

MANAGERS COGNITIVE STYLE AND STRATEGIC BEHAVIOR OF CIVIL CONSTRUCTION COMPANIES

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ABSTRACT

The study aimed to identify the relationship between companies strategic behavior and managers cognitive style of the construction sector at Porto Velho city, Rondonia, Brazil. Following the evidence of these factors relationship according to the literature. Were adopted as basis for analyzes the strategic typology behavior proposed by Raymond Miles and Charles Snow and the theory of Michael Kirton adaptation-innovation to determine cognitive style manager. We conducted quantitative research of descriptive nature. Primary data were collected through questionnaires given to the managers of a sample of 104 companies from a population of 142. The industry demographic indicators were collected from institutions that have joined the sector's companies. It was found that managers are predominantly innovative, and the studied companies adopt, mostly analytical behavior. There was no significant correlation between cognitive style and strategic behavior for the group companies studied.

Keywords: *Construction Sector, Strategic Behavior, Cognitive Style*

1 INTRODUCTION

After a long period of political and economic crisis, Brazil went through monetary stability period with economic growth, positively impacting the construction sector, it is understood as a broad productive chain industry, including steel, mining steel, aluminum metallurgy, glass, ceramics, wood, electrical and mechanical equipment, several service providers as project offices, engineering services and contractors (Mello, 2007). The last two types cover agents of stage where construction is embodied, can also be understood in three divisions: construction of buildings and civil; infrastructure works or heavy and specialized services for construction (IBGE, 2011).

On the construction sector there are organizations with very heterogeneous characteristics, including both multinational companies, as micro and small companies. In Brazil, much of the construction is performed by small local construction companies, whereas the micro and small companies represent 81.05% of the total active companies (Brazil, 2011). Micro, small and medium enterprises (MSE) do not behave in the same way that large because they have greater capacity for innovation, adaptability and flexibility provided by its simplification and structural reduction, which allows greater flexibility in decision-making, a desirable context of rapid political and economic transformations (Hall, 2004; Cravens, Shipp & Cravens, 1994).

Jones and George (2008) distinguish two basic models for the decision making process inherent in any size company management function: i) classic, which believes that all information is available to managers, who have necessary capacity to select the most appropriate decision; ii) administrative, which assumes the non-availability of all information, the existence of uncertainty and that the decision-making capacity is determined by the managers cognitive limitations. Kirton (1976) deepens this issue in his Theory of Adaptation-Innovation, suggesting that individuals adopt preferred styles of creativity, problem solving and decision making, which he called cognitive styles.

The frequent lack of distinction between ownership and management in the MSE, the process of strategic decision-making is concentrated in a few or a single person, usually the owner-manager, whose way of thinking can influence both positively and negatively selecting the organization's competitive strategies generating patterns of

behavior. Several authors have developed typologies for classification strategies, however Miles and Snow (2003) developed a relevant typology for its comprehensiveness, which enables the analysis of organizational behavior regardless doesn't matter the company size (Vasconcelos, Guedes & Candido, 2007). In Brazil, studies of Gimenez (1993, 1997, 2000) add as focus the approach on strategic behavior of small business concepts related to creativity, from the Theory of Adaptation-Innovation, of Kirton. Following this research line, this study analyzed the relationship between strategic behavior and cognitive style adopted in the management of construction companies in Porto Velho city, Rondonia state (RO), Brazil (BR), considering the lack of study on this sector. The problem was investigated in 2013.

In Rondonia, there was significant implement on the number of companies, especially after 2007, explained by the launch and official institution of the Growth Acceleration Program (PAC) by the Federal Government, through Decree 6,025, January / 2007. Large projects such as hydroelectric plants on the Wood River, generated big demand for residential civil works, commercial and public. In addition to providing the growth of existing construction companies and the creation of conditions for the opening of others, this scenario attracted large construction companies based in other cities and states, which now operate mainly in residential construction, changing competitive conditions in the sector. This fact highlights the importance of a strategic behavior analysis of these companies as a way to highlight the sector configuration.

2 THEORETICAL BASIS

For Simon (1979, p. 8), "[...] the administrative processes are decision-making processes, both consisting of daily selection of alternatives as the company's goals." In addition, the author distinguishes the following stages of decision-making: discover the times that should be carried out, identify and analyze the possible courses of action and decide for one of them, they are also activities that spend differently amount of time, plus variable in organization size and function of the administrator's personal characteristics.

For Meredith, Nelson and Neck (1982) there are differences on decision-making of large and small organizations, when it is observed that, for the first ones, it is a formal process, based on information and documents continuously and systematically collected. Already in the smaller organizations, it is usually concentrated in one person, the entrepreneur, taking key decisions for the future of his/her organization with little relevant information available.

So when it comes by analyzing organizations of various sizes, cognitive main manager characteristics seem to be crucial for understanding the genesis of the decision-making process. A feature is considered an important cognitive style.

Cognition is a broad concept, related to perception, finalized action, the conceptual organization, reasoning, learning, communication and language and also the way people acquire, store and use knowledge (Hayes & Allinson, 1994). It is distinguished some sub-questions within the concept of cognition, such as cognitive skills and cognitive styles. While the first implies content domain and individual's performance capacity, the latter relates primarily to the form and nature of this performance (Hayes; Allinson, 1994). Thus, the notion of cognitive style is therefore broader than skill, personality or psychological trait, because it relates to the possibilities of action and thought, and not a fixed way of dealing with reality (Sternberg, 1999).

