

AC 2009-694: BREAKING THE ICE: CUTTING THROUGH GEOGRAPHIC, CULTURAL, AND TIME-ZONE BARRIERS TO EFFECTIVELY LEAD IN A GLOBAL ENVIRONMENT

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Breaking-the-Ice: Cutting through geographic, cultural, & time zone barriers to effectively lead in a global environment

Abstract

Global integration is now a reality in every industry. But what exactly is global integration? One of the most common thoughts about it is that global integration is synonymous to outsourcing. But it is much more than outsourcing. It describes a new model of business where the focus has shifted from local economy to global economy.

However, along with the benefits of globalization, come the challenges of leading in a global environment. Besides the obvious issue of time differences, there are several other barriers prevalent in a global team, especially during the initial phase of it. These include communication differences, cultural differences, different expertise levels, different work styles and schedules, and most importantly, trust issues. It is these barriers that commonly form the ice in a global team and can create a very challenging management experience. As a leader of a global engineering team, it is not only essential to break this ice immediately after the team is formed but even more important to lead the team in a manner such that it prevents the ice from forming again.

Developing effective global leadership skills is a challenge for even the most experienced engineering managers. However, offering proper (in)formal education in the area of global engineering management can significantly help train emerging and current leaders and can enable them to identify and overcome the barriers in a global team. This paper takes a look at key concepts that must be taught to and understood by managers seeking success in global markets. The material presented in this paper can be formally integrated as part of a core course in a MBA global management program or can be offered as an elective towards an undergraduate business management degree. Informally, it can be used as part of an executive coaching program and/or an internal educational course that most companies make use of to educate their engineering leaders and executives. Or it can simply be a chapter in a textbook on global management.

Specifically, this paper will provide insight into several key areas. After starting off with a brief discussion on how this material can be used to educate engineering managers, it will proceed by first describing the IBM core competencies required in a globally integrated team. This is followed by a discussion on the initial team barriers, “ice”, that arise when a new global team is formed along with effective ways of breaking through these barriers. This discussion will be supported by examples drawn from practices and experiences of senior industry professionals’ as well as the author’s personal global business experiences. Next, the paper will offer tips on how to leverage the barriers such that it can actually help the team become more effective along with a summary of modern techniques to increase team bonding and collaboration. It also includes a brief literature review on global management educational resources. To highlight the do’s and don’ts in a global team, the discussion will end with two case studies drawn from industry to help realize the good and bad practices in leading a global team. Upon conclusion of this paper,

engineering management students and current engineering leaders will have a sound understanding of how to successfully start and lead a global team.

Introduction

Globalization is the current buzzword in the technical industry. But at the same time, it's also a relatively new concept. Consequently, there is a growing interest and curiosity among existing and new engineering managers to learn what is really required to be an effective global leader. Globalization is definitely a good learning topic for new leaders. But it is equally, if not more, important to educate the existing leaders on this topic since they need to learn and adapt to a new form of leadership.

Understanding globalization is a good start to becoming an effective global leader but the learning does not end there. In addition, industry leaders and management students need to be able to understand and answer the following questions:

- What to do and what not to do when leading in a global environment?
- What skills are required in a global environment?
- How to identify & tackle problems in a global team?
- How to think outside the box and use innovative & creative ideas in a global team?
- How to leverage the assets within a global team?

This paper will attempt to educate on these very topics. The driving force behind this paper is to educate existing and future engineering managers on how to become effective leaders in a global team. The material in this paper is complemented by real world examples and case studies from industry and can serve as a framework on which a course in a global engineering management program could be based on. The course can provide a good learning experience for both novice and current leaders. Infact, one approach that could be used to teach such a global management course would be to focus it around similar case studies as the ones presented later in this paper and use such exercises to educate on the topic of the barriers in a global team. Such a course would make the class more interactive and would instill the key points within the students. In terms of integration within educational programs for engineering managers, there are several ways of doing that.

Integration with educational programs

Teaching global management formally as part of an educational curriculum is one of the most effective ways of developing global leadership skills in current and emerging leaders. Infact, a growing number of universities are offering advanced degrees in the area of global technical management. Obtaining a global management degree has become a good way of increasing one's value as a potential employee. To name a few, Stanford Graduate School of Business offers a certificate in global management as an academic option within their MBA program. Howe School of Technology management offers a major in Global technology management (GTM). Thunderbird oversees a school of global management. Even internationally, universities like the Queens School of Management offers programs in global management. And the material presented in this paper can become a course in any of these MBA curriculums.

However, for existing leaders, the most feasible way for them to get education on globalization is either thru the executive coaching program or classroom study courses offered within most major companies. Therefore, this material can be integrated informally within executive coaching programs or classroom study courses.

Even for undergraduates in business management degrees, this topic can be very useful. This can be an elective course towards their degree. Or it can be combined with a study abroad program to provide a combination of global leadership theory with an international experience. Within the US, University of Pittsburg, College of Business Administration offers a global management major where the studies on globalization are completed with a study abroad program. This allows students to successfully integrate classroom learning with the experience of doing business and leading in different cultures.

