Impact of Hierarchy on Collaboration within a Scientific Project Team

by

Heather Cline

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Approved:

____________________________________  __________
Advisor/Research Coordinator  Date

____________________________________  __________
Second Reader  Date
**Introduction**

Collaboration within cross-functional groups or teams has been in existence within private industry for many years. Companies that do research and development, who design new products and transfer them into large-scale operations that manufacture licensed products, e.g. in the pharmaceutical industry, create interdisciplinary teams to solve short term and long term problems. Within the teams that are formed however, there are many factors such as group dynamics, compatibility, and social networks that can impact the functionality or collaborative ability of a team.

These interdisciplinary teams are formed as required within the biotechnology sector of private industry as an example. Within the research and development teams specifically, scientific collaboration may be different from other varieties of collaboration in that it is shaped by social norms of practice, the structure of knowledge, and the infrastructure of the scientific discipline. Scientific collaboration is not purely rational, but is influenced by social factors (Hara, Sonnenwald, Kim, & Solomon, 2003). This social perspective contrasts with the idea that science and technology are objective. This is important to note because there may be assumptions that the scientific community is more objective than other disciplines are, however this is may not be the case. Also important in discussing collaboration are partnerships and relationships that are developed within the scientific communities that foster scientific work in order to create successful new discoveries. The operating mechanisms of collaboration are complex as
one would imagine. One of the goals of this project will be to define the dynamics of collaboration and how it works within a scientific project team.

Many scientists tend towards a specialization in a scientific field because it takes much knowledge and understanding to become an expert in biology, engineering and chemistry for example. In today’s world it is important to have teams that consist of several members who have the expertise in a relevant scientific, quality or production field that can contribute to solving complex problems by bringing with them different perspectives. This is important in order to solve complex problems in a timely manner or to develop a new process and product for the pharmaceutical market which is also very complex. This means that teams are often also composed of people from several levels of an organization (hierarchy) as well.

Devine, Clayton, Philips, Dunford (1999) have put forth a study on team types and concluded that there are four primary types of teams: a) ad hoc project teams, b) ongoing project teams, c) ad hoc production teams and d) ongoing production teams. The type of team examined here will be an ongoing project team. This was chosen because the group or team studied will involve many scientists and others who will be working together for several months to a couple
of years. The potential for collaboration is high on this type of team; the team members must come together and work closely to achieve their goals in a relatively short period of time to develop a new product. The other team types will be further discussed in the section on teams.

As the literature describes, teams form together to solve problems that a company may face with a product or in creating a new product (Katzenbach and Smith, 1993). In order to solve problems, they need to make decisions that they can all agree on. However, each member of a team may carry with him/her a set of values, biases, hierarchical positioning and political positioning. How does one know that the decisions these teams make are the most effective decisions that can be made? What types of teamwork help a group make the right decisions for themselves? Do we need to ensure that every voice has been heard? How does cross-hierarchy in a team affect its ability to effectively collaborate and problem-solve? Answers to these types of questions will be the focus of this project.

**Purpose of Master’s Project Proposal**

This project will study the impact of hierarchy on collaboration within an ongoing
scientific project team. This includes the study and observation of this team with representatives from different departments within the organization. Some of these departments include: project management, research and development, clinical development, manufacturing support and various quality assurance depts. etc. The members from these departments also represent different levels within the organization and also differ according to their ability to make decisions and impact change depending upon their level. This membership can include managers, directors, scientists, specialists. In some cases other department representatives may join the team in the face of new challenges that can’t be quickly solved by the current team reps. In addition to studying the impact of hierarchy on the collaborative ability of this team, the primary goal will be to look at is how the collaboration is effected positively or negatively. This will be more defined in the research methodology section.

The project’s goal will be also be to better understand and recommend ways to enhance collaboration within a scientific team. Firstly, this project will involve the observation of one meeting with the cross-functional (cross-hierarchical) scientific team. The second type of observation will be through interviews of between four and six employees from the team; one or two high level leaders; one or two mid-level managers; and one or two mid-high level scientists
and/or specialists. They will all be asked the same questions about their participation on the team and whether they view the team as collaborating based upon a given definition of collaboration with examples to back up their observations, and how they think the hierarchy present in the team affects the team’s functioning. Through qualitative analysis, using a grounded theory approach, it will be possible to extract the primary themes and conclusions of these four to six interviews as to whether there was a positive or negative impact from the hierarchy upon the collaborative ability of the team.

This team is part of a larger employee base, which in turn is part of a large company with over 60,000 employees. Simply put, many large and small project teams that conduct business within a large corporation like this need to find more effective ways to collaborate today. By studying the mechanisms of collaboration and the possible effects of hierarchy within one of these teams, a large company can potentially make improvements to their team trainings that will strengthen and enrich the company’s progress and more effectively meet their goals. This can in turn enhance their portfolio with increased collaborative ability and get their product to the market faster as well.

**Literature Review**
Many articles in the literature reviewed presented concepts and definitions of collaboration and hierarchy. More importantly however, within the literature was the discovery of the benefits and challenges of hierarchy and collaboration as they relate to organizations. With this fact in mind, “the majority of large organizations remain hierarchical” (Leavitt, 2003). “As important, hierarchies deliver real and psychological value “(Leavitt). Within them, highly collaborative project teams are encouraged to form within organizations. In addition to the phenomenon of teams within a hierarchical structure, the literature revealed that the most common types of teams that operate in the U.S. and the one type to be studied here, are the ongoing project teams. For a successful project team to work together it needs to have all of the following: technical or functional expertise; problem-solving and decision-making skills and interpersonal skills. Without these,” the team is simply a “work group” and the collaborative ability within a workgroup is minimized” (Katzenbach and Smith,1993). In the same manner, the scholars listed in this paper conclude that some of the keys or mechanisms of collaboration rest upon finding the right combination of administrative capacity, coordination, some elements of hierarchy and the capacity to build good relationships. They rely on sharing control and the will to share information amongst each other. On the other hand the mechanism of hierarchy allows for the structure of work to unify a working system with many employees to do “real work”. The need for both hierarchy and collaboration on a team are probably not all black nor white these are most likely left within gray areas. However, in this study it will be of interest if the inherent hierarchical structure more negatively or more positively impacts the collaborative ability of the team.
As the literature was examined it appeared to indicate that there has been hierarchy both within organizations and also as such within families for thousands of years. Similarly, we also see in the literature that collaboration can exist within a team with the right combination of partnership building and joint ownership of decision-making. This is somewhat in opposition to how hierarchy works. Overall, the literature does indicate that hierarchy exists naturally and that collaboration takes an effort to create. An example of this is when the desire for scientists from different disciplines to come together and develop new medicines or pharmaceutical products, try to collaborate as they know that the outcome of the work is bigger than the sum of its parts or through individual attempts. It is true that these team members may come from different levels of the hierarchy to make specific and necessary decisions on the team. The point of this study is to see if there are positive or more negative effects from the hierarchy and decisions made upon the teams collaborative efforts or not.
**Definition of Collaboration**

There are many definitions of collaboration in the literature. In many cases the term “collaboration” is used interchangeably with the term “cooperation” and “coordination”. Bruner, Kunesh and Knuth (1992) argue that the development of clear language can be critical to research on collaboration. Consequently, distinct definitions of collaboration must be used in order to clearly see when a group or team is actively collaborating or only “cooperating” which happens to be at very different ends of a continuous spectrum. In the same manner Mattiessich and Monsey (1992) define collaboration between organizations as a “mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals” (p.953). Likewise Schrage (1995) defines collaboration as “the process of shared creation: two or more individuals with complementary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own” (p.953). This shared understanding is re-iterated in the literature in other places such as in the article *Collaboration Processes: Inside the Black Box* by Ann Marie Thomson and James L. Perry (2006) who claim that “it [collaboration] is transforming in the sense that you don’t leave the same way you came in. There is some sort of change. You give up a part of yourself. Something new has to be created. Something happens differently because of the process” (p.1). To illustrate this, two visual images demonstrating collaborative relations were suggested in the literature that include: the combination of hydrogen and
oxygen atoms to form water; and the combination of yellow and green circles to form a larger blue circle. These images start out as separate entities, likened to individuals on a team, and are put together in such a way that something “bigger” comes out of their connectedness (Thomson, 2001) This is collaboration.

Most scholars would agree that cooperation and collaboration differ in terms of their depth of interaction, commitment and complexity, with cooperation falling at the low end of the continuum and collaboration at the high end (Alter & Hage, 1993; Himmelman, 1996; Mattessich & Monsey, 1992). This can be interpreted to mean that collaboration takes more synergy and commitment than does cooperation. “As cooperation involves reciprocities and exchange of resources for a mutual goal, this can move to collaboration over time. This is where the whole is greater than the sum of its parts, and additional outcomes occur separate from the individual ends” (Thomson, 2001).

Collaboration also includes going beyond each individual’s own limited vision of what is possible and finding those solutions jointly. This is truly the “high end” of cooperation.

There are several definitions of collaboration that have a common thread, a higher order: “collective action” rather than cooperation or coordination. These include definitions from experts such as Thomson (2001), Huxham (1992), Gray (1998), and Perry (2004), etc. Thomson (2001) defines collaboration as “a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures
governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions” (p.5). In short, connection and relationships need to be built in order to collaborate well in a team setting. Gray also defines collaboration (1989) as involving “interdependence, dealing constructively with differences to arrive at solutions, joint ownership of decisions, and collective responsibility that recognizes collaboration as an emergent process”.

Benefits and Challenges of Collaboration

Collaboration has benefits in the scientific world which involve large scale projects dominated by “complex problems, rapidly changing technology, dynamic growth of knowledge, and highly specialized expertise “(Hara, Solomon, Kim & Sonnenwald 2003). The trends towards specialization have brought together a need for “multidisciplinary collaboration to bring the knowledge and skills needed to advance research” (Stevens, Campion, 1994). Researchers often benefit from collaborating to share resources and knowledge (Kraut, Egido, Galegher, 1990; Finhold, 1999; Kling and McKim, 2000). “Students collaborate in universities to solve problems or achieve more effective learning through cooperation “(Johnson & Johnson, 1998; Slavin, 1983). This is significant as much scientific progress is made through collaboration. A benefit and a challenge in scientific collaborations is that according to Hara, Solomon, Kim and
Sonnenwald collaboration is “neither easily achieved nor guaranteed to succeed even though the nature of scientific work requires working together for a common goal and the sharing of knowledge” (p.964). This is significant in that collaboration takes a unique set of skills including communication and bringing ideas together between teams or individuals to be able to integrate knowledge and make ‘better’ sets of solutions than alone.

Some challenges to a successful collaboration are spelled out by Sonnenwald (1995) where she goes on to say that there is ‘contested collaboration’ “where different patterns of work activities, expectations, personal beliefs, specialized language and individual goals make it difficult to collaborate and explore one another’s specialized knowledge”. She says that these differences can cause team members to challenge each others contributions. There are common barriers to collaboration that are challenging in educational environments. Allen-Mearres and Pugach (1982) say that “philosophical differences, educational preparation, organizational/institutional practices and small group dynamics are common impediments to successful collaboration”. Another challenge to a collaboration is the clear potential for conflict where resources, technical approaches and deadlines are subjects that must continually be debated and resolved to meet project objectives (Shrum, Chompalov, Genuth, 2001). Although the benefits can outweigh the challenges, it is of
interest in this study to see if scientific collaboration can exist in this case and be successful without hierarchical barriers or is there a need for hierarchy to solve complex problems.

**Mechanisms of Collaboration**

What makes collaborations work or not? An article by Hara, Solomon, Kim and Sonnewald (2003) called “An Emerging View of Scientific Collaboration: Scientists’ Perspectives on Collaboration and Factors that Impact Collaboration” has shown many insights into what mechanisms need to exist for a successful collaboration. This includes: “personal compatibility, research work connections, incentives and socio-technical infrastructure” (p.959). This study concludes that fully integrative collaboration appears to also require compatibility in approach to science and compatibility of personality, often including personal friendship and the trust that comes with friendship. Work style also plays a role according to this study. Also, an individual’s writing style and the approach to science when collaborating is key. It is important to have this in common so that project work takes less time and is more efficient. This is significant in getting a quality drug product to the market in a speedy fashion.

Other aspects of a successful collaboration in this study were indicated and they include: “complimentary expertise; interests and value in each other’s work; awareness and access, and development of a professional relationship as well as in a friendship” (Hara, Solomon, Kim and Sonnewald, p. 960. “The mechanisms of collaboration that appear to
work successfully include: work connections and work interests, skills, expertise, and perspectives regardless of collaboration levels. In the same manner complementary skills and learning from each other is important” (p. 961). The study discusses the motivation to collaborate for external purposes exist with the use of incentives (prestige, funding, and publications).

