



# ▶▶▶ Abridged Basics for Career Development

MODULE 01

# PROJECT MANAGEMENT

## Real World Examples



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## CASE STUDY 01

# DEVELOPMENTS OF A CAD (COMPUTER AIDED DESIGN) AUTOMATION TOOL

## BACKGROUND

My team was given a specific task to create a CAD automation tool for ball valves based on their technical specification and variety. The objective was to create a drawing and model from a single specification, and use the automation tool for size variances. The work was required to be delivered from our company in India to the US, which involved cross cultural collaboration.

Prior to the start of the project, the practice was to make drawings for each and every part and possible size of valve components, which was consuming a lot of manpower and time. The automation tool would create a drawing and CAD model for one specification, and as a result, the tool would allow the generation of drawings and CAD models for a range of products with different sizes and ratings.

The team was comprised of five members plus the project manager with a range of experience: two recent graduates, two early career engineers (each with two years of experience), one senior engineer (with five years of experience), and myself as the project manager (with ten years of experience). The team was sharp, enthusiastic and innovative.

The effect of implementing project management (PM) processes would be evaluated during the course of this project. Initially the total work was divided between the five members without any planning, except for a deadline to complete their tasks. As project manager, my role was to observe the team's progress. The working pattern was observed for two weeks, and progress was measured before the implementation of any PM processes. The results showed that there was no tracking of the project progress, scheduling was unrealistic, and actual spending was high. There were also delays in achieving milestones.

After evaluating the progress at two weeks, it was time to introduce PM techniques. As soon as the PM techniques were deployed, optimization and improvement with respect to time and cost became apparent. There was a drastic change in the way scheduling was getting done. Effective use of PM tools, during the planning process helped in proper estimation, resource allocation and control on actual spending.



The project was executed by applying PM processes such as Initiation, Planning, Execution, Monitoring & Control, and Closure. Some of the tools used were:

- Stakeholder analysis
- Project charter/Statement of Work
- WBS
- Gantt chart
- Estimation
- RASCI chart
- Meeting minutes
- Resource leveling etc.

A work breakdown structure (WBS) and Gantt chart were prepared to forecast the completion of the work and to track the progress of the project. Tracking of the project was maintained by holding regular meetings and updating the status of work completion. We targeted to complete the work one week before the required deadline and do quality checks on the last week before delivering the work.

A system was organized to maintain the database (CAD files, reference documents, standards) so that anyone outside of the project team could easily understand the work by looking through the database.

The major improvement achieved by applying PM process was in the Schedule Performance Index (SPI). Also there was an approximate 30% reduction in engineering hours. Below is a graphical illustration of the improvement with project management measures defined:

	PV	EV	AC	SPI	CPI
Before PM implementation	\$15,200	\$12,450	\$18,050	0.82	0.69
After PM implementation	\$14,703	\$13,576	\$13,865	0.92	0.98

*PV - Planned Value - amount of work planned (hours × per hour rate)*

*EV - Earned Value - amount of work completed (hours × per hour rate)*

*AC - Actual Cost - money spent for completing the work (includes all direct and indirect costs)*

