

ORGANIZATIONAL PERFORMANCE: INFLUENCE OF CONTINGENCY FACTORS IN SANTA CATARINA SOFTWARE DEVELOPMENT COMPANIES

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ABSTRACT

This study assesses the influence of contingency factors such as environment, structure, strategy, technology, and size on the organizational performance of software development companies in the state of Santa Catarina. After the presentation of the foundations that formed the basis for the elaboration of the research construct, there was a quantitative survey that used a structured questionnaire to sample 34 companies in the software industry. For the data analysis, we used statistical instruments, reliability tests, the Pearson correlation and regressions to achieve the proposed objectives. The results show that, in general, the contingency factors influence the performance of software companies. After individually comparing the contingency factors with performance, the only factor that showed no significant correlation was structure while all the other factors were correlated with performance. In the regression, the generated model retained only the variable strategy and excluded the others. This established a regression equation that provided the degree of influence of this variable on the performance of software companies.

Keywords: Organizational Performance, Contingency Theory, Software Companies

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RESUMO

Este estudo objetivou evidenciar a influência dos fatores contingenciais ambiente, estrutura, estratégia, tecnologia e tamanho, em relação ao desempenho organizacional das empresas de programação de software do estado de Santa Catarina. Após a apresentação dos fundamentos que serviram de base para elaboração do constructo de pesquisa, realizou-se uma pesquisa quantitativa, contemplando uma amostra de 34 empresas do segmento de software, por meio de questionário estruturado. Para análise dos resultados, utilizou-se instrumental estatístico, teste de confiabilidade, correlação de Pearson e regressão a fim de alcançar os objetivos propostos. Os resultados demonstram que, de modo geral, os fatores contingenciais influenciam no desempenho das empresas de software. Comparando individualmente os fatores contingencias com o desempenho, o único fator que não apresentou significativa correlação foi a Estrutura, enquanto os demais todos apresentaram. Na regressão, o modelo gerado manteve apenas a variável estratégia, excluindo as demais, permitindo estabelecer uma equação de regressão, indicando o grau de influência desta variável no desempenho das empresas de software.

Palavras-chave: Desempenho organizacional. Teoria contingencial. Empresas de software.

1 INTRODUCTION

Organizations exist in a competitive and challenging environment in which changes occur at an accelerated pace, and the ability to adapt determines who remains in this business environment. Improper management, or even the absence thereof, can cause entities to close. Thus, managers must demonstrate skills and competencies that are able to provide security in their daily choices and that are able to adapt and improve its performance. According to Fernandes (2006), performance means that the results of an organization are a result of its efforts.

One way to evaluate the performance of an entity is by using the balanced scorecard, which is defined by Araujo (2010, p.50) as “an integrated system of business performance measurement containing original financial perspectives, customers, business processes and learning and growth.”

To support this research, we used contingency theory. According to Gorla and Lavarda (2012), in contingency theory, nothing is absolute and immutable when applied in organizations, and there may be possible changes in the reality of the entities. This theory targets five factors that interfere in the organization: environment, structure, strategy, technology, and company size.

Thus, this study sought to join two dimensions: organizational performance, which aims to assist management processes, and other software companies, which constitute an industry in constant evolution. We checked whether this management accounting tool is inserted in the management of organizations, and we analyze the influence generated by the contingency factors in the organizational performance of software development companies in the state of Santa Catarina.

Therefore, this study assessed the influence of the contingency factors of environment, structure, strategy, technology, and size on the organizational performance of software development companies. Specifically, we seek to theoretically define and demonstrate the relevance of management accounting and identify the management accounting methods that can help managers in the decision-making process.

This highlights the importance of this study, since it makes use of management tools to measure performance to aid decision-making. Nevertheless, it is clear that there are no studies that address this issue in the software programming services industry. Research performed using the EBSCO, SCIELO and SPELL databases proved the lack of studies that simultaneously address performance, software and contingency, as seen in Table 1.

Table 1 - Analysis of databases on research predictors

PREDICTOR	SPELL	EBSCO	SCIELO
<i>Performance</i>	245	8670	6,329
<i>Software</i>	25	864	726
<i>Contingency</i>	6	175	45
<i>Performance and Software</i>	0	27	7
<i>Performance and Contingency</i>	0	22	0
<i>Software and Contingency</i>	0	2	0
<i>Performance Software and Contingency</i>	0	0	0

Source: Authors (2016).

