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SMEs: ERP or Virtual Collaboration Teams

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Abstract

Small firms are indeed the engines of global economic growth. Small and Medium Enterprises (SMEs) play an important role to promote economic development. SMEs in the beginning of implementing new technologies always face capital shortage and need technological assistance. Available ERP systems do not fulfil the specific requirements of Small firms. SMEs has scarce resources and manpower therefore many SMEs don't have the possessions to buy and operate an ERP System. On the other hand competition and competitiveness of SMEs have to be strengthened. This paper briefly reviews the existing perspectives on virtual teams and their effect on SMEs management. It also discusses the main characteristics of virtual teams and clarifies the differences aspects of virtual team application in SMEs. After outlining some of the main advantages and pitfall of such teams, it concentrates on comparing of ERP and virtual collaborative teams in SMEs. Finally, it provides evidence for the need of "Software as a Service (SaaS)" where an application is hosted as a service provided to customers across the web for SMEs as an alternative of ERP. It has been widely argued that ERP disadvantage in SMEs such as administrative expenditure and cost, isolated structure, severe lack of software flexibility, insufficient support of SMEs business and high operating cost, lead SMEs to use virtual collaborative team which is net work base solution.

Keywords

Virtual teams, Small and medium enterprises, ERP, Collaboration

Introduction

SMEs are a major part of the industrial economies [1, 2]. Their survival and growth has therefore been a prominent issue. Beck et al.[3] found that a strong, positive association between the importance of SMEs and GDP per capita growth. SMEs can successfully enter the global market if they can fulfill the customer needs regarding features and quality of products [4]. SMEs' survival depended on their capability to improve their performance and produce goods that could meet international standards [5]. In other words, a certain level of competitiveness may be a prerequisite for an SME's survival when dealing with dynamic conditions in the business environment. To compete with global competition and, overcome rapid technology change and product variety proliferation in the new manufacturing environment, SMEs must be able to sustain product innovation [6]. Internationalization holds much potential for the growth of SMEs [7]. One very important trend to enable new knowledge creation and transfer in and to SME's is the development of collaborative environments and networks to increase their innovation capabilities as a single unit but also the capabilities of the network as a whole through collective learning [8].The SMEs are one of the sectors that have a strong potential to benefit from advances in ICTs and the adaptation of new business modes of operation.

The combination of explosive knowledge growth and inexpensive information transfer creates a fertile soil for unlimited virtually invention [9]. The use of ICTs can be considered as key factors for innovation and entrepreneurship. ICTs are a must for SMEs to innovate [10]. Web resource services can help the enterprises to get external service resources and implement collaborative design and manufacturing [11]. ERP has administrative expenditure and cost, isolated structure, severe lack of software flexibility, insufficient support of SMEs business and high operating cost as a consequence SMEs lead to use virtual collaborative team which is net work base solution. In different point of view international collaboration is becoming increasingly important in creating the knowledge that makes research and business more competitive. Responding to the increasing de-centralization and globalization of work processes, many organizations have responded to their dynamic environments by introducing virtual teams. Virtual teams are growing in popularity [12]. Additionally, the rapid development of new communication technologies such as the Internet has accelerated this trend so that today, most of the larger organization employs virtual teams to some degree [13].

This paper briefly reviews and summaries the key finding of the existing perspectives on virtual teams and their effect on SMEs. It also discusses the main characteristics of SMEs, virtual teams and clarifies the differences aspects of virtual team application in SMEs. After outlining some of the main advantages and pitfall of such teams, it concentrates on comparing of ERP and virtual collaborative teams in SMEs. This paper would help researchers, managers and policy makers to better foster virtual teams in SMEs.

Virtual Teams

The concept of a "team" is described as a small number of people with complementary skills who are equally committed to a common purpose, goals, and working approach for which they hold themselves mutually accountable [14]. It is worth mentioning that virtual teams are often formed to overcome geographical or temporal separations [15]. Virtual teams work across boundaries of time and space by utilizing modern computer-driven technologies. The term "virtual team" is used to cover a wide range of activities and forms of technology-supported working [16]. Gassmann and Von Zedtwitz [17] defined "virtual team as a group of people and sub-teams who interact through interdependent tasks guided by common purpose and work across links strengthened by information, communication, and transport

technologies.” Another definition suggests that virtual teams, are distributed work teams whose members are geographically dispersed and coordinate their work predominantly with electronic information and communication technologies (e-mail, video-conferencing, telephone, etc.) [13], different authors have identified diverse. Amongst the different definitions of the concept of a virtual team the following from is one of the most widely accepted: [18], “virtual teams as groups of geographically, organizationally and/or time dispersed workers brought together by information technologies to accomplish one or more organization tasks”.

