Using MBTI in a Project-Based Systems Analysis and Design Course

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ABSTRACT

Most Systems Analysis courses are approached from a logical, detail-oriented perspective. While this may be consistent with the personality style of the majority of IT managers, customer and employee personality styles may be vastly different - leading to communication issues and resulting in failed projects. Introducing the Myers-Briggs Type Indicator (MBTI) to students in a Systems Analysis course results in fundamentally improved communication as well as an increased likelihood of success in the workforce. This paper describes the motivations for including such a topic in a Systems Analysis course and provides an experience report based on the implementation of a such a course using MBTI as a teaching tool.

Keywords: MBTI, Team Development, Systems Analysis, Interpersonal Perception

1. INTRODUCTION

There are a set of unwritten rules in Systems Analysis. The first two are especially important. Rule 1: Never forget who your customer is and what they want. And, Rule 2: Never forget Rule 1! The former is easy to say, but, in practice, very difficult to do. Why? In our experience as practitioners, typical customers do not know what they want. It is in their head, but not on paper. Moreover, they figure it out as the project progresses. And, the problem is compounded by the fact that people quite often do not fully understand each other. I.e., Why don't you say what you mean? Or, why don't you mean what you're saying? This problem is simple and simultaneously subtle and complex.

It is well known that the large majority of Information Technology projects fail - in one way or another. Statistics, derived from a recent Dynamic Markets Limited survey [10], show: 62% fail to meet their schedules, 49% suffered budget overruns and 25% were cancelled outright. In the 75% that were not cancelled, 80% of their budgets were consumed in fixing self-inflicted problems.

In an article entitled Why Software Fails [3], Robert Charette enumerates twelve reasons why software projects fail. Of these twelve, nearly half are directly related to poor communication between the customer, project manager, programmers, and other stakeholders. Similarly, in a recent post, ZDNet's Michael Krigsman observed:

> Many IT failures ultimately arise from so-called gaps, or misalignments, between business and technical groups inside an organization. When business and technical folks don't communicate sufficiently well, problems surface and can turn into failed projects. [7]

The root problem here is that people do not understand each other. We perceive the world in different ways and thus draw different conclusions from the same "reality." Although we may think that we are communicating our expectations, in reality we often are not. Moreover, a person who is a successful communicator is able to see the world as the other person sees it.

In recent years, there has been an emphasis in business on the so-called soft skills [12]. Hard skills are associated with knowing and using technology, and with experience, using that technology. On the other hand, soft skills include things such as the ability to lead, motivate, negotiate and solve problems [5]. More and more often, hard skills are assumed. They are what get your resume to the decision maker. On the other hand, soft skills are what get you the job [9]. Soft skills require and assume an ability to communicate effectively.

The well-known Myers-Briggs Type Indicator (MBTI), and the appropriate interpretation of its results, are a useful tool in learning how to communicate. It is used worldwide in team development and to improve job performance [2, 4]. In this paper we will present an overview of MBTI and a Systems Analysis and Design course that makes use of MBTI concepts.

2. MYER BRIGGS TYPE INDICATOR

Psychologist Carl Gustav Jung believed that people perceive the world in predictable ways. Thus it should be possible to categorize these perceptions. Moreover, it should be possible to characterize people's behavior based upon their perception of the world [6]. That is, perceptions affect how people communicate and arrive at conclusions. The mother-daughter team of Katherine Briggs and Isabel Myers, built upon Jung's ideas, and developed the MBTI.

MBTI is based upon four dichotomous traits. They are Extraversion (E) versus Introversion (I), Sensing (S) versus Intuition (N), Thinking (T) versus Feeling (F) and Judging (J) versus Perceiving (P).

- Extraverts get their energy by interacting with lots of other people. Introverts get their energy from quiet time alone.
- Sensors care about details and reality - the here and now. Intuitives care about concepts and ideas - the future and what can be.
- Thinkers prefer to make their decisions based upon logic. Alternatively, Feelers prefer to make their decisions based upon their feelings and those of the people around them.
- People who prefer closure tend to be of the Judging style. Perceivers usually prefer to wait for enough data until they reach a decision.