These are just some examples to give the reader an idea on how to assimilate the contents in this paper into educational programs for engineering managers.

Leadership Competencies

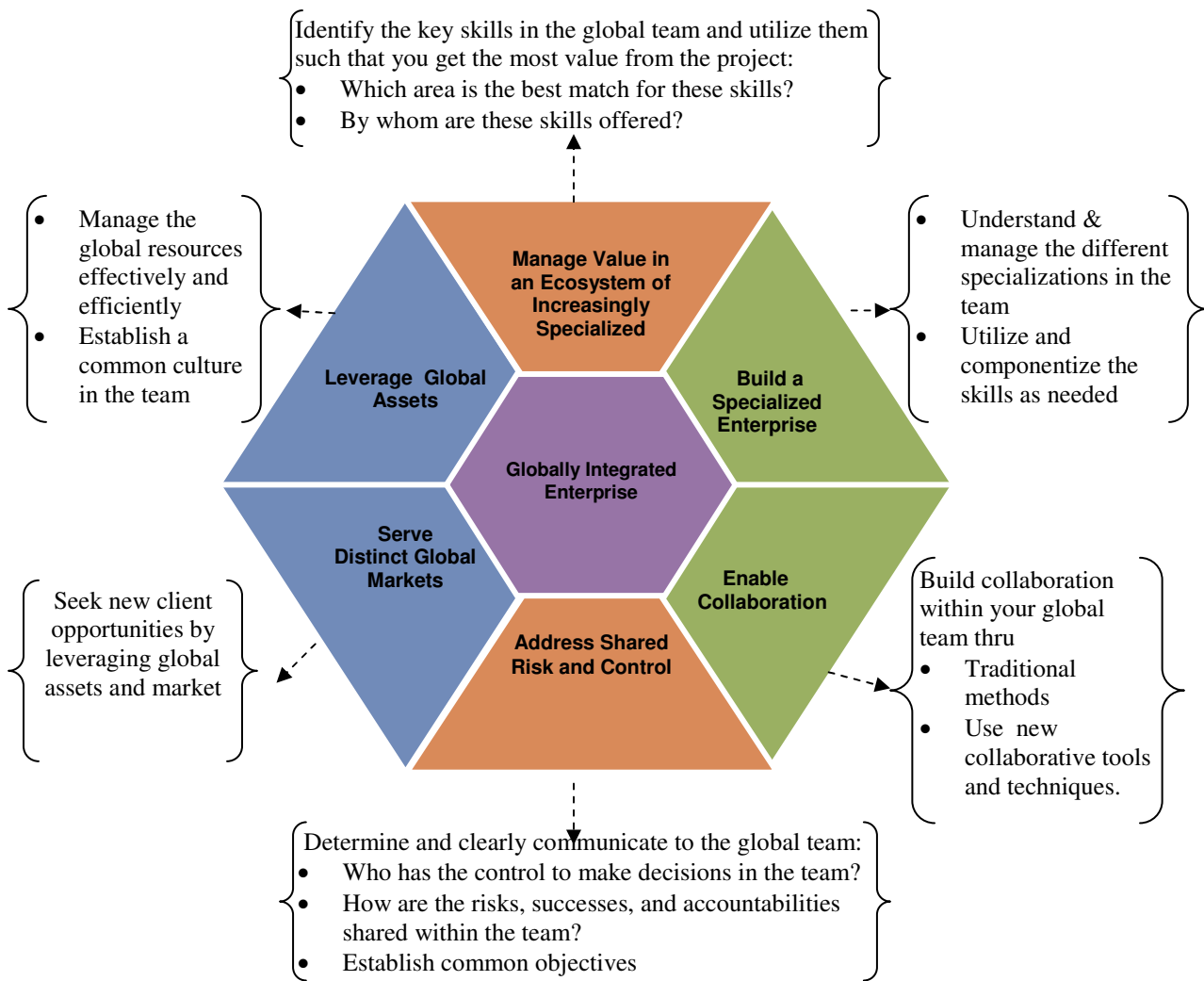
Moving on, what follows next is an overview of what defines global integration and global leadership. Global integration connects the different parts of the world together to form a unified team working towards a common set of business goals¹⁰. It promotes global collaboration as opposed to a master/worker business model.⁴ Emerging markets in India, China, Argentina etc are giving us access to the talent and skills around the world which can enable us to meet the client demands from various parts of the world.¹⁰ Global integration not only helps reduce cost but also provides additional sources for innovation and growth.

To accommodate the industry shift towards globalization, the leadership style has to correspondingly shift from traditional leadership to global leadership. Art Data, CIO for Navistar Information Systems, describes this trend succinctly by stating that "leaders today have to really think in global terms. You can't ignore it and that's a fundamental change. It's a characteristic that we're looking more at than perhaps five or seven years ago."⁹

It is clear that team leadership in a global environment is essential for all leaders in today's market but what does it really mean to be a global leader? IBM, the Fortune 500 computer technology company, has precisely answered this question by creating a model that encompasses six core competencies essential to building a global integrated environment:¹⁰

- Manage value in an ecosystem of increasing specialized entities
- Build a specialized enterprise
- Leverage global assets
- Serve distinct global markets
- Enable collaboration
- Address Shared risk and control

It is these six competencies that leaders should demonstrate when managing a global team. The following diagram¹⁰ translates each competency into specific skills that would be used by a global leader.



