# Software Methods and Tools

Assignment-1, Spring-2017

UMKC

UNIVERSITY OF MISSOURI-KANSAS CITY

**Submitted by:**

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**Question 1.** (30 points) **Questions about the paper "No Silver Bullet: Essence and Accidents of Software Engineering".**

**(1) What are four essential difficulties of software systems discussed in Fred Brooks's paper? Explain each using your own words.**

**Solution:**

Frederick Brook's argues that some problems in software engineering are essential and developing software will always be a time-consuming, difficult and an expensive endeavor.

The four essential difficulties of software systems that are discussed in Fred Brooks's paper are:

1. Complexity

2. Conformity

3. Changeability and

4. Invisibility

**Complexity:**

- Software systems are complex in terms of size unlike any other human constructs like buildings, automobiles etc., because no two parts in software entities are similar and if they are similar they are combined to form one.
- Software systems are more complex than digital computers. They have huge number of states. Each software entity is different from each other. They also interact with one another in non-linear fashion and hence as the size of the system increases, its complexity increases in a non-linear way.
- Descriptions of software that pulls away its complexity pulls away its essence. Complexity is an essential property.
- Complexity causes difficulty of communication among team members which leads to
  a) product flaws
  b) cost overruns
  c) schedule delays
- Complexity causes difficulty in understanding the requirements which causes unreliability.

- Complexity of function causes difficulty in invoking those functions which makes programs hard to use.
- Complexity of structures causes difficulty of extending programs to new functions which
    a) might create side effects
    b) causes security loopholes
- Complexity also causes management problems.

## Conformity:

- Here the author had discussed more about the compatibility. Not only the people who work in software face the problem of complexity but also there are many things in this world.
- Complexity refers to something that is very puzzling and difficult to understand. Einstein feels that there is a solution or easy way of understanding every problem. But, software engineers don't agree to this idea.
- This is because software engineers face the problem that their software doesn't work on every system as it is not compatible with every interface in the machine, as every interface is different, which is created by different people.
- So, the software created by him may not be compatible in other systems, as their codes and all differ, or because the software is latest or because it is considered most comfortable to use.
- The problem can't be solved just by redesigning this software, there is much more to be done.

## Changeability:

- The software which is built for an application, user, machine vehicle is under pressure to change based on two factors:

a) Users trying to use the successful software at the edge of the original domain. The users try experimenting with the successful software which demands to change the software.

b) When a software system is designed to work on a machine or interface, the software is also expected to work on the new incorporations to the machine or advanced versions of machine because the software is easy to change unlikely hardware.

- It is totally a logical construction. The cost required to make changes is also less when compared to the cost required to change hardware.

- Change in applications, user's expectation, law & machines subject to the change in software.

