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Significance of globalization-specific factors for SME competitiveness: a conceptual model and an empirical test

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ABSTRACT

On the basis of existing theory we suggest two main types of factors for SME competitiveness. The first type is comprised of the basic factors, including internal, external and entrepreneur-related factors, all well-defined and discussed in the IO and RBV approach and the configuration theory as well. The second type consists of globalization-specific factors, referring to the innovation related processes as a response to the globalization challenges (innovation, internationalization, ICT and quality standards adoption, etc.). Our main research question is: Do globalization-specific factors have a significant impact on SME performance in times of crisis and post-crisis recovery? Using the two types of factors, we develop a conceptual model explaining their role for SME performance. We suggest that globalization-specific factors determine SME performance, and that the configurations of the two types of factors differ in times of crisis and post-crisis recovery. Research hypotheses are tested through construction of indexes for competitiveness and logit models using data on Bulgarian SMEs for two periods – one of economic crisis, and another of post-crisis recovery. Empirical evidence confirms significant impact of globalization-specific factors in period of post-crisis recovery only. Our findings show that the configuration of basic and globalization-specific factors with respect to business success is dynamic: in times of crises globalization-specific factors have no significant impact while basic factors have dominant role. In times of post-crises recovery both factors seem to be equally important for SME performance.

Keywords: SMEs, competitiveness, basic factors, globalization-specific factors, configuration, crisis, post-crisis recovery.
1. INTRODUCTION

Research on competitiveness in the microeconomic setting focuses predominantly on large firms. At the same time, research on small and medium-sized enterprise (SME) competitiveness tends to be limited, particularly in the context of globalization. This research gap widened as economic globalization created new challenges affecting the validity of the traditional models of firm competitiveness at the SME level. Also, the relative importance of some SME competitiveness factors increased substantially (OECD, 2000), thus the need for alternative modelling approaches emerged. In a globalizing economy, there is a new role for information and communication technologies (ICT), quality standards, networking and clustering, innovations, intellectual property management, and internationalization, therefore strategies to enhance small business development have to take greater account of them. Despite the fact that those factors became critical for SME competitiveness in the global environment, there is still insufficient knowledge on how their effects differ depending on the phase of the business cycle.

Advancing the understanding of those factors will help entrepreneurs and policy makers to take context-specific measures to improve SMEs performance. This is particularly important for the competitiveness of European SMEs, which account for 98.8% of all enterprises, two-thirds of employment, and 58.4% of gross value added (GVA) in the private sector (EC 2011: 2-3). The modest recovery in 2010 showed that the export performance and the innovative capacity of an economy are intrinsically linked to a Member State’s SME sector performance (EC 2011: 39-40). At the same time, the competitive potential of many European SMEs continues to suffer from insufficient access to finance for risky projects, expensive procedures for intellectual property protection, small share of attracted public means for staff training, etc. (Blackburn & Wainwright, 2010).

Competitiveness is a multidimensional construct, which includes a combination of factors that determine the firm’s performance. A framework of different competitiveness models in terms of assets and processes was presented by Ambastha & Momaya (2004: 57) but, because of its complexity, it is difficult to utilise a common definition of competitiveness. Additionally, the existing global competitiveness indices refer to the national and not to the firm level. The European Commission (EC) defines firm competitiveness as an “ability of firms to sustain and gain in market share through their cost and pricing policy, innovative use of production factors and novelties in product characteristics” (EC, Competitiveness proofing). At the firm level, “technology development and innovation (of business products and/or processes) are of primary importance for both the cost and quality competitiveness of products” (EC, Competitiveness proofing). The findings of the European SMEs report for 2011/2012 underlined the importance of hi- and medium-tech manufacturing as well as of knowledge-intensive sectors industries (Ecorys 2012: 11).

The major theories which seek to explain firm-level competitiveness are the structure, conduct and performance (SCP) paradigm (being at the nucleus of industrial organization theory, IO), the resource-based view (RBV), and the configuration theory (CT). Building on these theories, our research aims to further develop the understanding of SME competitiveness factors while paying particular attention to key globalization-specific factors.

The paper is structured as follows: literature review, followed by research methodology, results, and conclusion. The Appendix provides further technical explanations of indexes and econometric models used.
2. REVIEW OF LITERATURE AND OUTLINE OF BASIC AND GLOBALIZATION-SPECIFIC FACTORS FOR SME COMPETITIVENESS

Within the framework of IO theory, M. Porter (1998) developed the concept of five market forces influencing firm competitiveness: 1) bargaining power of buyers; 2) bargaining power of suppliers; 3) threat of new entrants; 4) threat of substitute products; 5) competitive rivalry within an industry. Firms’ objectives are to achieve advanced product differentiation and efficient cost structures as two key competitive advantages.

In a sense, RBV is opposite to the IO paradigm by focusing upon the firms’ tangible and intangible resources as the most important sources of competitiveness (Wernerfelt, 1995). Firms have advantages if their resources are valuable, rare, immobile, and non-substitutable (Barney, 2001); if they have capabilities to combine resources in a unique way; and if they continuously improve their resources and capabilities base (Peteraf, 1993). According to some authors, intangible resources affect more significantly firm success (Mathur et al., 2007). In the new global environment, the employment of skilled workforce, and the possession of unique know-how, patents, trade-mark, brands, customer focus, etc. seems to be more important (Lev, 2004: 109). Prahalad and Hamel (1990: 81) introduced the term “core competencies” to describe the key strategic capabilities of “how to coordinate diverse production skills and integrate multiple streams of technology”. RBV developed a more dynamic perspective named “dynamic capabilities” (Eisenhardt & Martin, 2000).

If Porter’s framework reveals mainly the external (industry-level) characteristics, RBV underlines the role of the firms’ internal resources. For the emerging and transition economies, the institutional factors (as part of the external factors) grew in importance, too (Welter & Smallbone, 2011). Based on the complexity of the competitiveness drivers, many authors adopted combinations of the two theories. As Sarasvathy (2004) pointed out, there is a need to overcome the separation of analysis of internal and external factors on performance, and work towards their integration. Others proposed to combine Porter’s model, RBV, and core competencies into the theory of competences-based strategic management (Sanchez & Heene, 2004). The need to combine external and internal factors led some authors to the configuration theories. Miller (1996: 508-509) stated that both the competitive analysis framework and RBV can be extended by searching for the most successful configurations of organizational elements. The comparison of different approaches led Michor et al. (2010: 2) to conclude that “the configuration approach is best suited to analyze and model the performance of new ventures and SMEs” because it reflects the holistic nature of enterprises (Harms et al., 2009). A major disadvantage of the configuration approach, however, is the limited number of the variables which can be selected for each combination (Szerb & Ulbert, 2009: 110). The simultaneous use of these paradigms can be justified by the fact that both the SCP approach and RBV agree in their recommendations that companies should be innovative by creating unique combinations of resources and capabilities (Grant, 2002: 139; Porter, 2004: 123).

Many researchers focus on a selected competitiveness factor such as: ICT adoption (Simpson & Docherty, 2004); networking (Álvarez et al., 2009); innovation (Rosenbusch et al., 2010); internationalization (Williams & Shaw, 2011) etc., and only a limited number consider several factors at once. Relatively complex models of SME competitiveness factors were developed by Man et al. (2002), Sirikrai & Tang (2006), and others. The model of Man et al. (2002: 131) covers four constructs of SME competitiveness (external factors, internal factors, entrepreneur profile, and firm performance); three competitiveness dimensions (potential, performance,
process), and four competitiveness characteristics (durability, controllability, relativity, and dynamism), but it has not been tested empirically. Sirikrai & Tang (2006: 74, 78) proposed a framework of competitiveness which combines external drivers (IO-based factors), internal drivers (RBV-based), and financial and non-financial firm’s performance indicators. The external factors were divided into industry conditions and governmental roles, while the internal factors were mainly operational. The model of Toppinen et al. (2007: 386-387) considered: resources and capabilities, marketing strategies and industry key factors. Szerb & Terjesen (2010: 8) proposed configurations of seven factors, five of which were internal (physical resources, administrative routines, networking, human resources, and innovation), and two were external (supply and demand conditions). Chew et al. (2008) built up a framework for the Chinese SMEs’ competitive strategies, which included strategic alliances, innovation and differentiation. Yan (2010) showed the significance of cost reduction, differentiation, innovation, strategic alliances and the environment. All suggested models combine different factors of SME competitiveness without differentiating the effects of globalization-specific factors reflecting major changes in the operating environment. As Singh et al. (2008: 536) observed, the “holistic approach has not been adopted to analyse the competitiveness. Researchers analysed certain aspects of competitiveness in isolation”.

Following the above, the factors for the small firm competitiveness can generally be classified as external, internal, and ones specific to the entrepreneur profile. The first group includes the market forces of the IO-based theory combined with institutional factors. The second group encompasses internal resources and capabilities of the RBV approach. The third group covers the abilities of entrepreneurs. These factors are indispensable for the functioning of each enterprise. Their basic combinations assure the firm’s everyday activities, its ordinary reproduction and its equilibrium in the everyday business. Here, we will generally refer to those three groups of factors as basic factors.

Unlike them, a second group of factors, addressed here as globalization-specific factors for SME competitiveness, can be regarded as innovation-related processes with a global impact upon a broad range of businesses. As such globalisation-specific factors depend on specific combinations of firms’ internal, external, and entrepreneurial resources and capabilities. They reveal not the primary combination of resources as in the classical production function, nor small gradual improvements. They belong rather to the “residual element” of this function, where economists left technological progress, innovations, and other important firm’s capabilities. The significance of these factors stems from the fact that they indicate the new opportunities to combine and recombine further the firms’ resources and capabilities in response to environment changes. Their distinguishing feature is that they are related to organizational change, and as such they are close to the concept of dynamic capabilities.

«Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die» (Eisenhardt & Martin, 2000: 1107).

Zahra et al. (2003: 166) noted also that:

«... resources per se are not as strategically important as what the firm does with these resources... The leveraging of tangible resources with intangible resources allows for
unique combinations that are not only rare because they incorporate the firm’s specific assets but also because the inclusion of intangible resources creates an invisible dimension to the bundle of resources that makes it inimitable and non-substitutable.»

Here the concept of dynamic capabilities approximates the configuration approach as both paradigms underline the importance of configurations of firm’s resources and capabilities. These configurations may be seen as particular organisational genomes. Entrepreneurs introduce new combinations of production factors in the form of: new product, higher quality of an existing product, new production method, new market, new sources of raw materials, or new organization in the sector (Schumpeter, 1934). Today, we might add to these the adoption of ICT, international quality standards, internationalization (as new foreign markets, Jansson & Sandberg, 2008), etc. Although there are some common determinants of most of the globalisation-specific factors, the latter are distinctive due to their own specific determinants. Each innovation depends on internal factors such as strategy, organizational routines, human capital, etc. (Wang et al., 2010); external factors such as industry sector, regulations, access to finance (Galankis, 2006: 1231); and factors linked to the entrepreneur’s characteristics: learning, market orientation, etc. (Masurel et al., 2003). Therefore, the basic factors are fundamental for the development of globalisation-specific factors. If we consider SME development over consecutive periods of time, we may find an interrelationship between basic and globalization-specific factors consisting of the following: on the one hand, basic factors determine success or failure of any innovation. On the other hand, once an innovation is accomplished, it leads inevitably to a subsequent change in basic factors (re-organization of technological process, development of new skills related to the innovation through staff training or hiring, etc.). Therefore, it could be considered that present structure and contents of basic factors are result of previous efforts, including efforts in innovations. In the same time, basic factors determine present attempts to innovate, which again, following a chain re-action, re-shape SME basic factors in future periods. Further analysis on their causality could lead to a conclusion that in the present period basic and globalisation-specific factors might be referred to as first-order and second-order factors for SME competitiveness3.

3. RESEARCH QUESTION, CONCEPTUAL MODEL AND HYPOTHESIS

Although most of the globalization-specific factors are viewed as adequate responses of the SMEs to the new environment, the above models do not account for their relative importance. Besides, these models are applied to periods of economic growth and do not consider changes in factors’ configurations pertaining to periods of economic crises or post-crisis recovery. The present article’s aim is to contribute to filling these gaps by offering an answer to the following question: “Do globalization-specific factors have a significant impact on SME performance in times of crisis and post-crisis recovery?”

On the basis of the SCP/ IO and RBV approaches, as well as the configuration theory, we suggest a conceptual model depicting the configuration of the basic and globalization-specific factors for SME competitiveness (Fig. 1).

The role of the basic factors in the model is as follows: they are fundamental for the successful SME performance, and they also determine globalization-specific factors within the firm. The
nature of the relationship between basic and globalization-specific factors is suggested on the basis of previous research findings as discussed above, but this relationship is not analysed here.

Figure 1. Configuration of basic and globalization-specific factors in determining business performance

Similarly to the situation in the large enterprises, the globalization-specific (or innovations-based) factors, are crucial for obtaining sustainable competitive advantages, which have not been usually related to SMEs before the globalization, but nowadays are of significant importance for SMEs competitiveness. Thus, business results of SMEs depend on both basic and globalization-specific factors. Here, we attempt to find evidence for the configuration of the two types of factors with respect to their impact on SME performance during the recent global economic crisis, as well as to track the changes emerging during the observed economic recovery. The hypotheses, which are tested with data sets on SMEs and their performance for each of the two periods, are as follows:

**H1:** Globalization-specific factors have a significant impact on SME performance.

**H2:** The configurations of the two types of factors with respect to business performance differ in times of crisis and post-crisis recovery.

Previous research has shown that globalization-specific factors are crucial for large companies; therefore we assume they have a significant impact on SME performance as well. Since theory and empirics have not prescribed which of the two types of factors has a leading role, we assume they are of equal importance. We assume that there may be variations in the configurations of the two types of factors regarding SME performance in the different phases of the business cycle, but existing research does indicate neither such variations, nor what the nature of such variations might be in periods of prosperity or recession, etc. Hypothesis testing for the two periods takes this restrictive assumption into account.
4. DATA AND EMPIRICAL METHODOLOGY

Data from the annual SMEs surveys conducted in the beginning of 2011 and 2012 for the Bulgarian Small and Medium Enterprises Promotion Agency are used. The 2011 survey was focused on the competitiveness and performance of the Bulgarian SMEs in 2010 - a year of economic crisis. The 2012 survey kept the same focus but the reference period was 2011, when a modest economic recovery was observed. The sample description for the two waves is provided in table 1 below.

Table 1. Sample description

<table>
<thead>
<tr>
<th>Year</th>
<th>Sample size</th>
<th>Firms’ size</th>
<th>Field of economic activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Micro</td>
<td>Small</td>
</tr>
<tr>
<td>2011</td>
<td>300</td>
<td>89%</td>
<td>9%</td>
</tr>
<tr>
<td>2012</td>
<td>300</td>
<td>89%</td>
<td>9%</td>
</tr>
<tr>
<td>Core sample</td>
<td>250</td>
<td>89%</td>
<td>9%</td>
</tr>
<tr>
<td>Booster on bigger SMEs</td>
<td>50</td>
<td>-</td>
<td>53%</td>
</tr>
</tbody>
</table>

Source: 2011 and 2012 Annual SMEs Survey, Bulgarian Small and Medium Enterprises Promotion Agency

Based on the conceptual model presented above, questions about business performance and activities related to SME competitiveness were formulated and used in both survey waves. Business success can be measured through various financial and non-financial indicators, though the literature does not identify a generally accepted list of variables. Here, SME performance is measured through the usage of dummy variables (lack of decrease in sales vs. decrease in sales). Standard questionnaire was used covering questions on the implementation of activities related to SME competitiveness and provided answers were used to construct indexes for seven factors for SME competitiveness: (1) innovations; (2) internationalization; (3) trademarks and patents; (4) information and communication technologies; (5) business and marketing strategies; (6) human resources development; (7) access to finance. Indexes were constructed as ratio between the sum of individual scores and the maximum sum of scores of the constitutive items, and multiplied by 100. Index values vary from 0 to 100 so that the close the values to 100 are, the better developed is the relevant factor. The empirical testing of the formulated model is done using a limited number of basic and globalisation-specific factors, namely:

- **Basic** factors: human resource development, implementation of business and marketing strategies, and size of company (internal factors); access to finance (external factor); age, education and gender of the entrepreneur (entrepreneur profile);

- **Globalization-specific** factors: innovation activities, internationalization, ownership of trademarks and patents, and usage of information and communication technologies.

The impact of the factors for competitiveness on business performance was estimated through logit models explaining the lack of decrease in sales. The acceptance or rejection of \( H_1 \) was based on the following relationship:

\[
D_i = c_i + \alpha_1 G_{1,i} + \alpha_2 G_{2,i} + \alpha_3 G_{3,i} + \alpha_4 G_{4,i} + u_{1,i}
\]
where \( D_i \) is a dummy variable, with a value of one indicating no decrease in sales of the \( i \)th firm, and a value of zero indicating the firm suffered a decrease in sales. \( G_j, j = 1, \ldots, 4 \) denotes the four *globalisation-specific* factors under consideration, \( c_1 \) is the intercept term, and \( u_{1,j} \) represents the stochastic error. Model (1) was estimated for the two periods considered. In addition, a similar specification for the basic factors was used:

\[
D_i = c_2 + \beta_1 B_{1,i} + \beta_2 B_{2,i} + \ldots + \beta_7 B_{7,i} + u_{2,i}
\]  

(2)

Where \( B_j, j = 1, \ldots, 7 \) denotes the seven basic factors under consideration, \( c_2 \) is the intercept term, and \( u_{2,i} \) is the stochastic error. Model (2) was also estimated for the periods of economic crisis and post-crisis recovery.

5. RESULTS AND DISCUSSION

5.1 Competitiveness of the Bulgarian SMEs

Using the survey data we have computed indices for competitiveness factors of the Bulgarian SMEs for the two periods of investigation. The index values were grouped into five intervals: low level [0, 20], rather low level (20, 40], average level (40, 60], rather high level (60, 80], high level (80, 100]. The distribution of index values is provided below (table 2).

<table>
<thead>
<tr>
<th>Factors for competitiveness</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Rather low</td>
<td>Average</td>
</tr>
<tr>
<td>1. G Innovations</td>
<td>80</td>
<td>11</td>
</tr>
<tr>
<td>2. G Internationalisation</td>
<td>95</td>
<td>3</td>
</tr>
<tr>
<td>3. G Trademarks and patents</td>
<td>94</td>
<td>4</td>
</tr>
<tr>
<td>4. G Information and communication technologies</td>
<td>74</td>
<td>15</td>
</tr>
<tr>
<td>5. B Access to finance</td>
<td>93</td>
<td>6</td>
</tr>
<tr>
<td>6. B Human resources development</td>
<td>10</td>
<td>53</td>
</tr>
<tr>
<td>7. B Business and marketing strategies</td>
<td>63</td>
<td>26</td>
</tr>
</tbody>
</table>

Notes: G – Globalisation-specific factor; B – Basic factor

Source: 2011 and 2012 Annual SMEs Survey, Bulgarian Small and Medium Enterprises Promotion Agency, own calculations

Each table cell contains the percentage of firms having the respective level of factor development. The data show that there was an overall improvement in the level of development of the *globalisation-specific* factors for competitiveness in 2011. In the beginning of 2012, index values shifted significantly to the right section of the distribution which accounts for higher level of competitiveness.

The factor-specific data show that there was an intensification of innovation activity. This could be explained mainly with the adoption of new organisation of production targeting cost
optimization. Nevertheless, in about 82% of SMEs in 2012 the innovation activity remained at low or rather low levels. The most innovative companies were medium-sized and small firms, most of them in manufacturing, while the least innovative ones were micro enterprises, most of them in trade. As other researchers have shown, the SMEs sector experienced an innovation management deficit (O’Regan et al., 2005).

Increased values of the internationalisation index corresponded to the improvements in the export position of the country in 2011-2012. According to the index values, 95% of the SMEs in 2011 and 78% in 2012 had a low level of internationalisation, while the rest had rather low or average levels. Companies with rather high or high levels of internationalization were observed only occasionally. The most internationalized were medium-sized and small firms, most of them in manufacturing\(^\text{11}\).

The higher index value for trademarks and patents could be explained by the partial improvement of the institutional environment and by the slight simplification of the index methodology in 2012. Humphrey & Schmitz (2002) demonstrated that SMEs could be more successful by developing higher quality or creating their own brands and trademarks. However, this is a difficult task in extremely competitive international markets. Index values indicate that 94% of the Bulgarian SMEs in 2011, and 73% in 2012, had low level of these activities. There were only isolated cases of high levels of such activities which could be explained with insufficient financial resources.

The higher level of usage of information and communication technologies followed the general trends of digitalisation of government and households. The role of the sector in ICT implementation corresponds to the data from other studies (e.g. Oliveira and Martins, 2010). However, their introduction to smaller businesses is hindered by various difficulties (Fabiani et al., 2005, Ramdani & Kawalek, 2007: 49). These practices were more developed in SMEs in bigger cities and less developed in smaller settlements, which data are in line with other findings (Forman et al, 2008).

Similarly to the globalisation-specific factors, in early 2012 the index values of the basic factors indicated a considerable progress in SME competitiveness.

Access to finance improved since an increased number of SMEs benefited from bank credits in addition to in-house cash and unincorporated sources of funding. In early 2011, financing was at low access levels for 93% of the SMEs, while in 2012 this share dropped to 69%. These findings correspond to the European Central Bank (ECB) data for 2010 and 2011, which showed difficulties in SMEs access to finance in the European Union (ECB, 2010, 2011). The biggest difficulties in financing were observed in micro enterprises, where the average index values were two times lower than in the medium-sized enterprises. Usually, banks grant credits to smaller firms under a higher interest rate and larger collateral because of higher information asymmetry, which makes small businesses prefer using internal funds (Klapper et al., 2006).

In general, SMEs offer less staff training, because they find costs to be higher than the expected return to training (Westhead & Storey, 1997: 63). Index values confirm a positive development in human resources. Two thirds of the SMEs provided some training for one or more of their employees, while 17% of them had various types of trainings for their management and staff. Other studies have also revealed the importance of human capital (Johnson et al., 1996). According to Warner (1996), “learning and innovation in modern economies are inextricably linked” (Warner, 1996: 348). Therefore, companies with limited resources (as SMEs) or
countries with limited natural endowments should invest in human capital as a strategy for competitive advantage (Chen et al., 2005).

Good practices in developing business and marketing strategies became implemented more often in the post-crisis period. While in the period of economic crisis 3% of the SMEs implemented such practices at a high level, in the post-crisis year 19% of them started using such intensively.

5.2 Empirical evidence on the configuration of basic and globalization-specific factors in the determination of business performance

The specified equations in model (1) and (2) were analysed through logit method of estimation. The acceptance of the hypothesis is done through a likelihood ratio (LR) test checking whether \( H_0 : \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0 \), and through the Hosmer-Lemeshow test (H-L test) which provides evidence whether there is a difference between observed and predicted values. The acceptance or rejection of \( H_1 \) was supported by standard measures of goodness-of-fit for logit models like specificity, sensitivity and percentage of correct predictions of the two specified equations. Using these goodness-of-fit measures, we try to identify whether one of the two types of factors has a dominant influence on SME performance, or both of them are of equal importance. Thus, we provide evidence for the configuration of basic and globalization-specific factors regarding sustaining the levels of firm’s sales. The estimation output is presented in table 5 in the Appendix. Table 6 and 7 in the Appendix contain additional information about the mean values of the explanatory variables (indexes for competitiveness) within each category of the dependant dummy variable (indicating for the business performance).

The econometric results for the period of economic crisis do not provide sufficient evidence to accept \( H_1 \). The LR test shows that there is joint significance of the coefficients in front of the globalization-specific factors but the probability of the H-L statistic is rather low and we cannot be sure whether actual and fitted values differ. In other words, there is some evidence that these factors affect business performance, but it is not sufficiently convincing to make a strong conclusion (Fig 2).

The individual significance of included factors is checked using the z-statistic (see the estimation output in the Appendix), though it has no direct relation to the research hypothesis. The only significant factor is innovation though its impact on business performance could be limited: the products and services of innovative firms are more expensive, and when incomes in the economy drop, the demand for and the sales of products of innovative firms may decrease (Esposito and Vicarelli, 2011). However, innovative firms experience stronger growth during periods of economic recovery and growth (see also Ecorys, 2012: 44).

Unlike in the above case, there is sufficient evidence to accept \( H_1 \) for the period of post-crisis recovery: both the LR and the H-L tests show the joint significance of the globalization-specific factors (Fig. 3).

Here, the significant individual factors are internationalization and ownership of trademarks and patents. The lack of individual significance of internationalization in the previous year, and its presence in the post-crisis period could be explained by the fact that the economic crisis was global and affected both export-oriented SMEs, and those focused on domestic markets (Berthou and Emlinger, 2010). In a year of international markets recovery, internationalisation matters once again. The case of the factor related to trademarks and patents ownership is analogical – in a period of post-crisis recovery, intellectual property becomes more important for sales.
The estimation of *logit* models for both periods let to the confirmation of the joint significance of the regression coefficients in front of the basic factors for SME competitiveness. During the period of economic crisis, only the implementation of business and marketing strategies had a significant individual impact on business performance. This finding is consistent with recent research: according to Bloom et al. (2012: 617), “the quality of management practices appears to become more important during the crisis period”. In the period of post-crisis recovery only the development of human resources and the size of the company had a significant influence. Prediction classification of the estimated models is used to accept or reject $H_2$. 
For the period of economic crisis, evidence shows rather low levels of sensitivity of the model with globalization-specific factors compared to the model with basic factors. The percentage of the correct predictions is also smaller in the case of the globalization-specific factors (Fig. 2). In addition, as discussed above, the econometric results do not indicate a robust relationship between globalization-specific factors and business performance. The empirical data indicate that the basic factors have a dominant role in determining business performance in a period of economic crisis.

