

The Hidden Pyramid¹

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Abstract

Soft skills for the Project Manager have been traditionally identified as a set of cross-cutting skills that should complement the core job of establishing and maintaining reasonable tradeoffs among the elements of the traditional project management “iron triangle”. But there is more: the project manager needs to extend its integrative role also to a “hidden pyramid” where “soft factors” like motivation, socialization and attitudes are managed into a constrained environment between themselves and with the traditional “hard factors”, like scope, time, cost and quality. Project management can rely upon tools for dealing with “hard factors”: scope, time, cost and quality can be quantitatively defined and measured. But, what about “soft factors”? This paper presents the result of an extended research effort aiming to identify a model for “soft factors”, including taxonomies and proxies representing their qualitative/quantitative values. This model can be put in place in any context where the integrative project management effort is extended to the “hidden pyramid”.

Background

In the last three decades the issue of what constitutes project success has been debated, and many efforts have been made to provide the project manager with tools and techniques useful to pursue project management success. At the beginning the effort was focused upon tools and techniques related to the “iron triangle”, originally focused upon scope, quality, time and cost, and further integrated with tools and techniques focused upon uncertainty governance issues (Atkinson, 1999; Bernroider and Ivanov, 2011; Toor and Ongulana, 2010). Some steps ahead have been made in the direction to incorporate “soft” factors in the basis for project management success: “the project manager’s leadership style influences project success” and “different leadership styles are appropriate for different types of project” (Muller and Turner, 2006, p. 30). Even recently (Serrador and Turner, 2015, p. 30), in debating the relationship between project efficiency (as they redefined project management success) and project success referred “team satisfaction” as one of the dimensions of project success and identified “team morale”, “skill development”, “team member growth” and “team member retention” as possible measures for it. Overall, there is a quite diffused tendency to complement the traditional view of project management success based upon the successful maintenance of the “iron triangle”, with a need to support, throughout the project, the growth needs of individual team members; at the end of the day, no one is happy if the project delivers according to the goals set up by the iron triangle and, as a result of this, team members suffer for low morale and may decide to leave the performing organization.

In 2012 the existence of a soft pyramid (Exhibit 1) has been postulated, in which the management of “soft” factors in a constrained environment should complement the traditional effort of managing “hard” factors in a constrained environment (the “iron triangle”), and that this should be reflected appropriately in project management methods (Caccamese, Bragantini, 2012).

¹ *Second Editions are previously published papers that have continued relevance in today’s project management world, or which were originally published in conference proceedings or in a language other than English. Original publication acknowledged; authors retain copyright. This paper was originally presented at the PMI 2015 North America Global Congress. It is republished here with the permission of the authors.*

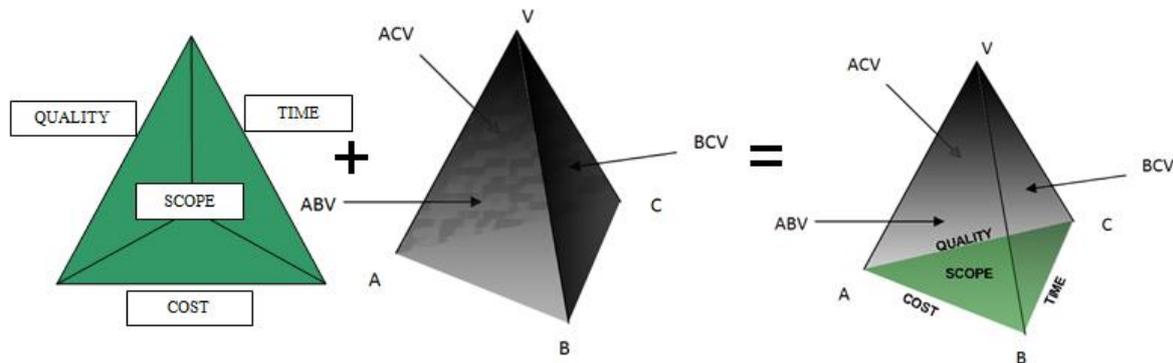


Exhibit 1 - The soft pyramid

Exhibit 1 depicts the “spaces for soft factors” as the interconnected faces of a triangular pyramid:

- **ABV: motivational space.** This is the space available for the project to activate the context for individual motivation. For example, like working conditions, job security, advancement, growth, power, affiliation, esteem, decision-making processes, rewarding systems (Verma, 1995);
- **ACV: social space.** This is the space available for the project to activate the protocols for acceptable behaviour. These are made of both task-related rules as well as social rules, like punctuality in task completion, agreed time to read and respond to messages, respect of consensus decisions, honesty, truth, preparation for and attendance to meetings, punctuality on meetings (Whatley, 2009);
- **BCV: analytic/holistic space.** This is the space available for the project to foster and facilitate the development of individual thinking models. The analytic model is centered upon analysis, linearity, sequentiality, reductionism and places high value upon expansion, competition, quantity and assertiveness. The holistic model is centered upon synthesis, non linearity, parallelism, holism and places high value upon preservation, cooperation, quality and associationism (Capra, 1982).

Caccamese and Bragantini (2012) postulated that the traditional paradigm of project success must be revised complementing the activity of integrating and balancing “hard” factors with an activity of integrating and balancing “soft” factors, and “hard” factors with “soft” factors as well.

Good project management, in this view, is more than delivering in scope, time, quality and cost, rather it implies also the ability to manage a set of interrelated constraints, with the aim to create a project climate in which the various personalities working in the project may develop their own peculiarities in state of internal satisfaction. The message is that effort should be given to uncover and manage a “pyramid” that is hidden in every project, as a complimentary effort to the management of the tradition “iron triangle.

The qualitative model

Based upon the original idea, an effort has been made to identify a taxonomy for soft factors and appropriate “proxies” for their numerical evaluation; the effort was done for the soft factors of the project (i.e. the measure of the “offering of space”) and for the soft factors of the individual team member (i.e. the measure of the “request of space”).

This led to the definition of a qualitative model (Caccamese and Bragantini, 2013) that is synthetized in Exhibit 2, that shows the three spaces, their decomposition in subcomponents and proxies (shown in *italics*) for numerically measuring their values, either in the case of the space made available by the project (“offer”), or in the case of space requested by an individual working in the project (“demand”).

	Project		Individual
Motivational space	Challenge	<i>Innovation</i>	<i>Challenge</i>
	Reward	<i>Rewarding System</i>	<i>Reward</i>
	Satisfaction/Enjoyment	<i>Serendipity</i>	<i>Satisfaction/Enjoyment</i>
		<i>Learning</i>	
	<i>Exploring</i>		
Social space	Task space	<i>Standards</i>	<i>Inform of not completion</i>
		<i>Work acceptance rules</i>	<i>Punctuality in production</i>
	Maintenance space	<i>Open communication channels</i>	<i>Face-to-face interaction</i>
		<i>Punctuality at meetings</i>	<i>Trust</i>
		<i>Messages feedback</i>	<i>Meeting attendance</i>
Analytic/holistic space	Analytic/synthetic	<i>Amount of integration</i>	<i>Analytic/synthetic</i>
	Expansion/conservation	<i>Amount of reuse</i>	<i>Expansion/conservation</i>
	Quantity/quality	<i>Perceived value</i>	<i>Quantity/quality</i>

Exhibit 2 – Qualitative model of soft spaces

Motivational space

The model decomposes the motivational space according to the following taxonomy:

- challenge, that means that the drive for movement stays in the originality and hardness of the activity to be performed. This element is typically present in research and development projects;
- reward, that means that the drive for movement comes from the need that individual efforts or abilities are valued by some external subject, with either tangible (economical) or intangible (personal esteem) recognition factors;
- satisfaction/enjoyment, that means that the drive for movement comes from the ability to display and show individual abilities or knowledge, to enhance personal competences and to take personal control of the activity.