“Internally, personal motivation exists for complementary collaborations based upon working with colleagues with good reputations that may increase the chances of getting projects funded and articles accepted by journals” (p. 962). Lastly, from this study one can see that socio-technical infrastructure was important in successful collaborations. Although it is mentioned that research institutions normally have individual scientists running their own laboratories and seldom communicating with each other, just having them available to collaborate is important. Subsequently, awareness of each other’s work and the possibility of communication with other’s are important in collaboration (p. 963). This is important in order to work closely together and to be on the same page with colleagues. This is another key to collaboration.

Another article from the journal Social Studies of Science called ‘Trust, Conflict and
Performance in Scientific Collaborations’ by Shrum, Chompalov and Genuth talks about collaborations “emerging from core groups trusting each other”. Trust they state “classifies participants not in terms of money they bring to an experiment but rather in terms of what is known about them: whose work can one build upon, whose results are ‘believable’, and who does one wish to ‘cooperate with’, and alternatively, who does one wish to avoid”. Relationships between colleagues are built this way and trust of each other is possible. The article goes on to describe the complexity of collaboration and finds that along with trust may come conflict. This may be disruptive and also stimulating to the team. It goes on to say that “in scientific collaborations, too, conflict need not be unhealthy”. Conflicts in general may be caused by competition for resources, dissatisfaction over the assignment of tasks, and claims for credit, all part of organizational processes (p. 684). Conflict exists within organizational teams that collaborate together. The team type does not matter. In this particular case study it will be of interest to see if conflict exists, as it is healthy to have debate amongst the team specifically when decisions are made. Goods decisions are based upon the best and most diverse perspectives within a collaborative team.

Shrum, Chompalov and Genuth discuss bureaucratic organizations,” such as government or hierarchically structured ones and that these organizations may segment
work and impose a structure for interaction resembling work that is actually noncollaborative” (p. 685). These experts also say that trust is inversely associated with conflict, which is higher in more bureaucratic collaborations. The study also finds that from an outside account of success, that a consensual (may be considered collaborative) team account of success was around 40% while hierarchical teams were 81.8%. This may be due to visibility of the projects. The project that will be studied has high visibility and is on a critical path to developing a new product line that may outdo the competitor several years in advance. Finally, in contrast to the above article Shrum, Chompalov and Genuth found that “no connection was evident between the formation of collaborations through pre-existing relations and overall levels of trust”. Therefore higher levels of trust are not inherent due to knowing a colleague previously before a collaboration team is formed.

Ostrom (1998) from the article “Collaboration Processes: Inside the Black Box” agrees with the Shrum, Chompalov, Genuth in that “a reputation of trustworthiness is one of the three core factors (the other two are trust and reciprocity) that increases the likelihood of collective action”. Mattessich and Monsey (1992) and Ostrom (1998) also conclude that closely related to the process of building trust, commitment is the value of face-to-face communication and the creation of an “ethic of collaboration” (Radin et al., 1996). This allows each partner to give the other the benefit of the doubt while they build the reputations needed for joint decision making.

Collaboration scholars seem to agree here in that the key to getting things done or
the mechanisms of collaboration at work rests in finding the right combination of administrative capacity (through coordination and elements of hierarchy) and social capacity to build relationships. Good collaborations also include a willingness to share control involving team members that are willing to share information (1996, Himmelman). This includes what they can and can not offer the collaboration. “When personal relationships supplement formal organizational role relationships, psychological contracts substitute for legal contracts, and formal organizational agreements mirror informal understandings and commitments, inter-organizational relationships may be sustained over time” (Ring and Ven de Ven, 1994). Observations of this kind will be documented within this study and make for meaningful conclusions on what defines a good collaboration within a team.

**Definition of Hierarchy**

Unlike collaboration, a definition of hierarchy is in Wikipedia, “a hierarchy is a system of ranking and organizing things or people, where each element of the system (except for the top element) is subordinate to a single other element. It can link entities either directly or indirectly, and either vertically or horizontally. Its only direct links in a hierarchy, insofar as they are hierarchical, are to one's immediate superior or to one of one's subordinates, although a system
that is largely hierarchical can also incorporate other organizational patterns. Indirect hierarchical links can extend "vertically" upwards or downwards via multiple links in the same direction.

All parts of the hierarchy which are not vertically linked to one another can nevertheless be "horizontally" linked by traveling up the hierarchy to find a common direct or indirect superior, and then down again. This is akin to two co-workers, neither of whom is the other's boss, but both of whose chains of command will eventually meet”.

The definitions of hierarchy found in the literature show a contrast to collaboration.

Hierarchy as defined by Fairtlough (2005) “has been the most commonly used way of combining system, culture, leadership and power in order to get things done” (p.27). It starts with a supreme ruler at the top, whose will is supposed to control the whole of an organization (Fairtlough, 2005). He goes on to say that “hierarchy has its history and definition in a sacred origin: Hierarchy starts with a single supreme ruler, who passes authority on to a series of lesser rulers and so on through a pyramid” (p.27). He goes on to say that today it refers to rule by a single supreme ruler, whose will controls a society or an organization. Also, the traditional
patriarchal family has/had a single Head of Family. This is also a form of hierarchy where the primary decisions regarding change and progress are made at the top or by the family head. This contrasts to collaboration which has a more collective action driven decision-making process.

Another alternative definition of hierarchy is found that where the “organizational structure is viewed as a vertical hierarchy or chain of command whose major objectives are accountability and control” (Chapple & Sayles, 1961; Hammer 1990; Scholtes & Hacquebord, 1988). This includes:” division of labor in the workforce within a company that serves as the primary means of attaining performance goals and ensuring technical rationality. Optimization of systems is done by controlling activities within functional areas of a company” (Spencer, 1994). This can be seen in the organization that will be studied here. There are several departments that are controlled within a vertical hierarchy with supervisors, managers and directors in a chain of command. Each functional area or department has accountability to the next layer upwards. Division of labor occurs based upon level in the hierarchy.

To emphasize this Harold Leavitt an expert on managerial systems and organizations discusses the notion that “hierarchies are really authoritarian systems”. He says that authority empowers while isolating. Isolation of leaders in a hierarchical structure is common where the
decisions are made at the top individually. Again this is in contrast to collaboration because collaboration is about sharing control and decision-making within a team.

Leavitt (2003) states that hierarchy is not just an organizational construct but “a phenomenon that is intrinsic to the complexity of the natural world. Indeed, all biological organisms are made up of systems-circulatory, skeletal, and respiratory-which themselves comprise many subsystems. Our mental processes are often hierarchical, especially when we perform complex tasks”. This then is a construct inherent in nature and it appears that humankind automatically use these types of structured systems thinking to run organizations. Leavitt goes on to say that hierarchies “provide clear markers that let us know how far and fast we are climbing the ladder of success” (p. 6). This is demonstrated with promotions and increases in pay which is common in most hierarchical organizations.

Hierarchies give one an identity (Leavitt, 2003). Self-esteem is involved: one’s role in society, one’s very identity. Hierarchies add structure and regularity to our lives (p.7). They seduce us with psychological rewards like feelings of power and status. There are times when power and status may become important when running a team and making decisions. At other times, a more collective action driven decision making may take precedence and allow for a more level playing field. This depends upon the nature of the team and the goals of the team members.
Elliott Jacques (1990) in his article “In Praise of Hierarchy” defines hierarchy as “a kind of organization we call bureaucracy and it did not emerge accidentally. It is the only form of organization that can enable a company to employ large numbers of people and yet preserve unambiguous accountability for the work they do”. He also says that the answer is that managerial hierarchy is and will remain the only way to “structure unified working systems with hundreds, thousands, or tens of thousands of employees, for the very good reason that managerial hierarchy is the expression of two fundamental characteristics of real work”.

“It ensures that real value is added to work as it moves through the organization. It is identified at each stage of the value-adding process, ensures that people with the necessary competence are placed at each organizational layer, and ensures a general consensus and acceptance of the managerial structure that achieves these ends” (p. 4). This is interpreted to mean that there is normally a chaotic nature in organizations and that order in the form of hierarchy exists to allow the organization to function well and perform “real work”.

One sees as a necessary function that both collaboration and hierarchy are exhibited within all types of organizations, specifically on teams formed to solve-problems or create something new within an organization.

**Benefits and Challenges of Hierarchy**
Some of the benefits of hierarchy exist that are very obvious. In the book Getting Things Done by Gerard Fairtlough he says that we are familiar with hierarchy and it works for us as humans. “Hierarchy feels natural” he says. He goes on to say that humans have an inbuilt tendency towards it. Hierarchy prevents chaos. It produces discipline and order such as in having systems and standard operating procedures. It is claimed that only with hierarchy that we get the benefits of well-trained people who stick to laid-down procedures (p. 40). He goes on to elaborate on the advantages of hierarchy and mentions effective leadership is only possible because of hierarchy. This signifies that leadership of high quality can only come from the top.

Hierarchy motivates people. This occurs when people try to move up the ladder which gives them something to strive for. You also know who makes the decisions. When things go wrong he says “you know who is to blame” (p.41). This is common in most large organizations.

In another article by Harold Leavitt in the Harvard Business Review (2003), he says that “more important than hierarchy and how it adapts well to change is that it delivers real
practical and psychological value”. This doesn’t just enslave the individual but it also fulfills our deep need for order and security. Another benefit mentioned by Elliott Jacques (1990) is that “properly structured hierarchy can release energy and creativity, rationalize productivity and actually improve morale” (p.1). He also says hierarchy is not to blame for our problems. It is we, he says who have burdened the managerial systems with a series of inept structures and attitudes.

Several challenges exist with hierarchy as well as benefits. Jacques (p.3) says there are complaints about hierarchy such as “too much excessive layering in companies, too many rungs on the ladder. Information passes on through too many people, decisions through too many levels, managers and subordinates are too close in levels and in experience and ability to have effective leadership, and this can promote lack of accountability and buck passing “(p. 3). Another challenge is that hierarchy can promote and bring out the nastier aspects of human behavior such as “greed, insensitivity, careerism and self-importance “(Jacques, p. 3)

Why do hierarchies thrive? Harold Leavitt says a challenge that exists with hierarchy is “for
deeply individualistic Americans, it’s hard to blend ingrained egalitarian values with constant mindfulness of who the boss is. For leaders, it’s just as hard to maintain their individual authenticity while working inside a hierarchy no matter how modern and benevolent it may be.”

The challenge of hierarchy is to remain individual which presents an annual organizational challenge for American businesspeople (Leavitt, p. 7). This may also positively enhance or negatively impact them and be a barrier to collaboration within a team.

**Mechanisms of Hierarchy**

Hierarchies have always existed in organizations. Hierarchy remains a basic structure of most if not all, large, ongoing human organizations. Leavitt (2003) in his article on *Why Hierarchies Thrive* talks about how many organizational pyramids work because they have proven themselves quite capable of change. They have shown adaptability. They deliver “real practical and psychological value”. A mechanism for why the hierarchy works is that they managed, although, empirically authoritarian to incorporate the most radical managerial innovations of the past few decades (GE, Sony and IBM to mention a few) (p. 5). Alternatively, mechanisms of hierarchy are regularity and routine structure. They are “unbending and slow in the ways they work”. There is usually a lot of paperwork involved that enable deadlines to be met. Some large hierarchical companies like AT &T, GM and Kmart have had trouble trying to adapt to
their rapidly changing surroundings. The companies listed above have adapted well.

Hierarchy appears to remain one of the best available mechanisms for doing complex work (Leavitt, p. 8).

Nevertheless according to Elliott Jacques (1990), if hierarchy is properly structured it can release energy and creativity, rationalize productivity and actually improve morale (Elliott, p.1). He goes on to say the reason we have hierarchical organization of work is “not only that tasks occur in lower and higher degrees of complexity- but that sharp discontinuities that separate tasks into a series of steps or categories exist”. It works to employ large numbers of people and preserve accountability for the work they do. (p. 3). “The mechanisms of a hierarchical structure work to unify working systems with many employees to do real work. Also the tasks we carry out are not only more or less complex but they also become more complex as they separate into distinct categories”. “Mental work has the same mechanistic workings. So hierarchy allows for four fundamental needs to be met: to add real value to work, to identify and nail down accountability at each stage of a task, to place people with the necessary competence to teach organizational level and to build consensus and acceptance of the managerial structure that achieves these goals” (Jacques).