It is possible to observe these dichotomies in action. Extraverts love to think aloud. Extraverts often use a kind of "verbal sorting" to form their ideas. They may dominate a conversation or a meeting. Introverts prefer to think quietly before speaking. Thus, in the presence of a person with a strong preference for Extraversion, it may be difficult for an Introvert to get a word in edgewise. Similarly, Perceivers may frustrate those who prefer the Judging style. Their need for sufficient evidence before reaching a conclusion may be seen as procrastination or resistance.

The four dichotomies yield 16 psychological types. That is ISTJ, ISTP, ..., ENTJ. You may refer to the TypeLogic.com website for a description and functional analysis of each type. Incidentally, we and our students have found that, almost always, these descriptions are exactly right. And, as a side note, Intuitives tend to value this kind of analysis, while Sensors tend to believe that there are an insufficient number of types. It is important to note that there is no value associated with any of the 16 types. They are all equally valid and valuable.

Analyzing interpersonal communication using combinations of the traits can be particularly useful during the various project management phases: planning, analysis, design and implementation. The style combinations are: NF, NT, SJ, SP. Specifically:

- NF: makes decisions by participation, but plays favorites
- NT: is good at planning change, but is skeptical and may escalate standards
- SJ: is patient and reliable, but may decide issues too quickly
- SP: is open and flexible, but may ignore the consequences of past problems

Why is this important? Tendencies of these sub-types amplify strengths which can also then be weaknesses. Moreover, if one is aware of these tendencies, it is possible to adapt and utilize the strengths while avoiding the weaknesses. Moreover, if one ignores these differences, it can lead to an unfortunate lack of communication and gross misunderstanding and failed projects.

Before coming to academe, one of the authors spent over two decades in industry at EAS, GE, IBM and NYNEX. Here is an example of how understanding the differences between two of these style combinations led to an overnight change in understanding and appreciation. The dialog in question was between an SJ type and an NT type. During meetings about the project they were both working on, the NT would describe the big picture and how the project was building a conceptual framework for similar projects in the future. On the other hand, the SJ focused on what had been accomplished this week and how specific progress was being made toward the project's next deadline. The SJ quickly decided that the NT had done nothing substantive and should be off the project. In the NT's mind, the SJ had no idea how different and difficult the project was - and should be off the project.

Then, the SJ's wife asked him to take a MBTI workshop with her. During the workshop, the SJ learned that his style combination was Sensing-Judging (SJ). Moreover he learned that he focused on facts, details, today's problems and sometimes made judgments too quickly. In addition, he learned that there are people, like his coworker, whose focus is not only solving the current problems, but also understanding the overarching meta system - so that these problems might be avoided next time around. For the SJ, a crucial part of the workshop was learning how different types communicate. That comprises, how persons view the world, their motivation and what kinds of words are used to exchanging information. Thus, as a result of the workshop, the SJ learned how to ask the NT about the details of the project. The result: "The schedule? Of course we're on schedule. In fact, we've solved a few problems that will bring the project in ahead of the due date. And, in addition, we found several problems with other groups' software." In the SJ's opinion, the NT became a genius overnight!

Although forms of the MBTI preference indicator are available on line, interpretation of the results is another matter. Like anything else, it takes time, training and experience to do MBTI results interpretation well. And, interpreting the outcome of the preference indicator is what actually results in accurately determining a person's type and thus allowing them to better understand how to communicate. This task should not be taken lightly and should be done by someone who has the minimum qualification: MBTI Certification.

There are two options available to the typical university professor: find someone on campus who is already certified or become certified yourself. The Psychology department, Human Resources and Career Development are good places to look for those with certification. In addition, the Center for Applications of Psychological Type (CAPT) runs certification workshops several times each year. Their website (www.capt.org) contains a wealth of information about MBTI, Isabel Myers, and using type to facilitate communication.

