

Use of overtime in projects: Why and how to avoid it^{1, 2}

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ABSTRACT

In a constantly changing environment, projects face multiple issues. Overtime is a common answer to constraints among most companies: scheduled or not, it will guarantee project completion on time and flexibility. Although it might seem like a useful solution, it appears that extended use of overtime has disastrous consequences on a project organization, the main one being productivity loss, which is one of the main reasons of project failure. Considering those facts and focusing on the model of construction projects, this paper aims at exploring alternatives to overtime, in order to avoid productivity loss and limit all the negative consequences on cost, time, quality and scope of the project.

For our research, we chose to use a qualitative and two levels of quantitative methods. Thus we could answer the following question: what are the possible and best alternatives to overtime considering the constraints and obligations of the project? Our final studies will explain why shiftwork or construction methods and sequencing should be used instead when considering our attributes.

Key words: Overtime - Productivity - Labor - Schedule - Project Management - Construction projects - Contract - Cost - Performance - Alternatives

INTRODUCTION

As numerous government references such as the Human Resources Management Manual state: "Overtime work shall not be resorted to except where it is absolutely necessary"³, overtime as never been proven best practice in project management. However, certain firms commonly use overtime work in order to finish a project following the initial schedule and thus respecting the contract time requirements of the project: "Some owners and contractors consider extended

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³ Ministry of Civil Service and Administrative Reforms. (2011). *Human Resource Management Manual*. Retrieved from http://civilservice.govmu.org/English/Documents/HRM%20Directory/HRMM_08042011.pdf

overtime as necessary and required to meet the demands for faster schedules or to staff their projects.”⁴ But what is overtime and how does it affect productivity? In most studies, experts state that a normal labor week is 40 hours of work (Carter, 2017). Above that number, the extra hours worked are considered overtime. “The resulting stress and fatigue that overtime produces can affect cognitive performance such as attention, concentration, memory, and logic errors”⁵, which are components of productivity.

Overtime can either be scheduled (mechanical contractors, contractors and owners have agreed on the schedule and performance requirements in the contract) or unexpected, and thus being a consequence of multiple factors or events occurring before and during the contract. For instance, we could cite change orders in construction projects⁶, constructive changes or unexpected working conditions: those will necessarily have an impact on the scheduling and as a consequence impact on costs, and require specific project management interventions. In fact, an “often forgotten impact to productivity which has consequences to both time and costs is the number of hours per day and days per week being scheduled for work.”⁷

If we look at the root causes analysis of overtime in projects, we can trace it back to ineffective policies and procedures, lack of effective scheduling and time management, before and during the project:

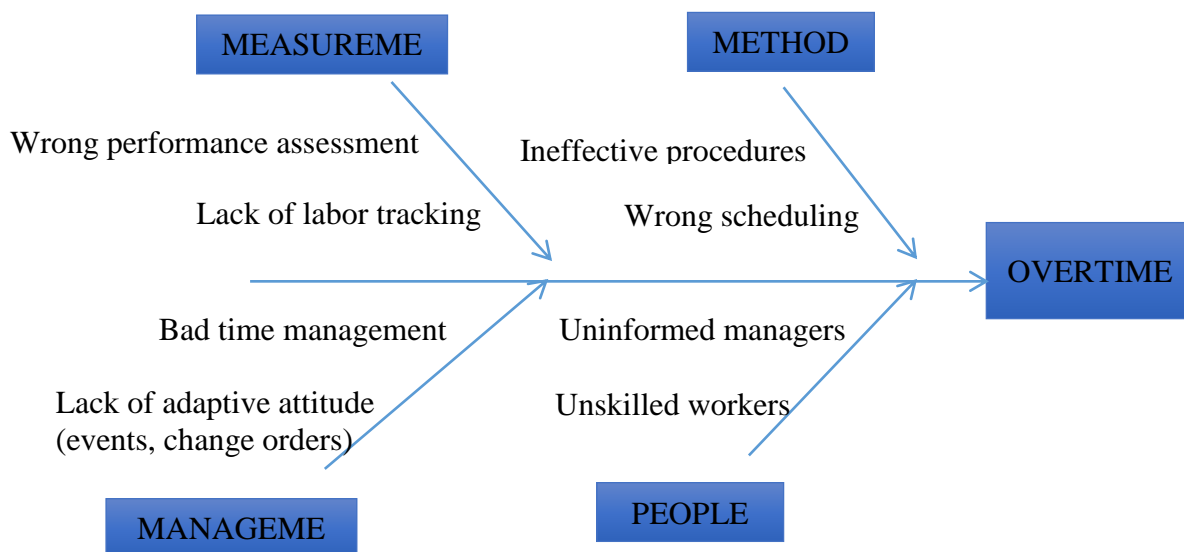


Fig. 1 Fishbone diagram, root causes analysis of overtime⁸

⁴ The Construction Users Roundtable. (2004). *Tripartite study on extended overtime on construction projects* (R-402A). Retrieved from <https://kcuc.org/wp-content/uploads/2013/11/R402A-Extended-Overtime-on-Construction-Projects.pdf>

⁵ Olson, B., & Swenson, D. (2011). *Overtime effects on project team effectiveness*. Retrieved from http://micsymposium.org/mics_2011_proceedings/mics11_olson.pdf

⁶ Ibbs, W., & Vaughan, C. (2015). *Change and the loss of productivity in construction: a field guide*. Retrieved from http://ibbsconsulting.com/uploads/Changes_Field_Guide_Feb_2015.pdf

⁷ The Guild, <http://www.planningplanet.com/guild/gpccar/acquiring-manpower-for-the-project>

⁸ Fishbone diagram, root causes analysis of overtime, by author, 2018

In this paper, we will address the problem of extended overtime and its impact on workers and team productivity in projects. We will try to provide effective solutions for project management in order to avoid loss of productivity and thus increasing project costs, by exploring different alternatives.

METHODOLOGY

Step 1: Problem definition

In this paper we shall address the problem of the impact of overtime on productivity (10% loss on productivity with a 10-hour overtime⁹), and thus on time and cost requirements of a project. Considering that: “With premium wage rates and reduced productivity, the total cost impact of extended overtime can increase project labor costs by more than 80 percent”¹⁰, one crucial goal is to be able to maintain productivity at the highest possible level throughout the whole project, handling last-minute constraints, restrictions and change with different methods. This can be done by finding alternatives to overtime.

As we saw in our root cause analysis, overtime depends on management, measurement, methods and people factors. We will consider all them in order to answer the following questions:

- Which criteria should be used when considering and comparing alternatives to overtime to tackle productivity problems and respect project requirements?
- What are the possible and best alternatives to overtime to reach project objectives?

Step 2: Feasible alternative solutions

The following solutions are usable alternatives to overtime and are brought to PM knowledge in order to limit productivity loss. We chose to select and formulate feasible alternatives considering two major sources of recommendations on best practices in construction projects: the Construction Users Roundtable⁸, and report of the World Academy of Science, Engineering and Technology journal¹¹. We also decided to add two targeted schedule management methods, crashing and fast-tracking:

⁹ The Guild, Figure 9 - Hours Worked and Efficiency. <http://www.planningplanet.com/guild/gpccar/acquiring-manpower-for-the-project>

¹⁰ The Construction Users Roundtable. (2004). *Tripartite study on extended overtime on construction projects* (R-402A). Retrieved from <https://kcuc.org/wp-content/uploads/2013/11/R402A-Extended-Overtime-on-Construction-Projects.pdf>

¹¹ Robles, G., Stifi, A., Ponz-Tienda, J. L., & Gentes, S. (2014). *Labor productivity in the construction industry - Factors influencing the Spanish construction labor productivity*-(Vol:8, No:10). Retrieved from World Academy of Science, Engineering and Technology website: <https://waset.org/publications/9999560/labor-productivity-in-the-construction-industry-factors-influencing-the-spanish-construction-labor-productivity->

