Knowledge in projects:
a collection of insights for improving project performance through knowledge,
across the temporary dimension of projects

Introduction

Projects are the realm of knowledge. Every project is a unique and temporary adventure where current knowledge is unleashed, applied and transferred, whereas new knowledge is uncovered, shared and documented.

Projects and knowledge are strongly related: on the one hand projects should exploit current knowledge available within the project environment, for improving project performance. on the other hand projects should develop new knowledge throughout the project life cycle, to be used for carrying out the current project and to be reused for future projects.

The key assumption is that projects are unquestionably a dramatic source of knowledge. Every project offers many learning opportunities to generate knowledge and increase both individual competencies and organizational assets. However knowledge is too often not yet formally considered and well-managed like other project management topics, such as scope, cost, risk, schedule. This lack of focus leaves knowledge unaddressed decreasing the project value in terms of conformance to requirements, professional development, business results.

The term "project" is to be considered in the broad sense of term: it may refer to a stand-alone project, to a project as a part of a larger program, to a program by itself.

This collection of insights is aimed at addressing knowledge topics with respect to the unique and temporary dimension of projects.

Insight 1 - Knowledge: definition, types, application in the project environment

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1. Definition of Project Knowledge

"Project Knowledge is a dynamic combination of explicit artefacts, implicit patterns and tacit expertise, applied for developing options, taking decisions and implementing actions throughout the project life cycle".

This definition underlines the "contextual mix" of different types of K, to be used intentionally to achieve project objectives.

Four are the key features of an effective Project Knowledge (PK):

- contextual (tailored on project peculiarities),

- intentional (focused on project options, decisions and actions),

- dynamic (progressively elaborated and shared within the project environment),

- combined (based on different project cognitive elements).

From an epistemological perspective PK consists of three different types:

2. Types of Knowledge

- **Explicit (represented).** Explicit Knowledge (EK) is based on formal logics, codified, written, context independent, asynchronous (who produces EK doesn't know in advance if it will be used, when, by whom, in which way, it's hard to modelize, easy to communicate and transfer. EK must considered as a stock, as an "universal rule" for the entire community. An example of EK is the formula for computing the area of a rectangle (width times length). Other examples of EK are documented best practices, formalized standards, codified rules by which a customer order must be processed by the company, the official theory test for car drivers, the PMBOK® in the world of project management. EK: a) is already available before its use (i.e. criteria for structuring the WBS - Work Breakdown Structure to be included into the scope management plan), b) formalizes the progressive outputs, produced during its use (i.e. scope baseline, including WBS and WBS dictionary of the specific project), c) documents the final results after its use (i.e. formal documentation for accepted deliverables and user manuals of the new solution carried out by the project).

- **Implicit (embedded).** IK - Implicit Knowledge (IK) is a collective interpretation of EK in a specific context by a specific community that share a common goal. For example the community of car drivers is asked to put in action a collective IK for driving successfully in the traffic of a certain city at a certain time. Driving in the traffic of New

Delhi at rush hours is quite different than driving in the traffic of Zurich at midnight. IK is less collective and more dynamic than EK. IK resides in systemic routines, organizational culture, codes of conduct, ethics, social behavior, habits, social norms, heuristics. IK is a property of the system as a whole, rather than a personal feature of individuals belonging to the system. IK is a collective knowledgeable answer to a contextual challenge. It's an unwritten and unspoken agreement for coping with a shared situation or accomplishing a result together. For developing the WBS of a specific project, the project team, due to its composition, puts in action its own process and practices (IK), starting from the scope management plan (EK). If project constraints change (i.e. less planning time, lack of a key resource, more compliance with PMO standards) the project team changes its IK. If similar situations come into view, the same pattern of IK will be typically put in place.

- **Tacit (emboided).** Tacit Knowledge (TK) is personal in nature, subjective, intuitive, based on physical experiences ("flight time"). It's context dependent and emotional (beliefs, insights). It's a continuous flow, it's easy to protect, but hard to gain, tell, write down and transfer. TK bodily lives with the individual and is deeply embodied in it. Expert judgment is a classic example of TK, widely applied for managing a project. For example a senior specialist will troubleshoot a big problem based mainly on his/her experience, insights, intuition and secondly on codified standards. At the same time it would be quite difficult for him/her to translate his/her TK into a document (EK), to be shared with a junior specialist (the document is the top of the iceberg, the expertise is the iceberg). The amount of TK owned by an individual is directly proportional to the amount at stake (time, money, effort, trust) for replacing the individual. TK is fully contextual: it's might come to mind only against an intentional need of knowledge. TK might be shared through physical proximity, F2F interactions, learning by intrusion, observation, imitation, joint practices, but first of all through a real trust and willingness to live common situations closely together. TK is "in the doing". Refer to the famous example of TK used by Polanyi *"being able to recognize a person's face but being only vaguely able to describe how that is done"*. TK can't be articulated, it consists of a set of personal models, fully played, less told and more less written.