**Invisibility:**

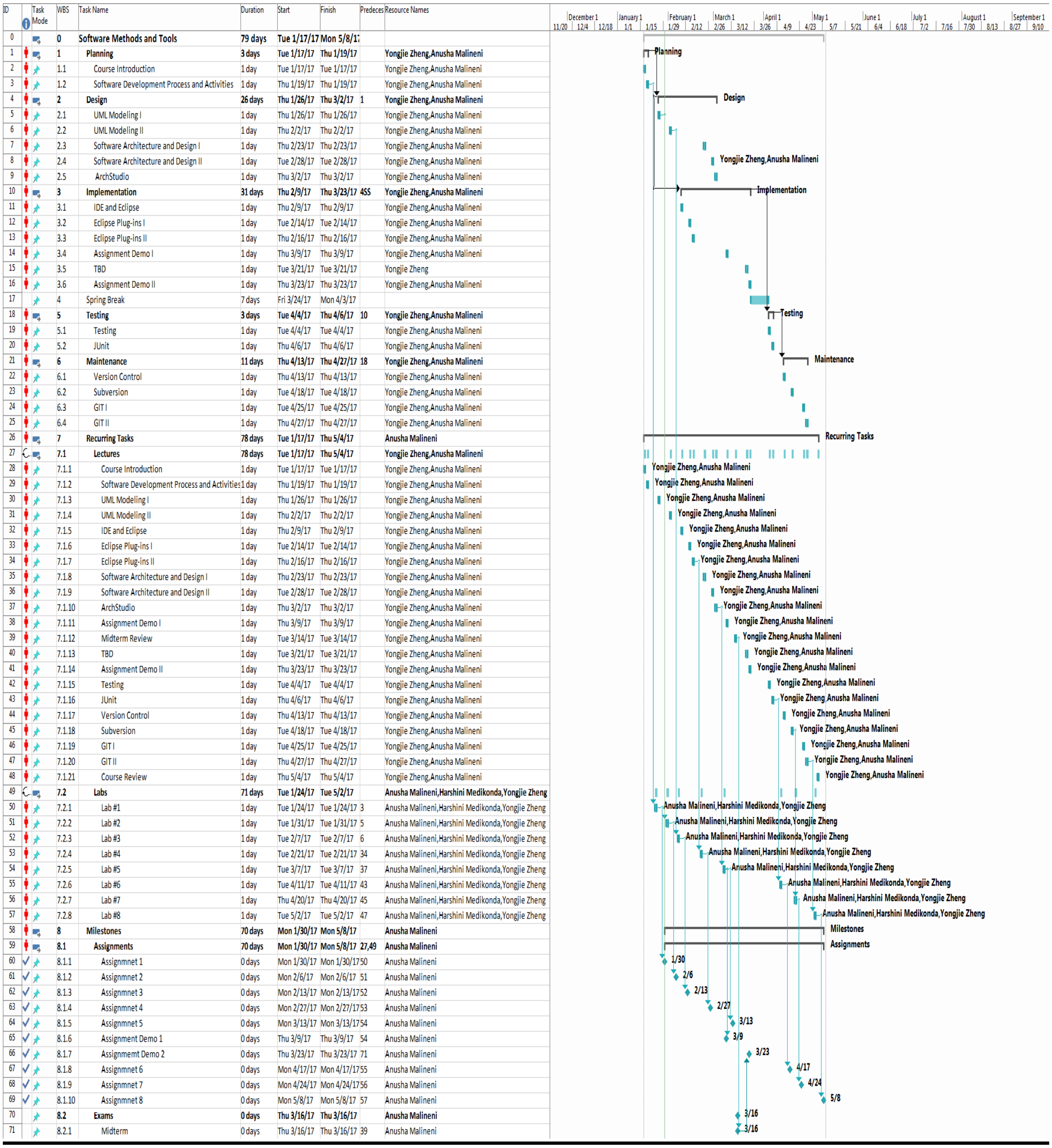
- The software is un-visualizable since it cannot be depicted on a paper unlike floor plans of building, geometric abstraction where the flaws can be rectified easily.
- Though we try to design the software architecture there are many dependencies or many internal factors to be considered like flow of data, name space relationships, time sequence, patterns of dependency.
- Hence a clear picture of the software cannot be represented which obstructs the process of design and causes difficulty in communications among the team members.

(2) **Pick one software method or tool that you used before and specifically explain whether or not you think this method or tool is a "promising attack" on the essential difficulties mentioned above.**

**Solution:**

The tool I encountered before is Jira which is a proprietary issue tracking product, developed by Atlassian. It alleviates the difficulty of communication among team members and difficulty in understanding the requirements. It has requirements specified as task description which ensures that the entire team and the product owner are on the same page. If there is any change in requirement those changes are addressed by creating new tasks. The tasks are listed based on priority in the backlog which helps during the planning phase and in avoiding chaos. Jira tool also keeps track of release of the software. It provides the information on the versions. There is another application in Jira called zephyr which is used for test management. In this one can design the test cases and execute the test cases. The users can have a track of the fixed bugs and open bugs. Combining these features the Jira tool enables the entire team to be prepared at every single stage of software lifecycle which reduces the complexity, changeability difficulties of software system at initial stages of implementation.

**<u>Question 2:</u>** (50 points) **Make a class schedule for this course using Microsoft Project.**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Planning
Design
Yongjie Zheng,Anusha Malineni
Implementation
Testing
Maintenance
Recurring Tasks
Yongjie Zheng,Anusha Malineni
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Anusha Malineni,Harshini Medikonda,Yongjie Zheng
Milestones
Assignments
1/30
2/6
2/13
2/27
3/13
3/9
3/23
4/17
4/24
5/8
3/16
3/16