These competencies are instrumental in helping a leader overcome the barriers, “ice”, that form in a global team, especially during the initial formation of the team. There are several challenges and barriers that a leader will have to face and break to form an unified team. By doing so, it will enable the leader to establish a successful and productive global team. Marie, senior R&D manager at a major computer corporation in Ireland, very clearly defines the challenge that global leaders face, “In my opinion the biggest challenge in leading globally distributed teams is building a sense of belonging within the global team where people feel they are all one team and part of a shared vision that can only be executed by the team as a whole.”

Global Team Barriers

There are several factors that contribute towards creating the “ice” within a global team and can hinder the team’s progress. The most significant ones are

- Geographic and time zone differences
- Trust Issues
- Language and communication differences
- Cultural differences
- Differences in expertise level
- Work Style differences

One should realize is that these differences are not restricted to only global teams. They exist in local teams as well but the problems are of a higher magnitude when they get extended to global teams. The following section will explain each of the barriers and offer tips on how to overcome those barriers. These sections will be supported using real-world examples based on both noted industry professional’s and author’s personal industry experience. Furthermore, the following sections on the different barriers could be used as core material when teaching a basic educational course on global engineering management. In another words, it can be used as core material for a course titled ‘Global engineering management 101’.

Geographic and Time Zone Differences

When discussing global team barriers, the first thing that comes to mind are the geographic & time zone differences. Hosting a meeting at 11 am PST may be a desirable timeslot for a team member in the US west coast team member but can be frustrating for a China team member, considering it would be 3am in China.

Time zone differences can be more than just inconvenient. Sometimes, they can cause stress in personal life and problems in maintaining the work/life balance. For instance, working in the office during the normal working hours and then getting back online from home and working late thru the night to connect with global team members is common practice for most developers in global teams. Since the team is spread out all across the time zones, many people feel that they are always working and that they are pulled away from other personal and family responsibilities. For instance, when I was in working in a global team with Germany, I received the following comment from their senior architect, “Do you never sleep since you are always online during the nights, (which would be daytime for Germany)? “

Infact, in some cultures, it may not even be feasible to work from home and they may need to stay in the office late into the night. For instance, in some cultures, a joint family is quite common. Taking a call at 11 pm or working from home may just not be feasible when there are too many other members around at home.

There are some solutions to this and as a leader, it is the responsibility of the leader to make use of the following solutions:

- When the initial team is formed, determine a common time range that works for all time zones.

- Clearly communicate to the team the acceptable time range to host common meetings.
- When possible, allow flexible work schedules to accommodate work/life balance.
- Sometimes, it's not necessary that everyone participate in all meetings and filter the invite list as needed.
- If needed, adopt a share the pain approach and establish a rotation schedule. For instance, if it is necessary for the team to have support early in the morning, then rotate the early risers on a weekly basis.⁶

Trust Issues

Probably the most important barrier is the trust issues that arise when a global team is formed. This is the most critical barrier that a leader has to cut thru to form a successful team. Any of the following can be a hindrance in establishing trust within the team:

- Lack of comfort level in the team
- Motivational issues
- Sense of isolation and not being noticed
- Hidden personal goals

One of the primary things that a leader needs to focus on when given the responsibility of managing a global team is how to build trust within the team and between the leader and the team members (especially global team members). Some fundamental practices that will help build this trust are:

1. Building virtual relationships within the team will greatly help in building trust among the global team members. Nothing can replace the importance of a face-to-face meeting. However, in today's economy and budget constraints, that is not always possible. But if at all possible, when an initial global team is formed, the first thing to attempt is to arrange a face-to-face meeting between the global team members and the leader of the project. For example, on a recent joint work effort between Germany and Silicon Valley, a face-to-face meeting between the German architect and the US team was not done until the end of the project. When the fact-to-face meeting happened, it was unanimously agreed that this meeting should have been done much earlier. Certain misunderstandings that had been formed by both sides based on the work styles could have been avoided and would have enabled a relationship to be formed between the teams.
2. Secondly, organize a break-the-ice session between the teams to help the local and global teams form a relationship. A successful example of this was demonstrated when a US team was working with Germany on a development project earlier last year. The US team organized a video-conferencing meeting where every team member in the US put on a movie star mask. It was a good way of bringing in some humor within the two teams and breaking the ice.
3. Clear communication is key to establishing trust. Be sure to clearly communicate the team objectives, team responsibilities, team member accountabilities, project timelines, and the risk in the project along with how objectives are aligned with organizational strategy. This communication should be kept going on a regular basis thru 1-1 and team meetings.

