



Background

There is a plethora of literature on the topic of Management. There are also a plethora of Management Models and Theories. While so, they are all derived from and focused on manufacturing organizations and perhaps to some extent, on services such as retailing, banking, insurance etc. Those organizations started as “person dependent” but have grown to become “technology dependent” – in the process, reduced the dependency on the inscrutable resource - the human being.

The software development industry, which helped other sectors to reduce person-dependency, is still woefully person-dependent. Consider these aspects -

Predominant Aspect	Software Development Industry	Other Sectors
Type of workers	White Collar (Professional Workers)	Blue Collar
Education	College	Some School
Number of College Educated persons	Mostly	Few
Knowledge-gap between the managing and the managed	Very little	Vast
Type of work	Mix of routine and new	Mostly routine
Pay/Salary	High	Low
Environmental Change	Frequent	Infrequent

In a nutshell, other industries needed blue-collar workers while software industry needs “professional Workers” or white-collar workers - predominantly.

The management of Blue-collar workers and white-collar workers is vastly different.

This paper looks at management from the standpoint of a Manager – particularly a Software Project Manager. In this paper, I am trying to give as much info as is known to me on the subject of management. I am going touch upon briefly in this paper but would be publishing separate papers on management topics, namely,

1. Project Planning
2. Project Execution and Control
3. Motivation and Morale
4. Inter-personnel Relationship Management
5. Communication

What is Management?

There are three angles to look at the term “Management”.



Chemuturi Consultants – Do it well or not at all

1. First view is as a set of people responsible for the affairs of an organization. Here the word “Management” is used in its noun form.
2. Second view is as an art (and perhaps science) practiced by people to get things done by others where the authority is not absolute and there is vagueness in the procedures / processes. Here the word “Management” is used in its verb form.
3. A body of knowledge on the subject of managing

This paper looks at the term Management from the second angle described above.

Why did I mention the word “art” to describe the word “Management”?

There is a large body of knowledge under the topic of management. This body of knowledge has been collected empirically by practitioners themselves or by studying the practitioners. Adopting this body of knowledge, many cases produced predictable results. Many mathematical models – such as Linear Programming, Transportation Problems, Management Games and so on – have been developed to assist managers make objective decisions and obtain predictable results. Yet, many aspects of management are still not measurable and there are no formulas that can objectively predict consequences precisely. Therefore, we can confidently say that Management is slowly but steadily moving towards science – but it is, as yet, an art.

Evolution of the discipline of Management

The word “management” itself signifies the fact that something is not under control!

If we can – we control it

If we cannot – we manage it.

This brings to mind the adage “ If you can not surmount it – then circumvent it”.

The objectives of management are – somehow -

1. Achieve what your originally set out to achieve
2. Attain your goal, reach your target
3. Not to win the race but to stay the course
4. Not to win the race but to finish it
5. Keep all concerned from becoming unhappy / dissatisfied

Perhaps, I should have said that the word “Management” signifies the fact that something is not desirable to be controlled – it is better be managed. “Control” begets the penalty-avoidance level performance – therefore, it is not always desirable to control – it is better to let things happen and manage (maneuver) to get better than average performance.

Thus – ***if we can – we administer***

If we cannot – we manage!

Management – in the days gone by – was akin to oversight and ensuring that everybody worked – to their full capacity. Then came along Frederick Winslow Taylor who proved full capacity is not really maximum output thru physical experiments and coined the term



Chemuturi Consultants – Do it well or not at all

“Scientific Management”. He advocated study of the work being carried out, designing proper methods for carrying out the work and providing rest breaks increases the output. It led to new fields of “work study (Method Study and Work Measurement)”, Industrial Engineering, Ergonomics, “A fair Day’s Work for a Fair Day’s Pay”, Productivity, (Inspection & Testing to Quality Control to) Quality Assurance to what today’s workplace is. Taylor’s work caused a significant impact on work design and workstation design.

Henri Fayol whose work is the forerunner of present day management thought, also vastly influenced the process of Management. Henri Fayol started as an apprentice Engineer and had grown to be the Managing Director of a mining company in France. He wrote a book titled **Administration industrielle et générale** (1916) which was translated and published in English as **General and Industrial Management**. He classified Management Functions into five categories, namely –

