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Forward

This book contains a description of the tools, concepts, and examples of what is taught in the QUEST Honors Program at the University of Maryland. It may be used by students in this program and beyond as a resource to help improve the individual, teams, external clients, and even the world around us.

QUEST is a pretty special learning community at the University of Maryland. This year, we celebrate the 20th anniversary of the program that started as the IBM-TQ (Total Quality) program in 1992. This first edition of the book is a small teams’ effort to codify some of the concepts that have been taught within QUEST since its inception. Accordingly, we are very thankful to the many wonderful individuals that have shaped and improve the QUEST program over the years. We are especially grateful to the many students, faculty and staff, and corporate partners who have participated in the QUEST program.

We wish to especially acknowledge our contemporary colleagues who have helped us over the past year write this book. The list includes Dr. J. Gerald Suarez, Dr. Nicole Coomber, Dr. Jeffrey W. Herrmann, David Ashley, Melanie Ashton, Kylie Goodel, and Kathryn Weiland. Please excuse us from any omissions in this list since we have benefited greatly from many colleagues within and outside of QUEST.

Finally, please take a look at the book’s web site for additional information about the material in this book or to give us feedback. QUEST strives for continuous improvement and this book is no exception.

Joe, Brian, Emily, Sahil, and Saul
College Park, Maryland
April 2012

www.quest.umd.edu/qualitymatters/
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Chapter 1

Individual Skills

1.1 Interview Skills

One of the final steps to getting an internship or job: the interview. One of the most important ways to prepare for an interview: practice. Practice really does make perfect.

1.1.1 Before the Interview

Before going on the interview, research the company, ask friends if they have had experience working with the company, and research the interview.

Researching the company encompasses what the company does, who the company’s customers are, where they are located, how they operate, who their major competitors are, general news released in the last month about the company, and the company culture. Not all of this will be fully learned by exploring the Internet, and that is expected. For example, company culture is hard to gauge online without interaction with company employees, but it is possible to get some insight into the company’s culture. But it is just as important to learn about what the company does, who their customers are, who their competitors are, and where they are located. For example, Coca-Cola produces Honest Tea, Canada Dry, Coke prod-
ucts, and much more. Their biggest competitor is Pepsi. Their customers are restaurants, food stores, individuals, etc. and their headquarters are located in Atlanta, GA. For some positions it would be good to know specific information about a company. For example, if applying for a corporate finance job with Coca-Cola, it would be good to know their annual revenues and stock price.

Asking friends if they have had experience working at the company or interviewing for them before will also be helpful as it can give added insight into the process. They may be able to tell you one of the harder questions asked during the interview, which can help with the preparation process. In addition, if they held a position at the company before they can describe what it was like and what they did, which can help you determine if you want to do it.

Researching the interview is also important. Check to see if it is a group interview, individual interview, or some of each. Ask about the interview schedule will it be just one interview, or multiple interviews back to back, and how long with the interview(s) be? Also find out the type of interview: behavioral or case. Find out where the interview is located and how long it takes to get there. Plan the course of travel so it is not a worry the day of the interview.

Finally, practice interviewing. Find a friend, ask parents, or go to the Career Center for a mock interview. It is important to have a list of well-thought out examples to choose from during the interview. The examples should play to your strengths and show your leadership, teamwork, innovation, and time management skills among other skills. Also be sure to know the answer to “Tell me a little about yourself,” and “What are your strengths and weaknesses?” Walk into the interview with questions you want to ask as well, and especially with case interviews, practice with people. Most of the consulting company websites and some banks have practice cases online that should be done before going into the interview. The company you are interviewing for will likely have practice case interviews online as well if they are giving one.
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It can be a nerve wracking experience, so practicing beforehand and knowing what to say will help increase your confidence. Practicing will also help determine how much detail needs to be said for an example to make sense while conveying its point.

If there is an event the night before the interview, or the night of the interview go. It is a great chance to network and show them your interest in the company.

1.1.2 During the Interview

Three things to do: arrive about ten minutes early to the interview, assume each person seen is the interviewer, and turn off your cell phone and put it out of sight. Someone is always watching and you never know who they may ask of their opinion of you. The person in the waiting area will be asked to give his/her opinion of you, so engage the person in pleasant conversation and ask him/her any questions you may have.

In addition, make sure you dress well. It is usually safe to wear a suit and then, even if you are overdressed, it is better than being underdressed and disrespecting them. Be sure to bring a resume so you can provide it if asked. It is also suggested you bring paper and a pen, especially if it is a case interview so you can take notes and do some quick math calculations. Most, if not all, companies will not allow a calculator into the interview room, so make sure to review basic math computation before a case interview if needed.

When entering the interview room, firmly shake hands with the interviewer while maintaining eye contact. Keeping eye contact during the rest of the interview is important as well do not look at your hands or the wall as it will detract from your confidence and could distract the interviewer. Also, smile and convey a positive attitude. The interviewer is trying to figure out if they would like working with you, and people typically do not like negative, unhappy people- so smile.

While conveying a positive attitude is important, do
CHAPTER 1. INDIVIDUAL SKILLS

not get too familiar with the interviewer. Many interviewers have been interviewing potential employees for a long time, so they know how to make a candidate feel comfortable. However, remember it is still an interview. For example, in an interview for an IBM Consulting internship a question asked was “Tell me a time when you had to give up something in order to do something else.” An answer they liked was giving up time spent with friends and some campus club involvement in order to participate in a nonprofit consulting program through the Center of Social Innovation. An answer the HR personnel said she did not like, given by an earlier candidate, was skipping class to play an intramural basketball game. The interviewer was very friendly and personable, so the previous candidate likely felt as if s/he was talking to a friend, but it is important to remember it is still an interview.

Usually team situations are brought up in interviews; however, it is important to know the interviewer is looking to hire you, not the team. When answering questions relating to a team situation remember to not only say what the team achieved, but what you specifically did on that team that helped lead to their success. The interviewer is not psychic and will not know what you did versus everyone else on the team, unless you tell him/her.

Some things not to do:

1. Do not look at the clock during an interview. It will send the message you would rather be somewhere else, which is not the message you want to leave with the interviewer.

2. Do not use inappropriate language. You do not know the interviewer and they could take offense to the inappropriate language or think you are not able to hold your tongue. If you cannot hold your tongue in an interview, they will not be able to trust you to hold your tongue in front of a customer, potential investor, etc.

3. Do not lie. You would not like the interviewer to lie
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1.1.1 INTERVIEW SKILLS

to you about what it is like working at their company and leave you with a false impression that you will use to make your decision of the company, so do not do that to the interviewer.

4. Do not chew gum or wear a strong scent (i.e. smoke, perfume, cologne). People can take offense to this. Chewing gum during an interview can be taken as a sign of disrespect. Wearing a strong scent may also rub the interviewer the wrong way based on their prior notions linked to the scent. Also, you never know if they have allergies.

5. Do not ask about salary, time off, and/or benefits. This will lead the interviewer to believe you are only interested in the job for its perks and not the actual work done.

It is important to leave the interview on a strong note, so enter the interview with questions. A good question shows you have done research on the company and want to learn more about what you can expect. For example, possible topics to ask about are mentorship programs, continued training, and feedback how these are run, how to get involved, etc. The end of the interview, when you are asking questions, is your chance to interview the interviewer in order to learn more about the company. An interview is a two way street where the company is looking to see if you are a good fit for them and you are looking at the company to see if they are a good fit for you.

Also, make sure you know the next steps to the interview process. If you do not know, then ask. Find out when you can expect to hear their decision, and how many rounds there are. If there is another round, what does it entail (i.e. interview research)?

1.1.3 After the Interview

Make sure to get the interviewer’s contact information before leaving, such as their name and email address. Then,
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send an email no later than the next day thanking them for taking the time to meet with you. If there was a key and/or unique point or connection made during the interview it would be a good idea to mention it in the thank you note to remind the interviewer of your conversation. Do not wait too long to send the email as some companies decide who advances to the next round as soon as the interviews are over.

Do not forget preparation and practice are the best things to do to ensure a good interview. Good luck!

1.2 Negotiations

When the subject of negotiations arises, many think about their experience haggling with the car dealer or other merchant for a lower prices. While this is one form of negotiations, many opportunities for negotiations exist all around us that don’t distill into a simple matter of price. For example, when we get together with our friends, we must negotiate where we will go, how we will get there, and how long we will stay. Often, these variables of “degrees of freedom” are negotiated simultaneously so that we can find an acceptable outcome for all parties. For example, you friend might say that they are willing to go into the city for dinner as long as someone else is willing to drive. The opportunities to negotiate for things we want while attaining the objectives of others requires thought and consideration.

The first step in negotiations is to determine what kind of negotiating it is. Often, parties that are negotiating fall into the trap on focusing on only one objective. Not surprisingly, this one objectives is often the one that is most disputed by the negotiating parties. Time should be spent exploring all of the degrees of freedom among negotiating parties by exploring all possible considerations. Then, the parties can describe which of these considerations constitute “strong preferences” and which ones are “weak preferences.” Often by stating the strong and weak preferences to each other, the negotiating parties realize that they may
be able to come to a solution without having to compromise their primary consideration.

The second step in negotiations is to brainstorm all possible solutions. This process will allow new and novel approaches to satisfying the negotiating parties without trying to determine how one side loses while the other wins. One way to think about this process is to imagine a pie chart that represents the value at stake in the exchange between the negotiating parties. If the size of the pie is fixed, then the negotiating parties are only determining how to split the pie. If, however, the negotiating parties start by looking at the value itself, they can find ways to make the pie larger.

The third step involves splitting the value between the negotiating parties. Hopefully by this point the parties have developed a level of shared trust after going through the first two steps. If, however, the parties cannot agree how to split the value between them, there are still a few techniques that can be used. One may be to use an objective third party. For example, when negotiating a salary with an employer, a job candidate and their potential employer may set the salary based upon competitive offers. Another technique involves an iterative process of dividing the portions of the shared value into separate and potentially equal set. Then, the negotiating parties express their preferences of which set they prefer and why. The negotiating parties may even exchange portions of their set if it is mutually agreeable.

Overall, negotiating is something that we do much more often than we think. The more practice we have and the more we can identify some negotiating techniques, the easier it becomes to find creative solutions that make all parties better off.

1.3 Presentation Skills

Public speaking and giving presentations can and should be a fun experience, in which individuals or teams are able
to present the key findings or ideas from their hard work to others. Yet, for many individuals, public speaking can be an extremely stressful engagement, and in fact it has been said to be one of people’s biggest fears!

Whether you are terrified to speak in front of others, or an experienced presenter, following these simple tips will allow you to improve your presentation skills so you can speak confidently and comfortably on any topic!

1.3.1 Attire

Another very important aspect of presenting is dressing well, as it allows you to appear professional and gives you instant credibility. You must understand who your audience is, and dress appropriately. For example, when presenting in front of a board of investors you will dress significantly differently than if you are presenting to a classroom of first graders.

While working in teams, it is especially important that teams coordinate the outfits that they are wearing. Teams should decide upon the appropriate level of dress, and attempt to match in terms of colors and style if possible.

1.3.2 Know Your Stuff

When preparing to give a speech, the single most important thing you NEED to do in order to be an effective presenter is to be knowledgeable on the material you are presenting on. Knowing the material you are presenting on inside and out will give you immense confidence when you are on stage, as it will allow you to focus on how to most effectively present the material as opposed to struggling just to remember all of the content you planned to discuss while on stage.

Along with this, it allows you to be the expert on the subject you are speaking on. It is very important to remember that when you are on stage presenting, people are listening to what you have to say because you are the
subject matter expert in regards to what you are talking about.

1.3.3 Relax

This may be the most challenging aspect of giving speeches, and even the most experienced public speakers get nervous at times. It is important to remember that however important you think the speech you are giving may be, you must remember that it is not the end of the world.

Even if you fall flat on your face and completely choke on stage, although it may seem like the worst thing in the world at the time you have to remind yourself that it is not. In fact, we are all so busy with our own daily lives and busy schedules that those in the audience are likely to not remember a hiccup or two you may have had during your presentation. When you relax, it allows the audience to relax as well and actually listen to what you are saying.

1.3.4 Speaking Style

This simple switch in speaking speed can significantly improve your stage presence and presentation ability. When people get nervous on stage, they tend to increase their speaking pace and begin to talk faster and faster. When people begin to speak too quickly due to nerves, it begins to erode their credibility and effectiveness of the presentation as they seem to be lacking confidence on the topic. It feels as though they are trying to say as much as they can as fast as they can, because they fear that people will lose interest in the topic.

Along with this, the audience can sense the speaker’s nervousness, and it causes the audience to feel slightly uncomfortable and rushed while listening to the speaker. Therefore, speaking slowly is a very effective way to demonstrate your comfort with speaking on the subject matter, and in front of large crowds.
1.3.5 Pausing

While giving presentations, you can also try using pauses at opportune moments to draw attention and highlight certain key points. A few seconds of silence is a very effective presentation tool, and builds the audience’s anticipation in regards to what you are going to say next. It also provides the speaker more time to think of what they going to say next. By utilizing pauses effectively, and developing a rhythm and tonality to your speech you will be able to draw audience attention to the areas that you want to focus on, and have them hanging on to your every word.

1.3.6 Body Language

Non-verbal communication has been proven to be an extremely important factor in interpersonal communication, and a majority of the messages we send and receive are through subtle changes in body language. With that said, you must evaluate what your body language is communicating to your audience while you are presenting.

Many presenters communicate poor body language without even realizing. These mistakes include body rocking (rocking back and forth or side-to-side while speaking), excessive hand motions, or other idiosyncratic behaviors.

1.3.7 Eye Contact

When presenting, you should try and make good eye contact with the audience. Literally make eye contact with different members of this audience, and move all around the room making eye contact with different people, as this will allow you to connect with the audience on a personal level. This sounds like a very intimidating thing to do at first, but like anything, the more you work at it, the easier it will become. A simple way to get started while improving your skill at this is to look for friendly faces on different sides of the audience, and when you get flustered look for those positive, smiling faces for reinforcement and charge ahead!
1.3.8 Prepare for Questions

While preparing for your speech, it is important to think of potential questions that members of the audience are likely to ask you. This way, you can be ready for any difficult questions that may arise, and you will be able to handle them gracefully.

Another useful strategy during presentations is to plant a question. This means that you ask a member of the audience (friend or colleague) to ask a specific question after the presentation during the Q & A portion, as it will allow you to touch on material that you may have run out of time to touch on, or answer common questions. You can also have additional slides in your slide deck to utilize for after your presentation, in order to answer questions you anticipate the audience asking. This allows you to demonstrate your preparedness, and provide additional clarity and credibility to your answer.