Types of Teams and Definitions

Katzenbach and Smith (1993) in their paper on The Discipline of Teams, define a team as

“a small number of people with complementary skills who are committed to a common purpose,
set of performance goals, and approach for which they hold themselves mutually accountable”
(p.1). The implication is that a team works and shares information with each other to be effective. Katzenbach and Smith state that the four elements of a team, common commitment and purpose, performance goals, complementary skills and mutual accountability make a team function. These qualities also assist a team to collaborate effectively. Devine, Clayton, Philips and Dunford (1999) define a team as “a collection of three or more individuals who interact to provide an organizational product, plan, decision or service”. There are many definitions of teams but for all practical purposes we will use the ones referenced here by both Katzenbach and Smith, Devine, Clayton, Philips and Dunford.

What makes up a team? It is “not just a working group” says Katzenbach and Smith.
Groups that work together simply because they work together are not necessarily a team. Performance results distinguish work groups from teams: “A work group’s performance is what its members do as individuals” (p.2). A team’s performance is based upon both individual and collective work products. This means two or more people working
together that reflect the real contribution of team members. (p. 2). Both authors go on to “A team is more than the sum of its parts” (p.2). Truly this is the goal of collaboration within a scientific project team as well in this case. The coming together of a group of people or team to create a solution or product that wouldn’t have been able to be produced as efficiently as a stand alone individual, scientist or manager could have done.

Certain skills are needed to develop a team’s ability to function cohesively. Katzenbach and Smith (p.5) define the skills needed to develop the right mix necessary to do a team’s work. These include: technical or functional expertise; problem-solving and decision-making skills and interpersonal skills. Most project teams need skills to solve product quality problems, formulate business strategy, and develop new products, and/or clients, or markets (Devine, Clayton, Philips & Dunford, 1999). Another point of interest is to define what an effective team looks like. Katzenbach and Smith state that effective teams are made up of between 2-25 people. Groups of 50 or more can theoretically become a team but normally break up into sub teams which are the case in this study. There are several specialty sub teams of which one of them will be studied. “Large groups face logistical issues, such as finding enough space and coordination of times to meet. They confront more complex issues like crowd and herd behavior, which prevent them from sharing critical viewpoints needed to build a team”. (p. 5). They may only produce “superficial missions and well-meaning intentions that can not be translated into concrete objectives”. (p.5). A large group that works in this way may well have more cynical behavior which may get in the way of future team efforts.

There are three primary team types according to Katzenbach and Smith (1993): teams
that recommend things; teams that make or do things and teams that run things. Teams that recommend things are normally task forces, project groups and audit, quality or safety groups asked to solve specific problems (p.7). Teams that make or do things include members at or near the front line who do the manufacturing, development, operations or marketing, sales and other value-adding services. (p.7). Teams that run things include groups from the top of the organization down through the functional groups. Many of these are working groups do not form teams. Indeed it is important to know what types of teams exist to be able to better define the type of team to be studied for this project. Identifying whether the work group is a team and is capable of collaboration will be observed along with the level of collaboration of the team. Through one of the strict definitions of collaboration used within this paper it will be determined whether the team is in fact collaborating together.

Another definition of a team comes from Devine, Clayton, Philips and Dunford (1999) as “a collection of three or more individuals who interact to provide an organizational product, plan,
In general these experts go on to classify industrial types of teams which include: blue collar organizations, white collar organizations and nonprofit organizations.

The biggest user of teams (81%) was nonprofit organizations, followed by blue collar organizations (50%) and then white collar organizations (34%) (p.693). This general pattern held up for all four team types. For all intensive purposes the organization being studied here is made up of blue and white collar employees. The primary make-up the scientific team however is white collar.

Many team members will have been educated with a bachelor’s degree, master’s degree or PhD in a scientific or business discipline. This is common for scientific project teams at this company.

Education may or may not be a factor in how well the team collaborates too. This will also be observed. However to be realistic, a great deal of work that comes out of the team will be delegated to blue collar workers. This is specifically true once the new product is licensed. This is also significant in seeing that different teams take on different parts of a large project such as getting a product to market and producing it on a regular basis.
Previously mentioned in the introduction are the most common types of teams. They include four types: a) ad hoc project teams, b) ongoing project teams, c) ad hoc production teams and d) ongoing production teams. Ad hoc project teams exist for a finite period of time to solve problems, make decisions and work with client and/or customers. Ongoing project teams are standing teams with relatively stable membership that solve problems, make plans or decisions or interact with clients and/or customers. Ad hoc production teams are finite in nature and are formed to build or construct or assemble products. They also may form artistically or competitively; or provide a public service. Finally, ongoing production teams are standing teams that perform the same tasks as ad hoc production teams over time. Determining and defining the ongoing project team’s traits for this study will be important to see if this team type, the ongoing project team, fits within this definition for all practical purposes. If it does not this will need to be explained further in the data analysis section of this master’s project.

Teams are more prevalent in organizations with multiple departments, multiple divisions, higher sales, and more employees. In 1992 a large sample of organizations with more than 100 employees was pulled from Dun & Bradstreet’s Directory of US businesses and Training; the researchers found that “82% of organizations with 100 or more employees reported some use of teams. 45% of these organizations used permanent work teams, 35% reported using self-managed teams, 30% used temporary project teams and 18% used permanent cross-
functional teams” (Gordon, 1992 “Industry Report”, 1995). Cross-functional teams are very prevalent within the biotechnology industry where many departments participate to make the best, compliant and most appropriate decisions and progress within a highly regulated environment.

Likewise a study on teams in organizations by Purdue University in 1999 looked at teams in organizations and observed along with others, two characteristics that emerge when classifying teams. There are product types of teams (Hackman, 1968; McGrath, 1984; Steiner, 1972) and temporal duration teams (McGrath, 1991; McGrath and O’Connor, 1996; Morgan, Glickman, Woodard, Blaiwes and Salas, 1986). These experts distinguish product teams by saying that they revolve around project tasks, processing information and production tasks that involve hands-on physical activity. In contrast temporal duration teams distinguish between short-term and ad-hoc teams. This translates into ad-hoc teams being formed for one task cycle. Short-term teams form that continue with on-going tasks and new tasks. Teams form for different reasons and goals within organizations. It is important to determine for the purpose of this study, the characteristics of the scientific project team observed and whether the team is a product or temporal duration team.

Self-directed teams are another type of team. Orsburn and Moran in “The New Self Directed Work Teams”, state that these teams “represent the natural vehicle for the sharing and
exchange of information supportive of successful task completion and customer fulfillment” (p. 180). The ability to “self-manage is what makes the employee whole. Every employee must also be part manager, developer of teams, coach, orchestration of resources, and runner of interference” (p. 183). This will also be observed within the scope of this project. What exactly is a self-directed team? Orsburn and Moran define it as a highly trained group of employees (p. 5-6) from 6-18 on average, that are fully responsible for producing a well-defined type of finished work. This could include a product, a service, an intermediate product, etc. “They have more resources at hand than a traditional team, a wider range of cross-functional skills within the team itself “(p.6). These teams set priorities, organize, coordinate activities with others and take corrective action. They solve problems, schedule the work, and handle personnel issues and team member selection. Self-directed teams Orsburn and Moran say “requires extensive training in administrative, interpersonal and technical skills”. The project team studied here may be self-directed and may exhibit some of these traits. The scientific team will be observed once to see whether any self-managed or self-directed team efforts are taking place. If so, this may imply that the team is perhaps more developed and potentially a highly motivated/trained team.

Above all, there are distinctions between the different types of teams listed above and whether collaboration can occur within each team type. Every team has the potential to
collaborate. However, not every team does in actuality. What traits must exist for a team to collaborate? As mentioned above the team type would have to have shared norms, and mutually beneficial interactions, trust and taking collective action. In short, connection and relationships would need to be built in order to collaborate well in a team setting. It would need to have interdependence, dealing constructively with differences to arrive at solutions, joint ownership of decisions, and collective responsibility.

Trends in Collaboration in Biotechnology

Some of the trends currently seen in the Biotechnology firms occur inter-organizationally between small and large companies, universities and private companies etc. Some of the literature talks about winning strategies for effective collaboration within these types of joint ventures and other articles talk about knowledge transfers and networks in the biotechnology field. Both types of articles are important to understanding the current trends in biotechnology and collaboration.
A paper by Rowlands, Morgan, Hawksworth in the *Journal of Medical Marketing*, March 2006 discusses key success factors for effective collaboration that are driven by the need for speed to the market. Informed and timely decisions are critical and do have large financial impact. They suggest that collaboration is a key factor to ensure value is delivered. It is also an investment companies are willing to make, to have teams work more effectively across departments, company, geography. "A major finding is that while technology is a strong enabler to good collaboration it must be intuitive, easy to use and allow for people to interact for widespread adoption."

A separate article by Walter Powell in 1998, specifically targets biotechnology and pharmaceutical firms and says they are “rife with a wide range of collaborative relationships intended to access knowledge, skills and resources that cannot be produced by organizations internally in a timely fashion”. This is significant in today’s world, as social scientists are discovering what mechanisms are at work that drive progress on collaborative teams within an
organization and between organizations. Powell’s article talks about the “key challenge in innovation-intensive organizations is that it is important to develop organizational routines for learning that are robust, flexible and durable. Transferring and transmitting information are also key and biotechnology companies rely upon external relationships for this knowledge”. There are many inter-organizational collaborations that go on in the field of biotechnology says Powell. He goes on to say, ”this doesn’t matter whether the collaboration is driven by strategy such as filling in missing pieces of the value chain or by learning ways to gain access to new knowledge or by using community practice connectivity to inter-organizational networks. These have become important drivers of the new logic of organizing”. ”Biotech companies increasingly measure success through networks, synthesizing and distributing ideas and the depth of an organization’s tie to diverse fields”. Finally, Powell concludes that because of the importance of the task and/or high expenses, organizations in biotechnology and pharmaceuticals are rapidly developing the capability to collaborate with a “diverse array of partners to create new medicines and get to the market in a timely cost-effective manner”. This is again a reason to effectively collaborate within a team. The benefits far outweigh the negatives, as the health of the patient in the field awaits the best medicines which are derived from sound scientific practice and scientists working together.
Conclusion

In summary, the literature review demonstrates that both hierarchy and collaboration are needed in organizational structures when working together on teams and are central to the teams being as effective as possible. Whether hierarchy is more positively or negatively impacts the efforts of a team to collaborate will be observed in this paper. Hierarchy and collaboration are in effect types of systems that approach work in different ways too. Hierarchy is a more controlling work structure that has existed throughout history and has at times adapted well to change and at other times has not adapted well to change as is seen in several examples of large corporations (AT &T, Sony) mentioned previously. Collaboration is a more shared type of team work that may or may not always work depending on the individuals and their relationships on the team. When collaboration works larger benefits result. A better solution may be derived with a collaborative team rather than a ‘work group’. The components of team types are important in determining whether a group of individual managers, scientists and specialist can come together and perform like a team or not.

Finally for the purpose of the study and of the previous sections of this paper the literature review has been meant to define and introduce the benefits, challenges and mechanisms of collaboration and hierarchy. This project will attempt to better understand collaboration within a scientific team setting. Within this study of collaboration the impact of the hierarchical structure and decision-making ability of the team will be observed. Also team types are discussed and will be used to aid in observing the team or “work group” whichever it may be. Interview questions will be asked of the interviewee and how he/she views the
team and the collaborative efforts going on. The data will be compiled using a grounded theory approach and direct themes will be taken from the observations of the team. All findings will be summarized into a report. Any recommendations coming from this Master’s project will be discussed with the client in strict confidence.

**Research Methodology**

**Research Method Overview**

**Purpose**

The primary purpose of this study is to see whether a scientific project team’s collaborative workings are impacted either positively or negatively by the theoretical hierarchical structure within the team. The company observed will be within the biotechnology sector. One project team meeting will be observed in operation along with interviewing individual team members.

This study will try to define collaboration and hierarchy in terms of a “for profit” research team and looking at its mechanisms of action. It will be of interest in this study to discover the benefits and challenges of both collaboration and hierarchy. The organization has historically been hierarchically structured for over one hundred years. Over the last five years the company has begun to flatten the organization’s structure.
However, a hierarchy of leadership continues to exist. Does this hierarchy affect decision-making that occurs within the team? This will be a point of discovery. However, the focus will be primarily upon the type of impact of this hierarchy has upon a working scientific project team. This team is made up of several levels of the hierarchy, e.g., Director level, Manager level, Scientist level, Specialist level, Administrative Assistant level. Are there different and more collaborative types of work going on within the team? Does the project team structure allow for everyone’s voice to be heard and listened to?

