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INVESTMENT CAPITAL BUDGET METHOD ORIENTED TO PROJECT MANAGEMENT

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Abstract

This paper proposes a method of managing the investment capital budget, using the principles of the Design Science Research methodology, which adapts budgetary management practices and increases synergy with project management, by adjusting the allocation of resources to the constraints and operational risks of business processes. As a result, it encourages flexibility to deal with unforeseen situations, focus on the strategic perspective, speed of budget management, cost-effective budgeting, value added to the enterprise, and encouragement for collaboration. The method was tested and analyzed in the present study. Recommendations for future research and development of the same complete the present work.

Keywords: Budget, Investment, Capital, Project Management, Process Management.

1.Introduction

This work aimed at presenting an investment capital budget management method, applied to project management.

One of the problems of traditional budget management is that it is considered unfeasible to estimate revenues, expenses and investments realistically. (Lorini and Angonese, 2013; Welsch, Hilton and Gordon, 1988). When estimating these resources for the corporate budget, managers tend to overestimate the amount to be spent or to be earned, aware that the final compatibility of the budget made by budget governance will tend to reduce these values (Welsch G. A., 1983).

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Another identifiable problem is that the budget process does not encourage people to perform business, but rather to perform the budget (Fischer, 2002; Jensen, 2001). According to Hope and Fraser (2003), the logic of managers tends to be "I have to spend so as not to lose the money next year". This can lead to waste of resources that could be better used by budget management in other investments.

The present work has as object of study the misalignment between budget management and process management. In this sense, an appropriate Investment Capital Budget Management method is proposed for the management of companies in the current context of business environments.

2. Theoretical framework

According to Sá and Moraes (2005), who defined the budget as a quantitative and formal expression of the company's management plans. It is, as they claim, the strategic planning of the company translated into numbers. Lunkes (2000) states that, in a scenario of generalized resource restriction, the prior definition of expenses and investments avoids disorderly expenditures without criteria, thus ensuring the most efficient use of these resources. Past body of research points to criticism of traditional budget management, as consolidated in Table 1, below:

Table 1
Past works on budget management model

Authors	Criticism	Need to be met
Oliveira, Perez Jr; Silva, 2005; Sanvicente; Santos, 2000	The data contained in the budget are estimated, subject, therefore to errors according to the sophistication of the estimation process and the uncertainty inherent in the branch in which the company operates.	Adaptability to unpredictability
Oliveira, Perez Jr; Silva, 2005; Sanvicente; Santos, 2000; Hope And Fraser, 2003	The cost of the system grows as sophistication increases in your process. It is necessary to establish a point where the budget system has an advantage in the cost-benefit ratio.	Economics of the Budget Process
Oliveira, Perez Jr; Silva, 2005	The budget should not take the place of the Administration. It should be an instrument to support decision-making and should not replace the flexibility, creativity and common sense of managers.	Support for proactive day-to-day decision-making
Fischer, 2002; Jensen, 2001	It does not encourage business performance in people, but rather budget performance.	
Lorini, New York; Angonese, 2013; Welsch, Hilton; Gordon, 1988	It is not feasible to estimate revenues and expenses realistically.	Effectiveness of Forecasting Required Revenues and Resources
Welsch, 1983	There is a tendency to be avoided from "cooking" the budget (e.g. underestimating sales, overestimating expenses or soliciting more funds than necessary)	
Hope, Hope, Hope, Hope Fraser, 2003; Jensen, 2001	The budget process can encourage an unethical behavior of managers, where they are encouraged to depreciate objectives and overvalue results.	
Lorini, New York; Angonese, 2013; Welsch, Hilton; Gordon, 1988	Budget process takes away the flexibility of managers, leaving them often cast in certain situations.	Flexibility to deal with unforeseen situations