| ID | | Task Mode | WBS | Task Name | Duration | Start | Finish | Predeces | Resource Names |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 0 | **Software Methods and Tools** | **79 days** | **Tue 1/17/17** | **Mon 5/8/17** | | |
| 1 | | | 1 | **Planning** | **3 days** | **Tue 1/17/17** | **Thu 1/19/17** | | **Yongjie Zheng,Anusha Malineni** |
| 2 | | | 1.1 | Course Introduction | 1 day | Tue 1/17/17 | Tue 1/17/17 | | Yongjie Zheng,Anusha Malineni |
| 3 | | | 1.2 | Software Development Process and Activities | 1 day | Thu 1/19/17 | Thu 1/19/17 | | Yongjie Zheng,Anusha Malineni |
| 4 | | | 2 | **Design** | **26 days** | **Thu 1/26/17** | **Thu 3/2/17** | **1** | **Yongjie Zheng,Anusha Malineni** |
| 5 | | | 2.1 | UML Modeling I | 1 day | Thu 1/26/17 | Thu 1/26/17 | | Yongjie Zheng,Anusha Malineni |
| 6 | | | 2.2 | UML Modeling II | 1 day | Thu 2/2/17 | Thu 2/2/17 | | Yongjie Zheng,Anusha Malineni |
| 7 | | | 2.3 | Software Architecture and Design I | 1 day | Thu 2/23/17 | Thu 2/23/17 | | Yongjie Zheng,Anusha Malineni |
| 8 | | | 2.4 | Software Architecture and Design II | 1 day | Tue 2/28/17 | Tue 2/28/17 | | Yongjie Zheng,Anusha Malineni |
| 9 | | | 2.5 | ArchStudio | 1 day | Thu 3/2/17 | Thu 3/2/17 | | Yongjie Zheng,Anusha Malineni |
| 10 | | | 3 | **Implementation** | **31 days** | **Thu 2/9/17** | **Thu 3/23/17** | **4SS** | **Yongjie Zheng,Anusha Malineni** |
| 11 | | | 3.1 | IDE and Eclipse | 1 day | Thu 2/9/17 | Thu 2/9/17 | | Yongjie Zheng,Anusha Malineni |
| 12 | | | 3.2 | Eclipse Plug-ins I | 1 day | Tue 2/14/17 | Tue 2/14/17 | | Yongjie Zheng,Anusha Malineni |
| 13 | | | 3.3 | Eclipse Plug-ins II | 1 day | Thu 2/16/17 | Thu 2/16/17 | | Yongjie Zheng,Anusha Malineni |
| 14 | | | 3.4 | Assignment Demo I | 1 day | Thu 3/9/17 | Thu 3/9/17 | | Yongjie Zheng,Anusha Malineni |
| 15 | | | 3.5 | TBD | 1 day | Tue 3/21/17 | Tue 3/21/17 | | Yongjie Zheng |
| 16 | | | 3.6 | Assignment Demo II | 1 day | Thu 3/23/17 | Thu 3/23/17 | | Yongjie Zheng,Anusha Malineni |
| 17 | | | 4 | Spring Break | 7 days | Fri 3/24/17 | Mon 4/3/17 | | |
| 18 | | | 5 | **Testing** | **3 days** | **Tue 4/4/17** | **Thu 4/6/17** | **10** | **Yongjie Zheng,Anusha Malineni** |
| 19 | | | 5.1 | Testing | 1 day | Tue 4/4/17 | Tue 4/4/17 | | Yongjie Zheng,Anusha Malineni |
| 20 | | | 5.2 | JUnit | 1 day | Thu 4/6/17 | Thu 4/6/17 | | Yongjie Zheng,Anusha Malineni |
| 21 | | | 6 | **Maintenance** | **11 days** | **Thu 4/13/17** | **Thu 4/27/17** | **18** | **Yongjie Zheng,Anusha Malineni** |
| 22 | | | 6.1 | Version Control | 1 day | Thu 4/13/17 | Thu 4/13/17 | | Yongjie Zheng,Anusha Malineni |
| 23 | | | 6.2 | Subversion | 1 day | Tue 4/18/17 | Tue 4/18/17 | | Yongjie Zheng,Anusha Malineni |
| 24 | | | 6.3 | GIT I | 1 day | Tue 4/25/17 | Tue 4/25/17 | | Yongjie Zheng,Anusha Malineni |
| 25 | | | 6.4 | GIT II | 1 day | Thu 4/27/17 | Thu 4/27/17 | | Yongjie Zheng,Anusha Malineni |
| 26 | | | 7 | **Recurring Tasks** | **78 days** | **Tue 1/17/17** | **Thu 5/4/17** | | **Anusha Malineni** |
| 27 | | | 7.1 | **Lectures** | **78 days** | **Tue 1/17/17** | **Thu 5/4/17** | | **Yongjie Zheng,Anusha Malineni** |
| 28 | | | 7.1.1 | Course Introduction | 1 day | Tue 1/17/17 | Tue 1/17/17 | | Yongjie Zheng,Anusha Malineni |