For the period of post-crisis recovery, only slight differences between the basic and the globalization-specific factors are observed in the values of specificities, sensitivities and share of correct predictions (Fig. 3). Econometric results show that both factors seem to be equally important and none of them has a dominant role for the business performance. Therefore, the empirical analysis allows us to accept H2 – the configurations of the two types of factors with respect to SME performance differ in the two periods.

6. CONCLUSION

A major finding of the research is that the assumed joint significance of globalization-specific factors for achieving better business performance may not be valid for all of the business cycle phases. In times of economic slowdown, the globalization-specific factors may not have a significant impact on SME performance, unlike the more traditional basic factors. Although considered as fundamental for mid-term business success, innovations, internationalization, etc. may not contribute for present business performance in a period of crisis. Once the economy starts recovering, globalization-specific factors may become of significant importance for SME better performance.

The basic factors for SME performance remain crucial both in times of economic crisis and recovery. In times of crisis when the access to finance was aggravated and accompanied by a high level of inter-company indebtedness and decreased sales, the short run business success required more efficient use of available tangible and intangible resources like human resource, business and marketing strategies, etc. A possible explanation of the obtained results concerning the configuration of the factors could be related to the country or SME sector stage of development. It might be that these configurations are typical for the efficiency-driven economies, and not for innovation- or factors-driven ones (Porter et al., 2002), but this hypothesis needs further testing.

Our proposition of two types of factors for SME competitiveness (globalization-specific and basic) does not imply the introduction of entirely new factors, but a new perspective on the traditional division of internal, external, and entrepreneur-specific factors. These factors have not previously been studied together in terms of their joint effects on SME performance. Our research findings provide empirical evidence on the role of globalization-specific factors for SME competitiveness. The proposed conceptual model allows a further analysis of the configuration regarding SME performance in different economic contexts (growth, economic crisis, and post-crisis recovery), in different sectors and countries, etc. Thus, in our opinion, the research findings contribute to the better understanding of the factors of SME competitiveness. The simultaneous usage of the SCP/IO concept, the RBV approach (particularly, the dynamic capabilities paradigm), and the configuration theory allows the development of a more complex configuration.
of significant organizational elements, on the one hand, and the integration of components from the external environment, on the other. The empirical evidence on the factor configurations can serve both businesses and SMEs policy makers, as they suggest context-specific measures and policies. There are at least three practical implications of this research. The first relates to the possibility that the economic crisis continues. In such an environment, the competent SME management should strive to develop new combinations of assets and skills which guarantee the efficient working of the key competitiveness factors. The second implication concerns the improvement of the SMEs positioning in the global economy as globalization opens new opportunities to access international markets. The third implication concerns the opportunities to improve public policies for SME development. In this respect the obtained results could enhance the deployment of innovative approaches toward the improvement SMEs competitiveness.

The interpretation of results should be performed with caution due to the small sample sizes for the two periods. Other limitations stem from the prevalence of micro enterprises in the 2011 sample (the period of economic crisis) since micro firms are typically less developed with respect to globalization-specific factors. Another limitation comes from the fact that SME behaviour was tracked only in two consecutive years, which happened to represent a period of crisis and post-crisis recovery. Observations over longer periods could contribute to the better understanding of the roles of these two types of factors in the different phases of the business cycle. As it is evident from table 4 in the Appendix, Cronbach’s $\alpha$ of indexes for SME competitiveness in some of the cases are not sufficiently high, which limits the scope for making inferences. A limited number of variables were used to test the significance of basic and globalization-specific factors. Finally, the distribution of the index values indicates significant dynamics over a period of one-two years. Those dynamics could be explained by the relative underdevelopment of the SME sector accompanied by the higher rate of convergence to the average levels of competitiveness in the EU. If there is a significant progress in the factors for competitiveness over the short run, their impact on SME performance may become more sizable.

In spite of the listed data limitations, the empirical analysis reveals informative evidence on the role of factors for SME competitiveness during periods of crisis and post-crisis recovery.

ACKNOWLEDGEMENTS

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REFERENCES


APPENDIX

Table 3. Questions on SME competitiveness included in the survey questionnaire and index formulae

<table>
<thead>
<tr>
<th>No</th>
<th>Type of factor</th>
<th>Factors for competitiveness</th>
<th>Questions</th>
<th>Index formula</th>
</tr>
</thead>
</table>
| 1  | G             | Innovations                 | Research and development indicators (R&D):  
SME establishment of innovation infrastructure (yes or no):  
1. availability of R&D unit;  
2. availability of specialized staff for R&D;  
3. application of research findings of research institutes/fellows;  
4. professional training of R&D specialized staff;  
5. keeping and updating a professional library;  
6. cooperation with institutions in education and science;  
SME development of new products (yes or no):  
7. issuing of new products on the market;  
8. improvement of existing products;  
9. development of new products to be launch on the market soon.  
| | | | | Index Innovation Activities (IRD) =  
\[
\frac{\sum R & D \text{ Infrastructure}_{n,i}}{\max \left( \sum R & D \text{ Infrastructure}_n \right)} + \frac{\sum R & D \text{ Products}_{n,i}}{\max \left( \sum R & D \text{ Products}_n \right)}
\]  
\[
= 100 \cdot \frac{1}{2} \left( PR + EX \right)
\]  
| | | | | \( R & D \text{ Infrastructure}_{n,i} \) is an indicator taking values of “0” or “1” with respect to the availability of infrastructural component \( n \) in company \( i \).  
max \( \left( \sum R & D \text{ Infrastructure}_n \right) \) is the maximum possible value for the sum of all indicators for the various infrastructural components (it is equal to the number of the R&D infrastructural components used).  
The notation for R&D Product is analogical. |
| 2  | G             | Internationalization        | SME participation in specialized international trade events (yes or no):  
1. exhibition/fairs in Bulgaria;  
2. exhibition/fairs abroad;  
3. cooperative stock exchange;  
4. international business forums;  
5. business delegations.  
SME international trade activity:  
6. availability of exports and imports (yes or no);  
7. share of exports in the total output (%);  
8. share of export sales in the total turnover (%).  
| | | | | Index Internationalization Activities (INT) =  
\[
\frac{\sum PR_{n,i}}{\max \left( \sum PR_n \right)}
\]  
\( PR \) is indicating for the level of participation of the firm in international trade events (promotion activities) so that:  
\[
PR_i = \sum PR_{n,i}
\]  
\( \max \left( \sum PR_n \right) \), where \( PR_{n,i} \) is an indicator taking values of “0” or “1” with respect to the participation in promotion activity \( n \) in company \( I \), and
max$\left(\sum PR_n\right)$ is the maximum possible value for the sum of all indicators for the various promotional activities (it is equal to the number of promotional activities). $EX$ is indicating for the level of exporting activities in the firm so that:

$$EX_i = \frac{w_1 \left( I_i + E_i \right) + w_2 \left( Eo_i + Et_i \right)}{2}$$

Where $w_1$ and $w_2$ are weights whose sum equals 1 (here we assign them values of respectively 0.4 and 0.6). $I_i$ and $E_i$ indicate for import and export activities in the previous year in firm $i$. $Eo_i$ is the share of export in total output in firm $i$, and $Et_i$ is the share of turnover that comes from exports.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td><strong>G</strong></td>
<td>Trademarks and patents</td>
</tr>
<tr>
<td></td>
<td>SME ownership of trademarks and patents (yes or no):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. in home country;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. abroad,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. forthcoming registrations in home country;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. forthcoming registrations abroad.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. SME availability of sufficient financial resources (yes or no)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. for registration of trademark,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. patent;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. other intellectual property.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SME awareness with respect to (yes or no)*:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. value and opportunities of the brand,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. procedures for registration of intellectual property in the EU.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index Trademarks and Patents (ITP) =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\frac{\sum TP_{n,i}}{\max\left(\sum TP_n\right)} \times 100^*$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$w_1 \cdot \frac{\sum TP_{n,i}}{\max\left(\sum TP_n\right)}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$w_2 \cdot \frac{\sum Fin_{n,i}}{\max\left(\sum Fin_n\right)}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$TP_{n,i}$ is an indicator taking values of “0” or “1” with respect to availability of registered intellectual property $n$ in firm $i$. $Fin$ is analogical indicator which measures the extent to which the SME can finance the registration of trademarks and patents. $w_1$ and $w_2$ are weights, which sum equals 1 (here we assign them values of respectively 0.6 and 0.4).</td>
<td></td>
</tr>
</tbody>
</table>

| 4 | **G** | Information and communication technologies |
|   | SME application of ICT (yes or no): |   |
|   | 1. implementation of management information systems – CMS type; |   |
|   | 2. implementation of management information systems – SCM type; |   |
|   | 3. implementation of management information systems – ERP type; |   |
|   | 4. implementation of management information systems – other type; |   |
|   | 5. availability of company’s website; |   |
|   | 6. availability of online sales of company’s products; |   |
|   | 7. availability of online payments; |   |
|   | 8. availability of electronic |   |
|   | Index Information and Communication Technologies (ICT) = |   |
|   | $100 \frac{1}{2} \left( \frac{\sum e_{n,i}}{\max\left(\sum e_n\right)} + \frac{\sum sys_{n,i}}{\max\left(\sum sys_n\right)} \right)$ |   |
|   | $e_{n,i}$ is an indicator taking values of “0” or “1” with respect to the usage of internet technology $n$ in company $i$. |   |
|   | $\max\left(\sum e_n\right)$ is the maximum possible value for the sum of all indicators for the various internet technologies (it is equal to the number of technologies in the |   |
### 5 B Access to finance
SME usage of the following financial instruments (yes or no):
1. investment bank loan;
2. bank loan for working capital;
3. bank loan for special purpose;
4. overdraft;
5. credit card;
6. financial leasing (for purchase of equipment, automobiles, etc.);
7. venture capital;
8. loan from family and friends;
9. means of the owner(s) of the company;
10. other financial instruments*;
11. EU pre-accession funding;
12. EU structural fundings**;
13. government funded programs;
14. third party government programs**;
15. other support received*.

**Index Access to Finance (IAF)** is defined as:
\[
IAF_i = \frac{\sum_{n} Financial instrument_{n,i}}{\max \left( \sum_{n} Financial instrument_{n} \right)}
\]

*Financial instrument$_{n,i}$ is an indicator taking values of “0” or “1” with respect to the availability of financial instrument $n$ in company $i$.

*max$ \left( \sum_{n} Financial instrument_{n} \right)$ is the maximum possible value for the sum of all indicators for the various financial instruments (it is equal to the number of the financial instruments).

### 6 B Human resources development
SME implementation of policies to improve staff qualifications (yes or no):
1. manager’s confirmation that staff qualifications is high;
2. provided trainings within the firm;
3. provided external trainings in management and sales;
4. provided external trainings in the main professional field of the company;
5. foreign languages courses*;
6. provided trainings in ICT usage;
7. other trainings*.

**Index Human Resources Development (HRD)** is defined as:
\[
HRD_i = \frac{w_1 \cdot HR + w_2 \cdot \sum_{n} Training_{n,i}}{\max \left( \sum_{n} Training_{n} \right)}
\]

w$_1$ and w$_2$ are weights, which sum equals 1 (here we assign them values of respectively 0.4 and 0.6).

HR is an indicator for highly qualified staff within the firm (as assessed by the manager).

*Training$_{n,i}$ is an indicator taking values of “0” or “1” with respect to training activity $n$ in company $i$.

**max$ \left( \sum_{n} Training_{n} \right)$ is the maximum possible value for the sum of all indicators for the training various activities.

### 7 B Business and marketing strategies
SME availability of business and marketing strategies (yes or no):
1. Short term business plan (1-2 years horizon);
2. Medium term business plan (3-5 years horizon);
3. Long term business plan(over 5 years horizon)*;
4. Developed marketing strategy;

**Index Business and Marketing Strategies (BMS)** is defined as:
\[
BMS_i = \frac{1}{2} \cdot \frac{\sum_{n} Plan_{n,i} + \sum_{n} M_{n,i}}{\max \left( \sum_{n} Plan_{n} \right) + \max \left( \sum_{n} M_{n} \right)}
\]

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Table 4. Cronbach’s α, number of items, means and standard deviation of indexes values

<table>
<thead>
<tr>
<th>No</th>
<th>Type of factor</th>
<th>Factor for competitiveness</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cronbach’s α</td>
<td>Mean SD</td>
<td>Cronbach’s α</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>Innovations</td>
<td>0.61</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>G</td>
<td>Internationalisation</td>
<td>0.57</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>G</td>
<td>Trademarks and patents</td>
<td>0.67</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>G</td>
<td>Information and communication technologies</td>
<td>0.64</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>Access to finance</td>
<td>0.46</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>Human resources development</td>
<td>0.45</td>
<td>41</td>
</tr>
<tr>
<td>7</td>
<td>B</td>
<td>Business and marketing strategies</td>
<td>0.65</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Overall total (index 1,2,3,4,5,6 and 7)</td>
<td>0.71</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: G – Globalisation-specific factor; B – Basic factor
* Included in the 2011 survey wave but were dropped out from the 2012 wave due to very low rates of positive replies; ** This option was included in the 2012 survey wave in addition to the previous option.

Source: Own calculations based on 2011 and 2012 Annual SMEs Survey, Bulgarian Small and Medium Enterprises Promotion Agency
Table 5. Estimation output

<table>
<thead>
<tr>
<th>Dependant variable:</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales/ ref. decrease in sales</td>
<td></td>
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**Specified model**

<table>
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<tr>
<th>Independent variables</th>
<th>Coefficient</th>
<th>Prob (z-stat)</th>
<th>Coefficient</th>
<th>Prob (z-stat)</th>
<th>Coefficient</th>
<th>Prob (z-stat)</th>
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<tr>
<td><strong>Basic factors</strong></td>
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<td></td>
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<tr>
<td>Business and marketing strategies</td>
<td>-</td>
<td>-</td>
<td>4.5252</td>
<td>0.0001***</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Size of company</td>
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<td>-</td>
<td>-0.0172</td>
<td>0.1960</td>
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<tr>
<td>Human resources development</td>
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<td>-</td>
<td>1.3311</td>
<td>0.3934</td>
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<td>-</td>
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<tr>
<td>Access to finance</td>
<td>-</td>
<td>-</td>
<td>-0.0333</td>
<td>0.1699</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Gender of entrepreneur</td>
<td>-</td>
<td>-</td>
<td>0.0817</td>
<td>0.8411</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Education of entrepreneur</td>
<td>-</td>
<td>-</td>
<td>0.4311</td>
<td>0.0376**</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Age of entrepreneur</td>
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<td>-</td>
<td>0.0051</td>
<td>0.4053</td>
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<td>-</td>
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<tr>
<td>Intercept</td>
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<td>-</td>
<td>-4.6234</td>
<td>0.0003***</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Information and communication technologies</td>
<td>-0.5051</td>
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<td>Internationalisation</td>
<td>-0.0061</td>
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<td>-</td>
<td>-</td>
<td>0.0094</td>
<td>0.0979*</td>
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<tr>
<td>Innovation activities</td>
<td>0.0215</td>
<td>0.0250**</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Ownership of trademarks and patents</td>
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<td>0.0184</td>
<td>0.0021***</td>
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<tr>
<td>Intercept</td>
<td>-1.2809</td>
<td>0.0000***</td>
<td>-</td>
<td>-</td>
<td>-1.1942</td>
<td>0.0000***</td>
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<th>Logit</th>
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<th>Logit</th>
<th>Logit</th>
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<tr>
<td>Observations</td>
<td>199</td>
<td>173</td>
<td>287</td>
<td>283</td>
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<tr>
<td>McFadden R-squared</td>
<td>0.0417</td>
<td>0.1599</td>
<td>0.0720</td>
<td>0.1187</td>
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<tr>
<td>LR statistic</td>
<td>9.6964</td>
<td>32.6730</td>
<td>26.5507</td>
<td>43.3420</td>
</tr>
<tr>
<td>Prob (LR statistic)</td>
<td>0.0459</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>H-L statistic</td>
<td>14.0015</td>
<td>2.2648</td>
<td>5.3573</td>
<td>7.4871</td>
</tr>
<tr>
<td>Prob. Chi-Sq (H-L statistic)</td>
<td>0.0817</td>
<td>0.9718</td>
<td>0.7188</td>
<td>0.4851</td>
</tr>
<tr>
<td>Specificity</td>
<td>95%</td>
<td>95%</td>
<td>90%</td>
<td>95%</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>11%</td>
<td>29%</td>
<td>27%</td>
<td>26%</td>
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<tr>
<td>% correct predictions</td>
<td>72%</td>
<td>77%</td>
<td>69%</td>
<td>71%</td>
</tr>
</tbody>
</table>

Notes: Level of significance is denoted as: *** p<0.01; ** p<0.05; * p<0.10.
Source: Own calculations based on 2011 and 2012 Annual SMEs Survey, Bulgarian Small and Medium Enterprises Promotion Agency.
Table 6. Categorical Descriptive Statistics for Explanatory Variables (2011)

**Model 1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dep=0 Mean</th>
<th>Dep=1 Mean</th>
<th>All Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and communication technologies</td>
<td>0.1542</td>
<td>0.2031</td>
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<tr>
<td>Internationalisation</td>
<td>3.4000</td>
<td>5.2593</td>
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<tr>
<td>Innovation activities</td>
<td>10.5379</td>
<td>20.1482</td>
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<tr>
<td>Ownership of trademarks and patents</td>
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<td>1.0000</td>
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</table>

<table>
<thead>
<tr>
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<th>All Mean</th>
</tr>
</thead>
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<td>0.2023</td>
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<td>14.3135</td>
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<td>Innovation activities</td>
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<td>24.2451</td>
<td>20.0198</td>
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<tr>
<td>Ownership of trademarks and patents</td>
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<td>8.7300</td>
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<tr>
<td>Intercept</td>
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<td>0.0000</td>
</tr>
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</table>

Observations: 145 54 199

**Model 2**

<table>
<thead>
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<th>Variable</th>
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<th>Dep=1 Mean</th>
<th>All Mean</th>
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</thead>
<tbody>
<tr>
<td>Business and marketing strategies</td>
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<td>0.3048</td>
<td>0.1980</td>
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<tr>
<td>Size of company</td>
<td>8.2000</td>
<td>7.0000</td>
<td>7.8671</td>
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<tr>
<td>Human resources development</td>
<td>0.4034</td>
<td>0.4642</td>
<td>0.4203</td>
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<tr>
<td>Access to finance</td>
<td>7.7920</td>
<td>7.0000</td>
<td>7.5723</td>
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<tr>
<td>Gender of entrepreneur</td>
<td>0.5360</td>
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<tr>
<td>Education of entrepreneur</td>
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<td>5.2708</td>
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<tr>
<td>Age of entrepreneur</td>
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<td>Intercept</td>
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<td>1.0000</td>
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<table>
<thead>
<tr>
<th>Variable</th>
<th>Dep=0 Mean</th>
<th>Dep=1 Mean</th>
<th>All Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and marketing strategies</td>
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<td>Size of company</td>
<td>24.7621</td>
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</table>

Observations: 125 48 173

Source: Own calculations based on 2011 and 2012 Annual SMEs Survey, Bulgarian Small and Medium Enterprises Promotion Agency
Table 7. Categorical Descriptive Statistics for Explanatory Variables (2012)

### Model 1

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<th>All</th>
</tr>
</thead>
<tbody>
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<td>28.5923</td>
</tr>
<tr>
<td>Internationalisation</td>
<td>10.3122</td>
<td>21.6429</td>
<td>14.1812</td>
</tr>
<tr>
<td>Innovation activities</td>
<td>16.8571</td>
<td>26.8163</td>
<td>20.2578</td>
</tr>
<tr>
<td>Ownership of trademarks and patents</td>
<td>8.0159</td>
<td>21.8878</td>
<td>12.7526</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.0000</td>
<td>1.0000</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standard Deviation Dep=0</th>
<th>Standard Deviation Dep=1</th>
<th>Standard Deviation All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and communication technologies</td>
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<td>24.8602</td>
<td>24.8562</td>
</tr>
<tr>
<td>Internationalisation</td>
<td>19.7124</td>
<td>32.6838</td>
<td>25.4303</td>
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<tr>
<td>Innovation activities</td>
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<td>25.5296</td>
<td>22.6901</td>
</tr>
<tr>
<td>Ownership of trademarks and patents</td>
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<td>Intercept</td>
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</table>

Observations | 189 | 98 | 287 |

### Model 2

<table>
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<th>All</th>
</tr>
</thead>
<tbody>
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<td>Business and marketing strategies</td>
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<td>37.3061</td>
<td>32.3463</td>
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<tr>
<td>Size of company</td>
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<td>Human resources development</td>
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<td>45.0530</td>
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<tr>
<td>Access to finance</td>
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<tr>
<td>Gender of entrepreneur</td>
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</tr>
<tr>
<td>Education of entrepreneur</td>
<td>5.2541</td>
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<td>5.2650</td>
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<tr>
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<td>1.0000</td>
<td>1.0000</td>
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</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standard Deviation Dep=0</th>
<th>Standard Deviation Dep=1</th>
<th>Standard Deviation All</th>
</tr>
</thead>
<tbody>
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<td>30.5751</td>
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<td>Size of company</td>
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<td>Human resources development</td>
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<td>Gender of entrepreneur</td>
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<td>Education of entrepreneur</td>
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<td>0.0000</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Observations | 185 | 98 | 283 |

Source: Own calculations based on 2011 and 2012 Annual SMEs Survey, Bulgarian Small and Medium Enterprises Promotion Agency
Endnotes

1 According to an OECD cross-country survey, globalization affects SMEs in three ways: (1) it opens new opportunities to access international markets for about 5-10% of the SMEs; (2) about 25-50% of the SMEs could react to incentives and become export-oriented; (3) the remaining SMEs are expected to experience its pressure in the future (OECD, 2007).

2 There are many unresolved issues related to SMEs development which concern both researchers and policy makers (O’Neill, 2010).

3 In previous research, we have tried to identify a causal relationship between the factors, which here are addressed to as basic and globalization-specific (Vladimirov et al., 2011; Simeonova-Ganeva et al., 2011, 2012). The data confirms a tendency for basic factors to determine globalization-specific ones, but there are cases which indicate the presence of some reverse causality. However, data limitations do not allow for a robust statistical estimation of a thorough structural model, and we have no sufficient evidence to assume a formal reference of first-order and second-order factors.

4 Each of the survey waves covered 300 SMEs managers through face-to-face interviews held by a professional vendor company (Noema) in February, 2011 and February, 2012. In 2011, a stratified random sample was used to elect 300 SMEs, representative in terms of economic activity, regions and size of firms (number of employees). In 2012, the sample was repeated using the same method to acquire a core sample of 250 SMEs but an additional booster of 50 relatively bigger SMEs (firms with over 10 employees) was introduced. Hence, for 2012, the empirical analysis was based on both the weighted data set (representative of the whole sector) and the raw data set (providing for a better presentation of the distribution of factors for SME competitiveness with respect to firm size).

5 In 2008 and 2009 only a few macroeconomic indicators aggravated including the GDP drop by 5.5%; in 2010 almost all indicators showed negative effects from the global financial and economic crisis: unemployment in Bulgaria reached 11.2%, foreign direct investments shrank more than two times, credit activity stagnated, etc.

6 In 2011 the growth rate of the Bulgarian GDP accelerated to 1.7%, mainly due to the rise of export by 12.8%. This recovery was modest as the stagnation on the labour market remained, and investments continued falling.

7 For more information please see for example Halabi & Lussier (2010).

8 Information about questions used is provided in table 3 in the Appendix.

9 Measures of competitiveness range from simple indicators to complex indexes (Buzzigoli & Viviani, 2009).

10 See the Appendix for the technical details regarding the index formulas and calculations.

11 Other studies on the SMEs internationalization also suggested that manufacturing firms were the more internationalized ones in comparison with trade firms (Matlay & Fletcher, 2000, p. 442).

