

An assessment methodology for IT management enterprise systems adoption in SMEs and Start-Ups

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Abstract: The assessment and objective quantification of the contributions and impacts to value-added creation resulting from the adoption of Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Product Lifecycle Management (PLM) is still challenging. Since IT systems aim at supporting the broad management process of the company, their implementation often compels radical organizational changes. The corporate reorganization and the learning/tuning of such systems affect costs, and require expenditure of company resources and a large period for employee training. Despite the great effort required to complete these tasks, the era of digitization and the Internet of Things (IoT) is imposing this transition. In fact, IT enables tracking and monitoring all operations carried out in the company (logistics, material handling and warehousing, purchasing and procurement, customer management and after-sale services, etc.) to preserve and/or increase market share by optimizing the overall performance. Starting with the state-of-the-art analysis of the benefits of using enterprise software, the paper suggests an approach to be adopted by small-medium companies and start-ups in selecting the right IT support solution. The attention will be focused mainly on the most appropriate solutions that cope with the high costs typical of these software packages, amortizable for large corporations, but not often affordable for companies in the early stage of their development

Keywords: ERP, PLM, CRM, SMEs.

I. INTRODUCTION

The development of a company is closely related to the speed and ease with which it has access to business-related resources and data. Nowadays, as digital integration continues to increase in industry, a business support software is needed to speed up and improve organizational and communication processes not only within the company itself, but also with its suppliers and customers. Moreover, it has become increasingly important to have a view of the company as a whole, so as to be able to identify ratios and indicators that summarize its strategies, resource management performance, positioning in relation to competitors, and so on [1].

The Enterprise Resource Planning (ERP) software are management systems that integrate the most relevant business processes for a company into a solid platform. The basic principle of ERP is the centralized collection of data from various functions (marketing, sales, production etc.) and from multiple departments and activities. ERP integrates all company activities such as production, inventory management of a warehouse, accounting, human resources with the goal of optimization, in terms of efficiency and profitability [2].

The most important strength of such an integrated system is the ability to have a complete database shared by all departments. In terms of internal operating conditions, the automation of procedures renders information flows much faster and more effective, resulting in an increase in overall performance [3]. The motivations and expected benefits that may lead companies to look at the ERP market are many [4,5], including: improved integration between business functions, increased organizational flexibility, reduction in the implementation time of purchasing and sales cycles, improving the timing and quality of the communication flow, greater guarantee of correctness of data entered the system, alignment with parent/affiliated companies belonging to the same group alignment with industry trends. These organizations strive to reduce total costs across the supply chain, production cycle, and inventory in order to cope with the fast-changing market which demands wider product variety, more accurate delivery dates, and effective coordination between supply and production [22].

The Customer Relationship Management (CRM) software enable the company to better maintain customer relationships. Platforms of this nature provide effective management of marketing activities as well as after-sales, customer support, or order and service management.

These applications improve business communication by optimizing the management of current and potential customers. CRM is often considered as a strategy that is part of the company's business, integrating functions and processes inside and outside the company, to create value for the customer and transform this value into profit for the corporation [6]. The heart of CRM is a set of company-wide processes and policies designed to acquire, retain and serve customers related to marketing, sales and service [7]. An effective CRM must give the ability to distinguish which customers are the most profitable, determine what generates that profit and ensure that the specific transactions and business practices of that customer maintain or increase their profitability. Although there are many different objectives that companies aim to for the implementation of a CRM solution, three are fundamental and always valid [9]: i) maintaining the existing customer base, ii) acquiring new customers, and iii) increasing the value of the company through increased sales. The CRM business is now one of the largest software markets in the world and growth is not slowing down. In fact, the CRM market is expected to reach more than \$80 billion in revenue by 2025 [8]. All these statistics and research point towards 2023 being the year of the customer. Nowadays, most customers begin their product research with one or more search engines before heading to a particular website and they will use mobile devices, laptops and desktops to search for products they are interested in. In order to engage potential customers across multiple devices in multiple channels, data and processes are needed and with CRM software, it is possible to create a 360-degree overview of each person that has been connected with.

Product Lifecycle Management (PLM) software integrates all the required processes for designing, building, distributing and tracking products. Organizations utilize PLM applications to reduce the time and expense of developing, manufacturing, and repairing or upgrading their products. PLM solutions aid in identifying and implementing changes to reduce manufacturing costs by optimizing design and centralizing supplier and parts inventory data. The core idea of these product management software consists in managing, as effectively as possible, company's products throughout their lifecycle; from a product's first idea to its retirement and disposal.