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Fischer, 2002	Budget is a waste of time since we stop planning the future to discuss the past (budget monitoring).	Focus on strategic perspective
Hope, Hope, Hope, Hope Fraser, 2003	The budget process is disconnected from the competitive and economic information environment.	
Fischer, 2002; Hope, Hope, Hope, Hope Fraser, 2003; Jensen, 2001	Budget review takes time and organizations can't manage it quickly.	Speed of Budget Management.
Hope, Hope, Hope, Hope Fraser, 2003	The logic of managers tends to be "I have to spend not to lose the money next year"	Economicity in the use of budgetary resources
Hope, Hope, Hope, Hope Fraser, 2003; Jensen, 2001	The budget process provides little value to the organization.	Adding value to the company
Jensen, 2001	It turns co-workers into competitors, creating mistrust and ill will, especially when rewards are tied to achieving budget goals.	Stimulating Collaboration

Ionesko (2001) has classified budget systems into two types according to their breadth: Operating or short-term budget, which involves the entire company's operations plan, with breakdown of revenues, expenses and costs and Capital Budget, or investment, or strategic, long-term, which exposes investment alternatives to deploy or expand its production capacity and/or commercialization.

In reaction to the criticisms made to the classic budget, several proposals for change in budget management can be seen in the literature, such as Continuous Budget, Activity-based Budget (ABB), Beyond Budgeting (BB) and Zero-Base Budgeting (ZBB). (Lopes & Blaschek, 2005; Lopes & Blaschek, 2005; Lopes & Blaschek, 2005; Fitzpatrick & Hawke, 2015) In any budget management approach, there is a concern about making investments obtaining economic viability. In the budget execution phase, there is still the possibility of organizing the investment through projects.

According to the PMBOK, a Project is a temporary effort, with progressive elaboration, carried out to create a product, service or unique result. Mendes (2006) defines Project Management as the art of meeting or exceeding expectations and needs related to a project. (Project Management Institute, 2013)

Artifacts can be classified as constructs, models, instantiations or (Dresch, Lacerda, & Junior, 2015) methods, hereinafter referred to only as Method in the present work.

Organizations need business methods that are adequate to the management needed to operate in unstable markets. Finally, Goldratt (1997) developed a project management approach called Critical Chain, suitable for implementing projects in an unstable business environment. Table 2 illustrates the proposed changes, as follows:

Table 2
The Critical Current Method of Project Management

Aspect	Project Management adopting the Critical Current
Organizational behavior	The human resources involved in the project are oriented to establish realistic weather forecasting (50 percent chance of success) and pessimistic forecasting (90 percent chance of success). The consolidated of projects receives a contingency according to statistical criteria on the variations between the proposed realistic and pessimistic forecasts. Instead of simple tasks with capacity lungs, the project receives a consolidated

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	time lung. This lung is calculated using statistical criteria on optimistic and pessimistic estimates.
Management Practice	In the application of The Critical Current, there is a cooperative effort to combine time estimates of the project team with the expectations and objectives of the organization. The lungs of the project allow Corporate Management to understand estimates as intervals rather than a fixed point. Adjusting the size of the time lungs in a participatory manner allows a better understanding of the company's risk appetite for each project
Run	The method adopts an activity prioritization scheme that prevents attention span from being dictated by internal policy. Teams are encouraged for delivery tasks, if possible, on optimistic dates. There is incentive to deliver the projects before the complete consumption of the lung of the project.
Resource Allocation	Resources shared across multiple projects are allocated according to criteria that assess the impact on the managed project pool. Few strategic resources are allocated using the relative priority of each project. Only the most common resources are managed within individual projects.
Resource Contingency	The method adopts resource contingency in the form of statistically calculated lungs. Each project has lungs of time and money that help deal with contingency changes in the project schedule.
Forecast Review	Project goals are defined in ranges of intervals (e.g. cost and time lungs). Therefore, not all deviations require corrective action (in addition to lung consumption). Even some level of important deviations can happen without compromise with scope or the expected cost and time intervals. However, any change in realistic projection, for more or less time resources, has to be reported to the General Project Management, which will perform the impact analysis and change the volume of the lungs.

