Justifying ERP Investment: The Role and Impacts of Business Case A Literature Survey

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Abstract
ERP systems are booming these days. But it suffers from high rates of failure among different industries. Consequently, clear vision, objectives and compelling justification is needed to increase the rates of success. There are different approaches to justify IT investment in general and ERP investment in specific. This paper focuses on Business Case approach. A comprehensive model based on best practices for Business Case is proposed.

Key words:
ERP, Business case, Justifying Investment.

1. Introduction

Nowadays, businesses are emerged to be expanded. And business stakeholders from different industries compete to open new markets in new geographic areas, which indeed raise the necessity to have ubiquitous systems to follow and simplifying these expanded and inflated enterprise organizations. Besides, they become in need to unify the fragmented business units and operations, and to control this non-stopping stream and of information. Enterprise Resource Planning (ERP) has been arisen to serve these increasing demands.

Basically, ERP is large complex information systems that integrate and stream line the organization's business process across departmental and geographical borders. (Gulla, 2004). ERP described as business software that is: multifunctional in scope; integrated in nature; and modular in structure (Simon and Murphy, 2001); complex mega-packages (Gable et al., 1997) designed to support key functional areas of an organization (Sammon, and Adam, 2007).

However, Jose and Joan (2000) states that the definition and measurement of ERP implementation make its success a thorny issue.

2. Critical Success Factors for ERP Implementations

ERP studies reporting that more than 70% of ERP implementations fail to achieve their estimated benefits because of (and not limited) unclear business strategies; cost overrun; project delay; underestimation of the required efforts for change management (Eckartz, et al., 2009), risks, moreover, overestimating of benefits. Many studies arguing that the success of ERP implementation depends on key factors called critical success factors, such as (Holland et al., 1999; Holland & Light, 1999; Bingi et al., 1999; Sumner 1999; Parr et al., 1999; Parr & Shanks, 2000; Chen, 2001; Esteves & Pastor, 2001; Nah et al., 2001; Somers & Nelson, 2001; Al-Mudimigh & Zairi 2001; Akkermans & van Helden, 2002; Hong & Kim, 2002; Al-Mashari et al., 2003; Brown and Vessey, 2003; Umble et al., 2003; Verville & Bernardas, 2005; King & Burgess, 2006; Finney & Corbett, 2007). CSFs were defined the first time by Rockart (1979) as "those few critical areas where things must go right for the business to flourish". This paper will focus on one of the most critical factors in ERP project implementation, which is justifying and planning for the ERP investment to the top management or decision-makers in the organization. It discusses the importance of careful planning and justification of ERP project, and the necessity of creating a clear vision and objectives for the ERP project that is consistent with the global strategies and goals of the organization. And what should have done in this phase before starting the implementation process. The rest of this paper will be organized as the following: III- justification of ERP Investment, IV-Business Case, V- components of comprehensive Business Case, VI- best practices in developing Business case based on consultancy groups.

3. Justification of ERP Investment

The desire of achieving sustainable competitive advantage from investing in ERP is not as probable as ERP vendors would have organizations believe. The act of investing in a multi-million dollar ERP system is extremely risky for managers (baker, 2006). Researchers have noted a deteriorating in evaluating IT investment in general and ERP in specific (Teltumbde, 2000; Chen, 2001; Ross and Beath, 2002; Sumner, 2000). This is not a new argument in the general IS field, where managers often have to make

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these kind of decisions without a clear and full understanding of why they should invest and what the outcome of the investment will be (Baker, 2006). The reason for that is because the organizations find it difficult to perform such evaluation (Ward & Peppard, 2002). Sammon and Adam (2007) argued that it is related to the lack of suitable and efficient evaluation methodologies for such strategic investment (Sammon & Adam, 2007), therefore, Teltumbde (2000) argued that if ERP projects considered as huge investment that has huge impacts on the organization, coupled with high probability of failure, then it should be imperative that proper evaluation must be undertaken (Teltumbde, 2000). Besides, a proper understand of what the perceptions of managers are when the decision is taken, and what is driving the ERP investment, rather, fitting the short and long term advantages of the organization (Baker, 2006).