**Research Process**

Questions like these above will be included through personal interviews. Observations of whether the team is self-directed or led by hierarchical leadership will also be observed during the study of group dynamics, decision-making and teamwork. While observing the team for any types of collaboration at work, a comparison to the literature’s definitions and examples will be given where applicable. Themes will be drawn out and summarized.

These types of teams normally work closely for months and sometimes years together. What are some of the experiences of individuals on this team and do they feel included? Do they feel like there is an effect of hierarchy and hierarchical decision-making upon the actual collaboration taking place in the team meetings at all levels? Do they have decision-making ability? Are their decisions followed depending upon their level in the organization?
The study will take place in two formats. The first will be to ask these types of questions to several individuals on each project team who will be from different hierarchical levels in the organization. Second, the team meetings will be attended a minimum of one time by myself and observations of the structure of the team, the types of interaction and collaboration and hierarchical structure as well as their effects upon the work and decisions made will be noted.

The outcome of this scientific project team study will be interpreted from a grounded theory approach, a qualitative method of research. This method is appropriate for this study since it will be focused on gaining an understanding of the subjective experience of the scientific participants, an area in which there is some literature but few actual studies from the individual participant’s viewpoints.

**Interviews**

Data collection will consist of in-depth semi-structured interviews with four to six individuals who met the criteria and have been chosen. Each participant will be interviewed once with the possibility of a follow up phone call for clarification or expansion of a thought or view expressed by the participant. All questions will be open-ended and will be asked in a non-leading neutral manner that allows the participants to express themselves in their own words. (See Appendix D for an outline of the primary and possible follow up questions.)

In the interviews, the participants will be asked to describe their actual scientific project team experience, what caused them to be on the scientific project team in the first place, how the team was selected, and what they have learned from the scientific project
team work as a result of the interview. They will be asked to reflect on what type of
decision-making takes place within the team and what is working and what is not
working for them. They will also be asked to describe how they have changed in the
approach to teamwork and how the interview may affect their work relationships. They
will be asked to discuss any changes that may have occurred.

Scientists do not always approach teamwork from a collaborative approach. They
may at times approach their work in a self-directed manner or by relying upon upper
level management to make decisions for them in a hierarchical fashion. The goal of this
study is to see if there is an impact of a specific hierarchical or structured top-down
approach upon the team and its members. Therefore, in those cases, the researcher will
approach applicable interviewees with the same terminology.

Each interview will be recorded, with the written permission of the participant
and will be transcribed by the researcher or a third party transcriber. Field notes will be
recorded at the end of each interview.

Site

The site for this study will be at one location. The location will be set in the Bay
Area. Observations of the primary project team meeting will be performed at least once
during the execution of the research methodology.

Sample

The sample will be four to six team member/managers/directory or scientists. The criteria
for each team member is the professional level at which the team member belongs. It will
also be important to interview a newer member of the team and an older member of the
team as each has a different viewpoint and history within this company and the hierarchy that exists. It will be critical to interview two to three team members at the higher manager or director level of the team and two to three team members at the specialist or scientist level.

Access and Sample Selection

Participants will be sought through team members with whom I am familiar and or through directors of various departments with which I am familiar. At this point, one Manager has agreed to assist me in accessing team members/scientists to participate in this study.

The Process Sciences or Project Managers of product development will be requested to submit the names and email addresses of potential participants to me at my email address. As an alternative, potential participants may contact me directly at my email address or by phone. I will confirm that each individual meets the criteria for the study. These criteria are only that each individual on the project team that is interviewed has participated on a scientific project team in the past or on a cross-functional team. This would lend credence to the individual having some experience with either team collaboration and/or hierarchy and their familiarity with it in their career. Those who do not meet the criteria will be advised accordingly and thanked for their consideration.

Participant Introduction to Project/Invitation to Participate
Participants will be selected from the list of interested individuals who met the criteria, listed above. Participants will be invited to participate in the proposed study via email invitation:

1. After identifying the potential list of participants, an individual email will be sent to each potential participant. (Refer to sample email correspondence in Appendix B.) Candidates will be invited to respond via email or telephone directly to me if they choose to participate.

2. Participants who respond affirmatively to the invitation to participate will be contacted by me directly via phone or email to schedule an interview date, time and location. If a phone interview is to be conducted, I will confirm the phone number at which they wished to be called. If an in-person interview is to be conducted, the location for the interview will be determined and agreed upon. A consent form (see Appendix C) will be forwarded to them for their review prior to the scheduled date of the interview.

3. Participants who will be interviewed by phone will be asked to sign and submit the consent form via confidential fax or U.S. mail prior to the scheduled date of the interview. Those who will be interviewed in person will be given a copy on site and asked to sign it prior to our proceeding to the interview.

**Confidentiality and Anonymity**

All information given by study participants is confidential and individual contributions are anonymous. All data will be stored in a secured, confidential location.
accessible only by me and a third-party subscriber. Each participant will be identified on
the tape by first name and participant code only.

All data and notes will be kept in a locked cabinet in the researcher’s home office
for the duration of the research process. All tapes of interviews will be destroyed upon
completion of the final paper.

**Voluntary Participation**

Participation in this study is completely voluntary and participants are free to
change their mind at any time and choose not to continue even after signing the consent
form.

**Informed Consent**

Human participants will be protected in accordance with the ethical standards
confidentiality will be given to each participant and discussed in detail prior to the
interview. The researcher will verify that the participant understands the documents and
the process. Participants will be given time to read and sign the consent forms. The
researcher will assign pseudonyms (participant numbers) to each participant to insure
confidentiality and anonymity. All code notes and participant identifications will remain
anonymous.

All participants who respond affirmatively to the invitation to participate will be
requested to sign the informed consent form. The consent form explains the above, that
participation in the study is voluntary and that participants are free to change their mind
at any time, even after signing and submitting the consent form. The form confirms that the information provided during participation in the study will be confidential and anonymous. (Refer to Appendix C.)

Debriefing Procedures

At the conclusion of the interview, individual participants will be given the opportunity to debrief with the researcher, to ask questions or express any concerns they may have. I will respond to their questions and concerns at that time. If, at any time, after the interview session participants wish to address any outstanding issues or questions regarding the interview or final report, they will be invited to call or email me directly to schedule a follow up session. A summary of findings will be made available to them if they request one.

Participants will be invited to contact the JFK University Project Advisor if they have questions or requests for additional information regarding this study and the interview process:

Sharon Mulgrew, M.P.H. – Organizational Psychology Project Advisor/JFK University

Email: SAMulgrew@aol.com  Telephone: 510-450-0378

Researcher Bias

The researcher conducting this study has a bias toward collaboration as generally a progressive and rewarding process for the team and individuals who accept accountability and responsibility for his or her own actions and inactions. The researcher
is, however, in an Organizational Psychology MA program and it is in her best interest to remain neutral in order to learn more from another perspective outside of the program itself. She is aware of this bias and will remain open to all data as it is presented. Due to the criteria of the research method, bias awareness is particularly important and an awareness of that bias will be maintained by the researcher.

Limitations

The findings of this study will be tentative. The sample size and procedures for participant selection are appropriate for qualitative research. They will not, however, due to the small scope of this study, support generalization to a larger population of scientific collaborations. The relationship between the researcher and individuals and/or team and measures of the effectiveness of the scientific project team has not been defined and is beyond the scope of this study.

Data Analysis

This is an exploratory study. Data from interview transcriptions and field notes will be categorized and coded. Interviews will be transcribed and field notes maintained. The researcher will pay particular attention to patterns that may develop and apply additional codes and categories accordingly, if applicable.

Three interviews will be conducted first. They will then be analyzed to discover whether or not additional questions are necessary to improve the data and to determine what questions would be added or changed for the remaining three interviewees.
Each interview will be analyzed separately. Upon completion of all six interviews, they will be cross-analyzed. Similarities and differences will be noted. Patterns will be coded to identify common themes. When information is in response to probing questions outside the standard questions, the researcher will indicate that in the analysis.

Each of the participants will be described and quotes taken from their interviews will be applied to illustrate common themes and responses.

Conclusion

It is the hope of the researcher that by gathering and analyzing information from those scientists and managers who participate on scientific teams for the good of the patient and their own individual and team development, new insights can be gained that will be of value to organizations, individuals and project managers.

Results

Purpose and Method of Research

This purpose of this study is to look at the negative or positive effects of hierarchy upon collaboration within a scientific team. Findings within the study discuss components of collaboration and interactions between team members. These observations are taken within a scientific team at a bio-tech company setting. The method used here to perform data analysis is qualitative grounded theory. One team observation and four interviews were taken and constitute the data for this study.
Summary of Participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>M/F</th>
<th>Position</th>
<th>Type of Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>M</td>
<td>Director of Manufacturing Sciences</td>
<td>Biotech company</td>
</tr>
<tr>
<td>P2</td>
<td>M</td>
<td>Clinical Medical Doctor</td>
<td>Biotech company</td>
</tr>
<tr>
<td>P3</td>
<td>M</td>
<td>Project Manager of new products</td>
<td>Biotech company</td>
</tr>
<tr>
<td>P4</td>
<td>M</td>
<td>Manager for Manufacturing Clinical products</td>
<td>Biotech company</td>
</tr>
</tbody>
</table>

Summary of Responses-Data Analysis

Question 1A - I would appreciate it if you would reflect back upon your participation within this project team and share as much as you can with me.

Time on the team

P1 and P2 have been on the team > 6 months.
P3 has been on the team for 6 months.
P4 has been on the team for 4 months.

Roles on the Team

P1 oversees the project and operations (production & development). P2 provides the clinical program on the team. This includes “being responsible for one piece of the overall development once information on the product line exists and how to produce the protein.” This also includes linking the clinical program with enough material to do the clinical trials. This role also includes animal testing and the road to test product in humans. He primarily works with the Regulatory dept to provide a sound report that can be used in front of FDA. P2 also says that he looks at the timeliness of each step. He
watches that the clinical program meets deadlines and can be ready for the market without overextending the project. His focus is primarily on GCP (Good Clinical Practices), regulatory rules, IRB approved protocols and compliance with ICH guidelines.

P3 is the project manager and works with the other team members. His goal is to work with SMEs (Subject Matter Experts) and to integrate their expertise. P3 is a facilitator and a coach where he helps to make transparent the relevant issues to all team members.

This is done through scope changes, additional resources, and if necessary escalate problems to get decisions and he deals with SMEs individually too. Each SME or member has various views and P3 serves as a facilitator. He also looks at the pros and cons with the team to make decisions.

P4 brings operations information to the team monthly. This is likened to Development, Clinical Trials, Pre-Clinical Trials to understand: a) What is my input to the process, what it looks like and b) what do my customers need.

**Question 1B- I would like to know about the type of experience you have had on the project team you are on now?**

**Some Members Report enthusiasm and commitment**

P1 says that he has no inhibition about participating. He stated that if there is incorrect information he tells it like it is. There is not a lot of censorship. P2 says that he is very positive so far. People are committed and have enthusiasm and dreams for this project. P2 also says participation of this team is key and the team is making this happen
and preparing for it. The team is very effective. P3 thinks that this may be a good experience for him.

Some are disappointed that more decisions are not made on the team

P4 has no high expectations of this meeting as it is only an information sharing meeting. The idea of the GPT (Global Project Team) was to have the team make the decisions, however he says “that in reality the decisions are made in levels beyond them.” P2 reports that some issues are addressed to the sub-teams and when things get off the scope in the GPT meetings, those issues are escalated to upper management. And also once the decision is made by upper management, they keep the project going. P4 agrees: “In that meeting I think that I don’t have high expectations for that meeting. To me, it is just to go there, deliver my piece and then it is done right. I think that maybe the really disappointing piece here is that -- the idea of the overall project structure was that the Global Project Team is the decision maker. But reality is that decisions are made in levels beyond the team members of that global project meeting.” “I have no room to negotiate.”

P3, however, felt that a lot of good decisions have been made that (1) made it feasible at all to do the project, and (2) made it possible to pull the timeline back from an initial prospected projection of what might be late 2013, to early 2012. Upper management and marketing originally wanted this deadline to be 2010 which was unrealistic.

Some are disappointed that there is not more open discussion on the team

P1 states that the meeting information swapping “takes a lot of energy away from what would be a more active discussion.” If this issue were solved P1 says that “discussions could feel more open to discuss more frequently.” There is so much energy
dedicated to reporting it. There is bureaucracy in information sharing solely. P4 agrees in that he says that the meeting is for information sharing.

There were some problems launching the process

P3 reported that Development was on solid ground. We knew once we had the material how we were going to test the product in the clinics. Transition of technology to make the transition from current product to new product was totally “screwed up.” It took collaborating with Product supply group, CMC and Engineering to clear that hurdle. The launch process is behind now.

