

Identifying Dimensions and Indicators of a Model for Assessing the Level of Maturity of Business Intelligence in Electronic Businesses (Case Study: Internet Service Providers)

Mahboobeh Golestani Zadeh¹, Akbar Etebarian², Amirreza Naghsh³, Reza Ebrahim Zadeh⁴

¹ Ph. D. student of Information Technology Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran.

² Associate Professor of Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran. Corresponding Author: etebarian@khuisf.ac.ir, 09132105784

³ Assistant professor of Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran

⁴ Assistant professor of Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran

Article Info

Volume 81

Page Number: 6457 - 6476

Publication Issue:

November-December 2019

Article History

Article Received: 5 March 2019

Revised: 18 May 2019

Accepted: 24 September 2019

Publication: 31 December 2019

Abstract:

This research aims to identify dimensions and indicators of a model for assessing the level of maturity of business intelligence in e-businesses for internet service provider companies which is done in a qualitative approach based on phenomenological approach. The number of participants in this Study is 10 specialists, experts and managers of electronic businesses who are active in the field of providing Internet services, which are selected using the maximum differentiation method. Data are collected by deep and semi-structured interviews and analyzed by Colaizzi's method. The findings are classified by Delphi technique in five levels of maturity of business intelligence (Level 1: Primary maturity, Level 2: Repeatable maturity, Level 3: Defined maturity, Level 4: Managed maturity, Level 5: Optimized maturity). Then, a model of 33 dimension and 232 indices approved in the subject literature of the study is designed in which the dimensions are distributed in the five levels of maturity of business intelligence, according to the researcher's viewpoint and experts' confirmation.

Keywords: Maturity, Internet Service Provider Companies, E-Business, Business Intelligence.

1. Introduction

Contemporary organizations are required by the social, economic fact to seek tools in order to facilitate the process of obtaining data efficiently, processing and analyzing them from a variety of sources in order to create a base for discovery of knowledge. Therefore, the use of concepts such as business intelligence has been considered today due to its role in organizational decision making and promotion of productivity in various industries. Business intelligence manages data using tools and applications and enables business managers to make constructive and effective decisions (Wieder&Ossimitz, 2015). In addition,

business intelligence is a system whose main purpose is to automate and integrate as much business phases and performances as possible (Lasi, 2013) and has a systematic architecture of processes, technologies, functional programs and support methods that need to be clearly supported (Djatna&Munichputranto, 2015). Therefore, an organization that uses business intelligence has a distinct competitive advantage in comparison with its competitors. What an organization knows about customers, vendors, business competitors, products and markets allows executives to make smart decisions that can be greatly effective on

revenue growth, lower costs, and increase of profits (Azma&Mostafa Pour, 2012).

The results of previous studies show that having clear goals for organizations beyond of business intelligence use in an organization often creates a better incentive and motivation for improving processes and providing services; hence the existence and definition of the maturity level independently help organizations to reach a higher level of puberty. Maturity means growth and evolution, and refers to excellence or full readiness. The most important components of the maturity models that should be considered studied for understanding, evaluation and comparison with each other are: the concept of maturity in the model, studied dimensions of the model, maturity levels of the model, maturity principles of the model, and method of measurement and evaluation presented by the model. The studied dimensions of the model include different areas and aspects such as processes, capabilities, and other organizational features that the model considers in its assessment of the business intelligence status of company. Maturity levels refer to ratings that each of them has a different and distinct degree of business intelligence growth; in addition, each level includes a specific and key identifier that represents the content and details of that level (Lahrman et al., 2010). Maturity principles of the model also refer to the standards and conditions that an organization must possess to attain a certain level of maturity, and ultimately a method of measuring and evaluating a model that can be qualitatively or quantitatively or a combination of both methods. Basically, the methods of assessing the maturity of the business processes are divided into three categories of initial assessment, advanced assessment, and confirmatory assessment in terms of the degree of accuracy and depth of the examination of business processes. In the initial assessment, the evaluation is conducted in a general way without entering into complex details, and the work is attempted to make the surveys as low as possible in terms of

cost and finish the process in a short time; whole areas of business processes and their activities within the realm are evaluated in an advanced assessment for evaluating the progress towards maturity level or foreseeing the results of verified evaluation. Quantitative data are collected and compared with the results obtained from the interviews and the products of the business process. This assessment is timely, but it does not have the accuracy and breadth of the assessment. Finally, a confirmatory assessment is a comprehensive and complete review of all of the process domains and activities within their territory for this type of evaluation. Evidence is collected from all levels of the organization. Organizations can claim that they have reached the maturity level, which has been verified through confirmatory assessment (Roglinger et al., 2012). A valid and appropriate maturity model should also have the same features as comprehensiveness, clarity, and theoretical basis (Lahrman et al., 2010).

In addition to the aforementioned issues, it should also be noted that developments in recent decades have led to many changes in the business environment and have forced the old and new organizations to use the new strategic business model. One of these strategies is electronic business. Electronic business can be introduced as a set of processes and tools that allow companies to use Internet-based information technology to conduct domestic and foreign trade (Pilinkiene et al., 2013). All activities in this type of business such as sending documents, exchanging data between producer and distributor, and business partners, customers, and the market are also based on the Internet (Brzozowska& Bubel,2015). In addition, e-business improves customer satisfaction, communication with businesses, and relationships with suppliers (Tsai, 2015).