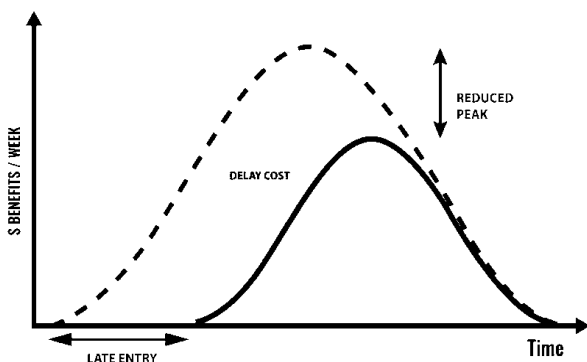


Fig. 1. Projecting the revenues over the lifetime.

The main objective of PLM is to increase product revenue, reduce product-related costs, maximize the value of the product portfolio and the value of current and future products for both customers and shareholders. They include processes, applications, product data, people, products, equipment, methods and metrics. A PLM system is intended to enable the integration of many information systems, such as CAD (Computer Aided Design), CAM (Computer Aided Manufacturing), PDM (Product Data Management), and more [10]. PLM is indeed focused on “the product”. There is nothing more important in a company than its products, and how they will be developed and used. Without those products, there will be no customers and no revenues. It provides many benefits across the lifecycle [11]. Product lifecycle management is increasingly important for organizations acting in dynamic and competitive markets. Normally, the life cycle of a product or service consists mainly of five phases, in each of which the product is in a different state.



Fig. 2. The five stages of a product's life cycle (Stark, 2018) [10].

During the ideation phase (beginning of life / BOL), the product is just an idea, while in the definition phase, ideas are converted into a detailed description (middle of life / MOL), including logistics (distribution), use, service, and maintenance. During the realization phase, the product acquires its final form in which it can be used by a customer. Lastly, the product reaches a stage where it no longer adds value to the market. It will then be stopped and disposed of by the customer (end of life/EOL) [12, 2]. It is therefore clear that these three software are of fundamental importance for the correct development of a company, especially in the era of digitalization in which we are living.

Due to the importance and amount of data that these platforms are expected to handle, particularly for purpose-built solutions developed for the organization, installation costs and time are usually very high. These two variables will clearly be affected by factors such as the number of services required, the level of customization, the number of user licenses, and integration with third-party software. SMEs are more cost sensitive, as they do not possess similar quantities of resources as compared to what large enterprises possess. Furthermore, any cost increase or project deferrals would adversely affect the SMEs' survival in the market [23]. To successfully implement these systems, managers must pay attention to the risks, critical factors and changes they will bring to the company. Particularly for small and medium-sized enterprises without any sort of baseline informatics structure to manage information and business processes, reengineering of enterprise operations is often necessary in order to effectively benefit from the advantages of IT [23]. For example, the installation of ERP software first of all requires a long

implementation phase of some business components, such as the production order procedure, the order closing procedure, the warehouse management, etc.; after which it is possible to manage with the ERP only a small number of codes, which serve as indicators of the initial management errors. Only after this first phase is it possible to move on to implementation, a procedure that has an extremely high variability in duration, from 4-6 months up to two years, and depends on several important factors: the size of the company, the receptiveness of the staff to changes, the time available for training, the existing data and systems and the hardware and software connection [24]. This “traditional” approach is often identified with the abbreviation BPR, which stands for Business Process Reengineering. Reengineering the corporate processes implies relevant organizational impacts, since it often involves changes in the way people work, in the distribution of decision-making power, in the strategic importance of business functions. Therefore, this approach requires specific skills on process design and reengineering, as well as the ability to administer both managerial and organizational issues. These changes can dramatically affect SME organizations, where such competencies are usually not developed, the entrepreneur is often the only one who has decision-making power and where long-term planning is very rarely performed [2]. Another factor certainly not to be underestimated is that of costs. The variable costs of ERP are usually related to the number of users simultaneous, intended as the number of users simultaneously operating the software, the cost of the license, the complexity and the number of areas involved (departments, integration with other software) the quality and accessibility of the data etc., but certainly one of the most important is that linked to the cost of hardware. In conclusion, the installation of traditional software designed specifically for a company can range from 75,000 euros for small to medium-sized enterprises and over a million for larger ones [13]. This amount is clearly not affordable for SMEs and start-ups. In addition, software of this type often has many features that are not essential for SMEs but are fundamental for large companies.