12 Sensitivity and specificity measure respectively the rates of successfully predicted values of ones and zeros of the dependent dummy variables.
1. INTRODUCTION

Until the mid-1970s countries were thought to trade with each other according to technology as suggested by David Ricardo or in terms of factor endowments as proposed by Heckscher-Ohlin’s theory. These economists provided an accurate explanation of the patterns of trade of the first half of the 20th century. However, it was observed that comparative advantages are less important in the modern world, where a large part of international trade was taking place between countries with similar technology and factor proportions and where similar goods were both exported and imported by the same countries. At the end of the 1980s Krugman (1979,1980) started the so-called new economic geography by integrating increasing returns in general equilibrium models of location and international trade. In his ground-breaking paper, Krugman (1979) assumes that firms can reduce average costs by expanding production and extending the variety of products. Under such conditions industries cannot be perfectly competitive. Thus, Krugman (1979), by borrowing from Dixit & Stiglitz (1977), articulated models that eliminated
the multiple equilibrium problem and explained international trade with a large number of differentiated products which agreed with the empirical literature about inter-industry and intra-industry trade. Even though Krugman (1979) assumes that trade is driven by economies of scale and economies of scope, in his formal model this source of increasing returns is in fact the result of migration flows of labor across the geographic landscape. This paper provides empirical evidence of the concentration of firms in certain geographical areas, which suggest that international trade is more a question of accumulation of production of differentiated products by large firms rather than migration of labor. Specifically, it shows that most large global firms are located in the countries with the largest trade capacity, such as United States, Japan, China, and Germany. This paper also proves that the large differences among countries in terms of trade capacity is determined by the skewness of the number of firms located in those countries. We proceed as follows. In the next section we survey the theory of large firms. In section three we explain the importance of the number and size of large firms in international trade and that four argue that in few developed countries there are a large number of big firms while in less developed countries there are a small number of big firms. We finish this paper with some conclusions.

2. THE THEORY OF LARGE FIRMS

Large firms are important to understand economic growth, industrial clusters, the growth of cities, international trade and other economic issues. In spite of its relevance the study of large firms has only been addressed by few scholars. Chandler (1962, 1977, 1990) was the inventor of the historical theory of large businesses, in which he discussed the idea that the structure of the firm of optimal size is due to the proper combination of all productive services. Therefore, the main intellectual contribution of Chandler’s historical perspective of large business was to recognize that firms had to do with a lot more than simply building large plants. Furthermore, large corporations had to keep their plants operating constantly at high levels of capacity utilization. In order to achieve this goal, firms had to insure that shortfalls in supply did not disrupt their production processes and that output did not pile up in their warehouses unsold. The solution, as Chandler saw it, was for firms to bring these activities under their direct control by integrating backward into raw-material production and forward into distribution.

According to Chandler, large firms can exploit not only economies of scale, but also economies of scope by investing large quantities of financial resources in research and development. This allows them diversify their operations into other industries and introduce new products in markets other than the original ones. Big corporations, besides, compete strategically by moving into growing markets more rapidly and effectively than do their competitors. Such rivalry for market share and profits makes more effective the enterprise’s functional and strategic capability which, in turn, provides the internal dynamic for its continuing growth. It also stimulates its owners and managers to expand its economic activities into distant markets in its own country and then to become multinational by moving abroad.

Chandler claimed that firms that exploited scale economies and scope economies improved upon the workings of the market, captured the resulting efficiency gains, obtained enormous competitive advantages, and over time brought under their managerial authority larger and larger portions of the economy. The only firms that could compete with them, he claimed, are those that could reproduce their vertically integrated structures and managerial hierarchies. But only a few
firms could have the capacity to gather the financial resources required to build such administrative framework. Chandler’s synthesis represents an extraordinary achievement. It provides business historians with a theoretical framework to explain the history of individual firms and industries that to that moment defined the field. With these ideas Chandler went beyond Ronald Coase’s (1988) transaction costs approach, Oliver Williamson’s (1975) contracts perspective of the firm, and Stigler’s (1958) notion of scale economies, for he discovered some of the most important causes of the growth of the firm.

The factors causing the emergence of large firms and their impact in the economy were a major achievement of Chandler’s theory (1962, 1977, 1990). However, in his approach the heterogeneity of firms is not addressed. Heterogeneity is an inherent characteristic of the components of complex physical, biological, economic and social systems and manifests itself by the large difference in size of their components. Because of this, the distribution of those sizes is well described by a very simple power rule: the number of objects whose size exceeds S is proportional to $S^{-\beta}$, where $\beta$ is a parameter that is a round number like 1 or 2.

One of the most interesting examples of power law is the size distribution of firms. The interest of distribution of company size started with Gibrat (1931) and continued with Zipf (1949) who established that USA corporation assets approximately follow the law:

$$s_r = \frac{1}{r}$$

where $s_r$ is the size of the company ranked $r$ in a list of firms ordered by asset size, beginning with the largest. Therefore, Zipf’s distribution is a particular case of power law where $\beta = -1$. Later, Ramsden and Kiss-Haypál (2000) showed that Zipf’s law does not describe the data for firm sizes of the different countries they analyzed. For instance, they found that $\beta$ for the 500 U.S. largest companies is -1.25. For other countries, such as South Africa and Hungary, $\beta$ is close to -0.44 and -1.4, respectively. Axtell (1999), in contrast, shows that American firm sizes follow Zipf’s law, independently of the year and definition of firm sizes. These studies prove that the size distribution of firms does not take any particular form for the general spectrum of countries. In spite of the fact that market structure differs from one country to another, the reality is that distribution of firm sizes is highly skewed. This pattern repeats itself at global level. Figure 1 depicts the size of Forbes’ 2000 largest global firms in terms of revenues. As this figure shows, a small number of very large firms coexists alongside a very large number of relatively smaller firms. It is clear, therefore, that there exist large differences in terms of size among the largest global firms. As a matter of fact, if Zipf’s law is applied to these data, it turns out that $\beta = -1.095$, as Figure 2 shows.

That large global corporation sizes is Zipf-distributed implies that they exhibit scale invariance. This indicates that common, standard, small events are not qualitatively distinct from rare, large events. However large global corporations lying on the far-right tail of the distribution have enormous consequences on the economy. These findings challenges conventional economic theory and provides important empirical clues about the underlying generative mechanisms that should be considered to build a sound theoretical explanation of the behavior of the firm. This also has tremendous consequences on the way international trade is perceived, as we discuss in the next section.
3. LOCATION OF LARGE FIRMS AND INTERNATIONAL TRADE

An extension of Krugman’s (1979) model is that, when migration between countries or regions is allowed, world trade and labor mobility are transposable. This economist argues that in the absence of trade, consumer welfare will be highest in the regions with a largest labor force. So there will be a tendency for workers to migrate to those regions where there is also a larger variety of products. That some regions end up with a greater population depends on scale economies, which is a major achievement. However, how economic activity agglomeration arises is more related to the concentration of firms in those regions than to the simple notion of production factors (especially labor) mobility. That the gains for international trade are more the result of the agglomeration of large firms in a region or country than the migration flows of labor is, to our knowledge, a completely new perspective to international trade. To measure the spatial distribution of large firms we rely on Forbes’ 2000 largest global firms. To do so, we adopt the country as the spatial unit of
observation. Certainly it would be better to count on data sources identifying location of large firms at city or metropolitan area level, but the state or country level is a good one, at least for the purposes of this paper. Large firms may have headquarters in their home country, but they may be composed of subsidiaries, divisions and other wealth-creating economic facilities in other nations. In this case, large firms more than being local, become global. Under these circumstances, to measure the concentration of firms becomes problematic.

However, if large global firms are thought of as multinational corporations (MNC), this problem is easier to handle. In fact, large firms grow by selling either in their home country or abroad. In the latter case, when a firm decides to internationalize its activities, it can do so through progressive steps. In the earliest one, large corporations may look to export their products and invest in production and distribution facilities in their home country; in the second phase large firms may become international by seeking new markets and establishing R&D facilities and assets in foreign countries; in the last stage large firms may become global. For the purposes of this paper, in any of these steps, the final result is the same. Whether a large firm is an exporter or a MNC, in both cases it can be considered as a trading company. The sole difference is that in the former case it trades from its home country and in the later it “trades” directly from its host countries.

There is enough empirical evidence that international trade takes place among ten countries and that United States is by far the most important country in this field. To great extent, this due to the fact that these countries concentrate the large number of large global firms. As we can see in Table 1, which show the countries with at least one large global firm, United States, with 536, is the country with the greatest number of large firms, followed by Japan, China, United Kingdom, France and Canada, with 260, 121, 86, 67, and 67, respectively. By contrast, just one large firm is registered in Liberia, Czech Republic, Panama, Jordan, Nigeria, Kazakhstan, Oman, and Liechtenstein.

As Figure 3 shows, the trade capacity of the countries enlisted in Table is strongly related to the number of large firms they possessed. Specifically, this figure depicts the relationship between the number of large firms located in the countries with at least one large global firm and their exports, and it is evident that there is a strong correlation. A particularly striking feature of these data is that they follow a power law. This implies that the aggregate geographic distribution of large global corporations throughout the world is closely linked to the trade capacity of the countries were these firms are located. In other words, this means that countries with larger number of large global firms have a greater trade capacity than a country with a small number of large global firms.

The skewness of large corporation sizes, an issue that was analyzed in section three, provides additional insights about this relationship. In this section it was found that there are few very large firms coexisting alongside a large number of relatively small firms. Consequently, that the largest percentage of trade takes place between the most developed countries is due not only to the fact they possess the largest number of large firms, but also to the circumstance that those firms are the largest among the largest. This issues requires further analysis, but it will be the subject matter of a future article.
Table 1. Numbers of the 2000 Largest Firms per Country.

<table>
<thead>
<tr>
<th>Countries</th>
<th>Number of Big Firms</th>
</tr>
</thead>
<tbody>
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<td>536</td>
</tr>
<tr>
<td>Japan</td>
<td>260</td>
</tr>
<tr>
<td>China</td>
<td>121</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>86</td>
</tr>
<tr>
<td>France, Canada</td>
<td>67</td>
</tr>
<tr>
<td>South Korea</td>
<td>61</td>
</tr>
<tr>
<td>India</td>
<td>57</td>
</tr>
<tr>
<td>Germany</td>
<td>54</td>
</tr>
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<td>Switzerland</td>
<td>47</td>
</tr>
<tr>
<td>Hong Kong-China</td>
<td>46</td>
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<td>Australia</td>
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<td>Singapore</td>
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<td>Mexico</td>
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<td>South Africa, Thailand</td>
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<td>Ireland</td>
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<td>Saudi Arabia</td>
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4. CONCLUSIONS

Using data from Forbes 2000 largest global companies, this paper shows that international trade capacity of a given geographical area or country is equivalent to the agglomeration of large firms in that specific country. This paper also suggests that the skewness in the size of large global corporations may exacerbates the differences we observe in the trade capacity of nations.

REFERENCES


Cultural Relationship Management

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ABSTRACT
Different socio-economic conditions have resulted in an increase inattention to the cultural product, both as a cultural asset, such as museums, archaeological sites and as goods or services within the cultural content, such as discography, cinematography. This work proposes cultural relationship management as managerial and organizational orientation in the policies of cultural organizations. This approach considers the management of internal and external relations fundamental to achieve a balance between conservation and enhancement of cultural product. The aim of the work is to provide a perspective of the best companies in the management of cultural activities, it would also enable cultural heritage to create value without being subject to an unproductive expenditure. In this paper we have noted that cultural enterprise has, more than anything else, unique resources and skills. This paper provides an analysis of the resource based review and theories of relationship management, in an adaptation to the cultural product. To understand the processes of management, it is appropriate to consider both internal and external resources and the possible relations that cultural enterprise can activate. The focus of the paper is to verify how a cultural product can create attractiveness for individuals and capital that will allow better access to culture for the benefit of the entire community, both public and private. Later, the possible alliances and relationships that can be triggered by a cultural enterprise are presented. They are grouped into equity, non-equity and hybrid relationships. In the light of the path traced in the course of the work, we propose a matrix of cultural relationship management.

Keywords: cultural product, cultural relationship management, resource based review, knowledge based view.

1. INTRODUCTION AND BACKGROUND
The increased availability of leisure time, reduction of travel costs (e.g. due to the low cost airlines), a higher education in recent years have brought about an increase in demand for cultural products. This increase has generated greater interest in operating dynamics of cultural products.
This increase has generated greater interest in the management dynamics of these products. This work will focus on the analysis of the relationship between the strategy and the inside of the cultural undertaking (enterprise). In particular, we want to analyze the contribution that the business perspective can give to cultural heritage management. In the past the multidisciplinary nature of cultural products was often acknowledged, with particular reference to the corporate doctrine, giving absolute priority to the protection of goods by placing them in the background for enjoyment and appreciation.

This conflict has led to statements such as: «culture is not merchandise», «art is not for sale» and «museums are not companies». In the cultural sector, the better known economic theory is due to the so-called «law of unbalanced growth» (Baumol & Bowen, 1966) according to which economic activity can be divided into two sections: one progressive, the other stagnant, distinguished by the ability to exploit growth opportunities related to technological progress. According to the authors, the cultural sector operates as part of the stagnant section, whereas the latter is refractory to technological change and therefore not able to ensure a continuous growth. The application of business requirements to cultural products can overcome this stagnation allowing the redirection of management towards the paradigm of autonomy, systematic nature and cost (Landriani, 2010). The opening to the change of cultural products is now evident and has allowed the development of new activities that will contribute to the achievement of autonomy and affordability. Empirical evidence has also demonstrated the ability of these instruments to stimulate direct access to cultural products which would increase the flow of tourists and visitors at various sites. In macro-economic disciplines, conceptual pairing between the general interest is employed, related to the use of cultural heritage by the community and the protection of the same guaranteed by the intervention of the public sector. The current crisis has imposed greater restrictions on public spending as well as the general state of neglect which characterizes the sector has led to a greater openness to private capital. In this sense, it becomes particularly interesting to observe the cultural organizations in order to understand the conditions through the private action. The subsequent analysis will investigate the reasons that can push private parties to invest in cultural organizations. Openness to private capital is often viewed with distrust, to that effect it is sufficient to think of the controversy raised by the opening of McDonald’s in the Louvre. Perplexities, however, seem to be especially ideological, the real problem does not seem to be the public/private relationship but the achievement of the economic balance for companies of cultural heritage. To that effect, it is important to take note of the review of the role of cultural heritage, which are increasingly open to virtual reproduction technique, the export of its brand and the search for greater accessibility and use of the products offered. Through management, cultural heritage conducted in accordance with corporate policies can create value and avoid being an unproductive expenditure.

In that case, the management of cultural heritage should guide our actions following two main directions:

- use cultural heritage economically, as well as create employment, wealth, opportunity for development and notoriety of the territory or geographic area in which they are located;
- protection and preservation of cultural heritage.

If it is true that the cultural product needs public, private or both enterprises to intervene with strategic management actions to create value, it is important to consider the reference models. In
this sense, it becomes essential to analyze the value and management models of cultural products, that are based on the typical tools and logic of business economics. Therefore, the paper starts with an analysis of the theories of resources, by specifying the application to cultural enterprises, such as the Resources Based View, evolved into Dynamic Capabilities and into the Knowledge View. In particular, we will try to understand which could be the most appropriate theory of Resources. A special section will be dedicated to investigating the relationships that can attract private capital.

2. RESOURCE-BASED AND RELATIONSHIP THEORY TO CULTURAL BUSINESS: A BUILT PERSPECTIVE

In order to understand the strategic management and the related processes of creation value, many ways of analysis have been proposed. Later, the interest gradually shifted towards the analysis of the factors within the company to reach the formulation of the Resource Based Theory (Wernefelt, 1984). Therefore, this kind of studies focuses its attention on internal factors of the firm, such as the availability of resources in terms of quantity and quality, distinctive skills, organizational structure and the cost structure. These are considered essential to acquire and maintain a sustainable competitive advantage and to choose, as a result, the competitive environment within which to assume a position.

In this sense, the resource-based theory attempts to explain and predict the reasons why some companies achieve positions of competitive advantage and others do not (Grant, 1996). The resource-based view (Rumelt, 1984; Barney, 1991) focuses on the quality within the firm, as major drivers of competitive advantage and, therefore, the ability to generate value (Hamel, Prahalad, 1995).

The approach to the strategy based on resources is, in fact, characterized by a definition of the company, formulated on the basis of what it is able to create using its resources and competences rather than the market need that it tries to satisfy (Quinn, 1992; Bruni & Garzoni, 1999). If for most of the products, especially those at high technological innovation, events like crisis, evolving demand and other factors, have shown that the strategy must especially start from the potential demand, for cultural ones is not always true, in particular for products "in a strict sense". The increasing competitive pressure within the industry and among separate sectors (hypercompetition), the technological change and the speed of action and response to changes in demand are some of the factors that led to the integration of external analysis with the study of internal resources.

With this work we want to emphasize that cultural enterprise has, more than any other, unique skills and resources. The setting of the Resource Based View starts from the assumption that every company is different from the others because it has a combination of specific resources that cannot be easily reproduced.

In the analysis of the resources of cultural organizations it is possible to use a taxonomy, according to a simplified scheme we distinguish the resources into the following three categories (Grant, 2006), please find the adapting to the cultural enterprises below:

- **Tangible**, representing corporate asset that usually allow services and goods production and distribution. These are easier to detect and assess; for cultural organizations in the broadest sense. such as a film company, being generally, more easily reproducible than
other resources, they contribute less to the realization of competitive advantage. Conversely, cultural products in the strictest sense, such as museums, historic buildings, archaeological digs, represent the core of cultural heritage and the only ones that determine the identity of the product and the company's competitive advantage culture.

- **Intangible** assets (technology, reputation and corporate culture), are generally more difficult to identify and assess, because they depend on the trademarks and patent reputation, and on the culture and the experience gained from technological knowledge, etc. These resources are, for some cultural products, vehicles and facilitators to access cultural resources and sites. An example is a digital museum that reproduces w the archaeological and historical reality of the past by computer. Moreover, for many cultural products, copyright is the essential element of protection of culture and copyright itself. For example, we can mention record and publishing companies. Therefore, they are fundamental in the creation of the product.

- **Human** (skills and specialized knowledge, analytical skills and decision-making), refer to the distinctive characteristics and knowledge of people who work in the company. Also these resources have a strong impact on the creation of competitive advantage. In the case of cultural organizations, as noted in this paper, the individual has a crucial value because in many cases it is the «creator» of the product, a typical example is the author of a book or a song, or the manager of cultural company. As for cultural product in the strictest sense, however, the lack of competent and adequately trained human resources, such as tour guides, can put the provision of cultural services at risk.

Over the past few years, for the creation of competitive advantage positions, in addition to the tangible resources, the weight attributed to the intangibles and human resources has gradually grown: intangible factors, in fact, take on more and more frequently a key role in the strategic management (Itami, 1988). In our view, human resource plays a central role within the company culture. It is the common thread that unites culture and the business economy, which is given precisely by the role of the human being (Landriani, 2010). It is the engine and at the same the aim of the company, as well as culture it is the set of its knowledge, beliefs, conventions, values that are formed in the environment, the living space of the companies (Catturi, 1994).

So, we can say that in the definition of the strategic process you cannot ever give priority neither to the internal nor to the external environment but to the right mix of both, or a prevalence of one of the two. You can, however, for each of the economic references, draw the prevailing attitude among external environment, internal resources and business. The aim of the work, in fact, is to provide the guidelines to follow in the mixed environment/business/resources within the companies that offer cultural products.

These considerations have an even more important value in the context of this, cultural enterprise, this is because it has more resources and unique skills, which need to be protected and enhanced, but also a close connection with the environmental context of reference as well as with the demand. To fully understand the strategic potential of cultural organizations it is, in fact, necessary to analyze both internal resources and the connections between them, both external relations that are established with the territory or in particular with other companies working in it. A strategic management of the cultural business can create value throughout the country in order to involve other companies.
We can say that some cultural enterprises, such as archaeological cultural heritage, should have a greater orientation to resources and expertise, conversely a gallery can have a greater attention to the potential of the external environment.

Consider the external environment, the business and internal resources involves a relational activity based on knowledge and the sharing of the same. These reports are increasingly involving the "outside" that lead to reticular configurations (Lorenzoni, 1997; Mancini, 1999). In recent years the concept of network, is becoming increasingly popular in both theory and practice.

Businesses increasingly conciliatory to their needs build strategic relationships (Stocking, 2005) and long-lasting operation, to represent their organizational structure (Golinelli, 2000) with a reticular form, in an optical systemic-life (Barile, 2009). The companies are in fact increasingly forced to create and manage a series of reports (Ford, 1990). The studies and the approach to the analysis of the enterprise through the lens of relationships (Gummesson, 2008) has involved non only the organization but the whole economy and enterprise management. Recently, several authors, in different sectors, have considered relations both as a tool to improve the coordination between «value chains», and to create synergies among companies.

Developing stable and lasting relationships is the key to gaining competitive advantages through three important elements: provide a better business model, build trust, and build knowledge.

The Subject Area is Management of «Cultural Products» through relationship approach (Grandinetti, 1992; Webster, 1996) that is a different approach to marketing based on the concept of networking.

Gummesson (2008) defines relationship as a major economic, cultural and social phenomenon, which has two fundamental dimensions: «value society» and «network society».

The value society is the optimal value creation as a result, the network society is the reticular structure of organizations and society. From the definition of relationship marketing and in particular from the sizes detected by Gummesson (1968) part of the idea of this work: relationship marketing as an approach to the study of cultural products and to relationships that can be activated.

### 2.1 The skills and competencies of Cultural Enterprises

The shortage and strategic relevance are two fundamental conditions that the resources must have (Grant, 2006). To enable long-term sustainability of the competitive advantage the resources must have the characteristics of the model VRIN (Barney, 1991), which identifies four key requirements for assessing resources, identifying them as a strength or weakness of the enterprise: valuable, rare, imperfectly imitable, substitutable. These features make the cultural enterprise, particularly those «in the strict sense», even more «attractive» because with internal cultural resources often become themselves value for companies and businesses operating in the same environment, such as an archaeological asset for an accommodation facility. The peculiarity of cultural enterprises is to have resources capable of contributing to the creation of distinctive competencies (Bianchi & Martini, 2001). The distinctive capabilities can be classified according to their strategic importance, dividing them into three types (Schiavone, 2008): «core», «additional», «enablers». For many cultural enterprises, outstanding capabilities are a distinctive and determinant factor in the process of development and growth of companies related to them. The distinctiveness, isn’t of course implicit in the cultural product but must be built by a process of awareness and dissemination of cultural value. Moreover, a good idea, a project or a cultural
activity are non-sufficient to determine the success of the enterprise culture, what is essential is the ability to properly employ a resource, generating a real distinctive competence characterized by an incremental development. The process leading to the formulation of an effective strategy for exploiting resources can be analyzed by breaking it down into three main steps, as shown in figure no. 1.

Figure 1. Strategy of resource enhancement.

Therefore so-called Resource Based Management logic has been proposed, according to which the critical strategic management of resources does not only consist in the exploitation of existing resources, but also in finding the best opportunity to protect, develop and enhance this heritage.

2.2 Knowledge based view in Cultural Enterprises

The resources, skills and expertise are a connecting element in the knowledge held by the different actors. From a simple functional tool to the realization of other organizational processes, knowledge has become a resource to manage because it is capable of creating value by itself. The attention paid to the study of knowledge and its role in the processes of value creation can be interpreted as the natural evolution of the resource based view. The above analysis has highlighted the role of distinctive competencies and intangible resources, the characteristics that resources must have in order to achieve a position of competitive advantage over their competitors. A similar view has led to a knowledge-based approach to capability based view, emphasizing the prominent role of integrative capacity of the resources than simple possession. The concept of knowledge is difficult to place within the various definitions proposed by the theory of resources. Knowledge, in its composite meaning, can be, in fact, an indifferently considered resource (input productive/distributive), capacity (skills) or distinctive competence (e.g. development of new products). Depending on the strength of the link which limits the usability of knowledge at a certain space-time context, it is possible to draw a distinction between general knowledge (common knowledge) and specific knowledge (Grant, 1996). Within the company, general knowledge is evenly distributed among the actors. Generic knowledge, being publicly available, is widely shared and detached from a particular context, it is not a tool to create value and achieve a competitive advantage for a culture enterprise like a gallery. Whereas, specific knowledge refers to the single company or individual sector and is, therefore, the basis for the definition of strategies and the establishment of a durable competitive advantage in the case examined an example is the ability to set up an exhibition. Generic knowledge is represented by skills which relate to the tools of guides and video tutorials. For some organizations, cultural-specific knowledge is also the core and vital part of the cultural product, so we can say that the
Knowledge Based View, in this case, non-only allows us to identify the significant resources of the organization but also the type. Moreover, participating fully in the value chain, does nonstop producing/providing the final output but are fully integrated into it. Within the wealth of knowledge it is possible to identify three types of specializations: technological, market and integrative. As we got to highlight earlier technological knowledge, for cultural enterprises, can be a key element for increasing forms of use, as well as the usability and accessibility of different products. Furthermore, when used, technological knowledge can be an important communication tool able to attract the interest of the community.

This resource may represent an unique richness to the company, transforming itself from an exogenous factor, which is available on the market, to a firm specific factor which generates a value within the enterprise. Knowledge is created by individuals, an organization cannot create knowledge without these (Nonaka, 1995). However, if individuals are the element of «vital» of the process of knowledge creation, organizations constitute the «engine» to spread the knowledge produced on an individual level, this situation is of particular evidence for cultural products. Consequently the allocation of a certain profile of skills is not sufficient to generate a competitive advantage, but necessarily requires an effective and efficient management of the same. Managing knowledge implies the creation of a set of processes through which organizations create value starting from the knowledge itself. The development of knowledge by internal means can be a long and uncertain path as it may be affected by the lack of resources necessary for the creation of new knowledge. Generally, this type of journey is characterized by an increasing development of knowledge that best fits a possible conversion/adaptation required by the constant environmental changes. This process can be integrated with mechanisms of development of the ability using knowledge from the outside, such as the acquisition of other companies or their knowledge resources or the recruitment of experienced staff. Another way to exogenously develop knowledge could be the use of strategic alliances. The analysis of the competitive advantage is no longer limited to the elements within the company, but is also extended to the relational space. The topic of relationships, in this work is for cultural enterprises and it is considered essential

3. RELATIONSHIP MANAGEMENT

As pointed out before, a management aimed at achieving an economic balance must focus on the enhancement of cultural resources inside and outside the company. In this sense, the approach can be that of relationship management. The core of relationship management considered here, is an approach in which the company, both in one to one and more to more perspective, have a common interest with one or more other companies/institutions/individuals. The whole point of relationship management considered here, an approach, is the company that, in both perspectives: «one to one» and «more to more», have a common interest to one or more other companies/institutions/individuals in the relationship.