In this taxonomy, challenge is mainly associated to the phenomenon of intrinsic motivation, with some elements of extrinsic motivation, reward is associated to the phenomenon of extrinsic motivation, satisfaction/enjoyment is associated to the phenomenon of intrinsic motivation.

Proxies for the three dimensions of project motivational space were identified as follows:

- *Innovation*. Innovation may be defined and measured as the level at which the project environment fosters creativity and imagination for the development of new ideas based upon an existing process or product model;
- *Rewarding system*. Rewarding system in the project may be defined and measured by the existence of visible and structures recognitions in the project environment, be they either tangible (incentives, bonuses) or intangibles (praise, job security, recognition);

- *Serendipity*. Traditionally, serendipity discoveries are understood as accidental findings made when the discoverer is in quest for something else (Garcia, 2009). Serendipity in the project may be defined as the level at which the project allows to develop the attitude to discover something when looking for something else;
- *Learning*. Learning in the project may be defined as the ability for the project environment to make available opportunities for enhancing personal knowledge, for example through the exposure to Subject Matter Experts, or to regulatory and compliance constraints;
- *Exploring*. Exploring for the project may be defined as the level at which the project environment allows individuals to try and test, to look outside their boxes.

There is no need of identifying proxies for the three dimensions of individual motivational space: as far as the individual is concerned, they may be identified and scored without any intermediate.

Social space

The model decomposes the motivational space according to the following taxonomy:

- task space, that is the social cohesion behaviors space concerned with project tasks execution, be they either technical tasks or management tasks;
- maintenance space, that is the social cohesion behaviors space strictly related to individual socio-emotional attitudes that are integrated with project tasks execution.

Proxies for the two dimensions of project social space were identified as follows:

- *Standards*. Standards represent rules that the project establishes for tasks and deliverables;
- *Work acceptance rules*. Work acceptance rules represent explicit protocols, procedures or rules governing the process of the acceptance of deliverables produced by the project;
- *Open communication channels*. Open communication channels represent protocols or infrastructures that facilitate peer-to-peer communication among team members;
- *Punctuality at meetings*. Punctuality at meetings represent the value that the project attributes to the need for meetings to be attended and managed in respect of established timeframes;
- *Messages feedback*. Messages feedback represent the value that the project attributes to the need to close the communication loop opened by any team member.

Proxies for the two dimensions of individual social space were identified as follows:

- *Inform of not completion*. Inform of not completion may be defined as the attention the individual pays to the need to keep others informed about difficulties to complete tasks in the assigned timeframe; the same holds as far as the expectation from others' behavior in the same situation;
- *Punctuality in production*. Punctuality in production may be defined as the attention the individual pays to complete tasks by the expected date;
- *Face-to-face interaction*. Face-to-face interaction may be defined as the attention the individual pays to a direct and non-mediated interaction with others;

- *Trust*. Trust may be defined as the attention the individual pays to presence of reliability in human and professional relationships;
- *Meeting attendance*. Meeting attendance maybe defined as the attention the individual pays to the participation to meetings of diverse kinds.

Analytic/holistic space

The model decomposes the analytic/holistic space according to a taxonomy based upon the thinking model and priority of values:

- analytic/synthetic thinking model, that is the attitude to apply a model of thought oriented to linearity, reductionism, versus a model of thought oriented to non-linearity, holism;
- expansion/conservation value priority, that is the level of priority attributed to introduction of new components and procedures, versus conservation and integration;
- quantity/quality value priority, that is the level of priority attributed to volumes and numerosity, versus level of detail and finishing.

Proxies for the three dimensions of project analytic/holistic space were identified as follows:

- *Amount of integration*. Amount of integration may be defined as the level at which the project product or process implies integration with external “systems”;
- *Amount of reuse*. Amount of reuse may be defined as the level at which the project implies the reuse of product parts, production processes, methodologies or techniques;
- *Perceived value*. Perceived value may be defined as the level at which the project values deliverables according to their volume.

There is no need of identifying proxies for the three dimensions of individual analytic/holistic space: as far as the individual is concerned, they may be identified and scored without any intermediate.

