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CONTROL AND STANDARDIZATION PROCEDURES FOR STRATEGIC PLANS OF A BIG CONSTRUCTION COMPANY, BASED ON THE STANDARD ISO 21500 METHODOLOGY.

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This work aims to develop some useful ideas and tools for monitoring and controlling the strategic plan of a big construction company, such as sanitary or hospitality companies, chain restaurants or large hotel brands. The research is based on the standard ISO 21500, the guidance of project management, to start from an internationally accepted methodological basis. Control tools are responsible for control scope, change, risks, cost, time or resources. Also ad-hoc solutions for various works are searched according to its scope as a project and its valued within the strategic plan, so this will make easier future management in works with similar scope. There are lots of strategies to carry out a repositioning plan and attain the company being visible in a higher level; marketing, publicity, political affairs, construction... In this study, we will focus in construction as the most important part in the company for the change we are looking for. Construction is one of the most important methods to reactivate the economy during years, and if it is correctly used could generate lot of development opportunity. Urban planning, new construction or refurbishment could generate jobs opportunities or possibility of expansion for companies.

Keywords: *Project Control; Strategic Plan; ISO21500.*

PROCEDIMIENTOS DE CONTROL Y ESTANDARIZACIÓN DE PLANES ESTRATÉGICOS EN UNA EMPRESA DE CONSTRUCCIÓN, BASADOS EN LA ISO 21500

El presente trabajo pretende investigar y aportar ideas en el campo de control en obras de construcción dependientes del plan estratégico de una empresa. Las obras de construcción serán los proyectos centrales que se han de realizar en una empresa para reposicionarse o revalorizarse. Este tipo de plan es típico en empresas hospitalarias, hoteleras, cadenas de restaurantes o grandes marcas que viven de sus inmuebles o de lo que de ellos producen. Por tanto, un plan de obras y apertura de nuevos locales bien gestionado será fundamental de cara a los objetivos de expansión. Dicha investigación estará apoyada en la norma ISO 21500 para partir de una base metodológica internacionalmente aceptada. Las herramientas de control se encargan de controlar, el alcance, el cambio, los riesgos, los costos, tiempos, recursos... Además se buscarán soluciones AdHoc para las distintas obras según su alcance como proyecto y su valor dentro del plan estratégico que facilitarán la gestión futura de obras de alcances similares. Con esta investigación se pretende descubrir nuevas herramientas para abordar y gestionar los planes de negocio basados en proyectos de construcción.

Palabras clave: *Control de Proyectos; Plan Estratégico; ISO-21500.*

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1. Introduction

This work aims to develop some useful ideas and tools for monitoring and controlling the strategic plan of a big construction company, such as sanitary or hospitality companies, chain restaurants or large hotel brands.

The research is based on the standard ISO 21500, the guidance of project management, to start from an internationally accepted methodological basis. Control tools are responsible for control scope, change, risks, cost, time or resources. Also ad-hoc solutions for various works are searched according to its scope as a project and its valued within the strategic plan, so this will make easier future management in works with similar scope.

When we talk about repositioning, we refer to the strategic plan developed by different companies to recover or improve the position or value they had in global market. The mentioned plan aims to improve the perception of the stakeholders. Generally, this kind of plan try to revalue the company and respond to all the investments made by the company or by 3rd party (property or investors).

There are lots of strategies to carry out a repositioning plan and attain the company being visible in a higher level; marketing, publicity, political affairs, construction... In this study, we will focus in construction as the most important part in the company for the change we are looking for.

Construction is one of the most important methods to reactivate the economy during years, and if it is correctly used could generate lot of development opportunity. Urban planning, new construction or refurbishment could generate jobs opportunities or possibility of expansion for companies.

Same happens in other Project Management areas such as IT, product development or consulting, construction must be equilibrated in three aspects: Scope, Cost & Timing. These three points should be aligned with strategic plan so that, if any problem appears in any project, the plan maintains its own criteria.

The project management in this case is applied to two levels: level 1, strategic plan or portfolio of projects and level 2, the proper project. Having these two levels aligned is the most important issue when a perfect control is needed.

Figure 1: Risk color code.