Relationship management is considered, in this paper, an approach: a perspective, a way of looking at the phenomenon from different points of view, with the goal of having complex and extensive vision. This is what Gummesson (2008) defines as eye-glasses (lenses relations). Through the relationship marketing approach, each analyzed phenomenon is observed from the perspective of the relationships created, maintained, dissolved. The R 30 (thirty marketing relationships) of Gummesson are grouped into: market relations; relations not to market: mega-
relationships and micro-relationships. The first reports are divided into classical market (triad between supplier/customer/competitor) and special reports of the market (such as relationships classic but under certain conditions, e.g. supplier/customer in a loyalty program). The reports are not classified as mega-market relations (are above the market, e.g. relations) and nano-relationships (they are in the market, e.g. between the human resources). The characterization of the relationship is not always clear because the environment is complex and the levels are not always defined. The relationship approach has several theoretical strands and the same authors, based on two lines of study: the Nordic and the Latin. Both approaches are focused on the study of market relations. The Nordic approach considers the interaction strictly controlled and organized with the client in systems service-scape clearly designed, the purpose of which is to provide added value to the customer. The Scandinavian school, whose exponents are Hakansson and Ford, studies the relationships between companies, with an interactive approach. In Europe, however, the study of relationships is realized in the study of networks. The Latin School considers instead that the products and services have a link value because they «bring together» the individuals in the community where they can expressed both individual needs and tribal identity. The relationship management studies the relationship as a means of facilitating collaboration between different parts of the company and between them and the outside. The relationship management becomes an «interactive process» that is placed in a social context where the creation and management of relationships, both internal and external, are essential elements. The basic aim becomes, therefore, the establishment of long-term relationships, with all the individuals actually present in the environment of reference. It is a vision that involves a common thread: the creation of symbiotic coordination through the definition of languages and their subsequent socialization within the systems of value creation.

3.1 Relationship Management of Cultural Business

In the analysis of different aspects of the cultural sectors, some common and distinctive managerial characteristics can be highlighted: complexity, organizational structure, relational plot. Cultural products are complex because they are the sum of other kind of services, goods and ideas, hence the second distinctive feature: the organizational structure.

The structure, which is responsible for the tasks of management and administration of the resources mobilized to carry out different activities, must have a character of permanence in time that allows you to use the knowledge, skills and professionalism that from time to time are formed inside. The determinant managerial characteristic is what the author calls relational plot (Solima, 2006). Apart from the work done, the operators of the culture activated an extensive network of relationships with a number of different subjects, stakeholders (stakeholders), able to express, with a variable intensity, what Solima defines power to influence on the lives of some institutions and distinguishes them in primary and secondary stakeholders. The major players generate reports and strategic needs-directional, such as the relationship that is created between the owners (e.g. public bodies) and managers who need to exercise their function in line with the objectives laid down at a political-institutional level. The major players generate reports and strategic directional needs, such as the relationship that is created between the owners (e.g. public bodies) and managers who need to exercise their function in line with the objectives laid down in political-institutional level. The employees, however, have that individual interests, however, they must share the business or political-institutional values. The secondary stakeholders are those who, although affecting the orientation of the business enterprise culture, have an indirect
involvement. Secondary actors are lenders, donors and sponsors who play a key role in the fund-raising, i.e. in research and obtaining financial resources. These people are crucial to the preservation and enhancement of cultural heritage and can be private or public. In the last few years local development agencies have taken a great interest. The figure no. 2 shows the representation of stakeholders Solima.

**Figure 2. The system of stakeholders.**

![Stakeholder Diagram](image)

*Source: elaboration on model of Solima (2006).*

The company is the generator of cultural defined relationships, that, in this work, we have defined primary and secondary. Primary relationships are vital for the enterprise and relate to suppliers, customers, owners and; secondary relationships are enabled with the lenders, authorities, donors, the scientific community, local actors, the media, opinion leaders and local operators. To detect the possible relationships that can be turned, allows the company to make the most of their potential relationship. The reflections on the theories of relationship management and their application to cultural products allow you to coin the cultural relationship, which may indicate the different relationships that the culture generates. It may be mentioned that culture involves a series of relationships, it is also the basis of the values of any company/organization/individual. The configuration of the relational paradigm has been
synthesized from Giulivi, in particular, the author considers the bi-directionality of the relationship, in this case the benefits are mutual and relational concern everyone involved in this perspective then, the cultural relationship management can be considered a perspective approach that allows to detect the advantage of the relationship for all the parties involved (Webster, 1992).

3.2 The Value of Relationships, Strategic Alliances and Minority Interests

The literature over the last twenty years, as we have seen, has focused on the study of relations and in particular on those elements that generate and reinforce, for example, the IT, internet, communication, globalization. From this point of view, therefore, the relationship is studied as a result of one or more actions/activities. The assessment of the relationship, which is central to the perspective of social exchange, is based on two variables: comparison level (standard for evaluating the quality and quantity of the results each party expects from a particular report); comparison level of the alternatives (assessment standards results potentially obtainable from the best relationship activated and constitutes the lowest level of result that a part will accept to remain in the relationship). The general properties of a relationship may contribute to the assessment of a report, to its development or interruption; they, however, cannot be the sole basis for making, planning and implement decisions. The reports should be included in a context in order to have weight and importance in the analysis of a phenomenon (Gummesson, 2008: 25).

The value of the report, in general terms, is defined as the strategic utility (Giulivi, 2001), of all the tangible and intangible resources obtainable from the relationship, as perceived by each part. The analysis of the strategic utility of the relationships related to the cultural holding can provide an understanding of the reasons that can lead to entry of private capital in the development of cultural products. In this regard, the strategic nature of relations in the context of cultural organizations can be investigated by focusing on the existence or otherwise of a bond liability between private companies and culture. Therefore, it will be possible to distinguish an equity relationship from a non-equity one. In equity relationships the link between the companies is the participation of one in the capital of the other one. Non-equity relations are due to the different forms of aggregations that are not characterized by capital ties. However, the equity relations, analyzed in a strategic perspective, are characterized by a bond sheet large enough to enable the exercise of control or significant influence of the management. The non controlling shareholding is not capable of allowing a significant influence, as a consequence, according to such an approach would be due to the relationship of non-equity type. In our opinion, such a classification, is not entirely satisfactory. Even from a literal point of view, the non-equity relations are characterized by the absence of capital ties. We believe, therefore, that it is necessary to analyze the various «equity» and «non-equity» reports based on two variables:

1. the investment relationship;
2. the exercise of control or, at least, significant influence.

Following a similar approach it will be appropriate to introduce a third form of relationship: «hybrid», due to the links that do not allow the control and significant influence and situations in which a control can be exercised even in the absence of a constraint sheet.
As regards hybrid relations, it will be necessary to distinguish further relations «hybrid participation» from the «hybrid control». So, in the aggregate equity, the link formed between the companies is the participation of one in the capital of the other one and the exercise of control and significant influence. The company that holds the participation becomes a cultural partner and, like the other members, has the right to attend meetings and express their will to the level of voting rights held. The company that owns the holding would become a partner of the cultural enterprise's capital and, like the other members, has the right to attend meetings and express its will. The acquisition of investments, to take on a strategic perspective, must not be carried out at the mere purpose of investing in a temporary surplus resources or in strictly financial and speculative area. On the contrary, it must be determined by the willingness to seek integration or a complement to its management. Moreover, assuming investment in cultural organizations in an exclusively speculative and financial optical there seems to be a more theoretical than practical hypothesis, such as the returns on the investments made by individuals are related to the core activities of investors. The non-equity company reports are, for the purposes of the analysis carried out by us, due to different aggregation phenomena, not characterized by capital ties and control. Similar features seem to be identified as part of the so-called business coalitions. The term coalition company represents a set of members, distinct, and relatively autonomous from each other (on a scale ranging from a minimum level - identifiable with the ability to take decisions on a combination of factors - to a maximum level of full, complete and conscious exercise of all the functions of strategic planning), linked together by relations of cooperation is not transient, and capable of forming, at least in the aggregate, a complex with a minimal individuality. We think that the characters of the coalitions may be summarized as follows:

- the nature of the non-equity associative;
- the autonomy of the individual business units;
- a system of relations that bind the individual members.

The various units can activate non-equity connections, that are characterized by the not possession of the rights of ownership of a business in the other. In this respect coalition do not, therefore, apply objective criteria, although not decisive in classifying other conditions such as
control and unified management. Within cultural businesses, the "non-equity" relations can be identified, for example, in the relationships that are established between the company culture and the companies operating in a given territory. Just the possibility of developing these types of relationships can be a powerful instrument that can push private capital to invest in cultural organizations. Such an investment would lead to opening up non-equity, where the link is most evident, that is the relationship asset relating to the possession of the units or shares of capital (equity). We can define these forms of relationship as hybrid. For the purposes of this paper, it is of particular interest to investigate the reasons that can push individuals to invest in cultural organizations. So, it will be necessary to analyze the non-equity relationships previously highlighted. As we know, the business system may comprise a hierarchy of subsystems that give rise to the following two levels of strategies, each of which has autonomy (Deal & Kennedy, 1982; Davis, 1991):

1. business or global strategies (corporate strategies);
2. competitive strategies (business strategies).

The participation of capital of cultural organizations, in the approach that we have proposed, must be traced back part to broader strategic decisions at the enterprise level. From this perspective, the logic which can attribute on a strategic investment companies can be traced to financial or organizational logical synergy.

In general terms, we adopt the financial logic to translating the industrial capital of the company in an ideal portfolio of stocks with specific risk and return. The financial investor is usually indifferent to the specific object of the assets in which it invests, since he is interested in the expected return and risk profile (Markowitz, 1991).

So, the financial investor would be characterized as being a temporary partner, that realizes capital gains and sells the shares; such logic, as highlighted above, does not seem applicable to cultural organizations. The logic of organizational synergy is a key priority in the development of competitiveness of a company through the exploitation of different relationships between the various investments that can be activated. The company, that wants to improve investment, develops and revises the system of relationships and resources and expertise that has already formed.

Participation in the cultural capital of a company in a strategic perspective, in our view, should be investigated by analyzing the following aspects: working relationships with the company culture; access to relational capital company culture; «image» of the company.

Figure 4 shows the different aspects given, even in the knowledge of the relations and overlaps, have been traced to the different levels of strategies.

The operational relations seem more evident and may have contained very diverse skills and competencies which can relate to the production and sharing of resources. Within the culture company, for example, relationships linked to the exploitation of the same customers can be developed. It seems, however, appropriate to dwell on the other two characteristics, the relational capital and the image, that the cultural enterprise in the strict sense is able to create thanks to the cultural property. In some cases, participation in the cultural capital of a company may not be linked to specific operational relations to be established with the company, but must be brought under a system of relationships that may also involve other parties.

To understand the significance and relevance of these situations it may be useful to consider the concept of relational capital, that is the business scope by applying some theories borrowed from
the sociological sciences (Costabile, 2001). The importance assumed by the variables of social order to explain the decision-making and action in the economic field have led to an integration between economics and sociology. The social relations are, in fact, able to affect the competitive processes, and they generate opportunities and limitations that are strictly linked to the relational contexts from which they emerge. The economic performance of companies and individuals are, therefore, significantly influenced by their “social benefit” and by economic context. In general terms, the relational capital can be defined as a common condition at the disposal of all social actors present in the network which can influence behavior and relationships (Burt, 1992; Nahapiet & Ghoshal, 1998).

*Figure 4. The relational advantages and strategies.*

These considerations can, therefore, be seen as the set of benefits that come with being «part» of a network of social relations. As a first approximation, we can say that the set of relations between the various enterprises represents the relational capital. According to some authors, the relational capital is divided into two components: the first refers to resources that flow through economic ties entertained by the actor, the second component is given, however, the broader structure of the networks where the individual reports what he can achieve (Burt, 1992).

According to a subsequent study, there are three components which make up the relational capital (Nahapiet & Ghoshal, 1998): a structural dimension, which refers to the existence of relationships between the members of the network, a relational dimension, which refers to the existence of personal ties and/or friendship between the different units of the network, a cognitive dimension, which is attributable to the objectives and values of the members of the network. In the inter-
organizational context, relational capital is available for anyone involved within that system of relations. Relational capital represents the benefit to which each member can have as a result of nesting (embeddedness) in a social relationship (Granovetter, 1985). Relational capital, according to a series of studies (Lin, 2001) is an endogenous resource of a social structure in the network used by the members of this structure to increase the efficiency of their actions. This means that the financial investment of a company culture can take on a strategic approach. If it is designed to access a wider relational system characterized by the presence of relational capital that provides access to a system of relations which allows access to inside information, as part of a wider system of social networks.

There are also reports available not only funded the initiative, but they can also be extended to other parties who are in a larger system of relationships. Another motivation fundamental to cultural heritage is represented by reflections on the image of a company. The sets of knowledge, impressions, experiences of interlocutors of the company, the corporate image. This image is, therefore, a particular form of knowledge that the various parties (internal and external) relatively have to a given company.

The company voluntarily or involuntarily transmits an image of itself to the environment and, in turn, the latter company attaches a certain identity. At the basis of the considerations made on the ability of cultural identity we can say that, while the relationship capital is linked to the importance of the external environment in its ability to create value for the enterprise, the image relates to internal resources that the firm possesses that an external entity (company) can exploit to their advantage through a financial investment in a company culture of public interest. As evidenced by authoritative doctrine, the company must pursue objectives that are placed on three dimensions: the production of income, that of customer satisfaction and that of the consent of the other critical stakeholders (Coda, 1995).

The social strategy is aimed, therefore, at ensuring the resources and the approval which the company needs to achieve its goals. The consent of all categories of social actors involved will be detectable by the level of satisfaction and the ability to attract resources. As part of the social strategies a first issue to be addressed is the identification of specific stakeholders in respect of whom a social policy is developed. In this phase, it will be necessary to identify, within each category of social actors, specific with those which the company wants to build relationships. As part of the series of studies on the purpose and corporate social responsibility (Porter & Kramer, 2006) we find that specific research, not only focusing on the relationship between the company and the various stakeholders, analyze the social orientation of the same.

For the purposes of our study, we consider of particular interest the analysis of the relationships that a company can establish with the community. Pursuing social or cultural projects can be a policy that will affect the image of the holding. In this regard, the company will also be subject to the stimuli that come directly from the community Pressure so that the company is active in initiatives with social commitment or attendance at cultural organizations, may be examples of the pressures faced by various companies.

Today companies consider such initiatives as an opportunity and try to establish ongoing relationships with these organizations. In other words, we tend to contribute to an ongoing implementation of projects capable of generating benefits to the community rather than making such a sporadic form of contribution.

Companies can develop true partnerships with cultural organizations. According to one of the first studies on the topic, the various forms of cooperation between enterprises and non-profit
organizations can be classified as (Wymer & Samu, 2003): corporate philanthropy, are donations made to non-profit organizations, corporate foundation, bodies are specially created to manage the philanthropic activities; licensing agreement, is a form of collaboration that allows, upon payment of contributions, the use of the logo of the nonprofit organization, sponsorship, allows you to link the name of a company with a non-profit organization, transaction-based promotions, are donations made by donating a percentage of sales, joint issue promotions, are forms of collaboration in which the firm and the non-profit support organization, jointly, a social cause; joint ventures, are when the enterprise and the non-profit organization created a new organization with the aim of pursuing a joint project. Precisely from this perspective, these can take a significant strategic investment in a company’s financial or cultural society that have an important role in the community. Given the purpose of these reports, an important aspect to consider is the communication of partnerships undertaken.

4. FUTURE RESEARCH DIRECTIONS AND CONCLUSIONS

The resource-based theory, in spite of the interesting contributions to the study of strategic asset, proposes a static approach. The ownership of the resources cannot guarantee enduring and defensible benefits. The company, in fact, in order to win the competitive challenge must be characterized by the possession of traits of «oneness» that only the presence of capable managers can afford. Furthermore, the ability to combine and integrate the different resources depending on the different activities allows the maintenance of an advantage over their competitors. For these reasons, as mentioned, it is also important to consider the external environment and the relationships in terms of alliances, that the cultural company can activate. Although the work has limitations in the ability to provide concrete tools able to assess the results of the cultural relationship management, it can be said that the proposed approach may have some valid managerial implications.

The integrated perspective between internal resources and external environment also led us to develop a matrix that can be able to guide companies in the cultural choices of cultural relationship management, the model is presented in Figure 5.

The figure provides a representation of the different levels of internal and external relationships that can be activated by the cultural company. Depending on the level and the mix between internal and external relations, the cultural relationship management takes different managerial forms and guidelines.

With this figure we want to offer a matrix which supports cultural companies in their choices of orientation and management relations, starting from the resources inside and outside the company. In the first panel, the level of external relations is minimally activated while the inner one is up, the model of relationship management will be oriented to internal resources. This model can be sustainable only in an early stage of the cultural life of the company as it does not last because of the lack of economy requirements. For example an archaeological dig: at the beginning the company is orientated towards the internal resources, especially those with a high cultural value. However, at a later stage, if it is not able to activate external relations, it can trigger financial investments, resources and expertise, flows of individuals, the company does not survive because it will not be able to sustain itself financially.
The model presented in the last panel, the ninth, is not sustainable in the long term as the level of external relations is great but the internal one is minimal. An example of this is cinematography, production companies begin to produce starting from the relations that they have activated with sponsors, the tastes and trends of the market. In the long run, these productions must take into account the role of internal resources and the relationships between them, such as actors, set designers, logs, etc., otherwise the quality of the product and therefore the success of the investment and external relations can be affected. For the same reasons previously noted, the placements in quadrants fourth and eighth are insignificant and equally unsustainable.

The second and sixth quadrant have a similar but reverse situation. In the first case there is an average level of external relations and a maximum level of the internal ones, while in the second panel there is an average level of internal relations and maximum of the outer ones. In these cases the models are sustainable because, although the management focuses on one type of relationship the other one is still present. An example of this is cultural heritage, such as museums and archaeological digs, where the internal relations are a priority. Conversely cultural products with a high market orientation and sponsorship, such as the cinematography and discography, prefer...
the external ones. The highest point of internal and external relations activated is the third quadrant, where management takes full advantage of potential for both internal and external relationships of instance, in is the case of the «Sassi of Matera». The seventh quadrant presents a difficult case to find in reality or at least it is intended to be unsuccessful due to the total lack of both internal and external relations.

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Restructuring Urban Solid Waste Management and Housing Problems for Economic Development: A Case of Nigeria

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ABSTRACT
The paper focused on the need to reform solid waste management and housing problems as among the factors for the economic development of Nigeria. This is based on authors’ perception that decent housing and environment ensure quality of life and by extension a measure of development. The authors unraveled that housing and solid waste problems in Nigeria stemmed from increasing population, insufficient funding, lack of better condition of living in rural areas, thus leading to rural-urban migration. Consequently, there is a high concentration of people in Nigerian urban places and the insufficient availability of housing has compelled Nigerians to live in slums and shantytowns. This has raised the solid waste generated by households, businesses, artisans and markets thereby reducing the living standard. The efforts put in place by the government over the years to manage the situation have failed to achieve much, hence adversely affecting economic development. Based on the foregoing, among the recommendations made to revive the ugly trend are: repositioning the state of Nigerian rural areas; establishment of mortgage banks in every state of the country; increasing private sector participation in both housing provision and solid waste management and promotion of greater awareness on the need for proper waste disposal by all and sundry.

Keywords: Urban, Solid waste, Housing, Restructure, Economic Development.
1. INTRODUCTION

Urban solid waste management problems and housing shortages constitute some of the numerous economic and socio-economic challenges of the developing countries. Such a challenge is not far from the dual¹ economic base of these economies (Cai & Donghan, 2008). The large chunk of the population residing in those highly undeveloped rural areas is compelled by circumstances to migrate to the urban places in search of better living condition and employment given the increased economic activities and better quality of life (UN-HABITAT, 2008; Lehmann, 2010). Consequently, the urban areas become over populated, which in turn results in a high demand for adequate housing, pressure on the use of social facilities, increased waste from consumption not just from households but local market traders, artisans, industries and other associated problems. Within the economic perspectives, housing involves capital or labour expenditure to the households, rental payments to landlords and governments, backward linkages and an overall multiplier effect on the households and the financial system through mortgages and loans (Arku & Harris, 2006). Therefore, urban housing organization, adequacy and quality play a role in economic development of countries. Furthermore, in spite of the aim of Solid Waste Management (SWM) strategies which include, but not limited to quality of life, environmental sustainability and a general economic wellbeing. Urban solid wastes has continued to retard the above stated aims through various unethical dumping and disposal patterns (Numerow, 2009; Farahbaksh & Marshal, 2013).

Noting his concern about the state of solid waste generation, Palczynsk (2002) posits that waste generation, domestically and industrially, continues to rise globally in piles due to growth in consumption. In advanced nations, per capita waste generation rose nearly three-fold over the last two decades, reaching a level five to six times higher than that in developing countries. With increase in population and living standards, waste generation in developing countries is also increasing rapidly, and may double in volume in the current decade. If current trends continue, the world may see a five-fold increase in waste generation by the year 2025. This situation does retard development sought for in developing economies, specifically, in Nigeria.

In addition, people have settled at a place to seek for means of life sustenance. Obviously, the rapid growth in urbanization is one of the features of developing countries, and has been particularly so since the 1950s. Census in the early 1950s showed that there were about 56 cities in Nigeria and about 10.6% of the total population lived in these cities. This rose dramatically to 19.1% in 1963 and 24.5% in 1985. At present, over 40% of the Nigerian population lives in urban places. Among the reasons for this is that most centres for economic activities are established in urban places and there exist job opportunities and social facilities in these cities. Consequently, incessant rural-urban migration in Nigeria has called for increased development of housing facilities to accommodate the populace in the cities and also the need to manage solid wastes that are generated on daily basis. Succinctly, the patterns of life in Nigerian rural areas do not encourage the type of life desired by many dwellers. People migrate to seek for jobs, better health facilities, good water supply, electricity, good roads, good housing, business opportunities, better transport, and above all, to raise more income for the sustenance of life. Urban cities are the centres for vocational economic activity and the existence of various training institutions. So, because housing is immobile, when a household chooses a dwelling place, it is also choosing a location. The households go with only capital, skill and luggage leaving behind immobile accommodation (Abiodun, 1976; Ajanlekoko, 2001; O’Sullivan, 2003; Nigeria Rural-Urban Linkages, 2004).
This situation does compound the existing problem of the cities. Rapid expansion of urban population has brought with it numerous problems associated with the difficulty of provision of infrastructure such as good road network, medical facilities, power supply, waste management and most critically housing for the people. But one of the most prominent of urban problems is how to make available adequate housing facility which has compelled many Nigerians to live in slums. Attempts at ensuring the availability of low-cost housing have been insignificant, notwithstanding the establishment of the Federal Mortgage Bank of Nigeria in 1977. Hence, shantytowns and slums are frequently found in urban areas. Congestion in urban housing is a serious problem. Recent estimation shows that about 85% of the urban inhabitants live in single rooms, sometimes with eight to twelve persons per room. Conditions of living are poor. In 1996 for instance, only about 27% of urban dwellers had access to piped water as source of water supply. It is saddening to note that below 10% of urban populace has an indoor toilet. The total number of housing units in 1992 was 25,661,000, and this was highly inadequate (Abiodun, 1976; Ogu & Ogbozobe, 2001; http://www.Nationsencyclopedia.com).

Notwithstanding that the desire of most Nigerian leaders is environmental decency, as cleanliness ensures the health of the people, the attainment of the desired level of decency has been thwarted by solid waste scattered here and there in Nigerian urban cities. The generation of solid waste by the teeming population is higher than the rate of its disposal. This has escalated the incidence of endemic diseases in our cities. The situation of solid waste littered in Nigerian urban places is really a thing of worry. Solid waste includes papers, cartons, rags, wastes of industrial raw materials and finished materials, garbage from kitchens, plastic materials, broken glass materials, metal scraps; especially and recently, bags of cellophane water. They usually occupy a good portion of useful plots or acres of land. In Nigeria, solid waste is gathered and conveyed directly to the disposal site by vehicles. The waste is heaped at open places along roadsides. The open deposits provide habitat for diseases causing organisms such as house flies, bacteria, insects and rodents (Ijioma, 1987; Emehero, 1987; Agunwamba, 1998).

Given the situation of urban solid waste management and housing in Nigeria and the need for economic development which their positive changes, among others, will contribute, it is our intention to unravel how restructuring these factors will improve the economic development in Nigeria. So, in this paper, we wish to present it thus: section one is housing problem and urban solid waste management in developing countries and Nigeria; section two focused on the role of government in addressing the housing and waste management problems in Nigeria; section three dwells on the impact of urban solid waste management and housing problem on Nigerian’s economic development while section four is the recommendations and conclusion.