- Involvement of labor in decision making and follow up activities⁹
- Systematic control and revision of documents (objectives)⁹
- Construction Methods and Sequencing⁸
- Engineering and Procurement⁸
- Use of smart/front-end scheduling techniques (time, supply)⁸
- Crashing¹²
- Fast-tracking¹⁰
- Shiftwork⁸
- Increased Workforce⁸
- Selective Overtime⁸

In order to determine which might be the best alternative to reach the goals set in the project, we will first develop each of them and make comparisons according to selected attributes. To select our attributes, we are looking into the fundamental causes and factors of productivity loss, and also into how it impacts the project constraints of time, cost and scope. A study on the key factors influencing labor productivity¹³ underlined and ranked factors of 5 different categories ("Project, human, management or organizational, materials and tools, environmental"⁷). We chose to select our attributes according to this ranking, in order to really weigh our alternatives against overtime with clear proofs. Thus the selected attributes will serve the purpose of our research, by helping to rank our alternatives according to what should be done in situation of unpredictable or predictable events that might affect the productivity in a project.

As to formulate our attributes, we chose to incorporate some of the first impacting factor of each category: clarity of the drawings and project documents, level of skill and experience, clear and daily task assignment, shortage or late supply of materials, motion's limitation in the jobsite.

Thus our attributes are:

- Clarity and effective communication of goals¹⁵
- Clarity and effective communication of tasks¹⁵
- Resource planning quality¹⁴

¹² Essays, UK. (November 2013). The Crashing And Fast Tracking Of Projects Information Technology Essay. Retrieved from <https://www.ukessays.com/essays/information-technology/the-crashing-and-fast-tracking-of-projects-information-technology-essay.php?vref=1>

¹³ Robles, G., Stifi, A., Ponz-Tienda, J. L., & Gentes, S. (2014). *Labor productivity in the construction industry - Factors influencing the Spanish construction labor productivity*-(Vol:8, No:10). Retrieved from World Academy of Science, Engineering and Technology website: <https://waset.org/publications/9999560/labor-productivity-in-the-construction-industry-factors-influencing-the-spanish-construction-labor-productivity->

¹⁴ The Construction Users Roundtable. (2004). *Tripartite study on extended overtime on construction projects* (R-402A). Retrieved from <https://kcuc.org/wp-content/uploads/2013/11/R402A-Extended-Overtime-on-Construction-Projects.pdf>

- Direct impact on total cost of the project¹⁵
- Impact on workforce motivation¹²
- Flexibility of process¹⁶
- Complexity of planning¹²

Step 3: Development of the feasible alternative solutions

The first alternative to overtime and loss of productivity could be to involve labor in decision-making and follow up activities. In fact, as any member involved in the project, workforce can be a decisive changer in the advancement of the project: "Involvement of labor in decision making and follow up activities improvements and thus continuous improvement through feedback from laborers."¹⁷

Another alternative that tackles the problem of productivity loss due to overtime is systematic control and revision of documents. Making clear any objectives and tasks throughout all the project will help workers to organize in consequence, have clear conscience of when, how and on what spend their energy and time. In case of last-minute change, revised documents will allow them to pursue fixed objectives and reorganize correctly.

Sequencing is a management method used in construction project in order to gain time by coordinating activities between them. It requires preparation in the initiation stage of the project, and throughout the different steps of it, in order to always optimize time and have no "pending" activity when another one could be started : "Re-sequencing activities requires planners to determine the impact or "role" an activity has on following activities. They also need to determine which activities may or may not be delayed"¹⁸.