Similarly, Davenport (2000) argued that even if the organization had succeeded in putting ES in place, it would probably not have received real business value from its system because the justification including the objectives of the project were not clear in the first place (Davenport, 2000).

Based on our readings, and according to the papers reviewed for this literature, we have founded that there are two main approaches or methodologies to justify the ERP project Investment; IT-Investment framework (Ross & Beath, 2002, Sammon & Adam, 2007) and Business Case (Ward, et al., 2007; Davenport, 2000, Kimberling, 2006; Eckartz, et al., 2009). The paper will describe Ross & Beath Framework in brief, because the target of the paper is to focus on Business Case; its role and impacts in ERP projects.

3.1 IT-Investment framework

According to Ross and Beath (2002) "the success comes from using multiple approaches to justifying IT investments. Making the business case is only one approach". Basically, this framework looks to the investment from the point how strongly it is related to IT, so this framework does not serve ERP project investment only, but also other investments ranging from pure IT infrastructure to new business model.

Based on their analytical study for more than 30 Companies in America and Europe, they found that the investments differ along two dimensions: strategic objectives, which highlight the trade-offs between short-term profitability and long-term growth, and technology scope, which distinguish between shared infrastructure and business solutions. And to address both dimensions there should be four types of investments: transformation, renewal, process improvement and experiments. The driver each type of investment is as the following:

Transformation: (ERP project is under this type) it is necessary when the organization's core infrastructure limits its ability to develop applications critical to long-term success, it is risky and the entire company will be affected in it and everyone in the organization should participate in it.

Renewal: a new technology is introduced when the available infrastructure become outdated. Therefore, the companies engage in renewal to maintain the infrastructure's functionality and keep it cost effective. For example, one financial-services firm, after deploying various e-business applications on its standard Windows platform, recognized that the Windows environment could not handle its transaction volume, then the company introduce Unix as new platform after years of adopting Windows as a single-standard desktop environment. Thus the company enabled the same business outcomes, but reduced downtime and maintenance costs.

Process Improvement: when the company intended to improve its operational performance, then this type of investment is what it needs. Business process improvements should be low-risk investments, because managements knew with relative certainty how much it would cost to develop and support the software, and what business value of those improvements was to the company. To reach that level of predictability, process improvements must build on existing IT infrastructure.

Experiments: New technologies present companies with opportunities or imperatives to adopt new business models. To do that the company should have a steady stream of business and technology experiments. Successful experiments may lead to major organizational change with accompanying infrastructure changes (transformation) or to more incremental process-improvement initiatives (process improvements). Figure (1) shows these four types of investments.

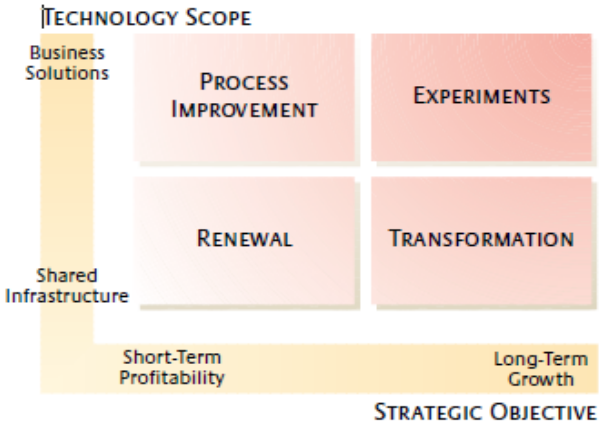

Figure (1): IT-Investment Framework. (Source: Ross & Beath, 2002)

Ross and Beath arguing that there might be some confusing in distinguishing between these four types of investments; this comes from the interrelationship between them, as one type can lead to another. In general this framework propose a comprehensive concept for assessing the company's investment, if the decision-makers realize the actual long-term benefits that they can get from ERP package then their investment is of Transformation type, but if their target was a short-term profitability then their investment in infrastructure is of renewal type.

Sammon and Adam (2008) have proposed a method for evaluating investments in ERP packages, which is based on Ross and Beath study, their method moves away from business case towards assessing the presence and absence of CSFs for ERP implementation at the outset of the project (Sammon & Adam, 2008).

