Project Teams: Cognitive Style

MIS Project Teams: An Investigation of Cognitive Style Implications

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Abstract

A profusion of technology is insufficient to implement effective computer systems without the full utilization of human resources to develop such systems. The issue of fully developing and utilizing available human resources is currently receiving careful scrutiny in the MIS literature.

One methodology for fully utilizing human resources has been by stressing team effort. This research focuses on evaluating the systems development activities of two MIS project teams. Empirical evidence was gathered from interviews with MIS personnel and key users concerning strengths/weaknesses of the two project teams. Analysis was performed to determine the personality characteristics (as measured by the Myers-Briggs Type Indicator) of the MIS staff.

The results of this analysis indicated a void of certain personality styles in project team one. This void correlated with weaknesses ascertained from the interview data for project team one. Project team two, with all four personality styles represented, was evaluated as very successful. Recommendations are made for assembling project teams based on these findings.

Keywords: Project teams, human resource management, MIS systems development, MIS systems design
ACM Categories: K.6.1, K.6.3.

The decade of the 80's has seen a profusion of new technology supporting a diverse array of computer-based activities. The MIS industry is discovering that technology will not ensure the success of their information systems [6, 8, 25, 32, 33]. In fact, with such technology available, the lag in productivity has become even more critical [1, 18, 38]. Technology alone is insufficient to implement effective systems without full utilization of the human resources who develop such technology. The biggest challenge facing MIS today is acquiring and developing the right human resources as MIS changes strategies, technology, and products. The issue of fully developing and utilizing available human resources is currently receiving careful scrutiny in the MIS literature [3, 4, 16, 17, 20].

One such method for fully utilizing human resources has been by stressing team effort [14, 19, 30, 31, 34]. Research in MIS has increasingly concentrated on the characteristics of the individuals represented on project teams [12, 15, 19, 22, 24, 28, 30] and on the success or failure of the systems created [14, 18, 23, 29, 34]. Very little research has concentrated on specific strategies for assembling project teams to develop successful systems.

This research endeavor focuses on developing a specific methodology for assembling MIS project teams. A base of relevant human information processing characteristics from behavioral and MIS research are developed. This base is used to guide the analysis of the human information processing characteristics exhibited by two MIS project teams and to determine the influence of these characteristics on successful decision solutions.

Review of the Literature

One of the primary themes running throughout the behavioral research is the basic difference in the way people perceive and evaluate information. A main contributor to the literature concerning these differences is the Swiss psychologist, C.G. Jung [13]. His theory is based on the assumption that much apparently random variation in human behavior is actually quite orderly and consistent. Jung identifies two bipolar
functions that deal specifically with the way an individual gathers and evaluates information.

The information-gathering function can either be "sensing" or "intuiting," as Jung labels these distinct differences. Sensing individuals utilize a structured approach to making decisions. An attempt is made to reduce the problem to a core set of underlying causal relationships and then to choose the optimal alternative. Intuiting individuals emphasize common sense, intuition, and unquantified feelings of future developments when selecting alternatives to solve problems. The intuiting approach is characterized by a trial-and-error method and the use of feedback to adjust the course of action chosen. They search the problem environment for analogies to formerly solved problems rather than for a system of underlying causal relations [7].

The other function identified by Jung concerns the way an individual evaluates the information once it is gathered. It can be evaluated in terms of the task or the humanistic aspect. Jung labels these differences in evaluating information as "thinking" and "feeling", respectively.

Jung combines these different orientations into four basic perceptual styles that individuals use to gather and evaluate information. Table I summarizes these styles and their identifying characteristics.

An instrument based on Jung's theory of personality typology, the Myers-Briggs Type Indicator (MBTI), has been used in almost 600 studies [26] and its use in business settings is extensive [5, 10, 11, 18, 21, 28, 35, 36]. Keen and Bronsema offer a thorough analysis of the MBTI and conclude that it offers an excellent solution for studying the differences between managers and analysts [15].

