Tools of the Trade: A Survey of Project Management Tools

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Abstract

In contemporary computing environments, project managers have been supplied with tools to assist in their project management tasks. This paper reports the results of a nationwide survey of 1,000 randomly selected members of the Project Management Institute. The results include the identification of tools used, level of use, types of uses, satisfaction with the tools employed, level of training received, and adequacy of the tool's use. The respondents not only listed traditional project management tools, but also several nontraditional tools. In general, project managers seem to be satisfied with the tools available.

Keywords: project management tools; project management software; satisfaction

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For carpenters, it is a hammer. For pilots, it is an instrument panel. For surgeons, it is a scalpel. These devices represent a primary tool of the trade for their users. Tools of the trade are those vital instruments without which completion of the tasks required for the job would be very difficult. In attempts to better serve the users of the tool, new features or enhancements are introduced periodically. However, sometimes these "improvements" can have unanticipated consequences, either negative or positive. For example, several versions of ergonomically improved hammers have been produced, but without successful adoption. When digital capabilities with specific, numeric displays were introduced into the cockpit of airplanes, pilots, who were accustomed to simply being able to scan their analog instruments, had to rethink the way in which they assessed their environment and physically "lock on" to the digital information. On the other hand, the introduction of lasers as surgical instruments has revolutionized the surgeons' job.

Virtually every profession has what would generally be regarded as special "tools of the trade," and project management is certainly no exception. A number of individuals have stated that the key to effective project management is the ability to track and control the progress of system projects (Rook, 1986; Zmud, 1980). Considering that many, if not most, projects are composed of hundreds of interrelated tasks, trying to track and control all those tasks effectively turns into a management nightmare. Therefore, using a computerized project management tool has become essential to achieving the requirements of effective project management (Moder, 1994; Shenhar & Laufer, 1995; Weil, 1986). Yet, we must be ever mindful that "improvements" in these tools should yield positive consequences for project managers, and therefore such "improvements" should be reevaluated periodically.

This paper presents the results of a nationwide survey (see Appendix) of project managers who provided insight into their "tools of the trade," along with assessments of satisfaction, training, and use made of these tools. A discussion of each element is presented, followed by a conclusion regarding the current state of project managers' tools of the trade.

The Survey

A nationwide survey was sent to almost 1,000 project managers. These individuals were randomly selected from the membership of the Project Management Institute (PMI) and represented a cross-section of the entire United States, many different industries and varying

PM Tool (*Developer*)	Percentage of Respondents Listing Tool
Microsoft Project (*Microsoft Corporation*)	48.4%
Primavera Project Planner (*Primavera Systems*)	13.8%
Microsoft Excel (*Microsoft Corporation*)	8.5%
Project Workbench (*Applied Business Technology*)	8.1%
Time Line (*Time Line Solutions*)	6.1%
SureTrak (*Primavera Systems*)	5.3%
CA-SuperProject (*Computer Associates, Int'l.*)	2.8%
Project Scheduler (*Scitor*)	2.8%
Artemis Prestige (*Lucas Management Systems*)	2.0%
FasTracs (*Applied Microsystems*)	2.0%

Table 1. Top 10 Project Management Tools

company sizes. The accompanying cover letter asked the participants to complete the survey only if their primary job responsibilities included project management. A total of 159 responses were received, representing a response rate of 16.3%.

The participants were first asked to provide various demographic information. The respondents averaged 10.4 years of project management experience and 12.4 years of experience in the field of information systems. The vast majority of participants worked for companies described as focusing either on engineering or software development, while a much smaller percentage worked for companies that focused on hardware, or were either retailers or wholesalers. The types of projects these participants either participated in or managed within the past three years were primarily for in-house use, commercially contracted, or directly marketed to external customers. The participants also indicated that a larger number of projects were worked on in the past three years with a calendar duration of six months or less, but considerably more time was expended managing those projects having a duration of greater than six months.

Next, the respondents were asked to identify as many as three computerized project management tools that they were currently using or had used within the past three years. For each of these tools the respondents were asked to list the primary use made of these tools and their level of satisfaction with the tools. The respondents were also asked to indicate (1) how much training, if any, they had received on the use of the tools, and (2) what was the perceived adequacy of this training. Lastly, the respondents were asked to indicate how much use they actually make of the tools, both with respect to the number of months the tools had been used and the number of hours per week each of the tools was used. The respondents also provided an indication of the perceived adequacy of this amount of use.

