16.682 The Aerospace Industry

March 16 Class
Special Guest: Prof. Wesley Harris
Plan for the Class

3:05-3:10  Announcements and Introductions
3:10-3:55  LEV Ch 5 Discussion
3:55-4:05  Break
4:05-4:50  Av Week Article Discussion
4:50-4:55  Return Journal Assignments
           Muddy cards
4:55      Adjourn
Software Upgrades More Than Code:

Program Initiation

End to End Software Development Cycle Time ~ 62 Months

System Design and Software Development ~ 31 months

Requirements Derivation ~ 26 months

System Test ~ 16 months

Field

Major Activities and Times

Other ~ 50%

(Sensors, Trainers, Etc.)

System Design and Development ~ 11%

- Code Generation ~ 1/2 the Design and Development Cost ~ 6% of total Cost

System Test ~ 34%

Requirement Derivation ~ 5%

Estimated Total Cost Distribution

Source: Ippolito and Murman, DASC 2001

Points Captured from Class Discussion

Islands of Success

• How do IOS get started and form?
  – From pressure such as to save money
  – Long term vision for the company
  – New project opportunity
  – Isolated groups idea
  – Culture accepting of change
  – Competition pressure

• What barriers inhibit IOS growth or spread?
  – Infrastructure already in place
  – Low-hanging fruit or don’t see whole value stream
  – It is hard to change people mindset
  – Lack of vision or leadership
  – Requires investment, high risk, untested
  – NIH
  – Not transferable
  – Value added may be different between fields in different areas
  – Geographic barriers
Aspects of “Culture”

• Socially transmitted behavior patterns or beliefs that are shared by a particular group.
• The predominant attitudes and behavior that characterize the functioning of a group or organization.
• The patterns or traits that seem to express something essential about a group, community, or population.
Applying Lean Thinking to MIT

- Can you identify any Lean Thinking IOS in the following areas of MIT?
  - Aero-Astro department curriculum
  - MIT curriculum outside of AA
  - Student life and living
  - Administrative support systems for students

- If Yes: What are they? What is preventing them from growing into “Mainlands of Success”?
- If No: What are some opportunities for starting some IOS? How could they be started?
Points Captured from Class Discussion

MIT IOS

• AA curriculum
  – Muddy cards: quick feedback
  – PRS: even faster feedback
  – Prof. Darmofal,
    • 16.100 homework before class, oral exams
    • 16.901, homework daily

• Barriers
  – Cultural between depts
  – Teachers have different values
  – Get the Dean on board

• Course III is attempting unifying approach

• MIT curriculum
  – Students come from varied backgrounds and MIT is addressing this with
    • Interphase
    • Concourse
    • ESP

• Barriers
  – Cost
  – Interest of students to try the alternate path
  – Getting the information
Points Captured from Class Discussion

MIT IOS Continued

• Student life and living
  – ARC and counseling support services
  – Dorm structure IOS on student level
    • Helping new students
    • Floor help
  – Barrier: Top down thinking
    • Meal Plan not the value that students want

• Adm support systems
  – Counseling support services.
    • Prof Vaneverta: fragmented approach or mindset. Lack of holistic approach
  – Computer support system in AA
    • Lack of integrated approach
  – Seamans’ lab
    • Is the library being used
    • Continuous flow, seamless of structure
AvWeek Discussion

• In addition to your prompting questions for each article, consider:

Are the principles of Lean Thinking relevant to this article, and why or why not?