1.3.9 Memorize Outlines, Not Words!

Although it may seem counterintuitive not to script every word of your speech, after trying this approach a few times you will immediately realize its benefits. When a speech is memorized, the speaker tends to sound a bit robotic and is unable to truly connect with the audience. On top of that, if you memorize a speech and forget or misplace even a single word, it has the potential to throw off your flow and can potentially mess you up for the entire speech.

Instead of memorizing material word for word, create an outline of your presentation and try and remember the outline and key points instead. This way, you can give your presentation in the correct order, and touch on all key points, while sounding and feeling more natural with the material. As mentioned in the beginning of this section, the most important thing here is that you know your material inside and out, so that when you think of the outline you will be able to comfortably speak on any of the bullet points.
1.3.10 Practice

Practice, Practice, Practice! And when you do, make sure you practice in the area you are actually giving the speech. This will allow you to feel comfortable when you are on the stage, as you have practiced giving your speech in that location before.

Along with that, it will allow you to perform a tech check before you present, allowing you to ensure that your presentation looks good on screen and works with the existing technology at the location.

1.3.11 Presentation Software

There are multiple presentation software programs that you can use in order to enhance your presentations. The most widely used and accepted presentation software is Microsoft PowerPoint, while a new online presentation software, Prezi, has steadily been gaining adoption. For the purposes of this book, we will discuss both.

1.3.12 PowerPoint

PowerPoint is an extremely powerful software produced by Microsoft, that provides a visual aid for presenters during presentations. There is an endless amount of customization one can employ, and is most effective when used to supplement the presenters talk and highlight key points.

When creating your PowerPoint, here are a few tips to help you have a powerful presentation:

1. Keep it simple - It is easy for one to overload their PowerPoints with all sorts of information in the form of texts, pictures and SmartArt. This can be a big mistake, as it tends to overwhelm the audience and draws attention away from you as a presenter.

Along with that, remember to limit the amount of text per slide. When you have too much text on the slides, the audience tends to try and read the slides
1.3. PRESENTATION SKILLS

instead of listening to what you are saying. The PowerPoint slides should supplement the material you are speaking on, not dominate it.

2. A very useful strategy, is to list key points as bullet points. This strategy is very useful, as it provides your audience a reference point to review the material you touch on. An added benefit of this approach is that if you get flustered, or momentarily blank on what you are speaking on, (although not encouraged) you can briefly glance back at the PowerPoint to see the key points you want to touch on, and proceed from there.

1.3.13 Prezi

Prezi is a relatively new online presentation software, that has been gaining traction in the past couple years. The software allows for a fun, and unique presentation style that allows users to dramatically zoom in, and out of information to highlight key information or provide a big picture view of the topic at hand. The growing number of users has shown that this software can be a powerful tool, and has provided some competition to Microsoft PowerPoint.

A majority of corporations and professional presentations still utilize PowerPoint, so it is important to understand when it is appropriate to use the Prezi software. If in doubt, asking whether or not Prezi is acceptable.

Making a Prezi can be lots of fun, and you can get very creative with how you bounce back and forth from information and highlight different topics. As with PowerPoint presentations, it is very important that you keep your Prezi presentations clean and simple. This is especially important with Prezi, as the screen tends to bounce from one part of the screen to another. If you bounce from one place to another, not only will it confuse your audience, but it may give them a headache and irritate them.

As with PowerPoint, you want to limit the amount of text on your Prezi, and highlight key talking points for
your audience. You also want to make sure that your audience has enough time to read and process the information on one screen before bouncing to the next, as it can be very frustrating for the audience if they are struggling to follow your presentation. If you avoid these common mistakes with Prezi, you will be well on your way to creating a memorable and impactful presentation!

When using presentation software such as PowerPoint and Prezi, as mentioned earlier, you must be sure to practice using the software at the actual presentation location. Viewing your presentation on the projector before the actual presentation will allow you to ensure that everything looks as you planned, and limits the potential for technical difficulties or last minute issues when you actually get up on stage.

1.3.14 Tell your story

In Simon Sinek’s world famous TED talk, as well as in Dr. Gerald Suarez’s BMGT390H: Systems Thinking course the concept of explaining why you are doing something, and your visceral purpose are heavily touched upon.

Great speakers and leaders have the ability to explain why they are doing the things they are doing, as this approach allows the speakers to relate to the speakers on a visceral level. Let us take the example of TOM’s Shoes.

Let us look at two approaches to explaining what the company does.

1. “TOM’s shoes sells trendy shoes to American customers order to increase the company’s overall profitability, and provides one pair of shoes to poor children for every pair purchased. Through this program, Tom’s has been able to help many people.”

2. “In 2006, American traveler Blake Mycoskie befriended children in Argentina and found they had no shoes to protect their feet. Wanting to help, he created TOMS Shoes, a company that would match every pair of shoes purchased with a pair of new shoes given to a child in need. One for One. Blake returned to Argentina with
1.3. PRESENTATION SKILLS

a group of family, friends and staff later that year with 10,000 pairs of shoes made possible by TOMS customers.” (source: www.toms.com)

Which one sounds better to you? The second one of course. The reason is because the second paragraph (Taken directly from the TOM’s website) explains why they are doing what they are doing. It allows the audience to relate to what they are doing, and makes them believe in it and want to be a part of it. As you can see, when giving a presentation it is important that you tell your story.

Steps of Storytelling:

1. Problem identification
2. Why is the problem important?
3. Team formation, initial resources and budget, etc.
4. Constraints
5. Solution
6. Impact of solution

1.3.15 Understand your audience

While presenting, it is extremely important that you understand your audience. To make a lasting impression on your listeners, you need to know who your listeners are. For example, you could be giving a speech about the evolution of cell phones, and the current smartphone market. Imagine you were giving this speech to a classroom of Harvard MBA students (Very professional, well-dressed, in-depth, detailed). Now imagine you are speaking on the same talk to a classroom of first graders. Clearly the presentation style, content, length, and even the way you will dress will change considerably.

Although that is an extreme example, it is very important that you understand your audience, and tailor your presentation to that audience in order to be most effective.
1.3.16 Pay Attention!

If presenting with others, or by yourself, paying attention to your teammates and the audience are two of the most important things you can do while presenting.

In a team presentation setting, paying attention means that you are actually listening to your teammates while they are speaking. Before it is your turn to present, it is very easy to get caught up worrying about your part and not paying attention to what your teammates are saying. Likewise, after you have finished your turn, it is equally easy to take a sigh of relief and disengage from the presentation, knowing that you are done with your part. If you have found yourself doing either of the above, it is time for you to change that behavior. When you are not looking at what your teammates are saying, it makes it appear as the team is not a cohesive, confident unit. Along with that, your teammate may talk more or less than they were expected to, and you may need to adjust your part as a result and listening is the only way to make that possible. Finally, by paying attention to your teammate and looking in that direction, the audience is naturally drawn to what you are looking at, meaning they are more engaged in your team’s presentation. Remember that your body language is extremely important at all times while on stage, and in life.

Paying attention also is applicable in another sense, and this is in terms of your audience. During your presentation, it is important to read the body language of your audience, as this will allow you to understand what they are responding well, or what they are not responding well to. For example, if you are giving a business pitch, you will be able to alter the direction of your pitch towards what you felt the investors were responding well to, and highlight those attributes of the project in order to increase their interest.
1.4 Professionalism

An individual who is able to carry themselves in a professional manner is able to draw attention to their content and not themselves. Have you ever been in a situation where someone is acting in a way that makes you uncomfortable? Perhaps their attire or manners may even embarrass themselves? If this is the case, it is likely that you walked away from this encounter without being able to focus on the substance of what this person was saying because you were so distracted by their lack of professionalism. So, how does someone be professional?

The first step in being professional is to understand the context. Being professional means different things when you are in an interview, presenting to the Board of Directors, or even attending a company picnic. The way you dress, behave, and communicate are all different based upon the context and what others' expectations are of you. For example, you wouldn't wear a suit to a company picnic nor would you want to wear a sleeveless t-shirt and ripped jeans. The more situations you find yourselves in, the easier it is to take a cue from those around you and know what it expected. Please don't take this advice as thinking that you must be conformist in order to be professional. In fact, there are many ways to stand out in a positive way base upon attire, behavior, and communication. However, please do realize that how you address each of these issues is contextual.

The first consideration is attire. Be sure to understand the different levels of professional attire including business casual, business professional, and business formal. Business casual attire would be pants (not jeans) or a skirt for ladies along with a collared shirt. If you do wear a skirt, then be sure that it is appropriate length (it should reach the top of your knees). Business professional attire includes a sports coat (with our without a tie) or a suit jacket (no tie) for gentleman over a collared shirt and slacks (not chinos). For women, they may wear a blouse with dress pants or a skirt of appropriate length. Finally,
business formal is a suit for men (with a tie) or a woman. If you find yourself in a situation where you are unsure of the attire you should wear, always err on the side of caution. Men are luck that they may be able to take off their tie and turn business formal attire into business casual attire very easily. If someone points out that you are overdressed for a particular context, you could always let them know that this meeting or event is very important to you and you wanted to make sure that your attire matched your perceived level of importance.

The second consideration is behavior. In general, this means that you will have good manners. Be sure to look people in the eye when you talk with them, listen to them, and shake their hand. Since people have two eyes, pick one eye and look at that one. When you shake someone’s hand, be sure to give a firm handshake. The “dead fish” handshake when you have a limp hand indicates that you are not excited to meet someone or—even worse—you lack confidence. Be sure to say “thank you” and “please” when appropriate.

The third consideration is communication. Most people think that good communication in a one-one-one setting is all about speaking. Not true. Many people speak clearly but are not good listeners or communicators with respect to the body language that they use. Try to avoid interrupting someone. Be sure to make sure they are done talking before you speak. While someone is speaking, try not to cross your arms since this may indicate your resistance to their message. Try to lean in when they speak. Don’t yawn. In general, you want to engage in communication with someone and let them be at ease with you. Believe or not, a simple smile when you greet someone or a head nod to show appreciation with what someone is saying can go a long way in making you present yourself in a professional manner.
1.5 Networking

Networking is generally viewed as a chore, a cumbersome task that must be done in order to advance in your career and expand your network. When people hear the word, they generally envision themselves at large events, awkwardly trying to meet new people who could possibly be useful contacts in the future. That’s not the way networking should be. Networking is all about establishing new relationships and creating mutually beneficial connections with others.

Building relationships can be an extremely fun, engaging and rewarding experience, through which lifelong friendships can be developed. It is necessary for you to approach new encounters as an opportunity for you to meet interesting new people and make new friends; a chance to learn from their stories and experiences of others, while sharing your own.

The ability to effectively network is one of the most important skills one can have today in an increasingly competitive job market. A majority of job placements today are received through informal channels, and through the use of one’s network and personal references. As you can see, connecting is a very important tool for you to thrive in both your personal and professional life.

1.5.1 We are Constantly Networking

A crucial component of becoming an effective networker, is understanding that networking can and does happen anywhere. Just because there are organized networking events, created solely for the purpose of allowing you to meet new people, does not mean that those are the only times you will be networking. It is important to realize that every time you meet a new person, whether at a party, charity event, etc. that you have created a new contact through networking!
1.5.2 Growing Your Network

As mentioned above, we are constantly “networking” with everyone we meet. An exciting concept today is that through the power of the internet, we are able to identify different types of people we want to build relationships with, and put ourselves in positions to meet those people without too much effort. A good example of this would be, if you are an entrepreneur, and would like to meet fellow entrepreneurs and potential mentors, or investors, you can take the initiative to attend an entrepreneurship convention or event, thereby offering you the opportunity to rapidly growing your network.

To make this happen:

1. First, identify what type of people that you would like build relationships with.

2. Second, identify where these groups of people generally congregate, and events they attend (www.meetup.com is a great website you can use to identify groups of people with similar interests).

3. Finally, once you have identified these events, you can begin attending them and building relationships with those you desire to meet!

1.5.3 Know Your Audience

If you are going to an event with lots of people from a particular industry, geographic location, or with specific interests that you are unfamiliar with; it is a good idea to do a little background research to help you interact smoothly with those in attendance. A good example of this is if you are going to a convention of surfers, or auto industry professionals, picking up a trade magazine, talking to a friend who is in the industry, or Googling the topic would be a good idea so that you are able to decipher the industry jargon, and appear “in the know” when new relations are talking about different topics.
1.5. NETWORKING

1.5.4 Stop Thinking so Much, and Say Hello!

Approaching new people is one of the most interesting activities you can do, but when you first start doing it, the task can be very nerve wracking and challenging (especially when it is an important contact). When meeting new people, at times your own worst enemy is yourself, as humans have a tendency to focus on the negatives and it is easy to replay potential or past negative outcomes of approaching a new person (will they like me, what if they’re mean to me, etc).

It is very important that you overcome this initial anxiety, and one of the best ways to do so is by letting go of outcomes. As you interact with different people, do not enter conversation with any expectations. If you go into a conversation expecting a certain outcome, (i.e job, new business partner, etc.) and your expectations are not met you will walk away from the conversation disappointed. Along with that, people can tell when you are only speaking with them because you want to get something out of them...if you have ever had that happen to you before, you know that it is not a good feeling.

1.5.5 Smile

When approaching an individual, or group of people it is pivotal that you smile as you join the group. This will initially lower people’s defenses, and inform them on a primal level that you are a friend not a foe and make them more inclined to speak to you. Along with that, you want to match the energy level or be slightly more energetic than the rest of the group (No one likes a Debbie downer, or negative Nancy).

1.5.6 Listen and Connect

It is important to genuinely seek to learn about the person you are speaking with, and listen to what they are saying. Seek to make friends and lasting relationships, as opposed to asking “How can this person help me now?” When
meeting someone new, truly listening to them is one of the most important skills you can develop (yes, it is a skill) as it allows you to connect with them. As an added benefit, for most people the most interesting thing to talk about in the world is themselves. As a result, when you meet someone and they spend a majority of the time talking about themselves, they will feel more connected to you even though they haven’t learned as much about you. Try it!

1.5.7 Nametags

Wearing a nametag at a networking event is a useful tip in order to help you standout from the crowd, and have your name remembered by those in the audience.

1.5.8 Choose Your Position Wisely

If there is someone who you would like to build a relationship with at an event, one very effective maneuver in order to meet them is positioning yourself in a manner that makes it easier, and seemingly more natural for you to interact with them. For example, if this person sits down in one area of the auditorium, sitting next to them or in close proximity to them will give you a much better opportunity to meet them than if you are on the other side of the auditorium.

1.5.9 Eat Before You Go

When going to a networking event, or any event where you have the opportunity to meet new people, remember to eat before you go! This may sound counterintuitive, especially if the event will be serving delicious meals, but you cannot (or should not) talk to people if you are stuffing your mouth. Along with this, instead of spending your time eating, you will be able to spend this time making new contacts and meeting new people.
1.5.10 Assist Without Expectations

Along with that, if an opportunity presents itself where you can provide value to your new relation (introducing them to an important contact, new ideas, etc.) do so, with no expectations but just out of kindness and friendship. You will find that these selfless acts will serve to deepen the bond between you and your new contact. More importantly, you establish goodwill and as a result that contact will have you in mind in the future.