There are some problems with other members’ inflexibility

P3 says that some team members are very strong willed and represent their areas of expertise without controversy. However, he feels that they may not be getting enough support and the best team members that they really need.

Summary

While members appear to be enthusiastic about the team effectiveness, there is stated disappointment that it is not more of an open discussion and decision making body.

Question 1C What has motivated you to become a member of this team?

Some members state that team participation is a requirement

P1 states: “I mean, it’s part of my job responsibility to be there, and it’s not that I wouldn’t be there anyway. But it is part of my job responsibility.” P2 said “actually, you don’t become a member as a voluntary step. You're just nominated as a member.” P4 said “So, it wasn’t by choice; it was by selection.”

Another motivating factor is expressed by interest and contributions of each member’s skills.
P1 stated “I think that I have some unique experiences that make me capable of assessing some of the challenges that are facing moving the process from Development to Manufacturing.” P3 stated, “Well, I think my skill set, my background, makes me quite a good candidate for this kind of a role.” He also added “that being the project lead was a “good fit.” P2 said he is motivated “because this is really a --- a new --- advancement in the licensed drug generations; so this is very motivating. In this aspect, it's going to introduce an additional safety margin in this kind of drug.” P4 stated “Well, I mean the over all project is a very interesting project.”

Summary

The primary motivator to be on the Global Project Team was that they could contribute their skills to the team. There was also interest to be on the team itself because it was an interesting project.

**Question 2 Have there been examples of teamwork that have been successful? If so, give me an example of a time when it was and tell me what made it successful?**

There were several areas where the team was successful, and this helped motivation as well.

The team was successful in the meeting with all stakeholders. This included non-team members and others outside the group. The goal was to identify some of the operational business external to that of the GPT group. This larger group would look to solve ongoing business problems, thereby allowing some more opportunities for the project team that hadn’t even existed prior. This was a good example of how the teams became successful and worked together. P1 stated “I think one way of getting a buy in from all
the relevant stakeholders was helped, frankly, by the fact that it was a clear win-win solution. Nobody really had to give up anything.”

Team saved money for project and found the right transition of steps

One example of this success was how the original predicted timeline was reduced between clinical Phase I and Phase III.

P2 reported that “We had several sub-team meetings in which we discussed several different possibilities. And after analyzing all these different possibilities, we came up with a very good solution.” P4 agreed “I think an early success was that we got everyone’s agreement that we would change the facilities between Phase-3 and launch.”

P3 and P4 agreed that the Global Project team decided and saw how $60MM was being saved due to using the same facility for pre-clinical and research steps to produce product for Phase III clinical trials. And the launch would go into a facility with little upgrade required. P3 states “we would do Phase-3 in the non-modified building 5A right, which saves us a lot of time”.

Group decision making determined the type of filter with an analysis of pros and cons

P3 and P4 agreed that the team successfully determined the type of filter to be used in production. P3 stated that “we got all the data together and looked at each one and said, “Okay, where are the pros for this, and where are the cons for each one?” And it turned out in the end that it was a pretty obvious decision to go with a certain type of filter.” P4 states “we got the agreement on the isolation process which was either Ultra-filtration versus MA (Membrane absorption), and we had decided on MA, which was good that we had the decision there.”

Summary
All team members (P1-P4) reported examples of successful team work. None of this success happened without involving the entire team or people external to the team. All successes were based on collaboration. No one identified the hierarchy was the reason things didn’t get done. There were several areas where the team was successful, and this helped motivation as well.

**Question 3: Do the team leaders (if there is one) encourage input from everyone in the group? Just a few? If a few what are their roles?**

Three of the participants believed that the new team’s Lead (Project Manager) solicits input that helps the group move forward and make decisions. One of the Participants was the PM (Project Manager) team leader, who believes that he can improve in this area.

**Team Leader encouraged input from the whole team:**

P1, P2, P4 agreed that the team leader (in this case there is one) encourages input from whole team. There are one-on-ones with team members in weekly meetings with him. This makes for more intimate relationships with individuals on the team. The Global Project team meets once every month. P2 reported “So, this allows us not just to give our input when there are issues discussed in the forum, but you can also discuss any other input you may have on a one-to-one basis, on a weekly basis with the leader.” He goes on to say” This gives --- all the possibilities --- for you to give the input if --- in a group basis or in a personal basis.”

P1 felt that the “team lead is much more directed, much more --- aware of all of the requirements to get the project successfully into operations. And so, he’s much more intimately involved with the team operations.” Additionally P1 stated “I think the team
lead does encourage input.” P4 “The team lead tries to involve everyone. He, tries to solicit, everyone’s input.”

**Improvement of team once the former team lead left the position**

P1 stated:”Absolutely. Well, leadership changed, right. So, we went from the former team lead to team lead P3 very recently (4 months ago). I would say that the complexion of the team completely changed at that point. The current team lead is much more directed, much more --- aware of all of the requirements to get the project successfully into operations. And so, he’s much more intimately involved with the team operations.”

**Team lead has good style to involve everyone and solicit everyone’s input.**

P2 stated “he --- offers a platform where the discussions can openly happen and then you have the impression that you are really advancing and discussing real problems. So, I think the --- the role of the leader is --- is a good role”. …“(P3) does encourage input.”

**Allowing input from the whole team has resulted in advanced discussion and decisions:**

P2 found that “the leader is really very open first to listen to different issues that the different functions bring to the group, and at the same time, he --- offers a platform where the discussions can openly happen. P4 agreed. “I think that the lead has a very, very, very good style for a team environment“.

**Project manager comments that he has improvements to make:**

P3 believes that he needs to improve encouragement of the individuals on the team as needed. He still does rely on SMEs for their input primarily (Quality and Regulatory, Operations) and if anyone else in the group needs to express their view it is welcomed, but not elicited. He first states: “I think it’s their business to say… if they
have something that’s really urgent, they should speak up.” So, I don’t need to go solicit them.” Then he reports that to improve this situation and become more inclusive he could more directly solicit input. “Okay, look, on this issue, is there anyone else out here that has an opinion on this, or can make a contribution on this”.

Team uses SME’s input as an additional way to encourage input from experts, even those external to the team:

P3 stated that “One, I tend to rely heavily on the subject matter experts and pretty much them alone. If it’s a regulatory issue, or quality issue, I’m going to go to the Quality or Regulatory rep, and respect their opinion, and solicit their opinion. P1 stated that “I think the team lead does encourage input. I think people tend to defer to subject matter experts more than not.”

Summary

In summary, three of four members interviewed (P1, P2 and P4) agree that the team leader asks for input from the whole team. The team leader believes he can and should improve on this.

**Question 4: How does the team work to solve problems?**

There was not a consensus on how problems were solved and decisions made on the Global Project Team (GPT). Some reported that Subject Matter Experts (SME) or members with more experience made the decisions. Others stated that problems were solved by the team, or sub teams. To others, the process appeared fragmented and inconsistent.

The team uses discussion to solve problems & make decisions
P2 reported that “there was some kind of disconnect between --- the PTP and the GPT --- the PTP is the Project Target Profile, which defines what the attribute the product should have at the end, and there were some discrepancies or at least some lack of clarity on that. So, the way this was approached was, the whole PTP was re-discussed in the --- in the team and everyone could agree or --- or disagree. But finally, a consensus document was issued out of that meeting.”

P4 stated that “a big success was that we got to the agreement that we would launch in building 60, (a building we already had) which would not require a big capital project, which saved us again, one to one and half years and probably $60 million if you want. That was also a very good accomplishment we had.”

P3 agreed that there was “a lot of discussion between Product Supply and the Development folks about doing the isolation step with or during capture, for a particular step in manufacturing or MA, versus ultra-filtration (same step). And each one had some presumed advantages. And really, we got all the data together and looked at each one and said,” ‘Okay, where are the pros for this, and where are the cons for each one?’ And it turned out in the end that it was a pretty obvious decision to go with MA type of a manufacturing tool. So, the team has done those kinds of things, and I think that we can be proud of that. We make good progress; we keep the development going. And, it’s not just one individual; it’s the whole team who helps do that.”

**Primarily, decisions are made at the lower levels, or sub teams, or subset of the GPT unless they are bumped up to the GPT.**

P4, the project manager, stated that he thought that “what is described in here is a collaboration that is happening in the lower levels. I think that it is not even happening on
my level. I think it is happening between the process engineers and the developers ……
all the problems are being first discussed in a subset of the Global Project Team.” “I think
this is not wrong; this is just the nature of the beast. If I have a production issue, for
example, then this is being discussed between the developers, the engineers and myself.
There is no Regulatory Affairs involved, no Marketing.”

P1, an SME,” stated that the Project Manager would flush out the issues and give
the members space so that they can look at their options. Then team members would
bring the decisions back to the GPT.” P3 agreed and as well says:“ we’ll say, okay, if
this is the appropriate group, then we’ll typically have an offline discussion, or set up a
separate meeting or a sub-team or somehow to address that, to solve it, and then bring
that back to the team as a whole.”

Decisions are made by individual experts (SME’s) or members with the most experience
on the (GPT)

P1 reported that “the problems are solved genuinely around the people that have
the expertise around that problem. So, if it’s a clinical strategy one, then our regulatory
clinical folks focus on it and, you know, the leaders give their input. But, generally
there’s, I think, appropriate deference to people that have more experience.”

Sometimes decisions or recommendations are made at higher levels

At times, a need for a decision goes to the higher levels (VP and Senior VP) for
solutions. There are some decisions made by the GPT. Primarily, though decisions are
made at the lower levels, the sub teams, unless they are bumped up to the GPT. At which
time the GPT looks at the issue and either makes a decision (with an SME) or bumps it
up to the VP or Senior VP (very important or risky decisions). P3 reported that “where
we have trouble making decisions, or we come up with a conflict, or we can’t make a
decision, there we require escalation. Then we’ll go to the VPs or… If we still can’t fix it,
then we’ll go to the Site Manager. Or if the business unit can’t fix it, it’s something else,
then we’ll go to the development committee or wherever we need to go to help get the
guidance, the feedback, the resources, whatever it is we’re lacking, to be able to break it
open.”

Problem Solving can be blocked by fragmentation

P1 and P4 reported that the project is fragmented, different activities are
fragmented, and the sub teams and GPT are fragmented. “There is not a good flow of
information coming from sub teams to the main team. This is most likely due to their
newness; they are not yet together as it is a brand new project. It might also mean that the
GPT is not communicating well within itself. They are discussing issues, but not making
decisions as they should be.”

P1 stated that the “GPT struggles with conflict and disagreement. “There are ego
problems and positions not easily changed ….. “Whatever first idea was in group, the
group goes with that. There is resistance to change on the team. P1 added “I think letting
go of their ego should be part of being a team.”

In contrast, P2 reported that all the problems were solved in a consistent way by
non-biased participation on the GPT team. He stated that there were some disconnects but
in the end there was a consensus. P2 stated that “I would say the problems are solved in a
consistent way by all the members.”

Suggestions
P4 suggested changing the current GPT and “try to utilize the Global Project Team for more than just sharing information. You could, in that team, have a way more aggressive approach towards project progress. You could meet more frequently, you could have longer meetings and you could look into project timeline more aggressively, and see where we currently are. But that doesn’t happen; that happens in the different sub teams.”

Summary

Most agreed that the decisions made on the team were made by the SMEs with help from the sub-teams (called cells) or higher up levels in the organization. Also, there are decisions made by sub-teams that are brought back to the GPT. When there is disagreement on the GPT, the sub-teams look at the issues and there may be mid-level meetings set up and as well the decision may be made at the higher levels in the organization such as VP or Senior VP. It appears that the team is making effective use of the hierarchy to remain collaborative even under the fragmentation of a new project.

Question 5: Do you feel included and that you have a voice on the team?

Participants stated emphatically in very short answers that they did indeed have a voice on the team and felt included. For example P1 states “yeah, absolutely.” P2 “Yes, I do. No doubt about that.” Project manager, (P3) states that “I feel very included because I make my voice heard whenever I need to. So, yeah, that’s a better question for the other guys.” P4 - “Sure.” P3, as the lead on the project team, reports that he is not hearing any complaints (about not having a voice) from the rest of the team, but suggests that if they do, they contact him directly.

Summary
P1-P4 is in agreement that their voices are being heard.

**Question 6: How are decisions made within this team? Is there consensus normally?**

**Give me one or two examples if possible**

Group members tend to defer to the SME’s.