Laura, director of Computer Science at a large computer corporation, states an example where communication was key to the success of her project, “When I was leading a global development team, we had colleagues in Japan who had to work closely with a team in San Jose. The Japan team had really good technical skills, but not strong English language skills. Their manager, therefore, was a critical person for back and forth communications and keeping the teams in sync. The first manager we had in that role had spent time in the U.S., and knew many of the San Jose folks. Perhaps because of that, he took it for granted that he would be trusted, and did not focus on presenting a clear view of where his team was, what they were doing, etc, but instead took a very laid back approach to communications. As a result, he was perceived as not credible, and not trustworthy, and the San Jose team was reluctant to give any significant work to the Japanese team. When he was replaced by a diligent young manager who did not know anyone in San Jose, that manager focused on facilitating communications, and on representing his team to each of the San Jose developers. Within 6 months, the two teams were working closely together on a broad range of line items with the Japanese team having considerable responsibility for the release”.

4. Invest extra time in forming relationships with the global team members.
 - For instance, when an IBM US Continuing Engineering team in Silicon Valley was working globally with the China development team, it was noticed that the developers in the China team would not ask any questions nor surface any issues which could possibly end up causing delays in deliverables. The US team lead made an extra effort to make the China developers feel part of the team and encouraged them and coached them to ask questions. Over time, they got more comfortable with the team and it became natural for them to get involved. Similarly, when an all-hands was presented to the US team, the same all-hands were also separately presented to the China team to make them feel part of the same global team.
 - For the people who are less vocal or seem less involved, have more frequent one-one-one communications with them to make them feel part of the same team. Once again, invest more time in establishing a relationship with them.
 - Pay more attention to email communication with global team members. Body language is read into emails especially when there is less or no face-to-face interaction. Try to bring some warmth into the emails but maintain a level of formality especially during the initial phases.
5. Trust is built by team activities and not just sending emails or participating in conference calls. But with global teams, such activities is not feasible. Therefore, as leaders, think outside of the box and use collaborative tools and innovative styles to communicate with the team. There will be specific examples of such techniques discussed later in this paper.
6. Finally, trust is especially important when the global team is formed thru an acquisition. In such cases, communication is key. This phase is usually marked with apprehension and ambiguity for both teams. Some time back, the organization I worked for acquired another company. From our perspective, we felt that the acquired company was the new decision maker. Interestingly enough, the folks in the acquired company were apprehensive and felt that they would now be lost by working for a larger corporation. So in such scenarios,

building trust by clearly communicating the responsibilities, the roles, and the impact is essential along with recognizing the emotional impact of this change

The key thing to remember is that once trust is there, the distance is not a real issue. Once again, Laura, summarizes this very effectively in the following quote. “Work to build an individual relationship with each of the team members (for a small team) or the key leaders (for a large one). If your team trusts you, they will be much more willing to navigate the inevitable mistakes, cultural incongruities, or other challenges. The other thing you must do is communicate, communicate, communicate. Find a style that works for you (email, newsletters, phone calls,) and use it to ensure that all members of the team know what is going on and feel included.”

Establishing trust within the team is a huge barrier in global teams. But within a classroom environment, it is perhaps one of the easiest scenarios to enact in an engineering management class. In another words, grouping students together to work on graded team based exercises will easily surface trust issues within the team. And when those groups are formed from members who have different backgrounds (e.g. cultural, educational etc), it will be very likely that they will hit upon some of the same issues that one does in a global team. Allowing the team members to work together and get over these issues will serve as a good learning experience for them on how one handles such issues in a global team.

Language and Communication Differences

Language & communication differences can become a strong barrier in a global team. The basic differences in accents or the proficiency and speed of the English language has the obvious problem of making communication difficult. But differences in language can actually cause a lot of misunderstandings in a project and can send out wrong messages. The following are some examples that highlight this issue:

- A team of three US developers, incidentally all women, went to Germany for a knowledge transfer session. At the end of the 2 week session, the architect in the German team said, “You are all very spongy”. The immediate reaction from the US developers was confusion and the comment seemed strange. Seeing the reaction, another German team member explained that it was a compliment and it meant that the US developers quickly absorbed all the knowledge like a sponge.
- Ekkehard, IT architect at a large computer corporation in Germany, advised that in “normal German talk, a no is a NO, a yes is a YES, a false is a FALSE and a true is a TRUE. However, this may appear rude to a British audience”.
- A US company executive had gone to Brazil and after the end of the session; the Brazilian team stated that “it was grand”. The executive came back with the understanding that the idea was considered to be great by the Brazilian team. However, it was later realized that “grand” in Brazil means simply average. ⁴
- Use of colloquials can be very tricky. Such statements as “step on it”, can be confusing and may be taken literally. For instance, during a local meeting between an US

development team member and an Indian QA (Quality Assurance) test lead, the US team member suggested that QA team members need to “get in the face of the developers”. By this he meant that the QA team members need to increase collaboration with the developers. The QA test lead responded in a slightly annoyed manner, “That is not the way I work”. He took it in the literal sense and thought it meant that the QA folks need to barge into the developer’s office everyday.

