Research Report: An Engineering Achievement of the 20th Century

Purpose of this Assignment
This report assignment will help you more fully understand the nature of engineering work, and its significance and many impacts on society. You will also work on your writing and collaboration skills as you and your teammate(s) produce a clear and interesting research report.

Background for Writing the Research Paper
Most engineering or technological achievements result from a perceived need – to make things easier, cheaper, more comfortable for users; to advance performance; to further knowledge and capabilities; etc. As William Wulf, president of the National Academy of Engineering, said when the “Top 20” list was generated: “[Ask yourself, what do I touch that is not engineered? Engineering develops and delivers consumer goods, builds the networks of highways, air and rail travel, and the Internet, mass produces antibiotics, creates artificial heart valves, builds lasers, and offers such wonders an imaging technology and conveniences like microwave ovens and compact discs. In short, engineers make our quality of life possible.” Astronaut Neil Armstrong, himself an engineer and the guest speaker at the unveiling of the “Top 20” list in February 2000, said it more simply: “Engineers are dedicated to solving problems and creating new, useful, and efficient things.” (both ASEE, 2000)

You have already, individually, spent some time reading and thinking about the “20 Greatest Engineering Achievements of the 20th Century,” published on the web site of the American Society for Engineering Education (ASEE). Today (Sept. 12), in class, we’ll use the notes you took on three of those achievements to talk about the issues brought up in the handout you received last week. To recap, let’s consider, in our discussion today and in your research papers, the following questions:

- What were the benefits and advantages resulting from this achievement?
- Who benefited from this achievement? Who didn’t?
- Were there any disadvantages or problems resulting from this achievement?
- Were there any environmental or ethical issues resulting from this event?
- What were / are the trade-offs made as a result of this achievement?
- How did this accomplishment change our culture or society? Think hard about this one!
- What other questions should we be asking; what other issues should we consider?

The Research Report Assignment
You will be assigned to a team, according as much as possible to your interests. You and your teammate(s) together will choose one of the list of 20 engineering achievements to research and report on. You might wish to use the ASEE site’s history and timeline of the achievement you choose as a starting point; then investigate as many other sources as possible. Your research can include interviews with engineers, other experts, and/or engineering faculty. Your goal is to produce a thoughtful and well-supported look at the impact of your chosen engineering achievement on society and culture.

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Requirements for the Research Paper and Oral Presentation

- The paper should be a minimum of four double-spaced pages, not counting title page, abstract, reference list, visuals, or any appendices. The paper may be longer, providing the writing is tight, clear, and interesting.

- Use standard 1” margins and 12-point serif (such as Times Roman) font.

- Your report should follow a typical, brief report structure: abstract/summary, introduction, findings and discussion, conclusions (and possibly recommendations), and list of references. Use specific, rather than generic, headings to organize the sections of your report. Give each major topic its own section (rather than a 3-page discussion!).

- Do not start a new section on a new page or with a large space above it. Rather, continue the report with an additional line or two of space between main sections. The exceptions are the abstract and the list of references, which do get their own pages.

- Every source cited in the text of your report should appear on your references page. And vice-versa: every source listed on the references page must be cited in the report. Use the in-text citation style: (Last name, year) rather than footnotes. (We’ll talk more about citing your sources in class.)

- Your references page should stand alone, and should show all sources (a minimum of four, plus the ASEE web page) you use in your paper. These should, ideally, be a mix of print and reputable online sources, and should include any interviews you have with engineering faculty. Arrange your references alphabetically, by author. You can find more information on APA citation at http://www.wmich.edu/library/handouts/apa.html or by asking to use Dr. Aller’s APA Publication Manual.

- You will also present your findings in an oral presentation, approximately ten minutes long (before questions), using overheads or visuals, and with all members of the team speaking. More information on this presentation will be given to you later in class.

Due Dates

**Monday, Sept. 22:** A complete draft of your report is due in class, to be exchanged with classmates for review. This draft must be as complete and polished as possible. Bring two copies to class; one will be turned in for points.

**Friday, Sept. 26:** Oral presentations by each team on their researched topic will be made in class.

**Wednesday, Oct. 1:** Your final research report is due in class. We will go over a checklist of everything that needs to be included; be sure it’s all there in the final submission.

Final Thoughts

The goal of this assignment is to help you explore, question, and understand the disciplines and accomplishments of engineering and technology. Be sure to ask questions, contribute your thoughts, and enjoy your investigation.