

The Future of Scheduling? *Scheduling Has No Future!*

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A few months ago, I was asked to speak to a national trade organization on “*the future of scheduling.*” I can understand why the question was posed to me, given my volunteer status as Managing Director of the Scheduling Excellence Initiative, a three-year undertaking by the Project Management Institute’s (PMI) College of Scheduling (CoS). They reasoned that, if any one person would have a finger on the pulse (and, hence, future) of the scheduling profession, it would be someone sitting in my seat. Right?

So, on and off, over a period of a month I pondered the question. The problem was that the more I thought about the question, the more certain I became that *scheduling*, per se, has no future whatsoever. Of course, this conclusion sent immediate surges of anger and annoyance throughout my body. After all, I have been a *professional scheduler* (whatever that means) for nearly thirty years. I have made my living, and sent my children to college, on earnings borne of Leroy ink sets, Chartpak tape, rolls of mylar, boxes of keypunch cards, countless trips to the nearest (often, not so near) computer center, Total Float printouts, monthly narratives, time impact analyses, Monte Carlo iterations, WBS, Earned Value, PDM, feasibility planning, etc.

My internalized ruminations on the question took me to the dictionary, where I looked up the definition of – oddly enough – cartographer: “a person who makes maps.” My curiosity next led me to look up cartography: “the art or technique of making maps or charts.” Finally, I queried Google about “careers in cartography,” and quickly learned that there is a new field called *geotechniques* that employs those with degrees and experience in Cartography.

Moreover, there apparently are numerous sub-disciplines within geotechniques, only one of which is cartography:

- Remote Sensing: Developing spatial and environmental data about the earth from data acquired by sensors located in satellites and aircraft.
- Geographic Information Systems (GIS): Inputting, managing, analyzing, and displaying computerized geographic data.
- Global Positioning Systems (GPS): Locating people, places, or things via satellite navigation.
- Photogrammetry: Deriving accurate topographic maps from aerial photographs.
- Topographical Surveying: Accurately measuring topographic features (roads, paths, houses, natural features) on the ground and plotting them on maps.
- Cartographic Design and Communication: Designing maps to effectively communicate their contained detail to the map user, including the use of color, symbolism, style, and other features.
- 3D Visualization: Converting spatial data to a virtual 3D image.
- Cartography: Generating maps for a wide variety of publication mediums, from paper to onscreen maps.

- Desk Top Publishing: Combining images and text together in a format ready for printing and publication.
- Web Design: Designing, generating and publishing material on the world wide web.
- Map Curatorship: Collecting, preserving, and promoting maps and spatial data.

As I read on, I learned that the singular label, cartographer (the origins of which go back centuries), has evolved into a set of related disciplines. For instance, while the *cartographer* position still exists in the new field of Geotechniques, many other specialties have emerged from this initial job title, including: computer mapper, GIS specialist, remote sensing analyst, hydrographic surveyor, land/geomatics surveyor, etc.

Both sweeping changes in the face of cartography as well as the extending reach of its functional tentacles were the direct result of exponentially expanding applications of the powerful science. Today, Geotechniques reflects a diverse listing of expertise concentrations that are not so much indicative of the knowledge necessary to *generate* the primary products of the Cartographer, as they are indicative of the broad spectrum of application for those cartographic products and services. This listing includes: computer science, biology, geography, physics, geometry, photography, ecology, graphic arts, forestry, engineering, community planning, transportation, military planning, environmental science, cartography, geodesy, industrial engineering, civil engineering, architecture, archeology, urban planning, agriculture, geology, medicine, aerial photography, economics, satellite imagery, meteorology, sociology, hydrology, manufacturing, and natural resource management.

Returning to the field of project scheduling, it struck me that the *project scheduling profession* has undergone a similar history of growth and evolution brought on, in no small way, by methodological and technological changes. In May of 2005, I spoke at CoS's Annual Conference in Scottsdale Arizona, and made another comparison, similar to the one above. I contrasted the parallel advancement of the temporal and financial fields. In the 1800s, if you were to step into a bank you would meet the "bookkeeper." Typically, he would be a male with reasonable competence in basic arithmetic, more task- than people-oriented, and possibly wearing a visor and a vest. His job would entail keeping records of deposits, withdrawals, loans, investments, and local market conditions. In short, he was the "money man."