When it comes to **engineering and procurement**, the best way to avoid overtime being required is to aim at quality. Quality planning and management is crucial to a project schedule: deliverables that have to be done again are a heavy loss of time. Quality Assurance, defined as "a process/effort that ensures that processes are followed, that the processes have the contractor (or owners own people) doing the right things, the right way, and when they fail to be used or fail to perform as expected we have a way to correct, adjust, or escalate the matter

¹⁵ Construction Industry Cost Effectiveness Task Force. (1980). *Scheduled overtime effects on constructions projects* (C-2). Retrieved from <http://mail.curt.org/pdf/156.pdf>

¹⁶ Sherwin, P., Vermal, A., & Figueira, E. (2016). *Perceived advantages and disadvantages of international arbitration - Proskauer on international litigation and arbitration*. Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

¹⁷ Robles, G., Stifi, A., Ponz-Tienda, J. L., & Gentes, S. (2014). *Labor productivity in the construction industry - Factors influencing the Spanish construction labor productivity*-(Vol:8, No:10). Retrieved from World Academy of Science, Engineering and Technology website: <https://waset.org/publications/9999560/labor-productivity-in-the-construction-industry-factors-influencing-the-spanish-construction-labor-productivity->

¹⁸ Koo, B., Fischer, M., & Kunz, J. (2006). *Formalization of construction sequencing rationale & classification mechanism to support rapid generation of sequencing alternatives* (167). Retrieved from Center for Integrated Facility Engineering website: <https://pdfs.semanticscholar.org/335d/48110f0cbaf8b788e22249d921cde9e26334.pdf>

until it is resolved to everyone's satisfaction"¹⁹, is the extra effort that ensures good response to risks.

The fifth alternative, which in fact can be related to other alternatives, is smart and **front-end planning**, as for time and resources (supplies) in particular. According to the definition on planning "a basic management function involving formulation of one or more detailed plans to achieve optimum balance of needs or demands with the available resources"²⁰, doing with the available resources is a key element. First hand, the contract owner and the contractor must agree on the use of overtime and adopt an "say no" or the "last choice" policy when it comes to overtime. This way, front-end planning is the first resource the project team needs to use, in order to meet project goals of time, cost and scope. Planning instead of compensating.

"Crashing" (shortening a project schedule) refers to a particular variety of project schedule compression which is performed for the purpose of decreasing total period of time (also termed as the total project schedule duration)."²¹ Crashing can be a clear alternative to overtime in the sense that instead of taking necessarily on the people, it takes on the schedule and tasks itself, in order to transform out-of-schedule activities in fit-for-purpose tasks, at higher cost.

"Fast tracking" is a special case of crashing. In fast tracking activities that would have been scheduled in sequence are scheduled to be done with some overlap instead."¹⁶ This fifth alternative counterbalances the need of overtime to respect the schedule by carrying tasks in parallel.

The eighth alternative to overtime would be **shiftwork**. Organizing shifts (1st and 2nd) requires good project management, and very good planning in particular. Everything has to be thought twice, but at least it allows the project to be respect the said schedule, and to avoid overtime. In addition, it underlines a true consideration of workers, and enhances motivation. It has been proven that "Workforce motivation affects productivity"²², so shiftwork appears to be a valuable solution when it comes to meet schedules while maintaining the right level of productivity.

A ninth option is to **increase the workforce**. In order to respond to change or last minute constraints, some project require additional workforce in order to stay on track with schedules and deadlines. Of course this kind of decision has a cost, but as stated in most studies on the impact of overtime on productivity and cost and time: "The premium cost for overtime hours,

¹⁹ The Guild, <http://www.planningplanet.com/guild/gpccar/accepting-completed-deliverables>

²⁰ The Guild : <http://www.planningplanet.com/guild/gpccar/introduction-to-managing-planning-and-scheduling>

²¹ Robles, G., Stifi, A., Ponz-Tienda, J. L., & Gentes, S. (2014). *Labor productivity in the construction industry - Factors influencing the Spanish construction labor productivity*-(Vol:8, No:10). Retrieved from World Academy of Science, Engineering and Technology website: <https://waset.org/publications/9999560/labor-productivity-in-the-construction-industry-factors-influencing-the-spanish-construction-labor-productivity->

²² Thwala, W. D., & Monese, L. (2017, January 1). Motivators of construction workers in the south African construction sites: a Case study. Retrieved from https://www.researchgate.net/publication/237268350_MOTIVATION_AS_A_TOOL_TO_IMPROVE_PRODUCTIVITY_ON_THE_CONSTRUCTION_SITE

plus the loss in productivity for the total hours worked, results in an unreasonable inflation of the unit labor cost.”²³

The comparison of total cost of both alternatives generally show a better use of increased workforce.