Good and fast is NOT CHEAP, Cheap and Good is NOT FAST, Fast and cheap is NOT GOOD. Having those three aspects balanced means good Project Management.

A real example will be presented, where all the control processes for construction projects are represented. Between others, the study looks for a way to compare and contrast possible crossing between different aspects of projects and could advice if any risk appears during the course of construction. Risks are the most important issue to detect, so the project and general plan must be controlled.

Tools will be presented in the following chapter. As we will see, tools are centered in strategic plans with different projects that are carried out at the same time or, if they are not simultaneously, they will be responding to the same philosophy. Attending to this criterion for standardization of cost, time & scope, workload will be reduced and methodologies will be controlled because suppliers will be grouped and there will be the know-how of previous projects. Obviously the reduction in workload will increase the quality, and will increase the attendance to the project and will reduce budget in a very important way.

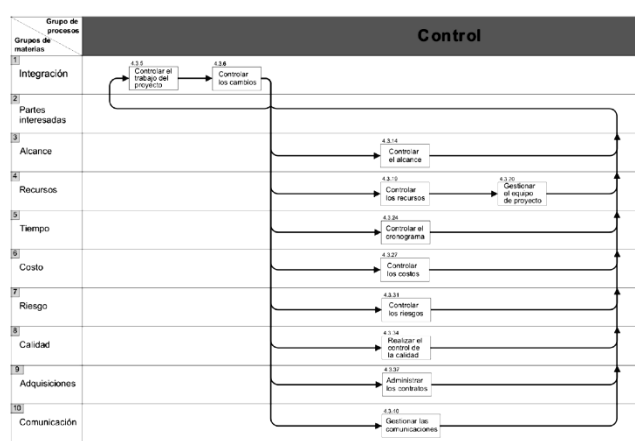
Generally, for this kind of projects in this kind of plan, the most important thing for the company is not to exceed the time-limit and not to increase the budget, so the solution will be changing the scope and thinking about solutions that could fit with the proposed projects. Therefore, change in projects should not directly affect in any case to the global strategic plan. The scope, in the case of lack of control, can be adjusted easily varying budget or time, finding alternative solutions. A valuation of the point to be adjusted will be done depending on the nature of the problem and the impact that the solution adopted could make. Of course, accepting the solution adopted which causes the least impact on the strategic plan.

2. Control tools for projects in construction

2.1 ISO21500: Context

Control methodologies will be supported by the ISO 21500, and will be focused on the chapter that refers to control.

Figure 2: ISO21500 Control



Developed methodologies will have relationship with inputs and outputs of each one of the points that are part of the ISO21500. Control for projects is focused on detecting and taking corrective actions in the way the project follows the course that should be taken as planned.

Below the purpose of each control type, are presented their inputs and outputs, as well as the way how it is applied to the example presented.

2.1.1 Control the works of the project

Purpose: complete the project activities in a way that is integrated into the plans of the project, the entire project should be performed.

Inputs: plans project, project data, measures of control quality, risks and problem register.

Outputs: change request, progress reports, and project completion reports.

How it is applied: control the work, the attention is focused in level 1 where a global vision of the plan could be taken into account through all data and information on different projects. That level could visualize the progress of works and change requests affecting to the global plan. It will be reflected in the first part of the monitoring phase, the one centered in level 2, project, and also in level 1, portfolio planning.

2.1.2 Change control

Purpose: It is necessary to register requests for change throughout the project.

Inputs: project plan and change request

Outputs: change approval and change register.

How it is applied: Changes should be controlled during the whole project and a change approval folder should be design, included level 1, with a compilation of change requests, and a document where changes are perfectly registered including the ones that are not realized for any reason. Changes will be controlled by the project directors in level 2. If this works, directors and by extension his team, will never be unnoticed of any change made during the project process.

2.1.3 Scope Control

Purpose: Maximize the positive impacts and minimizing the negatives ones.

Inputs: progress, defining the scope data, work breakdown structure, list of activities.

Outputs: change request

How it is applied: At level 2, project, scope will be studied and appropriate solutions would be taken to solve problems arising during the project. This is the vertex that most will vary, if time and cost do not change.

2.1.4 Resources control

Purpose: make sure that resources required to carry out the project and also that are suitable to bump into the requirements of the project.

