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Relate Barnard's 6 Aspects of Organizations to Your Experience

Subsystems play an important role in both the managerial science and engineering in general. They allow us to abstract away complexities and view a large complicated system as a simple combination of simple pieces. At MIT Lincoln Lab, where I interned last summer, the structure of the lab and my group in particular are very easily viewed as subsystems. The lab is divided into divisions, and each division is divided into groups. Usually, groups are further divided into project teams. For example, I was in division 9, group 2, and I was on the "Through-Rubble Radar" project team. The team was further divided into responsibilities, namely analog processing and digital processing. From there, each person worked on a particular problem – I worked on digital signal processing for radar platform motion compensation.

Synergy seems to play a rather different role for software developers and engineers compared to other professions, as said by the famous quote "Adding manpower to a late software project makes it later." Counter-intuitively, the whole is less than the sum of its parts and so synergy in software engineering should be seen as something which mitigates this effect. That being said, my group did encourage frequent team meetings so that everyone in the group could express ideas about other people's projects and issues they were facing. The lab also frequently held seminars which allowed interns from all groups and divisions to see the work of other groups, as well as some events where full time staff would be able to speak with those from other divisions. Inter-division communication was crucial for certain projects, and could be seen frequently when a project required expertise from multiple areas.

The lab was far from an *open system.* Because many projects at the lab require secret or top-secret government clearance it is very important that the lab remain a closed system, especially regarding access from the general public. That being said, the lab did work with MIT which is a fairly open system so accommodations had to be made to ensure no secrets were leaked.

Since there were employees without clearance, most interns for example, *boundaries* were closely tracked and guarded. For example throughout the building, there were areas which were locked with ciphers so only those permitted access could open them. That being said, the actual boundaries of operation of the lab were far reaching. They operated satellites in space, radars on the ground which interacted with space craft, and they had test sites across the United States.

Regarding *flow, no* electronics documents were allowed to be removed from the lab, nor brought in without proper procedure. The only flow allowed for interns was the person themselves and a few paper materials that might be kept like notes. Of course for higher level operations, raw materials and components must be brought in, and completed prototypes must be moved out. However even moving equipment from the lab to a nearby air base required clearance beforehand.

*Feedba*ck was of course an important component of the general workings of the lab. For interns, feedback was given in a very direct way – via a rating form where mentors would comment on certain attributes laid out beforehand by upper management or HR. Given that you had a good mentor, they would also provide feedback along the way pushing you in the right direction. Another purpose of the weekly meetings in my group was to have all full time staff available to provide feedback and say what they think would be useful for ultimately achieving the goal of the project.