Therefore, it can be concluded that e-business has experienced a high growth rate as one of the information technology subsets in the past decade. So that the policy approaches of most

business organizations in accepting and using electronic business is in this direction to enter global markets and attract new customers. However, the use of electronic business in business activities requires attention to a series of intrinsic and extrinsic factors that affect it. In such a way that the attention of commercial enterprises to these factors and planning in order to use optimally electronic and business technology, guarantees the success of its exploitation and provide the growth context of user enterprises. One of these factors is the assessment of business intelligence maturity. Various models such as Gartner's business intelligence maturity model, Garcia's maturity model, capacity maturity model, integrated power maturity model, process maturity model, business information maturity model, business intelligence development model, infrastructure optimization maturity model, business intelligence Package Business maturity model, business intelligence maturity hierarchy model, analytic competition model, matrix of business intelligence maturity model, business intelligence maturity model, Min-HooiChuah's EBIMM model, service-oriented business intelligence maturity model can be considered for this purpose (Shaaban et al., 2011).

Based on performed research on the evaluation of business intelligence maturity models, each of the mentioned models identifies separate steps along with the growth of business intelligence of a company and uses different indicators for evaluating maturity, but most of these models do not cover all dimensions, levels and principles of maturity of business intelligence in one way. In addition, surveys show that despite the importance of evaluating the maturity of business intelligence in business and electronic works there is no model that exclusively evaluates the level of maturity in such a space. Therefore, the present study seeks to address this issue.

However, in most of the business intelligence maturity models that have been presented so far, the most prominent approaches include three main domains. The first is an organizational-management approach that consists of analytical process, organizational structure, government structure and cost and benefit dimension. The second is the human-social approach that includes skills, education, support and culture dimensions, and the third is area of technical approach that includes technical infrastructure and data quality dimensions. Considering the importance of the growth of e-business and the role that plays in the economic growth of countries and the lack of a comprehensive model in terms of attention to the three main areas of the business intelligence approach and its specific dimensions, the present study seeks to design a model for assessing the level of maturity of business intelligence for e-businesses, from various angles to all aspects of managerial, organizational, human-social, technical-technical dimensions. Hence the main question of the present research is that:

What are the dimensions and indicators of a model for assessing the level of maturity of business intelligence in the electronic business associated with the provision of Internet services?

2. Models of business intelligence

From the beginning of the introduction of business intelligence maturity models, various models have been introduced with different dimensions and levels, many of which have similarities or differences in some of the features, but the philosophy and the nature of all of them are equal based on their performance, ranking of organization status. Therefore, we summarize the existing models in table 1.

Table 1: Business intelligence maturity models

Model name	Description	Reference
Data warehouse maturity model	The data warehouse model consists of 3 initial, growth and maturity levels, and 9 distinct dimensions for the data warehouse. This model is created based on the concept of growth and it studies maturity amount based on changes observed in the temporal period.	Watson et al. (2001)
The data warehousing institute (TDWI) model	This model covers various aspects of business intelligence such as architecture, business intelligence, organizational domain, users' group, and perceived executers of the business intelligence role.	Eckerson (2004)
Ladder of business intelligence (LOBI)	This model has 6 levels of maturity (data fact, information, knowledge, perception, intuition) and 3 dimensions (technology, process, individuals), and uses the concept of object-oriented maturity in which data obtained by observation is the basis of work and the concept of maturity changes to being human-centered at the higher levels of maturity.	Cates et al. (2005)
Package Business Maturity Model	This maturity model includes three dimensions of business ability, information technology, strategy and program management. of course, this model needs to be improved by adding technical aspects, such as data warehousing and analytical aspects.	Hewlett (2007)
Gartner's maturity model	The Gartner model identifies five levels of maturity, including unconscious, tactical, centralized, strategic, and inclusive, by considering the three key areas of individuals, processes, standards within the organization, and technology. This model is often used to examine input data and growth amount of business intelligence.	Gartner (2008)
Model of information evolution	This model has 5 levels (action, reinforcement, integration, optimization, innovation) and 4 dimensions (process, individuals, culture, and infrastructure). In this model, the higher we go, the closer to maturity we get.	SAS Company (2009)
The maturity model of business information	This model has 3 levels and 7 key areas of strategic position of business intelligence which covers cooperation between business	Rajteric (2010)