While some of us are concept-oriented, and speak about what can be, others of us focus on details, facts and the "here and now" of life. For example, when a concept person describes a system, they will often start with the big picture and work down to the details (top-down). On the other hand, the detail-oriented person will start from the details and work up to the big picture (bottom-up). What happens is the detail-oriented person, if there is too much emphasis on concept, will not see the leaves (or trees) because there is too much emphasis on the forest. Sticking with the same metaphor, the concept-oriented person,

however, will drown in the details, unable to see the forest (or trees) for the leaves. What is needed, then, is an awareness and appreciation of the strengths of the different types. Such an appreciation allows those people to learn the different approaches they need to effectively communicate with each other.

Smith's research shows people who chose a career in technology tend to be SJs and NTs. Moreover, Smith has shown that the majority of those who work in technology tend to be people for whom a logical approach is preferred. These groups are STJs and NTJs. For example, Smith's data showed that 21% of the general population are STJs, compared to 64.8% for technologists [11]. (Incidentally, CAPT's research indicates that between 22% and 28% of the general population are STJs.) It is reasonably obvious that the technologists' preferences are significantly different from the population as a whole. In part, this may explain why some people "get computers" and many others do not.

Customers' type preferences are much more evenly distributed between the 16 MBTI types and the four style combinations. As has been pointed out previously, one cannot assume that those of different types will communicate effectively. As a result, technical conventions, acronyms and specific information (data rates, storage space, languages, etc.) which may seem to be completely understandable to the majority of technologists, may be gibberish to the customers. This is not a good thing.

3. COURSE MODELS

Traditional Courses
In an effort to see how often MBTI is used in Systems Analysis and Design courses, the authors searched for syllabi and course descriptions using the Internet. Our search was by no means exhaustive, however we stopped looking after we found 30 such courses. While Systems Analysis and Design courses are those most often found in Information Technology curricula, Needs Assessment and Requirements Analysis courses also appeared in a few school's list of courses.

In all cases, what we found as course content was the traditional set of concepts and tools one would expect to encounter in a Systems Analysis course. These concepts include: the Systems Development Life Cycle - in its various forms and methodologies, requirements definition, project estimation and management, design and debug, UML, Data Flow Diagrams and so on. As you might imagine, oral, visual and written communication is emphasized and team projects are a focus of these courses. And, interaction between team members, and the assessment of an individual's contribution to the total team effort, is a part of many courses. What appears to be different in our course is the use of MBTI and its analysis to better understand communication styles and preferences - and how that can affect someone else's understanding. Thus, it appears that our approach to teaching Systems Analysis and Design is moderately unique.

Extreme Programming is a methodology taught in both Systems Analysis and Software Engineering courses. In our opinion, Extreme Programming (XP) is an attempt to deal with some of the communication issues. In the forward of Extreme Programming Explained [1], Erich Gamma says that the primary distinguishing feature of XP is "...its early, concrete, and continuing feedback from short cycles." Essentially, keep in constant touch with the customer and be sure that the system under development is what the customer wants. However, XP does not work well for all projects. It seems that - when the scope of the project exceeds a certain size, the methodology stops working as well. Understanding how to facilitate communication between people whose MBTI preferences differ may well extend XP to larger scale projects.

Our Course Model
The Systems Analysis and Design course at Plymouth State University is taken by our Information Technology Juniors. It is a semester-length, three-credit course. The course uses a standard Systems Analysis text and features articles from IT trade journals and blogs. Students engage in a significant group-oriented project that starts just before mid-semester and ends with a post mortem presentation during finals week. The topics covered in the course are those found in most other Systems Analysis courses, as described above, with the notable addition of MBTI-based activities.

Students take the MBTI Preference Indicator at the beginning of the semester. After Dr. Drexel interprets the individual results, students are given an opportunity to determine if they agree that the description of their type fits who them and their perceptions of the world. Short descriptions of each of the 16 types are provided by CAPT.

One of the dichotomies might change if their preference is not strong (e.g., P vs. J). They may then choose the type with the other letter (e.g., INTP vs. INTJ). Incidentally, it is almost never the case that two or more dichotomies switch. Students complete the exercise by writing a short paper based upon further research using CAPT and other pre-specified websites. It is almost always the case that their research will definitely confirm their previous decision about type.