The power of this framework is its ability and flexibility to cover different types of goals and benefits of IT investments including ERP projects.

3.2 Business Case in Justification of Investment

It is another method to justify the investment. Basically, it is a generic tool to justify any investment, but this paper will deal with it from ERP point of view. In this regard, and based on the research that have been done about business case in ERP projects, there was a lack of researches that deal with BC comprehensively, we found it fuzzy and fragmented under different topics, such as, ERP project evaluation, benefits realization, risk assessments, chartering phase, business plan, project vision and objectives. Moreover, different frameworks and researchers such as (but not limited) (Al-Mudimigh & Zairi, 2001; Markus & Tanis, 2000) deal with BC as its traditional concept based on financial benefits and costs (eckartz, et al., 2009), to justify IT investments and gain budgetary approval (Kimberling, 2006), and ignore other critical factors or components that make it comprehensive and compelling to succeed, and then leads to the successful of ERP project implementation. In next coming sections will be dedicated to Business Case.

4. Business Case

The quality and comprehensiveness of business case has a significant effect on the success of the investment (Ward, et al., 2007).

BC definition: based on (businessdictioanry.com) Business Case (BC) defined as: "A type of decision-making tool used to determine the effects a particular decision will have on profitability. A business case should show how the decision will alter cash flows over a period of time, and how costs and revenue will change. Specific attention is paid to internal rate of return (IRR), cash flow and payback period. Analyzing the financial outcomes stemming from choosing a different vendor to sell a company's product is an example of a business case", from this definition we find that BC is basically a trade-offs between cost and profit (financial benefits), but in ERP projects the BC should have done more than driving to budgetary approval (Kimberling, 2006), and has proven inadequate for modern IT projects (Teltumbde, 2000; Sammon & Adam, 2007). Gartner Consultancy group (2008) set an analogy between the traditional BC and the compelling BC specified for ERP projects. Figure (2) shows that a BC for ERP project should contain a plan and mechanisms to guide the project. Moreover, (Gartner, 2008; Kimberling, 2006; Markus & Tanis, 2000) arguing that the traditional BC has several disadvantages that make it not suitable for ERP project:

- Often lack stakeholder involvement and commitment, long-term support.
- May lack alignment with business objectives, or fail to link technology to business strategic plan, do not consider the migration of strategy.
- Doesn't clearly and credibly document the facts.
- Doesn't identify all potential benefits, who will achieve them and how they will be measured, key performance indicators not or poorly defined.
- Isn't focused on achieving benefits.
- Often ignores major risks and mitigation strategies
- Isn't leveraged to guide the projects.
- Often focus on technology, but not people and process.
- Unrealistic parameters.

Many research studies clarify the importance and role of business case in ERP projects, they add other roles to the traditional role of BC to be in all as the following (Ward, et al., 2007; Robey, et al., 2000; Industry week, 1998; Zairi & Al-Mudimigh, 2010; Sammon & Adam, 2008, Kimberling, 2006):

- To clearly state objectives of the investment.
- Identify all of the expected benefits that will arise when the objectives are achieved, Ward, et al. (2007) differs between objectives and benefits, that is, the investment objectives are the overall goals that should be agreed by all of the relevant stakeholders. In contrast, benefits are advantages provided to specific groups or individuals as a result of meeting the overall objectives.

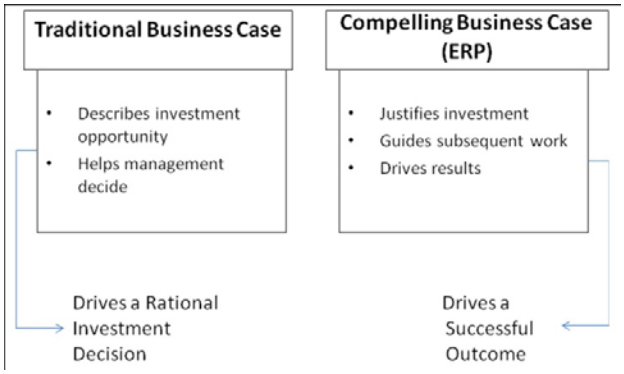

Figure (2): Comparison between traditional and compelling (ERP) BC. (Source: Gartner, 2008)

- State a benefits realization plan.
- To obtain fund for the investment, and to ensure the top management support to achieving the intended investment benefits.
- Provide the decision makers the ability to evaluate their preparations for their ERP implementation, and to ensure that the expected outcomes can be achieved.
- To enable priorities to be set among different investments for funds and resources.
- Enabling the success of investment to be judged objectively.
- Control the project scope.
- Show the accomplished costs with potential benefits.

