

The Matrix: Reloaded For The Information Systems Classroom

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ABSTRACT

As the matrix organizational structure continues to be used in a variety of workplace environments, students can benefit from the experience of using the matrix in classroom assignments and projects. This structure encourages teamwork and familiarizes students with group dynamics through the utilization of participant skill strengths, leadership, and peer evaluation. The assignment of an office layout project in an information systems course recently provided the opportunity to employ matrix structure for work teams. Student perceptions of the matrix organization for work teams in respect to productivity and participation were positive, but suggestions for improvement were also provided.

INTRODUCTION

The matrix organizational method in business has been widely applied since a strong interest developed in the 1970s and 1980s (Sy & D'Annunzio, 2005). Indeed, literature documents the development and beginning uses of the matrix structure (Kolodny, 1979) to the much greater integration in firms worldwide (Bartlett & Ghoshal, 1993). "By its simplest definition, the matrix is a grid-like organizational structure that allows a company to address multiple business dimensions using multiple command structures" (Sy & D'Annunzio, 2005). This organizational type encourages the use of self-directed work teams, which utilize team member strengths, to independently undertake projects and tasks. Matrix work teams often have one or more leaders that emerge in the team, while a higher-ranking overall supervisor provides necessary supplementary guidance. This method attempts to promote performance through complementary worker strengths and through worker participation.

While being enacted in various corporate work situations, the matrix method of team organization may be introduced to students when classroom simulations are designed to resemble "real-world" workplace projects. In a matrix setup for a project, students are responsible for a variety of human resource tasks as well as undergoing group dynamics in the effort to achieve a successful project outcome. One such project in an information systems course detailed the outcome of the matrix system through the engagement of students to design a productive office environment.

This particular assignment in an information systems class was the design of an office layout. Particular emphasis in the assignment is given to work flow, communications, and technology issues. In order to provide as much reality as possible, an actual office location on campus was chosen for the students to redesign. "Exposing students to workplace conditions and expectations shapes their knowledge of and attitudes toward their future careers . . . (Quam, Smet, & Ivey, 1998). Students work on this project in groups of four or five.

One of two methods is traditionally used to form teams for classroom projects: the instructor assigns members or the students form their own groups. After several class sessions devoted to organizational structure and leadership, the instructor decided to

conduct an experiment using the matrix structure to designate the work teams for this project. The primary objective was to give the students experience in identifying requisite project skills, assigning members to the team, and evaluating student performance.

PROCEDURES

The instructor reviewed the components of the matrix organizational design, emphasizing that the process would be conducted in as realistic manner as possible. The team members reported to the instructor (their normal supervisor) and their team leaders (their matrix supervisor). The first step in the assignment was the formation of the work teams.

Team Leader Selection

The students participated in a brain storming exercise to select the attributes necessary for the team leaders in this project. As the students made suggestions, those qualities were entered into an electronic document and shown on the classroom screen. This file was made available on the campus network, and the instructor advised the students to examine it and be prepared to formulate a final version at the next class meeting. The final version (see Appendix A) included expertise in such areas as time management, delegation, organization, and time management.

All of the class members rated themselves on each item of the checklist. These completed forms were posted on the server, and the students emailed the instructor with their votes for their top five. This is, of course, a departure from the method used in business to choose team leaders; however, it seemed to be the best method to ensure impartiality and promote loyalty to the leader.

Team Member Selection

After instruction on the fundamental concepts of office layout, the students formulated a set of questions they wished to ask the occupants of the designated offices. As stated earlier, much attention was given to assuring efficient workflow and communications. Since all the students were information systems majors, the use of technology in the office was also crucial.

Again, a class session was used to identify the skills needed for each group to accomplish the task. The areas chosen for the final checklist included such skills as creativity, expertise in Visio (the software used to illustrate the layout), and responsibility. A document was developed (see Appendix B), and those not chosen as team leaders self-reported their level of expertise in the selected areas. From these forms, the team leaders met and divided the students into the five teams, attempting to ensure that each team was comprised of members with various skills and characteristics.

Process

The team leaders were given a great deal of autonomy during the project. They were to function as the true managers during this process. For example, they could “fire” any team member for just cause; and, if this occurred, that member was required to complete the project alone. The leaders were responsible for coordinating the entire process, including delegating tasks to the members and therefore utilizing the strengths for which they had been chosen. The team members were aware that they would be evaluating their respective leaders at the end of the project. The leaders would, in turn, evaluate each team member.

In another attempt to add realism, the students were still responsible to the instructor for other class assignments simultaneously with the office layout project. As has recently been affirmed regarding work teams on the job, various types of functional conflict can emerge while simultaneously answering to more than one supervisor in the workplace hierarchy (Xin & Pelled, 2003). Through this classroom experience, students experienced the simulated workplace setting of reporting and evaluation via organizational hierarchy and multitasking. In addition, the self-delegated office layout project teams had the opportunity to experience possible improvement of worker participation and productivity cited by sources from corporate experiences (Seung-Bum & Guy, 2004; Glassop, 2002).

FINDINGS

The students completed three quantitative evaluations at the end of the project. The team leaders rated their members on performance in their respective identified skill areas. Likewise, the members evaluated the leaders on their leadership performance. The team leaders also self-reported perceptions of their leadership success on the project.

In addition to the three previously described quantitative evaluations, one qualitative measure was employed. All students wrote comments on their opinions of using the matrix method in this project; these comments are subsequently transcribed in Appendix C.

Quantitative Measures

The three quantitative measures all used a 0 to 10 scale with 10 being the most positive.

Performance of Team Members

The team leaders were asked the question, “To what extent did the team members exhibit the attributes for which they were chosen?” Each team member received a separate rating, and the leaders were asked to defend the score given. These evaluations produced an average score of 8.97.