Once type is established for all students, the professor and the students engage in activities that illustrate the difference in type perceptions. For example, in one exercise, the Ns and Ss are separated into two groups. (The class experiences the differences inherent in the other dichotomies with similar kinds of group exercises.) Each group is then given a ceramic cup, asked to look at their cup carefully and make notes about what they see. The two cups are reasonably identical. Then, the groups are told that they have ten minutes to make a list of these notes, that will be shared with the other group. At this point, the groups move into two separate spaces, so that they cannot hear each other. When the groups come back together, they each present their list with the rest of the class.

One might think that the groups' lists would be quite similar. But, almost always, they aren't. The groups may start out with the same items: size, shape, color, age, etc. However, after that the lists diverge. The Ss will list their best guess - or measurement to the 64th of an inch - of the height and diameter of a round cup. They will include a list of any cracks or flaws in the cup. They may try to guess the age of the cup to within a year or two of its manufacture. In other words, they list as many details about the object as possible. On the other hand, the Ns will describe how the cup reminds them of the hot cocoa they had at Grandma's during the holidays. They will talk about how they miss their folks. They may describe how they once

had a set of cups like that at their summer cottage. In other words, their list consists of concepts and what might be, rather than what is right in front of them. The bottom line is: the same stimulus generated two rather different responses. And, the lesson for them is, you and your customers may also have two very different responses to the same information.

The activities just described are used to demonstrate the validity of the MBTI typing concept. Students are also shown how different type combinations can communicate more effectively by using the appropriate way of presenting the information. The S vs. N war story described earlier is used as a convincing example. In-class work and homework assignments are used to strengthen students' grasp of this material. Moreover, an exercise entitled Determine Your Dominant is used to show the differences between how Introverts and Extraverts exhibit their strengths. Then, team-building exercises are used to show how a mix of different types can strengthen a team, while teams with a narrow range of types can exhibit blind spots - an inability to discern or anticipate problems. However, the specific details of these activities are beyond the scope of this paper.

Given that this class is a sort of training-ground for the students, nothing is lost in "playing" with how they communicate with each other and with their professor. Students are encouraged to pay attention to how they relate information to those of different type. And, the authors found that real-life examples of successes and failures tend to strengthen the students' understanding of the MBTI concepts and in trusting that MBTI concepts can enhance communication between different types. For example, throughout the remainder of the semester, type concepts, perspectives, strengths and weaknesses are incorporated into real-life examples found in the literature, on the web and from the authors' industry experience. Students especially enjoy hearing about the "good old days" and how similar these experiences are to the IT cult film "Office Space." It is another useful tool in reinforcing the ideas they've heard about in class.

The Systems Analysis course at Plymouth State was taught for several years before the Myers-Briggs ideas were introduced. At that time, the course was the writing-intensive course in the Information Technology major. As a result, a significant amount of time was spent on enhancing students' writing skills and in allowing students to critique each other's writing. This left little time to cover anything but the major Systems Analysis topics. Some years later, our CyberEthics course became the writing course. This made more time available for the MBTI concepts and activities.

Our major goal in this course is to help prepare students for successfully entering the workforce. Thus, we are looking long term. As a result, the effects of using MBTI in the Systems Analysis course will be difficult to measure. However, as we are collecting data from our alumni about their experience at PSU, we may be able to quantify this part of their experience. Currently, anecdotal evidence does indicate that the MBTI communication work does help students in their careers. Students have come back to us, a year or two after graduation, and have said that the Systems Analysis course has helped them significantly in doing their job. That includes comments about working with their customers. Moreover, they often comment that they wish they had paid more attention to what was covered in the course, because now they use it every day.

From our teaching experience, empirical evidence indicates that using MBTI in the Systems Analysis course produces positive results in the short term. That is students seem more interested in working on real-life projects. Students have a choice between using canned projects - that are provided with the textbook. Or, they may find their own project. These projects are for entities within the campus - either for academic departments or for Information Technology Services - and may also be for entities outside the campus: businesses and non-profits. Although their grades don't show it, they were not very involved in what they were doing before we began using MBTI. In the past, 69% of the students chose the canned projects. Even though the external projects were much more meaningful, these canned projects seemed easier for them to complete. After MBTI, 76% of the student teams were confident enough to find and often successfully complete a project for an external entity. Canned projects are now unusual, where they were the norm in previous years. Moreover, the course survey that students completed at the end of the course contained many positive comments about their project experiences. Out of 70 students enrolled in the course from 2004 to 2009, 30 of them included written feedback with the course evaluation form. Of those 30, 28 (93%) included the MBTI components of the course in their list of what they liked best about the course.