Another factor that contributed to the decision to carry out a project focused on software companies is the relevance of this segment in the current market. According to the Brazilian Association of Software Companies (ABES) (2015), in 2014, Brazil was in 7th place in the world ranking of IT investments and conducted 60 million dollars' worth of services related to hardware and software in 2014, thus representing 2.6% of Brazil's GDP and 3% of the total IT investments in the world.

This study is structured as follows. The first section introduced the studied topics. The second section presents a theoretical review of the issues in management accounting and the balanced scorecard, as well as the foundations of the contingency theory. The third section demonstrates the employed methodology. The fourth section presents the evidence and data analysis, and the last section presents the conclusions, limitations and suggestions for further studies.

2 ORGANIZATIONAL AND ITS PERFORMANCE EVALUATION

Management accounting is presented as a branch of accounting that is used for the planning, control and decision-making in organizations.

Thus, it is defined by Coronado (2012, p.25) as "one of the areas of the organization with specific functions of management, decision-making, measurement and information." Management accounting means accounting information management (Padoveze, 2010).

According to Crepaldi (2014), management accounting provides administrators with information for evaluating the performance of activities and the economic and financial situations of the organization; meanwhile, Berti (2011) points out that it plays an important role in corporate governance, and so it is a branch of accounting that includes several other areas (taxes, finances, and costs).

In a practical sense, Gamba Junior et al. (2012) state that the assessment of organizational performance has become an indispensable tool for managers in the decision-making process, given that the assessment of organizational performance helps companies identify the activities that add value to the products and services offered.

It is noted that organizational performance is analyzed using multiple variables and not only from a single perspective. Bulgacov and Paulin (2009) adhere to this broader aspect and argue that organizational performance should be checked in more than one area, since it is a multidimensional concept.

It is also noted that the performance indicators are no longer only financial. Measuring organizational performance through financial indicators has caused much confusion, since these indicators often do not reflect the actual performance of the organization (MAYFIELD, 1997; NISIYAMA, et al. 2016.).

The relevance of the performance measurement methods can be evidenced. Slack et al. (2006) state that they help to analyze the performance of the operations in an organization, since

without measurements, there is no indication of the efficiency and effectiveness of the processes, products and services.

According to Pereira (2002), a performance appraisal can have several meanings, depending on the meaning assigned to the term “review” and the context for the “performance” of this evaluation object. It is understood that evaluating the performance means to judge or assign a concept before the preset targets.

Cunha (2011) agrees with this thought when he says that the performance evaluation of an organization’s basic and primary premise, which is the evaluation of its results, must be combined with the intentions of organizations (strategic objectives) to ascertain whether the progress is in line with what is planned and desired. It is understood, therefore, that performance evaluation compares and evaluates whether the expected results of its operations have been performed.

Finally, it is important to note that performance evaluation serves as a tool for managers to be able to periodically carry out the management control of business activities (OLSON; Slater, 2002). In addition, it may also be understood as a strategy that provides organizations and their respective departments with a tool for the analysis of their performance in order to correct possible strategic failures, thereby enabling improvements in their processes (SCARANO, 2013).

2.1 BALANCED SCORECARD

Several performance evaluation tools in organizations have been created and developed since the mid-1950s. Martindell (1950) was the forerunner when he proposed the Martindell Performance Evaluation Model, which proposed the measurement of endogenous and exogenous variables that allowed the organization to understand their performance. Then, Drucker (1954) proposed a new model called the Management by Objectives Model, which expanded the variables for innovation characteristics, profitability and management development.

Subsequently, other models and tools have emerged that have been used for performance evaluation, such as the Key Income Areas Model (KOONTZ; O’DONNELL, 1969), the Buchelle Model (BUHELLE, 1971), the MADE-Model (CORREA, 1986), the SMART Model (CROSS; LYNCH, 1988), the Scandia-Navigator Model (EDWISSON, MALONE, 1997), the Performance Prism Model (NEELY; Adams, 2000), the Total Management Model (HORNEAUX JR, 2005) and models based on accounting reports (Hopwood, 1972; IUDÍCIBBUS, 1993; ASSAF NETO, 2001; GITMAN; MATURE, 2005). However, the Balanced Scorecard (BSC), which was created in the mid-1970s, has established itself as the most used tool in performance evaluations.