	units and information technology, business intelligence activity management, use of information and analysis, the process of improving business culture, the process of creating a culture of decision-making, the technical preparation of business intelligence- data warehousing.	
-	In this model, the maturity stages include: (Predefined reports, Data marts, Organizational data warehouse, Forecasting analysis, Business intelligence operations, Business intelligence management). The characteristics of the business intelligence maturity model include: Six main features (time, data, decision-making insight, output insight, approach of business intelligence processes, and other features). The model focuses on three perspectives: people, process, technology.	Sacu&Spruit (2010)
Teradata	It is the warehouse and business intelligence maturity model which has 5 levels. Reporting (what has happened?), analysis (why has it happened?), prediction (what is going to happen), exploitation (what happens), being active (that happens); and it concludes two dimensions of expertise in data complexity of workload.	Lahrman et al. (2011)
Business intelligence maturity model	This model consists of 5 initial, repeatable, defined, managed and optimized levels, and 4 dimensions of information quality, macro data management, data warehouse architecture and analysis	Tan et al. (2011)
SOBIMM	This model includes five levels (initial, immature, controlled, managed and mature) and three dimensions (technology, organization, business expertise) and a service guide checklist. The technology dimension of this model includes (quality, flexibility). The organization dimension consists of (system based services, profitability, standardization) and business expertise dimension also includes metrics (organizational value, business credit, business processes, and process trends).	Shaaban et al. (2011)
-	In this model, the maturity levels are considered (initial, defined, and managed), respectively. The stages and lifecycle of	Fedouaki et al. (2013)

	implementation of business intelligence projects include (correction and planning, analysis and business design, construction and deployment).	
	119 criteria are presented to evaluate maturity. These criteria are divided into 23 components and four dimensions of function-tasks, information technology, dissemination-publication and organization. The index of performance and tasks includes: (defining goals, measuring, analyzing gaps and spaces, decision making, data quality, integrity of tasks). The information technology index includes: (reporting, interfaces, users' profile, information technology integration, standards, information supply). The dissemination and publication index includes: (users' access, users' system, processes coverage) and organizational index consists of: (BI) business intelligence strategy, business intelligence budget, organizational coverage, key user capabilities, user capabilities, component improvement, coordination with partners and suppliers).	Lessanibahriet al. (2015)

3. Research method

Since the researcher is looking for the extraction of components of business intelligence maturity based on the individual thoughts and experiences in order to understand the essence of the research which is the design of the evaluation model of the level of business intelligence maturity and to extract the components of this structure within the framework of E-business, the phenomenology methods based on Colaizzi method is used. The reason of using the phenomenological method is phenomenology describes the meaning of the live experiences of several individuals about a concept or phenomenon. The criterion for selecting participants in the study is a profound experience and knowledge about the components and indicators of business intelligence of individuals that affects the electronic business. The method of

selecting participant is maximum differentiation sampling method. In this way, the researcher selects those participants who have wide differences in their ideas and experiences. In other words, this method is a purposeful sampling strategy and aims to select a small and heterogeneous sample. This methodology is used when the researcher is interested in understanding how a phenomenon is perceived and understood among different people at different times and positions. Sampling is started with the first participant and end up by getting the information saturation threshold i.e. 10 participants. Separation sampling is used to make the researcher realize that saturation has occurred. That is, the researcher again considers another participant as confirmation of saturation after the interviews reach saturation, and it is found that all

the issues raised by the new interviewee do not differ from the views of the previous interviewees. Therefore, the adequacy of the interviews is announced. In the present study, the phenomenological method is used based on Colaizzi model and Delphi technique as a data analysis method. The steps in the phenomenological method are as follows:

- In the beginning, personal experiences related to the studied phenomenon are described. The researcher presents a complete description of his own experience of the phenomenon. This step is in fact an attempt to exclude the researcher's personal experiences from the research process (which is, of course, not entirely possible), as well as fully focus on the contributors to the study.

- A list of meaningful sentences and phrases is created. At this stage, the researcher finds phrases and sentences on how people have experienced the considered subject by interviewing other sources of data. In the following, these terms and meaningful sentences are listed, and each of these expressions is given the same value. In this list we try to make non-repetitive and overlapping phrases.

- Interpreting meaningful sentences and phrases are listed and grouped into larger units of meaning called meaningful units or topics and themes.

- Writing a description of what participants have experienced in the study with the considered phenomenon. This description is called as the structural or textural experience (what has happened) which includes examples of the same quoted expressions of the phenomenon.

- In the following there is a description of how the experiences occurred. This description is called a structural description in which the

researcher reflects the environment and context in which the phenomenon in question is experienced.

- Finally, the researcher writes a composite description of the phenomenon investigated by combining construct, textural, or structural descriptions. This text is the essence or nature of experience and shows the peak of phenomenological study. This requires writing a long paragraph that tells the reader what the participants are experiencing and how this experience has been achieved (Creswell, 2007).

277 significant codes are extracted by analysis of the interviews with 10 participants. Because the focus of the research is to evaluate the level of business intelligence maturity, 40 experts including: academic experts (masters in the field of management and information technology), senior executives and experts in E-business activities that are active in the field of Internet services and are master in the notions of business intelligence are asked to divide the achieved concepts in line with the definitions presented (in accordance with Table 2) at 5 levels (Level 1: Initial maturity, Level 2: Repeatable maturity, Level 3: Defined maturity, Level 4: Managed maturity, Level 5: Optimized maturity) by Delphi techniques and snowball sampling method. Eventually, after three Delphi rounds, 232 codes remain from of the total 277 initial codes. Face and conceptual validity of the identified factors is verified and confirmed by the experts. In order to evaluate content validity, Lawshe content validity ratio is used and Kendall's concordance coefficient is used to check the agreement degree of experts. Content validity is obtained (0.88) and Kendall concordance coefficient is estimated (0.919) which indicates a good agreement among respondents.