The Tools

A quick review of both the literature and the market indicates that there are many computerized project management tools available and the survey conducted confirmed those findings. The respondents generated a listing of 70 unique computerized project management tools that they were currently using or had used within the past three years. Ten of these tools were identified by almost 75% of the respondents, and therefore, subsequent analysis was limited to these top 10 choices. The top 10 most frequently listed tools and their relative percentage of respondents using those tools are shown in Table 1.

Clearly, Microsoft Project is by far the most frequently used computerized project management tool on the market today. This is consistent with previous surveys of project management tools (Levine, 1995). Levine

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Type of Company		Artemis Prestige	CA-Super Project	FasTracs	MS Excel	MS Project	Primavera Project Planner	Project Workbench	Project Scheduler	SureTrak	Time Line	Total
Software	#	2	3	1	4	36	4	11	1	2	2	66
	%	3.0	4.5	1.5	6.1	**54.5**	6.1	*16.7*	1.5	3.0	3.0	100%
Hardware	#		1		2	11		3		1	1	19
	%		5.3		10.5	**57.9**		*15.8*		5.3	5.3	100%
Engineering	#	2	3	4	16	52	22	1	5	11	11	127
	%	1.6	2.4	3.1	12.6	**40.9**	*17.3*	0.8	3.9	8.7	8.7	100%
Retail	#				2	9	2	6		2	3	24
	%				8.3	**37.5**	8.3	*25.0*		8.3	12.5	100%
Wholesale	#		1		1	8	1	2			1	14
	%		7.1		7.1	**57.1**	7.1	*14.3*			7.1	100%

Legend: **1st** *2nd*

Table 2. Project Management Software by Type of Company

contributed this leap to the top of the project management software sales to Microsoft Corporation's marketing and leveraging skills rather than the superb nature of the product, and comments that Microsoft Project is "far from being the perfect project management software package." Regardless, it remains the most widely used tool.

The second most widely used project management tool, as indicated by the survey, is Primavera Project Planner (also known as "P3") from Primavera Systems. This is considered to be a high-end tool, retailing for several thousand dollars and providing significantly more capability than a low-end tool such as Microsoft Project.

It is interesting to note that the next most widely used tool marketed specifically as a project management tool, ABT Project Workbench, was actually listed by fewer respondents than Microsoft Excel. Evidently, project managers do not rely solely on software packages specifically designated as project management tools, but consider a variety of other general-purpose software tools such as spreadsheets as part of their menagerie. Other nontraditional project management tools that were mentioned by the respondents include word processing packages such as Microsoft Word and WordPerfect, presentation packages such as Microsoft PowerPoint, and database packages such as Microsoft Access.

A cross-tabulation of these top 10 project management tools in relation to the types of companies for which the participants work is shown in Table 2.

Table 2 shows both the number of users and relative percentage by tool and company type and indicates that Microsoft Project consistently is the tool of choice across company types. The second most frequently selected tool is Project Workbench for all types of companies except engineering. Engineering firms prefer Primavera Project Planner considerably more often than Project Workbench, and actually rank Project Workbench as the least used tool.

A further analysis compared which project management tools were used with respect to both the number of projects worked on having a calendar duration of either less than six months or greater than six months, and the relative percentage of time spent working on the projects. This cross-tabulation is depicted in Table 3.

As indicated in Table 3, it is interesting to note that three tools—Artemis Prestige, Primavera Project Planner, and Project Scheduler—are used more often for long-term projects (greater than six calendar months duration) than short-term projects. The other seven tools are chosen more often for smaller-scale projects.

The respondents also were asked to indicate the percentage of time they used each tool compared to all tools listed. This is essentially a measure of exclusivity of use. This measure is listed in Table 4, in descending order of exclusivity. These results show that project managers who listed that they used Project Workbench, for example, use that particular tool 72.3% of the time, and use other project management tools 27.7% of the time.

In an open-ended question, the respondents were asked to indicate the primary use(s) for which they used each project management tool they had listed. A variety of responses were provided, which are summarized in Table 5.

It appears that project managers use all of the project management tools for essentially the same basic functions: planning, scheduling, tracking, and controlling their projects. Project managers also use the tools to varying degrees for budgeting and analysis.

Satisfaction With the Tools

The respondents were asked to rate, on a 5-point Likert scale, their satisfaction with each of the project management tools

Project Duration		Artemis Prestige	CA-Super Project	FasTracs	MS Excel	MS Project	Primavera Project Planner	Project Workbench	Project Scheduler	SureTrak	Time Line	Total
< 6 mos.	#	1	4.9	2.4	6.9	8.5	5.1	4.2	5.7	7.4	7.4	6.85
	%	12.4	51.7	13.0	31.7	21.7	27.2	28.3	16.3	40.8	40.8	25.9%
> 6 mos.	#	3.4	2.3	2.0	5.8	5.4	6.3	3.1	22.5	5.0	5	5.65
	%	87.6	48.3	87.0	68.3	78.3	72.8	71.7	83.7	59.2	59.2	74.1%

Note. Average number of projects and average percentage of time worked on projects.