Starting from an analysis of the benefits related to the use of business software, the paper suggests an approach to be used for small-medium enterprises and startups in choosing the right IT support program. The paper will focus on the most appropriate solutions to be adopted to cope with the high management costs that are typical of these programs. Software is indispensable for the correct administration of a company, but its prices often make it unaffordable for companies in the embryonic phase of their development.

II. PRELIMINARY REMARKS FOR SOFTWARE SELECTION

First of all, it is important to highlight that the main cost in the installation of management software lies in the purchase of hardware components. The solution to this

problem is a cloud-based software which significantly reduces costs, as this type of technology does not require any special hardware installation in the company. Another point in favor of open-source software is its greater scalability. In fact, it will be possible to further reduce costs by purchasing only the modules needed for your business from the supplier [6]. This table details the differences between the infrastructure and cloud solution (SaaS):

TABLE I
THE DIFFERENCES BETWEEN TRADITIONAL AND CLOUD-BASED INFRASTRUCTURE SOLUTIONS [7].

Differences	Cloud-Installation	In-house installation
<i>Economic aspects</i>	Zero initial cost	High initial cost, but amortizable over time
<i>Investment flexibility</i>	User capacity can be easily increased or decreased as business needs change	User capacity can be increased or decreased according to business needs
<i>Integration with business systems</i>	Good	Excellent
<i>Ownership of the license</i>	No	Yes
<i>Speed of implementation</i>	Fast	Medium
<i>IT</i>	The supplier manages the IT structure, data back-up and data security	Internal IT structure required

However, a cost comparison should not only be made on the initial expenditure, but it should be made between the TCO (total cost of ownership) of open-source solutions and the TCO of proprietary solutions. A well-known argument in favor of OSS is that, with a lower cost of licenses, the budget of an organization can provide a higher cost for services, and thus in theory higher service levels. In conclusion, it is not necessarily the case that the TCO of an open-source solution is lower than the TCO of a proprietary solution, but normally the open-source solution offers more flexibility in the use of the available budget. In general, open-source software is more suitable to be customized or extended in functionality than proprietary software. As a result, it could be possible to implement the software with some useful modules for the development of a specific business, at a lower cost than proprietary software [2,15].

With regards to the BPR problem: for the reasons listed above, it is necessary to use a different approach in the ERP installation phases. In fact, it could be worth considering a simpler approach that considers BPR as a possible activity, following the implementation of an ERP system. This alternative approach firstly requires that, in the first place, that the company adapts its processes according to the ERP system requirements. Consequently, the time requested for the implementation

of the system can be shortened, while possible reengineering of critical business processes could be postponed. From the technological point of view, the effectiveness of this solution depends on the IS flexibility. If the existing information system makes use of standard communication protocols, without being tied up to customized solutions, the adoption process of an ERP system will be easier and cheaper. From the organizational point of view, this approach has a lower impact on SME structure: it implies less structural changes, a short-term impact and lower financial resources [14]. Nevertheless, the simple automation and integration of business processes could imply a too limited performance enhancement. In that case, the company could consider a partial redesign of its processes: thus, the ERP system should be flexible enough to map its procedures on the reengineered processes through the adjustment of its parameters values [14]. The first fundamental point in the installation of an ERP is therefore the choice of the program already in the definition phases of the business plan.

The same principle must also be applied in the choice of PLM software to maximize workflows from the outset and not have to incur huge losses of time caused by the transcription of data and the transfer of information from unsuitable software previously used. Another key point of the business plan is the market feasibility. This phase consists of identifying the markets to be attacked (with attached analysis of the development rate of the target market), the products to be provided, the methods of placement and a brief analysis of competitors. During this phase it is also advisable to define a marketing strategy to be followed, highlighting the critical success factors of the business and, where possible choosing the target market to be directed.

The installation of CRM software could then be considered. However, it is estimated that ERP systems will overcome the need for other specialized systems (e.g. CRM). This kind of software is called ERP II and it was envisioned to virtually cover all the processes within organizations from supply chain, CRM to e-business. Due to their massive scale and coverage of the micro and macro environment's stakeholders, and the different business functions and operations, ERP II systems were and are expected to be very complex to implement [15]. The use of 'hybrid' cloud ERPs, such as SAP, Oracle, Compiere, and Odoo could therefore be a solution to lowering programs costs, considering that there will also be considerable advantages in using a single software, rather than sharing information between different platforms [15]. As pointed out above, it is nowadays indispensable to have software that fulfils the functions of a CRM. Today's markets are increasingly moving towards full digitization. It is estimated that by 2040 around 95% of all purchases will be made via e-commerce [15]. Most of the investments made by large companies are inherent in the purchase of a CRM, which shows how the adequacy of this software is fundamental in the expansion of a company. It is reasonable to ask

whether it is better to buy specialized software in this area than an ERP II. Indeed, despite the fact that there have been great advances in ERP systems, and that most current ERP systems include modules and CRM applications, separate CRM systems are still widely adopted by big organizations.