The BSC is a strategic planning tool aimed at the management, monitoring and control of the performance of organizations. Created by Kaplan and Norton in 1997, it is one of the performance evaluation models that is most widespread both in the academic sphere and in enterprises (CHIARETO, 2014).

The BSC, according to Frezati, Grass and Junqueira (2010), is designed to assess performance through a network of measures and indicators that reflect the organization’s business strategy at all levels. Thus, it presents itself as an efficient system for monitoring the performance of the company’s strategy (KLANN, BEUREN, 2011).

Padoveze (2010) notes that the BSC is an information system for the management of business strategy. With its use, it translates the mission and strategy of the company into a comprehensive set of financial and nonfinancial performance measures, which together serve as a basis for a strategic measurement and management system.

According to Silva (2003), the BSC measures organizational performance from four balanced perspectives: finance, customer, internal business processes, and learning and growth;

thus, the BSC constitutes both a control tool and a communication and learning system. Furthermore, each perspective is properly adjusted according to the characteristics and demands of the organization and focuses on the organization's vision and strategy.

Based on these concepts, Silva (2003, p. 66) also states that the BSC is designed to "make understandable to all levels of the organization, the vision, mission and strategy, so that everyone knows what to do, so their actions impact organizational performance. " Thus, in order to shape the organizational structure, actions and efforts are directed at the implementation of the designed strategies.

Kaplan and Norton (1997) state that the four perspectives "balance the short- and long-term goals, desired outcomes and performance drivers of these results, the concrete measures and the most inaccurate subjective measures."

Crepaldi (2014) treats the variable people (customers) in the way the company is seen by the clients and how the company can understand the clients in the best way. The company's concerns should be directed to meet the needs of its customers (ARAUIJO, 2010).

The variable internal processes relate to how the organization should act to achieve excellence and stand out from competitors in order to attract and win customer loyalty and satisfy the financial returns expectations of its shareholders (Yokomizo, 2009).

From the perspective of learning and growth, "the executives focused on enhancements to its intangible assets - human resources, information technology and culture, and organizational alignment" (Atkinson, 2015, p. 27). Yokomizo (2009) complements this by saying that this variable analyzes the organization's ability to remain competitive and evolve over time. It has as its main objectives the ability to innovate and develop employees.

Completing the BSC perspectives, the financial variable by Crepaldi (2014) defines how the company is perceived by its shareholders or owners. It translates the form that is most used by organizations in performance measurements (Yokomizo, 2009). In addition, Araujo (2010) measures and evaluates organizations' results from the financial angle.

More generally, Kaplan and Norton (1997) emphasize that the management processes developed from the BSC help the organization stay aligned and focused on the implementation of the long-term strategy, which, thus, becomes the basis for the management of companies.

3 CONTINGENCY THEORY

Contingency theory states that nothing is absolute in organizations and that each entity has its peculiarities. This is evidenced by Lawrence and Lorsch (1967), who state that in contingency theory, there is no single best way to manage the organizational and decision-making processes, since different environments provide different backgrounds.

Its origin dates to the late 1950s and early 1960s (Junqueira, 2010), but the research that deepened its application occurred more frequently around the 1970s. This research sought to form structural models of successful businesses. They found that the organizational structures depended on the external environment and that there were no predetermined models of success but rather several possible combinations of several factors (SILVA, 2007).

Thus, one can understand that the structure of the organization and its operations are directly related to the external environment, which contributes to different environments requiring different organizational methods for greater efficiency.

Corroborating this, Wright, Kroll and Parnell (2009) and, more recently, Voss (2014) present an interesting view by stating that there is no single way for an entity to manage the importance of constant alignment to environmental conditions, thereby implying that organizations must be flexible and must continuously learn.

It is noted that contingency theory shows that each entity is managed according to their characteristics and organizational processes by taking into consideration some aspects. These are defined as the following contingency factors: environment, structure, strategy, size and technology.

Regarding the contingency factor of environment, Teixeira (1988) defines it as representing the set of forces, variables or external institutions that affect organizational performance in any way. Voss (2014) says that the complements to the environmental factor relate to the characteristics of each organization, such as the amount of labor or the type of technology used in production. Thus, the environment is an important contingency variable that has been used since the founding of contingency research (Chenhall, 2003).