Today, the field of finance has mushroomed into various groups of related disciplines. Under money management are career opportunities in portfolio management, investment advising, mutual fund analysis, and hedge fund trading. In the area of investment banking, career choices include mergers and acquisition, project finance, trading, derivatives, equity and fixed income research, international sales and emerging markets, public finance, stock brokering, institutional sales, and ratings analysis.

Commercial banking job opportunities include positions as credit analyst, loan officer, branch manager, trust officer, mortgage banker, teller, and such. In accounting, job options include auditing, budget analysis, financial accounting, management accounting,

taxation, and more. In corporate finance, careers choices include: treasurer, financial analyst, credit manager, cash manager, benefits officer, chief financial officer, capital projects manager, investment relations officer, controller, payables/receivables clerk, and yes ... bookkeeper.

These two comparative examples (cartography and finance) well highlight the first *observation* we can make with respect to modern project scheduling: it lacks sufficient labels to describe the many different functions performed by the professional scheduler. Before I leave this point, and move to the main subject of this article, I would like to mention that CoS's SEI is currently working on developing, or the first time in the history of the profession, a complete set of job titles and descriptions, intended to represent the vast array of roles played by the professional scheduler. If you would like to participate in an effort that promises to have relevance and impact for decades to come, go to www.pmicos.org, read about Project Roles, and then volunteer.

The second observation we can make with respect to the project scheduling profession is that the term *scheduling* is a very limiting descriptor. While cartographers still exist today, whether drawings maps by hand or with the aid of computers, they are a clear minority among those in the cartography field. Similarly, if we were to reserve the label *scheduler* to refer exclusively to the individual who *creates* schedules, then there are surely dozens of other functional roles that involve schedules in one form or another, which have no titles whatsoever.

This realization brings us to the other side of the same coin. Just as cartography is much more than the limited functions of a cartographer, scheduling is far more than the limited functions of a scheduler. To be sure, if I were to write this same article six months from now, after SEI has given us a definitive set of job labels and descriptions, the previous sentence would still be just as true. We might see labels such as scheduler designer, schedule developer, schedule analyst, schedule monitor, schedule auditor, feasibility planner, strategic analyst, schedule projectionist, schedule trainer, etc. The project scheduling profession involves the products and services rendered by a host of discrete skill sets, only one of which might be called a *schedule developer*.

This, of course, returns us to the second point: does the word *scheduling* adequately or best describe the suite of products and services performed by an array of project management professionals whose only common thread is a project schedule, in one form or another? Recall that the field of cartography re-engineered itself into the field of *geotechniques*. This new label would have made no sense even 100 years ago, when all that a cartographer did for a living was create and maintain maps. As technological and methodological advances permanently changed the landscape of the profession, the word *cartography* no longer qualified as a sufficiently descriptive label. I respectfully suggest that our profession is in dire need of a new, more descriptive label than *scheduling*.

You want to start a fight at any gathering of schedulers? Just ask this simple question: what's the difference between *planning* and *scheduling*. Then, stand back, and watch the sparks fly! In my role as SEI's Managing Director, I have sat through far too many

debates over these two terms, and I can report to you that there is absolutely no consensus among scheduling professionals as to what these two terms mean. I can assure you that there is as much support for the term *planning*, as a professional umbrella label, as there is for the term *scheduling*. In other words, maybe we are members of the project *planning* profession, as opposed to the project *scheduling* profession.

So far, in this article, I have addressed the question of scheduling's future from both an internal (to the profession) and somewhat semantic perspective. Now let us consider the same question from a functional perspective. For starters, I think I would get little argument about my third observation: that, prior to the advent of network scheduling,¹ there was no such animal as the professional scheduler. I looked up the word "computer" in an 1861 dictionary that I had found at a garage sale. The definition was: "one who computes." So, I guess prior to the advent of Critical Path Method (CPM) in the mid-20th century, a scheduler was "one who scheduled." But there was certainly no science, no art, no software, no formal methodology, no dogma, and no formal profession.

