issue in projects with enabled-IT, especially with ES projects when business and market environment change take place, all the structural works and performance measurements should be rearranged, the work environment and society of system users need to be acclimated. Good communication between organization teams, individuals and decision makers with top management support are often very important factors for mobilizing a change during the project should be considered inside an organization. In post-project stage organizational individuals commit themselves to use ES application in a comprehensive and integrated manner as a normal activity to gain high-level views of organizational work, therefore the organization management should urge the using of a new application by institutionalization efforts. Three optimization categories can be aligned for ERP systems optimization: software mastery, improvement, and evolution. Regular review, workshops, Post implementation audit and improvement ideas existence to solve problems are other methods to facilitate system optimization in the post-project stage. ES implementation process is two stages: project stage and post-project stage. Fig. 2. illustrates ES implementation framework. Zhou [22] worked on the requirements of software quantities for designing quantities software model. They utilized some UML diagrams such state, sequence, component and class, in order to detect digital values quantity in the designed software model. They expressed illustrated some digital values that can be found in the solution of e-business system design for example: number of classes and functions exist in the system. Moreover, number of users that the system supported, provided security level and the time of recovering the e-business. In addition, in the design process of software architecture they found various digital rules. Podgornaya et al. [23] proposed the main element in the flexible enterprise development theory for enhancement of Russian enterprises competitiveness, the authors selection is an enterprise

development growth rate, because rapid growth rate may have risk on an enterprise more than easygoing growth rate, rapid growth rate means additional budget (i.e. cost). To form the model of enterprise flexible development the authors considered the relationship in the rated amount of items mastered, these are the basic elements:

1. Time of mastering ( $T_m$ ) - represents enterprise flexibility internal factor which is used for determining the cycle, it includes three phases: I) R&D; II) preproduction; III) production assimilation;
2. Time of production ( $T_{pr}$ ) - defined as an external factor of enterprise flexibility, it is a new product realization, and it consists of stages: creation, development, maturity.
3. The coefficient of renewal ( $Cr$ ) which represents the capability to realigning for new goods production to meet environmental demands.  $Cr$  also enables evaluating technical flexibility quantitatively of the enterprise, therefore, it acts as the basic factor in enterprise flexibility theory  $Cr = T_m : T_{pr}$ . The flexible development plan involves three portions and allows performing an evaluation of enterprise flexible development in the current period, strategic planning for the following periods and long-term period.

**TABLE 1**  
THE SCHEME OF ENTERPRISE'S FLEXIBLE DEVELOPMENT [23]

Cycle 1		Cycle 2	
The result today	The ability to master today	The result tomorrow	The ability to master
Sr1	the product which will be in demand tomorrow $\Phi\kappa1$	Sr1.	tomorrow the products in demand $\Phi\kappa2$
Current period			
Long-run period			
Strategic planning			

**TABLE 2**  
THE NUMBER OF CODES IN THE TRADITIONAL SYSTEM [24].

Back-end				Front-end			
The number of Codes		Related Processes		The number of Codes		Related Processes	
19861		3183		18967		2263	
Data Persistent Layer			User Interface	Data Control Class Layer			
				Control Classes		Configuration Files	
Pojo	Dao	Service	JspDetail	Read Action	Save Action	Structs	Spring
730	164	156	2162	364	445	106	75

**TABLE 3**  
THE (TRADITIONAL AND NEW) SYSTEMS TIME EFFICIENCY [24]

Traditional System	The number of Codes	38828	The Amount of Time	8 people*month
New System	Related Processes	4385	Related Time	27 People*day
	JBPM Modeling Time			5 people*day

According to scheme shown in (Table.1) the enterprise's flexibility can be described as enterprise's capability to gain aimed result, which leads it to perform overall stages of the development and putting into production (mastering and technical upgrading) in determined time regular amount of products, this may be market requirement and it may be in future period which leads to obtaining necessary and needed result, capable to keep enterprise's development and survival. As is shown in table.2, to determine the enterprise flexibility there are two main criteria:

1. For presumption, the results of current period enterprise activity, ensuring required technical and economic ratio.
2. To determine the relationship between external environment and an enterprise, which mean the enterprise's capability to draw a plan and forecast/predict the operation of its development (ability to renewal, growth rate).