Goldratt (1990) also studied enterprise systems and concluded that the performance limitation of an entire organization lies in enterprise constraints. Thus, restrictions can be operational or management, related to organizational policies and culture. To identify constraints in an organization, you must understand how the organization works as a system. In the business sphere, the operation of the company is the vision of business processes. According to Hammer and Champy (1993), business processes are sets of activities that create results (products and services) whose value is perceived by interest groups (Stakeholders).

3. Methodology

The present study followed Design Science Research (DSR) as a research method, also known as Constructive Research, which consists of building methods that can bring benefits to people and society. The DSR that handles problem classes. Dresch et al. (2015) define classes of problems as the organization of a set of practical or theoretical problems that contain useful (Van Aken, 2004) methods for action in organizations. In this study, the class of problem is the management of capital budget to support project management.

DSR can sustain the development and construction of methods and contribute to strengthening the existing knowledge base. The elements of induction to the proposed method by the DSR are the observation of phenomena, generalization of the relationship between phenomena and discovery of the relationship between them. (Lakatos & Marconi, 2003).

DSR method steps' are: (a) identification of the problem; (b) awareness of the problem; (c) systematic review of the literature; (d) identification of artifacts and configuration of class of problems; (e) proposition of artfacts to solve the problem; (f) selected artifact design; (g) development of the artifact (method); (h) evaluation of the artifact (method) and (i) explanation of learning .(Dresch, Lacerda, & Junior, 2015)

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4. Identification of Artifacts (Methods) and Configuration of Problem Classes

To impose the rigor of research in this work, this section presents the understanding of the problems that affect the functioning and the relationship between Budget Management and Project Management. According to Goldratt (1990), managers "do not want estimates, they want a response with precision and accuracy of future results". But in unstable business environments, sales forecasts fail, production capacity is reduced by machine breakdown, customers change their minds, suppliers are unreliable, management can be undisciplined, and labor can present competency problems. The impact of deterministic decisions in the short term on the overall outcome of the organization is reduced. However, the Budgetary Management methods do not present a probabilistic approach as observed in the proposition of the critical current method as a means of improving project management in an unstable business environment. The Theoretical Framework, classes of problems, is detailed in the following Table 3:

Table 3
Methods s used in Project Management and Budget Management

Problem Class	**Problem**	**Usable** Method
Efficient Long-Term Resource Spend	How to efficiently spend resources for increased sales or operational improvement in the Long Term but where the instability of the business environment is not adequately accepted and the adoption of a deterministic approach is sought.	Project Management
Efficient Spending of Long-Term Resources on the Organization in Unstable Business Environments	How to implement projects in discontinuous environments where it is accepted that goals and constraints change more frequently and means are structured to deal with variability.	Critical Current Method
Operational Budget Management	How to properly allocate resources **in the short term** with reduced impact on business results but where the instability of the business environment is not adequately accepted and the adoption of a deterministic approach is sought.	Traditional Operating Budget Beyond Budgeting (BBO) Continuous BudgetActivity-Based Budget (ABB) Zero-Base Budgeting (ZBB)
Investment Capital Budget Management	How to manage Investment Capital Budgeting in discontinuous environments where it is accepted that goals and constraints change more frequently and means are structured to deal with variability.	No method was found directly related for this purpose. A specific medium should be proposed.

5. Purpose solution of the method for solving the problem

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Budget Management and Project Management should be more related to properly manage the release of investment funds and their use through projects. The relationship between strategic planning and the structuring of project portfolios is recognized by PMI (Project Management Institute, 2006)

The conventional approach for conventional budget management of investment capital and conventional project management in companies use similar inadequate approaches in view of the principles of efficient companies, illustrated in Table 4, as follows:

Table 4
Similar inappropriate practices in Investment Capital Budget Management and Project Management