### Jungian styles and performance

Researchers have noted the variance in these styles in problem determination activities. De Waele [8] found that intuitors enjoy problem finding and sensors enjoy problem solving. He also found that feelers enjoy the implementation or execution stage more than thinkers. McKinney and Keen found significant differences among types in terms of preferred learning activities [21]. Myers said sensing types "need experience with the real thing before learning the verbal and mathematical symbols." Intuitors prefer learning independently and in a less structured environment. Feelers communicate skillfully and have an in-depth understanding of the content and underlying intent of verbal messages [27].

Mason and Mitroff [22] used the MBTI and further related the scales to information systems:
"Each of these styles has a different concept of information and this is important in MIS design. In information gathering, the Sensor speaks of "raw data," "hard facts," and "numbers," while the Intuitor wants to look at the total problem and determine future possibilities. If one evaluates information as a Thinker, information will be entirely symbolic, preferring it presented in tabular form devoid of almost any empirical content. The information evaluation of Feelers prefers information related to humanistic issues."

Kaiser and Bostrom [14] found an unsuccessful design team completely void of feeler types. A successful design team was identified as having 43% feelers. These findings imply that perceptual differences, or lack of, effect the success of project teams.

Case Study

To further investigate Kaiser and Bostrom's findings, a case study of two MIS project teams was conducted. The specific objective was to identify the individual Jungian styles represented on the project teams and to determine, through interview data, if the teams' performances differed.

The MBTI was administered to two project teams with ten MIS employees assembled on each team. Both teams had already completed various assigned projects. A summary of the styles exhibited by project team one and two is shown in Table 2. The table includes the numbers and percentages of team members representing each MBTI style. Only the middle two dimensions of the MBTI, those measuring the information-gathering and information-evaluating orientations, were utilized and reported.

<table>
<thead>
<tr>
<th></th>
<th>Project Team One</th>
<th>Project Team Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>7 (70)*</td>
<td>4 (40)</td>
</tr>
<tr>
<td>NT</td>
<td>3 (30)</td>
<td>2 (20)</td>
</tr>
<tr>
<td>SF</td>
<td>0 (0)</td>
<td>2 (20)</td>
</tr>
<tr>
<td>NF</td>
<td>0 (0)</td>
<td>2 (20)</td>
</tr>
</tbody>
</table>

*The numbers in parentheses indicate the percentage of the project team with the perceptual style.

Indepth interviews were conducted with project team members, other MIS personnel, and key users that were involved or affected by the project. These interviews (also referred to as focus interviews) were personal and one-to-one interviews where the interviewer used probing techniques in order to draw out, fully develop, and capture the ideas and reactions of the respondents [2, 9]. These interviews yielded vital information concerning the project teams' performances.

Project team one

Project team one was assigned responsibility for a computerized order-entry system. Work on this system continued for two years until it was discovered that the base design did not support an enhanced product line created during system development.

It was generally recognized that a planned product line would necessitate a revision of the existing product structure code, but it was considered a maintenance problem that could be dealt with after system implementation. It became a critical design factor when it was discovered that the code could not accurately describe the enhanced product line, nor could it be easily revised. At this point it was determined that much of the extremely technical programming modules were built around the existing code. The decision was made that it would be more cost effective to abandon the current order-entry system and to begin again.

An analysis of the interview data relating to project team one revealed a very technical orientation in their systems development activities. When users described project team one, the term "technicians" surfaced repeatedly. Users recognized their technical skills but did not always feel their abilities best served the organization. Such a conclusion is highlighted by the following comment:
"These people got caught up in technical detail and forgot their objective was to deliver a business system."

Although such a comment can be biased, it does point to an overall dissatisfaction with project team one's activities.

Such a quote as "These people talked lines per minute and I wanted to talk orders per day," not only supports previous comments, but also typifies much of the interview data indicating an overall communication gap between key users and participants on project team one.

**Project team two**

Project team two was also evaluated using the method previously described. The interview data revealed quite different results. Interviewees' evaluations of project team two centered around three main topics: communication skills, user satisfaction, and overall work accomplishments. Using these categories as a guide, project team two was rated as superior.

Effective communication skills surfaced as a component that distinguished this team. Documentation was mentioned as complete and comprehensible for the systems completed. A quote that attests to strong interpersonal skills was, "This is the first time I have worked with a project team that seemed to really hear what I had to say."

Users consistently expressed satisfaction, not only with the end products or systems produced, but also with the process used. One user said, "They let us really get involved in the design of this system."