P1 states “It sounds like it’s unanimous, like everybody is on the same page, we all agreed. But, I think the level of knowledge that the other people have, probably was insufficient to know exactly what they were agreeing to. So, again, “I think we tend to defer to the subject matter experts and we don’t tend to challenge them very much. And, that lends a little bit to a sense of a group thing sometimes.” P2 agrees that “the decision is not imposed, but is driven by the --- expertise of the different functions.”

Example: There was a perceived benefit of going to vegetable cell line vs. protein based cell line (less risk to patient). The decision was going to be made qualitatively. However, the SME marketing rep. needed accurate financial numbers which delayed the project 6 months.

If the SME doesn’t know the answer, the whole team will look at issues.

P3 states that first they strive for consensus. Usually, it’s driven by the subject matter experts in the area. “If there’s conflict, we try to understand the key stakeholders, get them together to understand their concerns, the issues; try to quantify as much as possible the pros and cons of the different approaches.”

Also, the functional leaders (Product supply, Development) group looks at pros and cons and whether there is any need to escalate issues to VP levels. The PM does have authority to escalate these issues primarily.

Sub teams make most of decisions
In contrast, P4 states that “I think the reason this (decision) is not happening (at the) Global Project Team (level) is because the different activities are still very, very fragmented.” Additionally, he states that the “GPT is not at the heart of the project. It doesn’t have the right kind of setup the problem is that the GPT is about sharing information.”

P4 believes that this doesn’t hold the team back. “A more aggressive approach is needed to meet more frequently or have a longer meeting. Looking at project time aggressively, this doesn’t happen.”

Summary

All participants believed the team was working well. However, participants disagreed about who made decisions for the team. Some participants felt that SMEs made the decisions; others believed the entire team did, while others believed the decisions were made at the sub team level.

**Question 7: Using this definition of collaboration (definition below shared) how much do you see this team acting in this way? What are some examples of this? Are their any examples of the opposite behavior?**

**Definition of Collaboration**

1995 Schrage defines collaboration as “the process of shared creation: two or more individuals with complementary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own.”

Collaboration does exist on the GPT team. However, there has also been some friction and lack of discussion of partial data which results in a lack of trust occurring.
There does appear to be more collaboration at the sub-team level. However, there are examples of when the GPT team collaborates and also confrontation occurs.

Development does not share information before they think it is ready

P1 and P4 both indicate that Development will not share their information with the manufacturing groups, partly due to being stung in the past. People had ‘jumped on’ partial data from Development in the product line before it was ready. P1 agrees: “Certain members of the team (Development) don’t want to share their data and this is a lack of trusting the other team members.”

Synergy and collaboration albeit some friction, does exist on the GPT team.

P1, P2, P3 somewhat agree that there are occasions when there is synergy and collaboration and that there are times when there is no collaboration. P3 states that “in some cases, it flows very naturally and it’s really pleasant to be in that environment when it happens. And in other cases, it happens, but it’s uglier. There’s more friction, and one or the other party is more grudging to accept and integrate what it is that makes the overall a better outcome.”

P2 believes that collaboration exists on the team; he reports that the team has a new leader and things are going well. P2 describes a successful collaboration between manufacturing and marketing: “Marketing (knows) --- how to --- define and how to position this drug in the market, and this is --- shared with people (Manufacturing) that have the skills on how to physically make that protein. And they (Marketing & Manufacturing) just interact in a way that they come up with a process that both is technically feasible according to the person producing the protein and also …. meets the --- the requirements of the market.”
P3 agrees with P1 in that it is not always easy as a team to collaborate without friction or confrontation.

**Team did not manage confrontation well when challenged**

P1 mentions that collaboration was possible without confrontation on the “timelines” of the project. However, when the team is more challenged and there was more confrontation, the team didn’t collaborate. P1 states “a lot of button pushing, I think, around how to handle conflict, because again, it goes back to very black and white positions taken by some team members that --- they’re not flexible. They feel that their professional credibility is being called into question if they’re flexible.” He adds “However there is a lot lacking in the discussion (collaboration) due to the people not willing to change their view. Win-lose situations. Not an understanding team and judgmental at times.”

P3 states that some people can get over the friction better than others. This may be attributed to pride perhaps. Some people may be less invested or they’re more open to seeing and incorporating other’s ideas. In this case a positive outcome and a positive spirit for the next one. However, when there is confrontation a bitter taste is left in the mouth.

P3 says: “Other times it is uglier. There is more friction where one or the other party is more grudging to accept and integrate what it is that makes the overall better outcome.” Additionally, P3 reports “There’s more of an antagonistic position or a confrontational position, but yet in the end I think people eventually see the benefits when you look at the pros and cons in an impartial and unbiased way. They get over it
and they say, “Oh, yeah, okay, you know what, you’re right.” And then, boom, the light bulbs all go on and that… whatever that consensus is… They had to have that”…

P3 describes how the team works. “So, there are positions put out there where the other side says, ‘Yeah, I hear what you’re saying, but I don’t agree with it. I don’t think it’s all that relevant or significant.’ So, we go through that every once in a while. And that’s where it becomes more challenging for me to try and lead those individuals through, try and get all the facts out on the table, and to quantify it as much as possible, to take the personality out of it, to take the emotion out of it, and to go as much as possible based on facts, and based on what is quantifiable. There is antagonism but eventually people see the benefits when you look at the pros and cons in an impartial and unbiased way.”

P1, P2, P3, P4 agree that there are times where the team did collaborate together. Despite this, P4 states directly that there is not much collaboration going on at all on the GPT. “Maybe I see that from a wrong angle, but I think what is described in here is a collaboration that is happening in the lower levels. I think that it is not even happening on my level. I think it is happening between the process engineers and the developers (on sub teams).”

Summary

Each interviewee mentioned that there were times when collaboration does work, especially for the win-win problems when there isn’t that much to be confrontational about.

Others thought that there was little collaboration going on the GPT team. There are times when the team did not seem to understand each other win-lose situations.
Several times it was mentioned that the sub-teams are where the majority of collaboration is going on.

**Question 8: What might you do to improve how this team functions?**

While several participants took this question as an opportunity to talk about what blocks or challenges there still were to collaboration on the team, a few participants made some suggestions.

P2 states that he is more comfortable with this group than the other project groups he is in. -- He believes that the different assigned tasks are moving at a very fast pace. “I could see a lot of improvements (needed) in other groups, but in this one, I think things are going pretty well.”

**Teambuilding**

P1 felt that there should be team building to increase the empathy that team members have for each other.

**Change out or coach members with poor conflict management or networking skills**

P3 reported “we’ve actually changed project representatives in some of the areas. And that’s helped or will help. And, I (will) continue to work with those individuals who … need to work on their conflict management skills, on their networking skills, etc. I have one-on-ones with each one of these guys, and I’m trying to coach them to recognize these situations and to help them work better together as team members. … these guys don’t even realize when they’re pushing the hot buttons of the other guy. And so, (I try) to get them to acknowledge that so that it becomes more collaborative as opposed to confrontational somehow or antagonistic, even if it is not intended to be that way.”

**Focus more on timelines, facts and decision making**
P4 believes that too much “sharing” takes place in the meeting. “If you expect something from someone by a certain time and it is not there then there has to be at least consequences.” In general P4 believes that it is better to meet timelines, don’t hold back on the project. Be a little bit harder on the members. Shift the focus more to seem more important. More hard work is required to be successful. Also “You could meet more frequently as a team and you could have longer meetings, you could look into project timelines more aggressively, and see where we currently are.” This team is exaggerated and a dull sharing session. So, a little bit more drive in that meeting would be great. The team needs to feel that it is important at the Berkeley site. It needs more timelines, facts and to be a decision making meeting.

Summary

The four participants shared different views of how the team could improve. They include: more collaboration, more trust between Manufacturing and Developers, more team building, more networking, acceptance of the team members and more empathy on the team (diversity issue). Some believe that conflict management skills are necessary to have.

**Question 9: What has been positive about your experience on the team?**

The interviewees agreed that they have had positive experiences on the team Currently P1 agrees that the experience with the new leader (P3) has been richer and that P3 is helping to get to the real issues and that conflict comes to a head but is dealt with directly. P3 believes that “the project is moving forward, I think I certainly
learned the value of having good team leadership.” P3 has also met with individual’s offline to flush out the real issues and get them ready to work together.

P2 sees the positive in the team when learning about other member’s positions and how they approach problems. “It's been positive that you learn outside of your area of expertise from others. You also see how people, not just the group leader, but also members of the group approach and discuss things and you're just learning from one to the next.”

P3 says that he is happy with the progress of the team’s tasks which resulted in being on track now with the projects, e.g., “shorter timelines, appropriate lot size and development of the use of a different more efficient membrane process step.” This includes getting the issues (the lack of sharing information) of the GPT under control. “A clear path has been forged and we have a great deal of confidence that we will be successful.”

Interviewees attribute progress to being able to see other’s point of view.

P4 appreciates the team’s work. “Everything (is good). We are making good progress. We have had good creative solutions. It is very multifaceted. Seeing the whole project, instead of (just) from Manufacturing Production manager’s (point of view), is good.”

P2 agrees. Both appreciate that there are different views and different expertise outside of their own on the team. And this means seeing the whole project from other views instead of your own. “You also see how people, not just the group leader, but also members of the group; how they approach and discuss things.”

Summary
There were several positive experiences mentioned by participants: that they are making good progress on the team; that there are different views than just their own; that there have been some good creative solutions made, and that the progress of the team’s tasks -- being on track now with the project.

Team Observation

One team observation was taken. The team appeared to work and match findings that were discussed during the individual participant interviews and subsequent data analysis. The project manager had a significant impact upon the team where he was constructively mediating and filtering information coming from the team and assisting in the collaboration between members.

Discussion

The team studied here, the “Global Project Team” pulled different departments together and is using their contributions to develop a new product line within a specific amount of time. The team is comprised of high level directors, scientists, managers and one lower level production planner. The team meets once a month. The meeting lasts around two hours. There are also continuous communications during the month on sub teams and individual team member meet with the project manager and also there is communication via e-mails.

This discussion will assess whether the team is successfully collaborating or not by evaluating whether the company as a whole, and the team reflected each of the 20
factors of collaboration as explained below. References to the literature review are
brought in to support several of the 20 collaboration factors.

Mattessich, Murray-Close, Monsey and the Wilder Research Center, (2001) in
Factors Inventory, carried out a review of research literature on factors influencing
successful collaboration” and identified 20 common factors of collaboration. This work
was taken from 133 studies examined. 18 of these studies were considered relevant and
influenced the identified factors.

A definition of collaboration from this work is below:
“Collaboration is a mutually beneficial and well-defined relationship entered into by two
or more organizations to achieve common goals. The relationship includes a commitment
to mutual relationships and goals; a jointly developed structure and shared responsibility:
mutual authority and accountability for success; and sharing of resources and rewards”.
(pg.4)

The twenty factors, which are listed below will be used to assess the level of
collaboration within any team. This team can come from the non-profit sector,
government agencies and private organizations such as the one studied in this project.

Each of the twenty factors can be addressed generally by the author of this
master’s project because I have been an employee of this organizational setting for 15
years. First, I will compare the literature definitions and findings on collaboration with
the findings of the Global Project Team. Second, I will then assess how the company, as
a whole, operates at the bio-tech site and whether the company environment supports
collaborative teams in general. Third, in each factor section, I will compare the Global
Project team – to the factor, and comment on whether and how it reflects that collaboration factor. And, fourth, the final section of this discussion, given the above assessments, will assess whether the Global Project team’s collaboration is working and whether there are any improvements they could undertake to improve their level of collaboration

**Factor #1 History of collaboration or cooperation in community**

Yes of course and also no. There is a history with both collaboration and cooperation of work at this bio-tech site. There have been many teams on site that worked and collaborated very well together. There were also groups or teams on site that were very political and disrespectful of each other and the dept. they came from. They did not work together. There have been situations of both types historically.

**This team collaborated on several projects that allowed the team to be successful,** e.g. One way this is occurring is by currently acting on the launch of a new and improved product line into the market by 2012. Specifically deciding to use a specific filter system that would be more productive was made. Also, reducing costs of producing clinical product in one facility versus another saving the company $60MM. Members did not report any disrespect of each other was decided.

**Factor #2 Collaborative group seen as a legitimate leader in the community**

Yes they are. In fact there are several of them who have produced a lot of good work regarding new products and/or solving problems with the products. The groups that
work together and do collaborate well are seen as legitimate leaders. Members on site see it as progress.

**The team works with other high and lower level teams to resolve issues in a collaborative way.**

The Global Project team works with the sub-teams and if necessary Vice-presidents collaboratively to facilitate decisions in order to develop a sound process of introducing a new product into the market. This is appreciated by the upper management and the site. For example when there is disagreement on the team, there may be mid-level meetings to solve the problems. If necessary the use of hierarchy may happen and result in a more effective team.