The model that is used to identify the organizational structure, according to Junqueira (2010), must take into account the incentives given to work teams to engage in tasks, training programs, participatory management and the company's structured, decentralized activities. Thus, the organizational structure refers to the ways in which tasks and responsibilities are allocated to individuals and how individuals are clustered in offices, departments and divisions (WRIGHT; KROLL; PARNELL, 2009).

Regarding the contingency factor of strategy, War (2007) states that strategy is related to the planning and execution of actions to achieve goals. Voss (2014) complements this by saying that the internal factor strategy directs researchers to conduct a more detailed study of the environments where organizations are located. Mantovani (2012) states that the term strategy can be defined through various concepts that still rely on numerous practical applications.

Mintzberg (1995) classifies the contingency factor of strategy into two areas. The first is known as generic, and the other is called the strategic groups of companies, which comes from Industrial Economics.

The size variable can be defined as an internal variable of the organization; however, it allows one to contextualize the company within its environment in which it operates (SILVA, 2007). Speckbacher, Bischof and Pfeiffer (2007) define the number of employees of the organization as a routinely used parameter to determine the size of the company and its degree of functional differentiation.

Regarding the contingency factor of technology, Alves and Milk (2011) state that is one of the independent variables that powerfully influences the organizational characteristics, and thus, the knowledge of the technology that is used by the company is vital for organizational analysis.

For consistent analysis, Voss (2014) and Junqueira (2010) state that two variables must be considered in this process. The first assesses the information technology used by the company and the second analyzes the technology that is applied in the manufacturing of the company's products. However, Woods (2007) states that there is little discussion of the role of information and communication technology as an important influence on the contingencies in organizations.

Therefore, the theory of contingency shows that organizations should be managed according to their particularities and processes with a view to contingency factors. These, in turn, highlight the external variables of the entity and the distribution of tasks and actions that are required to achieve the objectives and goals of the company.

3.1 RELATED STUDIES

In this section, we present studies that resemble the theme of this research and treat approaches to performance evaluation techniques using the Balanced Scorecard.

Castro et al. (2012) analyzed the relationship between the performance and the use of the BSC in large Brazilian companies. The research showed that the BSC's presence is linked to

a better contribution margin in companies that have adopted the tool for over a year. Thus, the BSC usage time has a positive and significant relationship with the contribution margin but not with the billing organization.

Garcia et al. (2013) developed a case study based on the literature and descriptive documents using a BSC directed toward essential customer perspectives. The survey was conducted in a cooperative located in the state of Rio Grande do Sul, and the data collection period was from January 2009 to November 2010. The result of this research showed that the price factor is not considered as the most relevant aspect to the customer, but it can be used by the company to capture customers. Finally, the variables with the highest relevance for customers were the reputation and authority of the image.

Valente (2014) conducted a case study in which he used BSC concepts to develop indicators that would allow for analyzing the performance of the National Commercial Training Service (SENAC) of the state of Paraná. The scope of information was limited to 2013 and included 33 technical schools in the state. The survey showed that, in fact, there was no difference in the performance of the evaluated units, i.e., the gratuitous programs, offered by the SENAC and they are not consistent in all the analyzed schools.

After demonstrating the studies related to the research topic, the following chapter shows the methodology used in its realization.

4 METHODOLOGY

This study highlights the influence of the contingency factors of the environment, structure, strategy, technology, and size in relation to the organizational performance of the software development companies. For this, it is necessary to consider the methodology that is to be used. Silva (2010) defines methodology as the study of the method required to get certain knowledge, and it is an instrumental concern that deals with the ways of doing research and taking care of procedures, forms and ways.

Thus, the methodology can be seen as the general knowledge skills that are necessary for the researcher to guide the research process and allow them to make timely decisions and select concepts, hypotheses, techniques and appropriate data (THIOLENT, 2011). Therefore, it is necessary to detail how this investigation will be conducted.

The study design was developed as descriptive research. It is defined by Barros (2007) as research in which the researcher does not interfere but only describes the object of the research and seeks to discover how often the phenomenon occurs and its nature, characteristics and causes.

The survey is characterized as quantitative. Nardi and Santos (2003) consider that research of this kind using numbers or quantities to translate data and information by following mathematical and statistical rules.