Today, the term *project scheduling* represents a set of functions that, because we do not enjoy adequate or consistent labeling, we tend to understand more intuitively than precisely. The term differs from region to region, industry to industry, or age to age. In recent decades, the broader discipline of project management, to which *project scheduling* is central, has experienced explosive growth. Riding that boom, the many practices of project scheduling are now performed in far more "*discrete application environments*" than ever before. The great challenge for the profession is to establish a set of best practices and functional guidelines that have relevance to a diverse customer base. Here is yet another opportunity for me to plug SEI, for it is working diligently at writing such best practices and guidelines. If you want to take a seat at the development table of this vital work, visit www.pmicos.org, read about the Scheduling Enhancement Series, and then volunteer.

The role of the scheduler, as well as that of scheduling (as a set of products and services), has certainly evolved since the days of arrow diagramming (ADM). But it isn't just a case of the profession reflecting changes in technology or methodology. There have also been dramatic changes in project management itself. As I look to the future, I see the very real possibility that Chaos Theory will make its way into the jobsite trailer, and completely change the project manager's approach to project oversight, coordination, planning, direction, control, and management. That change is taking place already.

I predict that the pendulum will swing back from the present-day Newtonian style of business management, which emphasizes component contribution, to one that stresses outcomes over approach. Sir Isaac Newton sought to explain nature through a decomposition process that broke larger elements into their smaller component parts. He reasoned that, if he could dismember an entity into its smallest parts, and if he could understand how those smallest parts worked, then he could re-assemble and understand the greater entity, across its layered levels of granularity.

¹ PERT (Program Evaluation and Review Technique) and CPM (Critical Path Method); both circa 1957-59.

In the latter half of the 19th century, the business world adopted this Newtonian view, structuring modern organizations along the same line of thinking. As a result, conglomerates are seen as being comprised of enterprises that, in turn, are comprised of corporations. Corporations are comprised of business units, and these are comprised of either product-oriented or function-oriented divisions. Such divisions are further subdivided into departments, and departments are subdivided into groups, and teams/crews, etc.

Then, in the late 1950s, along came network scheduling, the first real application of the recently invented computer to the world of project management. Suddenly, Newtonian theory could be taken even beyond the team/crew level, where it had previously stalled. It could now be further subdivided: into major deliverables, minor deliverables, activities, and even tasks (which collectively comprise a single activity). In the end, the infamous Work Breakdown Structure (WBS) became the epitome of Newtonian thinking.

The professional scheduler, intent on clinging to his/her arcane role in project management, further enhanced the *science* of project scheduling with developments in Precedence Diagramming Method (PDM), simulation planning, risk analysis (e.g., Monte Carlo), Earned Value, etc. And let us not forget the flagship technology itself, the *total float* value, and its by-product, the *critical path*.

Each of these innovations built on the unproven premise that to manage the smallest detail means to manage the greater entity. And so, activities would be “rolled up” into “hammocks,” and convenient Total Float and Earned Value statistics would suddenly represent the overall *health* of a project. Sir Isaac would be so proud!

At odds with this slow migration from the theoretic to the absurd were changes happening in academic centers with respect to the philosophy of management. Moving into the latter half of the 20th century, “*group think*” was becoming a respected concept. This management theory recognized that a group adopts a unique persona, distinct yet not always consistent with the collective consensus of its individual members (assuming consensus even exists). In the 1970s, the hot concept in management circles was *management by objectives*. This philosophy insisted that the destination is more important than the route. It anchored on a fundamental trust in the ability of management and labor to rally around a management-defined cause, and “get the job done,” without the need for micro-management of every task.

By the 1980s, computers were not only present in every major company, they were radically changing the very essence of project management. A new field, Information Technology, was necessitated to handle the vast amounts of data inundating Management (including the project manager) on a daily basis. [Note: One of the folks with a shovel in his/her hand, burying the project manager in quite often, useless data, was the project scheduler.]

The role of the project manager was changing, as well. Projects were getting larger and more complex. Deadlines for completion were becoming shorter, often unrealistically so.

With ever-present mounds of data everywhere, suddenly everyone wanted to *know* something. All too often, the project manager found himself more in the business of *reporting* the project than in *managing* the project. So did the project scheduler – find himself in the business of *reporting* the project rather than *understanding* the project.

“Out of control” is the best words I can find to describe the current state of our profession. On the technological front, those with vested commercial interests continue to push for greater and greater granularity. The most recent trend in scheduling software, operating under the banner *enterprise project management*, is one that pushes at both ends of the spectrum simultaneously. At one end, such software drills even deeper below the activity level, insisting that each activity be further subdivided into contributing resources, specialized calendars, intricate coding, and more. At the other end of the spectrum, enterprise software insists that all of the projects of an enterprise can be amalgamated into a single monstrous database. They assure us that this *megabase*, to coin a term, will allow management at the highest level to know the most minute details at the lowest level. To this I say, *poppycock*.