**Factor #3 Is there a favorable political and social climate**

Good collaborations also include a willingness to share control involving team members that are willing to share information (1996, Himmelman). This includes what they can and can not offer the collaboration. “When personal relationships supplement formal organizational role relationships, psychological contracts substitute for legal contracts, and formal organizational agreements mirror informal understandings and commitments, inter-organizational relationships may be sustained over time” (Ring and Ven de Ven, 1994).

In this team, there was not a favorable political or social climate. There has always been politics at the bio-tech site. Even though the company has streamlined its operation (less hierarchy) there are politics on site. One example is when a new building is erected most people think they can solve problems efficiently as a team. Eventually the politics with other depts. catches up with the production staff in that building. What is
meant by this is that the old politics between depts. eventually occurs again and again. Seeing the other’s views isn’t always possible.

**The social climate and political environments get strained at times.**

This occurs between the development team and the Global Project Team where in the past the “manufacturing team jumped on the data from development’s work” (P1) prior to it being ready. Currently the development team is withholding data and this can be political at times.

There are also some politics between members of the GPT as well. One member stated that there are ego problems and positions not easily changed. Lack of flexibility exists and resistance to change on the team exists. This can lead to a political environment where each member holds onto their position and is not able to compromise.

**Factor #4 Mutual respect, understanding and trust**

The journal Social Studies of Science called ‘*Trust, Conflict and Performance in Scientific Collaborations*’ by Shrum, Chompalov and Genuth talks about collaborations “emerging from core groups trusting each other”. Trust they state “classifies participants not in terms of money they bring to an experiment but rather in terms of what is known about them: whose work can one build upon, whose results are ‘believable’, and who does one wish to ‘cooperate with’, and alternatively, who does one wish to avoid”. Relationships between colleagues are built this way and trust of each other is possible.

Also listed in another section of the literature review Ostrom (1998) from the article “*Collaboration Processes: Inside the Black Box*” agrees with the Shrum, Chompalov, Genuth in that “a reputation of trustworthiness is one of the three core
factors (the other two are trust and reciprocity) that increases the likelihood of collective action”.

Other aspects of a successful collaboration in this study were indicated and they include: “complimentary expertise; interests and value in each other’s work; awareness and access, and development of a professional relationship as well as in a friendship” (Hara, Solomon, Kim and Sonnewald, p. 960). “The mechanisms of collaboration that appear to work successfully include: work connections and work interests, skills, expertise, and perspectives regardless of collaboration levels. In the same manner complementary skills and learning from each other is important” (p. 961) (2003). On this team, there was mutual respect and understanding. There is a lot of respect for scientists on site. There is maybe a little less respect for the managers and directors on site. There is more politics within these levels. However, overall there is trust with and between the scientists.

**Interviewees on the team attribute progress in seeing each others viewpoints.**

This implies that there is respect and understanding for each other on the team. One example of this is when there are “good creative solutions” (P4) made. This has occurred more than once, but one example is the decision not to use the newest building to produce the clinical trials, but rather the older facility, thereby saving the company and the project many millions of dollars.

Trust developed within the GPT team has spurred creative solutions and fostered good interpersonal relationships overall.
Factor #5 Appropriate cross-section of members

An article by Hara, Solomon, Kim and Sonnewald (2003) called “An Emerging View of Scientific Collaboration: Scientists’ Perspectives on Collaboration and Factors that Impact Collaboration” has shown many insights in to what mechanisms need to exist for a successful collaboration. This includes: “personal compatibility, research work connections, incentives and socio-technical Infrastructure” (p.959). This study concludes that fully integrative collaboration appears to also require compatibility in approach to science and compatibility of personality, often including personal friendship and the trust that comes with friendship.

There is an appropriate cross section of members on this team. There is normally a representative from the appropriate dept. on site, e.g., one person from QA, Production, scientists, engineering. This helps with accountability. Also having the stakeholders at the meetings help everyone make progress.

A broad cross-section of team members are being used for the development of the new product line.

This team includes persons such as the Director of manufacturing (P1), who because of his unique experiences can help in moving the product from the development stage to the licensed manufacturing stage. The Project manager (P3) is a good fit for the team and his individual experience in facilitating the group towards its goals. The clinical medical doctor (P2) helps to ensure that the collaborative group working on this project will introduce an additional margin of safety. There is also a Quality Assurance and a Regulatory member on the team that regulates the safety and helps to ensure the quality within the federal regulations of the clinical product being produced on site.
Factor #6 Members see collaboration as in their self-interest

Members do see collaboration as in their self-interest. I think their awareness of the team is good. The members can usually see if the team is collaborating or not and this is a good thing. There is more tension if the team isn’t working together. I think the teams that aren’t collaborating together know it. This would be in their self-interest to see the team working together and finishing its goals.

Motivation to be on the team shows interest and self-interest in working together

Hara, Solomon, Kim and Sonnewald (2003) found that “The mechanisms of collaboration that appear to work successfully include: work connections and work interests, skills, expertise, and perspectives regardless of collaboration levels. In the same manner complementary skills and learning from each other is important” (p. 961). In addition, they add that “Internally, personal motivation exists for complementary collaborations based upon working with colleagues with good reputations that may increase the chances of getting projects funded and articles accepted by journals” (p. 962).

Most if not all members in some way showed interest in being on the team and contributing their skills to the team explicitly. For example P1 saw his skills as being part of improving the transition from development to manufacturing. P2 saw that the knowledge of working on a product to improve its safety margin was great. P3 thought being a project manager was a fit for his skills. And P4 thought that the overall project was interesting and important.
Factor #7 Ability to compromise

Katzenbach and Smith (1993) state that the four elements of a team, common commitment and purpose, performance goals, complementary skills and mutual accountability make a team function. These qualities also assist a team to collaborate effectively.

In the company, there has been compromise when a team likes itself and works together. There are teams that bicker and don’t get along well. This however usually works itself out someway. The membership can be changed or members are asked to leave of which I have seen both.

This GPT team works together and compromises while working with Project Manager and with stakeholders

The Project Manager works with this team individually and is inclusive in his weekly meetings with team members. This makes for a better setting where compromise can occur. Each individual’s needs can and are discussed on a one-to one basis.

One compromise occurred by holding a meeting with all stakeholders to solve ongoing business problems and this then allowed compromise and spurred further opportunities for other projects to exist that didn’t exist before.

In another view, a lack of a more open discussion and decision-making ability plus a lack of flexibility does affect the ability to compromise.

An example of this is when the group is only information swapping and this takes a lot of energy away from an open discussion. P1 states, “discussions could feel more open to discuss more frequently”. P4 agrees.
Decision-making was the original intent of the team. P4 thinks that decisions are actually made below or above the team for the most part. “There is no room to negotiate”. P1 and P4 think there is fragmentation of the team that leads to indecision and this is due to the newness of the team perhaps.

As for flexibility P3 and P1 state that there are members that are very strong willed and not able to compromise due to their inflexibility. P1 states that there is “resistance to change”.

Factor #8 Members share a stake in both process and outcome.

Katzenbach and Smith (1993) in their paper on *The Discipline of Teams*, define a team as “a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable” (p.1).

Over the last few years, in the company, there has been a striving for more ownership and interest in the process and outcome. There are actions that are taken by each dept. (action log and project objectives) that share a stake in the outcome. Stakeholders and their roles are identified and discussed and a common purpose and goals are set up.

Allowing and encouraging individual and team input gives the team a vested interest over the life of the project

P2 states that the project manager “offers a platform where the discussions can openly happen and then you really have the impression you are making and advancing the discussion of real issues”. This can also happen through meetings on a daily and
weekly basis with the project lead. Subject matter experts make a lot of the decisions and have a vested interest in the projects and their outcome and implementation.

**Factor #9 Multiple layers of participation**

Katzenbach and Smith (1993) found that some of the keys or mechanisms of collaboration rest upon finding the right combination of administrative capacity, coordination, **some elements of hierarchy** and the capacity to build good relationships. They rely on sharing control and the will to share information amongst each other.

In the same manner Mattiessich and Monsey (1992) define collaboration between organizations as a “mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals” (p.953).

Normally on a new project, there are several sub-teams that represent different layers in the organization. The hierarchy and re-organizations have flattened out the organization and made it possible to have less layers of participation which is a good thing.

**Subteams, Subject Matter Experts and upper level management contribute to all levels of participation**

Primarily decisions are being made at the sub-teams. This can be seen as a collaborative environment between all involved. This can occur even if there are separate teams or members involved outside of the GPT team. For example the Development group and the manufacturing groups (with an SME from the GPT team) can work together and the information is passed back to the GPT team for information and possible decision-making.
A side note: The decisions made on the GPT are primarily from the Subject Matter Experts or the more experienced persons. Decisions are also made by the GPT team but less frequently.

**Factor #10 Flexibility**

Walter Powell (1998) specifically targets biotechnology and pharmaceutical firms and says they are “rife with a wide range of collaborative relationships intended to access knowledge, skills and resources that cannot be produced by organizations internally in a timely fashion”. This is significant in today’s world, as social scientists are discovering what mechanisms are at work that drive progress on collaborative teams within an organization and between organizations. Powell’s article talks about the “key challenge in innovation-intensive organizations is that it is important to develop organizational routines for *learning that are robust, flexible and durable*.

I would say there is not a lot of flexibility at this time in the company as a whole. However, this is improving across the bio-tech site within team meetings where different departments come together. It’s difficult and hard to work together on complex time-consuming projects. Some members only see their view. This is on going.

**This team has less flexibility at times specifically within the team itself, but it is not known if this also occurs during the collaborative times with other groups**

P1 states that there is a lot of button pushing around how to handle conflict, it goes back to the inflexibility of the members. They feel that their professional credibility is called into question when they are flexible.

**Factor #11 Development of clear roles and policy guidelines.**
Katzenbach and Smith (1993) state that “a work group’s performance is what its members do as individuals”. A team’s performance is based upon both individual and collective work products. This means two or more people working together that reflect the real contribution of team members. Both authors believe that “a team is more than the sum of its parts” (p.2).

Roles, throughout the company, are not very clear upfront and do not enter into the discussions between members. As the teams work together more though there are better defined roles. I have seen groups who have some ownership amongst members (take on parts of the projects), but don’t have defined roles. Policy guidelines are sometimes defined by the regulatory agencies and their rules not by the bio-tech personnel.

This team is made up of members from specific departments

The GPT team has members from almost every general department on the site. Each member represents his/her area of expertise that reflects that dept.

Policy guidelines exist for most depts. The guidelines are enforced within the viewpoints of the representatives and come about from experience, not necessarily written guidelines. Writing guidelines does occur on site but is not a requirement for running a team like the GPT.

Factor #12 Adaptability

I would say that the people that are at this bio-tech site have to adapt a lot to change. There is change all the time. This includes change of first generation product to new products, improving the process and the changes that come with it, re-organizing
depts. almost yearly. On the teams there are constant changes that come with it. I would say the site is very good at adapting to change.

**This team has had various members join at different times. The team has also changed the project management which is the primary facilitator for the project.**

P1 and P2 have been on the team for more than 6 months. P3 has been on the team for six months and P4 has been on the team for 4 months. P3 is the newest project manager who replaced the original one and was brought in after around 4 months. This significant change appears to be working well. P1 states that “the complexion of the team completely changed at that point. The current team lead is much more directed, much more aware of all of the requirements to get the project successfully into operations. And so he’s much more intimately involved with the team operations. Three of the four members interviewed agreed that the project manager has encouraged input and intimate relationships and consequently a more collaborative environment. These changes can occur a few times during the project which need to be adapted to and are ultimately done so.

**Factor #13 Appropriate pace of development**

The groups and certain individuals at this bio-tech site drive the pace of development. It is usually appropriate. Sometimes the teams get off track and don’t focus as much as they should. Luckily, there is a system in place that doesn’t allow people to go off track as much as in the past. This system is called the action log and primarily drives the meetings. I also observe that the key players on the teams drive the pace too.

**This team uses collaborative methods that keep it on track and focused**
The project manager through his use of one-on-ones and weekly meetings critically helps the team develop and be inclusive thereby creating a collaborative environment. Along with the team leaders, he/she also drive the pace of development. And as well as the meetings and to some extent the project itself uses deadlines and the action log to drive its itinerary and focuses the group on action instead of allowing for too much indecision.

**Factor #14 Open and frequent communication**

Mattessich and Monsey (1992) and Ostrom (1998) also conclude that closely related to the process of building trust, commitment is the value of face-to-face communication and the creation of an “ethic of collaboration” (Radin et al., 1996).