Among several authors who use the term cognitive style, Kirton (1976) employs the term meaning the relationship between creativity and thinking, proposing that individuals have stable differences in the ways to obtain, organize and use information in decision making, setting preferred styles. From this meaning, Kirton developed the Theory of Adaptation and Innovation based on the assumption that problem solving is part of life and creativity is a structure formed in childhood or even inherent in every person who sets up a preferential mode in which the individual produces the solution, with which he called cognitive style.

Adaptation-Innovation Theory defines a continuous two poles indicating a preference for "make things better", characteristic of the style adapter or "do things differently", characteristic of the innovative style, both possessing weaknesses and potentialities. The relevance of the approach is to aid understanding of the preferences and the resulting behaviors from them, helping the achievement of a higher performance in an organization, for example. The fact that people have adapters or innovative features led to a breakdown on behaviors related to each style, as table 1 shows.

The instrument developed to measure preference for one of the cognitive styles was called Kirton Adaption-Innovation Inventory (KAI), which consists of a questionnaire with 32 items. The instrument was tested by Kirton (1987), Foxall and Hackett (1992) and Gimenez (2000), in several studies, obtaining confirmation of the correlation between high scores on the score and risk taking and innovation and positive evidence for the validity

and convergence of theory of Kirton and the KAI instrument. In addition, several studies have shown that there are differences between the cognitive style of professional groups. Goldsmith and Kerr (1991) found the prevalence of innovative style entrepreneurs and analytical cognitive style in general administrators. Foxall (2000) presents studies that cognitive styles vary depending on both the operating area, such as engineering, marketing, as the hierarchical level within the organization.

Table 1 – Cognitive Styles.

Adapters	Innovators
Characterized by precision, trusted, efficiency, caution and disciplin.	Seen as undisciplined, challenging rules.
Seek for solutions which are new, creative, relevant and acceptable.	Produce numerous ideas that might not seem relevant or acceptable for others.
Prefer situations well structured and stablished.	Prefer non structured situations.
Important for current situations.	Important for situations changing and crisis.
Seen by the innovators as trusted, conformed, previsible and inflexible.	Seen by adapters as non trusted, non practical, stablished system threatening.
Are able to keep high accuracy on long periods of detailed work.	Susceptible to detailed routines just for short term periods.
Are authorities in the structural organization.	Take control of non structured situations.
Rarely change, only when sure about the strog support.	Offer criteria to challenges, have few respect for past behaviors.
Are essential for the company operation.	Show, certainly, when generate ideas.
Sensible, maintains the group cohesion and cooperate.	Insensitive, threatening group cohesion.

Source: Adapted from Kirton, 2003, p. 55.

As the cognitive styles are characterized by behaviors, it is expected that, in organizations, they influence decision making and policy formulation and objectives. Thus, it can be said that the strategic choices are influenced by personal characteristics of decision makers in the company (Simon, 1979; Gimenez, 2000).

The formation of mass markets provided by the development in the transportation sector drove the adoption of business strategies that acted affecting the competitive environment, through economies of scale in production and distribution scope (Ghemawat, 2000). More recently, the use of the term strategy is common in the study of organizations because of the independent nature or sector, all are subject to the complexity of the world. The same technological advances that promotes continuous improvement in products and services also provides transportation and more efficient communications, intensifying competition (Hoskisson, Hitt, Ireland & Harrison, 2009) and demanding an organization placement due these issues. The strategy seeks to provide managers the ability to guide organizations in this complex environment, despite the existence of successful companies with implicit or even unconscious strategies. To Oliveira (2010), however, makes it difficult for an organization to remain competitive without the understanding of their own strategies.

For Mintzberg, Ahlstrand and Lampel (2000), a review of existing literature on strategy leads to ten (10) different viewpoints called strategic schools of thought, which can be grouped into prescriptive, descriptive and configuration. In most studies and business reality, however, dominated by prescriptive studies, which focus on aspects related to the formal process of drafting the strategy. Despite this prevalence, these authors identified at the Configuration School a search online in descent strategy, which presupposes that cognition of the organization's manager is crucial to the development of strategies. In this context, Miles and Snow (2003) developed a theoretical model whose structure is based on two dimensions, the first one being a general organizational model adaptation, and the second type presenting an organizational patterns of different behaviors.

The authors organizational adaptation model explains that effective organization establishes a continuous process of reevaluation of its purposes and realignments to the environment and adjusting your task structure, relationships, decision-making and control, called by them cycle adaptive. This cycle begins, usually, but not necessarily by the entrepreneurial phase and subsequently engineering and administrative. In the entrepreneurial stage, the organization seeks to address the product-market definition issues, winning attitude, growth policy and environmental monitoring. The engineering phase consists of selecting the right technology to produce and distribute the chosen products or services and the administrative phase corresponds to the stage where there is a predominance of administrative functions, through planning, organizational structure and control. At each stage, the organization develops four performances and can be predominantly defensive, prospectors, analytical or reactive.

In defensive behavior, the organization is characterized by high specialization in their area, with little tendency to seek new opportunities. Its manager (s) realize stability in the organizational environment as a big deal, so success would consist on his ability to aggressively maintain its prominence within the chosen market segment. The prospector behavior characterizes organizations which continually are seeking new opportunities for products and continuously markets through a strong incentive for research and development. For its manager (s) is important to try answers to emerging environmental trends, making their business is the sector generating changes where they are located. Organizations with analyst behavior working in two types of product-market domains, a relatively stable and another changing. By using a combination of products / markets and stable and changing, these organizations adopt the most promising innovations developed by prospectors, without the extensive concern with research and development. Finally, the reactive behavior refers to organizations where managers often perceive change and uncertainty occurring in their environment, but are not able to respond effectively. According Gimenez (2000), the latter is a kind of no strategy, because only venture into new products / services when threatened by competitors with the loss of important and / or profitability customers.