The quantitative model

So far, a full qualitative model for soft spaces was developed in which a taxonomy was defined to decompose each single attribute into component sub attributes, and for each of them proxies were defined, where appropriate to determine their numeric value. The question at that point was whether the components of this taxonomy were or not equipotent. For example, “satisfaction/enjoyment” is a sub component attribute for motivation. Three further proxies were defined in the taxonomy, namely “serendipity”, “learning” and “exploring”: are they equally important in the measurement of the satisfaction/enjoyment? Rather, different weights apply to proxies in determining the extent of satisfaction/enjoyment? And, in turn, is “satisfaction/enjoyment” equally important as “challenge” and “reward” in determining the extent of motivation?

There was clearly the need to complement the qualitative model with relative weights applicable to the diverse subcomponents and proxies, so to transform the qualitative model into a quantitative model. Research showed no evidence of similar studies, therefore the decision was taken to involve a selected group of Subject Matter Experts to get their guidance and advice in determining the appropriate weights. Seven experienced Project Managers, Italian, four males and three females, most of them PMP certified and belonging to diverse industries, were involved in a process in which they were asked to execute

individually a pair wise comparison between the components and subcomponents of the qualitative model.

The individual results were collected and organized, and a full one-day workshop was executed to reach agreement among the individual evaluations. The results are shown in Exhibit 3, Exhibit 4, Exhibit 5 and Exhibit 6:

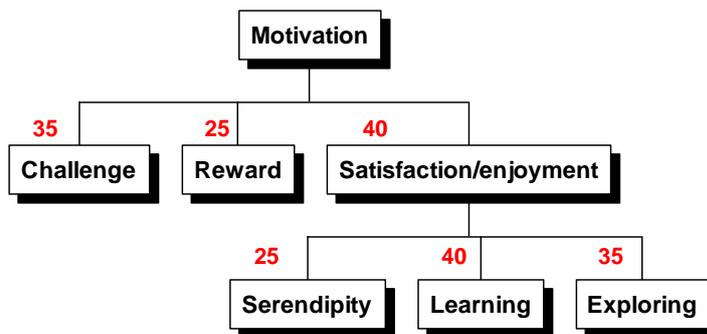


Exhibit 3 – Weights for motivational space

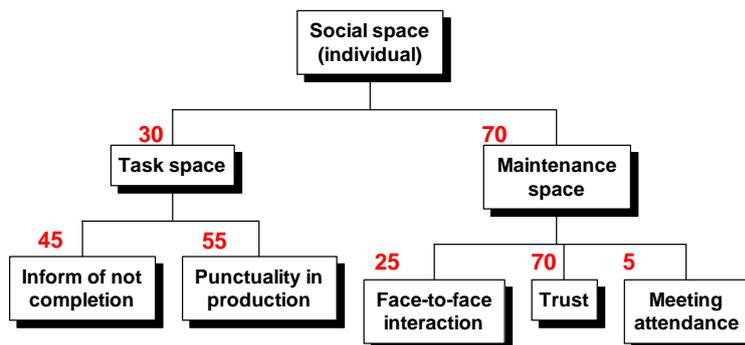


Exhibit 4 – Weights for social space (individual)

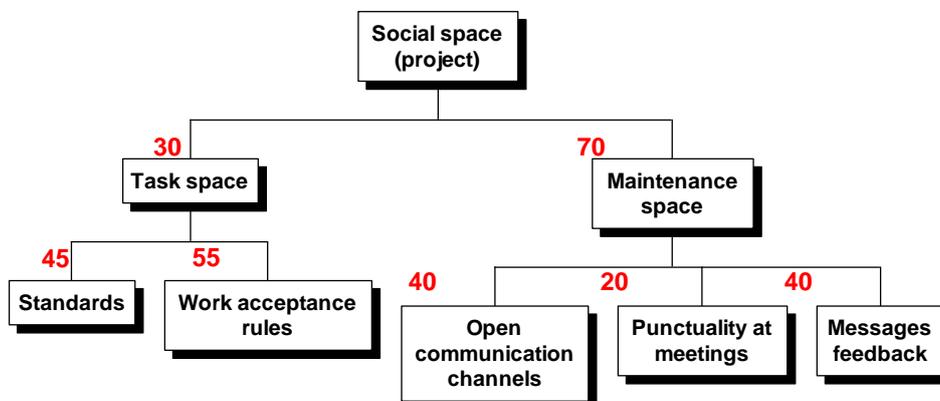


Exhibit 5 – Weights for social space (project)