Table 3. Project Management Tools by Project Duration

PM Tool	Exclusivity
Project Workbench	72.3%
Microsoft Project	58.6%
Project Scheduler	50.1%
Microsoft Excel	47.5%
Artemis Prestige	45.0%
Primavera Project Planner	37.4%
SureTrak	32.7%
Time Line	29.9%
CA-SuperProject	28.7%
FasTracs	11.0%

Table 4. Exclusivity of Project Management Tool Use

listed (a rating of "1" indicates a lack of satisfaction and a rating of "5" indicates excellent satisfaction). Satisfaction was measured using Doll and Torkzadeh's (1988) 12-item User Satisfaction Instrument. This instrument provides a measure of overall satisfaction, as well as a measure of satisfaction pertaining to each of five specific elements: content, accuracy, format, ease of use, and timeliness. The average satisfaction scores for each of the top 10 most frequently listed project management tools are shown in Table 6, in descending order of overall satisfaction.

Clearly, the most widely used project management tools are rated above average (an average rating is 3.0) both in overall satisfaction and for each of the five elements (the one exception being the ease-of-use rating for Artemis Prestige). Therefore, it appears that project managers are reasonably satisfied with the currently available selection of project management tools.

Training on the Tools

The respondents also provided an indication of how much training they received on the tools that they listed, as well as a measure of the perceived adequacy of this training. The measure of perceived adequacy of training on the project management tools was based on a 5-point Likert scale, with a "1" indicating totally inadequate and a "5" indicating totally adequate. Table 7 shows, in descending order, the average number of hours of training received on the 10 most frequently listed project management tools and the respective measure of perceived adequacy of this training.

Several respondents reported that they had received no training on the use of a particular tool and subsequently did not report a measure of perceived adequacy of that training. Other respondents reported that they had received no training on the use of a particular tool, but subsequently did provide a measure of adequacy on the training, or lack thereof, on the tool. For example, every respondent who listed FasTracs reported that they had received no training on the use of the tool. However, several of these respondents rated the adequacy of the training, or lack thereof, which resulted in a mean score of 3.0. Overall, both measures of the perceived adequacy of training were above an average rating of 3.0, and thus it appears that project managers consider the training they receive on the use of the project management tools to be reasonably adequate.

Considering that several project managers reported a measure of perceived adequacy of training even if they had not received any training, a further analysis was conducted comparing the adequacy of training scores on those participants receiving training, regardless of how

PM Tool	Primary Use(s)
Artemis Prestige	Multiproject planning and tracking; scheduling resources; cost analysis
CA-SuperProject	Small and large projects; scheduling; tracking and planning; training
FasTracs	Small projects; presentations; quick Gantt charts; scheduling analysis
Microsoft Excel	Budgeting; cost analysis; variance analysis; tracking and reporting; work breakdown structures (WBS)
Microsoft Project	Small, medium, and large projects; control and tracking; detailed scheduling; early project planning; communication; high-level planning; Gantt, CPM and PERT; planning, analyzing, tracking, reporting; total project management; "everything"
Primavera Project Planner	Large, complex multiproject environments; planning, scheduling, resource allocation, control; build overall detailed project plan; critical path analysis; client requested, corporate standard
Primavera SureTrak	Single and multiple projects—small, medium, and large; project scheduling, resource allocation, control
Project Scheduler	Multiprojects; scheduling, resource management, budgeting, tracking
Project Workbench	Small, medium, and large projects; planning, estimating, scheduling, analyzing, tracking, reporting; WBS, Gantt, resource utilization
Time Line	Small- to medium-sized projects; planning, tracking, and scheduling

Table 5. Primary Use(s) Made of Project Management Tools

PM Tool	Overall	Content	Accuracy	Format	Ease of Use	Timeliness
Project Scheduler	3.93	3.9	4.3	3.9	3.2	4.4
Primavera Project Planner	3.91	4.1	4.3	4.0	3.2	3.9
Project Workbench	3.90	3.9	4.3	3.8	3.5	4.1
Microsoft Excel	3.88	3.8	4.3	4.0	3.8	3.6
Primavera SureTrak	3.79	3.7	4.1	3.8	3.2	4.1
CA-SuperProject	3.75	3.8	4.3	3.8	3.0	3.8
Microsoft Project	3.64	3.5	3.9	3.6	3.6	3.8
Artemis Prestige	3.33	3.6	4.0	3.3	2.0	3.5
FasTracs	3.33	3.3	3.5	3.6	3.4	3.0
Time Line	3.24	3.0	3.5	.3.2	3.2	3.6
Total	3.70	3.6	4.0	3.7	3.4	3.8