Characteristics of virtual teams:

Virtual teams reduce time-to-market [4, 19-28]. Lead time or time to market has been generally admitted to be one of the most important keys for success in manufacturing companies [20]. Time also has an almost 1:1 correlation with cost, so cost will likewise be reduced if the time-to market is quicker [29]. Virtual teams overcome the limitations of time, space, and organizational affiliation that traditional teams face [30] and reducing relocation time and costs, reduced travel costs [21, 31-39]. Virtual teams overcome the limitations of time, space, and organizational affiliation that traditional teams face [30]. One of the most important of employ virtual R&D team is able to tap selectively into center of excellence, using the best talent regardless of location [12, 34, 35, 40-44].

Virtual team also, respond quickly to changing business environments [25, 33], able to digitally or electronically unite experts in highly specialized fields working at great distances from each other [45], more effective R&D continuation decisions [46], most effective in making decisions [47, 48], provide greater degree of freedom to individuals involved with the development project [35, 43, 49], Greater productivity, shorter development times [25, 31], Producing better outcomes and attract better employees, Generate the greatest competitive advantage from limited resources [32, 50, 51], Useful for projects that require cross-functional or cross boundary skilled inputs [52], Less resistant to change [53], Facilitating transnational innovation processes [17, 35], higher degree of cohesion (Teams can be organized whether or not members are in proximity to one another) [54, 55], Evolving organizations from production-oriented to service/information-oriented [53] and Provide organizations with unprecedented level of flexibility and responsiveness [18, 22, 26, 30, 39, 56]. Beside these advantages virtual teams are self-assessed performance and high performance[57, 58], employees perform their work without concern of space or time constraints[59], optimize the contributions of individual members toward the completion of business tasks and organizational goal [41], reduce the pollution [60], manage the development and commercialization tasks quite well [61], Improve communication and coordination, and encourage the mutual sharing of inter-organizational resources and competencies [62], employees can more easily accommodate both personal and professional lives [12], cultivating and managing creativity [43, 63, 64], facilitate knowledge capture and sharing knowledge, experiences [28, 42, 45, 65], Improve the detail and precision of design activities [66], Provide a vehicle for global collaboration and coordination of R&D-related activities [67], Allow organizations to access the most qualified individuals for a particular job regardless of their location[56] and Enable organizations to respond faster to increased competition[56, 68].The ratio of virtual R&D member publications exceeded from co-located publications[69] and the extent of informal exchange of information is minimal [70, 71]. Virtual teams have better team outcomes (quality, productivity, and satisfaction) [30, 55, 72], Reduce training expenses, faster learning[43, 64] and finally greater client satisfaction[73].

As a drawback, virtual teams are particularly vulnerable to mistrust, communication break downs, conflicts, and power struggles [45, 74-76].Sometimes requires complex technological applications[33, 43] and have lack of physical interaction [21, 32, 47]. Virtual teams comprise challenges of project management [43, 77, 78], determining the appropriate task technology fit [43, 79-81], managing conflict [30, 79, 82, 83] and technophobia (employees who are uncomfortable with computer and other

telecommunications technologies) [60]. Cultural and functional diversity in virtual teams lead to differences in the members thought processes therefore develop trust among the members are challenging [21, 43, 58, 67, 78, 80, 81, 84, 85]. Variety of practices (cultural and work process diversity) and employee mobility negatively impacted performance in virtual teams[57] and Team members need special training and encouragement [86].

Small and Medium Enterprises (SMEs):

Importance of SMEs:

Acs, et al.[87] argued that small firms are indeed the engines of global economic growth. Small and Medium Enterprises (SMEs) play an important role to promote economic development. SMEs in the beginning of R&D activities always face capital shortage and need technological assistance. In most countries, SMEs dominate the industrial and commercial infrastructure [88]. More importantly SMEs play an important role in foreign direct investment (FDI) [89]. Many economists believe that the wealth of nations and the growth of their economies strongly depend upon their SMEs' performance [90]. In many developed and developing countries, small and medium-sized enterprises (SMEs) are the unsung heroes that bring stability to the national economy. They help buffer the shocks that come with the boom and bust of economic cycles. SMEs also serve as the key engine behind equalizing income disparity among workers [91]. China's recent rapid growth is also linked to the emergence of many new small firms in village townships and in coastal areas, often in new industries [87].

SMEs and Virtual Teams:

To survive in the global economy SMEs have to improve their products and processes exploiting their intellectual capital in a dynamic network of knowledge-intensive relations inside and outside their borders[92]. SMEs need appropriate and up-to-date knowledge in order to compete and there is a strong need to create, share and disseminate knowledge within SME's [93]. Especially in the emerging and dynamic markets the shared knowledge creation and innovation may speed up market development [94]. Most firms today do not operate alone; they are networked vertically with many value-chain partners [9]. The typical Taiwanese production system is a cooperative network of SMEs that are extremely flexible and respond quickly though under-capitalized and sensitive to market demand and highly integrated in the global economy [95]. Strategic alliance formation has been touted as one of the most critical strategic actions that SMEs must undertake for survival and success [96]. Gassmann and Keupp [97]found that managers of SMEs should invest less in tangible assets, but more in those areas such as R&D that will directly generate their future competitive advantage.