Inputs: project plans, designations of team members, availability of resources, progress information, resources requirements

Outputs: change request and corrective actions.

How it is applied: choice of good resources will be essential to avoid threats. In addition to this, it is really important to delegate and trust the team so that PM or director does not have to be forced to care about all aspects of the project. In construction projects there will be a

responsible for resources control, usually Faculty Direction, Site Supervisor & Safety supervisor

2.1.5 Time control

Purpose: Track changes in the schedule and take appropriate corrective actions

Input: Planning, Progress information and Project plan.

Outputs: Change request and Corrective actions.

How it is applied: At the project level, level 2, timing will be studied and different solutions could be taken to solve the problems of deadlines that may appear during the project. Usually can be solved through change of scope or budget.

2.1.6 Cost control

Purpose: track variations in costs and take appropriate actions.

Inputs: Details of progress, project planning & budget plans

Outputs: Actual costs, estimated costs, change request, corrective action

How it is applied: In level 2, the project budgets will be previously studied in a deep way to ensure that there are not major changes that could occur. PM will attempt to have contingencies as well as reserves in the global plan and in each project to control possible deviations. If the economic changes are too many, the Team Director should decide to stop the corresponding project in level 2, so that this does not affect to level 1, the repositioning plan. The paralyzed work will be moved to another time-window until problems are solved.

2.1.7 Risk control

Purpose: minimize the problematic of the project determining risks. If the answer to the risk has been well executed, the desire effect will be achieved.

Inputs: Register of risks, progress information, Project plan & Risk response plans.

Outputs: Change request and corrective actions.

How it is applied: Project level risks will be studied and will be detected in the global plan. The alignment between level 1 and 2 must be perfectly controlled and coordinated. Many risks affect to both level, and sometimes one risk can be critical in level 2 but not in level 1, and that is the reason why risk management is crucial.

2.1.8 Quality Control

Purpose: determine if the objectives of the project, the quality requirements and standards are being met, and identify the causes or methods to eliminate the unsatisfactory part.

Inputs: progress data, deliverables, quality plan.

Outputs: control measures of quality deliverables verified, inspection reports, change requests, corrective actions.

How it is applied: It does not apply during the project. The quality criteria is established when contract with suppliers or contractors is closed. The contracted part is the one who take responsibility in case of lack of quality.

2.1.9 Contracts administration

Purpose: Managing buyer-supplier relations.

Inputs: Contracts and purchase orders, project plans, approved changes & inspection reports.

Outputs: Change request & corrective actions.

How it is applied: Does not apply in the project process in level 2. It is only applied at the time of bidding and contracts with suppliers. Is better to establish this administration and contracts only in level 1 to reduce costs.

2.1.10 Communication management

Purpose: ensure that the communication needs of the project stakeholders are satisfied and solve the problems of communication as soon as possible when they arise.

Inputs: communication plan and distributed information.

Outputs: accurate information, corrective action.

How it is applied: good overview of the organizational chart of the company and pre-project established communications.

2.2 Application of the ISO 21500 acquired tools

Taking into account the inputs and outputs that are offered in the ISO 21500, a chart in which documents are crossed with other information is proposed. In this chart the documentation and information is controlled by the PM, and we can have access to it easily, and it is easy to report executives or committees.

These documents are used to control the processes of work proposed and those templates based on ISO21500 are also used to follow the project in which we are working. In the mentioned templates, weighted values are given to difference aspects of the project and also could cross information or rate data that in a glance are impossible to be compared. The weights of these weightings will be given by the PM in charge of the strategic plan, who will define every aspect and every possible risk or change.

These methodologies will be applied in both, level 1 and 2, and will be studied differently depending on the type of project.

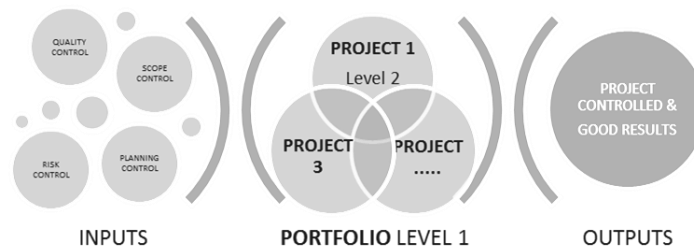


Figure 3: ISO21500 Control

2.3 Control for different sizes of projects methodology

Three groups of projects are defined to control ad-hoc solutions: small, large and special projects. In any case, regardless of the strategic plan, this differentiation into types of project it is important to be carried out. Criteria of typology will be defined pending in the goals and resources. The following proposal could be modified if it is suitable for the rest of the plan.