1.5.11 Talk to Everyone!

A great way to get started on improving your connecting abilities, is to talk to everyone! From store clerks, to a stranger on the street, the more you talk, the better you will get at it. You will also be able to learn what people respond well to, and what they do not.

You’re not going to master networking overnight, but if you practice talking to as many people on a daily basis, when the time comes to talk to the important contact you’ve been looking forward to meeting, you will be well-practiced on connecting and improve your chances of success.

1.5.12 Utilize Your Network

There are many times when people could use help from a relation within their network, but are afraid to ask for assistance. Obviously, this will vary from case to case, but generally it is not a bad idea to ask your relation for the help that you are seeking. The big fear with asking for help, is the inherent concern “What if they say no to my request?”

This seems like a rational thought, but in response to this fear another question must be posed: “If the person says no to your request, what changes?”

The answer to this question is almost always, nothing. If the person says no to your request, although you do not gain anything, you do not lose anything either. Along
with that, if you do not pose the question, you will always wonder what-if I had spoken to that person, as you had not explored all of your options.

In fact, many people derive satisfaction from helping others, especially those they have a good relationship with. Allow people the opportunity to derive that satisfaction by asking them for help!

1.5.13 Remember Names

It is vitally important that you remember the name of the people you are speaking with. Asking for a name a second time can be terribly awkward, so it is important that you remember it the first time you hear it. One effective strategy for doing so is to repeat the person you are meeting name 3 times within the first few minutes of conversation so that you are able to memorize it.

1.5.14 Work a Room

So people will want to meet you. Meet everyone, whether you think they will be an important contact or not. This will give the impression that you are a popular person worth speaking to at the event, providing you with social proof. As a result, when you do end up meeting the people you would like to build a relation with, they are the ones who are eager to meet you.

1.5.15 Keep Them Talking

Ask interesting questions about the person you are talking to, although they won’t know much about your background, people’s favorite topic is themselves and your new relations will like you more and feel more connected to you if they talk about themselves.

1.5.16 Small Talk

Small talk is something that not many people like doing, but is crucial in the early stages of relationship building. It
allows you to smoothly continue a conversation with a new relation, while avoiding the awkward pauses. Great small talk topics include weather, sports, and current events. A useful tactic to ensure that you are able to hold small talk effectively is to pick up a copy of a major newspaper (i.e. New York Times, Washington Post, or Wall Street Journal) and read different headlines and articles so that you are able to speak on the subject if the need arises.

1.5.17 Be Interesting

Most conversations follow a relatively similar, predictable pattern (Hello, my name is Sahil and I work...). Try and have interesting conversation points and unique knowledge that engages a group, and will separate you from others at a networking event, allowing you to be remembered by those you seek to build relationships with.

1.5.18 Follow-Up

After you have met, and begun to build a relationship with the people you are meeting, possibly the most important component of effective networking is following up with your new contacts.

One useful tactic is to have an Excel spreadsheet, in which you jot down the names of people you have met after the event in order to remember them. You can also use your cell phone to create a list, or whatever form works most effectively for you.

Within a couple days after meeting your new relation, reach out to them via e-mail, text, or phone just to say hello in order to solidify the relationship. If you had discussed a certain topic with that person, you may want to bring up that topic in this follow-up to remind them exactly who you were at the event.

When meeting so many people, writing what you talked about, or an interesting fact about the person on the back side of their business card will help you remember all of the new relations you have met more clearly.
1.5.19  Don’t Overstay Your Welcome

Know when to leave a conversation (when the conversation seems to be dragging on) you do not want to monopolize someone’s time, so learn to exit gracefully from conversations in order to maintain the mutual positive feelings between parties.

1.5.20  Follow up with new contacts

Write info on the back of their business card, and e-mail them after the networking event so that they remember you, and you are able to maintain a relationship.

1.5.21  Pick up a Networking Book

If you follow the tips in this section, you will be well on your way to becoming an engaging, and effective networker. If you would like to continue honing these skills to become a master networker, it is highly encouraged that you pick up a book devoted to networking and the art of building relationships. Recommended books include: Never Eat Alone, How to talk to anyone, and How to instantly connect with anyone.
Chapter 2

Team Skills

2.1 Getting to Know Your Team

On any successful team, the team must be comfortable with each other. Each individual on the team must share their true feelings with each other, their true ideas and their crazy ideas, because that’s where the good and implementable ideas come from. When somebody on the team can inspire passion and make the rest of the team feel the same way they do, the team will be successful. But these things do not come easily. The team must have a certain level of comfort with each other in order for the “true you” to surface. So how do you break down those barriers? How do you skip the awkward, long getting to know you phase?

I have been on teams where awkward icebreakers were facilitated upon formation of the team, and I have found these to be quite successful when properly implemented. When you put yourself out there early on, and say, “this is who I am, I can be kind of odd...but you can be too, so we’re cool” the barriers are down! You’ll never be embarrassed to pitch an idea.

Another great way of getting comfortable with your team is to do a ropes course together. A ropes course, or something like it, imparts trust and a common goal on the team. You rely on your team to help each other out,
and figure out how to work together to reach a common goal. With these awkward-free trust based relationships, teams will be able to further their success and be passionate about what they are doing and with whom.

Once these barriers have been knocked down, and your comfort zones have been extended, how do you know how to work with your team? Once you’re comfortable with pitching anything to your teammates, how should you pitch it for it to be the most effective? Essentially, how does your team work successfully together? You have to know yourself and know your team. You have to know your own strength and weakness, and know where you thrive, in addition to knowing the same of each of your teammates.

Without you properly knowing yourself, no one will properly know you. Start by knowing your personality type— are you introverted or extroverted? Know if you make decisions based on emotions or logic. Know what settings you thrive in. Understand why you thrive in the settings you do. Know what you know, know what you don’t know, and just as important, realize that there are things you don’t know that you don’t know (and if you want to stay positive—know that there are things you know but don’t know you know them). Once you have a firm handle on yourself, show your team. This is tough task, but if your team is comfortable with each other it will come naturally.

A good tool for this is the Myers-Briggs assessment (see www.myersbriggs.org). The Myers Briggs assessment is a psychometric questionnaire that helps you learn about yourself. It lays out what your preferences tend to be, and how you perceive the world. It bases this on attitude (introvert/extrovert), function (sensing/intuition and thinking/feeling) and lifestyle (judging/perception). With an assessment like this you will understand yourself better and be able to communicate it to your team. This knowledge is also very important for your leadership development.

It is important to adapt to your team. Again, if the team is comfortable with each other this will come naturally, but do not let yourself get shut out or allow what you
have to offer be suppressed. Figure out how to mesh your skills into the team’s collective skills. This is one of those things that has to be learned through experience and cannot be taught in a book. But it is important to understand that it has to happen.

Now for a quick story. I led two alternative break trips over winter break of my junior and senior years of college. They were both service oriented and involved meeting with and learning about the community, and some sort of physical labor (painting elderly people’s homes, planting gardens in different neighborhood, building a compost station, etc). For the first trip, we had a few orientations; the point of them was to relay all the necessary information to the trip participants (flights, housing, food, etc.). We had an icebreaker at the beginning of each orientation, but they were not particularly effective. Once the trip began we started working immediately. The trip ended. We got a lot accomplished, but not as much as we wanted, the quality of work was not where it could have been. Once we got back, we assessed the trip, and discovered more bonding time prior to the service aspect was needed, so that we could learn more about each other before embarking on such a big project.

We planned the next trip with that in mind, made the orientation very conversation based and incorporated some additional group activities before the trip started (ropes!). Once the trip began, we decided to have the group spend a day together before we started our service and bond - get to know each other, get comfortable with one another. The results were amazing. We got so much accomplished, and the quality was superb. We even built more friendships with the community we were working in than we did the year before. The differences between the two trips were unbelievable.

I would attribute the trips success to the amount of group bonding prior to the trip. We all spent time, getting to know each other, and essentially become comfortable with one another so that when we got on the ground and began working together we had nothing to worry about.
Granted, we did not run any Myers-Briggs, but we were able to get a good sense of how to work together by learning more about each other.

\section{Multidisciplinary}

When presented with half a glass of water, we have all heard that an optimist would say the glass is half full while a pessimist would say the glass is half empty. What would an engineer say? They would say that the glass is twice as big as it needs to be. Diversifying this “team” by bringing in the added perspective of an engineer provides a fresh and non-obvious answer to an age-old question. You likely would not have gotten this range of answers if your team were comprised of people of all the same background.

A multidisciplinary team brings in people of all backgrounds who have different educational, work, and real-life experiences. This gets all different perspectives and avoids a rigid, straightforward way of doing things that leads to a very simple and not robust solution. People have complementary skills in different disciplines and they can leverage each others’ strengths so that the whole team becomes greater than the sum of its parts. Consider, for example, a QUEST project that is financially based. Finance majors or business majors in general would probably evaluate a company based on its published financial data or do a comparables analysis of other companies within the industry. If they did not have a multidisciplinary team perspective they might miss out on something a more technical person, like an engineer, would capture. The engineer would consider things such as any emerging technologies that might soon come to market that would change the whole nature of the industry. A second example, which would be the opposite scenario within QUEST, would be if you had a team of all engineers. This team of engineers would do what they’ve been taught; follow a set of steps to find a solution that, while it will work, it might not be the best solution. This team would benefit from some less technical
members who would be more creative would pull in out-of-the-box ideas that would lead to an overall better solution. As you can see, multidisciplinary teams avoid one way of static thinking and can lead to better brainstorming, execution, and more robust problem solving once you take into account all perspectives.

Over time, you will also benefit greatly as an individual from working on multidisciplinary teams. You have the chance to work with and learn from people of all different backgrounds that you might not have gotten a chance to interact with otherwise. Had you just worked on a team of people within your major or field, you would never have been exposed to other ways of thinking about and executing projects. As you progress from one project to another, you will be able to draw from your past experiences working with all types of people and will provide more value to the whole group as a dynamic team member.

2.3 Team Charter

Working with others in a team environment can and should be a very positive experience for all involved. With that said, if people do not have a common goal, they can begin heading in different directions and potentially cause the team to waste valuable time and resources, or worse: fail. Therefore, it is extremely important that the team is all on the same page and united behind a common goal.

The team charter is a living document that is created in the early stages of team formation to help teams maximize their performance. The document can be extremely valuable, as it allows teams to understand the purpose of the team’s formation, and focus on the goals that the team seeks to accomplish. It also serves another valuable function, as it provides ground rules and expectations for the team as well as team members. An effective team charter is one of the best ways to get your team started off right on the road to success!

It is imperative that the team charter is formed right
at the outset of the project, and that all team members are present during the creation of the charter. This is crucial, as the first meeting is the launching pad for the project, and creating the charter at this time allows all team members to contribute to the direction of the team’s project and team’s guidelines. It is equally important that all team members buy-in to the agreed upon guidelines and goals laid out in the charter, as this will allow the team to be more committed to following the charter as it proceeds through the project.

The charter can also be used as a “big picture” reference guide for the team. This is especially useful for a team when making difficult decisions, or determining scope creep, as they can refer to the charter to see if they are still focusing on what they initially set out to accomplish.

Team charters will vary from project to project, as a consulting team’s charter during a supply chain project will be very different than that of a high school basketball team’s charter.

With that said, team charters generally follow a similar structure. Charters usually include 7 main components:

1. Context
2. Mission and Objectives
3. Composition and Roles
4. Authority and Boundaries
5. Resources and Support
6. Operations
7. Negotiation and Agreement

**Context** is the introduction to the charter, and is the portion where the team identifies the reason that they have come together, and the problem that they are attempting to solve.

**Mission and Objectives** is at the core of the document, as it allows the team to decide what the team aims
2.3. TEAM CHARTER

Once the team has identified its mission, it is very important that the team creates measurable goals. The SMART (Which stands for Specific, Measurable, Attainable, Relevant, and Timely) goals are usually good targets for teams.

**Composition and Roles** is the portion of the team charter where team members identify each other’s strengths and weaknesses, relative to the project at hand. Through this process, the team is able to assign different roles to different members, and define roles and responsibilities. Examples of this include deciding who the team leader is, who will be taking meeting minutes, or who will be the primary point of contact for clients or stakeholders. Personality tests (i.e Myers-Briggs) and strengths finder tests can be useful, as they allow team members to understand one another’s personalities and strengths/weaknesses.

**Authority and Boundaries** are the next step in the team charter. In this section, team members discuss issues such as how to effectively handle potential conflicts between group members, etc. It also outlines what decisions the team is able to make autonomously, and what types of issues they must seek approval on before proceeding (Be it a faculty advisor, boss, client, etc.) .

**Resources and support** lists the different resources such as time, budget, equipment, etc. that is available to the team in terms of the project.

**Operations** is the portion of the charter where the team outlines how it will operate on a daily basis. This section can be as detailed as the team would like, and generally includes information on how often the team wants to meet, for how long, preferred method of communication, etc.

**Negotiation and Agreement** is the final and possibly most important part of the charter, as it is imperative that all team members are on board with the information decided upon in the team charter. This will allow the team to unify, and move forward towards accomplishing the goals they had listed earlier.

As we all know, we cannot predict the future, and in
most projects there is an inherent element of ambiguity which can lead to changes as the team proceeds. As such, it is important to note that the team charter is a living document, meaning that it is subject to modifications as deemed necessary by team members.

2.4 Team Stages

Forming, Storming, Norming and Performing. We’ve all heard this easy to remember sequence of words used to describe teams, but what do they actually mean?

In 1965, Psychologist Bruce Tuckman came up with this model to discuss the 4 stages of team development, describing it as the path that most high-performing teams follow \(^1\).

When teams are first created, they generally go through a forming stage. It is in this stage where the different members who comprise the team generally meet for the first time, and pleasantries and contact information are exchanged between one another. It is important that during this forming stage, the team puts together its team charter in order to get the team started off on the right foot (See Section 2.3).

The next stage is known as the storming phase. In the storming phase, conflict tends to arise as team members get to know one another better and the team progresses further into the project. The issues that arise in this stage can be attributed to three main factors. For one, different members begin to identify roles within the team, and at times compete for leadership and dominance within the team. Another common cause occurs as the project workload and difficulty increases, and the team can stagnate a bit causing members tend to grow overwhelmed or frustrated with the lack of progress. One of the biggest stumbling blocks for teams during this stage is that members may form different ideas and opinions in regards to best

actions for impending decisions.

Many teams fail during the storming phase, and it is important that teams recognize that this is a natural progression within team dynamics and to not grow too frustrated or disengaged during this process. If you see your team falling into any of these patterns, it is important to identify this and tactfully discuss the issues with team members in order to proceed forward with the project. The team charter is a useful document to refer to in such circumstances. Facilitators can also play a pivotal role in maintaining team morale and ensuring teams transition smoothly out of the storming phase.