Conant, Mokwa and Varadarajan (1990) conducted a cross-sectional study developed an instrument based on Miles and Snow theory (1978), composed of 11 questions for the strategic dimensions, distributed among the three adaptive cycles. According to the authors, through this questionnaire you can determine the dominant archetype in the strategic organizations performance and to operationalize the concept, becomes effective tool of self-knowledge, analysis and potential change of strategic direction.

Kirton's work (1976) on cognitive styles is consistent with studies of Miles and Snow (2003) on strategic behavior, because these last emphasize the dynamic character of the organizations strategic process. When based on a focus of strategic choice, Miles and Snow clarify that the organizational structure, although pre-ordered environmental conditions, is strongly influenced by senior managers, who are the links between organization and environment. In both works, it measures the degree of adaptability - as the organization or the manager - which, in micro, small and medium enterprises tend to be coincident, the centralization of functions in a single individual manager-owner.

Studies show that the creativity style of management is intrinsically linked to the strategic company behavior, they are responsible for the strategic choices. Thus, the fact that companies can be explained in one location and industry use different ways to achieve the common goal, business success. The theoretical comparative analysis between models of Miles and Snow (2003) and Kirton (1976), according Gimenez (1998), indicated evidence that organizations with prospector strategic behavior would tend to managers with innovative cognitive style and the defensive behavior is related to an adaptive style troubleshooting. Research conducted in Brazil and Britain in various sizes and sectors companies, using different methodologies, as repertory grids, mind maps and instruments proposed by Kirton and Conant found that, in some situations, there is also a strong participation of environmental turbulence in the strategic choices; but in others, found that the influence of the environmental context stems from the manager perception (Conant, Mokwa & Varadarajan, 1990; Gimenez, 2000). There are also studies that seek to relate the strategic behavior of firms with training manager, gender and the sources of information used by him (Carter, Anderson & Shaw 2001); (Ferreira, 2005). However, most authors consider that despite the importance of training and information available to the manager, are the mental processes of managing the key factors of perception of reality and recreation in behavior patterns. For this reason, this research explored the relationship between cognitive style and strategic behavior, but also analyzing aspects such as gender and training leader.

3 METHODOLOGICAL PROCEDURES

This article was prepared on the premise that managers cognitive styles can influence the strategic behavior of organizations (Gallen, 1997; Smith, 1999; Gimenez, 1997; Allinson, Chell & Hayes, 2000), adopting a quantitative approach and research can be considered as descriptive. The type of study used was a cross-sectional survey.

In line with this discussion on the theoretical framework and the desired goals, this paper identifies the following variables:

- Independent variable: managers cognitive style.
 - Dependent variable: strategic behavior.
 - Control variables: company size, company lifetime and characteristics of the managers.
- Assuming that managers cognitive styles can influence organizations strategic behavior (Gallen, 1997;

Smith, 1999; Gimenez, 1997; Allinson, Chell & Hayes, 2000), the research adopted as: business, life of the company and characteristics of managers.

Working hypothesis: the strategic behavior of construction companies in Porto Velho is positively correlated with managers cognitive style.

And as Research Hypotheses: Hypothesis I - leaders with more innovative cognitive style tend to develop prospector strategic behavior in organizations that administer; Hypothesis II - leaders with more cognitive style adapter usually adopt the defensive strategic behavior; - Scenario III - in more turbulent environments, as in Porto Velho, the predominant innovative strategic behavior and cognitive style prospector.

The survey was conducted with 142 construction companies in Porto Velho city. The determining size of the random sample to the questionnaires was defined considering a confidence level of 95% and an error margin of error of 5% (Smiles & McGrane, 2006, p. 175), which resulted in 104 companies.

The data collection instrument, consisting of a self administered questionnaire divided into three parts, assuming that respondents have knowledge and motivation to complete it individually. The first part of the instrument consisted of seven questions referring to the information about the company characteristics, and the personal characteristics manager. Part II of the questionnaire consisted of 33 questions related to manager cognitive style from the inventory of Adaptation and Innovation Kirton - KAI (1976). The last part of the questionnaire, on the company strategic behavior, was extracted from the model Conant, Mokwa and Varadarajan (1990) and consisted of 11 questions where the respondent had to choose between the four alternative proposals that best suits the strategic behavior of the company (prospecting, analytical, defensive or reactive). In Brazil, both instruments have been tested and validated by Gimenez (1998; 2000) and Pearl and Gimenez (2000) in research in various sectors. Obtained 102 answered and validated questionnaires.

The variables of the first part of the questionnaire were identified as administrative (ADM), some nominal (gender, company size, position in the company), other ordinal (education and business operating time) and the remaining scalar (age, time management, number of employees). The variables of the second part of the questionnaire were identified as cognitive (CoGn). The points counting followed the inventory of Adaptation and Innovation -kai Kirton (1976), in Likert scale, given 1 point to "strongly disagree", 2 points for "partially disagree", 3 points for "indifferent" 4 points to "partially agree" and 5 points to "strongly agree". A score between 32 and 79 points classifies the respondent as far adapter, between 80 and 95 as an adapter, between 96 and 112, as an innovative and above 112 points, up to a maximum of 160 points, will be classified as innovative extreme. By the third part of the questionnaire, the variables were identified as strategic (EST). The 11 questions have four possible responses, each corresponding to a type of generic strategy adopted by the company, considering the identification of the dominant responses strategy made by counting each strategy. In case of a tie between the analytical strategies, prospectors and defensive, the company was rated as having analytical behavior; since the tie between any of the above strategies with the reactive strategy classified the company as reactive.