Performance of Team Leaders

Team members used the same form constructed for the original selection of the leaders to indicate the success of those leaders. An average score of 9.54 resulted. The leaders gave themselves a somewhat lower score of 8.25 when evaluating their own performance.

Qualitative Results

Overall, the students indicated positive experiences while using the matrix organization in this project. Affirmative remarks were given by 86.7 percent of the respondents. Of that number, 40 percent, while mostly complimentary, did give suggestions for improving the process. Only 13.3 percent had nothing positive to say about the procedures.

The positive comments centered mainly around the following: the balance and variety of skills in each team, the advantages over other methods, the ability of members to focus on their areas of strengths, the opportunity to work with people they didn't previously know well, and the impartiality in the selection of team members.

Those with only negative impressions cited the time required to complete the preliminary screening for leaders and members, the tendency for leaders to use favoritism in selecting members, and the likelihood of low self-assessment by students who didn't want to devote the time necessary to be a team leader.

Suggestions for improvements included forming the teams earlier in the semester, solving the difficulty in accurately assessing abilities, and providing coverage in all skill areas by including a sufficient number of team members. One student accurately pointed out that in the business world team leaders would have been appointed rather than elected. Selected student comments can be found in Appendix C.

CONCLUSIONS AND RECOMMENDATIONS

Using the matrix organizational structure can be successful in the classroom. The overall ratings from team leaders and members support the concept for student work teams.

If this method is chosen, the following recommendations are offered:

1. Care should be taken in the selection of the type of project. For example, specific required skills should be readily identifiable. The students commented that they would have included other areas of expertise if they had been more experienced in office layout.
2. The project should cover an appropriate period. The approximate three weeks devoted to this study did not provide sufficient opportunities for demonstrating and/or evaluating proficiency in the self-reported areas of strongest skill.
3. Perhaps teams should be composed of more than the four members in this type of study. The absence of expertise of all requisite skill areas in every group proved to be a problem.
4. As would be the case in business, the instructor might consider appointing the team leaders rather than having them elected by the members of the class. Though the process used seemed to result in the selection of students with strong leadership

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qualities, the margin of error could be greatly increased if the students were less than candid about their abilities. For example, students could intentionally rank themselves low to avoid the responsibility of being a leader.

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APPENDIX A

In the form below, on a scale of 0 – 10, rank your expertise in the indicated leadership attributes, with 0 being none and 10 being terrific.

Name:		
Information Systems 462 Team Leader Selection		
Attribute	Score	Comments
Creativity		
Delegation Skills		
Ability to be Open Minded		
Availability		
Organization		
Communication Skills		
Social Skills		
Respect from Team Members		
Responsibility		
Time Management Skills		

APPENDIX B

In the form below, on a scale of 0 – 10, rank your expertise in the indicated leadership attributes, with 0 being none and 10 being terrific.

Name:		
Information Systems 461 Team Member Selection Questionnaire		
Attribute	Score	Comments
Knowledge of Workflow Concepts		
Space Perception		
Wiring Problems/Networking		
Decorating Skills		
Presentation Skills		
Creating Presentation		
Making the Presentation		
Visio Skills		
Creativity		
Excel		
Willingness to Take Responsibility/Delegation		
Team Communication		

APPENDIX C

COMMENTS FROM PARTICIPANTS

Team Leaders

I enjoyed working with the matrix method. I feel that the selection questionnaires helped in selecting well-rounded teams. I saw the quantities that were described throughout the project. I feel that the matrix method would be a good method to use in future projects as long as students provide information that is accurate and come through during the project with proper utilization of the skills they promoted in the questionnaire.

I think the matrix method works very well. However, for a project this size, I think the teams were too big. There were times when I struggled to find something for everyone to do.

I thought that using the matrix method was pretty effective. It allowed all team leaders to have a balanced group as far as skills were concerned. The only suggestion I have for improvement is that the teams could have been chosen sooner.

The matrix system worked fine for this project. I don't think that it worked exactly the way we wanted it to, though. I believe that it was hard to find somebody for every need that we thought we would need. And on some attributes not one person scored themselves high on them. So it was slightly hard to pick.

I would rather have the teams chosen for me. It's like being picked for a sports team as a kid - you don't want to be the last one. You can make do with what you are given, but assessing abilities is tough with limited information. If people don't want to be picked as team leaders, they will assess themselves poorly.

Team Members

The matrix form was an excellent choice. I think all the groups got an even chance to do well considering the division of different skills in different areas.

This method of selecting allows you to see how really well you can work with others. If we had the choice to select team members, we probably would choose people we know or either the people we know that will do most of the work.

In my opinion, the matrix method did not work that well. It was too hard and too time consuming to get everyone to evaluate themselves, and if they were not interested in being a team leader they evaluated themselves poorly.

I believe that this system worked very well for my group. The leader delegated according to everyone's skills.

It enabled each group to have a qualified and willing team leader. Also there was, at least in our group, a good mix of team members. The matrix method is very useful when forming teams because of the diversity it provides. By using team members that are skilled in different areas, a group has a variety of individuals who can work efficiently on a project and provide unique ideas.

I have been on several teams in different classes, and I think that this works the best. I feel like I was finally on a team that could work well together.

I feel that the way the teams were picked was not fair because only the team members picked who was in their group. The class as a whole should have more input on the way the teams were selected. The way the leaders were picked was an excellent idea because the class voted on who they thought would be good leaders.

Honestly, I don't like the way the groups were chosen. I think that the professor should have picked the different groups so that favoritism would not have been shown towards people in the class that team leader liked. I do agree with the way the team leaders were chosen.