Taking all of this information into consideration, it is legitimate to ask: what is the best solution for a small or medium-sized enterprise or a startup? To answer this question, the needs that are strictly necessary for a manufacturing company in the initial phase of its activity must be firstly analyzed. Company's needs vary considerably depending on the sector in which it operates, its size, the economic choices it makes, the strategies it adopts, the technology it owns, etc. But there are some fundamental components that can be considered common to all kind of manufacturing society, like the management of project data (BOM, PLM, etc.), data sheets, documents and work plans, order, inventory (components warehouse, finished products, costs and sales, invoicing, logistic (internal and external), production, website E-commerce and Social Network, marketing, client support and analysis. These factors are crucial in deciding on the right ERP, CRM and PLM software. To reduce costs, it is necessary for a startup to purchase only the essential modules. The choice of provider will then be based on the services their programs offer, on their cost and their reliability. The following section will show the most suitable software for startups and small and medium-sized enterprises with a focus on the key points to evaluate.

III. CRM SOFTWARE MARKET ANALYSIS

This paragraph will attempt to identify the most satisfactory CRM software for a small-to-medium sized business or startup through the use of some user-friendly websites and statistical sources. The first of these is g2.com: on this website it is possible to compare all the main business support software, offering a choice between several different categories. First of all, it is possible to have a wide overview of the software on the market thanks to the G2 Grid®. G2 scores products and sellers based on reviews gathered from their user community, as well as data aggregated from online sources and social networks. Together, these scores are mapped on the G2 Grid®, which can be used to compare products, streamline the buying process, and quickly identify the best products based on the experiences of peers [18]. With this website, it is also possible to get detailed information about individual software. In fact, there are numerous statistics with the opinions of users on the different features. It is also possible to compare up to four software belonging to the same category. Another very useful website in choosing CRM software is selecthub.com. Again, from this platform all enterprise support software can be viewed and compared. This page also has some very interesting settings to accurately choose the right support software: it is in fact possible to

accurately select the size and the branch of the company. Furthermore, due to a dedicated section it is possible to obtain a report comparing the various features of up to 5 different software [19]. Another factor that can be helpful in choosing the right type of CRM software is to check the Gartner Magic Quadrant. The Magic Quadrant is a series of market research reports published by IT consulting firm Gartner that uses proprietary qualitative data analysis methods to demonstrate market trends such as direction, maturity, and participants. Their analyses are conducted for several specific technology sectors and are updated every 1-2 years; once an updated report is published its predecessor is "retired" [20]. In this case, the focus was on the CRM Magic Quadrant for the year 2021. To conclude, the last website that has been taken into analysis is Capterra.it. The most interesting peculiarity is a very user-friendly interface and the possibility to get quick information about the services offered by various software providers. Intersecting the data and feedback from the examined sources, the authors propose the most suitable CRM software for small-to-medium enterprises and startups (Fig. 2).

CRM indicators and benefits

Author	HubSpot Sales Hub	Salesforce CRM	Zendesk Sell	Zoho CRM	Monday.com
Price	0-1200€/10 users per month	25-300€/user per month	19-199€/user per month	From 0 to 40€/user per month	8-16€/3 users per month
g2 users ease of use	88/100	81/100	89/100	83/100	94/100
g2 users ease of setup	85/100	76/100	91/100	80/100	91/100
Key features	Sales Automation Email Tracking and Management Prospect Management	Contact Management Opportunity Management Lead Management	Database Management Opportunity Management Pipeline Management	Sales Force Automation Process Management Performance Management	High flexibility and customization Workflow automations Easy-to-use visual interface
More used in companies with n. of employees	< 1000	> 1000	< 1000	< 50	< 1000
Mobile App	X	X	X	X	X
Integrated external software	More than 230 third-party apps	Variable, but very high integrability	Limited	More than 50 third-party apps	About 20 third-party apps

Fig. 2. Authors’ choice of CRM software for small SMEs and startups.