The **norming** stage takes place when team members have become comfortable with one another and their roles within the team. At this time, the team has come together and firmly decided upon which direction they would like to go with their project.

Following the norming stage, highly successful teams enter the **performing** stage. The performing stage occurs when teams are motivated, do not require facilitation, and are working together effectively in order to accomplish their goals.

With the Tuckman’s 4 stages of team development, it is important to note that although this is the traditional model of team development, not all teams follow this pattern. For example, there are times where some teams never go through the storming phase, and others times when teams go through multiple storming phases before reaching the norming or performing stage. Variations of this model do occur, and if you do not see your team following the noted pattern remember that this is not a cause for concern.
Chapter 3

Design and Innovation

3.1 Identifying the Problem

Every project follows the typical problem-solution format. There is some problem, and the project aims to solve the problem. The first obstacle in any project is to identify the proper problem, particularly the root of the issue. It is important to research and learn as much as possible about the situation or system that is being dealt with in order to pinpoint the actual problem that needs to be solved. In a large system, it is very easy to be misled and just solve a symptom of the problem, or the wrong problem all together; this will leave you with band-aids on a broken system, with the problem persisting.

A good tool to use in order to identify the proper problem is the “Five Whys.” The “Five Whys” is a simple tool that allows you to delve deeper into a problem simply by asking “why is this happening?” until you cannot answer it anymore. For example:

Problem: The community center’s window is broken.
Why? A baseball went through it.
Why? The neighborhood kids have been playing base-
ball outside all week.

Why? The Baseball field is flooded.

Why? The Baseball field was not properly covered before the storm.

Why? The cover was stolen.

Why? It was not properly secured. Identified problem: Baseball field needs a new cover that can be properly secured.

The purpose of the “Five Whys” is to delve deep into a problem and understand the root cause. It is not necessary to ask “Why” exactly five times, but simply to ask however many are needed to identify that root problem.

Another necessary tool for identifying the problem is a fishbone diagram. This tool is taught in depth in Section 3.2, but is essentially a visual representation of the causes of a particular problem. With all the causes mapped out, you can understand the symptoms of the problem, and devise a solution that will take each aspect into account.

Often when tasked with assessing and solving a problem within a system, you will encounter many potential problems that are not related. It is important to prioritize these problems and not take on too many problems at one time. Take this scenario for example:

A student consulting team was tasked with reducing the amount of failed audits in the organization’s laboratories. The first step was to identify exactly why the labs were failing their audits. After some serious data mining and doing the “Five Whys” exercise, the team found that the labs were often failing due to one of five issues: Safety, Calibration, Shelf Life Compliance, Personnel Certification, or Clutter. With these five root problems known, the team constructed a Pareto Chart (Section 3.3) and prioritized the problems by how common they were and the possibility of the team’s success given limited resources and time constraints. Every team’s criteria for prioritizing the potential problems that they choose to pursue will be different, but it is important to prioritize them to ensure you are maximizing the impact of your work. Another tool that might be of use is the effort-impact analysis taught in
3.2 Fishbone Diagram

The Fishbone Diagram is a tool that allows you to brainstorm, visually display, and analyze the many causes of a specific event or problem. The fishbone diagram looks like the skeleton of a fish (see Figure 3.1). You write your problem at the head of the fish and then detail all the causes of the problem along the various bones of the fish. Today we are going to run through the example of pizzas not being delivered on time, so this problem will be located at the head of the fish. The main bones of the fish split up the causes into categories. These are often classified as the 6 M’s, which are Man, Methods, Materials, Machines, Measurements, and Mother Nature (or environment). Below, we will categorize and list causes for all the different reasons that our pizza is not delivered on time. It is important to write causes that are detailed enough for someone else reading your diagram to understand. For this reason, avoid listing one-word causes.

![Fishbone Diagram](image)

Figure 3.1: Fishbone Diagram
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For the “Man” category you look at things caused by the people involved in this whole system, so in our example, the employees of the pizza shop. These might include:

- Improper training causes employee to make pizza incorrectly.
- Delivery driver gets lost.

“Methods” relate to the processes you have in place in your system. For our example, these include things in the cooking and delivery of a pizza, such as:

- Employee doesn’t follow the established steps for making a pizza
- Store is set up in such a way that it is hard to find the necessary ingredients

“Materials” relates to the parts that compose the product or service you are providing. In our cases this includes the ingredients of the pizza. Things that could go wrong are:

- The pepperoni spoils.
- The wrong vegetables were ordered.

The “Machines” category relates to the devices and components you use in the system. In our case, problems could arise from:

- The oven could break down.
- The drivers car breaks down or gets a flat tire.

“Measurements” relates to any data used in the process. For our pizza example, two things that come to mind involving data are the oven, and the driver’s GPS system. Causes of the problem could be:

- The oven temperatures are inaccurate or fluctuating
3.2. FISHBONE DIAGRAM

Figure 3.2: Fishbone Diagram: Pizza Example

- Driver’s GPS provides an incorrect route.

The last M is “Mother Nature” and refers to environmental factors that affect your process. In the case of the pizza example, things might get thrown off when:

- There is a snowstorm and delivery is slowed down
- The shop loses power from lightning and you cannot make any pizzas

So now we have completed the pizza delivery example, but what does applying the fishbone technique tell you? We listed out only two causes for each bone of the fishbone, but that already provides 12 causes for this problem, and we could easily think of a lot more. Displaying all the causes in this way can allow you to put them into groups. From our example, you could split the causes into problems within the store and problems with delivery. Or you could split the problems into matters of late pizza and matters of incorrectly made pizza. Once you organize your thoughts visually using a fishbone diagram, you will start to see patterns and different groupings emerge. You can then
rank these causes in different ways, such as by importance, likelihood of them happening, or the severity of the impact. Once this prioritization is in place you can focus your effort in the correct places to resolve the causes that are most potent in causing the problem.

In our example, we only looked one level down, or in other words, at the primary causes to the problem. For complex problems, it is necessary to continue the analysis and add more branches off each main fishbone by listing secondary causes. You then keep going down more and more levels until the causes are simple enough to address effectively. To resolve our problem, we begin to look at solutions to the lowest level causes of the problem. As you can see, many of the solutions overlap. Those that are implementable and overlap the most are the solutions that should be applied first when working to resolve the problem. Using a Fishbone Diagram is a profound tool because it easily allows the continual breaking down of the causes into smaller and smaller pieces until they become easy to address and eliminate.

3.3 Pareto Chart

An important tool to visualize performance and prioritize among problems is the Pareto Chart. This chart is used extensively within manufacturing and service settings to help communicate to all members of an organization or team. This communication is particularly important for several reasons: 1) accountability of individuals to the team or organization, 2) to seek solutions to problem areas from all team members, and 3) improve team morale when performance improves. In the spirit of continuous process improvement, the Pareto Chart is a baseline for improvement going forward.

The general format of the Pareto Chart is an x-axis showing sources of problems, a left-side y-axis on discrete measures of the occurrence of a problem, and a right-side y-axis showing the cumulative measures of problems. Figure
3.3 shows a completed Pareto Chart that will be useful to describe each axis. The x-axis (i.e. horizontal axis) shows the different sources of errors. These sources are arranged from left-to-right based on the number of occurrences of errors for each source. This then leads to the left-size y-axis that actually shows the number of discrete occurrences of an error for each source. Since the x-axis is arranged in descending order, the bars on the chart will start at the highest point (in Figure 3.3 this is 10 errors caused by the problem that the “Machine wasn’t loaded properly”) and decrease as we move to the right. The right-side y-axis then shows the cumulative number of errors where we add the errors from the previous source. Accordingly, the last point of the line in Figure 3.3 is at 23, which is the sum of all five categories (10 + 6 + 4 + 2 + 1 = 23).

Now that we have a Pareto Chart, we should know why it is valuable. Imagine the figure above posted on a bulletin board within a factory where they stamp metal. Each week the manager collects data about the sources of problems in their production and creates this Pareto Chart. As a manager or an operator in the plant, I become accustomed to seeing this chart and looking at the scale on the left-side. This person may think that there were 23 errors last week. Perhaps this is good or bad depending upon
the expectations set by the team. If the parts are used in high-precision products, then 23 errors may not be acceptable. However, if this is a volume production process, 23 errors relative to millions of parts produced may be very good. Each week people on the team can use the Pareto Chart as a visual cue to how well or poorly they are doing. Similarly, the chart can be used to understand the sources of errors and troubleshoot problems. After many weeks, team members may be able to diagnose system problems or just one-time errors. Of course, reducing system errors is very important.

3.4 Cost-Benefit Analysis

The name “Cost-Benefit Analysis” says it all. A Cost-Benefit Analysis is a way to measure whether the benefit of a potential project exceeds the cost. This analysis should always be done before a project is pursued. It should never be done for the first time after implementation.

The tool is most often used on two occasions. The first is to ensure that a project is profitable and will not result in a loss of money if pursued. The second is to compare any number of projects to determine which is most beneficial.

As you can imagine, the equation is:

\[
\frac{\text{Benefit}(\$)}{\text{Cost}(\$)}
\]

If the value of the equation is greater than one, than the project is profitable. If you are comparing multiple projects, the project with the highest value is the most profitable.

To calculate the cost, it is important to incorporate all aspects of the cost. For example, if you are opening an ice cream store, it is important to add the cost of construction, the cost of contractors, the cost of ice cream equipment, the cost of an employee, etc. The same thing must be kept in mind for the benefit. This may get a little tricky. For example, say this ice cream store being planned is an eco-friendly ice cream store. Now how much benefit do you derive from being eco-friendly? It is important to evaluate all these aspects in terms of one form of currency to make
3.5 Survey Design

Surveys are important tool used to collect information from a relatively large (around 100) group of people. Since surveys are easily distributed and the data is easily collected, they are a great way of collecting data from a variety of people with little or no effort.\footnote{Take a look at how to create a form within Google Docs. The form is almost as easy to create as a Microsoft Word document and...}

accurate estimations (dollars).

With that, here is an example comparing whether the eco-friendly ice cream store should expand (Option A), or the store should start a delivery service (Option B). Of course, eco-friendly ice cream doesn’t melt! These calculations only take into account the first year.

<table>
<thead>
<tr>
<th></th>
<th>Option A</th>
<th>Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction cost</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>Car cost + gas</td>
<td></td>
<td>$30,000</td>
</tr>
<tr>
<td>Additional employee/year</td>
<td>$20,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Other costs (furniture, permits, etc)</td>
<td>$30,000</td>
<td></td>
</tr>
<tr>
<td>Increased profit (benefit)</td>
<td>$120,000</td>
<td>$150,000</td>
</tr>
</tbody>
</table>

\[
\frac{120k}{50k+20k+30k} = 1.2 \quad \frac{150k}{20k+30k} = 3
\]

Table 3.1: Cost-Benefit Example

Option B is the better choice to pursue because it has a higher Cost-Benefit value. Note that these calculations only consider the first year. If one wants to evaluate over a longer period of time, it is worthwhile to look into a more technical concept called “net present worth.” Net present worth is a way to calculate how much a certain amount of money, in a specified amount of time is worth now (taking into account discount rates, etc).
are easily made, many people are quick to create and distribute their surveys. However, only when the survey data comes in do the survey’s authors often realize problems in their survey design. There are many things to consider when designing a survey including:

- Be clear with your instructions. Be sure to describe to the survey respondents why they are being asked to fill out this survey and what perspective they should take when filling it out. For example, a survey could ask a respondent to characterize their perspectives as a consumer, a student, or a member of a group. Be sure your audience knows why their opinion is valuable given their perspective.

- Define the terms you are using. While you may think your audience understands what is being asked of them, often times different survey respondents have different definitions. Since you are trying to collect data from many respondents, offer a definition that it suitable to your audience and allows for a common framework of responses.

- Make your survey short. Many surveys want to ask questions because they think the results may be interesting or useful. Your audience does not want you to waste their time on a fishing expedition so don’t ask tangential or irrelevant questions. Shorter surveys are more likely to get more responses.

- Don’t forget to ask demographic information. If you are interested in learning about student experiences, for example, it would be good to know how the survey questions vary from freshman to senior. Accordingly, collecting demographic information will allow you to look for uneven distribution of respondents.

Within QUEST, we use forms within Google Docs to create, distribute, and collect survey data.
• Be sure to include quantitative information. Many survey responses that could be answered as a Likert scale (1-5 or 1-7) may be easier to summarize and find correlations after the survey data is collected. Be sure that the middle number in the scale corresponds to a neutral response while the end numbers represent stronger opinions one way or the other.

• Ask at least one open-ended question. Even though you want your survey to be short, it is important to allow the survey respondents to give you more qualitative information about the subject you are interested in. While this part of the survey probably works best as an optional section of the survey, you may find some of your best data comes from this section.

Perhaps the best way to improve your survey is to iterate. The more versions of your survey and the more opportunity to receive feedback from focus groups and potential survey respondents, the better your survey will become.

Finally, think about what you will do with the data once you have it. If you ask your survey respondents to tell you whether they think each of Garvin’s Eight Dimensions of Quality (see Section 3.6) is important, many respondents may respond that they are all important. Is this useful? Perhaps a better way to ask those questions is for the survey respondents to pick only a subset of the dimensions that are more important. Alternatively, the survey respondents may have to rank order the eight dimensions. This data will give you relative importance that could be much more useful in designing an innovation.

3.6 Garvin’s Eight Dimensions of Quality

Above is a mnemonic device to remember Garvin’s 8 Dimensions of Quality. These dimensions should be used as a
CHAPTER 3. DESIGN AND INNOVATION

Figure 3.4: Garvin’s Eight Dimensions of Quality

framework for strategic planning to ensure the end product or service created is of high quality.

3.6.1 Performance

Performance relates to the primary operating characteristics of the product or service being developed. Typically performance can be measured and used to benchmark similar products against each other. For example, if we were designing a basketball we would want it to be able to bounce and have a good grip.

3.6.2 Features

Features pertain to the secondary aspects of performance. They involve measurable characteristics that do not give in to biases. Features can be tangible or intangible. For example, the basketball we are designing could have a two year warranty on it in case of it ripping or popping due to too much air being inserted or the grip wearing out.
3.6.3 Reliability
Reliability concerns the probability of the product malfunctioning within a specific period of time. This also relates to how long the product’s performance stays up to par before starting to decrease. Reliability is better suited for durable goods used over a specific period of time than services or products used once. For example, relating back to the basketball, how long will the basketball’s grip last and/or air stay in the ball?

3.6.4 Conformance
Conformance deals with whether the product or service meets the industry’s standards. This can include safety standards, building specifications, performance standards, energy standards, legal standards etc. For example, with the basketball, it has to meet the size and weight guidelines set by the NBA for regulation basketballs.