3. Application of K in the project environment

PK is an indispensable ingredient for project success, along two directions, upward and downward.

The upward direction refers to the use of PK for developing the new solution that must be carried out by the project. The new solution is a bridge between two states: the current state (as is) and the desired state (to be). The higher the gap, the more K is critical for supporting the planned breakthrough. The upward direction entails a path from TK to EK, passing through IK. The starting point is represented by project stakeholders, as the primary source of knowledge. Stakeholders existed before the project, and will exist after the project (hoping for a better condition). Project is hostage of stakeholders' knowledge (primarily the tacit one). Particularly when: scope is vague and instable; stakeholders are so many, miscellaneous, distributed; interests are divergent, all the worse if opposite; project is crowded with

knowledge workers; project entails big changes; recognition and reward systems are not K focused. Because of this the upward K challenge is *"fostering stakeholders to uncover and share their current tacit knowledge"*. How to? First of all activating IK through networking and CoPs. It entails actions such as: promote professional connections, manage CoP - Community of Practice as a project stakeholder, define a recognition and reward system that fosters K sharing. In turns creating a *"shared space for emerging relationships and a collective reflection, where K gradually becomes explicit"*. Physical proximity and figurative dialogue are the keys of conversion to EK. Tangible result is important (i.e. WBS), interactions more (i.e. How we create the WBS). It entails actions such as: define specific externalization patterns for key planning activities (i.e. Collect requirements, Create WBS, Identify risks), use narrative language and visual tools, form colocated teams and war rooms as needed.

The downward direction refers to the use of K created by the project. The new solution carried out by the project changes incrementally or radically the current situation of project stakeholders (i.e. end users, technical staff, business lines, final customers). The assumption is that project stakeholders are the final destination of the new EK produced by the project. Too often the project is the "project right" (conformance to requirements) but not the "right project" (achievement of business results). Project is compliant but not sustainable, due to a lack in managing the path from EK to TK, passing through IK. Because of this the downward K challenge is *"supporting stakeholders to internalize the new knowledge created by the project"*. How to? First of all focusing on the real applications of the new solution. That's to say which are the new heuristics (IK) put in place by project stakeholders (heuristics are experience-based techniques for problem solving and decision making; they don't provide the "optimum" but the "good enough" against a contextual project challenge) . It entails actions such as: organize facilitated workshops for translating end user manuals into a "rule of thumbs booklet"; observe how stakeholders use the new solution in their day-by-day life; share their "tricks of the trade"; focus on "vital few", despite "trivial many". In turns focusing on a TK from an user perspective (i.e. field force that must use the new sales application software). It entails actions such as: create private spaces where individuals can embody TK, developing a personal tacit understanding, foster on-site activities, "learning by doing", without worrying too much about time, mistakes and other people's judgements, run tailor-made trainings for different targets of end users, support them with coaching and mentoring, collect pros & cons on field, foster P2P meetings, support a trial-and-error approach.

4. The coexistence and conversion of K

Along the two directions (upward and downward), not necessarily PK must be completely converted from tacit to explicit and from explicit to tacit. A full conversion is very often useless and too costly, in many cases impossible. For example TK can be shared within a high-tech distributed team, without codifying it into formal best practices. The result is a more powerful team in terms of IK that could be put in place for carrying out high complex activities in different venues, with respect to the project baseline. Similarly only a part of IK owned by the team as a whole, could be formalized in the pages of WBS Dictionary, according to a sustainable cost/benefit ratio. Whereas PK must be managed at the same epistemological level (E-E; I-I; T-T), upward and/or downward along the K chain, specific models and techniques must be applied, within the K governance of the project. All the

activities of PK coexistence and conversion must be included in the project management plan, in order to be assigned, estimated and scheduled. The balance between coexistence and conversion of PK is also influenced by the EEFs - Enterprise Environmental Factors and the OPAs - Organizational Process Assets. For example in highly hierarchical organizations, where the formal dimension of work drives, the conversion to EK might be forced, also if not so indispensable for project success. On the other hand, in highly professionalized organizations (technocracies, upside-down pyramids), where the expertise drives, the necessary conversion to EK might meet blockers, due to resistances to convert TK and IK properties into organizational assets, without personal and/or community advantages.

5. Contact me

Comments, suggestions, disagreements are really appreciated. Please send them to tiziano.villa@pmlab.it or find me on Linkedin (tiziano.villa).

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