Nevertheless, as it pertains to the scientific method, this research is deductive. Barros (2007) shows that this method consists of a resource that is a rationalization or combination of ideas and, in the interpretive sense, it is worth more than individual cases with reasoning that goes from general to specific.

The survey was conducted during the second half of 2016, and it covers software companies in the state of Santa Catarina. Thus, the research population was 275 companies, and the study sample was 34 companies in Santa Catarina who answered the survey instrument in its entirety. To contribute to the understanding of the sample, Silva (2010) indicates that it should cover the entire problem that is investigated in multiple dimensions.

Corroborating this, Marotti (2008) states that the intentional sample we choose should be a subgroup that is representative of the population. Therefore, making use of these techniques can meet the research objectives.

Thus, to obtain accurate and adequate data to meet the objectives of this study, we used the intentional sampling technique where the researcher selects a number of people to be included from among the population.

Regarding data collection, it is considered by Barros (2007, p. 105) as the “phase of research that investigates reality and retrieves data by applying techniques.” Thus, the data will be collected using a structured questionnaire that is administered to the managers of software companies in order to measure the views and information that are needed to meet the objectives of this study.

The instrument was divided into three parts. The first concerns the characterization of the sample, while the second and the third parts are composed of assertions that are responded to using a Likert scale. According to Aguiar (2011), Likert scales measure attitudes according to levels of agreement or disagreement, which is analogous to a given conclusion.

The questionnaires use a 7-point Likert scale, where 1 denotes complete disagreement and 7 denotes full agreement with the statement. Dalmoro and Vieira (2013) help to justify the choice of the 7-point Likert scale by arguing that the use of a greater number of points increases the range of the data and enriches the analysis of results.

In the analysis, initially, the data were tabulated to identify consistency, and we use Cronbach’s alpha to do this. Monteiro and Arica (2010) state that Cronbach’s alpha can be used to estimate the reliability of a questionnaire that is used in a search.

Cronbach’s alpha is quantified on a scale from 0 to 1, and the minimum acceptable value for a reliable survey is considered to be 0.70. However, it should be noted that when it is below 0.70, the internal consistency of the scale is considered low. The maximum expected value is 0.90, and above that, there is the redundancy in or duplication of information. Complementing this, Almeida Santos and Costa (2010) state that the number of items that make up a scale can influence the alpha value.

The interpretation of the data is performed initially by means of simple descriptive analysis to describe the sample, and Pearson Correlations and Multiple Linear Regressions will be used to assess the assertions.

The Pearson correlation, which is represented by the letter r , takes values between -1 and 1. It will be positive when $r = 1$, which means that there is a perfect positive correlation between two variables. Conversely, the variables presents a negative linear correlation for the data when $r = -1$. Thus, as one increases, the other decreases.

We use multiple regressions to assess the relationship between the independent variables and the dependent variable. According to Barbetta and Bornia Reis (2010), multiple regressions can provide values for the dependent variable and can identify the influence of each variable.

Contributing to this claim, Hair Junior et al. (2009, p.33) mentioned that the “goal of the multiple regression analysis is to use the independent variables whose values are known to predict values of the dependent variable selected by the researcher.” Thus, changes in the dependent variable are responses to changes in the independent variables. Therefore, the application of multiple linear regressions allows for measuring the value of a variable based on other variables. Corroborating this, Rozza, Silva and Müller (2015) state that the multiple linear regression function examines the multiple relationships between the dependent variable and the independent variables according to the linear combination of regression coefficients.

4.1 Construct research

The research aggregates the objectives and justification of the submitted study. The construction of this research is shown in Table 1.

Painting 1 - Construct research

Dimensions	Research variables	Content of the statements	Authors
Performance	People (customers)	Service delivery and satisfaction.	Kaplan and Norton (1997) Silva (2003) Frezza (2010) Padoveze (2010) Chiareto (2014) Atkinson (2015)
	Internal processes	Use of standard operating procedures, innovation, and the success and impacts of the internal processes in financial indicators.	
	Learning and growth	intellectual training of employees, allocation of resources and financial growth.	
	Finance	operational planning for finance, performance indicators and financial capacity.	
Contingency Theory	Environment	strategic adaptation to the environment and perception of opportunities.	Lawrence and Lorch (1967) Tan (1988) Chenhall (2003) Wright, Kroll and Parnell (2009) Voss (2014)
	Structure	Distribution of tasks, operational efficiency, hierarchy and access to new markets.	
	Strategy	Strategy setting, strategic behavior and competitive advantages.	
	Size	Determining the size, hierarchical composition and achievement of objectives.	
	Technology	added technology and organizational processes.	