- Brett illustrated an example in which a French team member saying “I demand” to a US team member was considered rude until it was later known that the French team member was using an incorrect but direct translation of “I am asking”.¹

In all the cases mentioned about, language led to confusion, frustration or even anger within the team. To avoid such problems in the team, it is critical for the leader to not only follow the below mentioned practices but to also communicate them to the team and establish them as part of team culture:

- Communicate to the team that extra measures should be taken to avoid using colloquials and jokes that are only realized by a certain culture or geography.
- Encourage the team to politely ask for clarification when something is not clear due to a language or communication issue.
- Don’t assume everything is the same in other cultures. English may be the working language in a global project but not all project team members are as proficient in English.^{4, 5}
- When visiting a foreign country, it is common that everyone around you may be speaking in a different language. Accept the difference and try to adjust.
- During communication with global team members, be comfortable with pauses. In US, pauses during conversations are avoided. But in other cultures, such as Japan, it is common to have pauses between statements. Be comfortable with that.⁴

Cultural Differences

Following closely behind communication and language difference are cultural differences. Culture is engrained from schooling, society and family. Cultural differences are a result of different education systems, different political systems, different religious backgrounds and simply different environments.

Some examples of cultural differences would be:

- Generally speaking, US is considered individualistic and rewards individual initiative whereas the Korean culture is more collectivist oriented and prefers to reward for working together²
- US encourages individualistic and creative thinking whereas in other cultures, following what the seniors ask with a no-questions approach is the norm.
- Some cultures can be more expressive in terms of words or body language whereas some are not and tend to prefer formality.
- In Japan everyone is addressed with a ‘san’ which is not something that the US folks do.

As a leader of a global team, the best way to adjust to cultural differences is to build cultural awareness and get an understanding of the different cultures being brought into the team before starting to lead the project. Building a basic understanding of culture, values, and norms along with some knowledge of cultural etiquette/protocol (e.g. greeting, dining) will go a long way in forming a relationship with the global team members. As an example, an US executive visiting Japan, made reference to Hello Kitty during her visit there to help form a relationship with the Japan executives.⁵

Another important thing to remember is to accept and respect the cultural differences. This is very nicely put by Bruno, an international program manager for a space system integrator in France, in the following piece of advice, “Get to know the culture of the country... the working culture... project management (style)... problem solving process. Forget about what you are and what you’ve done, and listen to what they say. They may not be right or wrong, just different.”⁸

Another good practice would be to form a common culture for the team. Collectively, come up with an acceptable set of values and protocol to conduct meetings and communication within the team. For instance, I was part of a development team where all the members were very active speakers which commonly caused parallel discussions during team meetings. So the team lead formed a rule that during meetings, whoever held the whiteboard marker would be the only one speaking at that time. This is an example of setting a protocol for the team based on the culture of the team.

Expertise Level Differences

A common problem in global teams are the issues that arise when there are different expertise levels within the team. Certain global areas can have specialized skills and it is essential to utilize those skills to get more value from the project. Difference in expertise levels can lead to ego problems and distrust within the team. It is the challenge of the leader to be able to empower the ones with the specialized skills and at the same keep motivation levels up for those that have lesser expertise in that area. Some key tips on how to do so would be:

- Align project goals and objectives with individual goals. When a team is formed, get an understanding of what the individual goals and priorities are for every team member and ensure they are aligned accordingly with the project goals. For example, if a team member has skills in designing solutions and is interested in higher level design, attempt to give the individual such opportunities within the scope of the project. This should be extended to local team members as well as global team members.
- Understand where the expertise is and utilize them towards a common goal.
- Communicate the common goals clearly to the team.⁷
- Most importantly, understand that US is not always the expert on every area. It is a global unified team rather than a master/slave relationship and therefore ownership and leads can be defined in local as well as global teams. It is perfectly valid to have a global team member lead and drive a work effort if the specialized skills are within that area and would be more beneficial for the project.

Work style differences

Work style differences come into play on a daily basis in a global team. Different geographic areas and sometime even different sites in the same geographic area exhibit significantly different work patterns. These differences can even be culturally driven. Some examples of this would be:

- In Germany, engineers and developers need special permission to be able to work onsite on the weekends. They have more vacations in comparison to US development teams. Furthermore, in the Boeblingen development lab, everyone tends to eat lunch outside their office in the cafeteria followed by an afternoon coffee/ice-cream break. On the other hand, in the US, there are lesser vacations along with a ‘no permissions needed’ policy to come after-hours for work. And a large number of folks eat lunch from their desk to catch-up on their emails or other work.
- Generally speaking, French team members are more detailed oriented and are known to analyze the entire problem and potential approaches before starting a solution whereas the US teams adopt a slightly more trial-and-error sort of approach³.
- Ekkehard, IT architect at a large computer corporation in Germany, shares his experiences in visiting the US development lab by stating, “One thing I found particularly strange when I was in US was the very flexible (if not to say chaotic) organization of meetings, dates, availability of rooms etc.”

Even in completely local teams, differences in work styles are very common. Some folks come to work at 8am whereas some come to work at noon, but both are expected to meet project deliverable timelines. In the same manner, in a global team, different work styles can require some adjusting from the team members but should not be a hindrance in meeting project deliverables if the leader clearly establishes and communicates the following three things to the entire team:

- Project deadlines
- Project goals
- Project risks and accountability

Another good practice is to establish the holidays for the entire team when the team forms. Since different work environments have different holiday schedules, determine the complete set of holidays across the team and communicate it to the entire team.