Table 2. Definitions of the levels of business intelligence (researcher’s compilation)

Identified Level	Description
Level 1 (Initial Maturity)	This stage of processes maturity is not standard and documentary and there is no awareness about the quality of information. As a result, no effort is made to evaluate and improve processes. The organization only responds when there is a problem in the quality of information. At this point, the reaction of the organization is completely passive and preventive activities have no meaning. Conflict and contradiction between the data is manually managed and conversation sessions are a lot for decision-making about change of data and other issues because the system does not automatically and standardly perform the data management work. Some reports print in the framework of management reports and spreadsheets are used for reporting and analysis.
Level 2 (Repeatable Maturity)	The processes at this level are planning, documentation, control and supervision. But they are still reactive and passive. At this stage, the organization is somewhat lawful and, can repeat its previous successes in similar circumstances according to performed the documentation.
Level 3 (Defined Maturity)	This level deals with defined and determined processes. At this level of processes, sub-processes and activities, standards, tools, etc. are defined at the organizational level. A defined process is a process which is well-defined at all levels of the organization; all members of the organization are familiar with it and implement it.
Level 4 (Managed Maturity)	At this level, processes are evaluated and analyzed according to the defined criteria, they are studied based on pathology and deviations are identified. In other words, the organization is in a position at this point to control its processes by collecting data and analyzing them.
Level 5 (Optimized Maturity)	At this level, the performance of processes is controlled and evaluated in order to identify and remove disadvantages continuously, and innovative and optimal processes are replaced by existing processes while feedbacks are reviewed in order to respond better to the needs of organization.

After classification (232) indicators in 5 levels of maturity, the researcher categorizes the indicators in 33 dimensions in accordance with table (3) by studying the literature and other existing models, in the next step; and, finally, the evaluation model of the maturity of business intelligence in electronic businesses is presented

related to the provision of Internet services. To validate the model, interviewers are again referred to the interviewers and the dimensions and indicators of the model are presented to them and they are evaluated for confirming or rejecting the model. All interviewees assess the identified dimensions and indicators as appropriate.

Table 3. Dimensions of the maturity model of business intelligence in electronic businesses

Row	Level	Dimension
1	Level 1 (Initial Maturity)	Reporting

2	Level 2 (Repeatable Maturity)	Advertising, Management and performance evaluation, Control, Documentation, Automation
3	Level 3 (Defined Maturity)	Accessibility level, Customer orientedness, Management of processes, Standardization of processes, Improvement of quality information, Improvement of service level
4	Level 4 (Managed Maturity)	Assessment and skill of analysis, Business development and organizational processes, Organizational Management, Organizational education, Human resources management, Organizational value, Security, Support, strategies Business, Management and development of requirements, Business Performance Management, Making policy, Cost-benefit
5	Level 5 (Optimized Maturity)	Predictive analysis, Dashboard, knowledge management, Innovation, Competitive advantage, Development of technology, Development of investment, Data mining

4. Findings

According to the research methodology, the model for evaluating the maturity of business

intelligence in e-businesses related to the provision of Internet services is in accordance with Table (4).

Table 4. Assessment model of business intelligence maturity

Row	Level	Dimension	Descriptions
1	Level 1: initial maturity	Reporting	Reporting by portal.
2			Use of the EPM system.
3			Use of spreadsheet.
4			Participation of all staff in reporting.
5			Attention to selling elements in reporting
6	Level 2: Repeatable maturity	Advertising	Use of media for informing new plans to clients.
7			Attraction of client by advertising.
8			Use of mouth-to-mouth advertising.
9			Preserving the client using promotional techniques (holding a festival, lottery, and contest).
10			Monitoring on advertising by checking how clients are familiar with the company.
11			Introducing and encouraging clients to use radio internet with the help of advertising.
12			Replacing digital advertising instead of traditional advertising.
13			Getting real feedback from digital advertising.
14		M a n a g e m e n t	Weekly, monthly and annually performance evaluation.

15			Providing feedback of performance evaluation to staff.	
16			Evaluation of personnel performance by use of reporting.	
17			Evaluation of personnel performance as provincial in line with the development plan of organization.	
18			Performance evaluation using 360- and 90-degree assessment.	
19			Evaluation of personnel performance by the same degree co-workers.	
20			The personnel's right to object to results of performance evaluation.	
21		Control	Use of monitoring tools for identifying subscribers activities.	
22			Supervision of monitoring unit on the activities of branches throughout the country.	
23			Use of SNR tool for checking possible on-line noises.	
24		Documentation	Storage of portal information as on-line.	
25			Use of data center for information archive.	
26			Save of subscribers conversations in the database.	
27			Maintaining documentation in detail in project-centric processes.	
28			Use of VOIP software archive.	
29		Automation	Use of automation system, rollcall system, letter-writing, CRM and ticketing.	
30			Converting the client registration system from manual to automation and mechanization.	
31		Level 3: defined maturity	Accessibility level	Determining accessibility level in reporting.
32				Accessibility to details of information in the reporting.
33				Accessibility to reports at the desired time interval.
34				Increase of security and accuracy of accessibility level.
35			Customer orientedness	Continuous interactions with client.
36				Creating a sense of belonging in the customer.
37				Customer retention even with non-profitable methods.
38				Enhancement of customer satisfaction with post-purchase follow-up.
39				Founding a customer club.
40				Scoring to the customers based on record of history.
41				Servicing to the customer based on client's need and desire.
42				Providing advice and guidance to users in order to select the right service.
43				Compliance with the principle of honesty in providing services.
44				Providing better services by making friendship relations with customer.
45	Study of personality psychology in order to improve customer better relationship management with customer.			
46	Quicker responses to the customer using online shopping.			

