PROJECT MANAGEMENT AND TEAMWORK
Jim Watson, PE
j.watson@ieee.org   http://www.linkedin.com/in/watsonassociates

In this age of dynamic change, engineers frequently establish project teams to address large and challenging tasks. The diversity of experiences and skills brought by several members of a team increase the potential for synergy and greater results. Progressive companies encourage teamwork and see this as an important developmental tool.

As young professionals, we should view projects as excellent opportunities to demonstrate our technical skills. For larger projects, we need to also develop and apply many non-technical skills as we participate effectively as part of a team. One of the best ways to advance our professional careers is to increase our level of success by showing how we can work with others to develop outstanding projects. This can be accomplished by following proven steps in developing and managing projects.

PROJECT MANAGEMENT PLANNING AND IMPLEMENTING STEPS
♦ Preplanning and looking at the big picture
♦ Planning
♦ Organizing
♦ Motivating
♦ Directing
♦ Controlling
♦ Communicating

As soon as the project team is assembled, members should review their assignment from a "big picture" viewpoint. This includes more than just solving a problem, developing a new product, or moving the company into new ventures. Preplanning should address the life of the product or venture including safety, ethical and other impacts on society, and venture termination.

During the planning stage, project teams should clearly identify their objectives and goals. Objectives include what the team wants to accomplish and the desired end results. Goals are targeted steps and benchmarks to accomplish those objectives.

Organizing includes asking questions such as:
♦ What will be involved?
♦ Why will it be involved?
♦ What type of resources, both materials and personnel, will be needed?
♦ Who will have authority and responsibility for various parts of the project?

To be successful, project team members need to be motivated to participate and contribute their skills and knowledge to the project. The bad news – we cannot motivate others. The good news – we can develop an environment in which others become self-motivated. Motivated teams are more efficient and successful, so effort should be made to establish a motivational environment.

The next important aspect of successful project teams is directing which includes:
♦ What type of leadership is best for the project?
♦ Who will assume leadership roles?
♦ How will the project be implemented?
♦ How will the team determine when goals and objects are accomplished?

A project will not automatically happen unless someone takes charge. The team needs a strong leader who will accept the responsibility to see that the team makes effective decisions in a timely manner. There are many different types of leadership, but typically, project teams identify a single leader.

The team also needs to control the project by establishing standards for measuring results. All members should use these to determine how their contributions to the project fit the overall plan. Standards help teams decide when initial plans need to be reviewed and perhaps altered. So, comparing various steps of progress against established standards should be a frequent activity of project management.

And this brings us to one of the most important project management team tools – internal and external communication. Throughout the planning and implementation process, team members should understand the importance of frequent and clear communication. This begins by every member of the team having a clear understanding of team objectives and goals, and their individual responsibilities.

Documentation of activities and results should start with the first project team meeting and continue throughout the process. Good internal communication saves time and reduces error. A common practice is the use of personal design notebooks in which entries become a standard operating practice. Good communication should be part of every project team meeting.

Communication to stakeholders is also important. There are appropriate times to provide information to everyone who will be affected by the project. This includes clear written reports and effective oral presentations. What you know is important, but your ability to effectively communicate your knowledge is even more important and is critical to your personal and project success.

Because project management is such an important engineering tool, it is included in senior design classes. This is an opportunity for you to learn and practice leadership, teamwork, planning, organizing, and interpersonal skills. As you focus on the technical part of your project, you should also be aware of the value of learning to work effectively with others, even when they may have different ideas. This broadens your knowledge base and usually results in a much more successful end product.

THE VALUE OF TEAMWORK

Teamwork is a powerful tool for technical professionals and teams often replace individuals as the primary unit of operation. This is especially true in the more innovative organizations in business, industry, government, research, and academia.

A Team **Is Not**:
♦ A group of individuals who work in the same location
♦ A group of individuals who work for the same person
♦ A group of individuals who do the same job

A Team **is**:
♦ A group that shares a common assignment
♦ A group that recognizes that it needs the efforts of all members
♦ A group that is committed to achieving maximum results within constraints

A successful team is a unified group of individuals with special and unique talents who work together to achieve common objectives. Strong and effective teams blend the various abilities and strengths of each individual to accomplish a greater result than merely the sum of individual contributions.