Summary of Barriers

The following chart briefly summarizes the six barriers that have been discussed so far along with the key tips on how to overcome those barriers. If this material is being taught as part of a global management course, this chart can be used as a reference sheet to be referred to throughout the course.

| Barrier | Key Tips to Overcome it |
|-----------------------|--|
| Time Zone/ Geographic | <ul style="list-style-type: none">• Determine common time range for meetings• Allow flexible work schedules |

| | |
|-------------------------------|---|
| | <ul style="list-style-type: none"> • Use rotation schedule when necessary • Avoid early morning/late night meetings |
| Trust | <ul style="list-style-type: none"> • Arrange a face-to-face meeting in initial stages • Focus on building relationships • Setup an initial, fun, Break-the-ice session • Collaborative team building activities. • Bring warmth to emails but balance with formality • Frequent 1-1 with global team members • Encourage team to ask questions • Communicate, communicate, communicate !! |
| Language/Communication | <ul style="list-style-type: none"> • Be cautious when using slangs/colloquials • Don't assume everything is the same • Be comfortable with the differences & adjust • Seek clarification when there is confusion |
| Cultural | <ul style="list-style-type: none"> • Build cultural awareness and understand the etiquette • Respect the cultural differences • Break the ice by referring to positive aspects of the culture • Form common set of values/protocols within team |
| Different levels of expertise | <ul style="list-style-type: none"> • Align project goal with individual goals • Utilize different skills towards a common goal • Communicate team goals • Unified team rather than a master/slave model |
| Different work styles | <ul style="list-style-type: none"> • Accommodate different work styles • Communicate project deadlines • Communicate project goals and risk • Set clear accountabilities • Determine and communicate the global holiday schedule |

How to teach this in a classroom environment

The topic of barriers and how to overcome them can be presented in one of many ways in an educational course on global management:

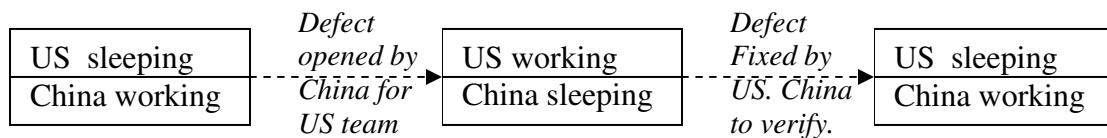
- Via a lecture
- Breaking up the class in smaller teams. The teams should be grouped in such a manner that certain barriers will be easily exhibited within the team (e.g. grouping a team where each team member speaks a different language). Once grouped, give each team real world exercises and reward the team that is able to overcome the barrier(s) and become most productive.

- Present case studies and invite the class to identify and resolve the barriers in each case study.

Leveraging the Barriers

The barriers that have been discussed so far are generally a hindrance for the team relations and team productivity. But there are instances where these barriers can be leveraged to help add value to the team. This section will explain how the leader should use these barriers to help the team.

Time zone differences can be utilized effectively in the development and testing phases of a project. For instance, if the global team is spread between US and another country whose time zone is significantly ahead (e.g. Germany/China/India), things can get done overnight due to the time differences.



In this example, when it is nighttime for the US folks, it is daytime for China. Therefore they can test functionality & open a defect against the US dev team. The next morning when the US team comes to work, it is nighttime for China. The US team has a day to fix the defect. When it is evening time for the US, the China teams comes to work and can verify the defect. If this were all local, the turnaround for determining and fixing a problem could take twice as long.

Cultural differences can be leveraged to establish client relations in global areas. For instance, many customers prefer dealing with folks who can understand their culture and/or language. So if there is a global team in Asia, it would be more beneficial to use that global team to establish relationships with Asian firms rather than having an US enablement team member work with the Asian clientele.

Differences in expertise level can be used to both empower the skilled experts as well as ease the transition of the less experienced team members. By giving the responsibility of coaching to the more experienced members it will solve the concern of how to ramp-up newer team members and will effectively integrate the more experienced folks into the team as well.

Different work styles can be utilized to cover different aspects of a project. For instance, certain geographic areas are more detailed oriented and pay more attention to process and documentation. Whereas, in other geographies, teams members may be better at creative thinking. Utilizing both styles effectively in different areas and phases of the project may help in covering more aspects of the project as well as bringing better quality to the project in comparison with everyone having similar styles and focused on doing the same thing in more or less the same way.