The most outstanding work accomplishment credited to this project team was the successful redesign and implementation of the order-entry system. Obviously, efforts by project team one identified certain pitfalls to avoid in the design of the order-entry system, but product enhancement had increased the complexity of this system to the point that, in essence, project team two had the task of designing a new system. Further evaluation, by members of the MIS department as well as users, indicated other work accomplishments to be superior.

**Discussion**

The assessment of styles represented on project team one revealed a complete void of feeling individuals (SF and NF) represented on the project team. The two existing styles (NT and ST) prefer evaluating information as a thinker. The one-sided perceptual activities of a team with the same information-evaluating preference is addressed by Myers [27].

"If people are exactly the same type, they will understand each other very well but will not make the strongest team because they will be prone to commit the same mistakes."

While many factors may be considered contributors to the failure of any project, the results of this study indicate that the perceptual homogeneity of project team one cannot be overlooked as a component affecting not only the design of the failed system but other aspects of their work as well.

Project team two contained all four perceptual styles. Feelers, as a counterpart to thinkers, were present on this team to evaluate the information. In reviewing the interview data, the communication skills and humanistic orientation identified with feelers in previously cited studies seems to have been present in this team's activities. Perhaps Myers put it best when she said thinkers need feelers to forecast what others will feel and to understand the intent beyond spoken words [27].

These findings present preliminary evidence that feelers add a needed dimension to the work of project teams. While there may have been other contributing factors to the success of project team two, the results of this study strongly suggest that perceptual heterogeneity may lead to better team performance.

Because the two project teams involved in this investigation were very limited in size and extreme performance differences may be atypical, conclusions must be drawn with caution. However, this study does lend evidence that certain MIS activities are best supported when all four perceptual styles are combined on a project team. It also supports the findings of Kaiser and Bostrom that SF and NF types are essential for successful system design.
Implications for Implementation

Experience in consulting using the MBTI, combined with project team research such as the study described in this paper, have convinced this author that recognition of individual perceptual strengths will greatly assist the successful planning, design, and implementation of computer-based systems. Specific steps that have been used in consulting are outlined for possible MIS implementation:

1. Administer the Myers-Briggs Type Indicator to the MIS staff. Before such an undertaking, a briefing session should be held to outline the results of such a program and to assure employees that it is a positive employee development program.

2. Once the results have been compiled, share them with the employees. Since it is positive in nature (individual differences are neither good nor bad — only different), it helps employees as well as managers recognize their own strengths and weaknesses. When consulting, this author presents specific instances of group interaction that have been gleaned from interview data or observed when working with the staff, to highlight differences in perceptions. Such instances, always non-threatening in nature, assist employees in recognizing specific differences in the way work-related issues can be perceived by the various styles.

3. A careful evaluation of past team performances usually reveals consistent patterns associated with the perceptual styles represented by the staff. Once such patterns are identified, that knowledge can be used to develop a questionnaire to guide future team endeavors. In the firm studied in this paper a questionnaire was developed to address a spectrum of issues ranging from elementary data items (i.e. product codes) to complex resource and capacity analysis items. The questions addressed specific problem areas that were identified in past systems activities. The development of such a questionnaire must be an ongoing process reflecting previous experience.

4. An awareness of the strengths and weaknesses of the staff’s past activities and of any voids of styles could assist management in performing reviews. Standards can be developed to monitor those activities that appear most neglected or difficult for the present staff members.

5. One result of style differentiation is the attraction an individual of one style feels toward another individual exhibiting the same style. This finding is also supported by Kaiser [14]. The implication is that many MIS staff analyses will show a skewness of styles similar to the manager’s style. Such an awareness is valuable when hiring additional employees. Hire technically competent individuals, but individuals exhibiting different personality styles than the ones currently represented on the staff.

Summary

This research offers preliminary evidence that the perceptual nature of team members affects team performance. It suggests that the perceptual component of project teams is of a significant enough nature that it should be carefully assessed. Although further research is required to validate and broaden the scope of the proposed perceptual combinations, it deserves careful deliberation as one of the most viable and promising productivity tools available.

References


Paper No. 70-8, University of California at Los Angeles, 1970-71.


