

BACKGROUND OF CRITICAL SUCCESS FACTOR RESEARCH

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1 Critical Success Factor Research

According to a study by Esteves (2004), the critical success factors (CSF) approach has been established and popularized over the last 30 years by a number of researchers, particularly Rockart (1979). Today, the approach is increasingly used by consultants and IS departments as a means of support to IS strategic planning (Esteves, 2004). Ramaprasad and Williams (1998) underline this position by stating that *“there is a great deal of attention devoted to the concept in the IS literature as many argue that the use of CSF can have a major impact on the design, development, and implementation of IS”*.

1.1 Definition

In literature, several definitions of CSF exist. Representing one of the most frequently cited definitions, Rockart (1979) uses ideas from Daniel (1961) and Anthony et al. (1972) in defining CSF as *“the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization”* (p. 85). Consequently, Rockart (1979) stresses, that these particular areas of activity should be constantly and carefully managed by a company.

In a similar fashion, Bruno and Leidecker (1984) define CSF as *“those characteristics, conditions or variables that, when properly sustained, maintained, or managed, can have a significant impact on the success of a firm competing in particular industry”*, while Pinto and Slevin (1987) regard CSF as *“factors which, if addressed, significantly improve project implementation chances”* (p. 22). According to Esteves (2004) however, both of these definitions fail to address the comprehensive concept proposed by Rockart (1979), which seeks to identify an ideal match between environmental conditions and business characteristics for a particular company.

Within the field of strategic management, the definition of Key Success Factors (KSF) is closely related to the CSF concept. In this context, Ellegard and Grunert (1993) define KSF as a qualification or resource that a company can invest in, which in turn, accounts for a signifi-

cant part of the observable differences in perceived value and/or relative costs in the companies' relevant markets. In literature, the terms CSF and KSF are often alternately used.

1.2 Evolution

Research on CSF can be traced back to 1961, where Daniel (1961) first discussed "success factors" in management literature. In a broad approach, he focused on industry-related CSF which are relevant for any company in a particular industry.

In 1972, Anthony et al. (1972) went a step further by emphasizing the need to tailor CSF to both a company's particular strategic objectives and its particular managers. Here, management planning and control systems are responsible for reporting those CSF that are perceived by the managers as relevant for a particular job and industry.

Combining the perspective of both Daniel (1961) and Anthony et al. (1972), Rockart (1979) described a study on three organizations in 1979 which confirmed that organizations in the same industry may exhibit different CSF. The reasons for such a constellation are differences in geographic location and strategies among other factors. Nevertheless, Rockart was also able to identify analogies between the CSF lists of the three examined organizations: *"It is noticeable that the first four factors on the mature clinic's list also appear on the other two lists. (...) These, it can be suggested, are the all-encompassing industry-based factors. The remaining considerations, which are particular to one or the other of the practices but not to all, are generated by differences in environmental situation, temporal factors, geographic location, or strategic situation."* (Rockart, 1979, p. 87).

In line with his initial study, Rockart (1982) gathered data in regard to IS executives. This data indicated that executives share a limited number of CSF. *"Each executive (...) lists some, but not all, of the CSF gathered from the sample as a whole"* (Zahedi, 1988, p. 190). The remaining differences were linked to organizational aspects as well as the time pressure facing the particular manager at the time the data was collected (Rockart, 1982).

Furthermore, Rockart (1979) stressed that his approach did not attempt to address information needs related to the field of strategic planning. Instead, his CSF approach concentrates on information needs for management control and seeks to identify data which can be used to monitor and improve existing areas of business. In this context, Rockart (1979) follows Anthony's (1965) categorization of management activities into operational control, management control and strategic planning. However, it must be emphasized that Rockart (1979) limited his approach to management control which was precisely defined by Anthony (1965) as *"the*

process of ensuring that resources are obtained and used effectively toward the attainment of corporate goals”.

Today, Rockart's (1979) CSF approach is particularly relevant within the limits of project management and IS implementation and therefore often used by IS executives. This is confirmed in a study conducted by Ramaprasad and Williams (1998), in which the results from 263 responses indicate the major areas in which the CSF approach is utilized: project management (63.49 %), IS implementation (49.21 %), and requirements (47.62 %).