Aspect	Capital Budget Management and Conventional Project Management
Organizational behavior	Responsible resources (Budget) / human resources (Project) tend their estimates of time in order to ensure future availability of time, avoiding the effect of any cuts established by the company.
Management Practice	Those responsible forthe Budget/ for the projects play a zero-sum game with the internal areas/execution teams. Since these teams are aware of the high probability of cuts in the execution and forecasting phase, usually without any adjustment of their goals, their managers tend to inflate their needs forecasts. There is little or no cooperation between the areas in the forecasting phase of their projects.
Run	Managers are punished for overspending and budget underutilization. The non-use of budget is viewed in a negative and often punished way. Project managers work on many activities outside the project. They tend to have "student syndrome" where spending/project efforts are initially slows and increases closer to the deadline.
Forecast Review	Project Management tends to overestimate the importance of complying with cost constraints, even if it means not achieving the objectives that were the reason for the creation of the project. Budget management/ project planning requires continuous review and adjustment. Any deviation tends to generate a requirement for corrective actions. Major deviations force changes in scope, costs, and/or activity times

In order to deal with inadequate practices in projects, the Critical Current method was proposed (Goldratt, 1997). But comparing the logic of Budget Management with that of Project Management, an important distinction between the themes is the dependence between the execution events. Project Management can define the interdependence of critical activities of each project (critical path and critical current). In this way, project management is characterized as a management effort of dependent variables (project activities), according to Mendes (2006).

Although in budget management, departmental forecasts of investment capital needs are not directly related to each other and represent the search for resource allocation of independent efforts oriented to strategic and local goals of areas of the company. Even when the central administration strives to prioritize investments, the organization is not seen as a system of interconnected activities and information processing, as proposed by Morgan (1996), tending the focus to be the improvement of each area, assuming that this will generate improvements in the system. This approach characterizes budget management as an effort to manage independent

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variables (departmental budgets) as revealed by Goldratt (1990). The following section presents the design of the proposed method.

6. Proposed Method

The method proposed in this work considers the budget management of capital of an organization in a systematic inspired by the critical current approach applied to projects. For this, we have to seek an approach that considers the organization where investments are made as a system of dependent variables, as illustrated in the following Figure 1:

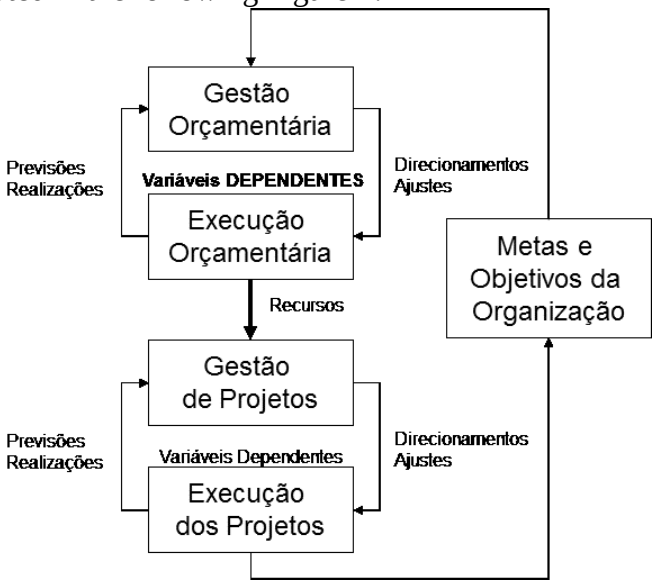

Figure 1 capital budget management and project management framework

Goldratt (1990) stated that the limitation of a system lies in its business constraints. One can use the organizational activity value chain view as a means of identifying current or probable constraints (risks) that can affect the performance of your entire organization. This condition baled the main strategy used for the design of the method, which was to consider the management of investment capital in a management of dependent variables if the resources are applied in prioritized projects based on the constraints and risks of the organization identified in its value chain. Properly applicating this strategy, the method of creating project management contingency lungs can be used to create lung contingency resources for the investment capital budget.

The method proposed in this work will be considered as "Critical Capital Investment Budget" (OCIC) / "Critical Capital Investment Budget" (CCIB), in reference to the Critical Current method, as detailed in Table 5:

Table 5
Transposition of the conventional budget management model to attributes of the "Critical Current" method.