Source: Authors (2016).

The above variables have certain aspects that characterize the meaning to which they are linked. In this study, the Balanced Scorecard consists of four factors and contingent theory is composed of five factors, and the questionnaire's questions are directly linked to each construct variable.

For the composition of the representative dimension of Performance, four variables all provided the same weight, which were then used to comprise a single variable. Table 1 also presents the authors that were used as a basis for this study, as well as the synthesis of the content of the questionnaire assertions.

5 PRESENTATION AND ANALYSIS OF RESULTS

This section presents the results of the research and is divided into four sections. The first relates to the characterization of Santa Catarina software companies. The second section presents the descriptive statistics and the data reliability. The third section presents the association between the dimensions and research variables. Finally, the fourth section presents the regression of the data.

5.1 Sample characterization

The sample included software companies in the state of Santa Catarina. The regional location of the business, the age of the company, and the numbers of employees and customers are listed in Table 2.

Table 2 - Characterization of search

Age of Company	Frequency		Region of Santa Catarina	Frequency	
	Absolute	%		Absolute	%
Up to 10 years	15	44.1%	East	10	29.4%
From 11 to 20 years	11	32.4%	North	7	20.6%
From 21 to 30 years	8	23.5%	Valley	7	20.6%
From 31 to 40 years	0	0.0%	West	5	14.7%
From 41 to 50	0	00%	South	5	14.7%
Over 50 years	0	0.0%	Plateau	0	0.0%
TOTAL	34	100.0%	TOTAL	34	100.0%

Number of employees	Frequency		Number of customers	Frequency	
	Absolute	%		Absolute	%
Up to 05 employees	4	11.8%	Up to 50 customers	7	20.6%
06 to 10 employees	13	38.2%	From 51 to 100 customers	5	14.7%
11 to 15 employees	6	17.6%	From 101 to 150 customers	5	14.7%
16 to 20 employees	1	2.9%	From 151 to 200 customers	4	11.8%
21 to 25 employees	1	2.9%	From 201 to 250 customers	1	2.9%
Above 25 employees	9	26.5%	Over 250 customers	12	35.3%
TOTAL	34	100.0%	TOTAL	34	100.0%

Source: Research Data (2016).

As seen in Table 2, it is noteworthy that 44.10% of the responding companies have been in the market for 10 years or less. This demonstrates that this segment is expanding and developing, and has been consolidating its position in the market. With respect to the number of customers, it is observed that 35.30% have more than 250 customers, which justifies the growing need for organizations to control their operations through software because of the large amount of generated information.

When questioned regarding the planning directed to the measurement of performance, 50% of the respondents said they have deployed planning, thus demonstrating that they are preparing for the economic instabilities to which they are exposed.

Since this section presented a description of the sample, in the following we address the descriptive statistics and information regarding the reliability of the collected data.

5.2 DESCRIPTIVE STATISTICS AND RELIABILITY OF DATA

For this study, we used seven factors in the simple descriptive statistics, including the minimum value, the maximum value, the mean, the standard deviation, the variance, the asymmetry and the kurtosis of the data. Table 3 shows the results of the simple descriptive statistics.

Table 3 - Simple Descriptive Statistics Sample

Variable	Freq.	Min.	Max.	Average	Standard deviation	Var.	Asymmetry		Kurtosis	
							Stat.	Standard error	Stat.	Standard error
Performance	34	4.33	7.00	6.0858	0.72372	0.524	-0.739	0.403	0.108	0.788
Environment	34	3.33	7.00	6.3039	0.93336	0.871	-1.523	0.403	1,873	0.788
Structure	34	2.00	7.00	6.0980	1.12973	1,276	-1.971	0.403	4,668	0.788
Strategy	34	2.67	7.00	5.6765	1.24041	1,539	-0.801	0.403	0.068	0.788
Size	34	2.67	7.00	5.8824	1.17173	1,373	-0.893	0.403	0.021	0.788
Technology	34	4.33	7.00	6.4314	0.78936	0.623	-1.348	0.403	0.690	0.788

Source: Research Data (2016).