Others have focused on using MBTI to enhance IT/CS team effectiveness [8]. Moreover, as discussed in Section 2, IT/CS teams are typically not that diverse to begin with. Thus, unless diversity will add needed perspective, diversity may actually slow the team down, and reduce their effectiveness in the short term [4]. The PSU Systems Analysis students are allowed to choose their own teammates for the course's major project. We have noticed two things. In some cases, the team leader of some teams actively recruits students of different type so as to bolster the strength of the team. For example, a group of Ss will recruit an N to work with them. These blended teams tend to be stronger. In other cases, birds of a feather - students with the same preference - tend to work together. For example, all the Fs will decide to work together. These tend to be the weaker teams. However, we are more interested in students learning how to communicate with their customers, as well as with each other. In other words, the problem may not be as a lack of understanding amongst IT/CS team members, it is more likely to be a lack of understanding between the team and those they are working for.

4. FUTURE WORK

Our future work will include building more assessment of communication effectiveness amongst dissimilar types. The purpose of this would be to simulate interaction between IT personnel and their customers. We can envision exercises wherein NFs would work with SJs. Clearly, priorities and communication modes would be very different here. (In our experience, while most IT/CS students are SJs or NTs, it is not unusual to find one or two NF students in a typical Systems Analysis class.) Obviously, students get to know each other through interaction over their years at PSU. Role playing may afford a way to allow the students to "stay in character" and thus present both sides an opportunity to use the communication skills they were taught. An even better approach would be for students to use the MBTI skills they've learned to work with their major project's customer. A means to ascertain their customer's type was described by Cunningham [4].

In addition, we anticipate using the MBTI communication concepts in the Software Engineering course for our Computer Science major. In this case, one of the authors, Dr. Roberson, is responsible for the course as a whole. The other author, Dr. Drexel, would serve as the MBTI consultant. We intend to follow a similar model of MBTI typing early on, with exercises used to demonstrate type differences. Moreover, the style combination exercises will also be used in the Software Engineering course. The goals for MBTI in this course are also team building and effective communication with the customer. Data gathered in the Software Engineering course can then also be used to modify and enhance our approach to using the MBTI concepts.

Part of the existing assessment process in both the Software Engineering and the Systems Analysis courses is a measurement of "how well" team members worked with each other. Students who contribute equally to a teams goal share the same grade. However, in the case where one student seems to "do all the work," that student's grade is improved while that of the other students suffers.

We want to determine how MBTI changed the students' approach to communicating with their peers. Because students have typically known each other for years, and have worked with each other before, learning how to more-effectively communicate may not improve the performance of an individual or the team. They have learned how adapt in order to be reasonably well understood. What might be feasible is to recruit students from other majors - non-technical people - to act as customers. In that case, it should be easier to characterize how effective a team is in understanding what their customer wants. Moreover, in such a situation, diversity should facilitate communication. Again, this is left for future work.

5. CONCLUSIONS

In this paper we explore the inclusion of a unit on the Myers Briggs Type Indicator in a Systems Analysis and Design course. Many IT projects fail. There is strong evidence that there is a connection between potential IT project failure and poor communication. To help solve this problem, we developed a course that integrates MBTI and stresses the development of communication and team-building skills throughout the semester. These soft skills, while extremely valuable to have, are not typically included in the curriculum of most Systems Analysis courses. Both term-project results and evaluation data collected during the course show that using MBTI has improved the quality of the work produced by the students and has facilitated a greater interest in learning systems analysis and design concepts. Our future work will include integration of MBTI into the Software Engineering course and direct assessment of MBTI's effect on communication between teams and their customers.

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