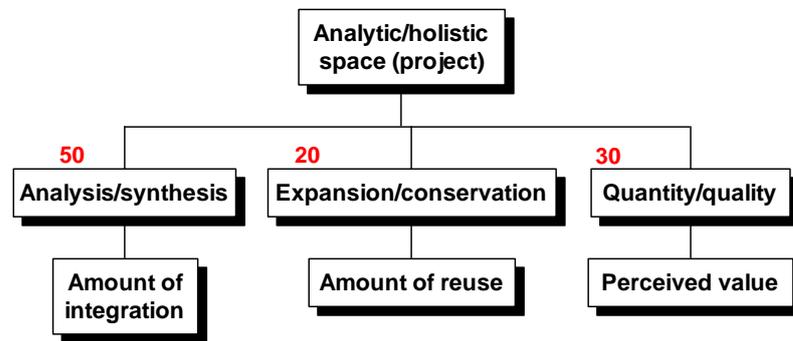


Exhibit 6 – Weights for analytic/synthetic space (project)

How to collect data for soft spaces offer and demand

The last effort stays in determining a viable method to assign a numeric value to the offer of soft spaces on the side of the project, and to assign a numeric value to the individual demand of soft spaces on the side of the individual team member.

The decision was taken to develop questionnaires made of statements representing the position of the project as a whole in front of the subcomponents and associated proxies were applicable. Having them available, the questionnaires can be submitted to a population of selected stakeholders of the project (for example, the Sponsor, the Project Manager, relevant Suppliers, Functional Managers), who can individually express their views, that in turn will need to be reconciled by the Project Manager to reach agreement. The questionnaires might be submitted for the project as a whole, or, where applicable, the analysis may be carried on for some of the relevant phases in which the project might have been structured. This might be useful to represent circumstances in which the level of soft space offers in the project may depend from diverse planned contingencies, for example task complexity, or involvement of specific suppliers.

Similarly, the decision was taken to develop questionnaires made of statements representing the position of the individual in front of the subcomponents and associated proxies were applicable. Having them available, they can be submitted to all team members planned to be involved in the project: each single team member, providing a position for the statements, will define the level of her/his demand for the specific soft space concerned. For organizations mature in Project Management, it would be advisable to involve a PMO in the collection and maintenance over time of the individual characteristics of organizational resources, that are very likely to be not very much dynamic, since they represent the intrinsic characteristics of the individuals predicated to work in projects.

A set of 121 statements to measure the project soft space offer, and a set of 99 questions to measure the individual soft spaces demand were preliminary developed, and the decision was taken to consult the Project Management community to get advice about the pertinence of each single statement with the characteristic it was designed to investigate. Besides personal and professional contacts of the Authors, the collaboration of two PMI Chapters, PMI Rome Chapter and PMI Southern Italy Chapter, was instrumental to reach an extended population of Project Managers who provided their viewpoint using a web-based survey. The survey registered a return rate of approximately 25%, an indicator of enthusiasm and cooperation from the population addressed. The survey related to the project soft space offer was completed by 216 individuals, and the survey related to the team member soft space demand was

completed by 167 individuals. Overall, most survey respondents were in the age 31-50, 75% male, 90% working in Italy.

