Organization and Management of Engineering Technology Units

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Abstract

In most schools, a department deals with a discipline and usually the various aspects of that discipline. This is also true for Engineering Technology. However; the department often doesn't stop at the various aspects of the discipline. It continues across boundaries to other fields of expertise, such as mechanical to electrical. The organization of this unit is often treated as a single department and is determined by the size of the student body and the number of faculty in each area. This type of unit is rarely seen in Engineering and involves management of various disciplines by people not experienced in those disciplines. This leads to many students and faculty not being well served within their area of study or expertise.

The disciplinary content of these units is discussed along with the types of managerial organizations being utilized. Pros and cons of the various organizational structures are discussed along with correspondence to program size. Finally, some comments will be offered to help alleviate some of these problems.

1. Introduction

Historically, Engineering Technology units have been organized by size to be either separate departments depending on the size of the program or it can be lumped together within a single department that is multi disciplined. Each of these types of organizations can have subsets of organization within the structure. The organization that each of these resides within also varies with the academic programs at an institution. A number of specific types of organizations will be discussed. The names of these types of organizations were created specifically for this paper and do not specifically correspond to any text representations. The pros and cons of each will be mentioned with respect to management of a discipline, upper and lower division degrees, management support (budgets, etc.), cross disciplinary cooperation and leadership within the discipline.

2. Discussion

"Type 1" ("Standard") Department Organization

The standard department will be considered to be a single discipline department within a College of ***** Technology. The department may be electrical or mechanical or civil, etc. engineering technology and headed by a credentialed person in that discipline. The department will receive its own budget, have its own technician and will lay claim to a series of rooms dedicated to that discipline. This department will have a department head who answers to the Dean of the College. The budget stands alone within the college's priorities as set in the Dean's office.

This department clearly represents the closest position to a department within an expected College of Engineering organization. The department head may be either a faculty member with administrative responsibilities or an administrator with faculty rank and position. If there are specializations within the department, then there may be a layer of coordinators within the department structure.

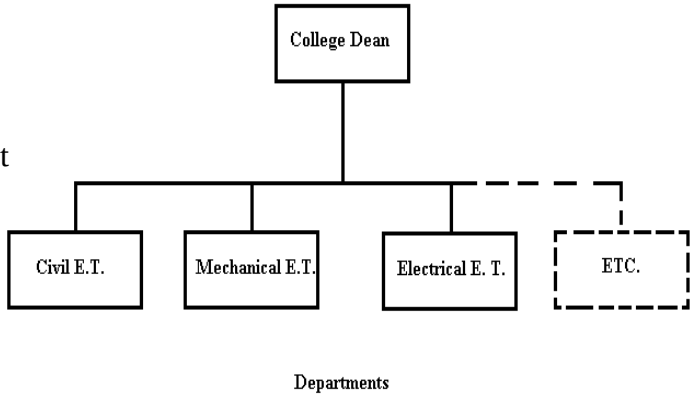

Figure 1. "Type 1" ("Standard") Organization

Organizational difficulties arise from normal communications challenges with the Dean's Office, Finance Office, other business offices and other departments.

"Type 2" Department Organization

The type 2 department results from either a necessity to reduce the number of administrators or the small size of the different disciplines. The disciplines are combined to build faculty and student numbers. An attempt is made to make the parts of the combination be as closely related as possible. The department head may be either a faculty member with administrative responsibilities or an administrator with faculty rank and position. If there are specializations within the department, then there may be a layer of coordinators within the department structure.

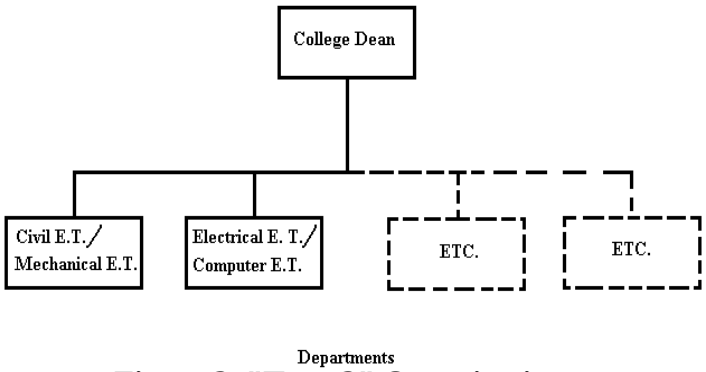

Figure 2. "Type 2" Organization

The relationship to the Dean is the same. The budget and communication remain the same. The advantages to this organization is that it is more compact and that there are fewer department heads. The major disadvantage is that neither Mechanical nor Civil is as well represented as they would be when separate. The department will have to have single priorities across two disciplines. A department head who is credentialed in both areas is very unlikely. This type of program would

suffice while building programs or discontinuation of programs.