2. A REVIEW OF THE HOUSING PROBLEMS AND URBAN SOLID WASTE MANAGEMENT IN DEVELOPING COUNTRIES

Studies on the urban solid waste management and housing in developing countries have often focused on two strands of ideologies such as market reforms and sustainability. From the solid waste management perspective, Bau et al. (2001) on market reforms established their case rather from the standpoint of a holistic privatization of the enterprises in the form of a private-public partnership in sewage management. Here, the private sector invests the needed capital in the operation of the waste management while the government on its own instills the standards of operation, coordination and competitiveness for efficient delivery system (Cointreau-Levine,
1994). Yet, this does not in any way rule out public sectorial limitations in terms of stiff laws and regulations guiding the operation, very low productivity of its staff given their manual operation methods and inadequate supervision of the private sector. Furthermore, outside the purview of the formal public sector are also the services of the booming informal private households. Ahmed and Ali (2004) posit that this scenario has often been the case of developing countries where most of the private sectorial workers in the solid waste management business are informal workers. Informality connotes their unregulated and unorganized (to an extent) operational styles, small scale and subsistence in its operation using direct labour from the households.

Considering also the sustainability perspective, the Earth Summit of 1992 further brought to limelight on issues regarding sustainability. But the developing countries on their path may have drifted slightly from the “Green Agenda” to instead the “Brown Agenda” stressing more on pollution control especially through proper waste disposal and management approach (Furedy, 1992; Bose & Blore, 1993; Bertone et al., 1994). For instance Kenyan government has reiterated its commitment to reducing environmental pollution as contained in the policy framework of Kenyan government and the United Nations Environment Programme (UNEP) 2005 while Zimbabwe applied a community involvement projects and education for a sustainable environment (Johnson & Wilson, 2000).

Furthermore, the housing provision equally share similar scenario but with a slight distinction. In the case of housing provisions, both the formal or conventional and informal or unconventional modes are often observed in developing countries. Formal is backed by legal and organized provision mechanism where the private and public institutions play a leading role while utilizing labour services of the household. It could be a case of private public partnership also On the contrary, informal housing provisions rather conforms to unregulated and traditional approach in housing provision. Gilbert (1990), Turner (1976) posits that such informality in housing production is as a result of the lower per-capita income as seen from the developing countries. Research works over the 60s and 70s gave even more credence to informal housing provision as an economic development strategy for the third world countries alike. Turner (1972 and 1976), Abrams (1966) established a market enabling strategy in housing provision through ‘self-help’ or ‘self-build’ where individuals at the lower income category are allowed to construct their houses with a financial help from the authorities. According to Bredenoord & Lindert (2010), about 60% of the population of Mexico in 1990/1991 and 53% of the urban population in Peru lived in houses built through ‘self-help’ while 85% and 90% of all houses built in Nicaragua and Indonesia respectively are all from the services of informal self-help workers.

3. HOUSING PROBLEMS IN NIGERIA

Really, population explosion in an area is associated with a myriad of problems, if there is insufficient policy, strategy, programmes and capital to match with the facilities needed to surmount rising problems. The problem of solid waste and housing in Nigeria has gradually escalated to the state it is now. Accommodations are indispensable needs of man. This is because man must settle at a place to aspire for economic activity. Housing is a place for business activity. Holland (1976) and Anusionwu (1982) point out that in terms of quantity and quality, the insufficiency of urban housing has been persistent and worsened over time in many less developed countries. This ugly situation has given room for a myriad of slums littered within human shelters without even the minimum necessary infrastructural facilities. In general, housing
has cultural, social and economic features which are of emotional importance to the households and the entire states. So, a large chunk of workers’ saving are spent on housing which is required for settlement and a focal point for the development of the family. A good number of urban dwellers spend over 20 percent of income on housing. In fact, the housing circumstances of households are often used in determining welfare measurement. The National Bureau of Statistics (2005) pointed out that 66 percent of the households lived in single rooms while 24.1 percent lived in whole buildings. The use of mud for wall construction is very high: 58.5 percent for the poorest household while for least poor household, it is 66 percent. Given the expected increase in urban population, the magnitude of housing problem in the country is enormous. The National Rolling Plan (1990) has an overriding objective of increasing the welfare and standard of living of the average citizen. It also points out that the national housing need in Nigeria is between 500,000 and 600,000 units considering the prevailing occupancy ratio of between three and four persons per room. Given the census population of over one hundred and forty million in 2006, and the expected increase since then, the housing need has risen considerably (Ajanlekoko, 2001; Osuka, 2006).

It is distressful to note that the needed costs of meeting up with housing requirements are not easy to come by given the Nigerian governments’ high cost of governance, underutilization, misapplication of resources, selfishness, greed, corruption, lack of focus and above all, insufficient capital due to over reliance on one sector for financing developmental projects. However, investment in housing is profitable. The Second National Development Plan (1970-1974), has among other objectives, the need to embark on a housing program. It proposed a total of 59,000 housing units made up of 15,000 for Lagos and 4000 for each of the then eleven states. The attainment of this intention was below average as only 12% was realized. Besides, during the Third National Development Plan (1975-1980), the total proposed housing units was 202,000, the then capital of the country was allocated 46,000 while 156,000 was for other parts of the country. But the realization was highly below expectation. Only 19%, that is 8500 units, were established in Lagos and 13%, that is 20,000 units, put in place in other parts of the country by the end of the plan period (Ogu & Ogbozoze, 2001).

Recently in Nigeria, housing provision was left to the private investors, which was later, included in government policy. Government limited its role at that period to provision of credit facilities through loans to building societies, housing corporation and staff housing schemes. Minimal allocation of revenue was channeled to housing issues. Consequently, there was high level of determination on housing issues in the Third National Development Plan. This was because of the government acceptance as part of its duty to play active role in the provision of housing for all income groups to minimize the proportion of income of workers spent on housing rent. It embarked on actions in that direction such as addition of subsidized rents, raising of construction of quarters for government workers and the extension of credit facilities to enhance private housing construction. In addition, the Fourth National Development Plan, among others, included reduction in rural-urban migration (Osuka, 2006:69), which can be said to be the basis for pressure on facilities in urban places. This intention has not been achieved. Furthermore, it is pertinent to state that there is poor economic situation in Nigeria, increasing cost of building materials, rising urban population and absence of effective housing policy. Besides, Nigerian urban centers have experienced unexpected increase in population within few years, mainly because of the high growth of the economy and expansion in government machinery resulting from state creation. So, the provision of housing lags behind the increasing
need leading to worsening housing situation among the urban households. In other words, the rate of increase in population seems higher than the rate at which buildings are erected to accommodate the teeming population. Most times, the high rent for available accommodations are unaffordable by low income earners. Even the high income earners do not find it very easy to raise the annual bulk payment of private houses. Some usually resort to bank loans or obtain salary advance with the intention to repay on installment basis. Be it as it may, the predicament of housing in urban areas compelled both the federal and the state governments to set up housing projects. The housing corporations all over the country have the mandate of acquiring land, plan, design, construct and manage houses. Regrettably, for over fifty years of Nigerian independence, it is yet to develop a bubbly mortgage market and houses continue to be provided through the painstaking conservative method of acquiring land and erecting building over some years, which could be an individual's entire life time. In many cases such buildings are left unfinished or individuals have to drain their entire life savings in order to erect a home (Andrew, 2007).

The shortage of housing in Nigeria in very recent time is put at 15 million houses whereas 12 trillion naira is needed to finance the shortage. This is a very large sum of money which is about 4 times the annual national budget of Nigeria then. The 1991 housing policy estimated that 700,000 housing units should be erected every year if housing deficiency is to be tackled. This presentation depicts that not less than 60% of the new houses are to be built in urban centers. In the same vein the ministry of Housing and Urban Development in 2006 announced that the country requires about 10 million housing units so as to cover the country’s housing needs. On micro-perspective, it is quite obvious that house ownership is one of the main priorities for most households and it represents the largest single investment for most (between 50% and 70% of household income). This circumstance becomes very significant when it is noted that per capita income and the real income of average Nigerians have been falling. The swift increase in the costs of building materials in the last two decades has additionally reduced the affordability for most Nigerians. If we link yearly needs for housing with the gross domestic product of N82.53 billion in 1988 and N85.82 billion estimates for 1989, and over N88 billion in 1991 as well as per capital income of N3, 000.00, financing becomes a major factor of the housing problem, especially, long term funding (Ajanlekoko, 2001; Mabagunje, 2007; Kabir & Bustani, 2010).

World health Organization holds the view that home plays a vital role in sustainable health delivery system. The rise in such urban population gave rise to the dearth and high cost of urban land including that of housing. Invariably, such an unprecedented demand for housing does not match with the supply. People are made to live in indecent and unpleasant buildings that create health problems. As an essential need of man, affordable housing units have remained a huge challenge towards absorbing rising urban population in Nigeria. The euphoria of oil boom led to a development of national housing program aimed at providing adequate shelter for the teeming population. Consequent upon this, various approaches were instituted in order to develop and improve the housing units, ranging from slum clearance and resettlement, private housing schemes, sites and services scheme associated with the use of new land for residential allocation, settlement upgrading and self-helping (Ogu, 1996; Ogu et al., 2001, Nwaka, 2005). Table below presents a housing plan of Federal Government of Nigeria from 1971-1996.
Table 1: Housing Schemes and Plans 1971-1995.

<table>
<thead>
<tr>
<th>Years</th>
<th>A) Intended number of housing units</th>
<th>B) Number of Units Produced</th>
<th>Percentage (%) B compared</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971-1974</td>
<td>59,000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1975-1980</td>
<td>202,000</td>
<td>28,500</td>
<td>14.1</td>
</tr>
<tr>
<td>1981-1985</td>
<td>200,000</td>
<td>47,234</td>
<td>23.6</td>
</tr>
<tr>
<td>1994-1995</td>
<td>121,000</td>
<td>1,136</td>
<td>0.9</td>
</tr>
</tbody>
</table>


Housing units’ provision has shown a very poor rating right from the oil boom era of 1970s to the mid-1990s. Also in the 1970-1974 targets, only about 12% was achieved. UN habitat 2008 held that the occupancy ratio of houses in Nigeria is at the threshold of 6 persons per room of 20m² and 60% of Nigerians are without adequate shelter (under-housed and no housing) with 25% or less of residents owning their own homes compared with the 75% international bench mark. Conditions of living are generally poor. Percentage of the population with improved sanitation facilities (indoor toilet facilities) was 10% in 1996 and 13% in 2010. However, about 27% of the urban population has an access to pipe borne water in 1996 and 75% in 2010 but housing is yet to experience this increase.

4. URBAN SOLID WASTE MANAGEMENT IN NIGERIA

Constitutionally, urban solid waste management in Nigeria is the responsibility of the three tiers of government as stated in the 1999 Constitution (FRN, 1999). These levels of government have not been able to make available financial, manpower and materials requirement to achieve proper waste management over the years. The conspicuous heaps of solid waste dumped in open spaces along the roads and along river banks in major urban centers is evidence of inability to meet up with that responsibility. This failure has compelled some state governments to adopt different measures aimed at tackling solid waste problem. Nevertheless, the degree of attainment in solid waste management is not satisfactory (Afon, 2007). The rate of population growth in Nigeria was pointed to be 2.8%, with urban growth rate of 5.5% per annum. This has contributed in no small way to the complexity of solid waste management. The growth of a city is associated with land use problem and increase in waste generation. Solid waste management (waste storage, collection and transport, resources recovery and recycling, waste treatment and disposal) in many cities in Nigeria, even in the capital territory have remained a hard nut to crack, in spite of all efforts put in place to address the issue. This has brought about varieties of health problems to the citizens (Omuta, 1987; UDBN, 1988; Imam et al., 2008).

The resources managers in Nigeria are aware of the increased solid waste generation over the years and have made attempts to manage it. Solid waste is one of the problems confronting the urban cities in Nigeria at present. Economic development, actually, among other things, includes positive changes in the environment which increases the decency of the milieu and health state of
the people. Nigeria as a country is besieged by environmental hazard resulting from inadequate solid waste management. The increased level of urban solid waste generated by industries, artisans and households, which piled conspicuously all over Nigerian cities, that contaminate streams and rivers without any treatment compelled the Federal Government of Nigeria to promulgate Decree 58 for the establishment of a Federal Environmental Protection Agency (FEPA) on 30th December, 1988. This guided the formulation of a national policy on the environment with the following aims, among others: to protect all Nigerians with a quality environment adequate for their health and well-being; to increase public knowledge and advance understanding of the vital linkages between the environment and development; and to promote individual and community participation in environmental protection and improvement efforts (Agunwamba, 1998).

Besides, Ogwueleka (2009) points out that solid waste management has sprang up as one of the greatest challenges facing states and local government environmental protection agencies in Nigeria. The quantity of solid waste being generated continues to rise at a quicker pace than the ability of the agencies to improve on the financial and technical resources needed to be at par with this growth. The situation has constrained the Federal Government of Nigeria to promulgate various laws and regulations to protect the environment. At present, the Federal Ministry of Environment administers and enforces environmental laws in Nigeria. It took over this function in 1999 from the Federal Environmental Protection Agency (FEPA), which was created under the FEPA Act. Pursuant to the FEPA Act, each state and local government in the country set up its own environmental protection body for the protection and improvement of the environment within its jurisdiction.

The government agencies are given the duty of managing, employing and disposing of solid waste generated within the area. The state agencies generate fund from subvention from state governments and internally generated revenue through sanitary levy and stringent regulations with heavy penalties for offenders of illegal dumping and littering of refuse along streets (Ogwueleka, 2003). Every effort has been on the best approach to tackle solid waste problem in Nigeria. On this note, the government decided to experiment with the privatization of the solid waste management sector. The Federal Government has instituted a National Integrated Municipal Solid Waste Management Intervention Program in few states. Lagos state government established municipal solid waste management policy to encompass private sector participation in waste collection and transfer to designated landfill sites. It is pertinent to define municipal solid waste at this point. Ogwueleka (2009) points that it includes refuse from households, non-hazardous solid waste from industrial, commercial and institutional establishments (including hospitals), market waste, yard waste, and street sweepings. Municipal solid waste management (MSWM) refers to the collection, transfer, treatment, recycling, resources recovery and disposal of solid waste in urban areas. The goals of municipal solid waste management are to promote the quality of the urban environment, generate employment and income, and protect environmental health and support the efficiency and productivity of the economy.

5. THE ROLE OF GOVERNMENT IN ADDRESSING THE HOUSING AND WASTE MANAGEMENT PROBLEMS IN NIGERIA

A great proportion of the population of Nigeria lives in substandard, poor housing and in deplorably unsanitary residential environment (Onibokun, 1985). The situation, according to
Acquaye (1985), is getting worse because of increase in population growth, urbanization, industrialization and improvement in general prosperity. All these have resulted in increased demand for housing and solid waste which cannot be matched by supply and its corresponding waste management (Afolabi & Olumide 2012). In Nigeria, as in most developing countries, rapid urbanization and population growth have not been matched with increase in housing construction and the corresponding waste management mechanisms, and therefore there is a colossal quantitative and qualitative shortage of housing units in the country and the required waste management agency to cater for the waste thereof (Adekunle, 2002).

Past and present governments in Nigeria have attempted to confront and are still on the path of confronting, the nagging problems of accommodation, given the increasing population of Nigerians. Problems have ranged from difficulties in collection, transfer, treatment, recycling, resources recovery and disposal of solid waste in urban areas (Ogwueleka, 2009). This gave rise to various programs and polices articulated and implemented to address these problems. These include; rent control, public land ownership, development of subsidized housing estate for the low income groups, direct and indirect subsidies to the middle and upper income people, housing loans schemes, establishment of housing corporations, building societies and Federal Mortgage Bank of Nigeria (FMBN), employers housing scheme (Aribigbola, 1992) and recently the National Housing fund (NHF).

In the same vein, urban solid waste management is yet to be satisfactory. The goals of urban waste management are to promote the quality of the urban environment, generate employment and income, and protect environmental health and support the efficiency and productivity of the economy. Agunwamba (1998) argues that solid waste management has emerged as one of the greatest challenges facing state and local government environmental protection agencies in Nigeria. In the bid to tackle this situation, the Federal Government of Nigeria has promulgated various laws and regulations to safeguard the environment, as pointed earlier. These include Federal Environmental Protection Agency Act of 1988. Pursuant to the FEPA Act, each state and local government in the country set up its own environmental protection body for the protection and improvement of the environment within its jurisdictions (Agwueleka, 2009). Municipal solid waste management is a major responsibility of the state and local government environmental agencies. The agencies are charged with the responsibility of handling, employing and disposing of solid wastes generated. The State agencies generate funds from subvention from state governments and internally generated revenue through sanitary levy and stringent regulations with heavy penalties for offenders of illegal dumping and littering of refuse along streets (Ogwueleke, 2003).

The federal government has instituted the national integrated municipal solid waste management intervention program in seven cities of Nigeria. The seven cities are Maiduguri, Kano, Kaduna, Onitsha, Uyo, Ota, and Lagos. Lagos state government established municipal solid waste management policy to encompass private sector participation in waste collection and transfer to designated landfill sites (Onibokun, 1999). In most urban areas, stationary containers system is adopted for waste collection, the waste containers placed at the points of waste generation. This method requires the delivery of waste by the residents to a storage container. These containers are generally at open space along street ends or junctions. These containers are placed 500-800m apart. The agencies find this system more convenient and less expensive than house to house services. Different types of ventures are used for solid waste collection in Nigeria. The compactor
trucks, side loaders, rear loaders, mini trucks, tippers skip truck, and open back trucks are commonly used as collection trucks. Although past and present government in Nigeria often expresses interest in the provision of housing for the Nigerian masses, as well as addressing the urban waste management problems, the strategies adopted were of little benefit to low income group (Federal Government of Nigeria, 1985). There is, therefore, the need for a dynamic approach or strategy to combat the problem of housing shortage in the face of the growing population, phenomenal increase in the volume of wastes generated daily in the country and dwindling resources of the country. This is more so since past efforts seemed not to have demonstrated meaningful effect or impact on housing provision and waste management in the country. Thus many Nigerians still live in very poor housing environments. The above and other issues have called for devising new approaches or strategies capable of facilitating, promoting and enhancing increase in housing construction and more decent environment in Nigeria.

6. EFFECT OF HOUSING AND SOLID WASTE ON ECONOMIC DEVELOPMENT

Early research on the nexus between housing and economic development was carried out between 1970s and 1980s with a leading paper by Turin 1970 and Drawer 1980. Before this time, housing was mainly seen as a social expenditure and not directly linked to economic development. Globally, environmental decency is a consideration for development. Development in actual fact consists of positive changes in the various sectors of an economy. Economic development often focuses on economic indicators. Economic development is often used synonymously with national development. It really includes, among others, the structural transformation of a country in various areas like income, employment, infrastructure such as housing, waste disposal facilities, road network and power supply. In Nigeria, the degree of availability of infrastructure distinguishes urban from rural areas. Infrastructures in both urban and rural areas in Nigeria are grossly inadequate. Although there is variation in population of both urban and rural, but insufficiency of waste disposal infrastructure and housing in places of need in Nigeria, has resulted to high level of its menace, thereby affecting the standard of living. Besides, the associated health hazard of solid waste mismanagement in the country is a thing of worry. Health actually is wealth. The number of sick persons resulting from contamination from solid waste littered in the country has eaten deeply on the low income of workers and also retards the ability to function, which in turn reduces work and income generation. Recent study has shown that funding for waste management in developing countries is always inadequate, and real costs are never fully recovered. The developing countries have a feature of capital inadequacy. Scholars have pinpointed that insufficient capital stock for industrialization and capital overheads provision have contributed to low level of income in developing countries, which resulted to low saving, thereby affecting capital formation or fund mobilization by banks. The protagonists of this view are Hans Singer and Regnar Nurkse. In his perception, Singer (1949) states that the less developed countries experience “a dominant vicious circle of low productivity.” Deficiency of needed capital for infrastructural development presupposes inability to acquire the necessary tools and equipment for industrial and environmental development. Nurkse (1953) notes that developing countries do experience the vicious circle of poverty, which can be perceived thus: low income gives rise to low saving, which in turn results to low
investment, leading to low productivity and consequently low income. Besides, there is high level of consumption. When there is insufficient saving by the few surplus units in the country, it becomes difficult to raise the necessary capital for provision of necessary tools for solid waste disposal. Based on the aforementioned, the economy is adversely affected as what are necessary to be done are left undone, thereby compounding the problems of the society and also retarding living standard. The low level of real income by a country is a reflection of low productivity, which in turn is due to the lack of capital. The lack of capital is a result of inability to save, and to escape from this ugly situation requires that a country increases its saving (Ashinze & Onwioguokit, 1996: 523-524; Eboh et al., 2006).

Really, there is the need to reposition the Nigerian economy by giving more attention to housing and solid waste management. This involves adequate provision of the needed capital for acquisition of solid waste management materials, so as to evacuate and properly dispose solid waste in our urban areas, thereby improve our environment and encourage living standard. Unequivocally, housing sector plays crucial role in nation’s welfare position than it is mostly recognized. This is because; it does reliably impact on, apart from the populace, but in the performance of other sectors of the economy. Countries of the world are aware of the importance of housing; hence housing adequacy has attracted much attention by virtually all countries of the world, especially developing ones since the 1970s. Among the reason attributed to it is that it is one of the basic needs of life, it is a significant durable consumer goods, which influence positively on productivity given that decent housing does greatly influence workers’ health, wellbeing and growth and also, it is a yard-stick for measuring standard of living of people in many places, the world over (Sanusi, 2003).

Synthesized concept of economic development considered environmental restructuring and decent housing facilities as essential requirements for development, it is quite clear that Nigerians are still battling with development. In view of the rising population of the country and the large number of slums scattered virtually all over the urban towns of the country. It is obvious that on the average large proportions of the population of Nigerian citizens are living in substandard accommodation. This can be attributed to low income, inflations, rising cost of building materials and lack of access to funds from Federal Mortgage Bank of Nigeria.

In Nigeria today and from all ramifications, suffice it to state that the problems of growthlessness, underdevelopment and poor living standard are associated with insufficiency of housing and solid waste management problem. The latter constitutes unhygienic environment with associated health hazards. The situation of urban places in Nigeria is highly unsatisfactory when compared with some third world countries. So, given the scenario in Nigeria, especially in the urban places with slums littered here and there, it can be deduced that housing inadequacy has been impacting adversely on the economic development of Nigerian economy.

## 7. RECOMMENDATIONS

Obviously, there exists the possibility of reviving the Nigerian economy by, among others, giving sufficient attention to housing problems and urban solid wastes management. It is quite a matter of radical exercise of political will. Nigeria has considerable resources to lead the economy out of low living standard associated with inadequate housing and poor waste management if the leaders are sincerely desirous for such change. The problem of housing and solid waste disposal can be tackled if the following points are earnestly pursued.
a) The rural areas need be reformed to minimize rural-urban migration. Transformation of the rural areas includes, among others, environmental restructuring such that good road network, power supply are put in place, medical centres, vocational schools, housing facilities and above all establishment of industries. This is expected to reduce rural-urban migration, cut the possibility of rising population in urban places and avoid pressure on the use of existing facilities. This in line with Olaseni & Alade (2011):

«Infrastructure is the umbrella for many activities usually referred to as “social overhead capital” by development economists... The adequacy of infrastructure helps to determine a country’s success or failure in diversifying production, coping with population growth, reducing poverty, improving environmental conditions ... Indeed socio-economic development can be facilitated and accelerated by the presence of infrastructure. If these facilities and services are not in place, development will be very difficult.»