The last alternative is **selective overtime**, or scheduled and limited overtime. One fundamental requirement of this alternative is that it has to be short term: “Short-term overtime is using up to 50 or 60 hours per week for one or two weeks”²⁴. This time limit is put in order to ensure maintained productivity: “There are added costs for this short-term overtime, but productivity and safety can be controlled by increased supervision and planning.”¹¹

Step 4: Criteria selection

In order evaluate methodically and to choose the best of the six alternatives developed in the previous section, we will use a non-compensatory model: the **Multi Attribute Decision Making Process (MADM)**.

This process will help us determining the best alternative, and also reject the irrelevant ones, through a 3-level scoring:

- Green score: shows the positivity of the alternative when analyzed with the alternative.
- Yellow score: global positivity of the alternative but needs some improvements
- Red score: the attribute is not in favor of the alternative

	Involvement of labor	Control & revision of documents	Construction methods & sequencing	Engineering & procurement	Smart/Front-end planning	Crashing	Fast-tracking	Shiftwork	Increased workforce	Selective overtime
Clarity of goals	Better	Better	Better	Equal	Better	Better	Equal	Better	Better	Equal
Clarity of tasks	Better	Better	Better	Equal	Better	Equal	Equal	Better	Better	Worse
Resource management	Equal	Better	Better	Better	Better	Worse	Worse	Better	Equal	Worse
Impact on cost	Better	Better	Better	Equal	Better	Worse	Worse	Equal	Worse	Worse
Workforce motivation	Better	Better	Equal	Better	Better	Equal	Equal	Better	Better	Worse
Process flexibility	Equal	Worse	Equal	Worse	Worse	Better	Better	Equal	Equal	Better
Planning complexity	Worse	Worse	Equal	Worse	Worse	Better	Better	Equal	Equal	Equal

Fig. 2 Multi Attribute Decision Making Process, Table of dominance²⁵

²³ The Business Roundtable. (1980). *Scheduled overtime effect on construction projects (C-2)*. Retrieved from Construction Industry Cost Effectiveness Task Force website: <http://mail.curt.org/pdf/156.pdf>

²⁴ The Construction Users Roundtable. (2004). *Tripartite study on extended overtime on construction projects (R-402A)*. Retrieved from <https://kcuc.org/wp-content/uploads/2013/11/R402A-Extended-Overtime-on-Construction-Projects.pdf>

²⁵ Multi Attribute Decision Making Process, Table of dominance, by author, 2018

As a conclusion to this qualitative analysis, we can say that the best alternatives when considering all the selected attributes are involvement of labor, construction method and sequencing, along with shiftwork. Selective overtime stays the worst alternative here. Fast-tracking and crashing are good answers to the need of keeping or reducing scheduling, but they have an heavy impact on resources, cost and workers

FINDINGS

Step 5: Quantitative analysis and ranking of the alternatives

After we listed, developed and compared the different alternatives to overtime, the qualitative analysis we conducted in the previous section allowed us to come to a preliminary conclusion. In order to confirm it, we will run a quantitative analysis that will allow us to properly rank our alternatives and make recommendations.

As to have quantitative results, we will follow he following scheme using our table from Fig. 2:

- Green = 1
- Yellow = 0.5
- Red = 0

	Involvement of labor	Control & revision of documents	Construction methods & sequencing	Engineering & procurement	Smart/Front-end planning	Crashing	Fast-tracking	Shiftwork	Increased workforce	Selective overtime
Clarity of goals	1	1	1	0.5	1	1	0.5	1	1	0.5
Clarity of tasks	1	1	1	0.5	1	0,5	0.5	1	1	0
Resource management	0.5	1	1	1	1	0	0	1	0.5	0
Impact on cost	1	1	1	0.5	1	0	0	0.5	0	0
Workforce motivation	1	1	0.5	1	1	0.5	0.5	1	1	0
Process flexibility	0.5	0	0.5	0	0	1	1	0.5	0.5	1
Planning complexity	0	0	0.5	0	0	0,5	0,5	0.5	0.5	0.5
SUM	5	5	5,5	3,5	5	3,5	3	5,5	4,5	2