Aspect	OCIC / CCIB
Organizational behavior	With each investment forecast, managers start generating two estimates for the action: an optimistic one (with a 50 percent chance of success) and a pessimistic forecast (with a 100 percent chance of success). The consolidated budget receives a contingency

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	calculated on the basis of statistical criteria. Instead of each simple investment action having a slack of resources, the capital budget receives a consolidated resource lung for all stocks. This lung is calculated using statistical criteria on optimistic and pessimistic estimates.
Management Practice	At OCIC/CCIB, there is a cooperative effort to combine organizational managers' investment estimates with the organization's expectations and objectives. The capital budget lung allows Corporate Management to understand estimates as intervals rather than a fixed point. The adjustment of the size of the lungs of resources in a participatory way allows a better understanding of the risk appetite of the company for each investment.
Run	The method adopts a prioritization scheme of activities where investments will be made based on **constraints** and **risks** of the organizational system. This prevents attention span from being dictated by internal policy. Teams are encouraged for delivery tasks, if possible, on optimistic dates. There is incentive to deliver the results of the actions before the full consumption of the budget lung.
Resource Contingency	The method adopts resource contingency in the form of statistically calculated lungs. Each project has lungs of investment financial resources that help deal with contingency changes in investment implementation projects.
Forecast Review	Budget targets are defined in rangeranges (e.g. investment lungs). Therefore, not all deviations require corrective action (in addition to lung consumption). Even some level of important deviations can happen without compromise with scope or the expected cost and time intervals. However, any change in realistic projection, for more or less investment resources, has to be reported to Budget Management, which will do the impact analysis and change the volume of the lung of resources for capital investment.

For the full integration of Investment Capital Budget and Project Management by the OCIC/CCIB approach, it will be important that all capital investment be organized on the basis of projects that act on operational constraints and risks. The OCIC/CCIB method acts on the problems studied (Table 1) by meeting the needs to be met by a new budget model (Table 6), as follows:

Table 6
Forms of OCIC /CCIB service to the needs to improve the budget process

Need to be met by a new budget model	**How to meet the needs by the OCIC / CCIB**
Flexibility to deal with unforeseen situations	The lung of resources for capital investment is a means of generating great flexibility in budget management in the face of unforeseen situations.
Focus on strategic perspective	The estimates of investments of managers are made based on the expectations and objectives of the organization generated in the current strategic orientation.

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	Strategic planning is the source of strategic actions that always seek to understand the organization's restrictions and risks that affect its competitiveness.
Speed of Budget Management	The OCIC/CCIB model has to be simpler to manage when it comes to investment capital. The number of projects invested tends to be smaller because they are more critical. And the monitoring of achieving the budget target becomes more efficient with the adoption of project management.
Economicity in the use of budgetary resources	Certainly, stimulating the economicity of resources given to managers opens up good possibilities for the good use of budgetary resources. And the structuring of the projects that spend these resources tends to generate more efficiency in their use. The focus of managers will be on achieving objectives with the generation of savings in order to return resources to the capital budget lung.
Adding value to the company	Organizations that have strategic management, budget management, project management and efficient and integrated process management tend to achieve greater competitiveness in their markets. And the information provided by these administrations makes the organization more transparent and valued by shareholders and investors in companies.
Stimulating Collaboration	The OCIC/CCIB model will only succeed with the commitment and collaboration of managers. In the search for better management of investment capital resources will stimulate the participation of managers in collaborative decision making. And equating constraints and risks tends to generate projects that involve several areas of the organization, generating more collaboration.

6.1 *Calculation of the Investment Capital Budget Lung*

Best management practices show that the allocation of capital for investments in the company's budget must be strongly linked to strategic planning. The actions are later implemented in projects and programs through Project Management, contributing to the correct application of resources.(Samuel, 2005)(Mendes, 2006)

However, at the time of the traditional annual budget forecast, an accurate list of projects to run is not available. This is a situation very similar to the problems faced in project management. It is therefore natural to adapt the successful "critical current" approach to budget management.