2.3.1 Methodologies of control for small-scale projects

We define small scale projects those projects of less than 5.000.000€. For these projects we need to balance the quality triangle; the weighting strategy will be committed by the consulting team or the corresponding equipment working on the strategic plan. In the ones considered as small scale, more than 3 or 4 team members are not needed. The main works of control in this kind of projects is the interlocution between the technician onsite and the team in charge of the repositioning. The main risk is a bad reporting of the works status and communication between headquarters and site. For small projects the services from the PMO are not necessary. So it is important to follow procedures on time and it is important to have quick resolution with change request and corrective actions.

2.3.2 Methodologies of control for large-scale projects

All projects that exceed 5.000.000€ are considered as large-scale projects. If a project of more than 5MM€ is also key in the strategic plan, it will be analyzed as special project. Most of the projects will be considered as large-scale projects. These kind of projects need more attention in terms of organizing, it is a good idea to contract a PMO or a big team may be considered. If we delegate PM services, there will be more time to invest in organizing and monitoring. Many times in these kind of projects we will need resources exclusively dedicated to them.

2.3.3 Methodologies of control for special projects

We categorize as special projects those who have great importance in the repositioning plan. And those that in case of chaos will directly affect the course of the strategic plan. PM will need to be extremely careful about monitoring the project and he should give feedback and report any potential risk. For this kind of project extra procedures will be included, those procedures

will control those aspects of the project in its wholeness. In this case, level 2 affects directly to level 1.

3. Analyzing and monitoring construction projects.

3.1. Repositioning Plan Control

For a good control of the construction plan, there is a control at two levels, firstly at the level of portfolio, level 1, and secondly, the project, level 2.

Table 1: Color code for control tables

RISK			SCHEDULE		TIPOLOGY		
Cost Risk	Scope Risk	Planning Risk	Planned	Finished	*Small	**Large	SP (special)

In project level 2 is important to control with different reports how the three aspects of the project are controlled. In addition, various active participants of the process will be assessed: Suppliers, Contractor & PM services, in this way, all the responsibilities will be clarified. The intention with this standardization of processes of control is to achieve a methodology easy to fill, to read, to understand and to approve, and this will make decisions really easy and can reactivate the project progress quickly if there is any problem. Projects defined as risky projects in any of the three vertex of the triangle of quality, will have an individual tab to control those points in particular. It is very important to take those risks into account:

Contractors report: Contractor will be evaluated for schedule, quality, cost, existence service coordination, safety & health, construction team, documentation, change management and installations. Each project will have one report with those points previously agreed in tendering. The strategy team or the one who design the portfolio will decide the weights he wants to give to each point. The average score will give the PM one number 1 to 5 and automatically is going to be considered in the cover as acceptable or not.

Suppliers report: Supplier's report is the easiest one, it consist in a valuation for each supplier with the weights that are interesting in different scenarios. Overall and delivery date are the two ideas proposed to control as critical.

Project Management Services (if needed): If a project is defined as special project, external services of project management could be contracted, for this situation two more templates are proposed. PM services group the works for the project. Scope, Project, PM Service, Design Team/ Third Part, Project progress (terms) and other issues; those are the points to be checked, the template works the same as the others.

Project Management Office (if needed): A template is also proposed for the Project Management Office contracted to accomplish special projects. The valuation will consider Scope, Procedures, Repositioning affection and other issues agreed in the contract established in tendering.

Cover/Main control: With all these control tools a new report can be created and we can see on it which part of the project is not working just in a glance. If something is not working

(acceptable 3 out of 5) we just have to see the report of the one that is not working. This procedure makes much easier the recognition of bad works.