The parameters that were taken into account are: the cost of the service, the number and variety of services provided, the quality of services, integration with external software and the opinion of users. According to previous comments, the choice has been made on cloud-based software, in order to reduce the costs of hardware components. It is also important to note that many of these software have similar features, but also unique modules, so it will be necessary to define together with the collaborators the priorities that are essential for the development of the company and, based on these factors,

choose the most suitable software. The variation of prices within the matrix is naturally related to the choice of different modules. This large variety of customization has made it impossible to compare the different software on the same level.

HubSpot Sales is a customizable, cloud-based system that enables companies to increase their sales by automating sales processes, thereby saving time at every stage of the funnel. This software also enables customer and prospect nurturing. Thanks to its plug-ins, it guarantees an improvement in lead conversion rates and facilitates efficient pipe-line management. Salesforce CRM offers multiple sales functionalities and different customer service features for both B2B and B2C industries. Zendesk Sell is a web and mobile application that helps companies manage their sales, marketing and customer service operations. Due to its great scalability, it can be used by both B2B and B2C companies to reduce manual overhead and improve operational efficiency and accuracy. Zoho CRM incorporates lead management, marketing automation, contact management, multi-channel forecasting, territory management and a host of other capabilities. One advantage of this software is that it has a conversational AI interface, which can support users by predicting lead and deal success, offering a voice assistant, and suggesting tasks to be automated based on behavior analysis. Finally, Monday.com is a very versatile program that allows small and medium sized businesses to improve coordination between teams using a visual and collaborative cloud-based approach. It features a great deal of customization by allowing companies to choose from various modules for project management, tasks, people, campaign management, bug tracking, CRM, PLM, marketing and more.

IV. ERP SOFTWARE MARKET ANALYSIS

By using the same of analysis criteria as in the CRM software category, the "Discrete ERP Software" category on g2.com will be considered. Discrete ERP software manages most operational and back-office activities of manufacturing companies that produce distinct or individually separated products. Discrete ERP systems are used to plan, manage, and track production activities as well as other related processes such as inventory management, sales, purchasing, or accounting [18]. Discrete ERP software can be delivered as a standalone solution or as a package combining multiple solutions. Many vendors also provide a core package and additional modules that can be bought separately. This type of software needs to integrate with other enterprise software such as CRM software, supply chain suites, PLM software, and HR management suites. Again, by intersecting data from the websites listed above, the authors selected 5 ERP software available on the market for small and medium-sized enterprises and startups (Fig. 3). Acumatica Cloud ERP is designed primarily for mobile and telecom-muting scenarios and is easily integrated with third-party collaboration tools. The main

features include online accounting, finance, distribution, manufacturing, e-commerce, business intelligence and CRM. All are fully usable from mobile devices, enabling access from anywhere and on any device using a browser. Acumatica's versatility also includes choice of deployment location and licensing options. An added benefit is that pricing is determined by the resources used, not the number of users. Odoo is an open-source software that is fully integrated, customizable and packed with hundreds of business applications designed by experts, which include CRM, sales, projects, production, inventory and accounting. NetSuite ERP is a cloud-based software that allows companies to automate and centralize processes across departments. At its core, we find features such as financial management, distribution, CRM, and supply chain management. Moreover, this software is highly customizable and has a relatively low cost of ownership due to its automated software maintenance. It also provides real-time data insights through workflows and includes the ability to build dashboards.

ERP indicators and benefits

Author	Acumatica	Odoo	Oracle NetSuite	SAP Business One	SAP Business ByDesign
Price	N/D	From 20\$/user/month	from 499\$/user/month	N/D	from 17\$/user/month
g2 users ease of use	84/100	85/100	80/100	88/100	79/100
g2 users ease of setup	75/100	76/100	70/100	83/100	79/100
Key features	Increased Productivity Centralized Database Support for Multiple Currencies	Modularity Order optimization Accessibility	Real-Time Analytics Real-Time Analytics Project Accounting	Financial Management Customer and Sales Management Purchasing and Inventory	Financial Management CRM 360 View Project Management
More used in companies with n. of employees	2-500+	< 1000	51 - 1000+	51 - 1000	51-500
Mobile App	X	X	X	X	X
Integrated external software	"More than 267 third-party	" Around 900 third-party	N/D	N/D	N/D

Fig. 3. Authors' choice of ERP software for small SMEs and startups.