1.3 Dimensions

Reflecting the progress in research on CSF, several different CSF dimensions have emerged in literature over the course of the years. In the following, the most common dimensions according to Esteves (2004) will be reviewed.

1.3.1 Hierarchy vs. Group of CSF

Rockart (1979) defines a specific hierarchy of CSF which is primarily based upon the organizational level at which the individual strategic issues are discussed. In line with this particular approach, CSF can be addressed on either an industry, corporate or sub-organizational level, thereby forming a certain type of CSF hierarchy within the organization (Rockart and Van Bullen, 1986). While a pre-defined level structure is dominant within the hierarchy suggested by Rockart, Barat (1992) argues that the hierarchy of CSF may also be built upon logical dependencies such as those existent between business aims and the factors influencing these aims.

In addition, the hierarchical approach is extended to include groups of CSF. Here, either CSF for a group of organizations belonging to the same particular industry (industry CSF) or CSF for a group of managers in a particular role belonging to different organizations (occupational CSF) are identified. As a result, the idea of generic CSF for these particular groups is addressed (Esteves, 2004).

1.3.2 Temporary vs. Ongoing CSF

According to Ferguson and Khandewal (1999), CSF can be of either a temporary or ongoing nature. An example of an ongoing CSF is the existence of a project champion in top management, thereby influencing all phases of the project's implementation. On the contrary, the definition of the project scope represents a temporary CSF which is only regarded critical for

a certain period of time. In this context, Ferguson and Khandewal (1999) note that all CSF can be defined in a way that makes them temporary. However the CSF may differ in their individual degree of temporality, some spanning a larger timeframe than others. Consequently, the key is to recognize their individual relevance for different stages within a project's lifecycle.

1.3.3 Internal vs. External CSF

CSF can further be distinguished by the dimension of which they are internal or external to the particular organization or unit in which they are applied. Arce and Flynn (1997) state that “*an internal CSF has related actions taken within the organization, while an external CSF has related actions performed outside the organization*” (p. 312). As a result, internal CSF are linked to issues within a manager's range of control, whereas external CSF may not be exclusively controlled by the manager.

According to Rockart (1979), the relevance of this CSF dimension is particularly high when determining the proper sources of information within a process of data collection.

1.3.4 Building vs. Monitoring CSF

Building and monitoring CSF refer, on the one hand, to the amount of control on the part of the management and, on the other hand, to the monitoring or building nature of the actions taken. According to Arce and Flynn (1997), “*a monitoring CSF is concerned only with monitoring an existing organizational situation (whereas) a building CSF is concerned with changing the organization or with future planning*” (p. 312). For instance, the maintenance of technological leadership would be a CSF which a company could build and control, while changing consumer demographics would represent a CSF which needs to be monitored and not controlled (Esteves, 2004).

In a similar approach Rockart and Van Bullen (1986) distinguish between building CSF, used to achieve certain goals or implement a certain degree of change in performance, and monitoring CSF, used to monitor key issues over a larger time frame. Such long term monitoring is often closely related to the strategic and tactical CSF dimension (see below).

1.3.5 Strategic vs. Tactical CSF

This dimension focuses on the type of planning which takes place within an organization, thereby differentiating between strategic and tactical CSF. According to Esteves (2004), while strategic factors seek to identify *which* goals are to be achieved, the tactical factors describe

possible alternatives in regard to *how* these goals can be met. Strategic factors, although based on opportunities, often contain a great amount of risk and, therefore, require long term planning primarily executed by senior executives. On the contrary, tactical factors deal with resources required to reach the goals described on the strategic level and only call for a short or medium term planning effort, most often performed by the middle management.

According to Ward (1990), *“there will normally be a mixture of tactical and strategic CSF. If they are all strategic, the business might founder in the short term while everybody concentrates on the blue skies ahead. Equally, if all CSF are tactical, the business might burn out like a super-nova”* (p. 117).