It can be seen in Table 3 that the data are significantly dispersed with respect to the minimum relative to the maximum answers, ranging from 2 to 7. Another highlight regarding the maximum of all the variables analyzed is that the results were the same and all variables has a maximum of 7.00.

The standard deviations of the variables are between 0.72372 and 1.24041. It is emphasized that the variable with the greatest dispersion from the average is strategy at 1,539, which reflects the data's quality and means that it is less likely to distort the results. This can still be seen in asymmetry where all the results are negative with an average of -1.2125. This result shows that the data has negative asymmetrical measures where the averages of the responses are less than the mode and median of the sample. The average kurtosis was 1,238, thereby reflecting higher than the normal distribution, which occurred due to the data having high standard deviations.

To analyze the reliability of the questionnaire of software companies, we applied Cronbach's alpha, which assesses the credibility of the information that was collected.

The result obtained for Cronbach's alpha was 0.829. Thus, this demonstrates that the reliability is within acceptable standards for quality information ($0.7 < \alpha < 0.9$), since values below 0.7 are considered as unreliable, and those above 0.9 reflect redundant or duplicated the information.

5.3 STUDY OF THE RELATIONSHIP DIMENSIONS

The basic objective of the Pearson correlation is to measure the degree of the relationship between two variables. Table 4 shows the Pearson correlations between the dimensions of the study.

Table 4 - Pearson correlation study of the dimensions

		Perform.	Environ.	Structure	Strategy	Size	Techn.
Performance	Correlation	1,000					
	Signif.						
Environment	Correlation	0.368 *	1,000				
	Signif.	0.032					
Structure	Correlation	0,273	0.625 **	1,000			
	Signif.	0.119	0,000				
Strategy	Correlation	0.744 **	0.309	0.216	1,000		
	Signif.	0,000	0.076	0.221			

Size	Correlation	0.455 **	0.566 **	0.360 *	0.524 **	1,000
	Signif.	0.007	0,000	0.037	0.001	
Technology	Correlation	0.433 *	0.685 **	0.491 **	0.446 **	0.654 ** 1,000
	Signif.	0.011	0,000	0.003	0.008	0,000

Source: Survey data (2016).

note: *. Correlation is significant at the 0.05 level (2 tailed).

** . Correlation is significant at the 0.01 level (2 tailed).

It is found that by individually comparing the contingency factors with variable performance, the only factor that showed no significant correlation was the Contingency Factor of structure, while the Contingency Factors of the Environment, Strategy, Size and Technology had significant correlations when compared with the dependent variable of Performance. The factor with the highest correlation was strategy with 74.4% and significance level of 1%. It was followed by size (45.5%), technology (43.3%) and environment (36.8%), and those had a 5% significance level. For these four variables, we can reject the null hypothesis of the joint insignificance of the dimensions of the equation, thereby indicating that there is significant influence of the contingency factors on the performance of software companies.

When carrying out the overall correlation, based on the overall average of all the variables, it is observed that the contingency factors present significant correlations when analyzed with variable performance, thereby demonstrating that, overall, the factors also influence the performance of the organization.

A linear regression assessed the relationship between the independent variables and a single dependent variable. In this study, we used performance as the dependent variable and the five contingency factors as the independent variables. Table 5 shows the summary of the linear regression model between these dimensions, which was rotated using the Stepwise method. The result does not rule out the significance of the model.

Table 5 - Summary of the linear regression model between the contingency factors and Performance

Model	R	R Square	R set square	Standard Error Ballpark
1	0,744a	0.553	0,539	0.49145

Source: Survey data (2016).

Note: a. Predictors: (Constant), Strategy.

Table 5 shows that the correlation coefficient is $R = 0.744$ or 74.4%. This percentage represents the relationship between the dependent variable and the independent variable of performance strategy, and in this case, it represents reasonable significance.

The R squared coefficient of determination corresponds to 0.553; therefore, 55.3% of the variation in performance is due to the variation of strategy. It is noted that the adjusted R squared, which considers the waste standardization index, is 0.539, which is somewhat less than the original index.

To test the hypothesis that the means of two populations are equal, we used ANOVA, as shown in Table 6.