Virtual Collaborative Tools

Building team collaboration is extremely critical to the success of a project. And in today's society, there are a vast number of tools that can enable virtual collaboration within the team. These methodologies and tools should be utilized within any global management class, irrespective of whether it's in the form of a university classroom or an industry educational course. It would help students get familiar with these tools and practices so that it becomes natural for them to start using it in a global team within a work environment. The following is a list of some of the more popular methods and tools that can be used for team collaboration:

- A WIKI for the team and/or a team blog
- Collaborative tools available within your company (E.g. Lotus Notes team room¹⁷)
- Instant messaging tools. Certain instant messaging tools may be restricted by engineering companies. But typically every company has an instant messaging mechanism. And this will serve as a prominent form of communication between team members.
- The use of video chats when communicating between team members in combination with regular instant messaging

- The use of web and video conferences during group meetings.
 - An example of a simple, light-weight, web-conferencing tool is Microsoft NetMeeting¹⁸.
 - Another good tool in this category is iLinc²¹. It's a web and video conferencing tool that allows team members to work together on documents thru web & video chat. The global team members can access files and programs off each others desktops and visit web sites together with a live browser²². One can even navigate the other to a page and walk them through a real demo²².

- The use of virtual workspace tools. Virtual workspace is a very modern concept. It is defined as a work environment in which geographically separated groups collaborate electronically toward a common goal or purpose and allows participants to study, analyze, and edit virtual objects in an interactive environment.¹⁹
 - BaseCamp²⁰ is a good example of a virtual workspace. It's a simple but popular management tool and is a web-based application. Specifically, it's a project management tool that allows the managers to complete all the project management responsibilities in an interactive and easy fashion.
 - Thinkofit.com²³ is an independent website that offers a list of collaborative workspace tools. The tools mentioned on this website are neither recommended nor disapproved by the author of this paper. The mention of this site is for its usefulness in offering a very comprehensive list that can be referred to by engineering managers who are interested in finding out which collaborative tools are out there.

- Establish team bonding thru virtual coffee sessions. For instance, once a week, the entire global team (local & global) can take out 15 minutes to take a virtual coffee break and chat on non-work related things.
- Celebrate team events (e.g. virtual baby shower, virtual birthdays)

Literature Reviews, Educational Guides, & Knowledge Bases

With the rise of globalization, an immense amount of information is available on the topic of global management in books store and on the internet. The following are some examples of valuable resources on this topic. Infact, any educational course on global management would be incomplete without the mention of some useful references for the students. Therefore, giving out the following references in a global management university course or in an executive coaching program can be quite handy for engineering management students and existing technical managers.

Website:

- Globesmart¹¹ is an excellent source of knowledge that offers insights and tips on how to do global business with people from other countries. Specifically, it discusses global business with 40 different countries. It's an online knowledge-base that gives quick access to information such as how to manage global employees, sell to global customers etc. Globesmart has a review process to review the validity of the material in this knowledge. In essence, it's a great go-to guide for global engineering managers and/or global business (wo)men.

Books

- “Apples are square: Thinking differently about Leadership”¹² by Dr. Susan Smith Kuczarski and Thomas Kuczarski. This book includes research on 25 of the top CEOs and their leadership styles. The authors have made use of an apple metaphor to demonstrate how effective leaders can manage and bring back up rotted or spoiled work environments.
- “When cultures collide: Managing Successfully across cultures ”¹³ by Richard d. Lewis. This is a book based on the differences encountered when doing business in different cultures and countries. It also includes some cultural analysis on several countries including India, Ireland, Brazil, Mexico, Europe etc and helps the reader understand what is real and what is perceived when working with the different countries.
- “Managing Virtual teams: Getting the Most from Wikis, Blogs, and Other Collaborative Tools”¹⁴ by Katherine Brown. This book offers tips to manager and teams members of a global team on the different collaborative tools available to help foster virtual relations within the team.

Classroom Textbooks

- “Global Business Today”¹⁵ by Charles W. L. Hill – This is an undergraduate level or MBA level textbook. It has a good and concise description of the major global and cultural issues in doing global business. This book is an established name within the global business market. It's a good resource for folks interested in doing international business and has relevant information on global management as well. It offers a variety of real workplace examples from companies around the world.

- “Global Management”¹⁶ by Betty Jane Punnett, David Ricks, Mark E. Mendenhall - This is an international management textbook for undergraduates. It is written by an impressive list of authors. Mark Mendenhall is a PhD scholar and specializes in global leadership development. The book includes an extensive list of references, probably one of the most thorough one found in an undergraduate international management textbook. It also includes exercises that make use of different countries and different organizations.

Case Studies

This final section will walk through two real industry case studies and identify the things that were done right when leading a global team as well as the things that should have been avoided. Case studies such as the following can be used in engineering management courses in universities to bring an interactive element to the course. If it's a short course used as part of a company's internal education for its engineering managers, then using a few case studies near the end of the session would suffice. Either way, making use of such case studies in a global management educational course and/or session will effectively instill the do's and don'ts of global management within the students.

Case Study 1 from IBM: Successfully leading a global project.

