Effective Problem Solving in Teams
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ABSTRACT
Have you ever been a part of a very talented team that solved a critical issue well for one circumstance and completely floundered for a somewhat similar problem in another case? In theory, this team has the technical and project management expertise to tackle many problems but fails when varied circumstances arise. If you can relate to this, you’re not alone, and it’s not necessarily the team and/or management’s fault. It’s quite simple if you view the problem as a moving target; we won’t need Enterprise Miner, SAS statistical coding or a lot analytics to figure this out. The goal of this paper is to provide some good tips on how to improve the problem solving ability of a team. After all, the whole is only as effective as the sum of its parts.

INTRODUCTION
Whether we believe it or not, for most of our life we have been involved in some sort of teamwork. We dream of and are motivated by teams like, the Bulls, Lakers, Celtics, Yankees, Bonnie & Clyde, and our parents. Many of these teams are famous (but not always successful or legal), and they all have two things in common -- a very clear objective, and an almost fanatic desire to succeed.

The goal of this paper is to provide some good tips on how to improve the problem solving ability of a team and how to handle change by examining the components of the team. After all, the whole is only as effective as the sum of its parts.

Some basic assumptions are being made for this paper with regards to problem solving:

- All individuals are agents of change
- Change occurs all the time

THE TEAM
Whenever a group of individuals get together two problems occur:

- Problem A: the reason why the team was formed (aka the project mission)
- Problem B: managing the diversity and difference, between each team member and their individual perspective

Often groups spend too much energy focusing on the problem B’s, this often is due to the lack of good communication and reluctance in handling the differences in the way each person participates. Problem B’s detract from the ability of the group to solve the problem A(s) and often results in missed deadlines, limited solutions and a poorer work environment. One key to the team’s success is their collective ability to minimize the energy spent on problem B’s and transfer that energy to the problem A’s for the mutual good. So the question then becomes how to avoid or minimize the problem B’s, while staying focused on the problem A’s.

Another aspect of the team is the leadership. The leader’s ability to manage problems A and B often determines the performance and deliverables of the team. The more effective the leader is at doing this, the more likely the team is to problem solve effectively.

The other dimension of the team is the composition. Are the team members too much alike, or do they have nothing in common? What skills and natural talents do they add to the team? These areas play significantly into the ability of the team to problem solve, also the effectiveness of the team leader.

FOCUS ON THE MISSION
First and foremost it is crucial that the team understands the reason why they are there. It has proven to be one of the most frustrating problems when people get together to solve a problem and have no idea what the problem is. It is important that the leader of the team keep the problem A clear and concise for the rest of the team, especially
throughout the forming and storming stages in the Tuckman and Jensen group development model\(^6\). During these stages the team is getting a feel for each member and how they work. This lack of knowledge can lead to independent member behavior which can be negative to the group’s progress because of divergent efforts. In the following hypothetical situation a SAS team assembled to improve the performance of the SAS server environment for a company. The project had a short timeframe and was also a corporate goal. The following was team composition:

- Three SAS administrators, two of which are also SAS developers, also one is the project's technical lead
- Two Windows system administrators
- Two Unix system administrators / storage area network (SAN) specialists
- One IT security analyst
- One project manager
- One business champion

In the forming and storming stages of the project the team wasted some time arguing over differences in viewpoints on the overall system design and also lost energy due to personality differences.

One such problem B had occurred when a problem A was ambiguously defined. The team had proposed a clustered server architecture which had two functional areas, SCRATCH and PRODUCTION. Each area had its own SAS product mix. Everyone signed off on this design, quotes were obtained and the final project funding estimate was submitted. The project got full funding and was about to proceed when the issue was discovered by the technical lead. He was putting in the order to purchase the servers and double checking with all involved when a sysadmin realized no one specified on the design document that all the servers in the cluster all had to have the same number of CPU's. The sasadmins assumed the mix of CPU's was okay and the sysadmins assumed the sasadmins knew that it was not. This was a major setback because it doubled the cost of the SAS licenses. Immediately there was finger pointing and increased tension amongst some members of the team.