In the data analysis were used descriptive statistics techniques, including position measurements, which depict what is characteristic of the group; measures of dispersion, assessing how individuals are distributed in the group and; measures of association, to check the level of relationship between variables. Considering the length of the questionnaire, factor analysis was used to explore how a variable or variables related groups relative to others. We used SPSS software for statistical analysis.

4 RESULTS AND DISCUSSION

Almost half of the companies surveyed have between 1 and 8 years old, which, added to the companies with 9-16 years of experience, makes up 90% of the total. That means, the sector is composed predominantly of young companies, most established in a period of rapid growth in the construction sector, corresponding to the installation of plants Santo Antonio and Jirau Hydroelectric on the Wood River and perhaps even without having suffered any major crisis that requires strategic redirection. The average age of companies is 10,11 years and there are only two companies with 30 or more years. Adopting the criterion of SEBRAE and IBGE for size classification, more than half of the companies are micro or small and, according to the discretion of Law 123/2006, almost 80% of companies have this characteristic. As the proportion of medium-sized enterprises, according to the two classifications, we have: 1/3 according to the number of employees and 1/5 according to gross revenue. It appears from this information that is a sector that employs considerable number of employees in proportion to its billing. It is, therefore, a predominantly small business sector, since only two declared to be large and only seven employing over 100 employees.

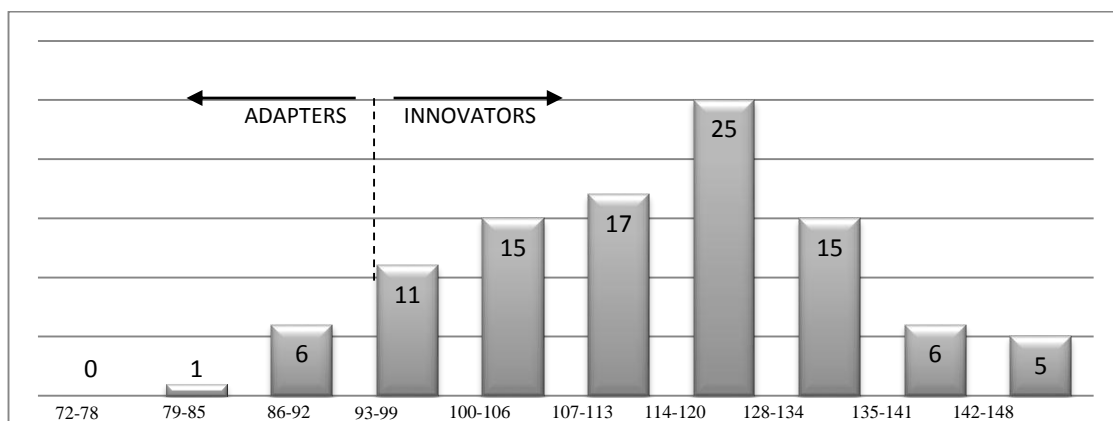
Similarly to what was observed in relation to the companies age, their managers are mostly young. Almost 70% of respondents have less than 40 years. The average age is verified 37,38 years and the mode is 37 years, and only three managers aged over 60 years.

The relationship between average company age and average time administrator ahead of the company indicated, respectively, 10.11 and 5.38 years, well below the 25 and 10 years observed in Gimenez research (2000). The studied companies are younger than those, but have a relatively larger structure on quantitative employees. It can be said that this is a regional characteristic of companies based in Porto Velho city, a new and fast growing market driven by the investments of recent large infrastructure works, which occupy a large amount of hand labor.

It is noticed the prevalence of male managers, with approximately 60% of the companies surveyed. However, the number of female managers is not insignificant and may indicate that even in a traditionally male sector, women's participation is on the rise. There is a clear concern in qualifying, when it is observed that more than 70% of managers are graduating, graduated or post-graduate.

Regarding the cognitive styles of managers, considering the binary classification where adapters hit by the search score below 96 points and innovative score above that instrument, it was found that 91.09% of managers are considered against 8.91% adapters, as shown in graph 1.

Graph 1 - Managers Cognitive Styles



Source: Elaborated by the authors.

The scores distribution of cognitive styles more often was the 114-120 points, with no researched with extreme adapter or innovative extreme style. The average score of the surveyed managers cognitive style was 112.84 points, median 114 points, 115 points mode and standard deviation of 13.088 points. As almost 80% of the studied companies are micro or small, this finding is consistent with the findings of Kirton (1976) to identify that, in large corporations the adapter behavior is valued, it implies minimization of risks, small businesses occurs the opposite.

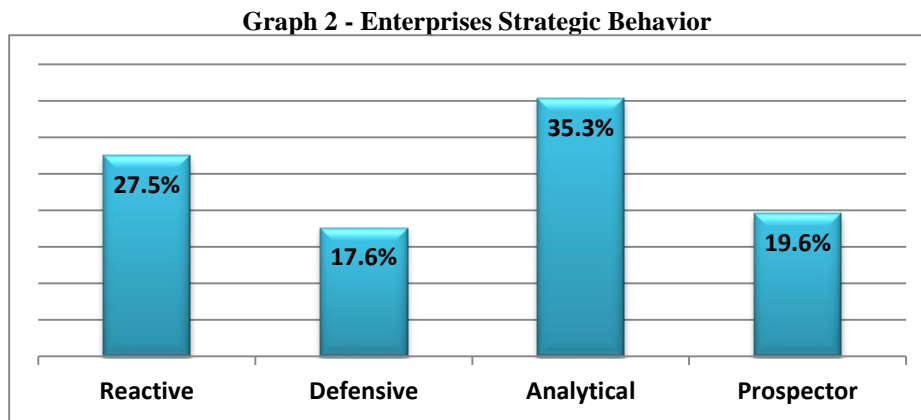
It was verified that the score for cognitive style of civil construction managers in Porto Velho city was above the average recorded by Kirton (1976), between 95 and 96 small business groups in England, as well as business managers in a shopping mal in Paraná city studied by Gimenez (2000) found that scores of 96.25. Moreover, one can infer that the average obtained in this research is higher than that obtained for general management in countries like the United Kingdom, United States, Italy, Canada, Australia and Singapore (95 to 97 points) and similar to that observed in the range of administrators of research and development projects in countries such as UK, USA and Canada (112 to 115 points) (Foxall, 1990).