Fig. 3 Quantitative analysis²⁶

The first quantitative analysis shows us a clear gap between selective overtime and other alternatives. But it also highlights two best alternatives, which are construction method and sequencing and shiftwork. In order to provide a precise rank order, we will run another analysis:

²⁶ Quantitative analysis table, by author, 2018

the additive weighting model. By ranking our attributes, this will help us determining the true best alternative.

See table below.

Attributes:		Clarity of goals	Clarity of tasks	Resource management	Impact on costs	Workforce motivation	Process flexibility	Planning complexity	SUM
Step 1	Relative Rank	4	5	3	1	2	6	7	30
Step 2	Normalized Weight A	4 / 30	5 / 30	3 / 30	1 / 30	2 / 30	6 / 30	7 / 30	1
		=	=	=	=	=	=	=	=
Involvement of labor	B	1	1	0,5	1	1	0,5	0	5
	A x B	0,133	0,167	0,05	0,033	0,067	0,1	0	0,46
Control & revision of documents	C	1	1	1	1	1	0	0	5
	A x C	0,133	0,167	0,1	0,033	0,067	0	0	0,5
Construction methods & sequencing	D	1	1	1	1	0,5	0,5	0,5	5,5
	A x D	0,133	0,167	0,1	0,033	0,034	0,1	0,117	0,683
Engineering & procurement	E	0,5	0,5	1	0,5	1	0	0	3,5
	A x E	0,067	0,084	0,1	0,017	0,067	0	0	0,335
Smart/Front-end planning	F	1	1	1	1	1	0	0	5
	A x F	0,133	0,167	0,1	0,033	0,067	0	0	0,5
Crashing	G	1	0,5	0	0	0,5	1	1	4
	A x G	0,133	0,084	0	0	0,034	0,2	0,233	0,568
Fast-tracking	H	0,5	0,5	0	0	0,5	1	0	3,5
	A x H	0,067	0,084	0	0	0,034	0,2	0	0,518
Shiftwork	I	1	1	1	0,5	1	0,5	0,5	5,5
	A x I	0,133	0,167	0,1	0,017	0,067	0,1	0,117	0,701
Increased workforce	J	1	1	0,5	0	1	0,5	0,5	4,5
	A x J	0,133	0,167	0,05	0	0,067	0,1	0,117	0,634
Selective overtime	K	0,5	0	0	0	0	0,5	0,5	2
	A x K	0,067	0	0	0	0	0,1	0,117	0,284

Fig. 4 Additive weighting model, quantitative analysis²⁷

Step 6: Ranking and election of the preferred alternative

As we progressed through more and more detailed ranking models, the results of the quantitative analysis can be reviewed. Indeed, ranking the attributes in the additive weighting model allowed us to really select the alternative that matter for our subject, meaning the one that will allow the project to avoid loss of productivity and thus consequently increased costs.

The proposed alternatives each have their negatives points. But according to our attribute selection and ranking, we can now say that the best alternative seems to be shiftwork, followed

²⁷ Additive weighting model, quantitative analysis, by author, 2018

closely by construction method and sequencing, which confirms part of our prior qualitative analysis (Fig. 2).

To clarify this order, we will calculate the ratio scale²⁸ between the first and the second option. This will help us deciding whether one should really be considered more than the other, since their score seem pretty close:

$$(0,701 / 0,683) \times 100 = 103 \%$$

This allows us to conclude that shiftwork is 103% better than construction method and sequencing. The first option is the most reliable, but option 2 stays a reliable one.

One noticeable change when comparing both our qualitative and quantitative analysis is the ranking of the first alternative: involvement of labor. Although it seemed to be recommended by one of our reference, this alternative loses interest against our ranked attributes.