47			Communicating with the customer through cyberspace.
48			Encouraging customers to introduce new customer.
49			Fitness of the price with the assigned traffic volume.
50			Contacting with customers and reviewing their opinions.
51	Management of processes		Sending and receiving data by use of ticket.
52			Use of MIS for performing processes.
53			Saving time by processes existence.
54			The division of activities into cyclical and project oriented activities.
55			Tracking process and organizational activities by use of processes.
56			Periodic review of the processes of the ticketing system.
57			The overlapping of the ticketing system by becoming process-oriented of company activities.
58			Identifying the importance of processes to all personnel.
59		Standardization of processes	
60			Existence of standards to avoid errors and maintain quality of information.
61			Observing the laws and regulations of the organization of radio regulations and communication of the country.
62			Use of predefined rules and regulations to prevent idiosyncratic performance.
63			Observing the standards in treaties and contracts.
64			Implementing ISO in the company.
65			Modification of performance evaluation indicators.
66			Indicators of business unit performance evaluation are: number, type, volume, importance and responsibility of assigned affairs to a person, number of incoming and outgoing calls, waiting time behind the subscriber lines, customer satisfaction of responsiveness and manner of contact, monthly sales (number, amount), income and sales growth rate, monthly attracted customer number, work discipline, effort, creativity, innovation, opinion of the unit manager.

67			The indicators for evaluating performance of technical and support unit are: type, volume, importance and responsibility of assigned affairs to a person, number of incoming and outgoing calls, waiting time behind the subscriber lines, customer satisfaction of response and manner of contact, number of lost customers due to the poor quality of services, customer satisfaction of service quality, number of customers who did not have the technical ability to receive the service, the number of resolving failures, problems and qualitative improvement of service, the number of predictions and preventing possible events in the network (such as: power outage, equipment damage), average failure time and customer problem solving, and effort to reduce this time, optimized structure (functional and cost), the downtime in month, year percentage of infrastructure and network growth, the acquisition and use of modern knowledge and technology, and the number and type of inspections and PM equipment and networks, innovation, creativity and change in work.
68			The indicators of the financial unit performance evaluation are: the number, type, volume, importance and assigned responsibility to a person, the amount of receipt and non-receipt of debts, the number of registered document in a day, month, the number of mistakes in issuing the invoice and document, customer satisfaction of contact, paying and receiving timely debt and liability.
69		Improvement of quality information	Increasing the quality of the provided data to the customer.
70			Increasing quality without dependence on a supplier.
71			Use of original monitoring software to improve data quality.
72			Continuous check of data quality by the quality control unit.
73			Pay for license right to use some software.
74		Improvement of service level	Providing new based on customer consumption.
75			Providing better service with special prices and offers and high quality services.
76			Bandwidth management and assignment of some bands for various uses to subscribers.
77			Making intelligent of user consumption.
78			Hardware and software coordination in order to achieve better service delivery.
79			Use of remote control systems.
80	Optimizing network service.		
81	Providing delayed service and less lost packet.		
82	Fast user authentication.		
83	Reducing network error.		
84	Use of free bandwidth capacity to provide better service.		

85			Deciding to provide new customer service based on customer surveys.		
86			Providing services tailored to the culture of regions.		
87			Expanding wireless coverage for all areas of the city.		
88			Use of medium software to simplify and make easier access of beginner users with the system.		
89			Reducing customer dissatisfaction after use of VOIP.		
90			Use of VOIP for extraction of peak hours and managing it to provide better services.		
91			Continuous reporting from VOIP to improve service levels.		
92			Designing applications for easier customer access to services.		
93			Sustainability in providing and improving the quality level of services.		
94			Server host of organizations.		
95			Providing virtual server services.		
96			Providing dedicated server services.		
97			Providing satellite communication services.		
98			Providing dedicated IP to the number of customer requirements.		
99			Providing scheduling table, launch and delivery of customer service.		
100			Providing equipment of center Internet in trust.		
101			Installation and conducting of services for customers in person and free of charge.		
102			Level 4: Managed Maturity	Assessment and skill of analysis	Detecting provided service errors and resolving them by use of report analysis.
103					Reviewing method of providing service to the customer by marketing team.
104					Analysis of the results of performance evaluation by managers and supervisors.
105	Applying organizational changes by use of performance evaluation results analysis.				
106	Adapting suggestions of research and development team with customer real needs.				
107	Assessing suppliers in order to identify better suppliers.				
108	Use of designer consuler groups for feasibility of projects.				
109	Analysis of market activities based on the obtained information from social networks, site and field research.				
110	Obtaining new decisions and policies based on the information obtained from the analysis of competitors' status.				
111	Investigating the activities of competing companies from formal and informal channels.				
112	Observing competitors' activities by assigning responsibility of the supervision over affairs of several companies, by personnel.				