Foxall demonstrated in his study that the various areas of expertise within the administration attract individuals with different cognitive styles, pointing differences in KAI score according to external degree orientation of the specialty, with lower scores for production managers and administrators in larger research projects and development. The findings of Foxall were confirmed, considering that the studied managers (average of 112.84 in KAI inventory) focus both operational decisions as strategic in small and midsize businesses. The fact of the score for management (female managers) is slightly larger is another interesting factor, for works such as Kirton (1976) and Gallen (1999) indicate that women tend to be more inclined to adapt than men. So this fact it is interpreted by the civil construction sector to be a traditionally male environment, attracting women with characteristics similar to those of men with regard to degree of innovation.

It was intended to verify if there is also a correlation between cognitive style and time management in the company, size, gender and age of managers, not obtaining significant values.

Regarding the companies strategic behavior, it was found that most present analytical strategic behavior, it means, characterized by the balance between prospectors and defensive strategies, and the second most found behavior is reactive, ie no defined strategy.

In graph 2 the results of the studied companies strategic behavior are presented.



Source: Elaborated by the authors.

For Miles and Snow (1978), the predominant strategic behavior characterizes companies where there is a balance between prospectors and defensive strategies, with companies seeking to minimize the risks without compromising the opportunities. As construction companies in Porto Velho are in many young companies, crave stability for their organizations, but without losing sight of the exploration of new opportunities, such as those created by the coming of large projects for the city.

The considerable occurrence of reactive strategies indicates that more than 1/4 of the companies react to environmental pressures only when forced. According to Miles and Snow, these organizations do not have alignment between strategy and structure, for three reasons: management fails to articulate the strategy; technology, structure and processes improperly tied to it; the administration adopts an inappropriate relationship between strategy and structure, environmental conditions.

Comparing this study with the results shown in Table 1, contact to both coincident discrepant results as found in previous studies.

Table 1 - Strategic Behavior Found in Three Previous studies

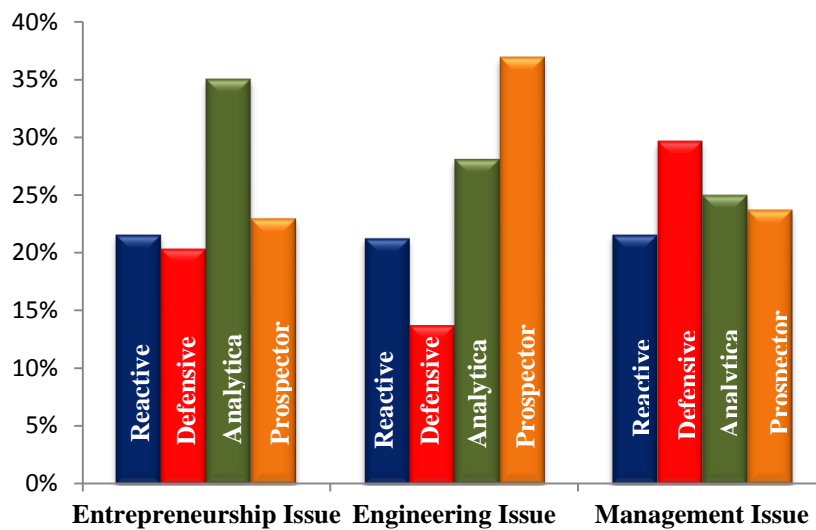
	Reactive (%)	Defensive (%)	Analytical (%)	Prospective (%)
Gimenez (1999)	22.40	44.80	14.90	17.70
Gomes (2004)	12.50	31.30	16.00	40.30
Brunaldi (2005)	7.79	28.57	44.16	19.48
Reis (2007)	33.00	15.00	23.00	28.00
Ribas (2007)	6.70	10.00	50.00	33.30

Source: Elaborated by the authors.

Less strategy found in this research is defensive. Comparing with results of other studies, this result would indicate a reduction of this type. This result may be due to the fact that the dynamism of markets is not strictly compatible with conservative strategies. Already the most common strategy found, analytic, is in line with the results of the work of Ribas and Brunaldi, and this last also addressed construction companies, which may indicate that this kind of strategic behavior is an industry characteristic. The result on prospective strategic behavior raised in this study is similar to the work results of Gimenez and Brunaldi. Regarding the results for reactive strategies, it appears that the high frequency resembles that found only by Reis, and in other studies, there was a downward trend of this type of strategy. It can be speculated that some environmental factor in the city of Porto Velho may be contributing to the incidence of strategic behavior of construction companies.

It was also sought to identify the distribution of types of strategic behavior in relation to areas of the adaptive cycle of Miles and Snow (1978) and the results are shown in graph 3.

Graph 3 - Strategic Behavior according to the Adaptive Cycle Problem



Source: Elaborated by the authors.