"Type 3" Department Organization

This type of department is the first real departure from a "Standard" university college and departmental structure. For the first time, all of engineering technology is embodied in one department. One department head is responsible for all of the disciplines, all of the degrees, all of the faculty and all of the budget. A department head who is credentialed in multiple areas is very unlikely.

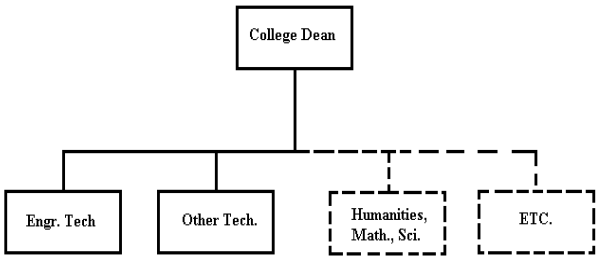

Figure 3. "Type 3" Organization

This type of department leads to at least two type of substructures. The first substructure designated Type 3A shown in figure 4. usually consists of designated coordinators for each degree area. The department head still maintains direct responsibility for the administration of the department in general as well as the details necessary to operate each discipline.

The second substructure designated as Type 3B shown in figure 5, would consist of discipline heads who would carry a portion of the administration of the department. Each discipline would have a leader but not an equal representation within the college. The responsibilities of this leader may include schedule preparation, course assignments, budgets, curricula and degree checks.

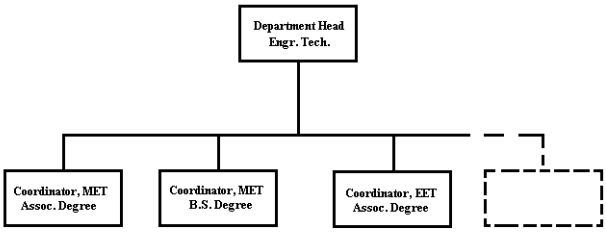

Figure 4 "Type 3A" Organization

The many variations on a theme continue to dilute the representation of the discipline within the college. Further subdivision would include a type of department which stretches over more than engineering technology to include other types of technology.

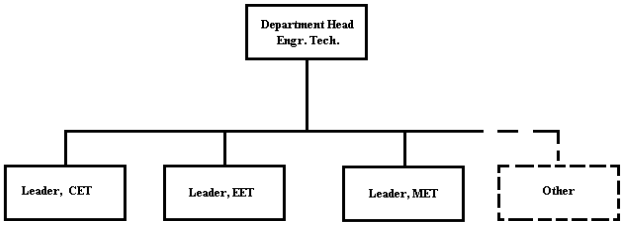

Figure 5. "Type 3B Organization.

Summary

As I started this paper, I envisioned a matrix of organizational types that I would be able to assign rankings to in areas of communications, representation, academic administration, equity in funding, qualifications of the department head, etc. I could still do that and try to cover every variation of the progression of organizations. It also became clear that the organization for today should be continually rethought as to its appropriateness in the long haul.

What should have been obvious, but was obscured, was the fact that as each type moved farther from type one the difficulties in appropriate leadership, communications, representation and equity increased. It is difficult to expect that someone in Mechanical would have the appropriate background to guide Electronics and vice-versa.

If an organization is dictated by the size of the constituent programs(i.e. too small), it is understood that the number of people dedicated to management must be reduced. If growth is anticipated, then continuation of a larger management organization can be justified. If that growth does not come or is not expected to, then serious consideration must be given to the fact that not every organization can be everything to everybody.

My recommendation is that every organization strive toward the type 1 model in an effort to optimize the factors mentioned above. We must remember that engineering technology is not one discipline any more than engineering is one discipline.

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Leonard M. Gold is a Professor of Mechanical Engineering Technology at Kansas State University - Salina. He received his M.S. and B.S. in Mechanical Engineering from Drexel Institute of Technology in 1962 and 1964. He returned from the army and received his Ph.D. in Solid Mechanics in 1969. Dr. Gold is a registered Professional Engineer in Pennsylvania and New Jersey. After 20 years in industry he returned to academia to teach Mechanical Engineering at Lamar University. He has also served as the Director of the School of Technology at Kent State University and as the Department Head of Engineering Technology at Kansas State University.