Successful teams share several characteristics including:
- ♦ Clear objectives
- ♦ Strong leadership and appropriate roles for all members
- ♦ Good communication and trust and openness to new ideas
- ♦ Cooperation and the ability to deal with conflict
- ♦ Ability to balance innovation, quality, speed, and cost effectiveness

Although teams help corporations accomplish major goals, there are advantages and disadvantages for individuals who participate in team activities. These can be summarized as follows:

Team Member Advantages:
- ♦ Work on new and more challenging projects
- ♦ Share resources and skills toward common goals
- ♦ Participate in learning experiences that enhance personal careers
- ♦ Practice interpersonal skills and develop leadership skills
- ♦ Benefit from synergy in group activities leading to higher productivity

Team Member Disadvantages:
- ♦ Lose freedom to operate independently
- ♦ Must be open to ideas of other team members
- ♦ Need to sacrifice individual goals to achieve team overall goals
- ♦ May waste time if not effectively managed

TEAM DEVELOPMENT PROCESS

A. Forming
- ♦ Team is established and members become acquainted with each other
- ♦ Personal information or agendas usually remain hidden
- ♦ Team needs to establish project objectives and specific goals
- ♦ Team needs to establish ground rules and identify roles for each member

B. Storming
- ♦ Individuals introduce their ideas and goals
- ♦ Members listen to other ideas and consider their value
- ♦ Members promote own ideas and question or challenge ideas of others
- ♦ Ground Rules need to be followed to minimize chaos

C. Norming
- ♦ Team leader takes control and moves team into a cooperative mode
- ♦ Hidden agendas may be disclosed to solicit support
- ♦ Individuals begin to compromise to arrive at a team solution
- ♦ Team solution is clarified and members identify assignments

D. Performing
- ♦ Group becomes committed to achieving goals and completing project
- ♦ Members review assignments and start work in a cooperative spirit
- ♦ Leader reviews work progress and encourages completion
- ♦ Team communicates results to appropriate management levels

THE VALUE OF DIVERSITY

Each individual is special and unique. We are all different in our backgrounds, experiences, attitudes and abilities. In each of our lives, we experience opportunities, challenges, disappointments, and moments of great success. Because we are unique, we respond to situations differently. Personal differences add spice to life. As we interact with others, we develop a better understanding of their personalities. Different personality traits are not good or bad, just unique.

The most important person to study and understand is our self. We must know how we relate to our professional environment if we are to build successful careers. Because we all are unique, we can better relate to others if we first understand our own behavioral tendencies.

In the process of evaluating personality traits of others, it is useful to remember that: all people are motivated; people do things for their reasons, not yours; you cannot motivate others, but you can create physical and psychological environments in which other people motivate themselves.

Based on the results of our observations, we can learn to influence others or to increase cooperation within group activities by providing an atmosphere in which others are motivated and successful. This will build a strong team.

There are four basic personality traits: **DISP** (Driver, Influencer, Specialists, and Perfectionist).
A person with driver traits should be given a leadership role in a project team. This individual will be successful if provided a challenge and given authority for the project. A driver would be a good choice to set up the procedure for a laboratory experiment or a senior design project.

An influencer can effectively verbalize the results of a team action. Influencers are not interested in details of a project, but they will be effective in communicating both within the group and with outsiders. The strongest asset of influencers in a team activity is their enthusiasm and creativity. Influencer types should not be burdened with details of the work, but will be excellent supporters of the team. They will also do a good job of communicating team needs and results and should play a major role in preparing and delivering project written and oral presentations.

Each team needs one or more specialists. They are good listeners, can concentrate on the tasks to be completed, and most effective when the procedure is well defined. They need to identify with the overall group. Specialists will become motivated with comments of appreciation from others. Because they are not usually aggressive, they may need help in getting started on the work. Their loyalty will encourage others to complete the task. They will be helpful in obtaining overall results.

A team needs at least one perfectionist. The project procedure will be strictly enforced under their guidance to obtain accurate results. Perfectionists will continually be checking for the correct procedure and accurate information. They will review plans and instructions very carefully and prevent the group from making serious mistakes. They will be effective if given opportunities to be precise.