Table 2: Valuation of reports in level 2

Contractor's Report	Supplier's Report	PMS Report	PMO Report	Overall
3,2	2,3	4,1	3,2	2,8

It is important that the tabs (the ones responding to requirements of the company or the ones that are necessary for the strategic plan) are weighted before the start of works. This is a method to achieve alignment between level 1 and 2. The most important part of this procedure needs is to be reliable between different projects so it will facilitate decision-making while detection of risks.

3.2. AD-Hoc solutions for different scales of projects, alignment between different levels

There are three types of problems (cost, scope and term) and three types of projects in which we have classified our works, i.e. 9 scenarios. Solutions to be adopted may be discussed and we will try to normalize these solutions so that, at the time of taking results, there is no major problem, so there is no delay or increment in the price.

The most important part of these reporting procedures is the way these two different levels are aligned. To achieve a good alignment is important to optimize different aspects of control, categorize in different typologies and organizing good standards for inputs and outputs.

The most important part of this alignment is how human resources are organized, how the know-how management is carried out and how leaders manage their teams and establish rules and procedures.

4. Case study: complete implementation of 10 industrial naves for supermarket chain and control of one project in repositioning plan.

A medium scale supermarket chain from Madrid wants to improve its services and make an expansion plan where they want to invest in ten different projects all over the country and if it is possible open another one in UK. The company has prepared a plan with a prepared schedule and budget. We will apply the method previously presented to optimize resources, time and cost. Level 1 is defined with the strategic plan, the global vision of the company, a picture where cost, time and scope are totally controlled.

Table 3: Planning Level 1

REPOSITIONING STATUS 2015	IMP	RIS K	2015												2016	2017	
			ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC			
BUY Madrid Sur	*	-															
BUY Madrid	**	-															
BUY Toledo	*	-															
BUY Bilbao	**	-															
BUY Barcelona	SP	-															
BUY Santander	*	-															
BUY Sevilla	**	-															
BUY Valencia	**	-															
BUY London	SP	-															
BUY Madrid Norte	*	-															
Projects Reserve																	

TOTAL FINISHED	!!!!	0	3	4	5	6	7	9	10
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Table 4: Cost Planning Level 1

REPOSITIONING STATUS 2015	CURRENT INVESTMENT 2015	2015			2014-2015	2014	2015	2014-15
		Extra 3 rd Party	Contracted	PROGRESS (***)	PROGRESS ACCUMULATED	INVOICED	INVOICED	INVOICED ACCUMULATED
BUY Madrid Sur	4,8		3,5	1,5	2,5	1,3	0	1,3
BUY Madrid	12,6	+ 2,1	7,5	2,3	2,3	1,2	0	1,2
BUY Toledo	4,4		1,0	0,0	0,0	0	0	0
BUY Bilbao	12,0	+ 4,3	2,0	0,0	0,0	0	0	0
BUY Barcelona	12,3		12,3	0,0	0,0	0	0	0
BUY Santander	3,5		3,5	2,1	3,1	3,1	1,1	4,2
BUY Sevilla	5,5		4,5	0,1	0,1	2,0	0	2,0
BUY Valencia	7,6		3,5	0,5	0,5	0	1,9	1,9
BUY London	25,0		0,0	0,0	0,0	0	0	0
BUY Madrid Norte	4,8		1,5	3,6	3,6	0,9	0	0,9
Projects Reserve	7,5					0	0	0
TOTAL Millions €	100,0	6,4	38,3	10,1	12,1	8,5	3,0	11,5

Level One: As we can see in the previous chart, we have 4 projects with potential risks in level 1. In addition, table 3 gives us a lot of information such as typology of project, planning and progress. Last row indicates when the end of works is planned and when a new supermarket is opened. To have a good cost control is important always having in mind the Cost control, the whole plan pretend to invest 100MM€ and there is not too much margin. Is not possible to exceed it, changes must be mainly focused in scope.


Suppliers will have double control, level one and level two. In level one we will look for a general vision and level two will score more specific information.