Finally, we can still observe that selective overtime stays the worst alternative, although it can be a necessary answer to unprepared management and unpredicted change.

Our recommendation will be then to use shiftwork, to answer best to constraints with fixed objectives of time, cost and scope.

Step 7: Performance monitoring and post-evaluation of results

As we determined our recommended alternatives to overtime, we will need to assess their efficiency throughout the project and its outputs, outcomes and benefits. Indeed, to select our attributes we took into account the major factors of productivity loss, and all those factors had a common point: unplanned increased costs, and bad scheduling at the end of the project, as a consequence of productivity loss.

Thus, in order to have clear view and conclusions on the use of our recommended alternatives, a detailed follow-up is required. This means project managers will have day-to-day check-ups to do on cost increase and planning modifications. This will consist in monitoring and controlling²⁹ any change in the project plans, and assess every consequence of decisions taken. Some of the work will have to be thought of in advance, and some of it will have to rely on smart and practical analysis and reaction of the managers, hence the importance of constant reporting and reviews during the project.

²⁸ The Guild, <http://www.planningplanet.com/guild/gpccar/managing-change-the-owners-perspective>

²⁹ Khraiwesh, Mahmoud. (2013). *Project Monitoring and Control Measures In CMMI*. International Journal of Computer Science and Information Technology. 5. 39-56. 10.5121/ijcsit.2013.5503. Retrieved from https://www.researchgate.net/publication/276197921_Project_Monitoring_and_Control_Measures_In_CMMI

CONCLUSION

For its major impact on time, cost and scope, productivity has always been considered a determinant factor of project success. In this paper we addressed the problem of productivity loss, due to internal and external factors affecting the project, like last minute change or constraints. Project management disposes of various methods to respond to those types of events, scheduled or not.

As we presented in our first section, overtime is one of the most commonly used answers to changing project constraints, although it has never been proven best practice by project management organizations, affecting team effectiveness and thus productivity. This solution finds its strength in its flexibility and reaction power. But considering its high impact on cost and schedule matters as it takes on labor productivity, this alternative should be a last thought method instead of plan A.

Having these facts in mind, the purpose of this paper was to answer the following question: What are the possible and best alternatives to overtime to reach project objectives?

For that purpose, we identified 10 possible alternatives, taken from construction projects experience and best practices. In order to choose the best one, we ran two kinds of analysis: firstly qualitative, and then quantitative. As we progressed we used more and more detailed methods, which led us to have a clear ranking of alternatives, putting shiftwork in the first place, followed by construction methods and sequencing. Reasons for shiftwork to be our recommended alternative are clear: as it is reliable because planned and controlled, it can also be a response to sudden project change, with strong project management. Moreover, shiftwork enhances workers motivation by respecting efficient work schedules. Of course, smart planning and management are required.

In consideration of all our attributes, this paper provided us with best answers to productivity loss and underlined the interest of best practices for project success.

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About the Author



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Florence Alliod is a French business student at SKEMA business school. After a generalist year in Lille where she learned about strategy, management, law and finance, she traveled to North America to start her second year, where she studied entrepreneurship and management in NC State University. There, she had the opportunity to work with entrepreneurs on their company project and started to understand the importance of Project Management.

After this semester, she came back to France for a 6-month internship as a Project Manager Assistant at By Terry, a luxury cosmetic brand company. She gained skills and competences as a young project manager and confirmed her will to work in that field.

Logically, she then chose to specialize in Project and Programme Management and Business Development for her last year. To learn in an even more challenging environment, she started the year in an international university campus at Fundação Dom Cabral, in Brazil. There she had the occasion to meet with local start-ups and NGOs and learned from their ways to do Project Management.

The second semester of her specialization was spent in Paris, during which she was certified Prince2 and AgilePM. Passionate about Project Management and sustainability, she will write her Master's thesis on these subjects, and is willing to start her professional career as a project manager in the energy sector. Her objective is to use her knowledge and skills to build the world of tomorrow, where social and environmental issues are the first interest of companies.

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