It is not recommended that a team consist only of members with the same strong personality traits. A group of drivers will spend all their time trying to elect a leader. Influencers will talk all day about a variety of topics but never establish a project plan. A team of specialists will wait forever for someone to make assignments. A team of perfectionists will study the assignment forever and take no action.

All individuals have some level of each of these traits. A mixture of stronger personality types results in the most successful project teams. Assignments should match the stronger traits of each member. This does not guarantee team harmony, but it should support a much greater success of the project mission.

SELF-EVALUATION OF YOUR "**DISP**OSITION" IN A PROJECT MANAGEMENT TEAM

Place a "1" for all traits that represent **what you typically do well** in a **team or group** situation.

DRIVER "D"	INFLUENCER "I"
___ Making things happen	___ Interacting with others
___ Recognizing accomplishments	___ Making good first impressions
___ Accepting challenges	___ Being comfortable in expressing ideas
___ Making decisions	___ Getting excited about a project
___ Questioning the "status quo"	___ Instilling enthusiasm
___ Taking responsibility	___ Entertaining people
___ Causing trouble	___ Helping others
___ Solving problems	___ Actively participating in a group
___ Visualizing the future	___ Talking more than listening
___ Taking charge in difficult situations	___ Not worrying about details

SPECIALIST "S"	PERFECTIONIST "P"
___ Using established work procedure	___ Following standards
___ Staying in one physical place	___ Concentrating on details
___ Showing patience	___ Being supervised by others
___ Using specialized skills	___ Being diplomatic
___ Concentrating on your part of project	___ Looking for accuracy
___ Showing loyalty	___ Accepting decisions
___ Being a good listener	___ Criticizing performance
___ Calming excited people	___ Thinking critically
___ Being sincere and honest	___ Liking familiar work situations
___ Wanting to feel secure	___ Receiving compliments for good work

SUMMARY OF YOUR EVALUATION RESULTS: **TOTAL "D"** _____

TOTAL "I" _____

TOTAL "S" _____

TOTAL "P" _____

INDIVIDUALS WITH STRONG DRIVER TRAITS

May Not Be Good At:	Are Motivated By:	For Success Need:
Evaluating alternatives	Power and authority	Difficult assignments
Being careful	Prestige and challenge	To understand needs of others
Working in a familiar setting	Accomplishments	To be practical
Completing research	Opportunities to advance	An occasional shock
Thinking before deciding	Direct answers	To identify with team members
Working in predictable setting	Variety of activities	To explain actions to others
Sacrificing self for others	Independence	An awareness of consequences
Patience and discipline	Diverse challenges	To relax more

INDIVIDUALS WITH STRONG INFLUENCER TRAITS

May Not Be Good At:	Are Motivated By:	For Success Need:
Discipline with their work	Social recognition	To use time more effectively
Gathering information	Public recognition of skills	Objectivity
Speaking directly	Freedom of expression	A democratic leader
Valuing honesty	People to talk with	Emotional control
Working independently	Network group activities	A sense of urgency
Preferring things not people	Freedom from control	To be less ideological
Thinking about new ideas	Comfortable environments	To focus more on end products
Being patient	Chance to speak	To improve organizing skills

INDIVIDUALS WITH STRONG SPECIALIST TRAITS

May Not Be Good At:	Are Motivated By:	For Success Need:
Adapting to change	Security of situation	Conditioning prior to change
Taxing physical capacity	Stability	To use more shortcut methods
Different tasks at same time	Happy home life	To appreciate value of others
Being opportunistic	Traditional procedures	Help with new tasks
Applying pressure	Sincerity by others	Supportive groups
Working in uncertain settings	Limited territory	Direction before acting
Being aggressive	Constant appreciation	Others to encourage creativity
Initiating new ideas	Identification with others	More self confidence

INDIVIDUALS WITH STRONG PERFECTIONIST TRAITS

May Not Be Good At:	Are Motivated By:	For Success Need:
Accepting control	Security assurances	Detailed work
Delegating work to others	Routine procedures	Careful planning
Making decisions	Safe work environment	Many explanations
Acting independently	Reassurance	Exact job descriptions
Standing their ground	Predictable circumstances	To spend less time on details
Taking unpopular stands	Being part of a group	Others to respect their value
Completing work quickly	Individual attention	Frequent feedback on progress
Initiating new ideas	Time for perfect results	To accept some imperfection