1. Planning
2. Organizing
3. Commanding
4. Coordinating
5. Controlling

These are later modified to

1. Planning
2. Organizing
3. Staffing
4. Directing (Leading) / Coordinating
5. Controlling

These are further refined later to

1. Planning
2. Organizing
3. Leading
4. Controlling

Henri Fayol also propounded 14 Principles for management – these are

1. **Division of Work (Specialization)** – divide the work into such packages that can foster specialization among the workers. This principle may be said to be the harbinger for assembly line in manufacturing and reduced cost of goods.
2. **Authority** – those who have responsibility for results ought to have authority to issue commands and exact obedience
3. **Discipline** – the personnel ought to be disciplined and perform their functions diligently
4. **Unity of Command** – each employee should have only one boss. A person should not be in a position that receives commands from multiple persons. In present days, this principle seems to have been dropped totally, especially in software development organizations.
5. **Unity of Direction** – a single objective for a position. Again, we do now a days seem to have multiple objectives for almost every executive position



Chemuturi Consultants – Do it well or not at all

6. **Subordination of Personal Interest** (to those of the organization's Interest) – this seems directed more at management personnel even though it applies to all – to pursue organizational goals while at work and not look for personal aggrandizement.
7. **Remuneration** – advocated fair pay – perhaps the harbinger for “need-based minimum wage” concept of today
8. **Centralization** – advocated making decisions at the top. Everybody else follows orders.
9. **Line of Authority** – hierarchy of management – a pyramidal structure for the organization
10. **Order** – a place for every thing and everybody and every thing and everybody in its place – segregation and strict order – still followed in armed forces
11. **Equity** – fair and just treatment of all personnel – advocated kindness in treatment
12. **Tenure for Personnel** – advocated ensuring that employees work longer in the organization. He recognized the loss when a trained employee walks out and that job insecurity is not good for the organization. He suggested putting in place steps that an employee does not leave the organization as far as possible.
13. **Initiative** – expected initiatives from all employees
14. **Esprit De Corpse** – advocated promoting Esprit de Corpse – morale and harmony in team-working – we are in this together spirit

As you can see – these principles are still very relevant even though we cannot practice all of them fully in these democratic days.

Management in present day context

Present day Management is understood to be -

1. Planning
2. Organizing
3. Leading
4. Controlling

Present day Managers are expected to be performing these tasks as their primary responsibility. The scale would be differing – A Project Manager would be performing these tasks at a Project Level and a Senior Manager may be performing at a Group or organizational level. I will discuss these in briefly below but would be addressing them in greater detail in separate papers – look for them on my web site.

Planning

Planning is defined as the intelligent anticipation of resources required to perform a predefined endeavor successfully at a future date in a defined environment.

The key terms are

- a. **Anticipation** - this indicates that the Planning precedes performance as well as using the best guess



Chemuturi Consultants – Do it well or not at all

- b. **Resources** – the 4 M's – Men (persons), Materials, Methods, and Machines (equipment) plus the time (duration).
- c. **At a future date** – the work is not already performed – it is yet to be performed
- d. **In a defined environment** – the environment where the work is going to be carried out is known and is defined. Any variation in the environment would have an effect on the plan. Environment refers to the working conditions including work & workstation design, methods of management, prevailing morale at the workplace etc.
- e. **Predefined endeavor** – the endeavor is defined – the scope of work is known

In order to accomplish this, we need to perform the following activities –

- 1. Size & Effort estimation for human resource estimation
- 2. Scheduling for estimation of calendar time resource within the constraints of existing facilities and availability of other resources
- 3. Cost estimation for estimation of monetary resources – also called budgeting
- 4. Definition of environment – estimation of machinery resources
- 5. Documenting all the above

Organizing

Organizing refers to the creating the work environment. This is –

- 1. Breaking down activities of the organization into departments / sections / teams so that work can be performed efficiently and effectively
- 2. Designing and arranging the workstations (workstation is a combination of a machine and human resources required to operate it in order to accomplish the work assigned to it) which accomplish the work
- 3. Breaking the work down into its constituent components such that they can be allocated and executed at a workstation.

Leading

Leading is concerned with providing the leadership to the team that works under the manager. More specifically –

- 1. Providing direction
- 2. Providing guidance
- 3. Providing assistance / removing obstacles to performance
- 4. Providing the motivation and ensuring team morale
- 5. Set targets
 - a. Productivity targets
 - b. Quality targets
 - c. Schedule targets
 - d. Technical goals
- 6. Performance evaluation
- 7. Pursue the team goals and track them thru till they are accomplished successfully.
- 8. Coaching and mentoring of team members



Controlling

Controlling involves ensuring that execution adheres to the plan – namely

1. Continuously measure progress
2. Compare the actual performance against planned performance
3. Take corrective actions to align actual performance with planned performance
 - a. Add resources
 - b. Provide expert assistance
 - c. Provide better tools / methods
 - d. Change the plan itself
4. Take preventive actions so that the future occurrences of slippage are prevented and the time lost is made up so that final deliveries are not affected adversely.