If the rural areas are improved sufficiently, excessive migration to urban places will reduce and consequently reduce waste generation and housing problem.

b) The three tiers of government in Nigeria have to willingly establish recycling plants and integrated waste management technology in the urban centers. This will go a long way to reduce both organic and inorganic wastes scattered in Nigerian streets. Kaosol (2009); Troschinetz & Mithelcic (2009) note that there are several sustainable technological ways to manage solid waste before landfill. For instance incineration gives energy; fertilizer is obtained from composting organic waste, anaerobic digestion produces energy and other useable materials are recovered through recycling. This necessitates integrated waste management, although capital intensive but it is an important requirement for restructuring urban solid waste management in Nigeria.

c) The population of households that make up the urban centers in each state should be known which will guide the provision of facilities. This is expected to assist to eradicate heaps of waste all over the urban places due to inadequacy of disposal facilities, thereby putting to an end the health hazards associated with it. The government has to make laws for the regulation of population of a specific urban area so as to ensure that facilities in an area are at par with the existing number of people in the place. This will help reduce excess waste due to over population of an area.

d) There is the need to reduce the cost of governance and the establishment of mortgage banks in the 36 states in Nigeria and encouraging entrepreneurial development that can empower more private individuals to delve into estate management. In other to have sufficient capital to improve house financing in Nigeria, political position in Nigeria should be exclusively for those who are already engaged. This implies that some government institutions should be on part time basis so as to reduce cost of governance as experienced in present day Nigeria. Sustainable housing policy is imperative as it will help to reduce poverty. Marcuse (1998) points that a sustainable housing policy must be one that tries to focus towards bringing into place socially fair housing system. House is an important physiological need of man and must be addressed sufficiently as a prerequisite for economic development.

e) Unemployment should be addressed. Great effort is required to tackle dependency ratio resulting from high rate of unemployment. Civil servants lack the ability to save because of extended family total reliance on their paltry income. Disguise unemployment and poor
remuneration affect many Nigerians from securing a decent home. Addressing unemployment and improving remuneration of workers will to a great extent, empower many Nigerian to be able to acquire decent accommodation. Given that Nigeria is agrarian economy, it is essential that the government has to encourage integrated agriculture. This in line with Uma et al. (2013) who point that it is imperative for the federal, state and local governments to establish integrated agriculture in all the wards in each local government. Apart from providing accommodation for workers, it is a source of livelihood for the people.

f) Waste management courses should be taught in schools and colleges. This will assist the youths to acquire the right skill and attitude toward cleanliness. Besides, the National Orientation Agency should co-opt the media houses, churches/mosques and business organizations to enlighten people on waste disposal. Also, waste management courses should be offered in the high institutions. Agunwamba (1998) and Singh et al. (1995) note that waste management courses are offered by very few schools and so there is shortage of skilled workers in this important facet. So, there is the need to ensure adequate trained personnel in environmental agencies. So, improving education on waste management will go a long way to help reposition solid waste management in Nigeria while the enlightenment campaign leads to attitudinal change.

g) In view of the aged parents depending on sons and daughters, it is imperative for the government of Nigeria to introduce old peoples’ homes in all the 774 local government areas of the country and be catered for by the respective local government authority. It is a measure that can go a long way to relieve dependants and apart from creating accommodation for aged, it will assist in alleviating general poverty in the country.

h) It is of utmost necessity for the government to make adequate legislation on waste disposal. The legislative agenda and fines for violation must be communicated to the Nigerians through schools, churches, mosques and market authorities in every state in Nigeria.

i) There is urgent need to increase both public and private sector active participation in management of housing estates. Mostly by making land available to such investors. This is like creation of enabling environment for private investors who have the will to go into long term investment.

j) The mainstay of the Nigerian economy in the 1960s that is agriculture should be renewed and introduction of modern agriculture relevant to various parts of the country will play a significant role. The insight in this is that modern farm settlement is a decent home for farmers. This has the tendency to reduce high unemployment, curtails incessant rural-urban migration, brings food to the rising population, raw materials to industries, income generation and ameliorates poverty in Nigeria.

k) All states and local government authorities have to implement and make sure that every day, the shop owners, artisans, hair dressers, automobile mechanics and industrialists do dispose their waste appropriately. Wastes deposited along roads, beneath bridges, in culverts and in drainage channels must be cleared and those wastes dumped around busy areas must be removed. In addition, the collection and disposal of waste should not be delayed, so as to guard against decomposition of organic waste. This involves provision of
enough facilities for waste deposit and also sufficient coverage by the relevant waste management authority.

1) Foreign direct investment in housing estate and solid waste management should be promoted. Lack of capital in developing countries has been a major setback in economic development. The foreign owners of capital wishing to expand beyond their home economies should be attracted by Nigerian government. This will involve creating enabling environment and ensuring the security of lives and property.

m) Slums and unplanned structures should be avoided in our urban centres. The uncontrolled heaps of waste in such areas are avoidable if low cost housing units are put in places with careful planning and the enabling political will, and zero tolerance for corrupt practices, this is achievable.

8. CONCLUSIONS

This paper has examined the impact of urban solid waste and housing problems on economic development of Nigeria. It was obvious that the governments of Nigeria over the years have attempted in different ways to tackle the problems but it has remained insurmountable due to failure to control rural-urban migration, lack of capital and increasing population rate. Consequently, there have been pressure in the use of urban facilities and the insufficiency culminated in creating slums, shantytowns, heap of waste deposits in conspicuous places and health hazards emanating from decomposed organic waste. The heaps of waste of different forms can be separated for recycling, composting and recovery for useful purpose. This requires integrated waste management technology, which the adoption will play significant role to reposition urban solid problem. Besides, increased low housing provision, strong mortgage bank and enabling environment for both domestic and foreign private estate management are expected to assist in resolving housing problem in Nigeria. It is our view that the trend can be revived if and only if efforts are made in putting into use the articulated recommendations.

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REFERENCES


Endnotes

1 Dual economic base is further characterized by undeveloped rural areas and a developed urban area existing side by side- see W. Arthur Lewis 1954.

2 The structural adjustment policies of the 80s re-invigorated the neo-liberal perspective of reducing the government control of markets while allowing the private sector play a significant impact.


4 Services of the informal workers are not limited to itenary and stationary waste buyers, small scale recycling firms, waste pickers and community based organizations.

5 Green Agenda 21 is the outcome of the UN Earth Summit if 1992 in Rio de Janeiro requiring a re-orientation of the human race to the environment.


8 As was the case between 1945-1960s with the ideas of post-war development planning as documented in Domar 1947, Nurkse. 1953 and Lewis 1954- See Arku and Harris 2006.
The Evolution to the Cloud – Are Process Theory Approaches for ERP Implementation Lifecycles Still Valid?

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ABSTRACT

Enterprise Resource Planning Systems (ERP) have been implemented for the past 15 years in both large-scale and Small & Mid-size Enterprise (SME) organizations. The implementation processes have evolved as the result of perilous attempts as organizations encountered numerous problems, financial strains, organizational difficulties, organizational cultural challenges, resulting in successful implementations but also failures to the extent of bankruptcy filings. There have been a number of process theory approaches developed to support these implementation efforts in traditional infrastructures, greatly reducing the risk of failure during the past decade. Concomitantly, a possible paradigm shift is in the evolutionary process with the emergence of Cloud ERP systems. Cloud systems are ERP operations that are hosted remotely and the vendor provides all systems software, maintenance, backup and security. This paper will examine the various process theory methodologies available to ERP implementation project teams, Champions, consultants and software vendors, as alternative approaches for a successful implementation. The paper will explore if these process theory approaches are still valid given the movement to Cloud hosting and the perceived need for acceleration in implementation processes for cost and productivity purposes.

Keywords: Cloud ERP, ERP Implementation, SME, Process Theory Methodologies.

1. INTRODUCTION

From an enterprise systems research perspective, small and medium sized enterprises (SMEs) are the leading market segment of organizations that provide a wide variety of researchable theories
and experiences. Not only are these organizations crucial to industrial economies, but also demonstrate operational qualities that promote cause and effect relationships that are proving to be enormously interesting to researchers (Katz et al., 2000).

“SMEs’ performance is essential for the development of any country’s economy” and establish a foundation for future economic growth and prosperity with their development into large enterprises as we consider the current global economy environment (Abouzeedan & Busler, 2004). Statistics indicate that historically most new businesses do not survive the first five years of operations (Castrogiovanni, 1996; Monk, 2000).

If a higher proportion of these fledging enterprises survived and grew into global economic competitors there would be a very positive impact on the global economy (Monk, 2000). The operational enterprise must be able to create, analyze and ultimately utilize business information systems reflecting its operations to provide quality leadership in products, improve business processes, enhance its supply chain, and create better customer relationships; this is crucial to compete and survive (Schubert & Leimstoll, 2007).

The majority of ERP systems were implemented in large-scale organizations in the mid to late 1990’s to the current day and generally were done to: 1) overcome the millennium date problem (often known as the Y2K initiative), 2) resolve issues of disparate systems within the organization, 3) resolve poor quality/visibility of information, 4) resolve lack of business processes and/or systems not integrated, 5) replace obsolete systems, 6) assist in integrating acquisitions, and 7) resolve issues of lack of support for organizational growth (Deloitte, 1999; Plant & Wilcocks, 2007).

Without due diligence, many organizations will find the ERP software system dictating the operational aspects of the business (Bajwa et al., 2004). Consequently, the challenge for the adopting organization is to properly choose how various processes will be implemented within the programmatic (configuration) options. Furthermore, it is critical how these options are selected to maximize the efficiencies and effectiveness of the organization (Shanks et al., 2000).

Given these factors, issues related to user satisfaction and perceived usefulness in the ERP implementation must be considered (Zviran et al., 2005). Even considering the highly configurable nature of ERP systems (Bancroft et al., 1998), the inherent data structures, programming code, and existent assumptions about business processes can impose a behavior on organizations that many management teams will find difficult to adopt (Piszczalski, M., 1997; Al-Mashari et al., 2003).

A significant number of organizations, for existing legitimate managerial reasons: financial, personnel, infrastructure resource limitations, etc. have not considered adoption of a new or upgraded system (Adam & O’Doherty, 2000). It is important to note that simply having an accounting information system (AIS) is not the equivalent of implementing a true ERP for the enterprise. AIS are typically a component, module, or subsystem of a complete ERP system.

Certainly, some SME organizations were compelled, or were in a position to be strongly influenced by a vendor/client relationship in their value chain to adopt a particular system, even though it may not be the most appropriate fit. Some SME organizations may be legal units of some larger organization and may be essentially forced to adopt a particular enterprise solution to remain within the strategic goals of the parent organization. It has been suggested by other researchers (Sistach et al., 1999; Sistach & Pastor, 2000) that this phenomenon may also occur in Supply Chain Management (SCM) situations and other modules.
There are numerous critical success factors (CSF) affecting successful implementation of ERP programs into any organization. Numerous studies have addressed these CSFs for the larger scale market. These CSFs have not been fully identified and described for the SME market. A research effort (Argyropoulou et al., 2007) specifically addressing SME implementations, reported that these organizations were much more likely not to use a structured methodology for implementation. Further the study reported that SMEs were either not familiar or unsophisticated with techniques such as business process reengineering (BPR) and change management.

The Data Envelopment Analysis (DEA) model was developed in 2004 to help mid-size organizations select ERP systems to best assess costs with capabilities/services to evaluate relative performance. Most SME firms lack the technical and financial resources to make the appropriate selection of ERP software. Historically SME IS professionals often used software selection guides or surveys to choose an organizational software package (Fisher, et. al., 2004).

This paper will progress through related elements. The Small and Medium Enterprises (SME) market segment will be defined and its relationship to ERP systems will be delineated. SMEs have different selection and implementation factors relative to large scale organization efforts, and this sets the foundation for the various process models introduced later. Cloud systems will be defined using the National Institute of Standards and Technology (NIST) definition and various factors of Cloud ERP implementations will be discussed: 1) essential cloud characteristics – NIST definition and overview, 2) cloud service models – the easily recognizable SaaS and other models, 3) cloud deployment methods – private, community, public and hybrid and current Cloud ERP systems typical deployment, and 4) cost considerations – a brief comparison of traditional hosted infrastructures vs. a cloud deployment.

Subsequently, ERPs will be briefly reviewed in a historical perspective progressing from early implementation efforts where dramatically high failure rates (approaching 70% at times) were the norm, to current day efforts where virtually all implementation efforts are successful. The evolution of implementation methods and attendant ERP critical success factors (CSFs) are explored.

Four existing ERP implementation models are examined in a cloud deployment rather than large scale approach. Although these models were originally developed for large scale ERP implementations (self-hosted environments), this paper reviews the models for relevancy assuming a “cloud” deployment strategy in SME organizations. These models include: 1) Cooper & Zmud (1990) advocate a six phase model, 2) Esteves & Pastor (1999) suggest a six phase model very similar to classic SDLC models, 3) Ahituv et al. (2002) developed a compressed four phase model, and 4) Markus & Tanis (2000) developed a simpler four phase system, that essentially merged most of the above phases.

2. SMALL AND MEDIUM ENTERPRISES (SME)

Many organizations are aware of limiting factors, subsequently cautious and hesitant to implement new ERP solutions due to well publicized problems and failures, and the financial and technical resources necessary. However, SME organizations are in a unique position to leverage this risk and financial commitment with a significant opportunity to gain a considerable competitive advantage and exploit future system evolutions by adopting ERP “best practice” systems (Wang et al., 2006).
2.1 SME organizations – marketplace definition

The market segments for software products, particularly ERP solutions, are differentiated into several strata including: large organizations, SME organizations, and SMB markets. There are no generally accepted definition parameters of SMEs in the United States, including the federal government (Ou, 2006). The following distinctions in market profiles are adopted for this paper and were sourced from the Journal of Accountancy (Johnston, 2003). Large organizations typically implement full ERP software applications and have annualized sales in excess of $500 million, and have more than 500 employees. Small to medium enterprises (SME) have sales up to $500 million, and have no more than 500 employees. This stratum represents more than 84,000 U.S. companies. Small to medium businesses (SMB) have sales up to $100 million, and have no more than 100 employees. This represents more than 516,000 companies in the U.S. SME organizations that have < 500 employees and <$500 million in annualized sales is the focus and definition adopted within this research.

2.2 SME organizations – ERP perspectives and challenges

In March 2006 a report was released: Thinking big: Midsize companies in the United States and the challenges of growth. The Economist Intelligence Unit interviewed 240 U.S. senior executives from a total 3,722 global midsize company business executives using similar SME segment parameters. These firms indicate an aggressive expansion of their customer base using a strategy of product and service diversification to secure new geographic (global) markets. The keys to successfully infusing this strategy are: improved operating efficiency, excellent work force, and critically efficient information technology infrastructure (Ramaswani et al., 2006). The executives identified growth priorities substantially influenced by a strong IS environment and information systems. The executives indicate IS are critical to enabling growth (76%), and a deficiency of talented staff (36%) to manage the growth and constraints such as resistance to change and lack of technical skills, are major impediments to IS investment (Ramaswani, Holloway & Kenny, 2006).

The Aberdeen Group (2006) provided their ERP in the Mid-Market benchmark report. Their definition of SMEs was much larger but findings were similar in most regards, but did focus more on the larger companies that tended to be financially and organizationally related to larger Fortune 1000 and S & P 500 type organizations. There were noteworthy analytical points, such as the correlation between ERP functionality utilized and company size. Their analysis demonstrated that functionality rose steadily and peaked at the $100-$250 million size organization (the typical definition of an SME), and then dropped. They concluded these companies did not have unlimited resources like their larger competitors, but have sufficient resources to maximize their implementations value and have learned to leverage these investments, with a greater incentive for productivity and efficiency (Aberdeen Group, 2006).

Forrester Research (2011) created a report: The State of ERP in 2011: Customers Have More Options in Spite of Market Consolidation addressing the current status of ERP system offerings and examined the possibility of Software-as-a-Service (SaaS), i.e. cloud applications and their viability in the current marketplace.

Hamerman & Martens (2011) indicate in the above study that the ERP market is predicted to shift from licensed to subscription model in five years, i.e. user organizations will consider the
SaaS/Cloud model much more viable given constraints. The global ERP market will grow to $45.5bn in 2011, and to $50.3bn by 2015, according to the report. This growth follows the trend of the ERP market size which has been growing steadily over recent years with $43bn in 2010 and $40.6bn in 2009.

3. THE CLOUD

The concept of The Cloud has metamorphosed over the past decade, working through three titles: Application Service Providers (ASP), Software-as-a-Service (SaaS), and now finally The Cloud. There are subtle differences between these terms, but all revert back to the same basis; providing IT services to a client base by providing the software system on a license basis rather than selling the system to the client.

Cloud Computing was first identified in an academic context by Prof. Kenneth K Chellapa. The venue was the 1997 Informs Conference in Dallas. The description referred to the concept of cloud computing a new computing approach and its potential would be more limited by economic rather than technical factors (Chellapa, 1997). This description is probably more simplistic than the various definitions offered by other authors, researchers, internet sources, vendors, and the NIST.


“NIST suggested this informal definition to enhance and inform the public debate on cloud computing. Cloud computing is still an evolving paradigm. Its definition, use cases, underlying technologies, issues, risks, and benefits will be refined and better understood with a spirited debate by the public and private sectors. This definition, its attributes, characteristics, and underlying rationale will evolve over time” (2011: 5).

3.1 The NIST definition of Cloud Computing

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models (2011).

3.2 Essential characteristics

NIST defined the Cloud as having five essential characteristics: 1) on-demand self-service, 2) broad network access, 3) resource pooling, 4) rapid elasticity, and 5) measured service. These characteristics deal with the consumer/client having the ability to acquire computing capabilities automatically as necessary. These capabilities would be available over the internet and accessible using standard computing and communication products such as laptops, PDAs, iPad and similar, and smart phones. The service provider possesses various resources that are pooled to serve
multiple user/organizations, and those users generally have no control or knowledge of the exact location of the resources. The capabilities are scalable and easily and quickly expanded to meet needs. Finally, Cloud systems automatically control and optimize resource usage.

3.3 Service Models

**Cloud Software as a Service (SaaS).** Essentially the system user accesses the provider’s applications running on a cloud infrastructure. The applications are accessible from various user devices and utilize a web browser (e.g., IE, Firefox, Safari). The user has no role in the management or control of the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities. The user may be able to access and customize limited user-specific application configuration settings.

**Cloud Platform as a Service (PaaS).** This approach is similar to the SaaS model. The difference in model is the capability for the user is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The user has no role in the management or control of the underlying cloud infrastructure including network, servers, operating systems, storage, but has control over the deployed applications and possibly application hosting environment configurations.

**Cloud Infrastructure as a Service (IaaS).** The final model approach has the user in the position to license processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software. This software may include operating systems and user applications (e.g., ERP). The user has no role in the management or control the underlying cloud infrastructure, but importantly has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).

3.4 Deployment Models

**Private cloud.** The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on premise or off premise.

**Community cloud.** The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed by the organizations or a third party and may exist on premise or off premise.

**Public cloud.** The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services.

**Hybrid cloud.** The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

3.5 Cloud cost considerations

The cost structure for SaaS (cloud) does not have a direct correlation to the operating and capital cost structures of traditional ERP hosted systems. With traditional systems the user/client
typically purchases the software system license (on an application or total system basis) and incurs all the other costs separately. Typically these other costs include: infrastructure costs related to hardware, network, storage, operating systems, and implementation, maintenance and post implementation support costs. It is not unusual for the system software license cost to comprise as little as ten percent of the total system cost.

In contrast to the traditional ERP (hosted model), the Cloud application provider generally includes a majority of these “other costs” within the monthly user fee. Often the perception by a potential cloud application user is that a SaaS/cloud ERP software system is very expensive, compared to traditional software. ROI and cost of traditional ERP systems could be hidden or not correctly allocated. The cost of in-house operators, servers, and storage are frequently not considered providing misleading total costs and metric analysis.

4. ERP IMPLEMENTATION

4.1 Historical perspective

In a classic MIS article, Kydd suggests that “failure to address the uncertainty and equivocality that exist during the development and implementation of a new management information system is a major reason why projects fail” (Kydd, 1989: 277). Implementation as a process has different definitions and connotations, spanning from the fully encompassing process of selection and ultimate upgrades years hence, vs. a very narrowly defined step in one project phase. This paper will adopt the broader, fully encompassing process approach definition that includes a complete process theory ERP lifecycle.

Supporting research indicates a sound IT strategy is linked to a full understanding of any organization’s business strategy. “IT strategy is the alignment of the information technology infrastructure and investment with the business’ strategic direction” (Norris et al., 1998: 22). ERP popularity can be traced to greater global organizational activity, mergers and acquisitions, short product life cycles, and system disaster fears from older legacy systems (Bingi et al., 1999). There are a number of primary reasons to implement an ERP system (Nadkarni & Nah, 2003). ERP can integrate disparate domestic and global systems under one enterprise operation, resulting in one consolidated database and the elimination of “islands of automation” (Kerr, 1988) that so politically and operationally plagued IS systems in the 1975-2000 time frames. Secondly, the “Y2K” date bug was effectively eliminated, and the organization/enterprise was expected to benefit with greater functionality and improved business processes; although fueling the original efforts, this not no longer exists as a major implementation factor.

Too often ERP solutions were viewed by a majority of enterprises as a panacea for their organizational ills. Many of these implementations were failures (at one point in the late 1990’s the failure rate was approaching 70% by some professional estimates) for any number of reasons, while some implementations were limited successes. There were many implications to managements of these organizations and they also had a profound effect on the accounting functions and financial and managerial reporting efforts. The literature reports have identified countless successes and failures. Some have been such monumental failures that lawsuits were filed and some organizations have been forced into bankruptcy proceedings (e.g. FoxMeyer Drugs driven into bankruptcy, 1998) from the subsequent business difficulties. Several implementations like Hershey’s have seen copious financial losses while others encountered
extensive costs when the realization that the software would not fit the organization’s needs, similar to Dell’s circumstances (Bingi et al., 1999; Esteves & Pastor, 1999; Shang & Seddon, 2000; Umble & Umble, 2002).

ERP systems have taken a more dramatic role than originally envisioned in the early 1990s. Organizations are rapidly being tested and asked to respond with qualified and well-trained professionals utilizing complex information systems (ERP) to meet not only the daily informational and operational needs, but also an ever-expanding governmental compliance initiative, e.g. SOX 404 compliance. Consequently, managements are facing an increasingly dedicated technological environment with significant challenges. In the last 18 years (1990 – present), information technology provided a methodology for contemporary organizations to integrate supply, production, and delivery processes. Prior competitive advantage in these organizations was persistently maintained with the previous deployment of technology into physical assets and excellent balance sheet management, but this could no longer be the champion of growth and management (Kaplan & Norton, 1996; Swanson & Ramiller, 2004).

A fully integrated ERP effectively defines the tasks and objectives of an organization. Champy & Hammer indicated that in contemporary business organizations, integrated business processes are typically the result of new and powerful information systems. These systems are continually improved and enhanced with powerful features and functionality, and with this technological capability, data mining, powerful DBMS system, information is more readily available and possess a higher degree of data integrity (1993). Additionally “all employees must contribute value ... by the information they can provide. Investing in, managing, and exploiting the knowledge ... has become critical to the success of information age companies” (Kaplan & Norton, 1996; Jacobs & Whybark, 2000: 6). In contrast to ERP, legacy systems are long-tenured, non-ERP, dedicated mainframe systems where each organizational subdivision may have its own dedicated computer system, often not integrated with other systems. Historically these have also been referred to as “islands of information” or “islands of automation” (Kerr, 1988).

ERP has been historically touted as cheaper to purchase and install/maintain than to classically construct legacy systems that are replaced, thus appearing to be a panacea to large and complex organizations (Nah & Delgado, 2006). ERP are perceived to be highly flexible and adaptable. History has proven ERP can generate organizational behavior restrictions, and behaviors that organizations did not expect. The discipline of the programming code, the DBMS complex data structure, the intricate integration of applications, and built-in assumptions of normal business processes, can and have taxed and frustrated many organizations.

4.2 “First/Second/Third Waves”

The “First Wave” of ERP implementation presented a fundamental transformation of any organization. Adoption and implementation of ERP systems experienced the “First Wave” as a far-reaching scope of business processes impact, and generates a paradigm change to businesses/organizations simply due to the magnitude of the changes. The efforts were predominately focused on the technical aspects of the implementation, i.e. software, infrastructure, basic training initiatives. However the business process changes envisioned and deemed necessary usually generated low priority. Hence, business process changes and operational enhancements were fundamentally deferred and became the major factors of the “Second Wave”.

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Marketers, researchers, practitioners, and software vendors coined the “Second Wave” and “Third Wave” of ERP implementations during the past 8 years. These characterize the time frame in the system implementation and operation, after the base system has been installed, and the “go live” point has occurred, and refer to major updates and enhancements to the software. These normally include business processes such as the implementations of Customer Relationship Management (CRM) and Supply Chain Management (SCM) modules. These efforts all provide value-added contributions to the ERP system and take the organization to the point of leveraging the system for overall operational and financial gains, i.e. ROI opportunities and value chain optimization (Deloitte Consulting, 1999; Smith & Fingar, 2003; Stein et al., 2004, 2003; Hawking et al., 2004).

In summary, companies were seeking efficiency benefits, higher-order effectiveness benefits, and ultimately transformation. Transformation is the ability of an organization/strategic business unit to fundamentally change how they conduct their business and associated processes (Deloitte Consulting, 1999).

4.3 Success and failure parameters

The ERP implementation efforts suggest an essential issue that calls into question the factors for success. An organization in the planning or processing stages of an ERP implementation must look to executive management to provide the critical leadership in all phases of the process to the organization members, the implementation team, and other stakeholders (Markus & Tanis, 2000). These questions are also posed by others (Deloitte Consulting, 1998; Davenport, 2000a, 2000b; Markus & Tanis, 2000; Ross & Vitale, 2000) all noting the multidimensional accrued benefits of these systems, running the spectrum of operational improvements to enhanced decision support systems for strategic goals.

Deloitte Consulting (1998) published a study that was based on in-depth interviews of 62 Fortune 500 companies, and although not an academic composition, it is accepted in the ERP industry, academics and professionals serving the industry as a benchmark publication in ERP implementation efforts. The Deloitte study provides some perspectives on ERP implementations at that time. Generally the objective in IT organizations was to install, implement, and operate an ERP, i.e. going live with perceived and stated operability parameters. However, an organizational metamorphosis of sorts occurred in the time frames generally referred to as First and Second Waves of ERP implementations enhancing enterprise transformations.