The author brings to light the enterprise flexible development model as follows:

Input -  $F_i = f(Sr, Ari); f(Ti)$ .

Where  $F_i$  is index of the enterprise's flexibility estimation, for realizing current and long-term;

$Sr$  – represents stability for renewal in various i-cycles;

$Ari$  - the capability to renewal in various i-cycles.

$Ti$  – defines technical upgrading in the i-developmental cycle.

For the innovative development of an enterprise the flexibility considered as a first-order condition. Yue Liu et al [24] proposed a case study based on repairing heating system for a company. They compared data-oriented business process management system with classical business process management system and realized the following differences: Data Persistence Layer, Pojo classes, hibernate mapping files, and Service classes with the traditional system are all needed to be written manually, but with the new system code, auto-generation realized it.

While the new system builds a JBPM modeling and taking into account the data, Configuration Classes and View Layer with the classical system, JSP files, Action classes, and some configuration classes have to be written manually, code auto-generation realized it now. As a result of the comparison, in view of codes: it is obvious that the process administration model with traditional/classical would face difficulty in the system implementation. While, the new system automatically generates backend codes and front-end codes related to process. Also, with existing system data process codes is generated automatically so the project development and management standardization will improve. In addition, when the demands change, the developers will only reconstruct the model without rewording the codes. The applied system in the study was based on data-oriented business process management is provided an effective system and reduces the costs and illustrated in Table.2 and Table.3.

### 3 DISCUSSION

The purpose of this paper is bringing to the light and presenting the main e-business requirements in view of flexibility and implementation which are required for gaining a competitive organization. Enterprise system with high flexibility leads to resource reduction without needing to rebuild the system from the beginning (i.e. effective cost). On the other hand, system optimization system is an important feature to make the system more efficient, therefore many studies focus on system optimization by evaluating and rating the system periodically to gain benefits from the enabled-IT system, users and management have a big role in evaluating the system. Another crucial feature for enterprise system is using appropriate tools which are used for implementing a system to get the aimed advantages and purposes of a certain system. From the previously discussed studies in this paper, these results were obtained based on various features as shown in Table 4.

**TABLE 4**  
MAIN FEATURES DIFFERENCES OF PREVIOUS STUDIES

Feature	Brzowska and Bubel [4]	Govindaraju and Rajesri [21]	Zhou [22]	Podgornaya et al. [23]	Yue Liu et al [24]
Cost (economic)	Cost-effectiveness and saving time of running highly specialized modules of an application for e-shop	-----	Avoiding current trial-and-error approaches to design, thus reduction of costs	Stable economic situation to master new products	Cost reduction by using code auto-generation a technique which uses the original resource, thus making the development cycle shorter
Tools	XML file	-----	Use Cases diagrams and UML	-----	JBPM
Optimization	Optimization of the value chain of production, high productivity at low operating expenses	Taking system optimization into consideration in the post-project stage of the ES implementation framework	-----	-----	-----
Security	secure payment for a service, using secure protocols during transactions	-----	-----	-----	-----



## 4 CONCLUSION

With huge numbers of E-Businesses, it becomes a difficult challenge to achieve success via Internet; therefore, enterprises need highly flexible architectures and workflows because they have to face and operate under changeable circumstances. To rapidly responding to the competitive environment most organizations are aware of the need to invest in ES. Integrated e-business with appropriate tools and channels designed for supporting the sale, building positive relationships with customers with adequate planning allow a positive effect on an e-business strategy building. Therefore, we present a business strategy for effective ES implementation with high profitability and advantages to increasing organization competitiveness and saving cost and time.

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