3.6.5 Durability
Durability has to do with a product’s life. How long will it last before it deteriorates and/or has to be replaced? This includes economic and technical components of durability. For example, for a basketball, durability would be how long it takes for the grip to completely wear off and/or the ball to get a hole in it. This is dependent on how often the ball is used, so time standards on daily use would have to be factored into the calculation.

3.6.6 Serviceability
Serviceability relates to how easy it is to repair or service the product. It also includes customer service around the repair work such as politeness, respectfulness, and speed at resolving the issue. For example, with the basketball, serviceability deals with the speed at replacing the basketball if it needs to be replaced under warranty as well as the
courtesy shown the customer when they call in to report a problem with their basketball.

### 3.6.7 Aesthetics

Aesthetics deals with how the product relates to a person’s five senses: smell, touch, sight, taste, and sound. It is very subjective, so it is hard, if not impossible, to satisfy everyone. With the basketball, we can put strong grips on it so it is very easy to hold and make it red with black writing to appeal to the University of Maryland community (our target audience).

### 3.6.8 Perceived Quality

Perceived quality deals with inferences made about the product and/or service without complete information. Reliability for instance is hard to measure before using the product, so judgments are made on it before it is bought. Often it comes back to brand name, and if a product has a strong brand backing it up, customers will typically give it a higher perceived quality. For example, with the basketball, if we get the design made by Wilson, it will have a high perceived quality since Wilson has a strong name brand, especially in the sports ball industry.

All eight dimensions are needed for a product to be considered high quality.

### 3.7 Hidden Assumption

In every project, assumptions are made. More often than not the assumptions that are made are correct, but this is not always the case. This chapter is about the Hidden Assumption; the assumptions that you do not realize you are making that are not necessarily true. These hidden assumptions most often arise towards the end of the project. In order to best explain the concept I would like to explain a challenge we like to present our teams with in QUEST. It is called the Marshmallow Challenge.
3.7. HIDDEN ASSUMPTION

The Marshmallow Challenge involves small teams competing to build the tallest free standing structure in twenty minutes using only tape, a piece of string, 20-30 pieces of dry spaghetti, a brown paper bag, and a marshmallow. Each team must place the marshmallow on the highest point of their structure. Straightforward, but challenging.

This seems like a daunting challenge, and it is absolutely not easy. But what tends to happen is that the teams build these great structures, and as time is about to be up, they gently place the marshmallow on top of the structure, step back, and kerplunk, the entire structure falls down. Why?

Because of the hidden assumption! It is assumed the structure will be able to hold the marshmallow, but more often than not, it does not. Most teams do not even realize they are making this assumption—and that’s the scariest part! Imagine you are on a team designing some great online education network, and without even realizing, you just assume that people will use it because it’s so well done and powerful, but in reality that’s not how the network effect works. You need to consider these assumptions and analyze them early on and have mitigation strategies from the beginning of your project in order ensure success. We must ask ourselves, what might go wrong? Why are we making this assumption? How do we know that this will not fail? What can we do to make sure this assumption is true?

A good example of a hidden assumption that failed was Apple’s Newton. Apple designed a handheld PDA in the 90’s, very similar to the Palm Pilot that came out around the same time it did. The Newton was a great idea in theory, a handheld device that fits into your pocket that you can write notes on, store contacts, etc. It was revolutionary for the time!

To Apple’s surprise, however, they made certain false assumptions, causing the Newton to fail. Why? They

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2featured on www.MarshmallowChallenge.com
assumed people wanted to take the conventional writing style and use that on the Newton, so when they write an ‘s’ it is the same stroke as if they were writing on paper. It seems like a very intuitive and valid assumption, but it turns out it was not. Apple’s competitor Palm Pilot designed a writing style called Graffiti that forced its users to learn a new way to write each letter, and that was the only way they can write it. This took off and Newton’s conventional style failed. Although it seems counterintuitive, and it seems like this was a valid assumption for Apple to make, it was not. They did not do their research and get the voice of the customer, and therefore this assumption led the product to fail.

Now it is interesting to note that in the marshmallow challenge, the teams that did the best were the teams of kindergartners. Why? Because children understand the concept of iterative prototyping. Create, fail, recreate (but keep the successful aspects), fail, recreate, fail, and succeed. The kindergarteners quickly built a structure, stuck a marshmallow on it, let it fall, picked it back up and rebuilt it, let it fall.... until it stayed standing. They understand that if they fail early, they can learn from their mistakes and eventually succeed. With that in mind, when we are working on our own projects, it is important to constantly create prototypes and allow them to fail in order to learn from failure and produce the best quality results. We must embrace failure early on and learn from it, so it does not occur in the end, where it counts.

It is also interesting to note that teams for the Marshmallow challenge with one CEO on them tend to do better (but not a team of CEOs!). Why? Because CEOs have a certain set of facilitation skills, and know how to extract necessary information and needed skills from different people for the betterment of the project. For more on facilitation refer to Section 4.1.
3.8 Gantt Chart

A Gantt chart is a visual display of a schedule. It is made by a team at the beginning of a project to plan out what tasks need to be done and when they need to be done by. By listing the necessary tasks for a project and the corresponding timeline, a team is better able to plan their time and develop a method of dealing with problems if they should occur later in the project. For example, extra time can be built in at the end of the schedule as a means of contingency planning in case a task runs long and pushes the project back. A Gantt chart also depicts what tasks are dependent on each other.

Below is an example of a Gantt chart. Imagine a team is asked to build a computer. They will have to find out what the end-user wants in a computer, will have to research the necessary components of a computer, such as motherboards, will have to buy the components, build the computer, and then test how it functions to ensure it is properly operational. The tasks are laid out in the Gantt chart below. It shows that research done on the customer’s wants and on the computer’s components can be done simultaneously; however, the components cannot be decided on and bought until the research has been completed. The computer cannot be built until the components are bought and delivered, and the end system cannot be tested for operability until it is built. The dependence on the completion on the previous task is shown by the arrows. It tells the team that they cannot start one task before completing the previous task.

The Gantt chart allows a team to visually track their progress throughout a project. By presetting the dates and predetermining what tasks are dependent on each other, the team can create a contingency plan beforehand in case a task is delayed. In addition, they will be able to see what needs to be pushed back if a task falls behind schedule.

To construct a Gantt chart, two types of software that can be used are MS Project and Google Docs. MS Project automatically creates a Gantt chart where the user types
in the task name, duration of the task, task start date, and, if one exists, task dependency. Additional information such as task completion and resources assigned to each task can be added to the Gantt chart in order to add more specificity. Other tools within MS Project allow for a more sophisticated Gantt chart to be created. Google Docs can also be used to create a Gantt chart. To do so, start by creating a spreadsheet with some of the following column headers: Task, Start Date, End Date, Percent Complete, Resources, Predecessor, and Unique ID. The unique ID column is necessary if the predecessor column is used since that is how the dependencies are tracked by matching IDs. After completing the table, highlight the cells wanted included in the Gantt chart, click ‘Insert,’ then ‘Gadget,’ and then, under the Gantt Chart option, ‘Add to Spreadsheet.’ Then click ‘Apply & Close.’ The chart will automatically appear.

In summary, a Gantt chart provides a pictorial view of a schedule that clearly shows task dependencies, which allows for contingency planning.

### 3.9 Feedback Loops

A feedback loop is an important part in a non-linear process flow and may give a process the ability to learn or even correct for problems. In general, a process flow has a serial or linear progression of steps. We can put them in order from start to finish. However, putting in a feedback loop
3.9. FEEDBACK LOOPS

in a process flow may allow us to repeat the steps of a process flow to make sure that their is an intermediate quality product along the way. Perhaps it will help through the use of an example. A linear process flow of baking a cake may involve the steps of mixing ingredients, pouring the batter into a pan, and then baking the cake in the oven for a set amount of time. You could follow these steps and have a great cake as long as everything is consistent each time you bake the cake. However, your oven temperature may not be 100% accurate. Therefore, you want to put in a feedback loop that has you check the cake’s moisture through the toothpick test. If you insert a toothpick and it comes out clean, the cake is done. However, if the toothpick has cake batter on it, then keep baking it long. This is a simple feedback loop, but it demonstrates the point that non-linear process flows can have quality benefits.

Feedback loops should be used to encourage positive feedback. When things are going well, then success can actually build upon itself. For example, the idea of compound interest is that the interest you receive on the principle then is able to generate interest In this way, a small amount of money can grow into a much larger amount of money over time. In a business setting, positive feedback loops can allow profitable parts of the organization to keep a portion of their profit for reinvestment. Organizations that divert funds from successful projects to ones that are unsuccessful may not be taking advantage of this positive feedback or reinforcing effect.

Some feedback loops are negative feedback loops. These feedback loops should be avoided. For example, if bad outcomes are rewarded or encouraged instead of being punished or minimized, then perverse incentives or negative indirect consequences may result. For example, if a manufacturing process starts producing defective goods thereby leaving gaps in the line of completed goods, a negative feedback loop may take the signal of gaps in a production process means that throughput should be increased. In fact, the errors in production may actually come from a throughput or velocity that was too fast to begin with.
Therefore, the correct feedback loop would be to slow down the process and not speed up.

3.10 Brainstorming

During at least one point in every project there is a time where it is necessary to come up with ideas. Whether it be to decide on a project to pursue, or a solution to a problem, ideas need to be generated. The most commons idea generation tool is brainstorming. Brainstorming is a simple and powerful tool aimed to generate as many different, well thought out ideas as possible.

There are three rules to brainstorming:

1. Quantity, not quality
2. No criticism
3. Get crazy
4. Facilitation is key

The goal is to produce as many ideas as possible. It is therefore important not to criticize any idea that is brought up by other members of the team. Some of the best ideas are derived from the craziest initial ideas. If someone on the team eliminates what they consider bad ideas, a good idea would be hard to come by. Without the crazy ideas, there would be no out of box thinking, and out of the box thinking leads to innovation. Get crazy. In order to get the most out of brainstorming, it is best to appoint a facilitator (for more on facilitation refer to Section 4.1).

Now, how to brainstorm. Depending on the type of team (extroverted, introverted, or a mix), a different variation of the tool might be preferred.

3.10.1 Extroverts

A team of extroverts, people that are more talkative and enthusiastic, tend to do well in verbally generating ideas.
They are comfortable in that setting and usually have no qualms with pitching an idea, and expanding on their own or other peoples thoughts in public. As it can be imagined, an idea is pitched, conversed about, expanded on, and recorded. The process can go on for however long the team wants, and can have as many initial pitches as the team wants. Avoid cutting off ideas and not fleshing out all the possibilities.

3.10.2 Introverts

A team of introverts, the quiet ones who generate all their energy and ideas from within, are not as comfortable verbally generating ideas as extroverts. A variation of brainstorming is often practiced amongst these teams, called written brainstorming. Written brainstorming is very similar to the standard brainstorming, but is all done on paper. It starts out with each team member writing down some idea on separate sheets of paper, then after a given amount of time, the papers are passed to another team member to comment on, expand on, or alter the previous idea. After a given amount of time (five minutes) the papers are passed and the process goes on for however long is wanted. New papers can be started at some point with fresh ideas, or the original papers can be continuously expanded upon. At the end of the exercise, there will be however many pieces of paper full of ideas and progressions of different thoughts that can be used to extract ideas.

More commonly, teams will consist of both introverts and extroverts. Brainstorming with these teams are more difficult because nobody is always in their element and comfortable with brainstorming. The introverts will not like the verbally intense part of the tool, and the extroverts will not like the written intensive part. A QUEST mentor developed a tool that incorporated both of these brainstorming methods to help both personality types flourish in brainstorming, and maximize the amount of ideas generated. Essentially, the tool is a combination of the introverted version and the extroverted version of brainstorm-
ing. It begins with a quiet brainstorm, where everyone has a sheet of paper writing down their ideas. After one or two passes of the paper, the team takes a step back and discusses what has been written down thus far. The results of this conversation should then be recorded on the respective papers, and the team goes back to a quiet brainstorm for a few more iterations, after which the team speaks again, and so on and so forth. This variation of the tool allows introverts and extroverts to be able to work together and provides the preferred working environment for both personality types.

Now regardless of which variation of the tool was used, the team should have a number of pursuable ideas. How does the team narrow down these ideas to a digestible size? One way is an impact-effort analysis.

An impact-effort analysis is a 2x2 matrix that measures the amount of effort versus the impact the idea will have. It looks like this:

<table>
<thead>
<tr>
<th>High Impact</th>
<th>Low Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Effort</td>
<td>High Effort</td>
</tr>
</tbody>
</table>

Table 3.2: Impact-Effort Matrix

On the matrix, the effort increases with respect to the x-axis, and the impact increases with respect to the y-axis.

Projects that are high impact and low effort are the best to pursue, for the obvious reason that you will optimize your efforts. After knowing where the different ideas fall on the impact-effort analysis, the team should decide which idea to pursue.

When a team chooses an idea to pursue, the team must be certain that everyone is on board with the idea. If not everyone on the team agrees with the direction the team is heading, and does not own the idea or project, the team
3.10. BRAINSTORMING

will not be working at its maximum capabilities and will not produce the quality results it could have. This cannot be stressed enough. The entire team must own the project and be passionate about what they are doing in order to produce the optimal results. Be quality.
Chapter 4

Mentoring

4.1 Facilitation

Facilitation is an extremely valuable skill that can be learned in order to make teams more effective, efficient, and high-performing. A facilitator differs from a mentor. Generally, a mentor is a more experienced person who is helping an individual or team grow. A mentor provides advice and has insight into the questions that the mentees are trying to solve. The facilitator’s role, on the other hand, is that of helping teams to reach their goal despite not always knowing the best way of reaching the answer.

This begs the question, how can a facilitator help a team if they are not directly participating in the process, and do not have the answers to the questions? The goal of a facilitator is to design and ensure the success of team meetings. This is accomplished through various subtle tactics the facilitator uses during the meetings, allowing the teams to remain focused and maintain positive dynamics. It has been proven that teams that work with facilitators are generally more effective than teams that do not. It is important that the facilitator is respected by the team members. Therefore, when a facilitator speaks, the team members listen. This allows the facilitator to control the flow of the conversation.
CHAPTER 4. MENTORING

The facilitator does not necessarily have the answers to the questions that the teams are attempting to solve, but works as a guide of sorts that helps the teams achieve their objectives.

One extremely useful tactic that facilitators use is asking different types of questions to spark conversation and keep the team on track. For example, if a team seems to be drifting away from its initial goal or seems to be getting sidetracked, a facilitator can ask a leading question such as “Do you believe that this topic will be the most effective way for us to achieve our goal?” in order to guide the conversational flow within the team. They can also ask leading questions to spark conversation when the team has reached a point where they are stagnating in order to give them positive momentum and idea generation.