Even if current technology is capable of such amalgamations (about which, I think the jury is still out), it is questionable whether the Essential Computer behind this ambitious attempt (the human brain) is capable of making meaningful use of this megabase. More significantly, though, the direction being taken by technology and methodology innovators alike is traveling in the opposite direction to that of the modern sciences of psychology, sociology, and organizational behavior. Specifically, Chaos Theory beseeches Management to empower the individual, as well as the smallest organizational clustering of such individuals.

My prediction is that, in the not too distant future, something similar to Management by Objectives will find its way back into acceptance in the project management world. For one reason, there is simply too much *project* for today’s project manager to micro-manage. For another, the business culture has changed, and iron-fisted, table-pounding managers are safely sealed in the museum vault. Today’s managers know to lay out *objectives*, give the team sufficient latitude to improvise a strategic and tactical plan, and then ... leave the room. The “project team” is then free to bring to the problem its collective creativity, imagination, intuition, experience, and passion, necessary to innovate a unique solution – one far better than what a sole project manager might develop in the vacuum of his cluttered, phone-ringing, email-flashing, autocratic perch.

Viewed from the perspective of increasing project complexity and changing management culture, tomorrow’s project manager’s primary job will be to ride shotgun, clearing the path while other team members, closer to the front line of scope production, pound out the details of approach, deadlines, and methodology.

And where does that leave the scheduler or, more to the point of this article, *scheduling* (as a vital component of project management)? My prophecy is that the progeny of today’s schedulers will be called *Project Facilitators* and the broader discipline will be called *Project Facilitation*. The overall role will still be as it is now, to assist project

management, but they will do so by providing products and services that facilitate project performance. Those products and services may well include planning, scheduling, analyzing, monitoring, reporting, forecasting, and -- *facilitating* itself.

Before I close, let me give you an example of Facilitation as a functional discipline. Imagine a coordination meeting in a construction jobsite trailer. Around the table are Superintendents for each of the key subcontractors as well as for the general contractor. In front of each participant is a laptop computer and all of the computers are linked together in a LAN configuration. Like an interactive computer game, the effects of what one participant types on his screen are instantly seen on all other screens.

Now, imagine project management software that incorporates project visualization, schedule data, cost data, resource data, and project objectives and goals functionality. The purpose of the meeting is to coordinate the next week's activities. And so, the process plays out. The Project Facilitator starts by asking if Wall Framing can begin on the second floor. The drywall superintendent "erects" the walls, using his keyboard, but the software responds, automatically, by indicating that (a) ductwork is being stored on the floor where the walls are to go and (b) that the drywall crew is behind schedule on the first floor. The software suggests that days will be lost before construction of walls can commence.

The electrical subcontractor, seeing that the walls won't be in place for another four days,² suggests that he can move to the mechanical room on the roof and do some equipment runs. Suddenly, the mechanical subcontractor realizes that he is about to have company in the mechanical room where he has been the sole occupant. In response, he then "moves" his work force to one end of the mechanical room, thereby allowing the electrical team to work at the other end. (What each of the meeting participants 'sees,' are three-dimensional, or virtual, images created by the software.)

You get the idea. By using the power of computers to provide instantly available and relevant information to those who are about to perform the work, the emphasis can be placed on finding creative solutions to the daily challenges posed by ever-changing projects.

In this light it is easy to see just how outdated, and essentially weak, are our current methods of management, using the traditional critical path reports. The current technology has project managers sitting before those same project superintendents, and reciting Early Finish dates and asking if they will be met, or why they were not met.

To be sure, some of the same discussions as above may be held verbally, but the singular purpose of such discussions, in the current Project Management model, is to assess the status of the work, and coordinate field activities. Even so, "coordination," under this model, amounts to little more than noting what "should have been done," what "was done," and what "can still be done." Non-negotiable is the order of events, the dependencies, the priorities, etc. In this sense, little has changed from the days of the

² And, therefore, that they cannot commence installation of in-wall conduit.

Pyramids. Management lays out directives, down to the day (or even hour), and labor must dutifully follow.

