Development, Assignment and Control of Technical Work

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Abstract *— The Development, Assignment and Control of Technical Work is a management system used in any organization as a standard operating procedure. The procedure will support the engineering manager, while mitigating the organization micromanaging the project. Everything provided in this system is a basic guideline of skills and knowledge a manager need to have in order to develop, monitor and complete technical work without or with minimal deficiencies. The system is has three phases: the developmental, assignment and control phase each phase provide skills, key management knowledge and software to the project or engineer manager.*

Key Terms *— Management Development, Quality Assurance, Quality Control*

INTRODUCTION

Technical work is important for the completion of engineering projects, since only skilled personnel has the ability to fulfill these tasks. With the heavy work schedule of an Engineering Manager, delegation of technical work and overseeing personnel can be complicated. This paper proposes a system that targets the development, assignment and control of technical work. The system provides strategies and support to the technical work schedule and the project management, while achieving successful completion of important work at hand.

PHASE ONE: DEVELOPMENT PHASE

The Development Phase for technical work plan is very important. This phase will choose the appropriate personnel, assign the proper tasks and develop a schedule to achieve task completion. "The critical role of a manager is to ensure that a company's many moving parts are all working properly together" [1]. Depending on the tools, budget and resources, sometimes management could face issues when delegating the tasks, these elements could place a manager on a more direct and personal relation with the resolution of each task, but for the Engineering Manager to be successful on every task, certain managerial characteristics should be engage to connect in positive way within the personnel. Organization, planning, communication and management development are crucial to complete the developmental stage.

Organization

Over the years one of the most common failure within management, is organization. Management needs organization to accomplish all of its goals. Developing an organizational skill training or SOP (standard operating procedure) within the company culture will aid newly promoted management personnel. In some situations "this might involve creating a new system of who reports to whom, designing a new layout for the office, or building strategy and planning around how to move through a project, how to move toward deadlines, and how to measure milestones" [1].

Why is the organizational skill so important to accomplish technical work? In any successful company without the ability to create or develop an organizational system within a project, the possibility of failing when multi-tasking, prioritizing or even following up would become higher. The following are a list of steps the Engineering Manager needs to apply:

- Develop a list with priority or key technical work within the project.
- Evaluate standards of each technical work and its relevance in the scope of work.

- Choose proper personnel or skilled labor that are in charge of accomplishing particular tasks.
- Place a board with the technical work to follow status and updates.

Planning

After the Engineering Manager has organized and placed a priority list for the technical work, the planning stage begins. With proper planning, the execution of the technical work will be accomplish accordingly. This is why it is very important that the Engineering Manager develops meetings with the personnel responsible to accomplish this work. A properly developed meeting agenda that will add particular items that need to be address before the technical work starts will cover very important details concerning the planning stage.

Table 1 proposes topics to discuss before commencing operations. When the meetings are completed is important that the organization structure follows up with meetings to ensure task or work completion.

Table 1
Management meeting agenda topics

Meeting Agenda Topics for the Planning Stage	
1st Meeting	Main topic should include – assigning personnel to specific tasks, work and main responsibilities
2nd Meeting	Main topic should include – developing a plan of action to accomplish technical work.
3rd Meeting	Main topic should include – listing resources, tools, equipment needed to accomplish the technical work
Following Meetings	Every other meeting that follows the third meeting will provide strategies to accomplish work, beginning of work, updates, milestones and details with relevance towards the particular tasks.

Communication

Good communication will provide purpose, direction and motivation. For the Engineering Manager to develop this skill, the perspective relies directly on the goals/milestones. A Manager will understand completely and accurately the technical work composition and with effective communication, the Engineering Manager achieves precise direction. When it comes to motivation, the manager should develop an encouragement system within his/her personnel; this should be coordinated within company or the organizations policies and human resources to develop the system. By motivating and supporting the technical staff, great satisfaction of goal achievements will provide enough purpose for each task.

Management development

Developing an internal structure to grow management within the organization is key for the systems success. Management development saves money to the organization and develop a managerial structure throughout the organization. Another factor considered when developing the management plan is that managers with technical work knowledge could train technical staff within the project, in case third party training is unavailable. The organization will provide a series of seminars or a training schedule within the new manager itinerary. The training is described in Table 2.

Table 2
Organizational training topics

Training Topic	Description
Project/Engineer Management Spectrum	Description of the position and the responsibilities inherited with the position
	Developing technical work structure
Application of Management skills	Basic management skills
	Portraying a management figure
Software and Technical evaluation	Software refresher course
	Organization evaluation procedures and methods

Management development is the last process from the developmental phase, but its application comes before Organization, Planning and Communication. The most important aspect of management development is that it becomes a cycle and a refresher training for the management staff.