Based on the stated points above about the important role that the BC played in making the ERP project implementation succeed, many researchers also such as (Sammon & Adam, 2007, 2008; Davenport, 1998, 2000; Ward, et al., 2007; Markus & Tanis, 2000; Al-Mashari, et al., 2010; Murphy& Simon, 2001; Holland, et al., 1999; Holland & Light, 1999; Eckartz, et al., 2009; Chen, 2001; Nah et al., 2001; Al-Mudimigh & Zairi, 2001; Somers & Nelson, 2001) state that putting a business plan and setting up a clear vision and objectives for the ERP project is one of the most important critical success factors in ERP projects.

Another important part of the discussion is who should be involved in building the BC?

Davenport (2000) in his book "Mission critical Realizing the promise of ERP Systems" state that the process of building a BC might consume long time and it may take several months just to gather all the needed information, so it is team work not "one man show". The members who should be involved are a group of business and technical executives within the company; the technologists educate the business people on how the technology works and the implications of particular technological choices. Whilst, the business people can determine or identify the business directions and what are the requirements imposed by particular business processes. Jointly they can determine how the technology might influence the achievement of business objectives. The conclusions should be presented by a small group from the team to the entire senior management team, as the decision should be made by the CEO and senior executive team, the board of directors also should be consulted, not just because of the huge investment, but also because of the business changes involved. After making the decision the results should be communicated to the entire organization. Figure (3) shows the process of decision making.

Gartner (2008) suggested also that the BC development team may consist of Business units' managers, Executive sponsors, budget committee, chief financial officer, chief technology officer, chief information officer, legislature, and project manager.

Suggested Components of Business Case:

Based on the discussion above, and as it is seen how BC in the early stages of ERP project implementation is a critical factor to succeed, this paper proposes additional components to the BC of ERP project based on the best practices suggested from researchers and consulting groups such as Panorama, Gartner, Deloitte, Hitachi, and group them into a model of best practices for building a comprehensive Business Case.

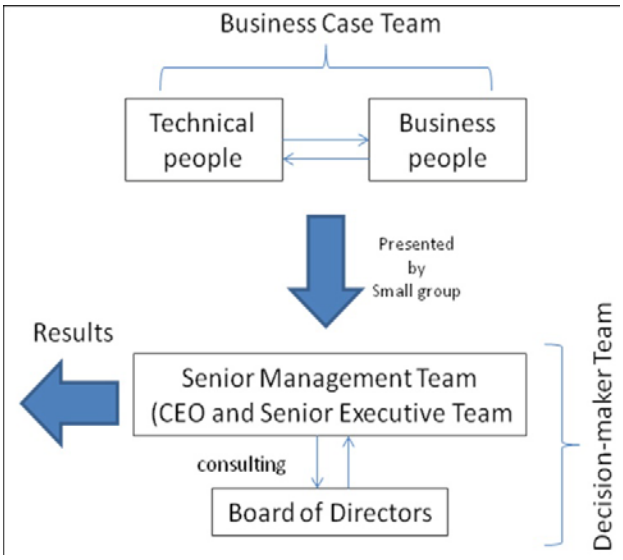

Figure (3): process of decision making on BC.