In the OCIC/CCIB, the capital budget is translated into a conservative forecast and a contingency lung budget. This lung can be called a buffer or pool. For its calculation, each area should provide the most conservative forecast and its pessimistic capital investment forecast, as shown in Figure 3, as follows:

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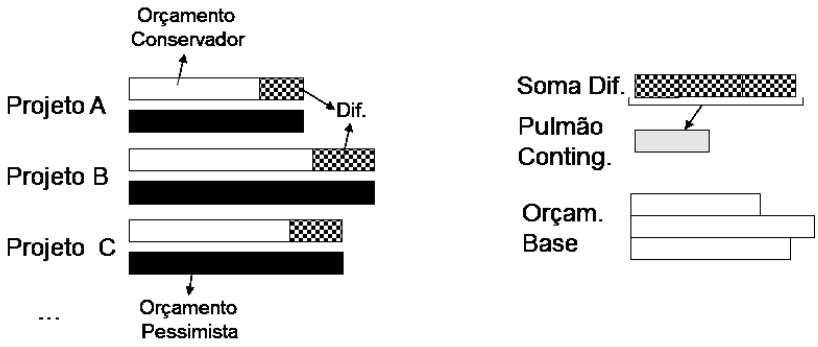

Figure 3 - Calculation of investment capital and base budget contingency lung

In order to calculate the contingency lung of the project, Mendes (2006) used the approach suggested by LEACH (2014), used in other project management techniques such as PERT. Its logic lies in the fact that the time used by activities are, in practice, greater or shorter than expected.

If the OICC/CCIB is used the same calculation can be adopted for the estimation of the contingency lung of the capital budget. Therefore, the constructs of the Critical Current for OICC / CCIB, the pessimistic budget (PP – *Pessimist Budget Prevision)* refers to a conservative forecast that the project manager attributes to the budget of his project, provides comfort for its implementation. A realistic budget proposal (AP – *Average Bugdet Prevision)* for a project should be requested from responsible managers. This estimate is cumbersome, but possible, if realistic expectations are applied to project stages, as recommended by Goldratt.

Regarding the investment definitions obtained in detail in the structuring of projects, we assume that the variations will follow a Gaussian probability function. The behavior of this curve is entirely determined by two parameters: its mean or expectation and its standard deviation. If these two values are known, we can calculate the probability that the actual cost will be less than a certain value. Good statistical practice guides that the proposal of the Average Budget is as the average estimates with probability of 50 percent occurrence and the Pessimistic Budget as approximately the value that represents 95 percent probability of accomplishment of the project.

The central limit theorem states that, under certain conditions, the total investment probability curve will be roughly distributed normally, regardless of the underlying distribution of resources in projects. In addition, the average of this total expense will be the sum of the averages of each project and the variation of this total expenditure will be the sum of the variance of each project. Variance is just the square of the standard deviation.

Applying-se this approach to calculating the capital budget lung, the following formula will be adopted:

$$\boldsymbol{BCapB = \Sigma\,[AP]}$$

$$\boldsymbol{BCP} = 3 \times \sqrt{\sum_{i=1}^{n}\left(\frac{\left[PP_i - AP_i\right]}{2}\right)^2}$$ 99 percent occurrence

$$\boldsymbol{TCB = BCapB + BCP}$$

Where:

TCB (*Total Capital Budget*) = Total Capital Budget.

BCB (*Contingency Budget Buffer*) = Capital Budget Contingency Lung.

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PP *(Pessimistic Budget Prevision)* = Pessimistic Budget for the project (with a 95 percent chance of occurring).

AP (Average Budget Prevision) = Optimistic Budget for the project (with 50 percent chance of occurrence), representing the realistic conservative budget

BCapB (*Base Capital budget*) = Capital Base Budget

With each review of the necessary investments, it is necessary to verify variations in expenses more or less in the project that carries out the budget execution. With the approval of variations by Budget Management, the capital contingency lung is reduced or increased. This practice, confirmed in project management by the adoption of the "critical current", will increase the probability of achieving the objectives, while at the same time that it will make activities more flexible, according to the unpredictability inherent to the current business environment. The following section presents the development of the method.