Table 5: Suppliers' Report Level 1

SUPPLIER	OVERALL	CONTACT	PROJECT 1	PROJECT 2	PROJECTO 3	References
			DELIVERY DATE	DELIVERY DATE	DELIVERY DATE	
James' Furniture	Good	676789833	15/01/12Delay	15/02/03 OK	Non defined	
Porcelanosa	Very good	675849302	On date	12/02/15 OK	13/04/15Delay	Previous projects
Supplier 3						
Supplier 4						
Supplier 5						
Supplier 6						
Supplier 7						
Supplier 8						

Level Two: As we have said before, level two is the one in charge of the project. Topics mentioned in ISO21500 and Project Management team are the ones that define how these procedures are going to be.

Table 6: Valuation of reports in level 2. Resume

CONTROL REPORT	BUY Bilbao	Date	colloz@urc
			
Address			
Contact			
Hotel	BUY Bilbao		
Scope (Brief description)			
Contract (€)			
FINAL SCORE			
Final score	2,817		
The reporter should define in this gap the priorities that are going to be scored.			
SCORE	GRADE	RESULT	
More than 4.4 points	Excellent	OK	
3.8 - 4.4 points	Good		
3.0 - 3.8 points	Regular		
Less than 3.0 points	CHECK		

CONTRACTOR		ONLY PROJECT MANAGER	
Final score	1,028		
The reporter should define in this gap the priorities that are going to be scored.			
SCORE	GRADE	RESULT	
More than 4.4 points	Excellent	OK	
3.8 - 4.4 points	Good		
3.0 - 3.8 points	Regular		
Less than 3.0 points	CHECK		

SUPPLIER		ONLY PROJECT MANAGER	
Final score	3,500		
The reporter should define in this gap the priorities that are going to be scored.			
SCORE	GRADE	RESULT	
More than 4.4 points	Excellent	OK	
3.8 - 4.4 points	Good		
3.0 - 3.8 points	Regular		
Less than 3.0 points	CHECK		

P&I Services		ONLY PROJECT MANAGER	
Final score	3,184		
The reporter should define in this gap the priorities that are going to be scored.			
SCORE	GRADE	RESULT	
More than 4.4 points	Excellent	OK	
3.8 - 4.4 points	Good		
3.0 - 3.8 points	Regular		
Less than 3.0 points	CHECK		

P&I		ONLY CLIENT	
Final score	3,555		
The reporter should define in this gap the priorities that are going to be scored.			
SCORE	GRADE	RESULT	
More than 4.4 points	Excellent	OK	
3.8 - 4.4 points	Good		
3.0 - 3.8 points	Regular		
Less than 3.0 points	CHECK		

As we can see problem in level 2 for BUY Bilbao is just with the contractor but it is critical, action must be taken. The procedure is the sum of different control aspects previously agreed between different parts, templates are set out below.

Table 7: Valuation of reports in level 2.