113	Business development and organizational processes	Investigating the degree of the company mastery on the market through different market analysis methods.	
114		Customer behavior analysis using surveys in the cyberspace.	
115		Utilizing technical information and support in analyzing user behavior and market analysis.	
116		Consulting with other companies in providing new customer service.	
117		Partnerships with other companies as holding.	
118		Collaborate with multiple suppliers in parallel.	
119		The multiplicity of representatives as the company development.	
120		Earning point of value added projects using companies in tenders.	
121		Holding exhibitions and international conferences.	
122		Collaboration with police of information production and exchange space.	
123		Providing consultation to other companies in choosing a market development strategy.	
124		Market development by maintaining a top position and status	
125		Organizational Management	The attention of senior executives to negative feedbacks from the bottom of the organizational pyramid.
126			Strengthening the spirit of criticism of company managers.
127	Strengthening the culture of change in the company.		
128	Becoming simpler decision-making of managers by EPM.		
129	Use of centralized management to promote activities.		
130	Human resource management, systems and processes using ITIL.		
131	Managers' awareness of organization affairs using bottom-up reports.		
132	Senior managers' trust to middle managers of the company.		
133	Filtering personnel information using CRM and VOIP.		
134	Improvement of organizational targeting and planning.		
135	Identifying strategies for barriers and organizational Weaknesses.		
136	Coherent leadership and stability in the intentions.		
137	Organizational education	Attention to the training and updating of personnel and recruitment personnel.	
138		Insist on the implementation of the necessary training courses.	
139		Preparation of educational files in the PDF format and holding online training.	
140		Time management and saving time of staff by use of online training.	
141		The importance of attending in the training needs assessment.	
142		Holding technical training courses for sales personnel.	

143			Holding customer relationship management courses for technical personnel.
144			Select qualified people to attend training courses.
145			Effective customer relationship training for personnel based on the same standard.
146		Human resources management	Attention to moralization and workplace improvement.
147			Expansion of informal interactions and relationships and friendly relationships of management with personnel in the workplace.
148			Paying salaries based on a job classification scheme.
149			Assessing staff feedbacks in order to improve welfare-motivational services.
150			Prioritizing knowledge forces in the recruitment process.
151			Attraction of powerful human resources through scientific seminars.
152			Reducing the cost of hiring using scientific seminars.
153			Focus on and attention to the topic of succession in the company.
154			Payment of bonuses based on employee performance appraisal.
155			The attention of managers to qualified and suitable personnel.
156			Financial and motivational support.
157			Attention to occupational safety and psychological safety of personnel.
158			Planning for excellence of satisfaction in personnel.
159			Increasing staff commitment after using VOIP.
160			New force support by experienced forces.
161			Supporting personnel by supervisor of units.
162			Organizational value
163	Performing activities as a team.		
164	Valuing staff and work commitment among staff.		
165	Support and aid of senior managers.		
166	Friendly interaction with competitors.		
167	Security	Maintaining security and strengthening security infrastructure by investigating future attacks and assaults.	
168		Enhancing security by use of the continuous development of security infrastructure.	
169	Support	Continuous and 24-hour support.	
170		Having a support unit for efficient equipment and qualified technicians.	
171		Maintaining and keeping satisfied customers with efficient support.	
172		Utilizing intelligent support system.	
173		Not being limited support domain of service.	

174		Business strategies	Annual analysis of business and marketing strategies.
175			Applying product development and marketing strategies.
176			Applying product pricing strategies.
177		Management and development of requirements	Enjoying a comprehensive and integrated system in all branches.
178			Homogenization of data in all branches by software.
179			Strengthen hardware and software to dominate on competitors.
180			Integration and merging of information.
181			Providing backup of human resources and hardware equipment.
182			Use of shared resources and virtual.
183			Providing required software by the company software team.
184			Providing automatic backup software of server information.
185			Increase of quality by use equipment change.
186			Utilizing the hardware equipment and suitable infrastructure for the utilization of new technology.
187		Using speed test software.	
188		Business Performance Management	Implementation of research and development team recommendations in the level of organization and country.
189			Applying crisis management in contact with dissatisfied customers.
190			Creating a balance in losing and attracting new customers.
191			The existence of a true financial management perspective.
192			Focus on profitable customers.
193		Making policy	Compilation of the annual outlook.
194	Moving toward goals based on perspective.		
195	Efforts in the transfer area of many-visited site servers to the country in line with the ordained policies of the radio regulatory organization.		
196	Taking into account the necessities and requirements of the information technology industry in the design and development of services.		
197	Cost-benefit	Execution of ideas under the condition of capital return.	
198		Estimate cost, profit and loss of projects before implementation.	
199	Level 5: Optimized maturity	Predictive analysis	Discovering the behavior pattern of users and providing strategies based on periodic reports.
200			Forecasting the future market by using personnel reporting and holding periodic meetings with other companies.
201			Providing new designs with market analysis and market necessity.
202			Anticipating customer behavior before becoming pervasive TD-LTE technology.
203			Anticipating the replacement of ADSL technology with TD-LTE technology.