From the analysis of survey responses, applying a value of 85% consensus as a threshold value to validate the pertinence of each single statement, it was possible to build the final questionnaires, that are now made of 63 questions to measure the project soft space offer, and of 74 questions to measure the individual team member soft space demand. Exhibit 7 displays an example set of questions for investigating the demand of “challenge” from the individual team member, a subcomponent of the motivational space demand:

team member: challenge	not agree	partially agree	mostly agree	totally agree
I like to try hard in unknown topics				
I am worried by unknown topics				
I feel scared by tasks requiring a high level of quality				
Deadlines? A nightmare!				
I prefer being excellent in my task rather than competing with others				
In my tasks I try to find relationships and similarities with my other experiences				
I work after hours if I like what I do				

Exhibit 7 – Example of questionnaire for investigating “challenge” for team member

Exhibit 8 displays an example set of questions for investigating the offer of “innovation” from the project, that is the proxy for a subcomponent of the motivational space offer:

project: innovation	not agree	partially agree	mostly agree	totally agree
This project involves well defined and known methods				
This project involves reference to innovative business models				
This project involves the application of new techniques, tools or platforms for product development				
The product of this project is "bread and butter"				
This project involves relationships with new and unknown suppliers				
This project uses a very conventional communication and collaboration system				

Exhibit 8 – Example of questionnaire for investigating “innovation” for project

Putting it at work

We have a model for soft spaces offer and demand, and appropriate questionnaires to collect data to measure both the soft space demand from any team member and the soft space offer from the project. As pointed out in previous research (Caccamese, Bragantini, 2012), this is the starting point to complement the well-known and coded activities of project planning and control, that are focused upon the “iron triangle”, with similar project planning and control activities focused on the “soft spaces”, to run a capacity planning and control for soft spaces in the project, so de-facto uncovering the “hidden pyramid”.

The following are few steps that might be put at work to execute the capacity planning and control for soft spaces:

- calculate the soft space offer from the project, basing upon the model, its taxonomies, proxies and relative weights. It is very important that the viewpoint of all relevant project stakeholders is taken into consideration. The calculation could involve the project as a whole if there is no perceived difference in the characteristics of the project environment throughout its life cycle. However, it could be executed for different time frames of the project life cycle, for example with reference to the phases in which the project is divided, when it is expected that the project context, in terms of soft space offer, changes from one phase to the other;
- for each team member, calculate the soft space demand, basing upon the model, its taxonomies, proxies and relative weights. These values are not expected to change during the project life cycle, since they are intrinsic of the individual and the duration of the project is short in comparison to the time needed by an individual to modify his/her individual request of soft space. Also, once the soft space demand is calculated for a specific team member, it should be stored for further usage in other projects that might involve the same individual: in this case the collaboration of a PMO might be instrumental;
- having available the scheduled presence of team members in the project, sum up the calculated soft spaces demand values for team member for periods of work;
- compare the offer and demand calculations to get an idea whether the project soft space offer can accommodate the cumulated team members’ soft space demand and in which periods of work. If there is an overload of request of demand (lack of capacity), this is a case for corrections, that might involve for example considering to change team members. Alternatively, the project manager can increase the offer of the project for one or more soft spaces, or level resources to obtain the right demand of soft spaces. No surprise that any change made to accommodate capacity and demand of soft spaces might have an influence to an already established baseline of hard spaces. For example, leveling resources to accommodate for soft spaces, might involve increasing the duration of the project. Note that, other from capacity planning for “hard factors” (like cost or time), lack of capacity does not mean that the project will fail to deliver on time and on budget, rather that the project will fail to provide team member with what they are looking for. The result of this should not be underestimated: disappointed team members are likely to be less productive, less oriented to quality, and eventually more oriented to leave the organization;
- repeat steps above at regular intervals of time or whenever contingencies of the project might require (for example when a project phase ends and before entering the new phase, or when there is a major change in the project), to assess whether the project can still accommodate the needs of team members.

Examples

Exhibit 9 shows a project where the project team is allocated flat either for the entire project or for a portion of the project life cycle (for example, a phase): in this example demand for motivation exceeds project capacity, then some intervention would be needed.