7. Method development

In the proposal of investment capital budget, the heuristic derived from this work for the construction of the OCIC / CCIB**Erro! Fonte de referência não encontrada.**), considering the necessary situation and deliverables of the budget process, as depicted in Table 7:

Table 7
Proposed steps for the OCIC / CCIB

Step	**Situation required**	**Deliverable**
Strategic Planning	For the corporate budget to be oriented to objectives and actions of high relevance to achieve these, it is necessary that the strategic planning of the corporation be elaborated.	Corporate Objectives Strategic Action Plan
Strategic Impact Analysis in the corporation's business processes	Strategic actions and business objectives will require changes in the systemic model of the organization under analysis. Thus, it is necessary that all business processes are reevaluated in order to be compatible with the defined strategic benchmarks.	With regard to the current strategy, the: Current Process Lag Identification Diagnosis of Operational Restrictions of Current Processes to meet strategic references Operational Action Plan for compatibility of current processes Operational Risk Map that threaten the achievement of strategic objectives through business processes
Project Definition	Based on the strategic actions defined in strategic planning and operational tactical actions defined on the lags of current processes, the organization can consolidate projects, programs or portfolio of projects	List of Projects for the implementation of the necessary actions defined Term of opening of Projects, Programs and Portfolio.

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	necessary for the realization of the necessary actions identified.	
Project Prioritization	Having available the list of projects, programs and project portfolio, the organization should evaluate the priority of the realization of projects in view of the organizational constraints verified and the operational risks to be faced by the company.	Prioritized list of business projects
Totalization of The Capital Budget based on Projects	For projects defined in a simplified way but organized around constraints and risks, the organization should detail the most priority projects in the 10 areas of project management knowledge. With regard to the cost of the project, the realistic budget and the pessimist based on the best available technical information should be created. The cost of the set of projects and implementation stages that are planned for the next budget period should be totaled and the capital budget lung required for the period is estimated.	Total capital investment budget for the realization of prioritized projects
Definition of the OCIC / CCIB	With the available data of the monthly budget of capital investment in projects and the calculated budget lung, the budget proposal must go through the evaluation of the senior management for its homologation.	Approved Corporate Investment Capital Budget
OCIC Review / CCIB	With the progress of coordinated project management in the company and the monitoring of the expenditures realized and the results of the projects, adjustments of the capital budget and the budget lung will be carried out by the governance of the organization.	Revised Corporate Investment Capital Budget

The proposal for this method covers only the decision for investment capital budget. The operating budget can be operationalized by any budget management approaches already described.

8. Method Evaluation

To evaluate the proposed OCIC/CCIB method, a capital investment simulation based on business projects was used.

In the example of Table 8, projects (A) to (E) are defined and prioritized for systemic risks and restrictions verified for an organization. The realistic and pessimistic budget is proposed by project managers together with the managers of the areas benefited by the project. By this method, the AB budget is the sum of conservative forecasts for projects. For a 95 percent probability of budgeting, bcb95 percent would be the Budget for the budget contingency lung. For 99 percent probability of budgeting, BCB 99 percent would be the budget for projects with a 99 percent probability. Both in total are smaller than the pessimistic PP budget, as shown in Table 8, as follows:

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Table 8
Example of Application of the GCIC / CCIB Method

	PP = Pessimistic Forecast (x1000)	**AP = Realistic Forecast** (x1000)	**ifference R= (PP-AP)** x1000)	**Standard Deviation (R/2)** x1000)	**Variance (R/2) ^ 2** (x1,000,000)
Project A	1,200.00	400.00	00.00	00.00	160.000.00
Project B	900.00	450.00	50.00	25.00	50.625.00
Project C	1,500.00	600.00	00.00	50.00	202.500.00
Project D	600.00	400.00	00.00	00.00	10.000.00
Project E	300.00	100.00	00.00	00.00	10.000.00