Another situation where asking the right questions can be very useful is in maintaining team dynamics. Teams are generally composed of individuals who do not know each other, and usually contain both introverts and extroverts. Let’s say that our introverts name is John, and the extroverts name is Steve. At times, it is easy for the voices of the introverts to be drowned out, as the extroverts dominate conversation, leading to resentment within the teams along with potentially valuable ideas not being considered. For example, If Steve the extrovert is doing a majority of the talking and other members’ voices have not been heard, a facilitator becomes very useful. They can ask questions such as “John, what do you think of that idea?” and then John the introvert has the ability to voice his opinions, and let the team know his thoughts on the project.

As part of this skill, the facilitator must be very adept at reading team members’ body language and understanding when it is and is not appropriate for them to step in and guide the conversation.

Through the facilitation process, facilitators can help teams achieve their potential and significantly increase their chances of success.
4.2 Gap Analysis

Gap analysis is a tool that can be used to determine how to get from a current state to a future state. It allows users to compare actual performance to potential performance. To start, list the qualities of the current state and then the qualities of the future state. What will result is a gap between the two states, and the gap is what’s used to help figure out how to achieve the future state. Below is a visual representation of how a gap analysis works.

![Figure 4.1: Gap Analysis](image_url)

Gap analysis can be performed on multiple aspects of a business such as the organization as a whole, business direction, business processes, and information technology. A combination of examining industry performance and company performance can be used to help determine what needs to be improved.

Often companies need to acquire new capabilities to bridge the gap. For example, for a 490 project Emily’s team created a gap analysis for their client where we analyzed the current content management system they used to update their website. Her team then looked at the client’s competitors’ websites, interviewed experts in the field, and did online research to figure out what the fu-
ture state should be. After determining the future state her team was able to see the gap between the actual and desired state and was able to fill in the gap. They found the main issue was lack of efficiency. A different content management system with certain features enabled could fix the efficiency issue and allow for the future state to be achieved.

The movie ‘Office Space’ also exemplifies gap analysis through the main character, Peter Gibbons. Peter is working in a mundane job that he does not like and has a girlfriend he believes is cheating on him. That is his current state. In his future state, he imagines himself happy, enjoying life, and not worrying as much. To bridge the gap and achieve his future state he gets hypnotized and successfully achieves his imagined future state of being happy as he now has the confidence to do what he wants without worrying about the consequences.

In summary, gap analysis is a business tool used to compare actual, current state performance to future, potential performance. Gap analysis can be used anywhere such as on organizational issues, business processes, and information technology infrastructures.

4.3 Mentoring Basics

Mentoring occurs when a more experienced person provides guidance to an individual or team in order to help them achieve their personal or professional goals.

Regardless of whether you are mentoring in a team or individual setting, you will be playing a very important role. Consequently, when a team becomes more successful, the mentoring experience can be very rewarding. For our purposes, we will focus on mentoring teams.

While mentoring a team, members of your team will initially be coming to you often seeking answers to difficult questions. As a mentor, it is important that you do not immediately provide them with these answers, as a big part of the individual and team development revolves around
them going through the process of coming to an answer on their own. Along with that, having a team find an answer on their own provides them ownership over the solution to that particular issue, and increases members’ buy in to the project or task at hand.

Therefore, the mentor’s job is to show the mentees the path, and allow them to walk down it. At times, the mentees may walk down the wrong path and it will be very tempting to correct them immediately, yet this may not be the best approach for their development. Teams can learn a great deal from minor failures and the iterative approach, so as a mentor you must decide when to allow your teams to fail, and when to step in to provide a small push to send them back in the right direction once more.

Pointing your team in the right direction and knowing how to handle disagreements within the team are a very important roles of the mentor. This can be accomplished very subtly through the use of guiding questions. The purpose of these questions is to spur conversation between group members, and to get them to answer the questions that they should be focusing on in order to head in the right direction towards completing a successful project.

Examples of guiding questions include:

- When the team is stagnating: “What does the team charter say you set out to accomplish?”

- When one or two team members are dominating conversation, you can ask: “John Smith, how do you feel about that approach?”

- If you feel they are entering scope creep you can ask “Does that fall within the scope of the project?”

- “Does this address the voice of the customer?”

- “What are the most important things that we need to accomplish to reach our goals?”
CHAPTER 4. MENTORING

As a mentor of a team, there is a strong probability that you will form favorites, or find individuals whose perspectives you agree with more than others in the team at times. It is extremely important that you remain neutral while mentoring your team, and that you do not take sides for anyone in the team. Showing favoritism can allow for animosity to build between team members and even with members and you as a mentor.

A crucial role of a mentor on the team is that of monitoring the status of each individual on the team. This means that if there are certain people who may need extra attention, or feel they need a pep talk or think they should be taking more of a leadership role on the project, as a mentor it is your responsibility to check in with those people and see how they are doing. They will provide you feedback, and you will provide them with your thoughts on how they could potentially improve within the team as well.

If team members are having personal issues with one another, and are not working together as a cohesive unit the mentor is responsible for trying to find a way to resolve this issue. They should speak to all parties involved, and understand the cause of the issues, and then bring the sides together in an attempt to resolve the differences.

One useful task a mentor can perform is to have team members list their strengths and weaknesses and share them with the other team members. Then have the team reflect on how these different skills complement one another, and the impact these findings can have on the team dynamic.

Another fun way to bring the team together in the initial stages is to play a fun game called Roses and Thorns. It is a very simple game, in which each team member tells the others the best part of their day and the worst part. This can be adjusted by how frequently the team is meeting (I.e best and worst part of week, month, etc.) Although it may seem like rather silly exercise, it turns out that it is extremely useful in that it allows team members to learn about one another’s interests outside of the office or
classroom workspace, and encourages them to learn about their team members lives. As people get to know each other, they are likely to work together and function more effectively as a unit.

Positivity is an invaluable trait a mentor can have, especially when the team is struggling to move forward. There will be times when the team is stuck on an issue, or rather frustrated by a lack of progress, and a healthy dose of positivity and energy can be an important factor to help the team maintain enthusiasm as they proceed.

Another very important role mentors play is being the one who calls out “the elephant in the room.” As the name “the elephant in the room” suggests, the elephant is something that can not be avoided and is extremely noticeable, but may be something that no one wants to address or is unaware of but may be holding the project back. As mentor, part of your responsibility is to bring up the issue with the team or individual so as to ensure that they do take steps to address the situation in an appropriate and timely fashion.

Here are some things to keep in mind as a mentor:

- A mentor must wear many hats, and at times can be leaned upon as a facilitator, confidant, advisor, etc.
- A mentor plays a helpful role in the brainstorming role as well.
- It is important for a mentor to do individual check-ins and not just the mentor the whole team.
- A mentor is able to facilitate when there is open disagreement among the team members and diffuses these situations. In other words, a mentor is able to manage conflicts.
- A mentor is able to address the “elephant in the room.”
- A mentor is able to ask very directed questions to push or nudge the team in the “right” direction without giving them to answers.
- A mentor sometimes allows the team to fail and helps them understand how they can learn from failure.
Chapter 5

Systems Thinking

5.1 Blue Ocean Strategy

Blue ocean strategy is about creating a brand new product or service, thus creating new demand in an uncontested market space. The goal of blue ocean strategy is to create value for the buyer and seller simultaneously by creating a low cost, and differentiated product or service. If successful, value is created for both the buyer and seller and makes competition irrelevant.

To help find where a low cost, differentiated product exists, four methods can be used:

1. *Eliminating* factors and/or extraneous processes.
2. *Reducing* the number of processes or factors.
3. *Raising* efficiency and/or quality of the product or service.
4. *Creating* a brand new product or service.

The new value curve created is called the Eliminate-Reduce-Raise-Create (ERRC) Grid, and it focuses the seller on creating value for the buyer. Benefits of the ERRC is that it is easy to understand, forces management to take a
close look at the company, and encourages them to pursue a differentiated and low cost strategy.

Blue ocean strategy creates new market demand, and the best way to accomplish this is to target noncustomers as the primary customer segment. The biggest problem with this approach is the lack of knowledge on noncustomers; however, it is necessary to learn more about this customer group to truly create new market demand. There are three types of noncustomers. The first tier of noncustomers is the soon-to-be noncustomer. These are the customers in the current market that unwillingly participate and eagerly await their change to exit the market. The second tier of noncustomers is the refusing noncustomer. This customer has consciously decided not to participate in the market even after knowing what the market can offer them. The third tier of noncustomers is the unexplored noncustomers. These customers have never considered the market's products and/or services as an option. Successful blue ocean strategy lies in the ability to take advantage of the commonalities between the noncustomers in order to create demand where there was none before.

Blue ocean strategy core components consists of creating new market demand, making the competition irrelevant, value innovation, and pursuing differentiation and low cost. Red ocean strategy, on the other hand, focuses on competing in an existing market over preexisting demand, beating the competition, making the trade-off between value and cost, and pursuing a differentiated or low cost strategy. Thus, a company with a red ocean strategy is swimming in a shark tank with many other companies all in a constant battle for market share. Meanwhile, a company with a blue ocean strategy is venturing out into unexplored blue waters trying to uncover a new market.

A strategy curve is a tool used to visually chart where a strategy's components currently lie in regards to a blue or red ocean environment. Below is an example. Competitors are used on the chart to compare strategies. A company knows it has blue ocean strategy in a competing factor when its strategic factors are above all competitors. Each
factor charted is ranked on a scale from low to high, but there is no acute measurement to the placement of points. The chart below arbitrarily uses 5 to mean high and 0 to mean low. The factors charted consist of the areas where the company competes or invests in. Typically the factors that fall under red ocean strategy appear on the left of the graph, and factors with blue ocean strategy appear on the right. The last five points on the dashed line in the graph below represent the blue ocean part of the strategic move. Below is a strategy canvas of Cirque du Soleil:

![Figure 5.1: Blue Ocean Strategy Curve](image)

An example of a blue ocean company is Cirque Du Soleil. Cirque De Soleil’s tagline states, We reinvent the circus, and that is exactly what they did. A traditional circus has clowns, animals, acrobats, jugglers, and a ringmaster. The names immediately associated with the circus are Ringling Brothers and Barnum and Bailey. Cirque Du Soleil began in 1984 by street performers and uses no animals (one of the traditional circus’s greatest expenses), and at the time did not have a recognizable name. The least expensive tickets for both circus shows reveal a 4.5 times higher price for the Cirque du Soleil tickets than the Ringling Brothers and Barnum and Bailey tickets. However, Cirque du Soleil targets an older, more sophisticated audience than the traditional circus that targets kids. The
separation revealed a market of people wanting to see acrobats and be entertained in an artistic way without the need to see and/or smell animals. Cirque du Soleil created a blue ocean strategy and capitalized on this market as can be seen in their ticket prices.

In summary, blue ocean strategy creates new market demand by emphasizing value innovation—the idea of creating value while decreasing cost. It targets noncustomers and breaks the value-cost trade-off. It can be made by companies that construct a completely new industry, such as EBay with online auctioning, or by altering the boundaries of an existing industry, like Cirque du Soleil.

5.2 Idealized Design

Idealized design is a design method that was developed in the 1950s by Russell Ackoff, a professor and researcher who was a pioneer in Total Quality Management. Idealized design falls under the umbrella of interactive planning, which is a tool that allows organizations to work to actively shape their futures, rather than just react to conditions in the marketplace. Instead of aiming to implement incremental changes, idealized design aims to be the design stakeholders would have right now if they could have any system possible be implemented within their organization. Idealized design is a framework for making radical improvements to an organization and you do not let the current state of an organization constrain your design process.

Idealized design is a very powerful tool, but there are two constraints for designing an ideal system. First, the design must be technologically feasible with what is currently available. Secondly, the design must be operationally viable. In other words, the design must be able to survive the current environment into which it is going to be implemented. Any kind of idealized design must also be able to adapt to and withstand any rapid change the organization might face. To put idealized design into effect, you basically picture an ideal sys-
tem you would like and contrast it to what you currently have within your organization. Then, once you do this contrasting analysis you find ways to bridge the gaps between where the current system and the ideal system do not match up. You then look to find ways to work to bridge those gaps and this is how you come to the design of the system. This is a very profound tool when used properly because you’re designing not just a good system for your organization, but the ideal system that everyone would want to implement because it would be the most effective.

5.3 Implications Wheel

An implications wheel is a graphic design and an extremely powerful tool that was developed by Joel Barker. Implications wheels can be used in order to help strategic thinkers understand the consequences, both positive and negative, of their decisions and actions. It involves non linear thinking patterns for the purpose of examining the possible implications of a specific issue, decision, event, or change.

An implication is a possible result or consequence. It is important to remember that the implications wheel is not used for outlines, brainstorming, SWOT analysis, or mind-mapping. It is a separate tool that is used to help strategic thinkers understand the implications of their decisions, and to better prepare them for potential future situations.

To start your implications wheel, you must choose the decision, event, or change you are contemplating in order to evaluate the implications. This is known as the center of the implications wheel.

Below is an example of an implications wheel.

As you can see, the center has many different nodes, representing implications that are branching out from it. These branches are all potential implications of the action you are taking in the center. It is important that your center is specific, relevant, and strategic. To develop your implications, ask yourself the question What may occur?
the action being considered happens. When writing your implications, try and write them so someone looking at your wheel for the first time will be able to follow along.

We will use a very basic example, to demonstrate the formulation of an implications wheel: You decide to get a dog for your house.

As you can see, you can make an implications wheel for nearly everything that impacts your life or business. As you expound upon these initial implications, you will realize that your initial implications will spawn implications of their own. A key question one can ask in developing the second level is: “What might occur if this implication happens?

Through analyzing the secondary implications, you are able to paint an even more accurate picture of potential future situations that may arise due to your current action. This pattern can continue to be extrapolated from 2nd to 3rd to 4th level implications and onwards. With that said, it is important to draw a hypothetical line as to what level implications you feel are relevant, and worth investing time exploring.

At times, while evaluating these 2nd and 3rd level im-
5.3. **IMPLICATIONS WHEEL**

![Implications Wheel Example](image)

**Figure 5.3: Implications Wheel Example**

When creating your implications wheels, it is important to be cognizant of unintended and unanticipated consequences. These are especially prevalent when one is attempting to implement a seemingly positive action.

Let’s give a hypothetical example of this situation. A major public university decides to shut down the biggest bar on campus due to an excess of underage patrons. The University feels as though they have made a very prudent decision, that will curb the underage drinking problem on campus.

Conceptually, this seems like a good idea, yet many unanticipated and unintended consequences begin to occur. The underage patrons begin to drink in their dorm rooms, where there is no supervision, and results in an increase of drinking related hospital visits. The town’s downtown nightlife scene is also severely negatively impacted. As a result, many local eateries whose main source of in-
come comes from late night food sales struggle to make ends meet, and are forced to shut down. Along with this, the reputation of the university as a well-rounded school goes down, resulting in a smaller number of qualified applicants to the university, in turn affecting the overall university rankings. If the University had utilized an implications wheel, they would have been able to anticipate the unanticipated consequences of their decisions.