SAP Business One Solution offers a cost-effective way to manage the entire business from accounting and finance, purchasing, inventory, sales and customer relations, project management, operations and human resources. With its applicative, it also allows users to streamline processes and gain greater business insight to help drive profitable growth. SAP Business ByDesign is a single, integrated solution that provides clear visibility into all business operations. This solution is mainly designed for small and medium-sized companies and, thanks to its excellent scalability, it allows companies to obtain numerous features adaptable to the type of

industry. These include finance management, sales and customer management, purchasing and inventory control, production planning, etc.

V. PLM SOFTWARE MARKET ANALYSIS

As done previously, all of the results from various websites are compared in order to get the most truthful result possible. For this category, however, Gartner's Magic Quadrant report is not available. In order to have different terms of comparison, the G2 Grid® and the grid of the 2021 Capterra Shortlist have been taken into account for this software category. By re-intersecting data from g2.com, capterra.com, and selecthub.com, it was then possible to identify 5 PLM software appropriate for a SME or a startup (Fig. 4). Arena PLM is a software that allows companies to keep their supply chain under control. In fact, it enables internal teams and supply chain partners to collaborate more effectively from initial design to mass production. Odoo was already described earlier. OpenBOM is a network-based digital platform that enables product data management and connects manufacturers and supply chain networks. This software provides seamless management of parts (items), item masters (catalogs), documents, BOMs, suppliers, scheduling, and purchase orders. Thanks to the cloud connection, it is possible to connect the various data silos in the organization (CAD, BOMs, POs, ERP/PLM and more) into a single process.

PLM indicators and benefits

Author	Arena PLM	Odoo MRP	OpenBOM	Unchain PLM	Siemens Teamcenter
Price	N/D	24\$/user per month	From 0 to 450\$/user per month	from 19.95\$	N/D
g2 users ease of use	84/100	85/100	81/100	86/100	69/100
g2 users ease of setup	85/100	85/100	77/100	77/100	51/100
Key features	BOM, Document, change, item, project management	BOM, Data, production, supplying management	Effortless integrations (CAD, PLM, ERP) Data Sharing Purchase Planning	Multi CAD, Data, BOM, document, change, project, product management	BOM, change, document, manufacturing materials, costs management
More used in companies with n. of employees	51-1000	< 50	< 50	< 1000	51 - 1000+
Integrated external software	N/D	Around 900 third-party software, modules are free or can be purchased separately	Around 25 third-party software	Very high	High

Fig. 4. Authors' choice of PLM software for small SMEs and startups.

Unchain is a cloud-based product data management and product lifecycle management software all in one. It

allows users to manage workflows by controlling processes to keep projects moving across organizations. With its high level of integration with Autodesk and third-party software, teams can work with the CAD and business tools they are already familiar with, avoiding wasted time converting data. Teamcenter software is a product lifecycle management system with high versatility, not only towards Siemens's software, but also with third-party software. This system allows to connect the digital world of the product creation process directly with the physical world of the machines used for the development of the product itself, thus ensuring a high level of coordination between all departments of the company.

VI. CONCLUSIONS AND DISCUSSION

The acquisition of companies' software is not just a technical issue but also an important strategic one. The acquisition of applications software could have profound implications on a number of vital business variables such as the productivity, the quality of the output of the production or services process and the customers' satisfaction, affecting thus the organization's competitive position. From a practical point of view, understanding the risk factors of implementation prevents SMEs from incurring additional costs. Risks decrease significantly with the choice of an appropriate IT system that gives flexibility to SMEs' business processes and objectives. The difficulty in the selection process arises when the classification of alternatives is not possible only on the basis of the results of financial analysis. This requires the identification of criteria and the inclusion in the selection process of scalability gain through significantly improved agility to respond to rapidly changing business conditions (ability to be flexible without losing a capital investment). These are costs that are not easily measurable for inclusion in the financial analysis but could have a major impact on the final selection. A proper approach, often used for similar decisions making problems, is the structuring of an Analytic Hierarchy Process (AHP). This consists in a systematic method for dealing with complex decision-making problems in which many competing alternatives (projects, actions, scenarios) exists [25]. The alternatives are ranked using several quantitative and/or qualitative criteria, depending on how they contribute to achieve an overall goal.

The selection of the supporting IT technology requires the evaluation of many alternatives that can vary enormously from the type of company, its stage of maturity (number of employees, market presence, available funds, etc.), as well as the sector from which it comes. The approach, risks, and market analysis proposed in this framework can help assess critical issues encountered during the implementation process; in addition, the variables and business needs presented can facilitate the focus on a particular type of product.

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