Tp	Traditional Budget (Sum PP)	4,500,000 .00
Ab	BCapB Capital Base Budget(Sum AP)	1,950,000 .00
Bv	BV -*Budjet Variance* (Sumatório de Variâncias)	433.125.000.000 .00
Bsd	BSD- Standard Deviation*(Budjet Standard Deviation)*) (BV square root)	658,122 .33
BCB95%	Pumão de Contigence with a 95% chance of occurrence (2* BSD)	1,316,244 .66
B95%	Budget with 95% chance of occurrence (AB + BCB95)	3,266,244 .66
BCB99%	Contingency Lung with 99% chance of occurrence (3* BSD)	1,974,366 .99
B99%	Budget with 99% chance of occurrence (AB + BCB99)	3,924,366 .99

The definition of capital investment is based on structured projects oriented to the real systemic needs of organizations. For the example presented, the proposed investment based on probabilistic (B99 percent) it is better substantiated than the initial traditional budget proposal for the areas (TB) or that it was the result of the reductions imposed by those responsible for managing the budget. Any cuts to suit the organization's total investment capacity would impact on a set of deductive decisions regarding scope, cost, time, quality, risks, etc. in structured projects. With the practice generated by project management in these adjustments, it can be believed that the effectiveness of investment actions tends to be better than the conventional budget method.

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9. Lessons learned and conclusion

This article is oriented to companies in search of excellence, which must be prepared to deal with business environments and unpredictable scenarios. The adequacy of current budget management practices and project management to this environment was questioned. Next, the similarities between budget management and project management were studied in positive and negative aspects. Based on the finding of this study, a method of managing the investment capital budget was proposed through projects oriented to the equation of constraints and risks and the calculation of the capital budget based on a good understanding of how budget estimates are actually made.

The conclusions hereafter presented, is applicable, and therefore helpful, to a greater number of managerial activities, such as (a) e-business negotiation (Dias, M.O. & Duzert, 2017); (b) aircraft manufacturer industry (Cruz, B.S. & Dias, M.O., 2020; Dias, M.O., Teles, and Duzert, 2018; Dias, M.O. and Duzert, 2018); (c) automobile industry (Dias, M.O., Navarro and Valle, 2013, Dias, M.O., et al., 2014; Dias, M.O., et al., 2013); (e) limestone industry (Dias, M.O., & Davila, 2018); (d) non-market forces (Dias, M.O. & Navarro, 2018); (e) brewing industry (Dias, M.O. & Falconi, 2018; Dias, M.O., 2018); (f) Non-governmental organizations (Paradela, Dias, M.O.; Assis; O., J.; Fonseca, R. (2019); (g) governmental negotiations (Dias, M.O. & Navarro, 2017); (h) airport network management (Dias, M.O. 2020;Dias, M.O.; 2019; Dias, M.O.; 2019b; Dias, M.O. & Albergarias, 2019, 2019b; Dias, M.O., 2019c, 2019d; (i) streaming film industry (Dias, M. O., & Navarro, 2018), among others.

It is understood that the application of this paradigm of budget management of capital OICC / CCIB will catalyze the system of implementation of targets through budget and projects by which:

Conclusion 1: Senior management will understand the efficiency of your investment and the profitability obtained, enabling the continuity of its support to the budget process;

Conclusion 2: A collaborative environment will be developed among the actors of the system (area managers, budget manager, project manager), generating gains in innovation, learning and efficiency;

Conclusion 3: The organization improves its initial conditions by increasing its operational flexibility and operational agility. This increases its probability of success in achieving its objectives and in the confrontation of adverse or favorable conditions in its external business environment.

Although the proposed OICC/CCIB method, to be implemented in organizations, requires them to exercise and integrate strategic management, budget management, project management and process management, these instruments are inherent in good corporate governance.

It is also recommended that every capital investment action of the organization be structured in the form of projects and the method of reward of managers should also reward those who achieve objectives with minimal use of investment resources. If possible, the manager should seek even return resources to the investment capital lung.

The proposed model was developed from the perspective of private organizations or business units of an organization, and should be reevaluated against specific conditions of public organizations and corporations formed by multiple companies.

Finally, it is suggested for future research on developed aiming at the identification of other business practices that may benefit from this paradigm shift.

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