Regarding the entrepreneurial organizational adaptation problem, the predominant analytical strategic behavior, with other behaviors in similar proportion. Thus, it can be said that the studied organizations, there is a balance between monitoring the approach taken by competition. And caution in strategic decisions regarding the definition of product-market success posture, growth policy and environmental monitoring the owner manager. Regarding the engineering problem, predominant strategic behavior is the prospector, followed by analytical. This result, a phase of selection of production and distribution technology, is consistent with the technological training found in most construction managers, allowing it to be said that, with regard to the production aspect, the analyzed companies seeking to invest in innovation, technology, incrementalism and synergy. For Miles and Snow (2003), the administrative problem is essential in adaptive cycle, because consists to develop an organizational structure and a set of management procedures capable of coordinating the technology chosen and continue to provide innovation. The results indicate that, in this area, there is balance between strategic behavior, with a slight predominance of defensive behavior, which does not characterize the sector with a specific type in administrative problem.

Analysing the three problem is identified that the analytical strategic behavior is prevalent in construction companies in Porto Velho, is not reflected in all phases of the adaptive cycle. Being a general model of organizational behavior physiology, the three problems are directly connected and this imbalance seems to indicate that the studied companies are innovative in the technological aspect, but at the same time its strategic directions are cautious and are organized now steadily, sometimes innovative, sometimes cautious, sometimes random, generating little consistency in their behavior.

It was sought to determine the existence of relationship between cognitive styles and strategic behavior. It was found that most of prospector strategic behavior is developed by companies whose managers have innovative cognitive style, it means, with scores above 96 in KAI inventory. Likewise, no reactive strategic behavior in both bands with higher scores for cognitive style, it means, above 135 points. The correlation between these variables was irrelevant, with $r = 0.129$ and significance $p < 0.1$.

Based on Gimenez (2000), was expected to find that managers with cognitive style adapter develop in their organizations a defensive strategic behavior and managers with innovative cognitive style prospectors develop strategic behavior. However, ruling with a higher score for cognitive style, participating companies with strategic defensive behavior opposite to that intended. Gimenez (2000) reports that perhaps result of this nature may be due to environmental turbulence degree, becoming an important variable in the generic strategy of organizations; this aspect was not considered in this study. Milliken (1987) defines environmental turbulence as a period of uncertainty and unpredictability, which in the sample can be characterized as the expectation of completion of some major projects, coupled with the uncertainty that the sector will continue as accelerated, leading to uncertainty about the relationship with competition, access to suppliers, customers availability, etc.

Significant correlation was contacted (coefficient 0.52) between strategic behavior and cognitive style in medium-sized enterprises (coefficient 0.42), now with more than eight years of operation and companies with managers

with degree of incomplete higher education (coefficient 0.53). On the first point, it is important to note that medium-sized company merges characteristics of small and large companies. On civil construction case, usually the owner is the main manager or member of a board, small business features, but on the other hand, the largest number of employees provides a more robust the organization structure, providing more professional and more efficient control competition. In relation to companies with more than eight years of operation can be said they correspond to a natural selection of companies with more structured strategies, due to greater consistency between cognitive style manager and strategic behavior of the same. With respect to the variable level of education, the correlation found may indicate that these professionals while they are studying, seeking greater consistency in their strategic behavior, aligning their way of solving favorite problems (KIRTON, 1976) to the strategic direction of the organization.

The attribute set on cognitive profile (32 items) managers is extensive, making it difficult to survey because of resistance to answer long instrument. An alternative is to check the possibility of using a smaller number of factors without losing significant information. So was taken the factor analysis to explore this issue. For the sample of 94 construction, the coefficient of the sample Cronbach's Alpha test is 0.805, which indicated the value of the sample reliability and allowed the realization of factor analysis. On the other hand, the Kaiser-Meyer-Olkin (KMO) and Bartlett sphericity indicated existence of a correlation significance 0.764 and 0.000, respectively, which indicated a correlation among the variables that compose the data set. Considering the higher minimum acceptable KMO test than 0.72, the analysis identified 5 components, accounting for 61.133% of total variance explained, as table 2.

Table 2 - Identified Factors and Components

Attributed Name to Factor	Components	% Explained variance
Innovation	<ul style="list-style-type: none"> • Normally I risk doing new things differently • I need the frequent change stimulus • I am methodical and systematic • Conform myself easily 	26.82%
<u>Self-reliance</u>	<ul style="list-style-type: none"> • I have many different ideas and usually share them • I have original ideas • I worry about small details, I am meticulous and specifier 	11.13%
Authoritarianism	<ul style="list-style-type: none"> • Give direct orders in situations that are under control • Prefer colleagues who do not disagree with my views 	8.32%
Prudence	<ul style="list-style-type: none"> • I am prudent when I'm dealing with authorities • I can maintain a disagreement position against the group • I prefer to work on one problem at a time 	7.86%
Multitask	<ul style="list-style-type: none"> • I can work with several new ideas at the same time • I have new perspectives to old problems • I like bosses and work patterns that are consistent 	6.99%

Source: Elaborated by the authors.

With exploratory, the managers sample was stratified into two groups: high school and incomplete higher (41 individuals) and; complete higher education (53), to check for significant differences in the correlations between variables. The factor analysis made it possible to identify the existence of three-dimensional attributes in the relationship between cognitive style and strategic behavior among managers who have high school or incomplete higher, including 10 variables, whereas among managers with higher education was possible to include 17 variables, and these grouped into 5 main components. It was found that 4 of 10 variables belonging to the array of main components of managers with medium or incomplete higher education do not make up the main factors for managers with higher education ("I have original ideas," "I prefer that changes occur gradually," "I like to vary routines already established "," deal with all the careful way of details "). In addition, some variables disagree within the components in the medium stratum and incomplete higher education, such as "I have original ideas", the component 1, "is methodical and systematic" and "prefer that changes occur gradually," the component 2 and "I deal with all the careful way of details," the component 3. These results indicate the need to seriously consider the improvement of the collection instrument taking into account the level of managers education.