I have observed a team where the project manager on that team follows up on the action items via communication. There are people on the teams that open up the dialogue. Other teams don’t follow up and communicate well at all. Much of the communication goes on in the e-mail. If you aren’t included in the e-mail you can be left out of a lot of the communication for that project.

**This team appears to communicate openly and frequently**

Meetings with stakeholders, sub-teams and vice-presidents allows for the team to communicate its needs and make decisions. The GPT team although at times inflexible (see flexibility section) does communicate among itself. The project manager also encourages open and frequent communication.

**Factor #15 Establish informal relationships and communication links**
Hara, Solomon, Kim and Sonnewald (2003) mention that research institutions normally have individual scientists running their own laboratories and seldom communicating with each other, that just having them available to collaborate is important. Subsequently, awareness of each other’s work and the possibility of communication with other’s are important in collaboration (p. 963). This is important in order to work closely together and to be on the same page with colleagues. This is another key to collaboration.

This occurs at a hierarchical level at this bio-tech site many times. Many people of the same level eat together and don’t socialize with those people at the higher or lower levels. I think this is driven by what is within their comfort zone.

This team works with folks from other teams, yet it is unknown in this study whether there are informal relationships made. There are definitely communication links with other depts. made though.

On this team with its SME’s, there is a lot of communication that goes on with either sub-team members or stakeholders for the project. One example of this is when the GPT met with non-team members outside of the group. They identified some of the operational business external to that of the group. This larger group would look to solve ongoing business problems that allowed more opportunities for the project team. This was a good example of how the teams became successful and worked together and communicated together.

P4 states that “if he has a production issue, for example then this is being discussed between the developers, the engineers and myself, there is no Regulatory affairs nor Marketing” This shows direct communication links outside of the GPT team.
**Factor #16 Concrete attainable goals and objectives**

A lot of teams at this site may not have a clear picture of the objectives. Usually the objectives and goals are spelled out over time. The meeting structure and goal of each meeting and team has improved and is more documented than ever. This has occurred over the last five years.

**The team primarily shares information and has set goals as they come up**

P4 says that the team is for sharing information primarily and does not make many decisions. P1 agrees. However, there are times such as choosing the right type of filter or saving the company on costs to produce the product where there are concrete attainable goals set. This is an ongoing prerogative of the team.

**Factor #17 Shared vision**

Thomson (2001) defines collaboration as “a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions”

There are a lot of teams on site but not a shared vision necessarily although this can occur. Many teams need better cohesiveness and team building. And this doesn’t happen to each team, only a few, that work together over a long period of time. The politics often get in the way.

**The sub-teams appears to be fragmented**

Currently the teams on this project are fragmented, specifically the sub-teams and the GPT. P1 states that “there is not a slow flow of information coming from sub-teams
to the main team. This is most likely due to their newness; they are not yet together as it is a brand new project.”

**Factor #18 Unique purpose**

The purpose comes from what is needed from the company. There is a unique purpose to get the product out of the door into the market. There are many purposes on site too.

**This team defines itself a team with a purpose to bring a new clinical product to the bio-technology market**

The team does have a unique purpose in bringing a new product to the market. This is done through use of decision-making ability and constant work to collaborate together. This purpose is seen through out the project.

**Factor #19 Sufficient funds, staff, materials, and time**

Researchers often benefit from collaborating to share **resources and knowledge** (Kraut, Egido, Galegher, 1990; Finhold, 1999; Kling and McKim, 2000).

This is getting more difficult but for the most part there are sufficient funds. This bio-tech company still has deep pockets. At times, there are restraints on staff and time. There are specific people who are always overloaded and have limited time to get the work done. Usually, there are enough materials.

**This team has saved the company money and therefore is ahead of budget**
Although it wasn’t spoken in the interviews, there is a large budget for this project. Millions of dollars are normally spent on these types of projects. However, this project has efficiently saved at least 60$MM on facility costs.

What is not so available is enough qualified staff and time to get the product to the market. P3 states “we may not be getting enough support and the best team members that we really need”.

**Factor #20 Skilled leadership**

There are some leaders that are very skilled. There are different leadership styles. There is a lack of leadership at the department manager level. Much of the leadership is at the project manager level. Individual leadership also occurs at times because there is a lack of upper level or supervisor leadership.

**This team has many leaders on it. The Project Manager is the primary one however.**

Each team member’s skills and expertise are reasons that they are nominated to the GPT team. These skills & expertise in effect makes them leaders within the GPT team. Most of the SMEs have to lead others to make good decisions outside of the GPT too.

P3 said: “Well, I think my skill set, my background makes me quite a good candidate for this kind of a role”. P1 states that “The team lead (P3) is much more directed, much more aware of all of the requirements to get the project successfully into operations. And so, he’s much more intimately involved with the team operations” One type of leader can take a project from start to completion while working with people as a team leader. P3 appears to have these leadership skills. The change from the old
leadership to the new leadership is significant; it helped to make the team more collaborative in general.

**Conclusion**

Is the collaboration on the team working or not? Overall the collaboration on the GPT team is working. This is in large part due to the new leader/Project manager on the team. And it also appears to be supported by the level of collaboration throughout the company.

Interestingly, while we do not associate hierarchy with collaboration, there appeared to be a combination of partnership collaboration and hierarchy collaboration in this company and on this team. It seemed to operate when decisions needed to be made at a higher level, but even then it was within a collaborative environment. Hierarchy is needed in companies, but it does not always foster collaboration; it distances people from each other. In this team, hierarchy was supportive and engaged collaboratively.

The new leader consults with most of the individuals at times three weeks prior and leading up to the 1x/month meeting. He/she brings out ideas in the individuals that perhaps weren’t spoken about or are an elaboration of what was discussed in the monthly meeting. Such discussions contribute overall to the collaboration of the team.

Collaboration within the GPT team can also be seen from accounts of the team members interviewed. The team members were enthusiastic and committed, appreciating each other’s skills and how each one contributes to the decisions made. Several key decisions that have saved the company millions have been made since the team formed about 1 year ago. There have been several differences between members as well, such as
lack of flexibility, ego clashes, and the members complaining about the meeting being an “information only” meeting which hinders frequency of discussions and the decisions made. The team goes on and continues to meet and is successful.

A third example of the overall collaboration occurs between the sub-teams and the GPT tea. Decisions and information flow can then escalate as needed to the Vice president’s level. It appears that many decisions are being made at the sub-team level. This information can migrate up to the GPT team where several decisions have been made there as well as a result. This is a well working collaboration/hierarchy that exists and allows subject matter experts (SMEs) at the GPT level to work within the team and to also communicate/partner with the sub-teams, and the VPs when necessary.

Overall, hierarchy --- using different levels to support and accomplish the work -- in this company and on the team supported the level of collaboration this project team reflected.

Recommendations
There are some recommendations that may be appropriate for this team to continue improving its level of collaboration:

- meet more frequently as the project gets busier;
- encourage more flexible team membership by listening more to each others viewpoints and being willing to bend more;
- bring more discussion and decisions-making opportunities to the table (coming up from sub-teams or other places);
- continue collaborating with the project manager; and
- build up the team with team building exercises.

Donkin, R., A hierarchy is not the only way to run a business structuring companies with strict pecking orders may not be the most effective organizing system; (Surveys Edition); Financial Times. London (UK): Nov. 3, 2005. pg. 9

Fairtlough, G., (May 2005), The three ways of getting things done, hierarchy, heterarchy and responsible autonomy in organizations. Triarchy Press, UK., p. 7-11, p. 21, 7-28


**Appendices**
Appendix A:

Appendix B: Invitation

Appendix C: Informed Consent Form

Appendix D: Interview Questions

Exhibits

Exhibit I: Copies of articles referred to in research paper

Appendix A
Appendix B

Sample e-mail invitation to identified participants:

SUBJ: Invitation to Participate in Study: Impact of Hierarchy upon Collaboration within a Scientific project team.

I am a graduate student in Organizational Psychology at John F. Kennedy University. As part of the requirements for the completion of my Master’s degree, I am conducting a research study on the impact of hierarchy upon collaboration within a scientific project team (new product development project). Since I am studying this project team in association with JFK and the associated company, I am requesting your consideration to participate in this study.

The proposed study will focus on the experience and results of your participation and attendance in the collaboration effort for a new product development project team. The study will be conducted through a series of individual interviews with participants of this team. Each interview is expected to be of 45-60 minute duration and will be tape recorded. Study participants will be asked to describe their own participation experience and how they observed the project accomplishing its work. Data gathered in interviews will be analyzed and interpreted with the goal of enabling a more complete understanding of how collaboration amongst team members of a project team are impacted by the existing hierarchical structure within the organization and possibly within the team. Focus will be on critical factors of the team member’s experience and a contribution of data that may add information that may benefit project team work within the scientific community and future teams.

Participation is completely voluntary and you are free to change your mind at any time and choose not to continue. Should you choose to participate, all information you give during the interview process will be confidential and your individual contributions will be anonymous. All data collected during the interview process will be stored in a secured, confidential location accessible only by me and a third-party transcriber. Each participant will be identified on the tape by first name participant code only. I will also make a copy of the completed project report available to you at your request.

Thank you for your consideration. I sincerely hope that you will choose to participate! If you have any questions or would like to talk with me further prior to making a decision to participate, please feel free to call me at 707-648-2870.

Sincerely,

Heather Cline
Appendix C

Informed Consent Form

My name is Heather Cline. I am currently a graduate student in the Masters of Organizational Psychology program at John F. Kennedy University in Pleasant Hill, California. The research project is a requirement toward the completion of my Master’s degree. This research project is being conducted under the advisement of Sharon Mulgrew, M.P.H. – Organizational Psychology Project Advisor. She can be reached a SAMulgrew@aol.com, or 510-450-0378.

Project Summary: The proposed study will focus on the experience and results of the experience of your participation within the scientific project team in question. The study will be conducted through a series of individual interviews with team members; each interview is expected to be of 45-60 minute duration and will be tape recorded. Study participants will be asked to describe their own participation and observations experience, to describe how the experience affected them and their work relationships in the immediate and long term, and to identify what particularly worked and did not work within the project team at this time point in the project. You may also be contacted by phone at a later date for clarification or follow-up necessary to insure accuracy of the data.

Data gathered in interviews will be analyzed and interpreted with the goal of enabling a more complete understanding of how hierarchy impacts collaboration on a scientific project team and by focusing on critical factors of the team member’s experience, contribute data that may add information that may benefit project team effort within the scientific community.

Voluntary Participation: Participation is completely voluntary and participants are free to change their mind at any time and choose not to continue even after signing this consent form.

Confidentiality and Anonymity: All information given by study participants is confidential and individual contributions are anonymous. All data will be stored in a secured, confidential location accessible only by me and a third-party subscriber. Each participant will be identified on the tape by first name and participant code only.

Availability of Results: A Summary of the results of this study will be available to participants upon request after completion of the study.

Consent: I hereby consent to participate in the above research project. I understand that my participation is voluntary and that I may change my mind or refuse to participate or withdraw at any time without consequence. I may refuse to answer any questions or I
may stop the interview. I understand that some of the things I say may be directly quoted in the text of the final report, and subsequent publications, but that my name will not be associated with this study.

Participant Signature: _________________________________     Date:

Name: (Please Print) _________________________________

Witness Signature: _________________________________     Date:
Name: (Please Print) _________________________________
Appendix D

Interview Questions

Primary questions are highlighted. The others are follow-up questions that will be asked if the team member does not address them in his or her response to the primary question. Additional questions may be asked, depending on the team member’s own story and responses.

Introductions – Self and Participant
Summarize the participant’s background as it was gathered in the selection process.

I would appreciate it if you would reflect back upon your participation within this project team and share as much as you can with me.

I would like to know about the type of experience you have had on the project team you are on now?

1. What has motivated you to become a member of this team?

2. Have there been examples of teamwork that have been successful? If so, give me an example of a time when it was and tell me what made it successful.

3. Do the team leaders (if there is one) encourage input from everyone in the group? Just a few? If a few, what are their roles?

4. How does the team work to solve problems? Does the whole team solve them consistently? Are they solved consistently by a few? Is it mixed? What are some examples?

5. Do you feel included and that you have a voice on the team?

6. How are decisions made within this team? Is there consensus normally? Give me one or two examples if possible.

7. Using this definition of collaboration, (you have a definition you share) how much do you see this team acting in this way? What are some examples of this? Are there any examples of the opposite behaviors?

8. What might you do to improve how this team functions?

9. What has been positive about your experience on the team?