Components of Comprehensive BC:

- Reviewing the organization vision objectives and strategic goals, and Determine the vision and main

objectives of ERP project under the umbrella of organization's vision: Davenport (2000) arguing that the organization before justifying the ERP project investment should ask what are the key strategies of our business, both at organization level and business units, geographies, products, etc? because if cannot articulate the answer at this stage, then it will not be articulated in the new system; the organization should think what it will need in the next two years, not what it needs today, because it does not work to wait until challenges come up (Davenport, 2000). The business vision should have quantifiable objectives that could be achieved and delivered through the ERP project (Holland & Light, 1999). Similarly, it is essential to set a clear vision and objectives for the ERP project that justify the triple constraints of project management goals: scope, time, and cost. It is also should be understood clearly from both, the top management, and project team. And setting metrics for each objective in the project is a good practice to make it easy to evaluate the project in subsequent stages. (Somers & Nelson, 2001; Nah, et al., 2001; Umble & Umble, 2003). It is also important to create a clear link between the ERP project and the organization business value. (Deloitte, 2009; Hitachi, 2009)

- *Evaluating the legacy system:* legacy systems are the business and IT systems prior to the ERP that encapsulate the existing business processes, organization structure, culture and information technology (Holland, et al., 1999). Evaluating the legacy system means to understand and document accurately and honestly your current "As-is" status (Deloitte, 2009). The key documents should be gathered and start the evaluation, by considering questions such as: Are your procedures up to date? Are there processes that could be automated? Are personnel spending overtime processing orders? Do your sales force customer service personnel have real-time access to customer information? The team should conduct interviews with key persons to cover additional areas and to evaluate the culture of the organization (O'Donnell). The Companies are less likely today to do their major exercise to understand existing business processes before modifying them with an ERP project (Davenport, 2000). Though it should be done to determine the amount of organizational change required to successfully implement an ERP system and to be the base line for your start in ERP implementation, and in order to define the nature and scale the problems that you will likely encounter (Holland & Light, 1999).

- *Benchmarking other companies in the same industry who implement ERP:* the organization may learn and benefit from other organizations in the same industry that implement ERP systems, and learn from their success and failure (Davenport, 2000), and use them as a starting point to improve your performance, and to get an idea of the best practices that have been done in this regard (Ward, et al., 2007). Paradoxically, it is not easy to know the details of other organization's experiments in the same industry because they considered as competitors and they will not spread their secrets.

Define the Desired State and the expected benefits: as a result of setting up your project's vision and objectives, evaluating your current system and processes, and benchmarking with other organizations in the same industries. The outcome is to define the desired "To-Be" state and what would success look like (Deloitte, 2009). In this point you can start focus and search exhaustively for the expected benefits focusing on people, processes, technology, management, and infrastructure. Try to justify the stakeholders' requirements and expectations from the ERP project (Gartner, 2008). Hitachi (2009) and Gartner (2008) have suggested building hypotheses and scenarios around the expected benefits that clarify them, and help decision-makers to understand deeply how the benefits could be achieved. In research area we have found that the expected benefits from IT investments ranked as the second most critical issue overall for organizations of different sizes specially the large one (Williams & Schubert, 2010). Research findings still identifying that the organizations do not achieve the desired benefits or the expected benefits from their investment (Williams & Schubert, 2009, 2010; Murphy & Simon, 2001; Davenport, 2000; Esteves-Sousa & Pastor-Collado, 2000). Mainly, there are three major critical issues regarding the benefits, which are: 1) Types of benefits; Tangible and intangible 2) Benefits realization and measurement, and 3) Following-up the benefits.

1)Types of benefits: researchers have been divided benefit into two main types, Tangible benefits, which could be quantified, has a cost and could be quantitatively measured, for example, an early business information systems were transaction processing systems that are designed to replace workers who perform repetitive tasks, such as payroll clerks, The determination of the costs and the benefits for these systems was relatively easy. The salary of workers to be replaced was compared against the cost of the system

and hence the project's value was estimated. On the other hand the second type, intangible benefits, which could not be quantitatively measured, the same as with example above. That is as the systems became more complex and began to support other types of activities, e.g., decision making, the ability to quantify their payback became more difficult. It was clear that more and better information improved decision making, but it was very challenging to quantify the value of a better decision. Better decisions represent one form of intangible benefit derived from the IT system, hence, Intangible benefits are the benefits that could not be captured or converted into quantitative value, to an organization's business value (Murphy & Simon, 2001). Many research papers tried to identify and differentiate between these two types of benefits, and explore the intangible benefits such as (O'leary, 2004; Murphy & Simon, 2001; Hares & Royle, 1994).

Hares & Royle (1994) have indicated two types of intangible in IT investments. The first one is internal improvement and the second related to the customers.