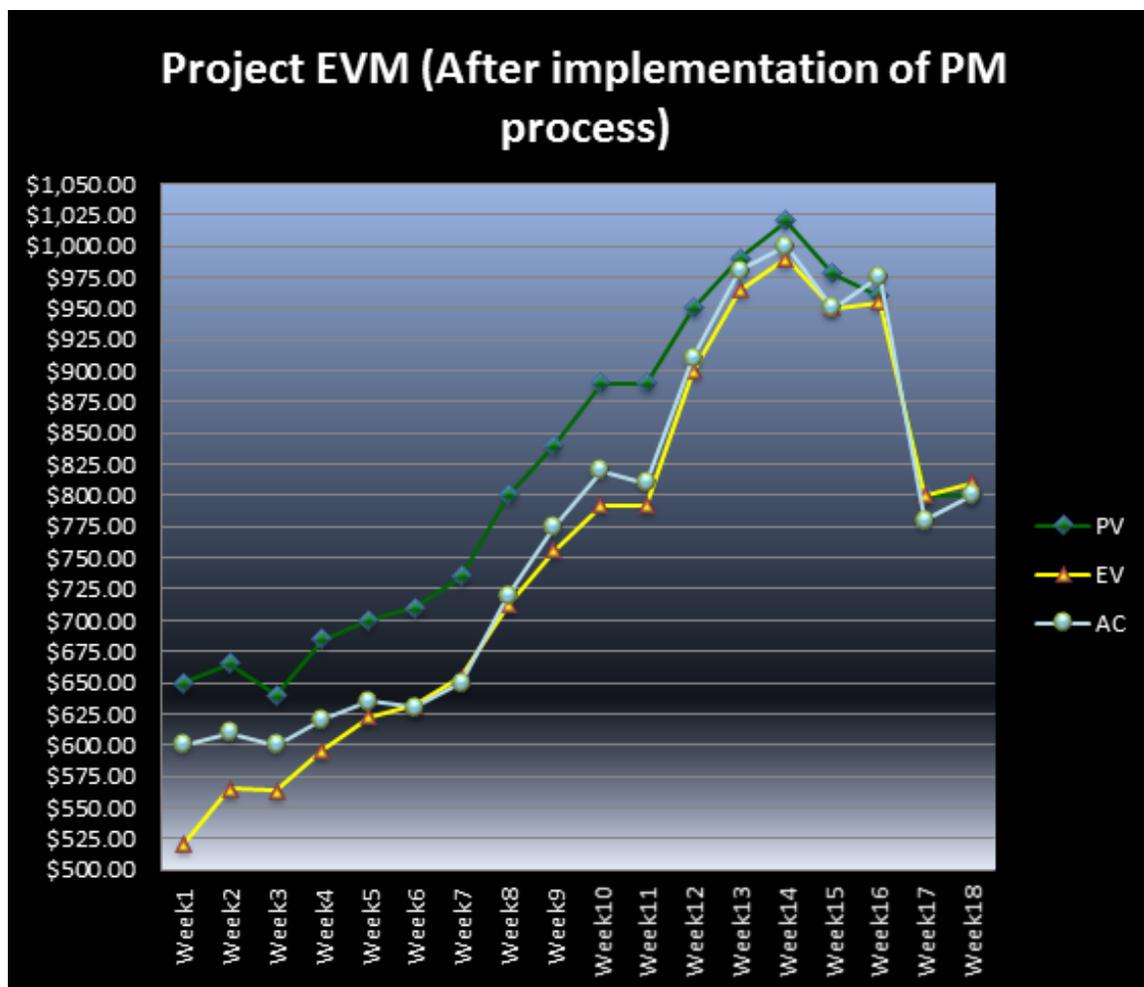
*SPI - Schedule Performance Index - ratio of EV to PV*

*CPI - Cost Performance Index - ratio of EV to AC*

## REAL WORLD EXAMPLES

The project was successfully delivered before the deadline, and the quality of the project met the requirements. The team also received appreciation from the organization on successfully achieving the goal. This project also helped to strengthen the leadership and project management skills of the senior engineer and the early career engineers.

Practicing sound PM methodologies greatly improved project organization and on-time delivery (OTD). For several projects spanning a period of three years, there was a great deal of continuous improvement in project execution. Also, team members started doing risk management, which plays a very vital role in any project management.



*Figures displayed in the figures above are for illustration purpose only and should not be used for any other purpose.*

### CONTRIBUTION OF EARLY CAREER ENGINEERS

There was appreciable contribution especially from early career engineers. They were given the responsibility to train the recent graduates, prepare the WBS, meet the deadlines, and deliver the expected quality.

To manage the required cross cultural collaboration, we decided to divide the work into two shifts, in the morning and in the evening. In the evening during India Standard Time, it was easiest to communicate with the counterparts in the US, where it was morning, avoiding errors and miscommunication likely to occur over email.

The senior engineer helped make improvements to the initial draft of the WBS prepared by the two early career engineers.

One of the early career engineers was given the duty to train the recent graduates for 10% of the time every day, while the other was focused on measures such as cost reduction, proper verification and validation, and quality checks on the deliverables, etc.

### KEY ASPECT OF PROJECT MANAGEMENT BEHIND PROJECT SUCCESS

Well stated project planning was the differentiator when it came to achieving project success. Clearly defining and documenting the scope, creation of a WBS, stakeholder's analysis, and a RASCI chart were some of the techniques and tools used to achieve the improved results.

## BIOGRAPHY

Paresh Kulkarni is a mechanical engineer working for Rotex Automation, which is catering to the various industrial & automotive applications by manufacturing & supplying electro-pneumatic flow control valves. Paresh has over 15 years of engineering experience in product design & development, project management and has worked in various industrial domains like pumps, valves & power transmission for heavy engineering industries.

Paresh has a Bachelor's of Engineering in Mechanical Engineering from Pune University, and is a certified PMP from PMI, USA.

Paresh is married to Ashwini & is having two children.

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