5 FINAL REMARKS

Historically late and little agile in its evolution, the construction sector is undergoing rapid growth, a result of economic stability and government incentive programs in the last decade. This reflects the large number of young companies with less than 16 years of operation. The proportion of small and medium between the construction

companies of the city of Porto Velho is similar to that found in the rest of the country: almost 80% of construction companies operating in Porto Velho have this characteristic, similar to the national reality, 81, 05% of all active companies, as RAIS 2011.

The survey results indicate that respondents have a profile strongly oriented to innovation, as indicated by the average score of 112.84 obtained in KAI inventory. Thus, it can be said that the sector's managers have an attitude characterized by creativity, challenge the rules and preference for unstructured situations, an appropriate situation to a new, busy and turbulent market like construction installed in Porto Velho. This finding is consistent with previous studies in companies with engineers managers, justified by the large proportion of these professionals among owner-managers in construction companies studied.

The study showed the feasibility of applying the model proposed by Miles and Snow in search of strategic choices adopted by corporate managers. It was found that the four strategic types proposed in the model (prospector, analytical, defensive and reactive) are present, predominantly the analytical strategic behavior, followed by reactive, with other companies in similar amounts distributed between prospectors and defensive behavior. The results are close to those obtained by previous study and are consistent with the demographics of the population, composed of young companies, without a forceful strategic direction, but alert to changes in the competitive landscape.

A slight correlation was found between the variable "main respondent administrator" and the strategic behavior of the company, which is in agreement with the predicted by theory - that the company's strategic behavior is influenced by personal characteristics of the main manager. The study found some correlation between operating time of the company and strategic behavior, which can be explained by the fact that the oldest companies in the market, by time and experience, could structure more consistently their strategies. This fact is confirmed by the absence of reactive behavior in companies with more than 25 years of operation and by the predominance of analytical and reactive strategies in young companies.

In the quest for understanding the relationship between strategic behavior of civil construction companies in Porto Velho and cognitive style of its managers, there was initially irrelevant correlation between these variables, indicating that both the managers with cognitive style adapter and leaders with cognitive style innovative not make use of a specific strategy.

In seeking to understand the role of demographic variables in the relationship between cognitive style and strategic behavior, there was significant correlation of the results of KAI in the strata with medium-sized company, female administrator, a company with more than eight years of operation and higher education incomplete manager. The fact that the score of cognitive style from female managers be slightly larger than the males and the weak correlation between cognitive style and strategic behavior in the first group is another interesting factor, for works such as Kirton (1976) and Gallen (1999) indicate that women tend to be more inclined to adapt than men. So, it is interpreted this fact by the construction sector be a traditionally male environment, attracting women with characteristics similar to those of men with regard to degree of innovation. Regarding the age of the operation of the companies, it was found that the most long-lived companies, with more than eight years of operation, there is a significant correlation between cognitive style and strategic behavior. It appears from this finding that in young companies, strategies are poorly structured, tacit, and as long as the organization will become experienced, develops mechanisms that keep greater identity to the preferences of the manager. Within the context studied, means that companies with higher correlation between cognitive style and strategic behavior are those created prior to acceleration of the sector provided by large infrastructure projects in the city, so more traditional in the region.

The working hypothesis was, therefore, partially confirmed, since the cognitive style of civil construction companies managers in Porto Velho has influence on the strategic behavior of these companies. Regarding the research hypotheses:

- The hypothesis I, about the predominant cognitive style of managers and strategic behavior adopted by construction companies in Porto Velho city, was partially support as identified despite being innovative cognitive style, the strategic behavior is predominantly analytical and not prospector.
- The hypothesis II was corroborated, as the average score in KAI indicates that the predominant cognitive style is innovative, with consistency with studies by Foxall (1990) and Gimenez (2000) concerning the cognitive style of engineers managers.
- About hypothesis III, was partially support as in more turbulent environments, as Porto Velho, it was hoped to identify a prospector strategic behavior and an innovative cognitive style, but the predominant strategic behavior was the analytical and cognitive style was confirmed innovative.

From the methodology developed in this work and the conclusions reached, it is suggested for future work: 1) Inclusion of other demographic variables on the instrument, and in which course the manager is formed, main types of activity in construction, existence of contracts subcontracting, etc. These variables allow to characterize better the organization, and other correlations and identify those surveyed managers are engineers; another possibility for future research lies in thorough research on a sample of companies with the lowest correlation between cognitive style and strategic behavior. In these companies, interviews could be carried out in order to unravel the subtleties KAI inventory could not capture the relationship between cognitive style and strategic behavior. This step could also resolve any questions regarding the respondent be the main manager of the company; 2) considering that strategic behavior is an ongoing process, another possibility is the application of an instrument to assess how strategic decisions were made in the past, since the survey describes just a moment, based on the final results of the strategy and; the adopted collection instrument was composed of questions developed for decades, reflecting another time and other contexts. So it seems important to develop and test new instrument.

