

Elevating Visibility of Project Management Knowledge: Artificial Intelligence (AI) may lead the way¹

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As a community, we agree that project management is the science and art of transforming an idea into its application.

- The scientific part of the project management method happens when it applies, in our case, to the development and implementation of a project management plan as intended. This part gets support from the application of scientific theories from Descartes, Euler, and Maxwell (Abdomerovic 2022, 6-12, 16-18, 36-41, 45-53, 60-64, 214-217)
- The art part of project management sociological conception happens when it applies, in our case, to changing a project management plan and living with consequences. This part gets support from classic social systems and actions (Parsons 1951), innovative views for individual and social behavior (Ackoff 1972), and early PMI's scientific conceptions (Adams and Campbell 1982; Cavendish and Martin 1982) and many contemporary views in the form of project management sociology on individual and groups having distinctive and evolving cultural and economic interests (Abdomerovic 2022, 13-16)

In more specific situations, the organized project management community may not agree on the approach to project management. Let's start with our usual routine.

As homeowners, can we recall how we planned our project, for example, the Garage Roof Repair? Yes, we can.

We write down the contents of the work to perform and the product to deliver.

- Describe or tell our understanding of the problem and expectation
- Get itemized the work to perform and the product to deliver with fixed-price quotes for the labor and material in the form of email, phone message, or verbal from two roofers, at least
- Select a roofer and negotiate the work to perform and the product to deliver
- Understand and accept roofer's promises in the form of email, phone message, or paperwork that describe the contents, timing, cost, quality, changes, and payments for negotiated work to perform and product to deliver
- Allow the roofer to work on garage roof repair as negotiated

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- Follow work development, accept and pay completed work as negotiated
We closely watch the work and product results during the warranty period.

That is how we talk with plumbers, painters, roofers, and other traders, which helps us reduce conflicts and risks that may arise in project development. During a period, most traders become our pre-selected choices for home improvements.

Can we use the above approach to plan a project of any size, for example, to manage the Residential Building Roof Construction? Yes, we can try, but there are options.

Work contents for any sizable project, on hardware, software, service, process, or information, cannot be defined and completed by heart. Yet, we have two options:

- Short-term management planning (SMP) is known as the Agile approach or the Continuous Delivery (Aguano 2013). It has the capacity to accomplish a negotiated segment of work that does not take longer than one month. Then, the Agile team focuses on the next segment of work negotiated for release. Sometimes, it leads to an unknown number of sequential segments and, consequently, to an unknown project completion date and cost.
It can apply for discrete production, mass production, or projects only if timing and cost to complete all segments of work cannot, or need not be specified, and the expected modification of accomplished segments of work is not expensive.
- Project management planning (PMP) is known as the Traditional approach. It has the capacity to plan and accomplish the whole project from start to completion.
It applies to any project since comprehensive planning minimizes changes to the planned timing and cost to complete project work.

For PMP, we must understand the fundamental and supplemental methods that help us define the contents of project work, relate the contents of project work, and follow up on the accomplishments of the project work.

- Fundamental methods have roots in well-known theories and the series of applied research, including their application to project management planning. Namely
 - Work Breakdown Structure, the primary method for analyzing project contents of work
 - Critical Path, the primary method for relating project contents of work
 - Feedback, the primary method for updating project contents of work
- Supplemental methods are rooted in general management knowledge and adopted for project management planning. That is
 - Assessment of requirements and conditions
 - Financing, Contracting, and Safety

- Quantity takeoff and Surveying
- Dealing with Time, Resources, Cost, Quality, Risk, Procurement, and Benefit
- Acceptance and Communication of a project management plan
- Payments, Changes, Claims, Legal issues processing, others

Let's consider the Residential Building Roof Construction. We must have the roof design and plan for a typical roof construction project.

- The roof design outlines a project explaining the type of roof, drawings, material, and work specifications. The process and contents of design are covered elsewhere, under the Thermal and Moisture Protection (Thomas, Scott and Clois Kicklighter 2022; CSI Master Format, Division 7, 2019, <https://www.csiresources.com>; Builders FirstSource, <https://www.bldr.com>; others)
- The roof plan results from PMP, an analytical setting for arranging the requirements related to roof construction. As mentioned above, we can develop the roof plan using the fundamental and supplemental methods and roof design. We specify and relate activities, present them in PDM (Precedence Diagramming Method), and load them at least with duration and weight factor derived from the total contract value. In continuation, we need to assess the activity's technological attributes (lead/lag time, resources, ...) and management attributes (status, progress, forecasts, ...) and use project management software (Oracle Primavera P6, Microsoft Project, ...) that help plan and perform project activities (Abdomerovic 2022, 18-67, 271-272, 296, 315-316).
- Roof construction is the implementation of roof documentation, where detailed roof design and roof plan are essential. There are other issues and documentation that must be ready for roof construction, as safety issues and procedures, pre-construction cautions and warnings, job site storage and material handling, installation details with definitive and flexible relationships, roof framing, sheathing, roofing, ventilation, flashing, gutters and downspouts, inspection, product coverage rates, work specification, and other technological (Carlisle 1995, 61-128) and management (Carlisle 1995, 1-7, 135-142) details of qualified databases and manuals.