Murphy and Simons (2001) have mentioned that Annie Brooking in her book Intellectual Capital, have decomposed intangible benefits into four areas: market assets, market assets, items which yield market power, e.g. brand names; Intellectual property copyrights; human-centered assets like knowledge; and infrastructure assets. IT falls into the last category. She states in this regard that "It is not the value of computers and software in the business, but their impact on the business' performance". Brooking examines Barclay's bank, whose computer and software assets equal approximately £100 million. If those assets suddenly disappeared, the bank would not open, so it is obvious the value of the assets is much greater than the cost of the assets themselves. This example leads us to the second point, which is 2) Benefits realization and measurement: based on these two distinct types of benefits managers have started to rely on these two types of benefits in order to determine a system's contribution. Many researches have argued that identifying the benefits arising from ERP systems, understanding their contribution to business value, and to maximize its value is still a key challenge for practitioners (Williams & Schubert, 2010). Benefits realization is a comprehensive project approach, which focuses on identifying, measuring, and ensuring that the business benefits are achievable through technology (Kimberling, 2006). 3) Following-up the benefits: once the expected benefits from the investment have been identified, then it is important to be followed along the implementation phases to make sure of the precision of what was meant by a particular benefit. Ward, et al. (2007) have suggested a model to trace the benefits. That is after identifying the benefits, essential pieces of information added to each benefit, which are: firstly, how the benefit could be measures and secondly, an individual who will be the owner of the benefit, and should be the one who gain advantages from achieving this benefit. This will make the owner of particular benefit willing to work with the team undertaking the project to ensure that the benefit realized. This model also develops a benefit dependency network that consist of benefits owners and change owner where there is an owner for each change happened. This will show how each benefit achieved and what risks may prevent it from being achieved (Ward, et al., 2007).

- *Risks Assessment and mitigation planning:* "risk" is a problem that has not yet happened but which could cause some loss or threaten the success of a project if it did (Tsai, et al., 2010). Several research studies have investigated the ERP risks, six main dimensions of risk in ERP implementation have been identified by Poba-Nzaou, et al. (2008) and listed in (Iskanius, 2009) namely, 1) organizational, 2) business-related, 3) technological, 4) entrepreneurial, 5) contractual and 6) financial risks. Organizational risk derives from the environment in which the system is adopted. Business-related risk derives from the enterprise's post-implementation models, artifacts, and processes with respect to their internal and external consistency. Technological risk is related to the information processing technologies required to operate the ERP system – for example the operating system, database management system, client/server technology and network. Entrepreneurial or managerial risk is related to the attitude of the owner-manager or management team, while contractual risk derives from relations with partners and financial risk from cash-flow difficulties, resulting in an inability to pay license fees or upgrading costs, for example (Poba-Nzaou, et al. 2008; Iskanius, 2009). Aloini, et al. (2007) refer these six dimensions of risks to ERP risk factors that listed in Iskanius, (2009) as the following: 1) inadequate ERP selection, 2) poor project team skills, 3) low top management involvement, 4) ineffective communication system, 5) low key user involvement, 6) inadequate training and instruction, 7) complex architecture and high numbers of modules, 8) inadequate business processes, 9) bad managerial conduction, 10) ineffective project management techniques, 11) inadequate change management, 12) inadequate legacy system management, 13) ineffective consulting services experiences, 14) poor leadership, 15) inadequate ICT system issues, 16) inadequate ICT supplier stability and performances, 17) ineffective strategic thinking and planning, 18) inadequate financial management. Gartner (2008) suggested that risk assessment should start in BC, and list all the expected risks in the organization, and put plans to mitigate these risks impacts. If the organization does not have such plan for risk, this will put the organization in a challenge of cost overrun, uncontrolled scope or shifting the timeline of implementation.

- *Cost in relation with benefits and risks:* after estimating all the expected benefits and assess all the associated risks for ERP project. Then a full business case should determine how much it will cost to achieve the desired state (Deloitte, 2009). The organization should assess the cost considering the trade-offs with benefits (tangible and intangible) and expected risks; this will be in a cost-benefits and cost-risk analysis, preferable to convert the targeted improvements and benefits to financial results (Deloitte, 2009; Gartner, 2008).