Contractor's Report		Supplier's Report		PM Services		PMO Report	
Rank of priorities/Scoring		Rank of priorities/Scoring		Rank of priorities/Scoring		Rank of priorities/Scoring	
Schedule		Supplier		Scope		Scope	
Start Date	0	Overall	3	Scope expected/done	4	Cost	4
Expected due date	3	Delivery Date	4	Budget	3	Deadline	3
Delivery date	2	Scoring	3,5	Suppliers control	4	Quality	4
Accumulated delay	0	supplier		Scoring	3,7	Completion	2
Scoring	1,3	Overall	3	Project		Scoring	3,3
Quality		Delivery Date	4	Project Design	4	Initial procedures	
Materials	0	Scoring	3,5	Project Cost/Planning	3	Stakeholders management	3
Material withdrawal	2	supplier		Design Management	2	Initial valuation (Check)	4
Construction order	0	Overall	3	Scoring	3,0	Validation of the scope with BU	3
Used means	0	Delivery Date	4	PM Service		Feasibility	3
Scoring	0,5	Scoring	3,5	Project Manager (PM)	3	Coordination between PM	3
Cost		supplier		Cost&Planning Manager (C	4	Coordination with Client	3
Estimated budget	2	Overall	3	Design Manager (DM)	4	Confirming of PoR (If applie	3
Deviation	0	Delivery Date	4	MEP Manager (MEP)	5	Scoring	3,1
Scoring	1,0	Scoring	3,5	Construction Manager (CM	4	Repositioning	
Existance service coordination		supplier		Site Supervisor (SM)	4	Complete repositioning	3
Noise	0	Overall	3	Safety Supervisor (SC)	2	Individual Cost Plan	4
Annoyance	0	Delivery Date	4	Scoring	3,7	Coordinates with Client	4
Dust	2	Scoring	3,5	Design Team / Third Part		Scoring	3,7
Affection	0	supplier		Senior Architect	4		
Scoring	0,5	Overall	3	Senior Engineer	4	Permits management	2
Safety & Health		Delivery Date	4	Faculty Office	3	Right team for project	2
Incidences	2	Scoring	3,5	Scoring	3,7	Centralized Design Developme	2
Personal injouries	0	supplier		Project progress (terms)		Follow us	3
Scoring	1,0	Overall	3	Preliminary Valuation (Che	4	PM Service Control	4
Construction Team		Delivery Date	4	Look and Feel	5	Procedure of improvements control established (ADR,Revspar,	4
Site manager	0	Scoring	3,5	Concept Design	3		
Technical office	2	supplier		Bidding Package	3		
Production Manager	0	Overall	3	Start Execution of Works	4		
Prevention expert	0	Delivery Date	4	Overall quality control	3		
Scoring	0,5	Scoring	3,5	Delivery	3	Online platform use Centra	3
Documentation		supplier		Scoring	3,6	Penalties	4
Licences	0	Overall	3	Other		Scoring	3,0
Processes	2	Delivery Date	4	Online platform use	3		
Building book	0	Scoring	3,5				
Plans	0	supplier		Scoring	3,0	Comments	
Scoring	0,5	Overall	3	Comments			
Change management		Delivery Date	4				
Alternative search	2	Scoring	3,5				
Adversarial procedure	2	Comments					
Technical proposals	2						
Scoring	2,0						
Installations							
General valuation	2						
Coordination with externa	2						
Scoring	2,0						
FINAL Score (out of 5)	1,0	FINAL Score (out of 5)	3,5	Final score (out of 5)	2,9	Final score (out of 5)	3,3
PM Valuation (the process could be avoided because a serious error in this valuation)		PM Valuation (the process could be avoided because a serious error in this valuation)		PM Valuation (the process could be avoided because a serious error in this valuation)		PM Valuation (the process could be avoided because a serious error in this valuation)	

5. Conclusion

The main objective of this article is to provide tools that make the project processes more effective, with which taking control of the three vertex of the quality triangle. To achieve the goal of controlled projects and plans, the study is made in two different levels, one for project and the other one for portfolio of projects.

It is said that construction is one of the most important part of change in a company so we focus in projects of construction. Is not easy trying to reduce all kind of projects of construction just into three types, so all the previously presented tools should be modify by the project management department reliant to what is interesting for control.

As we have studied the change management or the control procedures for construction, we could say that is mainly about control of the scope and monitoring the procedures during the execution. It is also about how suppliers work, how contractors work and how we can control all the stakeholders involved in the construction phase. Scope is the hardest part to control but it is also the most important one. On the other hand, time or cost could be critical if we decide it or if it is mandatory. Although, the main actions with the proposed tools are corrective action based in common sense.

Although tools for construction projects in strategic plans are based in ISO21500 or other standard internationally accepted, the "Control tools" proposed should be defined in each plan by the team. A clear strategy of alignment should be defined to achieve the requirements of the company. Once defined, ad-hoc solutions will be made much easier with the control and monitoring, and will facilitate future management of works with similar scope in similar strategic plans.

Level 1 and 2 should be coordinate; if any risk is detected in level 2 should be reflected in level 1 and vice versa. If projects are controlled deeply and if also the project plan is controlled, is quite easy to improve the association with contractors, suppliers & all the stakeholders involved and also is a good point to reduce cost. A PM should be in charge to control this connection between levels and to exchange requests, deliveries and with all those, inform change requests or budget rise.

Standardization of control tools works, it is a fact. Procedures or what we have defined "standardization of tools", is a way to have the know-how of the company or team written down. So in fact, standardization is installing as know-how in the company, a really positive topic and an improvement for the company.

To conclude, the proposed procedure could work. However, it is key to have a good team and good project leaders to organize and to define the strategy and the ways of working.

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