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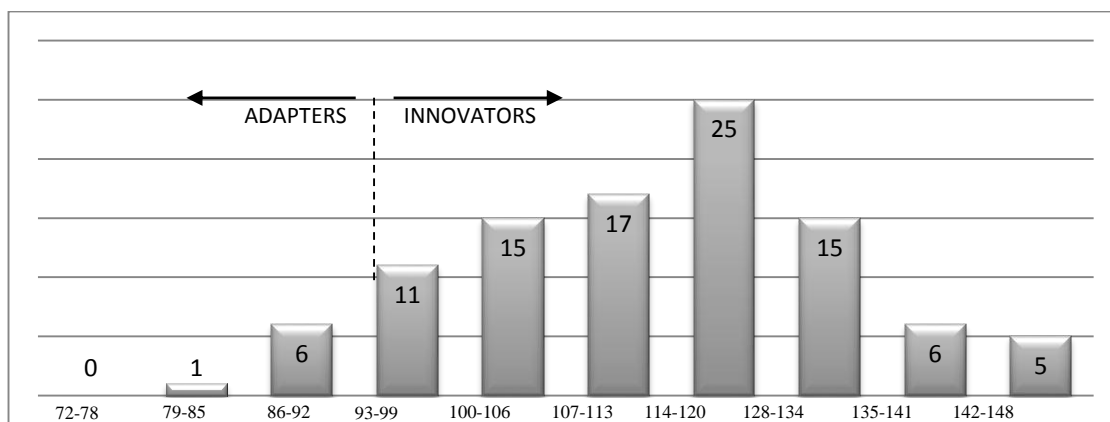
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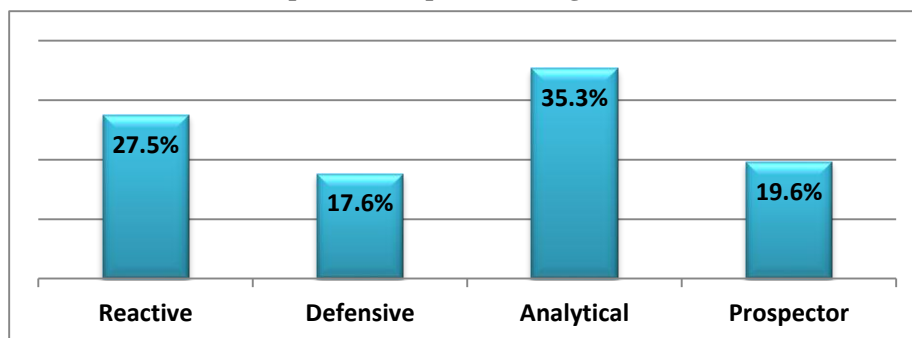
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Graph 1 - Managers Cognitive Styles



Source: Elaborated by the authors.

Graph 2 - Enterprises Strategic Behavior



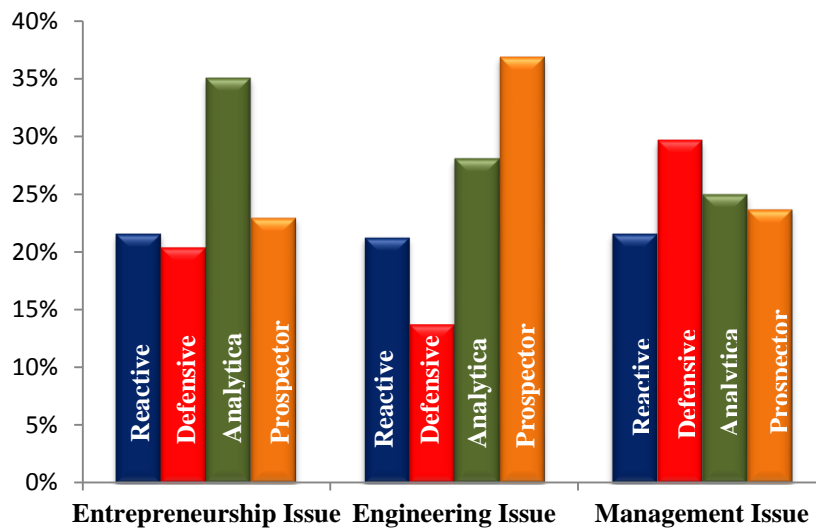
Source: Elaborated by the authors.

Table 1 - Strategic Behavior Found in Three Previous studies

	Reactive (%)	Defensive (%)	Analytical (%)	Prospective (%)
Gimenez (1999)	22.40	44.80	14.90	17.70
Gomes (2004)	12.50	31.30	16.00	40.30
Brunaldi (2005)	7.79	28.57	44.16	19.48
Reis (2007)	33.00	15.00	23.00	28.00
Ribas (2007)	6.70	10.00	50.00	33.30

Source: Elaborated by the authors.

Graph 3 - Strategic Behavior according to the Adaptive Cycle Problem



Source: Elaborated by the authors.

Table 2 - Identified Factors and Components

Attributed Name to Factor	Components	% Explained variance
Innovation	<ul style="list-style-type: none"> Normally I risk doing new things differently I need the frequent change stimulus I am methodical and systematic Conform myself easily 	26.82%
Self-reliance	<ul style="list-style-type: none"> I have many different ideas and usually share them I have original ideas I worry about small details, I am meticulous and specifier 	11.13%
Authoritarianism	<ul style="list-style-type: none"> Give direct orders in situations that are under control Prefer colleagues who do not disagree with my views 	8.32%
Prudence	<ul style="list-style-type: none"> I am prudent when I'm dealing with authorities I can maintain a disagreement position against the group I prefer to work on one problem at a time 	7.86%
Multitask	<ul style="list-style-type: none"> I can work with several new ideas at the same time I have new perspectives to old problems I like bosses and work patterns that are consistent 	6.99%

Source: Elaborated by the authors.