Table 6. Satisfaction With Project Management Tools

little, to those participants who did not receive training. Levene's (1960) test for equality of variance indicated that the variances were significantly different ($s_{training}$ = 3.48, $s_{no\ training}$ = 2.67, F = 25.09, p = .000). A t-test assuming unequal variances resulted in a significant t value of –3.65 (df = 86.42, p = .000), which confirmed this finding. Thus, obtaining even minimal training on the use of project management tools has a significant impact on perceived adequacy of training. Not surprisingly, the number of hours of training received and the perceived adequacy of this training were found to be significantly related and positively correlated. In other words, the more training, the better.

Additionally, the relationship between the measure of satisfaction with the project management tools and both the number of hours of training received and the perceived adequacy of this training was examined. Strong relationships were found in each case, and thus it appears that by obtaining training on the use of a project management tool, the project manager's overall satisfaction with that tool is increased.

Use of the Tools

As a final measure of the perceived adequacy of the project management tools, the project managers were asked

PM Tool	Hours Reported		
	Excluded		Included
	Average # of Hrs	Average Adequacy	Average Adequacy
Primavera Project Planner	31.00	3.53	3.60
Project Workbench	28.92	4.08	3.82
Project Scheduler	24.00	4.33	3.50
CA-SuperProject	16.00	3.00	2.50
Microsoft Project	13.61	3.41	3.13
Artemis Prestige	12.80	2.80	2.80
Microsoft Excel	11.43	3.29	3.20
Primavera SureTrak	9.71	3.29	2.82
Time Line	4.00	3.75	3.13
FasTracs	0.00	NA	3.00
Total	18.02	3.48	3.21

Table 7. Training on Project Management Tools

PM Tool	# of Mos.	# of Hrs/Wk	Adequacy
FasTracs	39.80	1.25	5.00
Artemis Prestige	45.40	6.50	4.40
Microsoft Excel	43.78	13.00	4.39
Project Workbench	38.05	9.35	4.35
Primavera Project Planner	42.62	11.63	4.14
CA-SuperProject	31.29	5.80	4.00
Project Scheduler	24.14	11.83	4.00
Primavera SureTrak	13.23	4.15	3.85
Microsoft Project	24.49	6.06	3.83
Time Line	43.54	5.10	2.90
Total	30.81	7.51	3.96

Table 8. Amount and Adequacy of the Use of Project Management Tools

to provide an indication of how much use is made of the tools and the perceived adequacy of this use. The respondents provided both a measure of duration (how many months the tool had been used) and intensity (how many hours each week the tool is used). This information, along with the measure of perceived adequacy of use, is summarized in Table 8. The project management tools are listed in descending order of the measure of perceived adequacy of use.

As Table 8 indicates, the project managers provided an above-average rating of the adequacy of use made of the tools. Additionally, a significant and positive correlation was found between the number of hours per week the tools were used and the perceived adequacy of this use. In other words, the more time spent using a project management tool, the higher the perceived adequacy of this use. Thus, it appears that project managers are indeed quite comfortable with the perceived adequacy of the use being made of the currently available project management tools. Generally, project managers had used the tools for at least one year, and often for several years. On average, project managers use the tools for the equivalent of almost an entire eight-hour workday each week.

Conclusion

This survey of project managers provides important insight into the project management tools currently being used by the profession. The survey confirms that there are literally dozens of project management tools on the market. However, the majority of project managers surveyed tend to use only a small subset of these tools, the most widely used being Microsoft Project. It is also interesting to note that project managers rely on nontraditional project

management tools, such as Microsoft Excel, as readily as they do more project-focused tools. Although each project management tool is marketed and advertised as providing various features that other tools may not have, the uses made of all the tools are quite similar and focus on the basic project management tasks of planning, scheduling, tracking, and controlling. With respect to the perceived adequacy of this collection of project management tools, overall the survey respondents indicated above-average ratings of satisfaction, adequacy of training, and adequacy of the use of the tools. It was confirmed that not only does receiving training on the use of a project management tool influence the perceived adequacy of the tool but also the overall satisfaction that a project manager has with respect to the tool.

Thus, it appears that project managers have quite a collection of project management tools at their disposal, and that they are relatively pleased with the adequacy of these tools. Considering that a computerized project management tool is an invaluable resource—the primary "tool of the trade"—for project managers, it is useful to periodically confirm that the tools are, in fact, meeting the needs of the professional.

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