204			Estimated sales.
205	Dashboard		Adding dashboards to all company systems.
206			Increasing speed and easier access for users by graphical dashboards and visualization.
207	knowledge management		Advice to business partners and competitors in order to share knowledge.
208			Existence of knowledge management and organizational knowledge in the company.
209			Developing the organization level knowledge through participation in seminars.
210			Marketing and market leadership using the knowledge of the day.
211			Simplifying knowledge transfer by defining processes.
212			Mouth-to-mouth knowledge transfer in the company.
213	Innovation		Attention to the idea and creativity and don't ignore weak ideas.
214			The formation of a thought room to cultivate created ideas.
215			Providing a chain of service to customers by using startup launches.
216			Innovation in providing customer service.
217	Competitive advantage		Having expert human resources.
218			Making-model of the leading countries in the IT field.
219			Having experienced technical and managerial managers.
220			Moving to cultivate people with multiple specializations.
221			Hosting services and website design alongside providing Internet services.
222			Topic mastery, sophistication and understanding of unit managers from current activities.
223	Development of technology		Optical fiber and microwave development across the country.
224			Development of TD-LTE technology across the country.
225			Development of sending and receiving satellite stations.
226			Extending facilities and cloud services.
227	Development of investment		Investing in the rural Internet network and trunking network project.
228			Investing in the service of residential towers.
229			Investing in services related to IT and Internet of shopping centers and organizations.
230	Data mining		Use of data mining tools for more accurate market analysis and customer behavior recognition.
231			Market analysis based on statistical methods.
232			Using artificial intelligence in data analysis.

5. Discussion and conclusion

Contemporary organizations are required by social-economic fact to seek tools to facilitate the process of data efficient acquisition, their extensive processing and analysis from various sources, in order to create a basis for knowledge discovery. Therefore, the use of concepts such as business intelligence is important because of its role in organizational decision making and promotion of productivity in different industries. Comprehensive planning, supply chain management, customer relationship management, and business intelligence are seen in successful organization. Business intelligence is an effective factor for business purposeful analysis and analysis of competitors of the organization in order to make strategic decisions and even immediate turns, and it points out to the ability of the organization to exploit all the capabilities and transform them into a wide range of information and knowledge that ultimately leads to the development of new opportunities. Identifying these opportunities and implementing effective strategies to exploit them can provide the opportunity to gain competitive advantage and long-term sustainability in the industry for the company. The power of decision-making of scientists and managers, both individually and in group form, is one of the main factors influencing the organization's performance and competitive ability. But the decisions of most scholars are based on intuitive methods established upon experience, professional knowledge and available information. Such an approach will lead to the formation of a static model in decision making, which will not be appropriate and efficient for unstable conditions resulting from rapid and continuous changes in the economic environment. The fact is that the decision-making process in today organizations is often more dynamic and complex that can only be performed by relying on intuitive methods, and this strengthens the tendency toward the use of analytical methods. In addition, product development cycles are

shortened and business risks have increased dramatically by the growth of competitive and volatile markets; therefore, decision-making processes have become complex and they are significantly related to the business intelligence system. Therefore, it is necessary that organizations learn and apply the best practices in the design, development and management of a business intelligence system. Accordingly, the present study designs a model to facilitate the decision-making process of e-business executives; especially the companies which are the Internet service provider that it allows companies to evaluate the current status and measure their distance to the identified goals. Since the present model has 33 dimensions and 232 different indicators in which all technical, managerial, and human aspects are easily considered, it can increase business capabilities and provide the basis for improving and enhancing the level of maturity in the business and play an essential role in competitiveness and business continuity. In general, the proposed business maturity model can be used in three ways: a descriptive tool that allows assessing the status quo of strengths and weaknesses, a prescriptive tool that provides a roadmap for improvement. And a comparative tool that enables modeling of industry standards and other companies. Therefore, businesses, by assessing the level of maturity of business intelligence by the presented model, are not only aware of their maturity levels and can be reached to desired level by their long-term plans, but are empowered against future developments and customers' expectations; and the context and bed of continuous improvement of their business activities will be provided by gaining commitment, improving performance and controlling process; thereby, higher business and operational performance benefits will be achieved.

6. Practical suggestions

- The presented model evaluates the level of business intelligence maturity in the electronic

businesses that work in the area of providing Internet services. Given the fact that the indicators of business intelligence maturity are constantly changing, it is suggested that in the next courses, Internet service providers extend and deepen this model based on the latest changes and updates in their business and then evaluate the level of business intelligence maturity.

- It is suggested that senior executives of companies which are evaluated by the present model deploy and define a process to examine all dimensions in which have not been achieved an appropriate result and require corrective and preventive measures; and recalculate the rates of factors at a given time interval in order to manage the improvement path.