Deloitte identifies the First Wave as a time frame where organizations actually went live and the concomitant organizations changes that occurred within the process. The Second Wave is characterized by the post implementation organizational efforts that promote the full functionality of the system and the organizational leveraging on the system with subsequent capabilities and benefits. These often unforeseen results were a function of the sophisticated processes and best practices initiated by the implementation effort (Deloitte Consulting, 1998).

Success in information systems (IS) implementations has long been a focus of academic research efforts (Lyytinen & Hirschheim, 1987; DeLone & McLean, 1992, 2003; Ballantine et. al., 1996). Others research efforts focused on the measurement of success, antecedents and explanations of success or failure (Markus et al., 2000; Koh et al., 2000). The exigency affiliated with success or failure in ERP systems results from the inherent risks and colossal costs, sometimes rivaling the expected benefits of these systems. In many cases, failures have led to losses and
bankruptcies (Bulkeley, 1996; Davenport, 1998; Bingi et al., 1999; Esteves & Pastor, 1999; Markus & Tanis, 2000; Ross & Vitale, 2000; Shang & Seddon, 2000; Davenport, 2001; Umble, & Umble, 2002).

There are different dimensions, e.g. technical, financial, economic, operational or strategic that can be assessed to measure success in ERP implementations (Markus et. al., 2000). Success can and should be measured at different time points (Larsen & Myers, 1999) to assess value, with evidence pointing to changing levels, e.g. early failure but later success. Paradoxically, research indicates performance slides after initial implementation with moderate to severe business disruptions (Ross & Vitale, 2000).

5. ERP IMPLEMENTATION – LIFECYCLE MODELS

The literature on ERP lifecycle models is somewhat dispersed with the resulting absence of a generally accepted enterprise lifecycle model (Rosemann, 2003). This is curious considering the extensive research conducted on systems analysis and design and software development without a significant effort towards the management of enterprise systems (Gable et al., 1997; Klaus et al., 2000). Currently, there are a number of software development models, (e.g. waterfall model, spiral model), but no standardized ERP lifecycle model. There is a concentration on implementation issues and critical success factors both in the literature and the trade press (Bingi et al., 1999; Holland et al., 1999; Stefanou, 1999; Sumner 1999; Nah et al., 2001; Umble et al., 2003). Process theory in a case study (Koh et al., 2000) was contrasted with variance theory utilizing an ERP process model. Several authors (Shanks et. al., 2000; Markus & Tanis, 2000; Nah & Delgado, 2006; Plant & Willcocks, 2007) stress the point that an ERP implementation project is best conceptualized as a business project and not simply the installation or update of an innovative technology.

Cooper & Zmud (1990) developed one of the first ERP related models that includes the following six lifecycle stages in an ERP implementation: 1) initiation phase – establishing the business case and identifying the problems and opportunities, 2) adoption phase – gain organizational support for the implementation effort, 3) adaptation phase – acquire the system, installation, maintenance, 4) acceptance phase – system has complete functionality and user training completed, 5) routinization phase – normal operations in daily activity, and 6) infusion phase – incremental organizational effectiveness. These stages have similarities to other researcher-developed models and as they are examined, these lifecycle models tend to have between three and six phases. Each of these phases’ success can be gauged and evaluated by a series of defined metrics including factors of human and organizational learning.

There are numerous highly referenced alternative ERP lifecycle models emanate from, Bancroft, (1997); Bancroft, Seip & Sprengel (1998); Gable, Scott & Davenport (1998); Esteves & Pastor (1999); Holland & Light (1999); Holland, Light & Gibson (1999); Parr, Shanks & Darke (1999); Markus & Tanis (2000); Parr & Shanks, (2000); Ross & Vitale (2000); Sandoe, Corbitt & Boykin (2001); and Ahituv, Neumann & Zviran (2002). Essentially, all of the above models distinguish similar, but not entirely identical phases; additionally, they group and name these phases differently.

Bancroft (1997) proposed a lifecycle model with an emphasis on the initiating phases starting with focus to the actual implementation. Gable, Scott & Davenport (1998) created a different approach with an initial focus on the consulting effort, through implementation to phases of
training and knowledge transfer. Esteves & Pastor (1999) have six phases also, but they included a final phase, retirement dealing with the next evolution of the ERP software. Markus and Tanis (2000) compressed the lifecycle model down to four phases of chartering, project, shakedown, and onward and upward. Finally, Ahituv, Neumann & Zviran (2002) developed a four-phase model, including selection, definition, implementation, and operation that closely resembles the actual implementation phases expected in SMEs.

5.1 Structured lifecycle models – process theory basis
The implementation of an ERP system is the result of many phases of organizational, professional and consulting firm review and analysis. Often this is a structured format similar to the MIS concept of SDLC. Some of these phases become nebulous and overlap during the actual implementation projects. Implementation is often confusingly referred to as the entire adoption, installation, and operational process of bringing an ERP system online, yet alternately can refer to the single phase within the overall project where the software system becomes operational. Cooper & Zmud’s (1990) phases of adaptation, acceptance and routinization are discussed by many researchers and practitioners as the “Second” and “Third Waves” of ERP implementation and post-implementation activity. Alternative ERP lifecycle models create a full spectrum of grounded theory: Esteves & Pastor (1999), Markus & Tanis (2000) and Ahituv, Neumann & Zviran (2002). Substantively, all four models address near identical phases, although grouped and titled differently.

6. PROCESS THEORY APPROACH - ERP LIFECYCLE MODELS
There are a number of ERP lifecycle models identified in the literature. Included in this detail review are a representative group that are chosen because of their multiple references in other literature or their inclusion of different phases of the lifecycle model: 1) Cooper & Zmud (1990) advocate a six phase model, similar to SDLC, but with different and more descriptive names for the phases and some differences as to where various sub-phases should be included, 2) Esteves & Pastor (1999) advocate a six phase model very similar to classic SDLC models, 3) Ahituv, Neumann & Zviran (2002) developed a four phase model, including selection, definition, implementation, and operation, and 4) Markus & Tanis (2000) developed a simpler four phase system, that essentially merged most of the above phases.

6.1 ERP lifecycle model – Cooper & Zmud
The Cooper & Zmud (1990) model identifies six phases: initiation, adoption, adaptation, acceptance, routinization, and infusion. This approach looks upon IS implementation from a general perspective and is somewhat similar to Esteves & Pastor, but with different nomenclature. The lifecycle model includes six phases of ERP implementation during its life in an organization (see Figure 1).
The *initiation phase* is characterized by identifying the organizational problems and opportunities for IS solutions. Likewise, these are seen as “push” “pull” alternatives. “Push” as a result of new technological innovation and “pull” as a result of an organizational need. The *adoption phase* has various activities and negotiations occurring to acquire and solidify organizational support for the implementation effort of the IS solution. The *adaptation phase* has the actual system developed or acquired, installed and maintained. This is the main core of the implementation process and requires great managerial, financial and human resources support. The *acceptance phase* sees the system operated as a live system with complete feature functionality, including user and system training. Acceptance however does not assume full operational functioning, just acceptance that the system meets all operational compliance factors. The *routinization* assumes that the IS system, in this instance the implemented ERP system is now operated in daily activity. The *infusion phase* assumed incremental organization effectiveness as a result of normal system operation. The system is used to its fullest potential.

SMEs have a unique environment vs. large scale organizations from many perspectives primarily related to organizational resources. Most SMEs generally do not have the IT/IS expertise and infrastructure resident in large organizations, have fewer financial resources, have fewer human resources, and are typically not as complex in structure and operations.

SMEs in a cloud SaaS implementation environment would address the *initiation phase* differently, typically unable to spend the resources on ERP consultants to perform the feasibility studies and due diligence prevalent in larger organizations. Potential ERP systems would certainly be examined by a myriad of internal operations, financial and IT/IS management regarding solutions to operational and control issues, but quite possibly without ever working within an ERP environment.

An organization may be limited by its current manufacturing, distribution and SCM approaches, or its financial applications may not be sufficient to meet Sarbanes Oxley (SOX) legislative and internal control requirements in US organizations. There may be a “push” need to meet technological innovations that in turn affect financial considerations, e.g. adopting various ecommerce online systems that drive sales and collections enhancing the cash to cash cycle for financial management. Likewise, there may be a “pull” factor to better serve marketing efforts with CRM solutions. The issue would then progress to the simple question: “does a cloud application become more feasible in our organization given our constraints related to financial, human, IT/IS, and customer service functions?” Further, will a cloud approach be more productive, for both initial implementation solutions and future enhancements? Will the cloud approach require less information systems technical expertise and have this essentially outsourced to the SaaS provider, allowing the organization to focus its resources on operations and customer service and response? As an SME, are we in a position to leverage the investment in an ERP for growth, increased market shares, and enhanced profitability? Utilizing the cloud approach and combining with a rapid deployment strategy may enhance successful leveraging.
The adoption phase in SMEs would conceivably follow similar approaches from the very detailed SDLC approach to quick implementation models. Traditional vs. cloud would still need to answer the same questions, keeping in mind that the final solutions may be very different requiring widely divergent levels of infrastructure improvements/enhancements.

The adaptation phase where the actual system is developed or acquired, installed and maintained could be substantially different. For example, the choice between implementing a multi-module traditionally hosted SAP system would require widely different implementation teams as opposed to a NetSuite cloud implementation, where the organization can more rapidly progress to “going live” and have far fewer system code and functionality issues.

The final two phases: acceptance and infusion would be similar. The acceptance phase looks forward to the routinization of the IS system. In cloud applications, presumably there would be a far lower likelihood of customization by the typically smaller and less complex SME organization, and the conversion of data should be less complicated given by definition, the smaller nature of these organizations. Most cloud applications, although giving a wide range of options and choices, would still be less complex to deal with as opposed to a large-scale organization. Given the less complex SME organization, we could imply that these organizations may be able to reach the infusion phase much quicker, i.e. incremental organization effectiveness as a result of normal system operation.

6.2 ERP lifecycle model – Esteves & Pastor

Esteves & Pastor (EP) (1999) suggested an ERP lifecycle model, representing the various phases that an ERP system would chronologically implement in an organization. The lifecycle is structured in phases going through the whole ERP project and functional life: adoption decision, acquisition, implementation, use and maintenance, evolution, and retirement.

The lifecycle model includes six phases of ERP implementation during its life in an organization (see Figure 2).

Figure 2. ERP Lifecycle model – Esteves & Pastor


The adoption decision represents the time when management determines that a new ERP system is necessary for any number of reasons. The phase includes systems requirements definition, the desired goals and benefits, and the impact of the ERP system adoption. The acquisition phase relates to the decision of system choice as a result of the systems requirements definition in the adoption phase. This also considers the system that needs the least amount of customization. The implementation phase deals with the actual adoption of the system into the computer infrastructure and any customization necessary to make the system functional. This phase is also characterized by the greatest degree of training. The use and maintenance phase deals with the functionality, usability and adequacy of the system to the organization. Post implementation issues include required maintenance, updates, correction of malfunctions both programmatic and option selection, systems operational optimization and overall general improvements.
evolution phase represents the period when additional capabilities are integrated into the ERP system for additional benefits. The evolution phase has benefits both “upwards” and “outwards”. The retirement phase deals with the period when an ERP solution no longer meets organizational goals and objectives and needs to be replaced (Esteves & Pastor, 1999). In many aspects, the first four phases of Esteves & Pastor are very similar to the Cooper & Zmud model. The phase names are somewhat different but the essential functional steps and information gathering and decision making is fairly similar. Esteves & Pastor portrays these phase a little differently in their definitions and slightly more or less emphasis in the various phases. Regardless, many SMEs, especially those at the higher level of the SME definition, would probably implement with phases more closely resembling classic SDLC, although the trend has been more aggressively advancing to a quick deployment strategy. Esteves & Pastor’s use and maintenance and evolution phases mimic Cooper & Zmud’s routinization phase. The major difference is the retirement phase in Esteves & Pastor. The presumption here is that at some point, the ERP systems will be replaced by a new generation of ERP or other systems. In SMEs, organizations are more likely to remain with existing IT/IS technology for longer periods of time due to the typical organizational constraints. In a cloud SaaS environment, this extensive usage of the same system is probably a feasible reality. SaaS implementations generally involve annual enhancements and updates as part of the licensing structure, and would enhance the longevity of the system, predicated on the ERP meeting the operational and security needs of the organization.

6.3 ERP lifecycle model – Ahituv, Neumann & Zviran

This model developed by Ahituv, Neumann & Zviran (2002) is a blended model of traditional SDLC, Prototyping and Application Software Package purchase approaches. This model is comprised of four phases: selection phase, definition phase, implementation phase, and operation phase. There are many overlays and consistencies with the previous three models, and is probably most closely related to the Esteves & Pastor ERP lifecycle model, with some phases combined. The Ahituv et. al. model is similar to the others, but has various detailed activities identified in each of the phases. It is a blended approach of three traditional system development models the authors defined, Information System Life Cycle (The Waterfall Model) and very much like classic SDLC, Prototyping Model that is the antithesis of SDLC and creates a prototype system for further development, and Application Software Package Model that is related to the purchase of a preexisting system. The authors also identified a series of characteristics that would influence the selection of an ERP lifecycle model for development methodology: system complexity, system strategic importance, system flexibility, application scope, technological infrastructure, organizational process changes, intensity of relationship with vendor, employment of external consultants, and users’ involvement. The lifecycle model includes four phases of ERP implementation during its life in an organization (see Figure 3).
The first or selection phase identifies the most appropriate ERP package and includes the definition of project objectives, collection of vital information about systems, vendors, and consulting firms, needs analysis, feasibility study, contract negotiation and signing. The second or definition phase is the shortest in duration and includes all preparatory activities for the following implementation phase. The third or implementation phase is the predominant phase of the ERP lifecycle and is designed to provide maximum organizational efficiency and effectiveness plus financial rewards upon movement into the operation phase. The phase is characterized by the iterative implementation of various system modules passing through activities to either add processes or organizational layers to the accomplished project objectives. The fourth and final phase is the operations phase. Here the system is brought to normal operations and is the longest of the phases, potentially lasting multiple years.

For SME organizations, the Ahituv, Neumann & Zviran model may most closely resemble the aggressive implementation methods used by ERP consultant for rapid deployment. This approach is markedly shortened vs. the previous approach that more rigidly resemble classic SDLC. Given the highly competitive nature of the global economies and constant management pressure for productivity and speed, this approach is probably the best fit for many SMEs. A weakness is that the model does not really address issues post implementation and acceptance. However, in a typical cloud SaaS platform, many of these issues would become the domain of the SaaS provider. Essentially, it is almost comparable to a systems security blanket for SMEs who can focus on the operational aspects of the ERP and defer more strategic aspects as well as scalability issues, security, backup functions, etc. to the SaaS provider.

6.4 ERP lifecycle model – Markus & Tanis

The Markus & Tanis (2000) lifecycle model created a unique phasing approach unlike the other models. Their proposed ERP lifecycle model reflects a more streamlined and simplified approach. Their life cycle consists of four phases: chartering, project, shakedown, and onward and upward. These phases have more commonality with the Cooper & Zmud lifecycle model than with Esteves & Pastor’s approach. They obviously combine some elements into broader categories, and thoroughly ignore any retirement and replacement issues. The lifecycle model includes four phases of ERP implementation during its life in an organization (see Figure 4).

Figure 3. ERP Lifecycle model – Ahituv, Neumann & Zviran

Source: Ahituv et al. (2002).

Figure 4. ERP Lifecycle model – Markus & Tanis

Source: Markus & Tanis (2000).
The *chartering phase* is the first in the process and includes all elements related to the original vision to adopt or upgrade an ERP system. This includes the feasibility studies, initial system design and selection process of the overall implementation process. The scheduling and planning for the system implementation is completed and all project leaders, champions and consultants are selected. This effectively is the combination of at least the first two phases in the other lifecycle models.

The second or *project phase* includes all installation and most implementation issues. The system is rolled out to the users, all training occurs for users and systems personnel, all data conversion activity occurs along with required acceptance testing and any integration with existing legacy systems. This includes parts of a number of other phases in each model.

The third *shakedown phase* has a definite time line delineated by the point of normal operations commencement by all users, though the point of when normal daily routine activity begins. Essentially this extends through all bug fixes and performance fine-tuning resulting in a stabilized functional system.

The fourth *onward and upward phase* assumes that the system has reached normalcy, i.e. routine and efficient operational status. This phase includes all time from this initiation point until the system is replaced or upgraded. When these events occur, it is assumed that the process restarts at the beginning of the lifecycle similar to Cooper & Zmud. Keys elements of this phase include assessing the actual and perceived benefits as a result of the implementation process, advancing the training and skill sets of the users and upgrading the software plus instituting all business process improvements.

The interesting element of the Markus & Tanis model is that all implementation and upgrade operations can use each of the four stages of the model. Any upgrades will begin again with the chartering phase and stage through all phases until completion.

The Markus & Tanis model is generally accepted as the simplest to understand and reference. It provides a well-delineated set of phases and also includes the contingency for upgrading of the system and replacement with a new evolution of IS systems. The Ahituv model could be the closest to what the real world has migrated into over the past ten years and has the most detailed structure and would also be an effective choice.

This option would probably more challenging to the typical SME organization but could be more appropriate in large scale ERP implementation efforts. Large scale enterprises are characterized as more complex and have more resources, both human and financial, to utilize in the implementation. Attempting to utilize this approach in the SME marketplace could burden the enterprise and the implementation team to a greater degree than is appropriate for the SME scale. Although the Ahituv *et. al.* model on the surface seems to be simplified and fit nicely with a SME ERP rollout, it is somewhat deceiving. The final phase could well past one year; consequently, this extended implementation phase duration would not appropriate for SMEs, given their organizational constraints. Markus & Tanis is the most general and simplistic of the approaches and is also very functional in a rapid deployment implementation.

### 7. CONCLUSION

SMEs certainly have different constraints than the large-scale organizations that led the ERP marketplace for many years. SMEs do not have the same financial resources, in-house technical...
competencies, and often have unique organizational cultures, all generating greater risk for any attempted ERP implementation. There are countless studies of critical success factors to promote a positive result in these efforts. Choosing a process theory approach combined with vendor tools, an exceptional ERP implementation team, a strong project Champion, and most importantly management commitment promote a successful project.

When considering a cloud computing ERP solution, organizations have the option to utilize one of the above models, or creating a hybrid approach based on one of the model. Likewise, choosing to implement a Cloud ERP solution using a legitimate vendor typically offers the option of some rapid deployment model offered by experienced consultants. Some of the lifecycle steps can be minimized, for example any phase dealing with development.

Most cloud ERPs will be “one size fits all” applications with the obvious configuration options and flags, but typically little development costs. Organizations may be currently experiencing “version lock”, a phenomenon that occurs when a customization has been written by in-house IT staff or outside software consultants. But when new versions are offered by the ERP vendor, the organization may be unable to upgrade because the customization may not work or may require extensive costs to upgrade also, plus additional implementation and training costs. The only way to migrate these customizations is to recode them from scratch, which takes too much time, money, and resources, and can often be fragile. Often this is not a consideration with cloud ERP vendors.

Customization within the cloud computing environment typically are structured so all processes rely on a single code base and utilize a managed version upgrade process. This approach is very advantageous in the lifecycle stages identified above particularly in the phases related to post-implementation maintenance. Customizing ERP applications in the cloud suggests that these can be accomplished quicker and easier than traditional ERP on-premise hosting platforms because the code base is standards-based instead of proprietary. This code base development approach provide cloud companies to code their customizations into individual components and have these components interact with other customizations through standards-based web development frameworks.

These web development frameworks automatically provide functionality of integration procedures throughout the entire technology application. Consequently, in the event a cloud application is upgraded to a newer version, customized components are migrated over to the new version seamlessly. This minimizes utilization of costly resources to manually migrate customizations to the newer version, and benefits the cloud organization users with improved process functionality or features innovation supplied with the upgrade.

Additionally, third party integrated solutions for specialized needs exist also eliminating the need for development. Regardless, cloud ERP adopters still much exercise their due diligence in the search, examination, selection and implementation processes. Other factors such as the safety of information and redundancy of systems will take on a different role. Since the adopters will not have the custody of information nor the requirement of backup systems and disaster locations, risk management issues will still exist but will be formatted differently for the cloud, when evaluating issues of system as a robust entity.

The process theory approach should help the project team and executive management understand and plan for the various stages the implementation will progress through. Some SMEs will be forced to take steps such as the “big bang approach” rather than a “phase-in” approach because of some of the constraints. But in all cases, this is a significant undertaking for any organization,
and without a good structured plan based on one of the process theory models, organizations will do little to promote risk aversion in their implementation efforts.

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An innovative Approach to sustainable Decision-Making in Complex Environments

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ABSTRACT
In a world of accelerating innovation cycles, shortening knowledge half-life periods, growing plurality of interests, sped-up communication flows and rapidly progressing global cross-linking, corporate environments become more and more complex. This contribution explores the relation between business environment complexity and the related challenges for sustainable decision-making. In a first step, various key aspects are identified and operationalized. Based on such framework, related approaches are categorized and criteria for complex decision support are derived. Finally, a methodology is introduced as a basis for more elaborate decision supporting.

Keywords: systems theory, complex environment, stakeholder management, sustainable strategy, system resilience, decision support tool.

1. INTRODUCTION
The case of nowadays business management is a complex one: It needs to grasp an increasingly complex environment by attaining a multi-perspective stakeholder view, matched with the consideration of long-term interdependencies among an ever widening array of relevant interactions. How can such a claim be transformed into commercial sense? How can it become instrumental in conceptualizing and implementing “better”, more sustainable strategies? The discussion on “sustainable” management approaches is often characterized either by a fragmented or by a rather intangible conceptual base. Fragmented concepts are subject to specific parameters that are perceived as key aspects of the overall sustainability picture, e.g. carbon equivalents, dealing with corporate emissions and its respective carbon footprint (e.g. Kranke, 2010). While such methodology is typically well operationalized, it is prone to focus on particular symptoms, at the expense of ignoring preceding causes with its multifold and interdependent effects.
Intangible approaches, in contrast, may pursue a holistic view, pointing-out human decision maker's responsibilities - but fail to translate a business ethics discussion into practical decision support (e.g. Garriga & Domèneç, 2004, Hiller, 2013).

This contribution aims at consolidating both conceptual bases: to develop a strictly operationalized, but holistic approach. Further, the approach should be generic in its applicability to different decision scenarios and to the quest for sustainability. Particularly, an approach shall be developed that helps analyzing business complexity in a generally applicable way, with a clear added value for strategic decision-making.

2. CONCEPTUAL PILLARS FOR BUSINESS CONTEXT ANALYSIS

Deriving the methodology starts with analysing the complex environment in which management decisions have to be made. Decision-making is about selecting among alternative action paths. While discrete decisions are subject to a defined set of alternatives, non-discrete decisions (such as the allocation of an advertising budget) need to consider a continuous range of decision scenarios. Decisions need to appreciate the business context. According to systems theory, such a context is described by the underlying open system in which corporate business is embedded. The idea of open systems is derived from nature and, consequently, elaborated by natural sciences (e.g. Holling, 2001). While reflections on eco-systems emphasize interrelations of system elements in a given time period, reflections on biological evolution have added the aspect of dynamics by analyzing the development of systems over time (Manzel, 2002). Consequently, such deliberations have entered the world of social sciences by referring to bio-cybernetics (e.g. Wiener 1948, Ashby, 1956, Cruse, 1981) or, in Europe, by elaborating on its implications for business organizations (e.g. Ulrich, 1968).

From the perspective of a corporate decision-maker the question arises, how a given relevant system can be described and analysed in a systematic and useful fashion.

2.1 System Mapping

Within its assumed boundaries, a system is characterized by the constituting system elements and their underlying interrelations. In the context of humanly impacted systems, decision subjects shall be differentiated from decision objects. Decision subjects are (human) stakeholders pursuing their interests by trying to influence other system elements. From the decision-makers point of view, other stakeholders’ dispositions shall be described by the following aspects (Jeschke, 1993: 48-59):

- Level of interest: Is the stakeholder’s interest in consent or dissent to the interest of the decision-maker?
- Intensity of interest: How strong is the respective stakeholder interest as compared to the decision-makers interest?
- Power: What is the impact potential of the respective stakeholder to enforce his interests towards the decision-maker - and other involved stakeholders?
- Aggressiveness: How ready is the respective stakeholder to exploit his or her power potential towards the decision-makers interests?
In a given time period, stakeholders may either impact other stakeholders or may be impacted by them. Translated into cybernetic terminology, they may act either as independent or as dependent system variable. For some stakeholder constellations, both impact directions may occur within the same time frame.

Decision objects are measurable products which are relevant for the system and, therefore, subject to the stakeholders’ interests, impact and exchange. Such interests may either favor the increase or decrease of respective product quantities – or adopt a neutral attitude.

Due to their multi-effect nature, it is questionable to assign products to anthropocentrically coined, rigidly defined categories. However, examples for decision objects with a predominately economical connotation may be profit, tax, liquidity, brand equity, customer churn rate, quantities of value chain related materials, and waste. Examples for decision objects with a predominantly ecological connotation may be soil, water and air quality (i.e. quantities of certain quality-relevant chemical ingredients), biodiversity, climate, or energy. Further, examples for decision objects with a predominantly social connotation may be health and education parameters, numbers and type of accidents, purchase power, income, or even a “happiness index”.

Obviously, the listed product examples can be specified and operationalized at different levels of detail; water quality, for instance, may be operationalized by its underlying BOD (Biological Oxygen Demand) and COD (Chemical Oxygen Demand) levels.