One must also be wary of linear thinking, as it can blind you from potential positive or negative implications of your actions. In implications wheels, bridges are ways to work around a bad implication to get to a good one.

5.3.1 Scoring

There are two main components that you score for on an implications wheel. One is the desirability of an implication. The other is the likelihood of the implication.

Rules for scoring:

1. Assume the previous implication happens
2. Don't get fanatical
3. Majority rules/minority reports
4. Choose a point-of-view before scoring

For Desirability, the scoring scale goes as follows:

- -5 extremely undesirable
- -4 very undesirable
- -3 undesirable
- -2 would bother you
- -1 a negligible problem
- 0 makes no difference
- +1 better than nothing
5.3. IMPLICATIONS WHEEL

- +2 not a big deal
- +3 desirable
- +4 very desirable
- +5 extremely desirable

To provide a benchmark when using this scale, the score of a +50 is extraordinarily good, meaning that it is an especially positive implication. On the other hand, a score of -50 is especially bad, and a potential disaster. It is important to note that scores for desirability or undesirability ALWAYS have + or - signs in front of them.

5.3.2 Scoring for Likelihood

Likelihood is scored on a scale of 1 to 9. Using this scale, a 9 is something that is extremely likely to happen; whereas a 1 is something that is extremely unlikely to happen. The numbers in between demonstrate the strength of the likelihood utilizing the scale mentioned above.

The wheel coloring is as follows:

- Red: significantly undesirable implications (so - 4 or - 5)
- Blue: significantly desirable implications (so 4 or 5)
- Circle: very likely implication (9)
- Stars: implications with a desirability score of -50 or 50

Useful applications of implementing an implications wheel include:

- New product or service
- New or adjacent markets
- New policy testing
- Mergers & Acquisitions
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- Startup
- Expansion
- Interdepartmental involvement
- Job changes
- Strategic alliance building

As you can see, implications wheels are a very useful tool that can be utilized in various applications from your personal to professional lives. They provide early warning signs for the future, and allow leaders to prepare for things before they happen, and avoid unintended consequences and unanticipated results.
Chapter 6

External Clients

6.1 Defining the Scope

6.1.1 Establishing the Scope

It is vital to the success of your project to have a crystal clear scope right from the beginning. Your project will begin with a proposal from your client about a problem they would like your team to solve. Depending on the client, this proposal may be long or short, vague or specific, and it is the job of your team to work with the client to translate this proposal into a succinct and actionable statement. It is crucial that you work with your client to develop the scope so that your project will achieve the main goals that they set out to accomplish for their organization. Once completed, the scoping document will also outline the deliverables your team will submit to the client at the end of the project. The scope document should not be unreasonably specific, but still contain enough specificity that your team has an idea of what to work towards and understand what project success will look like. For example, if your team is working on a project reducing costs for a certain manufacturing process, a portion of the scoping document might read: “We will aim to reduce costs by 10-20% for widget manufacture on production line A by improving op-
erational processes. Our team will focus on the conversion of raw materials into widgets up through the packaging of widgets for shipment.” This statement details what the project will focus on and also defines a target goal for cost reduction so that the team will have a number to aim for throughout the life of the project. It is also crucial to have the scoping document imply what is outside of the scope so your team is not working on extraneous things that your client does not really want. From the example above, your team would know not to focus on cutting costs by looking at different suppliers or by analyzing the methods of distribution. These exclusions are helpful when your client asks your team to work on things that are outside of scope. With an effective scoping document, you can refer the client back to your scope and politely point out that your team is not responsible for these extra items. The nature of some projects is such that your team will not be able to create a narrow scope right at the beginning of the project. These types of projects begin with a wide scope that is narrowed down as the team progresses throughout the semester. This is not to say that your team should go without direction if this is the case. Your team should check in with the client throughout your project to determine when the scope should be narrowed down. Creating a clear scope that is agreeable to both parties may take some work initially, but will go a long way in ensuring the success of the project.

6.1.2 Sticking to the Scope

Be sure that your team sticks to the scope throughout the duration of the project. Keep the scoping document in a very visible place and refer back to it, making sure your team is always working towards the ultimate goal the whole time you are working through your project. In the process of completing the project, your team might come to a juncture where you get really excited about taking the project in a new direction that you believe will provide more benefit for the client than the initial goal of the
project. While it will be very tempting to follow your passion, you have to keep in mind that the client is the one paying for the project and they want a specific solution for a certain problem. If you have set up the scope (and the ensuing schedule) correctly, you will only have enough time during your project to complete what was in the scope initially. The appropriate time to explore any alternative directions for the project is at the end, after you have already delivered what the client contracted your team for in the first place. Be sure to reference your team’s scoping document at key milestones throughout your project to be sure that you are still addressing the initial problem that the client wanted your team to solve.

6.1.3 Scope Creep

Something that can kill even the most promising project is “scope creep.” This is the situation where, for various reasons, the scope of your project will begin to expand, often going unnoticed. This can happen while your team is working through the project and becomes really committed, often adding extra features or information to the project without realizing they are extraneous and not vital to the original goals of the project. Scope creep can also occur when teams do not question the requests of clients. Clients will sometimes change their minds during a project and ask your team for extra things that were not in the agreed-upon scope you set together at the beginning of the project. If this situation arises, you have to stand up to the client and politely refer them back to the initial scoping document. If left unchecked, scope creep can lead to delays in schedule and increases in cost in your project, which threaten to derail project success. The best way to avoid scope creep and stay on track throughout your project is to build out a schedule and associated work breakdown structure from your scope at the beginning of the project. A work breakdown structure (WBS) is a more lengthy and detailed document with actionable steps.
6.2 Client Communication

One of the keys to success in working with an external client is to have honest, concise, and timely conversations. This communication channel can help save a consulting team valuable time. More importantly, strong communication with your client will serve as a foundation for trust that will help a team especially if there is bad news to deliver. Since the nature of the consulting projects that a team works on is inherently difficult and complex, unfortunately bad news is something that may consulting teams must deliver.

6.2.1 Foster Stronger Relationships

When first meeting with your client, remember to be friendly and that your client is a human being. This may seem like common sense but it is important to keep in mind that you should begin any meetings or phone calls you might have with a little bit of small talk. If nothing comes to mind to talk about you can reference an old conversation, mention something you know you or your team has in common with the client, or ask about another project you know the client company is currently undertaking. A little bit of small talk can really go a long way in fostering a good personal relationship with your client which will then transfer over into a stronger working relationship. Don’t let this take up too much time in your meetings, but starting off this way can really help.

Another thing that is important is communicating your successes as a team as well as your struggles. Show enthusiasm for your project when things are going well! Get your client excited about the project because it will get them more involved with what’s going right and get their support on these things. However, do not bug your client with every little detail of your project along the way. Keep in mind that your client is going to care more about results and what your team has done, rather than how you did it. Within your team, it is more interesting of course to
6.2. CLIENT COMMUNICATION

tell your story and how you accomplished things throughout the duration of the project, but at the end of the day, your client is really going to care about what got done and how it’s going to impact the rest of the project and the remainder of the timeline.

6.2.2 Avoid Common Pitfalls

One of the most crucial things in the relationship between a client and a consulting team is ensuring that there are no surprises for the client. If your team is falling behind on something, let the client know that you will be a little behind schedule as soon as you realize that it is inevitable. Whatever you do, don’t wait until you’ve missed a deadline or until the day of the deadline to inform the client your team is behind schedule. This is very unprofessional and the client will likely be upset they were not informed of the delay. The client will be much less angry if you tell them as soon as you know that your team is going to fall behind schedule. Simply inform the client of your difficulties and explain that you are experiencing delays but your team will do everything possible to get the project back on track. This also gives your team a chance to ask your client for information or to help in any other way that would speed up the process of getting the project back on schedule. The client will appreciate your team handling any problems in this professional manner.

Something that’s important to never say when a client asks you a question is, “I don’t know.” Instead, you should respond with, “I’ll find out.” This essentially means the same thing, but it shows your client that you’re eager to work on this project and solve whatever the problem may be. Along those same lines, if a client asks you a question you don’t know the answer to or asks you about something you have not done yet, never blame other people on your team. Instead, just say that your team has not gotten to that particular issue yet but will start working on it soon and will make sure that it is taken care of. This guarantees a nice united front and makes your team look stronger and
A final thing to keep in mind is not to step on any toes at your client company by contacting people without the permission of your project champion. It is likely that you will want to reach out to a subject matter expert or another point of contact at the client company at some point in your project. The correct way to go about this is to ask your project champion to put you in touch with anyone you are interested in speaking with, rather than your team just hunting down email addresses and contacting people out of the blue.

6.2.3 Communication Logistics

There are some simple logistical issues that if handled correctly will greatly improve communication between your team and your client. First off, you should designate one person on your team to be the point of contact with the client. This keeps things simple and prevents the client from feeling overwhelmed by being contacted by several different people they do not know. Your team should also designate an alternate contact person in case the main person becomes unavailable. When your team begins a project, find out your client’s preferences for communication. This can be phone calls, emails, video conferencing, or even in person meetings if possible. Also find out what frequency your client expects to be in contact with your team. This might be a weekly conference call, an email every two days, and it may also completely change throughout the course of the project. This is perfectly fine as long as the lines of communication remain open and your client remains informed of your team’s progress and your team is receiving the information you need from the client. When using email, find out if the client prefers that you send them a list of questions and they’ll get back to you in one email with all the answers or if they prefer to go back and forth one-by-one until they have all the issues taken care of. These may seem like minor details, but keeping these kinds of things in mind will help you communicate more
effectively in the long run with your client. One final thing to keep in mind is your client’s schedule. Just as your team will become busy with other classes and projects at different points in the semester, your client will become busy with other things at their company. Ask your client up front, perhaps on a monthly basis, if they anticipate being busy, out of town, or facing any circumstances that would prevent them from communicating with your team as much as usual.

### 6.3 Client Deliverables

It is easy to overlook, but it is important to discover what the client wants in terms of deliverables, not only concerning the content, but also the aesthetics of them. This is integral for all deliverables sent to the client—including drafts—so do not think this only pertains to the final deliverable.

Some important things to remember:

1. What form does the client want the deliverable(s) delivered in? Deliverables can be in the form of a Word document, PowerPoint presentation, or Excel document. It is important to ask the client what they expect to be delivered so the student team does not walk in with an extensive paper when the client wanted a PowerPoint presentation.

2. What software do they run on their computers? It is important to find out what software the client runs on their computer. A student team does not want to create a document that the client cannot open due to incompatibility. For example, if the deliverable is made in PowerPoint 2010 but the client has PowerPoint 2007, it must be saved in a PowerPoint 2007 format so the client can see it.

3. Does the client have a specific template or formatting they want followed? Some clients have a specific
template or format they want used so they can distribute the deliverable internally. Many companies have templates they require their employees to use for branding purposes, so it is important to learn if the client wants their templates to be used. Colors, graphics, text, etc. are all important elements of PowerPoint slides that clients may have an opinion about as well, and it is the student team’s job to uncover that opinion. Other clients may say they will change it to meet their branding requirements afterwards. In this case it is important not to do anything too fancy that will make changing colors and formatting difficult for the client in the future.

4. How does the client typically communicate ideas? If possible, look at another deliverable created by the client to get examples of how they convey ideas. Do they use a lot of detailed descriptions on the PowerPoint slides, do they use bullet points with more detail in a Word document or do they input the extra detail in the Notes section of a PowerPoint? The more closely the final deliverable matches the set-up the client is used to, the more use they will be able to get out of it later. The client may not remember that both a paper and a PowerPoint explain a project if just PowerPoint slides are usually used, especially if given to someone not directly involved in the project. Thus, it is important to stay consistent with the clients practices.

5. Can the student team use the client’s brand on their slides? Some clients do and some clients do not want their logo on the student team’s slides due to branding and legal reasons. So, before a student team puts the logo on the presentation slides, ask the client.

No matter how good an idea is, if it cannot be communicated properly it will go nowhere. Deliverables, throughout the project, are for the client, not for the student team. It is important to give them what they are looking for, even
6.4 Client Culture

Culture is the part of an organization that is impossible to be described, but instead has to be felt. It is the part of the organization that is beneath the surface. It lies in the values of the employees, the relationships the employees have to each other and to the organization, the daily routines throughout the organization, the common assumptions the employees hold about the organization, etc. Even describing the term “organizational culture” is difficult. Perhaps the easiest way to describe “organizational culture” is through examples.

The first example involves a team who consulted for a government organization laboratory department, working closely with the auditing department. With that alone you can probably make some accurate assumptions about the culture of the organization. The team was tasked with making the labs more compliable with some government standards. The first email with the project sponsor let the team know they were in for a real learning experience; there were no words in the email, only acronyms. It was understood that in order to do their job well, the team had to learn all the necessary acronyms of the organization; this is inherently part of the culture. The team tried setting up a time for a kick-off meeting on a Monday morning, and got an email back from our sponsor saying “If you want this to be a productive meeting lets not have it before Monday at 1 (still getting over the weekend) or any Fridays (the weekend already started).” The team was taken aback,
but once again, that’s just the culture.

The team finally arranged a meeting on a Tuesday, and got a tour of the facility, going around with the lead auditor to different labs. Next culture lesson the team learned was that everyone was friendly and wants to share what they are doing with you, but “no one likes auditors, they make things tricky for you and suppress your genius.” As the team kept on walking around we noticed the labs were nothing short of chaos, but it worked for them. The culture seemed to be very much like “we know what we are doing, we have been doing this for years and it had never been a problem, so don’t bother me about how I work’.

Now as you can imagine it is very difficult to consult for an organization like this. One of the most difficult parts of being a consultant is figuring out how to better the organization and telling people they are wrong without annoying them. With this particular client, the team had to work with the project sponsor (auditing team) and project champion (lab manager) separately. They did not get along very well, so the team had to set up separate meetings because each manager believed the other department was fundamentally wrong. The team knew both managers were not wrong, but they both needed some improvements and some actual communication. As a consultant you have to adapt to the culture and figure out how to maximize your impact within it.

The next example involves a government-consulting firm. A QUEST student interned there one summer, and found it very confusing at the outset. It was a very conservative organization, suit and tie every day (except Fridays when you did not have to wear a tie). Office doors are always open, except when with a client, and everyone is on a first name basis—even managers three levels up. You can imagine how awkward it is to be talking to your manager’s manager’s manager calling him “Gary” while you are sitting on his nice leather couch in his corner office on the top floor of the building. It is very comfortable, even though it is also a bit shocking. As comfortable as they are, and as casual as they may appear, they are a very successful
firm. The quality of work is off the charts and they have a very strong work ethic.

