In-Class Exercise

Allocation of Tasks to Humans and Machines   _____

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For each of the following tasks, either 1) state whether it is better suited for human or machine and quote a reason from the table on page 75 of DTUI or from the lists on the back, or 2) explain why you are not sure whether it should be allocated to man or machine.

a) Locking a surface-to-air missile on to a potential target.

b) Tracking a potential target as it moves, keeping the surface-to-air missile aimed.

c) Deciding whether to fire the missile.

d) Scheduling routine advising appointments with Dr. Kiekintveld.

e) Deciding whether to approve or deny a car loan application.

f) Debugging small C programs.

g) Checking if a student has all the classes he or she needs to graduate.

h) Piloting a routine rocket trip to the International Space Station.

Allocation of Functions

Allocation divides work between people and machines.   It determines, to a large extent, the quality of work experience. A well-thought-out allocation optimizes the interaction of people and machine elements.

What should machines do? What should people do?

These are important decisions in the design of any workstation, manufacturing system or process. Such decisions affect product quality, flexibility, overhead cost, worker health and the economic viability of the process. The list below shows some of the relevant factors for making such decisions.

An Over-Automation Example

In the early days of the Mercury space program, NASA engineers attempted to automate almost every aspect of space flight. The original Mercury 7 astronauts vehemently objected to their proposed role as mere passengers. They called it "Spam in a Can." As a result, Mercury and subsequent manned spacecraft designs assigned significant roles and tasks to the astronauts. The unique value that humans bring to certain tasks was demonstrated dramatically with the Apollo 13 mission.

This is an example of the strong tendency in some organizations to "over-automate" and assign most tasks to use machines. However, insufficient automation is equally ineffective. Much depends on the state of the technology and the relative economics of automation and labor.

People Are Good At	Machines & Computers Are Good At
• Nebulous Information	• Simple, Quantitative, Accurate Information
• Subtle Decisions	• Simple, Straight-Forward Decisions
• Vague Process Definitions	• Sharply Defined Processes
• Interactions With Other People	• No Customer Interfaces
• High Variety	• Repetition
• Short Runs	• Short Cycle times
• Varied Cycle Times	• Long Runs
• Quick Changeover	• High Volume
• Varied Inputs	• High Precision
• Multiple Work Locations	• Heavy Loads/Large Forces