It was realized that arguing about who did what was not going to solve the main problem. It became clear that they had strayed from the project mission, and, worse there was the significant potential for loss in credibility and damaged reputations. This provided enough motivation to reduce the negative interactions and allowed the team to refocus, producing updated budgetary figures. The technical lead and project manager took the readjusted budget to senior management and pleaded the case for additional funding which was approved.

PERSONALITY MIX

Whenever teams get together the goal should always be that diversity amongst the members is maintained. Diversity as used here is from the perspective of cognitive makeup (i.e. how people are hardwired to operate: for example, extravert or introvert nature). The composition of the team should always favor heterogeneity because homogeneity can at times lead to groupthink. Groupthink can be dangerous because it relies heavily on a single team member's perspective. The depth and variety of solutions of a homogenous team will always be less diverse than a heterogeneous team. In the team previously mentioned one of the sasadmins was a highly opinionated introvert and one of the sysadmins was a highly opinionated extravert. The rest of the group was closer to the middle of the spectrum but more on the extraverted side. The sysadmin also had a closer relationship with the rest of the team compared to the sasadmin. Additionally this sasadmin was the least experienced technically. This made the sysadmin more endeared to the other members of the group. This meant that if there was disagreement between the two, the sysadmin was more likely to win.

In one such case the sysadmin proposed a particular disk configuration on the storage area network. The introverted sasadmin objected because he had seen a better configuration at another job for the proposed environment. The sasadmin also took the opportunity to explain to the group the configuration they had seen and how it could be implemented. Through a democratic vote the team ended up selecting the sysadmin's proposal. Later on during the implementation the sysadmin's solution worked but had limitations for upstream systems\(^7\). The team revisited the sysadmin's proposal and was able to correct the problem quickly with little to no delay in the project utilizing the sysadmin's knowledge. Both solutions had merit, but the familiarity of the sysadmin to the rest of the team proved somewhat limiting. If the element of diversity the sasadmin brought to the table was missing the team would have been stuck and possibly could have missed the overall project deadline.
THE FACILITATOR

A very important element in a team, this person acts as a bridger, translator, mediator and in many cases, decision maker. This person is necessary where there is conflict and indecision within the team. The facilitator should have the following characteristics in the team:

- the respect of the team
- a willingness to facilitate
- somewhat experienced with the problem at hand

In the next scenario there was a couple seeking to get married, they had established their wedding date and were proceeding with developing their wedding plans. This couple could not agree on the majority of decisions about the wedding (e.g. the type of wedding [church or seaside], the colors for the wedding party, the guest list etc). Both would hold steadfastly to their opinion and hoped that the other would relent. The difference in personalities, while enabling in many areas, was more limiting in this case. After six months of disagreement, both were frustrated with the progress they made, and this almost led to the dissolution of marriage ceremony and possibly damage to the relationship. The couple, on the advice of a mutual friend, turned to another mutual friend.

This friend was mutually agreed upon (respected by the team), was willing to mediate (willingness to facilitate) and finally was married for thirty years and also a part-time wedding planner (familiar with the problems). This friend turned facilitator, listened to both parties, separately and then together. The facilitator's spouse sat in on some of the discussions, and also answered questions the couple had. The facilitator would get authorization from both team members before making some decisions so they had equal input and showed both compromises where each member could not see.

Within a period of thirty days, the relationship was sufficiently repaired so that communication became easier. After about two months the wedding plans were progressing at an acceptable pace.

THE LEADER

In most cases in the corporate world the leader is appointed. In practical experience leadership is a role and not a position. Teams exist because no one individual knows or can doing everything. What this also means is that everyone on the team needs to be heard and their opinions evaluated on the same merit as the next team member.

In the project team the project manager was the appointed leader. However for the different technical problems different people had the lead. In the project when it came time for documentation no one could document the details with strong accuracy and precision like the introverted sasadmin. When the team morale ran low it was one of the other sysadmin’s who helped to re-energize the team. For installation and configuration troubleshooting it was one of the sasadmins, who would lead the effort for both system administration and application troubleshooting. The project manager who led the way when it came to negotiation with senior management, and even the business champion relied on the project manager to provide guidance and effective people management.

What each of these instances represented was an alignment of the strongest skill set to the main problem of the moment.