Like this one, every organization is unique. Every organization has its ins and outs that make them run. Not every organizations culture works well with their productivity, but you must learn how to adapt your skills to the culture, and maximize your impact, because for one, you will never be able to change the culture.

A final example demonstrates how different the culture is among international organizations. You should avoid making any assumptions about their culture, because more often than not you will be wrong, and there is always the possibility of offending them—something to avoid!

Saul Shamash (one of the authors of this book) ran a trip overseas that worked with a non-profit organization in Israel. His organization brought in the trip participants, and the Israeli organization provided us with the Service projects. As you can imagine, the leadership of the organization and Saul were approaching this collaboration from different perspectives, which caused some friction between Saul and the organization. The Israelis were not appreciative of regular updates, or meetings at all for that matter. They preferred a more ad hoc approach and “working on the fly.” Saul began to feel underappreciated, because the organization was not giving any input into what was going on, and of course none of this was intentional, it was just a clash of cultures. Therefore Saul had to change his expectations, and find new ways to make his voice heard without directly confronting the organization about it, which might negatively impacting their relationship. In this example, Saul had to adapt after better understanding the cultural differences and how it impacted his ability to be effective.
Chapter 7

An Example

In this chapter, we take you through a hypothetical capstone project in the QUEST program. This example highlights some of the situations that you may find yourself in and how you may draw upon the previous six chapters of material to help navigate your way out of difficulty. While the inspiration for this hypothetical example may come from previous capstone projects within QUEST, the example is completely fictional.

7.1 Introduction

During the first class, Brian, Emily, Sahil, and Saul find themselves listening to the potential capstone projects the will work on for the next three months. They have done quite a bit of work to get to this point. Each of them has taken the previous QUEST class on design and quality (190) and system thinking (390). Furthermore they have all progressed in their majors over three years. Little do they know that one of the most challenging experiences of their undergraduate career awaits them. They will find out through successes, failures, and perseverance that this experience will also be their most memorable.

The project that the four QUEST seniors are most interested in involves a new corporate partner for QUEST—
Banana Computer. This company has distinguished themselves as a leader in design and innovation. Many undergraduates at the University of Maryland find themselves buying a Banana laptop when their old computer breaks. While the perception of this company is in high regard among our soon-to-be teammates, the opportunity for improvement is real: reduce the time it takes for a computer to leave its manufacturing plant in China to a store or a customer in the U.S. Right now, the process takes, on average, two weeks. Can the team do better?

7.2 September: Laying a Foundation

The good news for our four team members comes in an email on September 1st. They have been selected by the QUEST leadership to become a team and work with Banana Computer. Although all four team members have been in QUEST and know each other, they have never worked on a team before. Therefore, they start with the concepts in Chapter 2 with specific emphasis on laying out a team charter as covered in section 2.3. The team decides to call itself “Fast Logistics Consulting” or FLC.

After the team charter, the team decides to start learning about their client and the scope of their project. They start by understanding a brief history of Banana Computer and their operations in China. They find out that the company has been hailed as a leader in offshore production and its fast production cycle has allowed them to be innovative. Next they start learning about the “lead time” for any company. For this project, this metric is very key to helping Banana computer. While they don’t yet know how well or poorly Banana is in this metric, the team uncovers different reasons why lead time may be important. They also learn about the sources of problems that may lead to longer lead times. Emily remembers using the Fishbone Diagram in Section 3.2 of this book and thinks it might be a good idea to draw one of those dia-
grams for Banana. She makes a note to ask their project champion about this on the phone.

After a few days of research, the team reaches out to their point of contact at Banana computer. In QUEST this is called the “project champion” since it is the main point of contact within the client and will help arrange for other connections within the company. In other words, this person is a champion for the team within the client. For FLC, their project champion is named Kim and she is responsible for overseeing the process of placing production orders with Banana’s China plant and receiving them from their transportation provider.

FLC is pleased to “meet” Kim on the phone for the first time just a week after their first team meeting. The team has lots of questions for Kim that range from their logistics practices to the corporate culture. Kim has lots of data that she shares with the team about their metrics. FLC is in luck because their project champion seems to know everything that FLC asks. Even better, Kim is impressed with FLC’s questions and even says, “Are you sure you just started on this project a few days ago? It seems like your team has spent years in the logistics industry.” Well the team couldn’t be more pleased with itself. After an hour, the phone call wraps up, the team gives each other high fives, and then Sahil asks, “Was anyone taking notes?” The team looks at each other and realizes that they didn’t. There is no way that they remember everything they just heard. What should they do?

After a few minutes of discussion, the realization that they did not start off on the best foot with their client sinks in. Fortunately, they decide on a course of action consistent with the recommendations in Section 6.2. They decide that Saul will be the main point of contact with Kim. Since he will be facilitating discussion via email and on the phone, Brian then takes the responsibility of taking notes during team meetings—at least for now. FLC spends about an hour trying to recreate all the great information conveyed to them by Kim and sends her an email asking her to fill in the numbers that they missed. The team
admits to Kim that they were not taking notes and would like her to fill in the missing data points. FLC also explains to Kim how the team duties will be divided. Kim emails back to Saul a quick reply that simply says, “Sure. No problem.” Crisis averted.

Over the next couple of weeks, FLC works with Kim on better defining the scope of the project and a reasonable action plan. The team lists the class’s intermediate and final deliverables. Kim also describes how the team should best communicate with her: twice-a-week emails from Saul and a 30 minute conference call with the whole team on Tuesdays at 5pm. The first email will be sent on Monday by 5pm (by Saul) and will include an agenda for the next day’s conference call. The second email will be send by 5pm on Fridays and will contain any drafts of work product from FLC.

The iteration of the scope with Kim is invaluable to the team since they find out that they are not trying to reduce lead time, but reduce the lead time variability. In other words, they were focusing on the wrong objective. Now that they have the right objective, their faculty advisor is able to point them to several studies in the academic literature that show potential sources of lead time variability such as raw material production cycles and commodity price volatility. As team FLC gets deeper into understanding Banana’s facility in China, they realize that material is being sourced from India as well as from within China. Does the India-to-China portion of the supply chain fall within or outside of the scope of this project. Brian recalls reading about scope creep in Section 6.1 of this book and knows that they need to address this issue before October arrives. Fortunately, FLC convinces Kim that this is really outside the scope of the project since Banana Computer only has indirect control over Banana China’s Indian supplier.

The team is able to look back on September fondly and see their progress. They have a cohesive team. They have established trust with their client. They have learned a great deal about international (well, importing from China
at least) logistics. Perhaps most importantly, they have project scope that is acceptable to them and to their client. Fantastic! The team then realizes that they haven’t actually done any work yet.

7.3 October: Research

The team is excited about visiting Kim in Banana’s distribution facility in Baltimore. It is here that the orders are placed to China and it is here that the products are received. The team is sure to dress in business casual attire (see Section 1.4) based on the recommendations of Kim during their last phone call. As they are about to depart, Brian notes that Sahil is wearing flip-flops and that’s won’t do. While flip-flops may be business casual to some, they are going somewhere where closed-toed shoes are a requirement. They drive their car by Sahil’s apartment where a quick change occurs and the crisis is averted.

They show up at Banana, show their IDs to the security guard, and meet Kim in the lobby. Within a few minutes after handing in their signed copies of the non-disclosure agreement, they are on the loading dock looking at the trucks with pallets full of Banana’s products that were produced in China just two weeks prior. Seeing this in person starts to make the project seem real. Could their team really improve this impressive operation? What can four seniors do? Would anyone listen to them? Just then, Kim says to the team that she is glad they saw this shipment come in because this is what it should look like. What they don’t see if the product that Kim placed four weeks ago and has still not yet arrived. Kim’s counterpart in China assures her that the products are manufactured and sent in the order. In other words, the shipment should be there and it isn’t the China facility’s fault. They think the problem may lie in the shipping company that Banana uses. To save money, Banana uses a company that will find empty space on container ships at the last minute similar to flying standby on an airplane. There is usually room
CHAPTER 7. AN EXAMPLE

for one more, but sometimes you miss a flight.

The team starts making a list of people that it should talk to find out more about the possible sources of data. Emily reminds the team that they should start with a Fishbone Diagram and may even be able to recreate a Pareto Chart (see 3.3) for the past few months of shipping. Kim thinks that this is a good idea only if the team will explore the system systemically—in other words, if they explore the sources of problems even if they reside outside of Banana’s control. The team is reluctant about this at first because it may constitute scope creep, but they decide that this is the best way to go. Kim agree to make an email introduction to her contact at Banana’s shipping company. After a good visit with Banana, the team sits down with Kim, recaps what they have learned and describes the next steps. Each next step is assigned to someone within their team or with Kim. Everyone agrees that this will be the QUEST “Project of the Year!”

Then they get back to campus and things get busy. No one is at fault, really, but all that momentum from the site visit quickly wears off. The team realizes that they have ignored their other classes to prepare for the trip to Banana. In fact, two team members (who shall remain nameless) skipped a couple of classes to attend the trip. Now their are paying for their absence. The team skips some meetings and Saul even forgets to send his Friday email to Kim. On Monday morning, the whole team (not just Saul) receives an email from Kim. There is just one line in the email: “Is anyone there?” Man. It takes so long to build up client trust and it goes away so quickly.

The team decides that this won’t happen again. If some members of the team become too busy then they must re-distribute the workload to others. The crisis is adverted, but this project seems to be getting harder. While some data is coming in (Emily and Brian had a good phone call with Kim’s shipping contact), they realize that they may actually know less now than they did at the end of September. Back then, they thought they could just ask a few questions to the right people and the solutions will
become clear. Now they realize that this project isn’t as easy as it seemed. There seem to be many people responsible for getting Banana Computer’s product from China to Baltimore. The Chinese government may delay or even prevent the products from leaving China. The U.S. government may delay or prevent the products from entering the U.S. The shipping company has (it claims) no control over the government. Has the team’s project just evaporated?

7.4 November: Analysis

The team gets a break the next week and it couldn’t have come at a better time. Just when they think that hard work hasn’t been paying off, Kim calls and lets the team know that the data they have been asking for has finally “come in.” She doesn’t say from where, but the team is excited that after all these discussions about lead time variability, there might actually be some measures of lead time variability.

It takes Emily and Saul a full week to go through the data and make any sense of it. The data was sent in a database format that no team member knew. Smartly, Emily and Saul found some classmates who are not in QUEST but knew about databases. They were able to export the data into Excel—a format they are much more comfortable in—and start digging in. Within a week, Saul was sending Kim data that showed lead time variability for all sorts of Banana Computer products over the past two years. Kim is impressed and even suggests that the team come in a brief some of her colleagues. It dawns on the team that all this time they have been assuming that Banana Computer already quantified the magnitude of this problem, but they never did. All they had was a perceived notion that lead time notion that lead time variability was a problem. This was the “hidden assumption” that their team had (see Section 3.7).

The team’s progress that had been incremental to this point, is not going forward in leaps and bounds. The team
first decides to look at three possible solutions to reduce lead time variability: 1) manage their transportation channel directly instead of contracting to a carrier; 2) change their production schedule to improve product throughput; and 3) invest in package tracking technology that will allow Banana to know where their product is at all times. These possible recommendations were uncovered by the team almost a month ago as alternatives. The team decides to do a cost-benefit study among these alternatives (see Section 3.4). They do this by dividing responsibilities into two teams: Emily and Saul will work on the costs of these three alternatives while Brian and Sahil work on the benefits. They inform Kim of their proposed course of action and she agrees this is a good strategy.

When the data comes in from the sub-team, it looks like package tracking technology may be the best alternative. The cost of the first alternative is too high. The benefit from the second alternative is too low. The third alternative—package tracking—offers the best combination. The team spends four hours putting together their preliminary recommendation slides. Thanksgiving is just 10 days away and the team would like to enjoy their break knowing that they only have to polish their slides and practice their presentation. The presentation to class goes well. Some of the team’s classmates even congratulate them on their progress. They email Kim their slides and feel like they can relax for a few days the first time since the semester started. Seeing their families and watching football without spending all night in the QUEST Lab would be very welcome.

The day before Thanksgiving, Kim calls Saul on his cell phone. The analysis in their slides is wrong. The team did the cost-benefit analysis inconsistently across the three alternatives. It all had to be changed. Why hadn’t anyone caught this error within the team? Why hadn’t their instructors noticed? Fortunately, Saul uses his good client management skills to put Kim at ease. Saul also keeps his cool when he crafts an email to his team that simply says, “Kim called me on my cell today. She found
7.5. December: Making Recommendations

The team is able to reconvene after break and address all of the issues Kim found. Some of their cost numbers were monthly while others were annual. Basically, the team was comparing apples-and-oranges. As they spent more time with the data and used their fresh perspective on the analysis, they even uncovered some errors Kim had not found. They shared their improved analysis and more accurate data with Kim. The team smartly decided to point out the corrections to the errors Kim uncovered, and they also shared with her the other mistakes they made.

The team practices their presentation with the new data (it didn’t change their recommendations, fortunately). Each time they practice, they get better and better. Their confidence is so high that even when Kim asks the team to consider a fourth alternative with only a week to go, the team doesn’t panic. They remind Kim about the scope of their project only looking at three alternatives and those three alternatives were mutually agreed upon by the client in the consulting team by December 1st. It was now days after that deadline and yet Kim still wanted them to do this. The team chuckled a bit as they considered this because they thought that a real consulting team could ask for a significant sum of money to do something outside the scope of the project at such a late date. Eventually, the team realized that the work to examine the fourth alternative was mostly done anyway so they modified their presentation and put it in.

At the final presentation at the QUEST Senior Conference, the team was very pleased with how things had turned out. The team members’ parents were there beaming with pride. Kim was there with a couple of her col-
leagues and they were gushing about how well the team did. One of the executives from Banana Computer even asked the team if they would consider a job with them. Since the team was so busy with this project, many of them had not put their full efforts into a job search so this was welcome news. The team coordinated with Kim about the visit to Banana Computer the following week for their client presentation. After what the team did tonight, presenting to the client would be easy.

Before she left, Kim said something interesting to the team. “You know,” she said, “there is something interesting about this project. Ever since you questioned our logistics provider back in October, we haven’t had any variability in our lead times.” Had the team fixed the problem back in October without even knowing it? They may never know.
Chapter 8

Conclusion

While this book is intended to help people learn how to put more quality into their actions, the truth is that there is no substitute for learning through action learning. The authors of this book wanted to write down what they have taught and what they have learned in the QUEST Honors Program at the University of Maryland. While these concepts and ideas were presented in a typical classroom setting, the value of these concepts and ideas have only taken hold through action learning. This means getting outside the classroom and into the real world. We encourage you, the reader, to get outside your comfort zone and put these concepts and ideas in practice. You might not succeed at first, but you will learn. The more you learn the better you will be come at putting more quality into everything you do. Quality matters.
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