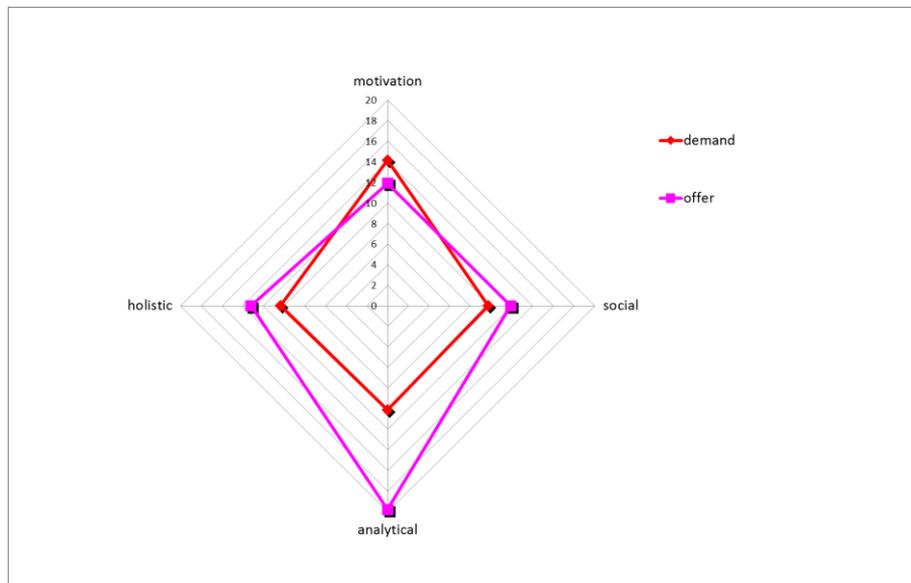


Exhibit 9– Example of an unbalanced project with flat team allocation

Exhibit 10 assumes that the project team is made of individuals whose allocation varies period by period, for example inside a phase of the project. In this case there are periods in the project schedule where the project is not able to accommodate the cumulative demand from the team members, then some intervention would be needed.

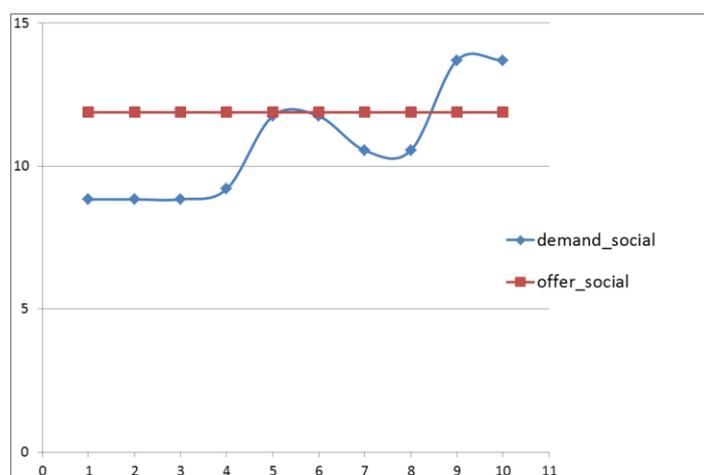


Exhibit 10 – Example of a partially unbalanced project with variable team allocation

Conclusions

Caccamese and Bragantini (2012) argued that the management of “soft” factors in a constrained environment (the “hidden pyramid”) should complement the traditional effort of managing “hard” factors in a constrained environment (the “iron triangle”), and that this should be reflected appropriately in project management methods and practices.

In this paper the authors presented a complete model that was defined to quantitatively deal with soft factors and to establish some sort of “soft factors” capacity planning and control, with the aid of appropriate questionnaires to be submitted to selected stakeholders and team members.

We believe that it is definitely time to move from the classical application of “soft skills” in Project Management, to a more structured approach by which the project manager should be able to properly balance the project, extending his/her approach to balanced and constrained optimization of “hard factors”, to “soft factors”, then uncovering and managing the “hidden pyramid”.

Further applied research is needed in the future to validate the many hypothesis made on taxonomies and proxies, to put in place and calibrate appropriate metrics, and eventually to integrate the model with some of the most popular project management tools.

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