- The cross between the business process management system and business intelligence in the organization has many benefits such as increasing efficiency, reducing the cycle time of processes, better and faster management errors, improving decisions, sustainability, agility and support of business models. Therefore, providing an efficient model that can map automatically or semi-automatically processes in the organization to business processes and its output will be used as input of analytical tools of business intelligence, will help the organization to achieve a high level of maturity of business intelligence.

- It is suggested that companies will analyze the results in an appropriate program and planning and use the results after evaluating the level of business intelligence maturity to improve their performance.

7. Reference

- [1] Azma, F., Mostafa Pour, M.A.2012. Business Intelligence as A Key Strategy for Development Organizations. *Procedia Technology*, 1(2012):102-106.
- [2] Brzozowski, A., Bubel, D.2015. E-business as a new trend in the economy. *Procedia Computer Science*, 65(2015):1095-1104.
- [3] Cates, J.E., S.S. Gill, Zeituny, N. 2005. The Ladder of Business Intelligence (LOBI): a framework for enterprise IT planning and architecture. *International Journal of Business Information Systems*, 1(1-2): 220-238.
- [4] Creswell, J. 2007. *Qualitative inquiry and research design*. Sage publications, 472p.
- [5] Djatna, T., Munichputranto, F. 2015. An Analysis and Design of Mobile Business Intelligence System for Productivity Measurement and Evaluation in Tire Curing Production Line. *Procedia Manufacturing*, 4(2015): 438-444.
- [6] Eckerson, W. 2004. Gauge Your Data Warehousing Maturity. *DM Review*,14(11):34-37.
- [7] Fedouaki, F., Okar, Ch., Almai, S-El. 2013. A maturity model for Business Intelligence System project in Small and Medium-sized Enterprises: an empirical investigation. *IJCSI International Journal of Computer Science Issues*. 10(6): 61-69.
- [8] Gartner. 2008. Gartner Executive Programs CIO Survey, available at www.Gartner.com accessed June 2008.
- [9] Hewlett, P.2007. The HP Business Intelligence Maturity Model. viewed on 21 April 2009, <<http://h71028.www7.hp.com/ERC/downloads/4AA1-5467ENW.pdf>>.
- [10] Lahrmann, G., Marx, F., Winter, R., Wortmann, F. 2010. Business Intelligence Maturity Models: An Overview. *Information Technology and Innovation Trends in Organizations: Conference Proceedings, VII Conference of the Italian Chapter of AIS (itAIS 2010)*.
- [11] Lahrmann, G., Marx, F., Winter, R., Wortmann, F. 2011. Business Intelligence Maturity: Development and Evaluation of a Theoretical Model. *Proceedings of the 44th Annual Hawaii International Conference on System Sciences*.1-10.
- [12] Lasi, H. 2013. Industrial Intelligence- A Business Intelligence-based Approach to Enhance Manufacturing Engineering in Industrial Companies. *Procedia CIRP*, 12(2013): 384-389.
- [13] Lessanibahri, S., Gastaldi, L., Pietrosi, A., Corso, M.,2015. Co-developing a Roadmap towards Precision Medicine: Measuring the Maturity of BI in Healthcare. 10th International Forum on

- Knowledge Asset Dynamics Bari, Italy, pp:1671-1688.
- [14] Pilinkiene, V., Kurschus, R-J., Auskalnyte, G. 2013. E-business as a source of competitive advantage. *Economics and management*, 18(1): 77-85.
- [15] Rajteric, I.H. 2010. Overview of Business Intelligence Maturity Models. *Management: Journal of Contemporary Management Issues*, 15(1): 47-67.
- [16] Roglinger, M., Poppelbub, J., Becker, J. 2012. Maturity Models in Business Process Management. *Business Process Management Journal*,18(2):328-346.
- [17] Sacu, C. Spruit, M .2010. BIDM: The Business Intelligence Development Model. *Proceedings of the 12th International Conference on Enterprise Information Systems*, Volume 1, DISI, Funchal, Madeira-Portugal.
- [18] SAS.2009. Information Evaluation Model. <http://www.sas.com/software/iem/> Retrieved September 2011.
- [19] Shaaban, E., Helmy, Y., Khedr, A., Nasr, M. 2011. Business Intelligence Maturity Models: Toward New Integrated Model. *Naif Arab University for Security Sciences*. 12(11): 276-284.
- [20] Tan, Ch-S., Sim, Y-W., Yeoh, W. 2011. A Maturity Model of Enterprise Business Intelligence. *Communications of the IBIMA*.2011(417812):1-11.
- [21] Tsai, H.-H. 2015. The research trends forecasted by bibliometric methodology: a case study in e-commerce from 1996 to July 2015. *Scientometrics*,105(2): 1079-1089.
- [22] Watson, H., Ariyachandra, T., Matyska, R. J. 2001. Data Warehousing Stages of Growth. *Information Systems Management*, 18(3): 42-50.
- [23] Wieder, B., Ossimitz, M-L. 2015. The impact of Business Intelligence on the quality of decision making—a mediation model. *Procedia Computer Science*, 64 (2015): 1163 – 1171.