Primary Responsibilities of Managers

Primary Responsibilities are basically four –

1. Work Management

- a. Division of work – breakdown the product to be developed into work packages that can be allocated to individuals for execution. The division also should ensure that they could be later assembled / integrated into the specified final product. The division should facilitate inspection / testing as necessary to ensure quality is built into the product. The work packages must also facilitate measurement of productivity. Work Packages also should be in such a way that the duration does not necessitate frequent work allocation (while there is no minimum duration specified any where, it is better that the allocated-work takes at least one day).
- b. **Allocation of work for execution** – allocate work in such a way that the person would have the ability to execute it. The targets for schedule, productivity and quality are achievable by the person. That is the targets are commensurate with the skill level of the person. Also that all people have similar workload – that is fair allocation all available people.
- c. **Integration of the product** – arrange assembly of all the components into the designed product; test the interfaces and make it ready for delivery to the client.
- d. **Ensure Quality** – implement all planned quality control activities that ensure that work is executed conforming to organizational standards and quality norms.
- e. **Ensure Productivity** – implement all measures necessary so that work is carried out at organizational productivity levels, if not at better productivity levels.
- f. **Deliver, install, commission, train and hand-over** – deliver the product to the customer conforming to schedule and quality specifications, assist in its implementation and roll out and obtain acceptance from the client.
- g. **Get Money** – arrange for billing for the services rendered; follow up with the client and obtain the money against the bills raised from the client.

2. Expectation Management



Chemuturi Consultants – Do it well or not at all

- a. **Senior Management Expectations** – Senior Management expects the project to be executed with minimal necessity for their intervention; maximum client satisfaction; meeting or organizational norms for schedule, quality and productivity; availability of right project info when needed and maintenance & enhancement of team morale; earn revenue
 - b. **Client Expectation** – client expects progress info, adherence to agreed schedules and quality norms; cooperation for resolution of issues and change requests and attention & quick turnaround for their communications
 - c. **Peer Expectations** – share knowledge and experience; assist in reviews; assist in interviewing candidates for recruitment; assistance in process improvement initiatives.
 - d. **Team expectation** – fair work allocation; assistance in troubleshooting of issues; fair performance appraisals; transparent and fair targets; fair recognition, rewards and punishments; grievance redressal
- 3. Morale Management**
- a. **Self Morale** – self confidence – confidence is personal capability to deliver expected results, and that management would support your actions; integrity in your actions and that of your management
 - b. **Team Morale** – confidence of your team that it can win and confidence that you would support the team
 - c. **Organizational Morale** – your actions foster confidence in the organization's confidence
- 4. Resource Management**
- a. Human Resources – Team members – use them effectively and efficiently
 - b. Time Resources – calendar time – optimize the time utilization and meeting of targets and schedules
 - c. Equipment Resources – computers, system software, development tools – use them efficiently and maintain them at their peak capacity
 - d. Monetary Resources – expenses, revenue – optimize utilization

This is the management theory that needs to be kept in mind while we try and understand about what is **Software Project Management**.

Delegation (utilization of subordinates)

The job of managers is getting things done – that means you have to work with / thru people. You would have subordinates. One important aspect to bear in mind is that while you can delegate authority **you cannot delegate responsibility!** Responsibility for results – that would always remain with the manager.

You can ask your subordinate to do something – but if he goofs up – you still have the responsibility to get it done.

Let us consider an exaggerated example –

The cashier in the bank runs off with the money. Who will be answering the customers / depositors? Yep – you are right – the Bank Manager. Would the depositors shirk their



Chemuturi Consultants – Do it well or not at all

shoulders and say, “Poor Manager – what can he do if the cashier runs away? It is our bad luck – let us not blame the manager” – no way!

While so, are subordinates scot-free? No – they are accountable for their actions. The Bank Manager would file a complaint with the police to track down the cashier, jail him and recover the stolen money.

So, as a manager, you delegate authority to your subordinates, you extract accountability from your subordinates.

People Management

This is a larger subject and I am devoting a separate paper for this aspect. However, it is pertinent to bring out the salient point here.

Interaction with subordinates

You need to treat your subordinates as a concerned and disciplined father would treat his teenage children.

Why did I say teenage children? Because teenage children –

1. Are grown up but not fully
2. Sharp and smart but not mature
3. Capable but slightly irresponsible
4. Proper handling, firmness coupled with love, can produce astounding results from them

So treat your subordinates with firmness coupled with love – you will see them responding – not reacting - to you.

Interaction with Peers

You need to treat your peers as a real friend would treat his friends.