Samir, an IT manager, has the responsibility of leading a global team consisting of members in Silicon Valley, California (SVL) and in China with a short period of help from the Germany lab. The team is responsible for the development of an auxiliary tool for their enterprise software project. Samir is a new manager and has not worked with the China team and therefore the China team is not sure of what to expect. However, Samir realized that the expertise of this tool belongs in China and the SVL team consists of new team members. Since half the team had no expertise in this tool, Samir decided to use a buddy system within the team. Every member in the China team was paired with a member in the local SVL team to help China integrate into the team as well as help ramp up the local folks on the key technical skills. As part of team culture, he deemphasized traditional formal training sessions in lieu of more communication between the buddies. He also established a WIKI page and a Lotus team room document to be used for team communication. Furthermore, he ordered headsets for every team member to allow them to do instant messaging & web conferencing. Also, many of his team members had small kids which needed to be picked up from school and therefore they had to leave by a certain time. However, most of the team members needed to be back online around 7 pm PST to communicate with the China team. Samir allowed his team members to utilize flexible work schedules where they can leave early and then log back in from home instead of working late in the office.

The key barriers demonstrated in this case study are:

- Trust issues
- Expertise differences
- Time zone differences
- Work style differences

The things that were done right by Samir included:

- He leveraged expertise differences via the buddy system to empower the team. He gave leadership opportunities to folks in China and eased the transition for the newer team members.
- He helped overcome the time zone barriers by offering flexible work schedules.
- He overcame language barriers by creating a focus on collaboration tools such as wiki and instant messaging instead of using direct methods such as phone or traditional formal meetings. This helped overcome communication issues between the two teams.
- He tried innovative styles of building collaboration and trust by using instant messaging web conferencing and the buddy system rather than traditional formal training sessions, which would have been a problem due to time zone issues.
- In a nutshell, he focused a lot of energy on collaboration and unifying the team.

Case Study 2: Not-so successful way of leading a global team

Ed, an experienced development manager has received the responsibility of managing a new global team between Silicon Valley (California) team members and the development team in Germany. The upper management for the project was all out of US. There is an architect in the US team as well as an architect in the German team. The project involves creating a new repository with a new front-end application. The front-end application layer expertise is with the German team whereas the mid-tier and server level experience is with the US teams. Members of both sides of the team are experienced engineers but are working together for the first time. Each team had their own kickoff meeting. In the US kickoff meeting, project timelines and project scope were defined but not communicated to the German development team and vice-versa. When working with the German development team, there was an issue of ownership. Since the entire management of this project was in the US, there was a concern by the German team on getting the right visibility. There has been no introduction with the German team and limited interaction with them until several weeks later when more technical discussions started to proceed. The US team is allowed a flexible work schedule so most of the US developers connect from home at night to communicate with the German team members. But technical meetings have been held as early as 6 am in the morning to accommodate the German team members who leave at 4 pm German time. Likewise, the German team members have held meetings at 7 pm their time to accommodate the US team members who arrive later in the day because they have to drop kids off to school. A common problem that everyone has been facing is build breaks. If there happens to be a build break from the code that the German team checked in the previous night, the US team is delayed the next morning when they come to work because they have to resolve a build break and debug code that they didn't develop. Also, the German team architect and the US team architect are unable to resolve scope issues and there is constant confusion on the scope of the project. Ed feels that there is too much focus on processes and documentation from the German team and not enough code being produced. On the other hand, the German developers feel that the US team does not have clear procedures and designs in place. Near the end of the project, a few of the US team members got the opportunity to visit Germany to meet the team members and the architect.

The barriers illustrated in this case study are:

- Trust issues

- Time zone barriers
- Workstyle barriers.
- Expertise differences

The things that went wrong in this project and should have been improved are:

- There was a lack of communication between the two teams and no relationship was formed between the two teams. To begin with, there were two separate kickoff meetings and no unified kickoff meeting for the entire team. Overall, the global team was separated from the local team and was managed as two entities rather than one unified team.
- More common communication was needed in establishing a common check-in criteria so that build breaks could have been resolved more effectively. Clarity in processes for global teams is a must.
- Time zone barriers could have been resolved by establishing the time range to hold meetings instead of allowing meetings to be held early in the morning or late in the evening.
- No common communication was expressed to the teams in terms of project dates and project scope.
- The face-to-face meeting should have happened earlier rather than at the end. The use of videoconferencing should have been utilized if a face-to-face meeting was not possible.
- Offering flexible work hours was a good idea to overcome time zone barriers.
- The German team's concerns on ownership were not addressed and more communication needed to occur.
- The different work styles were a cause of frustration for both teams instead of adding value to the project.
- In a nutshell, the project was being led as "them vs. us" rather than "all of us as one team"

Conclusion

Leading a global engineering team is a rewarding experience but has its share of issues. To become a successful leader in today's global environment, a few basic principles need to be rigorously followed to avoid forming the "ice" in the team. This paper provides insights, supplemented with real world examples, into those key problems and offers suggestions on how to overcome them. Throughout the paper, there are tips on how to present and teach this material in a classroom environment. The material discussed in this paper can be integrated in university management courses and/or industry leadership courses as education for engineering managers. It offers a solid framework on which such educational courses can be built upon. Lastly, the most significant message that should cross from this paper is that, in order, to be an effective leader, it is essential to manage the differences, use all methods of collaboration to form a unified team, and to properly flourish the resources in the team. As Art Data, CIO of Navistar Information System, says "Being a leader also means being able to take a step back and let your employees operate on their accord. ..."⁹

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