1.3.6 Perceived vs. Actual CSF

The identified CSF in one organization do not necessarily apply to all other organizations. Rather, each individual company must align their CSF in accordance with their own specific goals and needs. This is where the final dimension comes into play, distinguishing between perceived and actual CSF. Initially proposed by Ellegard and Grunert (1993), the concept of perceived versus actual CSF could bring forth useful implications by shedding light on the knowledge concerning discrepancies between actual and perceived CSF. Experience in this field could, for instance, lead to more stable strategy formulations and implementations.

Although the measuring of actual CSF is not possible, Dess and Robinson (1984) suggest a more frequent confrontation of key decision makers with these factors. By doing this, decision makers might win insight on their perceptions in regard to both truly relevant success factors and those which are only perceived as such.

1.4 CSF Identification

In order to identify the relevant CSF, according to Esteves (2004), a wide array of research methods can be used (see Table 1). Among them are for instance the realization of case studies (e.g. Sumner, 1999), group interviews (e.g. Khandewal and Miller, 1992), structured interviews (Rockart and Van Bullen, 1986), as well as the analysis of relevant literature (e.g. Esteves and Pastor, 2000). According to Shah and Siddiqui (2002) the most frequently used method to identify success factors is the realization of a questionnaire.

Research Method	Examples
Action research	Jenkins et al. (1999)
Case studies	Gibson et al. (1999), Sumner (1999)

Delphi technique	Atthirawong and McCarthy (2001), Brancheau et al. (1996)
Group interviewing	Khandewal and Miller (1992)
Literature review	Esteves and Pastor (2000), Umble and Umble (2001)
Multivariate analysis	Dvir et al. (1996)
Scenario analysis	Barat (1992)
Structured interviewing	Rockart and Van Bullen (1986)

Table 1: Research methods used for CSF identification

1.5 CSF Relevance

Pinto and Prescott (1988) argued that *“the majority of the studies in the critical success factor research stream have been theoretical and have assumed a static view of the importance of various factors over the life of a project. In other words, a critical success factor was assumed to have the same degree of importance throughout the life of a project”* (p. 5). After having examined the criticality of CSF throughout the lifecycle of a project, they came to the conclusion that the degree of criticality of a CSF is subject to change during the different stages of a project lifecycle.

Although the number of studies examining the relevance of CSF in regard to the individual phases of the project lifecycle has increased, most studies still remain limited to the sole identification of these CSF, not addressing their individual degree of relevance at all. Out of the more comprehensive studies addressing both the identification and the relevance, two different approaches can be found: The approach implemented by Pinto and Prescott (1988), for instance, is based upon the same set of CSF at all times, while examining their individual degree of criticality along the different project phases. In contrast, other studies have chosen to define different sets for CSF for each project phase. Although differently executed, both concepts generally tend to refer to the same set of CSF.

According to Esteves (2004), in order to gain insight on CSF relevance, researchers most frequently use case studies as well as surveys based on interviews. Most of the time, participants are asked to either create a list of the most relevant CSF for each project phase or examine the relevance of individual CSF using a scale which indicates a low, normal or high relevance.

1.6 Benefits

According to Rockart (1979, p. 87), the following benefits exist for managers when applying the CSF approach:

- *“The process helps the manager to determine those factors on which he or she should focus management attention. It also helps to ensure that those significant factors will receive careful and continuous management scrutiny.”*
- *“The process forces the manager to develop good measures for those factors and to seek reports on each of the measures.”*
- *“The identification of CSF allows a clear definition of the amount of information that must be collected by the organization and limits the costly collection of more data than necessary.”*
- *“The identification of CSF moves an organization away from the trap of building its reporting and information system primarily around data that are “easy to collect”. Rather, it focuses attention to those data that might otherwise not be collected but are significant for the success of the particular management level involved.”*
- *“The process acknowledges that some factors are temporal and that CSF are manager specific. This suggests that the IS should be in constant flux with the new reports being developed as needed to accommodate changes in the organization’s strategy, environment or organization structure. Rather than changes in an IS being looked on as an indication of “inadequate design”, they must be viewed as an inevitable and productive part of IS development.”*

However, according to Esteves (2004), the CSF concept itself can be used for more than only IS design. Current studies, suggesting a number of additional areas of assistance to the management process, reflect this.

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