PHASE TWO; TECHNICAL WORK ASSIGNMENT

Assigning and delegation of work is one of most basic responsibilities a manager has. An Engineering Manager should always provide clear and concise directives to perform the technical tasks. This is why having a board in a common area with technical task or work is in display. This will provide the team or staff assigned to the task an overview of what the task is composed of, timelines and any other particularity with the task. There are three important skills in relation to assigning technical work: delegation, staff assessment and time management.

Staff assessment

When it comes to technical work effectiveness is impulse by the skills and motivation of those with specific set of skills. Engineering Managers need to spend the time to assess the currents skills and abilities of their staff and help them put in place the plans that can support the technical work development. To assess the staff, the Engineering Manager needs a process to select the right staff as follows:

- The Engineering Manager will place comprehensive frame of work that will measure the ability of the staff to understand and comprehend the types of skills and the amount of knowledge each technical leader has.
- The Engineering Manager will evaluate their ability to produce a work plan per technical task.

By applying these steps, the manager will often pick the most qualified personnel to lead the technical crew.

Delegation

Once you have the proper personnel selected for each task, the manager will delegate the work. The manager will ensure the technical staff submit a work plan that addresses the task. A skill set that goes hand and hand with delegating is communication. “They have to explain why an employee has been assigned a task, what the task is, and what the expectations are” [2]. Is very important the engineer manager provides feedback of the work plan and the progress made throughout the duration of the task, the engineer manager has “to check in with the employee, particularly at the end of task, to make sure the goals are met” [2]. Providing clear feedback will ensure the completion of goals and if there any changes, errors or deviations to the plan, they are addressed in a timely manner, avoiding any possible setbacks.

Time management

Any manager needs time management to become more effective within the project. When it comes to technical work, the manager needs to ensure that meeting every task goal accordingly, with the scope of work. Applying proper time management techniques will ensure the accomplishment of each task:

- Create the scope of work list
- Schedule each activity or task appropriately (if the task is complex, apply extra time for unexpected issues)
- Avoid committing to a single task; place the same importance to every task.
- Create a technical work meeting to stay informed and on top of each task.
- Avoid getting overload with extra work or unnecessary tasks delegate to different managers or office staff to avoid it.

Applying time management to technical operations will ensure completion of key or critical work for each task and more important keeping the manager agenda free for important management duties.

PHASE THREE: CONTROL

As the Engineering Manager implements elements to develop and assign technical work, he needs a control system to ensure the work complies with standards and accomplish the intended goal. Like any industrial or manufacturing enterprises,

which implement control plans to avoid jeopardizing their product, each manager should place a control plan as a safety measure. The control plan is compose of a quality assurance and control technique and software to monitor any updates, milestones, delays and unforeseen circumstances that may arise in the technical work, and in addition to have control over the managerial schedule or agenda.

Quality Assurance and Quality Control

The idea behind a QA/QC technique is to obtain a sample size per technical task and evaluate for possible errors. In a construction environment, obtaining a sample size before a ninety percent walkthrough would be beneficial. It will detect any possible deficiency that could compromise achieving a crucial timeline or milestone. The Engineering Manager determines the sample size, it could be an evaluation every certain amount of time within the timeline of the work, or could be an inspection of multiple task on a bigger scope of work. In some situations, the Engineering Manager could apply a sample size on the performance of the technical crew by evaluating the way they work, tool usage, "man-hours" waste and complying with standards and regulations within the scope of service. In some scenarios, a third party is involved, which will provide the results to the engineer manger, who will apply corrections if needed.

Software

In this day in age, following up with schedules, meetings, updates in work and tracking the management agenda from the palm of your hand could be simple and achievable. The organization usually provide the management team with resources to keep track and control of their work and schedule. Utilizing the newest and most up to date software will improve management software skills that will be essential in the future of any organization. Technology is advancing immensely in the management field, applying software to keep track of work is only essential to be above any competitor within their business market. Basic software a manager needs to be knowledgeable in are Microsoft Outlook, Microsoft Excel, Microsoft Project, Microsoft Word and Adobe PDF. Wrike [3] a project management software is fully capable of providing the manager a full perspective of his project. This software is compatible with phones computers and different operating systems. The software offers multiple user license, this will help the management obtain real-time updates of each technical work and at the same time provide real-time feedback. The software provides:

- Task tracking
- View project on a timeline format
- Live collaborative editor
- Email integration
- Mobile applications
- Budgeting and resource tracking
- Custom reporting and analytics for tasks or on a project level
- User administration

Using this software provides the organization, management or Engineering Manager the support to monitor or track one or multiple tasks by an application on the phone. Not using software like Wrike will place the organization behind the competition, since utilizing software like this could save money in the short and the long run.

CONCLUSION

Using a system that works as the backbone for the engineer manager, but is structured and molded by the organization, is very crucial. Developmental, Assignment and Control of technical work is a structured system, which is supported by management research. The wide range of skills applied within the system provides common managerial knowledge to new management personnel. The system will ensure the quality of work, but also it will provide the engineer manager the necessary resiliency to comeback from project setbacks and accomplishing technical work with precision.

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