Table 6 - ANOVA^a of the linear regression between Strategy and Performance

	Model	Sum of Squares	df	Mean Square	Z	Sig.
1	Regression	9,556	1	9,556	39.564	0,000b
	Residual	7,729	32	0.242		
	Total	17,285	33			

Source: Survey data (2016).

Note: a. Dependent Variable: Performance

b. Predictors: (Constant), Strategy

In table 6, it appears that the R squared hypothesis of zero is zero, in which case it can be stated that in the model, strategy influences the performance of software companies.

Thus, to analyze the relationship between performance and strategy, it is evident that the regression that presents the lowest possible residual and explains the influence of the variables is represented by the following equation:

$$DES = 3,623 + (0,434 * ETE)$$

Here,

DES is the performance dimension, and

ETE is the strategy dimension.

Thus, when evaluating the dimensions, we see that for each variation of 1 percentage point that occurred in organizational strategy, an average increase of 0.434 points occurs in the performance of software companies. In addition, Table 7 shows the origin of the contents composing the equation and the standardization of its coefficients.

Table 7 - Correlation of predictor coefficients for strategy

Model		Not standardized coefficients		Standardized coefficients	T	Sig.
		B	Standard error	Beta		
1	(Constant)	3,623	0.400		9,047	0,000
	Strategy	0.434	0.069	0.744	6,290	0,000

Source: Survey data (2016).

Note: a. Dependent Variable: Performance.

It can be seen in Table 7 that the results support the model's validity, given that the standard error is low and has better than 5% significance.

As evidenced, despite that the contingency factors of the environment, technology, and size are not in the regression model, it is important to note that the relationship between these variables and the performance is also significant; however, they are largely explained by the strategies used by the organizations.

When comparing the survey results with related studies, as evidenced in this work, it reinforces the evidence that justifies the relevance of the issue, given that there are no any similar studies to this research that have been published in the analyzed databases. Thus, the results that are achieved are not fully consistent with previous studies, but rather they contribute to their improvement.

Given the presented data and information and the analyses that culminated in the regression equation representing the relationship between the contingency factors and performance, the following section discusses the final considerations of the investigation and the limitations and suggestions for further research.

6 FINAL CONSIDERATIONS

This study aimed to show the influence of the contingency factors of the environment, structure, strategy, technology, and size in relation to the organizational performance of the software development companies. For the development of the research, we used the descriptive method with a quantitative approach, as well as the deductive method, and conducted a structured questionnaire with 34 managers from software companies in the state of Santa Catarina.

The first specific objective of the study was met by demonstrating the theoretical definition of management accounting according to several authors that have contributed to realize its relevance and showed that it is a branch of accounting.

In the second specific objective, in identifying the methods of managerial accounting to help managers in the decision making process, it was clear that the evaluation of performance and the Balanced Scorecard could contribute so that managers can solidly conduct their information-based business and make more assertive decisions. Through these methods, the administration obtains information about the business performance and can correct strategic failures in order to optimize processes.

Following that, we assessed the correlation between the contingency variables and variable performance and noticed that the structure actually does not influence the performance of companies. The other contingency factors have significant influences; however, only the variable strategy remained in the model since it is responsible for 55.3% of the variation in the performance of software companies. The others were eliminated because strategy explained much of this relationship.

The research was carried out with software companies in the state of Santa Catarina. Thus, the research had some limitations. For instance, while the questionnaires were sent to a population of 275 companies, it was found that only 34 companies answered it in its entirety.

With respect to future research, we intend to apply the methods of this study to other organizations and industries. Since the investigation was carried out in software development companies in the state of Santa Catarina, the results cannot be generalized. This reinforces the idea of carrying out further investigations on different populations, but the methods should be adjusted by paying attention to the peculiarities of each line of business.

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Contribution	[Author 1]	[Author 2]	[Author 3]	[Author 4]	[Author 5]	[Author 6]
1. Definition of research problem	√					
2. Development of hypotheses or research questions (empirical studies)	√	√			√	√
3. Development of theoretical propositions (theoretical work)	√		√	√	√	
4. Theoretical foundation / Literature review	√	√	√	√		√
5. Definition of methodological procedures	√	√	√	√	√	√
6. Data collection			√	√		
7. Statistical analysis	√	√	√	√		
8. Analysis and interpretation of data	√	√	√	√		
9. Critical revision of the manuscript	√				√	√
10. Manuscript writing	√	√	√	√	√	
11. Other (please specify)						