- *Blueprint:* blue print is the project plan and schedule that ensure to implement the ERP software in a way that supports the organization business operations, ultimately saving time, money, and risk while increasing business benefits. Below are the expected activities to be done in blueprint plan (Panorama, 2010; Holland & Light, 1999; Robey, et al., 2000) as the following:
  - Develop a detailed implementation project plan, including scope, activities, milestones, and resources.
  - Conduct a risk assessment and risk mitigation plan.
  - Establish the project core team, project charter, and project controls.
  - Define software vendor technical scope and system requirements.
  - Define business process workflows, identify improvements, and start implementing process changes.
  - Define roles and responsibilities in the new ERP system environment.
  - Conduct an organizational readiness assessment to gauge employees' ability to adapt to the new system.
  - Define a business benefits realization plan, including KPIs and performance improvements.
  - Manage technical infrastructure upgrade plan.
  - Develop a data standardization and migration plan.
  - Create a migration plan for forms and reports.

  BC will suggest and plan for all of the above points, on high-level planning and then during the Implementation it will control and evaluate them in each phase. Updating the BC based new challenges and to ensure that the scope, time and cost are within the expected values.
- *BC life cycle:* many consulting groups suggested developing process for the BC. Based on our research findings Gartner (2008) model was the most comprehensive. Figure (4) shows the developing process of the BC:

In relation to the typical phases of ERP project implementation; pre-implementation, implementation; post-implementation, Gartner (2008) draw the Business case objective, role and key person or groups involved for each stage. Table (1) shows this relation.

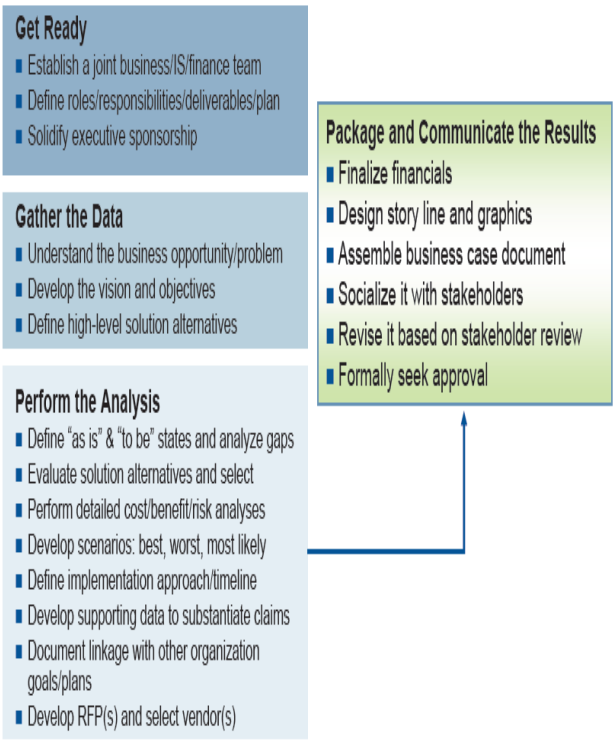

Figure (4): developing process of the BC.

Table (1): Business Case in relation with ERP project phases (source: Gartner, 2008 with changes)

	Life Cycle Phase		
	Cost Analysis (pre-implementation)	Project Execution (implementation)	Benefits Harvesting (post-implementation)
BC objective	Analysis Approval Funding	Keep project on track	Achieve project objectives
BC role	Convince, Inform,	Use as a baseline reference for scope decision	Measuring benefits realization
Key person & groups involved	Executive sponsor, BC team	Project manager, project steering committee	Program unit management, auditors

5. Conclusions

ERP systems have become the most significant IT investment for most companies in their capital budgeting. Business case plays a very important role in the successful of ERP project implementation. As it is the early main stage which collect the approval from organizations' decision-makers. Because of the specific features of ERP project, the traditional business case does not get the expected results. Failure of ERP projects with high percentage is evidence. In this paper we propose a model for comprehensive and compelling business case. A future work of case studies is to be done to verify the accuracy of this model. Further examples might be added to strength the point of view adopted in this paper.

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