Whatever the circumstances the leader must be able to utilize these resources effectively to achieve maximum efficiency and production. They should be a facilitator when necessary, prioritize the group by focusing the teams energy on the core problem or problems (problem A’s). Additionally the leader should hold him or herself and the team members accountable to the team and the customers. They must also endeavor to recognize the contributions of each team member. Most of all they have to operate with respect and integrity to be a truly effective leader, as the strong leader’s legacy is equally as important as their achievements.

THE INDIVIDUAL IN THE TEAM

Remember a team is a group of people, and a key ingredient in problem solving as a team is to understand the individuals that comprise the team. Beyond just the regular professional and social interactions it is useful to understand the team on a deeper cognitive level. This deeper cognitive level of understanding will help the team members to understand more about why each member behaves the way they do and also some of their hard
wired strengths and weaknesses. Some very good psychometric assessment tools to help organizations and individuals understand each other are:

- Kirton’s Adaption-Innovation (KAI) Inventory
- The Myer’s Briggs Type Indicator (MBTI)
- Highlands Ability Battery

These tools provide great feedback on personality tendencies and preferences, and also indicate how cognitively diverse the team is. The leader can then align people with problems that suit their skills, the right person for the right problem. Additionally by understanding each other it often reduces the stress level during the team interactions.

However, caution must be taken when handling such information. Details about a person’s personality are entirely confidential and must be treated with the utmost care and respect. It is not to be shared without the individuals consent. Additionally these tools should only be handled by trained professionals.

The same project team was offered a couple of the psychometric tests above, but these were administered after the project was over. They all consented to have there results shared with the rest of the team and the general feedback was positive. Looking back they realized if they had this information upfront a lot of mistakes could have been avoided especially during the forming and storming phases. Also the enlightenment that some of the members shared the same interests changed perceptions. Finally the tools confirmed suspicions the team members had about each other.

CONCLUSIONS

In conclusion, a team is made up of two or more persons who bring their own personal and professional perspective to the unit. The following key ingredients will help any team to problem solve more effectively:

- Focus on the mission
- Recognizing the personality mix
- Having a facilitator
- Addressing the role of leadership

Beyond the practicality, these components are based on tried and proven theories such as KAI and MBTI. Even when the problems change, the team and its leadership will be more agile because they will be better at aligning the right resource for the problem at hand within some defined scope. It does not matter as much if the team is newly formed or preexistent, the same concepts apply. I welcome and encourage feedback on this paper so that the content can be improved. I am also open to further discussions on the details of these and other psychological theories.

As for the project team, they eventually went on to successfully finish the project on-time and under-budget receiving an award from the company for their efforts. The couple previously mentioned is happily married.
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GLOSSARY

Upstream Systems
These are software applications, pc's or servers that consume the product (output such as data) of another system or application.

Tuckman and Jensen group development model
The model describes five linear stages that a group will go through in its unitary sequence of decision making (Tuckman & Jensen, 1977).

Forming: Group members learn about each other and the task at hand. Indicators of this stage might include: Unclear objectives, Uninvolvement, Uncommitted members, Confusion, Low morale, Hidden feelings, Poor listening, etc.

Storming: As group members continue to work, they will engage each other in arguments about the structure of the group which often are significantly emotional and illustrate a struggle for status in the group. These activities mark the storming phase: Lack of cohesion, Subjectivity, Hidden agendas, Conflicts, Confrontation, Volatility, Resentment, anger, Inconsistency, Failure.

Norming: Group members establish implicit or explicit rules about how they will achieve their goal. They address the types of communication that will or will not help with the task. Indicators include: Questioning performance, Reviewing/clarify objective, Changing/confirming roles, Opening risky issues, Assertiveness, Listening, Testing new ground, Identifying strengths and weaknesses.

Performing: Groups reach a conclusion and implement the conclusion. Indicators include: Creativity, Initiative, Flexibility, Open relationships, Pride, Concern for people, Learning, Confidence, High morale, Success, etc.

Adjourning: As the group project ends, the group disbands in the adjournment phase. This phase was added when Tuckman and Jensen's updated their original review of the literature in 1977.

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