The Traditional approach to PMP will not change soon; it is here to stay as a healthy framework for doing project business and beyond. Its ability to encompass all levels, from the top of the project management business to an activity performed by an individual, makes the traditional approach to PMP AI-ready. For example, Oracle Primavera Project Management is a tool that is integrated now with Oracle Cloud Financial Management, Procurement, Human Capital Management, Supply Chain and Manufacturing, and Enterprise Performance Management to ensure improved project implementation and financial efficiency (Oracle 2022).

Can we use a collection of project management systems “applicable to most projects” (Wideman 1991, IV-4; PMI 1996, 3; PMI 2017, 2; all editions between) to improve the Residential Building Roof Construction plan? Yes, the PMI Staff can.

For example, we can turn the PMBOK Guide into a practicum for project management planning and reduce the gap between the general collection of project management knowledge and practice if we consider this idea a project (Abdomerovic 2002; 2009).

- Relate the PMBOK Guide processes in terms of their inputs and outputs. What the PMBOK Guide says is that relationships between an input or output of a particular process and inputs or outputs of other processes of the PMBOK Guide are exposed. It results in a project management logic for the PMBOK Guide.
- Chronologically order the PMBOK Guide outputs/inputs. Using the project management logic of the PMBOK Guide, we can generate a chronological position for each input, output, or process identified in the PMBOK Guide. It results in a sequence of the PMBOK Guide outputs. Apply the sequence of the PMBOK Guide outputs as a template to develop or enhance a project management plan for the Residential Building Roof Construction.
- This results in a chance to do project management business, or its part, based on the specific PMBOK Guide Edition. Such an approach is a starting point to replace voluminous rhetoric with critical thinking about the PMBOK Guide Editions.

Can we look at a Futuristic AI to plan the Residential Building Roof Construction? Yes, we can. This general-purpose technology makes more straightforward use of existing knowledge.

The endeavor should not be a surprise; a project planner may

- Log into a project management database, if accessible
- Choose cost estimating database, then Roof Construction, if accessible
- Choose the link for design documentation, including bill of quantities, for the Residential Building Roof Construction, if accessible
- Chose the PDM logic template for roof construction, adaptable for Residential Building Roof Construction, if accessible
- Specify two phases for roof construction, the East Wing and West Wing, and an open overlap between phases to optimize the plan
- Run, analyze, modify, and accept the AI calculations for time, resource, and cost, if accessible
- Open online negotiation with a pre-selected roofing contractor

- Enter negotiated changes, then choose module Contracting, and accept the Contract, if accessible
- Monitor the site work with the roof superintendent from remote offices, if accessible
- Understand project status, progress, and forecast.
- Accept progress, approve payment requests, update project baseline and current plans, and initiate the changes, claims, and legal issues processing, if any.

Not bad, like online shopping! Futuristic AI management of the Residential Building Roof Construction looks much more straightforward than the Garage Roof Repair. It can be a reality if we employ AI technology to help deal with mature project business management documents, processes, databases, and software within a project or project-oriented enterprise. Such an AI role will most likely boost education, application, decision-making, and results for project stakeholders.

Recently, it was published that ChatGPT will impact project management. Among other insights, it will assist project managers in planning and executing projects by providing templates, checklists, and best practices. It can also help project managers create schedules, allocate tasks, and monitor real-time progress (Reid 2023, 4). It is excellent news, applicable to the Agile approach from day one (Kanabar, Vijay, and Jason Wong 2024, 189-358).

However, artificial intelligence technology follows the same input/output pattern as computer technology. Therefore, mature AI technology will not happen automatically for an actual project, certainly not before AI can access mature information within enormous collections of relevant knowledge and make it visible outside the organized project management community. It requires at least:

- Action on tagging the analytical and narrative documents of the project and programs enterprise-oriented management knowledge using a general classification code to improve information for PMP. For example, the Construction Specification Institute's codes can be added to project world-class collections of project management documents (Abdomerovic 2022, xxiv-xxv) and business intelligence documents (Pells 2013, 3-7, 13), making it easier to find specific information by AI (CSI MasterFormat 2019). Another industry-specific coding standard can make enterprise-oriented management knowledge visible to AI and connect with millions working on all phases and levels of the project and programs enterprise-oriented management.
- Action to use the PMBOK Guide to improve PMP for real projects and secure a qualified connection with AI technology. For this purpose, each PMBOK Guide Edition should expose its logic in the form of editable PDM templates. Besides, there should be action to enhance the inputs and outputs of templates by units of measure and relations to cost estimating databases, for example, the RS Means, that can help better estimate PDM activities or actual projects (RS Means 2022).

The more ability we have to reach specific AI-accessible project management knowledge, the more exposure and promotion we will get for particular project management documents and fewer unknowns we may expect. A continuous search for reaching and systemizing knowledge details and their attributes is the preamble to getting specific AI answers to a search question.

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