Virtual teams in SMEs

Most SMEs are heavily reliant on external sources, including customers and suppliers, for the generation of new knowledge [98]. SMEs of all sizes must reach out into their external environment for necessary resources [96]. In the present era of globalization it is obvious that the survival of the SMEs will be determined first and foremost by their ability to manufacture/supply more, at competitive cost, in less delivery time, with minimum defects, using fewer resources [99]. In order to face this challenge SMEs reinforce to create synergies that allow firms to overcome difficulties and succeed. Web resource services can help the enterprises to get external service resources and implement collaborative design and manufacturing [11].

The Major Characteristics of SMEs

In order to have a better understanding of SMEs behavior, a brief knowledge of the characteristics of SMEs is a must therefore the major characteristics of SMEs are listed in the Table 1 and Table 2 (These are generalizations, and not all may hold true for every SMEs.). The SME is not a scaled-down version of a large company. It has different characteristics that distinguish them from large corporations and that can of course change across different countries and cultures; they are generally independent, multi-tasking, cash-limited and based on personal relationships and informality , as well as actively managed by the owners, highly personalized, largely local in their area of operation and largely dependent on internal sources to finance growth [100].

Table 1: some of the major advantages of SMEs

Advantages	Reference
Generally dominated by the entrepreneur (owner-manager)	[98, 101-105]
Able to respond quickly to customer requests and market changes, Customers focused	[98, 101, 106-109]
Flexible and fast-response to change, easily adaptive to new market conditions , dynamic in behavior, developing customized solutions for partners and customers	[88, 101, 110-115].
Concentrated production and sales in their home country	[100, 110].
More extensive use of external linkages for Innovate.	[116, 117]
Un bureaucratic processes, flat and flexible structures	[88, 99, 101, 118-121]
Strong inter and intra-firm relationships , managing a great amount of information	[122, 123]
Creating astute alliances, networking	[121, 124-126]

Table 2: some of the major disadvantages of SMEs

Disadvantages	Reference
Scarce resources and manpower	[6, 7, 88, 111, 112, 120, 124, 126-134]
limited degree of information technology (IT) implementation	[2, 92, 99, 102, 105, 127, 135]
Strategy formulation on the basis of what available, lack a long run perspective	[5, 134]
Rely on outdated technology, labor intensive and traditional management practices	[3, 88, 130]
Lagging in the export, lack the resources necessary to enter foreign markets	[132, 136]

ERP or Web Base Collaborative

The internet, incorporating computers and multimedia, has provided tremendous potential for remote integration and collaboration in business and manufacturing applications [137]. A web-based collaborative product design platform is enables authorized users in geographically different locations to have access to the company's product data such as product drawing files stored at designated servers and carry out product design work simultaneously and collaboratively on any operating systems [138]. It is hard to allocate funding and to design infrastructures and software to support virtual team working [57]. Despite computers' widespread use for personal applications, very few programming frameworks exist for creating synchronous collaborative applications [139]. The integrated system can effectively support a dispersed team [140].

New trend in software will have full-fledged “Software as a Service (SaaS)” where an application is hosted as a service provided to customers across the web. Software as a Service reduce implementation barriers common to smaller manufacturing by offering low total cost of ownership, fast and easy adaptation and lower barriers to entry because of SaaS need fewer IT resources. Compare with ERP disadvantage such as administrative expenditure and cost, isolated structure, severe lack of software flexibility, insufficient support of SMEs business and high operating cost, SMEs willing to use SaaS and virtual collaborative team which is net work base solution. On the other hand Kohand and Simpson[141] argued that ERP systems could create a competitive advantage for SMEs.

Conclusion

It has been widely argued that ERP disadvantage in SMEs such as administrative expenditure and cost, severe lack of software flexibility, insufficient support of SMEs business and high operating cost, lead SMEs to use virtual collaborative team. The employed Web Services technology, although very popular nowadays but it is still not mature enough, so dealing with it can bring new findings. A comprehensive study, combining literature survey with case study would now seem to be essential to examine ERP and virtuality solution and compare them practically. Such a study would provide an assessing what patterns, practices, or types of activities must SMEs virtual teams carry out to achieve effective growth?, What types of process structure and technology support should be provided for facilitating such teams? , What different Methods of virtual team in SME’s are uses today and how effective are they? and What benefits and problems arise as a consequence of the creation of virtual team in SMEs or extending the ERP system?

While some studies have been conducted on model usage in large companies, applications within SMEs remain largely un-documented. Evidence shows management of virtual team in SMEs is largely in its infancy. Hence it is vital to bridge this gap and unlock growth opportunities for SMEs through research, and help them carry out or outsource research in order to develop new technology based products, processes and services, exploit research results, acquire technological know-how and train their employees to incorporate SMEs. Implementing a new paradigm has a major obstacle ahead therefore setting-up an infrastructure for virtual team in SMEs still requires a large engineering effort especially design a proper Web base collaborative system and a series of SaaS in preference to ERP.

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