The distinction between decision subjects and objects is novel – but essential to approach reality. Reality is about exchanging products – but it is also about human dispositions. If corporate incident management, for instance, aims at cutting down on accidents at the company’s construction sites both, stakeholder and product levels are essential for comprehending the situation: Products may refer to safety equipment, maintenance standards of involved machinery or the educational level of the workers. System understanding, however, will also need to include the dispositions of the stakeholders involved, e.g. with respect to attitudes towards safety measures. Another example: Climate research draws on a vast body of quantifiable information (e.g. Schleussner et al., 2013). However, such forecast models have typically not been capable to serve as a decision basis for adequate action. While data on decision objects provides a valuable information basis for human decision-making, it does not serve as a direct decision support as it disregards stakeholder interests. In essence, such interests are not self-sufficient, they are about increasing or decreasing certain system relevant product quantities.

By influencing the system, stakeholders may either increase or decrease product quantities; they do so intentionally or unintentionally, consciously or unconsciously. Products, in turn, impact other products (i.e. product quantities) as well as other stakeholder interests. Consequently, system mapping needs to identify a relevant set of system elements as well as possible cross-impacting relations among such elements.

Such underlying relationships may be of a linear, more likely though of a non-linear nature. They shall be structured in four parts, respectively four sub-matrices of one describing matrix. Choosing matrix logic opens up the field for later mathematical operationalization and analysis.

Figure 1 schematically describes a situation for a given time period, expressed by four sub-matrices: a) the interaction among impacting and impacted stakeholders, b) the interaction among impacting stakeholders and impacted products, c) the interaction among impacting and impacted products, and d) the interaction among impacting products and impacted stakeholders.
The preceding causal chain for current situations is initiated by the information exchange between impacting and impacted stakeholders. Such interaction will affect the existence and quantities of system-relevant products. Varying product quantities may lead to product interaction (chemical, biological or physical) without any direct human stakeholder impact. The resulting changes of product quantities will, in turn, impact stakeholder interests.

Each matrix cell contains the functional relationship (here depicted as algebraic signs) between impacting and impacted system elements in the given time period of analysis. The self-referencing diagonal cells are marked black as they will not be part of the cross-impact analysis (Lunz, 2012). In case a situation would, for instance, not include any product interaction, the cell values of the “product interaction” sub-matrix remained neutral, not affecting the ensuing steps of analysis.

The matrix in Figure 1 contains all information on assumed quantitative and qualitative exchanges among the system elements. It is generally applicable to all types of business situations. Current knowledge of the actual exchange properties may allow the description of assumed relationships with elaborated quantitative algorithms. In other cases, only qualitative or unconfirmed data may be available to approach reality, pinpointing future research needs.

### 2.2 System Complexity

After having elaborated on the nature of system elements, the issue of system complexity can be tackled. What parameters establish system complexity – and what are their implications for an
adequate management approach? The discussion on such characteristics (e.g. Gomez & Probst, 1995: 14-23, Sargut & McGarth, 2011) boils down to four parameters characterizing the design of a system: multiplicity, interdependency, diversity and dynamics.

- **Multiplicity**: How many elements describe the underlying system?
  To assess the level of multiplicity, the number of stakeholders and products involved needs to be identified. This way, a company can establish its own standards with regards to the relative multiplicity of a specific decision context. Looking at Figure 1, the higher the multiplicity, the larger the dimension of the situational squared matrix will be.

- **Interdependency**: In how far are system elements intertwined in a bundle of interrelating cause/effect schemes?
  The level of interdependency is given by the number of interrelations within the situational matrix: The higher the number of cells which are functionally connected the more interdependencies amongst the system elements.

- **Diversity**: To what extent are elements and the nature of their interrelationships comparable or dissimilar?
  Diversity can be operationalized by looking at the way relevant characteristics of the system elements deviate from the mean. For instance, the diversity of a team can be computed by identifying and evaluating relevant characteristics among the team members (for instance skill-set, educational and cultural backgrounds). The degree of diversity is then derived by averaging the variance of the individual team member’s scoring from the mean.

- **Dynamics**: In how far are system elements and their interrelations subject to change over time?
  The more dynamics we can observe, the less will the extrapolation of past decision patterns suffice. The degree of dynamics can be measured as the average change rate of the system elements and their interrelations: In how far - and to what magnitude - have stakeholder or relationship characteristics changed within a given time period? And in how far can they be expected to do so in the future?

Above complexity parameters are not linked to each other in a correlative logic. Therefore, clustering them, for instance in pairs of “multiplicity/diversity” and “interdependence/dynamic” (as suggested by Ulrich & Probst, 1988: 61-63), cuts down on the informational value of the individual parameter. This holds especially true since each parameter claims its own specific management response:

- A high degree of multiplicity calls for a widened environmental scanning approach, typically reaching beyond directly interacting market partners.

- With a high degree of elements’ interdependency, more causal analysis will be required to grasp the “big picture”. Otherwise, chances are that management focuses its attention on symptoms, not causes.

- A high degree of diversity challenges analysis tools to appreciate the particularities of the respective system elements. Flexibility and coordinative capacities are required to translate diversity into business implications.

- Finally, with increasing environmental dynamics, some continuous monitoring with early warning signals is required for an ongoing update on the business environment.
Dichotomizing these parameters leads to a set of 16 types of system designs (see Figure 2).

*Figure 2. Types of System Design*

Due to their limited degree of complexity, simple situations (1) - as they are quite common in our everyday life - can be interpreted with intuition. Complicated situations (9, 13), in contrast, will require support. Software programs, for instance, typically incorporate numerous variables (high multiplicity), either intensely interrelated or not (low/high interdependency). As a rather mechanistic tool, such programs will appreciate all variables’ effects with a binary code (low diversity), with the algorithmical functions remaining stable over time (low dynamics). Complex systems (16), in contrast, require a different rationale than a pure mechanistic one to account for environmental dynamics. The ensuing discussion will elaborate on such rationale.

As a consequence, complex systems and a complex decision context are characterized by the high degree of multiplicity of its system elements, combined with a high degree of interdependency, diversity and dynamics of both, system elements and their interrelations.

2.3 Chronological Structuring

Decisions may refer to a single choice between two or more discrete alternatives without follow-up decisions to be considered for the future, e.g. the selection of a consumable object for purchase. More likely, however, decisions in complex environments will require a consecutive string of decisions along an evolving situation. Here, initial decisions need to account for upcoming scenarios and corresponding corporate discretion.

Corporate talent management, for instance, may start with job descriptions, recruitment procedures and employment contracts. Succeeding decision phases would then include trainee programs and feedback schemes. Further, career counseling, promotion planning and advanced training may guide a talent along the different steps of a corporate career path. A fragmented approach to this overall picture will support failure in attaining corporate interests, e.g. by the migration of highly talented trainees due to the lack of adequate in-house career perspectives.
Figure 3 reflects the main analysis structure for the example of a gravel pit project. From project planning to the final phase-out of the gravel pit exploitation, such projects may last well over 20 years. Initial decisions (e.g. the choice of land) will have long-term effects on the success of the project outcome (e.g. ongoing cost structures).

**Figure 3. Exemplified chronological structuring of decision complex (gravel pit project)**

<table>
<thead>
<tr>
<th>Decision Phases</th>
<th>Decision Moments</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project planning</td>
<td>Requirements planning</td>
<td>2 Years</td>
</tr>
<tr>
<td>Regional planning procedure</td>
<td>Detailed planning</td>
<td>2 Years</td>
</tr>
<tr>
<td></td>
<td>Access assurance</td>
<td>2-5 Years</td>
</tr>
<tr>
<td>(Partial) permission</td>
<td>Description</td>
<td>3n Years</td>
</tr>
<tr>
<td>(Partial) digging</td>
<td>Biz Operations</td>
<td>2n Years</td>
</tr>
<tr>
<td>(Partial) succession utilization</td>
<td>Restructuring measures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Controls &amp; closing</td>
<td></td>
</tr>
</tbody>
</table>

Such projects – at least in Western Europe – are invariably subject to vivid and conflicting discussions among a wide array of stakeholders. The overall process is described by five consecutive phases that shall be called “decision phases”.

In general a decision phase (e.g. the initial “project planning” phase) may subsume one or more system-relevant decisions, each made at a given point in time. The moment when a decision is made shall be called “decision moment” (e.g. the decision moment “access assurance” which deals with securing suitable land). Each decision moment may be governed by a set of simultaneous decisions made by stakeholders to influence other stakeholders at a specific point in time. In the gravel pit example, the project planning phase typically refers to a stakeholder map which is limited to a small circle of parties (gravel pit operator and land owner). In contrast, the decision phases “regional planning procedure” and “permission” can involve more than 15 stakeholders.

The time period between two subsequent decision moments shall be called a “decision interval” and all system changes which occur during the interval are aggregated into the decision moment, defining the end of the decision interval. Due to the chronological order of the decision moments, all respective changes of the system are subsumed in one decision phase.

As earlier decisions (of preceding decision phases) impact later decisions (of succeeding decision phases), the initial project planning phase needs to anticipate the long-term implications for such a project. A less foresightful planning will most probably result in a less favorable starting position for the following regional planning procedure, e.g. by the wrong choice of land, causing conflicts with municipal interest groups.
A decision complex – understood as the sum of decision phases – can be a one-way street with defined starting point and end. Such straight-line decisions refer to a one-off stimulus of corporate decision-makers towards the system. In contrast, recursive decision complexes are designed periodically, representing a repetitive constellation of preceding and succeeding decision phases.

3. SUPPORTING SUSTAINABLE DECISION MAKING

Based upon the conceptual pillars discussed in the previous section, the term “sustainable decision-making” can be further explored and operationalized.

3.1 Absolute and relative Sustainable Management

Within a given system, product quantities will vary due to impacting system elements (either through stakeholders or through other products). Depending on their product interaction patterns, products may stabilize or destabilize the system, most likely in a non-linear way and within certain limits.

Let’s assume the human body as an open system. Depending on the level of exercise, a certain amount of carbohydrates will be essential to maintain sound body functions and to foster individual health. Excessive amounts of carbohydrates, however, will cause overweight (i.e. a destabilized system) with all related health hazards. In case that the impacting individual feeds carbohydrates which are absorbed by the metabolism, the individual acts sustainably. In case of excessive “carbo-loading”, such action would be non-sustainable with regards to maintaining a state of health.

As a natural scientist, Holling defines sustainability as “the capacity to create, test, and maintain adaptive capability” (2001: 390). Similarly, “sustainable” management decisions shall refer to corporate action that supports the long-term equilibrium of the underlying system. A sustainable national budget policy, for instance, would refer to equilibrium between national spending and national income. Further, “absolute” sustainable management can be distinguished from “relative” sustainable management. The former helps to stabilize a system in the long run with respect to specified system product quantities. Referring to the introduced example, an absolute sustainable budget policy would reduce the budget deficit, therefore stabilizing the national finances system. In contrast, relative sustainable business models would still destabilize a system, the destabilizing impact, however, would be lower as compared with the prior business conduct. As for the example, a relatively sustainable budget policy would still increase a budget deficit – but to a lower degree than before. Contrary, non-sustainable behavior focuses only on selected system product quantities, disregarding overall system stability and, therefore, perpetuity. Such behavior is actually evident for most national households of Western industrialized countries where clientele policy has increased the imbalance between national spending and income throughout the last decades (European Commission, 2013).

Figure 4 illustrates above notion by referring to a predator/prey relationship over time. In a stabilizing, sustainable system, predator quantities will react upon prey availability, typically by decreasing future reproduction and, therefore, by supporting a long-term equilibrium between predator and prey quantities.
In a non-sustainable relationship, predator quantities would develop at the expense of the prey population. While a relative sustainable relationship still shows an imbalance in population development, such imbalance is weaker as compared to the non-sustainable situation.

*Figure 4. Schematic diagram of different degrees of system sustainability.*

What does this mean for the corporate decision-maker? Decisions are about influencing the quantities of decision objects. Such impact may either support or hamper the perpetuity of the system itself - as defined within specified system boundaries. Hence, if corporate action stabilizes the underlying system, such action shall be viewed as “absolutely” sustainable. This may, for instance, be the case if a company introduces technologies that help to save on scarce resources to an extent larger than the decrease of such resources through direct corporate impact (e.g. production). Here, the overall ecological system is stabilized by the absolute increase of system relevant resources. Analogously, if corporate action still destabilizes a system, but with less magnitude than before, such action shall be viewed as “relatively” sustainable.

### 3.2 Categorization of Approaches to support Sustainable Management

How can approaches support corporate decision-making with respect to sustainable action that protects the basis of corporate legitimacy in the long run? How can they point out critical products, critical interrelations and the best way to transform such knowledge into sustainable, yet commercially viable management sense? According to their respective propositions, approaches can be categorized into descriptive, evaluative and prescriptive approaches:

- **Descriptive approaches** are dedicated to objectively describing past results of corporate decisions and actions. While such ex post analysis may serve as a valuable information basis for
future planning, the implications of past findings cannot be readily extrapolated in a dynamic, non-linear environment.

- **Evaluative approaches** are normative but, again, refer to findings of the past. They do so by employing a retrospective view without direct reference to future decision-making. Therefore, their informational and normative value may be useful – but limited with respect to future system scenarios.

- In contrast, **prescriptive approaches** focus on simulating future outcomes reflected by a given value system.

Figure 5. Categorization of Approaches supporting Sustainable Decision-Making.

Figure 5 categorizes sustainable management approaches by their propositions and their applicability. As for the latter, “specific” (i.e. with a particular application focus) and “generic” (i.e. generally applicable) approaches shall be distinguished.

Descriptive approaches - such as the Environmental Value Added or the Carbon Footprint - may refer to specific system parameters (such as certain greenhouse gases or customer retention indicators) by objectively looking at the implications of previous corporate action. Generic approaches like the Cross Impact Analysis will be generally applicable in describing different system environments.

Evaluative approaches assess previous corporate behavior based on an underlying value system. Here, specific approaches such as the ISO 14001 certification refer to a clearly defined set of parameters. Other approaches, e.g. the Sustainability Image Score, are designed more flexibly in their scope of application.

In contrast, prescriptive approaches are dedicated to future corporate actions and outcomes, either with regards to specific parameters - as with the EMAS approach - or in a more general way, as
with the Sustainability Balanced Scorecard. For an in-depth discussion of the different approaches, see Jeschke & Mahnke (2013: 8-13).

In principle, generic-prescriptive approaches are the most appropriate type of approach to support future decision-making due to its following features:

- A normative notion about “sustainability” and related decision-making; therefore, affiliated approaches provide a statement about desirable decision outcomes.

- A general applicability of the analysis; therefore, model use is not limited to a certain perspective and can be aligned with the chosen relevant system boundaries of analysis.

- The analytical framework can be applied to future context scenarios without just extrapolating past findings.

In particular, an approach that supports complex decision-making needs to respond to three challenges: a) a situation mapping, adequately reflecting and projecting the relevant corporate environment, b) an analysis approach able to describe multifold short- and long-term interrelating effects amongst the relevant system elements, and c) a monitoring routine tracking down changing patterns over time, fueling an ever-learning organisation with relevant information on how to continuously adjust its decision-making approach.

4. THE SUDEST APPROACH

As a generically applicable, prescriptive approach, SUDEST draws on systems theory, with a stringent focus on management decision-making in complex environments. Referring to the conceptual pillars previously discussed, this approach is based on a four step analysis: the context analysis, the specification of the scope of action, the analysis of simulated scenario outcomes, and the continuous learning process. SUDEST stands for “Sustainable Decision Support Tool”, with the mathematical approach being an extension of the model for product flow planning from Vaszonyi (1962: 385-419).

4.1 Context Analysis

The context analysis includes the specification of the underlying system and its system boundaries. Based upon such reference, the decision complex will be broken down chronologically into decision phases and their decision moments. A decision moment as the most detailed level of system analysis is compiled as a situation matrix which aggregates the changes due to their occurrence in the preceding decision interval.

Sciarelli & Tani (2013) review a wide array of stakeholder approaches, categorizing them with respect to the decision-makers’ stakeholder map and the way interrelations beyond the direct relations between stakeholder and enterprise are considered. Here, the category “Complete Network” approach also considers indirect relationships towards the enterprise but also amongst the stakeholders themselves: “This perspective will help managers get a holistic view of the environment and the actors operating in it as it will let them understand how the various stakeholders are related to each other.” (Sciarelli & Tani, 2013: 183). This “Complete Network” approach is consistent with the contextual approach of SUDEST. The relevance of stakeholders is not governed by the directness of their ties to the decision-maker. Rather, it is a function of their overall system impact – and resulting repercussions for corporate interests.
4.2 Scope of Action

The scope of action stands for the range of conceivable decision alternatives. Such alternatives may either be clearly defined (e.g. alternative marketing approaches for customer retention management) or rather diffuse (e.g. “the best way of keeping existing customers happy”). Without specifiable action alternatives, of course, there is nothing to decide. Therefore, the corporate decider needs to respond to the following set of questions:

- At which point of the chronologically structured decision complex is the corporate decider requested to take action (i.e. to impact the system)? Or, translated into SUDEST terminology: Which decision phase(s) and which specific decision moment(s) are subject to analysis?

- What kind of influence is the corporate decider inclined to exercise? Or, translated into SUDEST terminology: Which stakeholder or product relationships are subject to corporate management as an “impacting stakeholder”?

- What does such corporate action imply? Or, translated into SUDEST terminology: Which independent variables are impacting the consent/dissent profiles of the targeted stakeholder as well as the product quantities that are impacted by such stakeholder action?

4.3 Analysis of simulated Scenario Outcomes

While the preceding SUDEST steps of analysis are dedicated to a standardized and systematized analysis, the model is now ready for the actual simulation. Possible simulation approaches are a) the variation of initial values, b) the variation of corporate input at specific decision moments, or c) the variation of decision intervals (i.e. time between decision moments).

Figure 6. Modular Design of SUDEST Matrices.

The analysis focuses on different decision outcomes for different time frames and decision scenarios. The product of chronologically ordered decision moment matrices – as the most detailed entities of analysis - results in the decision phase matrix. Further, the product of consequence...
Executive decision phase matrices results in the overall system matrix, representing the whole decision complex (see Figure 6).

For the simulation of future scenarios, simulated results of a preceding decision phase will create the starting point for the directly succeeding phase, which is given by a set of stakeholder dispositions and product quantities. As each decision moment refers to all changes in the preceding decision interval and, therefore, to a complex decision situation, it will be described by an individual decision moment related matrix (“DMM”).

The set of initial values of stakeholder dispositions and product quantities on which the decision moment matrices will act as functions of change are assorted in a row vector. The initial vector contains the set of stakeholder dispositions and product quantities as they exist prior to the first decision moment.

SUDEST data processing results in a product of matrices acting on the initial vector values, establishing a comprehensive information basis for the respective decision scenario. Describing the complex system in this way includes the following set of data:

- Development of consent/dissent profiles of the involved stakeholders,
- development of involved quantities of products,
- sensitivity of alternative action paths with respect to decision implications, and
- resilience levels for the derived scenarios. As one piece of information, resilience drivers and opponents are identified with regard to their system impact.

Figures 7a und 7b show an example for the organization of system describing matrices and their aggregation into one Overall System Matrix (OSM). The example relates to a simplified version of Meadow’s Fishbanks Ltd. case (2001): Two fishermen are fishing for fish in a pond. The remaining fish reproduces at a constant rate, with the population being limited to a maximum of four fish. The Decision Phase Matrix (DPM) then contains the aggregated information about whether the fisherman decide to fish or leave the pond, how many fish were caught per fisherman (either none, one, two or three) and the reproduction of fish (doubling the number of fishes at the end of each period, but restricted to a maximum of four fishes).

It is clear, that over-harvesting will lead to a fish population of zero and, therefore, to the breakdown of the system (i.e. the stability of the fish population). The example displays three fishing seasons (i.e. three decision phases).

While the upper matrix product relates to a non-sustainable behaviour of the fishermen, including one fisherman leaving as there is not enough fish to be caught, the lower matrix product puts a more sustainable system management into numbers. The bottom row of vectors below the matrix product contains all chronologically ordered changes in the components of the system describing vector, representing the resulting impact development of the system described. Each vector contains the number representing the presence of each fisherman at the pond (A1, A2) and the amount of fish in the pond (F), starting with the initial vector at the very left.

To the very right of the vector row, one finds the key indicator which stems from the scalar product of the vector referring to the last DPM and the transposed initial vector which is named final vector.

The calculation itself also provides the opportunity to investigate the importance of each decision moment, measured by its contribution to the key indicator. The overall system description is represented by the aggregated product of all decision phase matrices, the Overall System Matrix.
For each scenario, the aggregated formulation, showing the OSM, is represented below each matrix product representation.

Figure 7a. SUDEST simulation results: sustainable case (Example "simplified Fishbanks")

In conclusion, Figures 7a and 7b show the importance of individual decision moments for the overall system development. The contribution of each decision matrix to the development of system elements (i.e. fishermen behavior and fish quantities in the pond) can be derived from the development of the vector entries, starting with the initial vector and ending with the key indicator for each description.

It becomes obvious that the key indicator is significantly smaller in the non-sustainable case. Following the development of the fish population in the lower vector row in the second non-sustainable product of matrices, there is no fish in the pond anymore after DPM 3, while in the first product, the sustainable fishing leads to a constant fish population over all three decision phases.

In systems theory, the concept of resilience is typically used to describe system stability (e.g. Hamel & Välikangas, 2003). In SUDEST terminology, resilience properties would be explored by looking at the stability of system-relevant product quantities over time - and under different impact scenarios. While resilience itself is not a normative concept, favorable resilience would be identified by looking at the desirability of the stabilized products.

Another useful mathematical figure is the nil potency. In case of periodic systems, when the decision phase matrices stay constant for each time period, the nil potency explores after how many
periods a matrix product would become a nil matrix (absolute nil potency). In other words, after how many decision moments do relevant product quantities get reduced to zero? “Life expectancy” would be an example for the application of nil potency, relating to the previously mentioned case of “individual health” as the underlying system.

*Figure 7b. SUDEST simulation results: non-sustainable case (Example “simplified Fishbanks”)*

The aforementioned “key indicator” in the matrix products is derived from the scalar product of the initial vector values with the final vector: Each change in the system leads to a change in the key indicator, as it represents a condensed comparison value of all changes. The relative importance of each decision moment (as laid down in each of the respective decision moment matrices) is expressed as a contribution to the key indicator. Thus, excluding a single decision phase matrix (DPM) in the calculation of the key indicator provides a measure of each DPM’s relative impact.

### 4.4 Continuous Learning

As Bosch, Nguyen et al. state, the “drivers of change all culminate into the need for a change in ‘what and how’ of learning, discovery and engagement in the creation of future leadership and enhancing and collaboration across different sectors and cultural groups in society.” (2013: 65). To comprehend environmental dynamics requires continuous monitoring of relevant context drivers, i.e. of the system elements and its interrelationships.
The employment of a decision support tool, therefore, asks for continuous organizational learning, both in psychological and administrative terms. Psychologically, new and unexpected information should not be coined as a disturbing nuisance but as an important stimulus to understand system dynamics. Administratively, reporting systems and corporate planning need to incorporate the information requirements of such a tool. As a result, future scenarios (especially for repetitive decision complexes) can be anticipated with higher degrees of confidence and corporate planning can make better use of the employed resources by incorporating system sensitivities.

As for SUDEST, new information can easily be incorporated into the modeling and simulation. Changing system maps are reflected in a modified matrix structure. Changing relationship patterns cause functions of the respective matrix cells to be modified. In the end, SUDEST application is about getting to know your system. This includes the issue of system boundaries: Do causal relationships reach beyond the current system definition so that the system perspective needs to be enlarged?

5. CONCLUSION

What value does a method like SUDEST add to corporate decision-making? In terms of model output such a method a) systematizes and reflects complex situations for corporate decision-making, b) specifies and evaluates decision alternatives and c) operationalizes sustainability effects of corporate action. SUDEST provides a basis for various analysis tools that may be derived from the introduced methodological platform. This platform satisfies the following criteria set:

- Specific: The SUDEST methodology relates to specified decision/action alternatives; „surprising“ results can be tracked by looking at the underlying causal chains and origins.
- Measurable: Model outcomes are indicated by a multi-layer set of indices representing different decision moments and phases of the overall decision complex.
- Relevant: In line with the saying „garbage in - garbage out“: The more valid the data input, the more valid will be the conclusions for future decision-making. Respective deficits should be cured over time by continuously improving the validity of the assumptions employed.
- Flexible: Complex situations should not be analyzed by a static approach. Along with environmental changes, stakeholders or products may be added or subtracted from the analysis; the same holds true for adapting relationship functions among system elements.
- Learnable: New insights, more detailed information or corrected assumptions can easily be fed into the model.

In their review of stakeholder network approaches, Sciarelli & Tani postulate a need “to develop an analytic framework balancing stakeholder characteristics and network structure”. Further, they state the need to “focus (...) on this more holistic approach aiming to develop new analytic frameworks to understand the effects of the network of relationships and hopefully, new tools to support managers in stakeholder management.” (2013: 185-186). We would like to see SUDEST positioned this way.
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- An innovative approach to sustainable decision-making in complex environments.