There is no sense of ownership of the problems by those responsible for performing the work, only finger-pointing designed to shift blame elsewhere. Meeting minutes, and not a clever solution to the problem at hand, become the main *product* of the meeting. During the meeting, words are skillfully couched and positions are cleverly crafted. Finding solutions to problems takes a back seat to relocating the goal posts.

Those of you who work in project management on a daily basis are nodding your heads in agreement as you read my words. Why? Because I describe it the way it is. Common sense says to me that things will not stay this way much longer. There will come a time, I think sooner than later, where the standoff between project management and project documentation (for legal purposes) will end. It must! Right now, neither legitimate end is served. Schedules built primarily for the courtroom are worthless to run the project. Schedules built primarily to solve ongoing problems will bury its contributors in the courtroom.

There is only one solution to this quagmire that I can think: two schedules. Surely requiring a dramatic change in project management and claims culture, I respectfully suggest the acceptance of two equally legitimate scheduling documents: the Barometer schedule and the Facilitation schedule. To understand the rationale, think of the difference between a thermometer and a thermostat. One reports the current temperature while the other (which, incidentally, uses a built-in thermometer) regulates the current temperature. While the temperature may change on the thermometer, the temperature “setting” on the thermostat does not.

To be certain, my proposal of a departure from the concept of a single Project Schedule is radical. Instead, each project would have two schedules. The Barometer Schedule would reflect the overall scope, timing, and approach to the project work. It would only change in response to formal scope changes, or the traditionally accepted justifications for major schedule revisions. By contrast, the Facilitation Schedule would be free to reflect contemporaneous adjustments in approach, meant to respond to corresponding changes in project conditions. The Facilitation Schedule would be exempt from use in a legal or contractual context to prove delay, except to reflect the collective, contemporaneous wisdom and intentions of the parties to facilitate project outcomes.

In closing, I see the role filled by today’s scheduler eventually being replaced by that of a Project Facilitator, working as the right hand of the project manager to foster solutions to project challenges, and to facilitate coordinated, purposeful, and positive direction in work prosecution.

If this vision comes to fruition, then the field of *Project Facilitation* will overtake the field of *Project Scheduling*. Likewise, the role of scheduler, already an overworked and rather meaningless label, will go the way of scheduling. If this is what happens, then the

answer to the question posed to me a month ago would have to be: *scheduling, per se, has no future.*

Obviously, I am playing with semantics again. The essential relationship between project manager and his/her key assistant (whether you call him/her a scheduler or a facilitator) is the same. The essential goals of the profession will not change, even if the tactics, labels, and methods do.

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Mr. Woolf is a Senior Executive Consultant with Long International. He has over 27 years of project management, project controls, training, consulting and expert witness experience. He spent the early part of his career providing project management and project controls services on over 125 projects worldwide, with combined value estimated at around \$28 billion.

In time, frequent writing and speaking provided opportunities to perform a variety of consulting services to the construction community in Florida and Washington DC. He guided his clients' successful implementation of Program/Project Management processes, including: Enterprise Project Management, Project Portfolio Management, Risk and Opportunity Management, Quality Assurance, Scope & Change Management, Communications, Cost, Organizational Development, Professional Training/Development, Contracts, Claims and Performance Measurement.

In addition to his responsibilities within Long International, Mr. Woolf also serves as Managing Director of the PMI College of Scheduling's *Scheduling Excellence Initiative* (SEI). The College of Scheduling is "the only worldwide organization dedicated solely to advancing the techniques, practice and profession of Project Scheduling," to quote its parent organization, the Project Management Institute (PMI). Operating within PMI's College of Scheduling, of which Mr. Woolf is a charter member, SEI's ambitious goal is to establish, for the first time ever, an authoritative context for the practice of professional planning and scheduling, including standardization of terminology, methodology, and philosophy, improved scheduling software, court-recognized professional standards, improved collegiate coursework, and an innovation incubator for emerging technologies.

Mr. Woolf bears ultimate responsibility for the collective efforts of approximately 200 of the world's leading experts in project initiation, project management, project planning, project scheduling, project management software, scheduled-based claims analysis, and project management training, education, and research. He has assembled experts from nearly twenty discrete "industries" that successfully and routinely employ Project Scheduling tools, techniques, methodologies, and personnel.