Why did I say friends? Because a real friend –

1. Is a friend in need – whenever your peer has a need – you step in – you do not need an invitation
2. Provides patient hearing and full consideration to his friend's ideas / views
3. Bridges gaps in the performance of his friend
4. Willingly teach a new skill to his friend
5. All the above without expecting anything in return

Interaction with superiors

You need to treat your superiors as a responsible son/daughter would treat their father.

Why did I say father? Because –



Chemuturi Consultants – Do it well or not at all

1. You do not have any suspicion about your father's intentions – you believe him
2. You wish to take care of your father
3. Your ego is not hurt when your father reprimands you
4. You always want to do better than your father
5. You always want to please your father and get a word of appreciation from him

As you exhibit this behavior, your superiors, slowly perhaps, but surely start exhibiting fatherly behavior towards you.

Why did I not say mother - because you love your mother. In organizational environment – it is discipline and results that are expected not just love and harmony.

Are these formulae sure to get results – always?

There are **difficult people** – everywhere. You may not get the results promised above from them. I have dealt a separate topic on handling difficult people in a separate paper.

Work Management

As you are a manager, you have some deliverables, which are possible, if you arrange for the necessary work to be carried out by your subordinates. The following are the activities that you perform for getting work done and deliver your deliverables to your clients –

1. Work allocation
2. Assistance and facilitation to the subordinates to carry out the work
3. Arrange quality control activities – inspection, walkthrough, review, testing – to ensure that the executed work and deliverables conform to the standards and design
4. Arrange for integrating disparate components into a single whole – a product perhaps – deliverable
5. Arrange for acceptance testing by the client
6. Deliver

Management Levels

The first level of management is often called also as Technical Management. They are very close to where work is carried out. They are the contacts between people who work and people who manage. They are more concerned with technical aspects of the work and provide technical leadership and manage people. Their planning is work allocation planning. Their control is work control and people control. This layer is the bridge between management and workers.

The second level of management is middle management. These people manage first level managers. This layer of management has often, multiple levels – Manager, senior manager, Deputy General Manager, General Manager and so on. The concern of this layer is to ensure integration, cohesion, results delivery, fire fighting and be the bridge between senior management and the first level management.



Chemuturi Consultants – Do it well or not at all

Senior Management is concerned with profitability of their unit. They take full ownership of a unit or division or group etc. Their key result area is “results” – deliver results expected of them by the top management.

Top management sets and manages strategy – they are concerned with direction, survival and growth of the organization.

Software Project Manager falls in the level of Middle Management.

What does a Software Project Manager (SPM) do?

I put this question to my self and came up with the answer - **Plenty**.

Then I tried making a list –

1. Delivery Functions
 - a. Manage Work
 - i. Plan
 - ii. Organize
 - iii. Allocate Work
 - iv. Progress Chasing
 - v. Completion of individual assignments
 - vi. Integrate
 - vii. Deliver
 - b. Manage Quality
 - i. Plan
 - ii. Implement Verification & Validation
 - iii. Allocate Verification and validation activities
 - iv. Progress Chasing
 - v. Completion of Quality assignments
 - vi. Monitor & Measure Quality continuously
 - vii. Improve Quality continuously
 - c. Manage Productivity
 - i. Plan
 - ii. Monitor & Measure Productivity
 - iii. Improve Productivity
 - d. Team Morale
 - i. Plan
 - ii. Monitor Morale
 - iii. Motivate Team continuously
 - e. Manage Schedule
 - i. Plan
 - ii. Monitor work progress vis-à-vis Schedule
 - iii. Implement preventive and corrective actions as required
 - iv. Deliver on schedule
2. Reporting Functions
 - a. To the Management
 - b. To the Client
 - c. To Quality Department or SEPG



Chemuturi Consultants – Do it well or not at all

- d. Participate in Meetings
- 3. Organizational Assistance Functions
 - a. Participate in Strategy initiatives
 - b. Participate in Quality Initiatives/Certification
 - i. Process Improvement activities
 - ii. Participate in Audits
 - iii. Conduct Audits
 - iv. Verification and Validation assistance to peers
 - c. Recruitment / Interviews
 - d. Human Resource Development (Training, Recruitment)
 - e. Assist in Project Acquisition
- 4. Miscellaneous Functions

Critical to Success (or is it Performance?) factors for a Software Project Manager are **Delivery Functions** and **Reporting Functions**.

In the next paper, you will find info about Software Project Planning.

=====
About the Author:

Murali Chemuturi is a Fellow of Indian Institution of Industrial Engineering and a Senior Member of Computer society of India. He is a veteran of software development industry and is presently leading Chemuturi Consultants, which provides consultancy in software process quality and training. He can be reached at murali@chemuturi.com