| 29 | | | 7.1.2 | Software Development Process and Activities | 1 day | Thu 1/19/17 | Thu 1/19/17 | | Yongjie Zheng,Anusha Malineni |
| 30 | | | 7.1.3 | UML Modeling I | 1 day | Thu 1/26/17 | Thu 1/26/17 | | Yongjie Zheng,Anusha Malineni |
| 31 | | | 7.1.4 | UML Modeling II | 1 day | Thu 2/2/17 | Thu 2/2/17 | | Yongjie Zheng,Anusha Malineni |
| 32 | | | 7.1.5 | IDE and Eclipse | 1 day | Thu 2/9/17 | Thu 2/9/17 | | Yongjie Zheng,Anusha Malineni |
| 33 | | | 7.1.6 | Eclipse Plug-ins I | 1 day | Tue 2/14/17 | Tue 2/14/17 | | Yongjie Zheng,Anusha Malineni |
| 34 | | | 7.1.7 | Eclipse Plug-ins II | 1 day | Thu 2/16/17 | Thu 2/16/17 | | Yongjie Zheng,Anusha Malineni |
| 35 | | | 7.1.8 | Software Architecture and Design I | 1 day | Thu 2/23/17 | Thu 2/23/17 | | Yongjie Zheng,Anusha Malineni |
| 36 | | | 7.1.9 | Software Architecture and Design II | 1 day | Tue 2/28/17 | Tue 2/28/17 | | Yongjie Zheng,Anusha Malineni |
| 37 | | | 7.1.10 | ArchStudio | 1 day | Thu 3/2/17 | Thu 3/2/17 | | Yongjie Zheng,Anusha Malineni |
| 38 | | | 7.1.11 | Assignment Demo I | 1 day | Thu 3/9/17 | Thu 3/9/17 | | Yongjie Zheng,Anusha Malineni |
| 39 | | | 7.1.12 | Midterm Review | 1 day | Tue 3/14/17 | Tue 3/14/17 | | Yongjie Zheng,Anusha Malineni |
| 40 | | | 7.1.13 | TBD | 1 day | Tue 3/21/17 | Tue 3/21/17 | | Yongjie Zheng,Anusha Malineni |
| 41 | | | 7.1.14 | Assignment Demo II | 1 day | Thu 3/23/17 | Thu 3/23/17 | | Yongjie Zheng,Anusha Malineni |
| 42 | | | 7.1.15 | Testing | 1 day | Tue 4/4/17 | Tue 4/4/17 | | Yongjie Zheng,Anusha Malineni |
| 43 | | | 7.1.16 | JUnit | 1 day | Thu 4/6/17 | Thu 4/6/17 | | Yongjie Zheng,Anusha Malineni |
| 44 | | | 7.1.17 | Version Control | 1 day | Thu 4/13/17 | Thu 4/13/17 | | Yongjie Zheng,Anusha Malineni |
| 45 | | | 7.1.18 | Subversion | 1 day | Tue 4/18/17 | Tue 4/18/17 | | Yongjie Zheng,Anusha Malineni |
| 46 | | | 7.1.19 | GIT I | 1 day | Tue 4/25/17 | Tue 4/25/17 | | Yongjie Zheng,Anusha Malineni |
| 47 | | | 7.1.20 | GIT II | 1 day | Thu 4/27/17 | Thu 4/27/17 | | Yongjie Zheng,Anusha Malineni |
| 48 | | | 7.1.21 | Course Review | 1 day | Thu 5/4/17 | Thu 5/4/17 | | Yongjie Zheng,Anusha Malineni |
| 49 | | | 7.2 | **Labs** | **71 days** | **Tue 1/24/17** | **Tue 5/2/17** | | **Anusha Malineni,Harshini Medikonda,Yongjie Zheng** |
| 50 | | | 7.2.1 | Lab #1 | 1 day | Tue 1/24/17 | Tue 1/24/17 | 3 | Anusha Malineni,Harshini Medikonda,Yongjie Zheng |
| 51 | | | 7.2.2 | Lab #2 | 1 day | Tue 1/31/17 | Tue 1/31/17 | 5 | Anusha Malineni,Harshini Medikonda,Yongjie Zheng |
| 52 | | | 7.2.3 | Lab #3 | 1 day | Tue 2/7/17 | Tue 2/7/17 | 6 | Anusha Malineni,Harshini Medikonda,Yongjie Zheng |
| 53 | | | 7.2.4 | Lab #4 | 1 day | Tue 2/21/17 | Tue 2/21/17 | 34 | Anusha Malineni,Harshini Medikonda,Yongjie Zheng |
| 54 | | | 7.2.5 | Lab #5 | 1 day | Tue 3/7/17 | Tue 3/7/17 | 37 | Anusha Malineni,Harshini Medikonda,Yongjie Zheng |
| 55 | | | 7.2.6 | Lab #6 | 1 day | Tue 4/11/17 | Tue 4/11/17 | 43 | Anusha Malineni,Harshini Medikonda,Yongjie Zheng |
| 56 | | | 7.2.7 | Lab #7 | 1 day | Thu 4/20/17 | Thu 4/20/17 | 45 | Anusha Malineni,Harshini Medikonda,Yongjie Zheng |
| 57 | | | 7.2.8 | Lab #8 | 1 day | Tue 5/2/17 | Tue 5/2/17 | 47 | Anusha Malineni,Harshini Medikonda,Yongjie Zheng |
| 58 | | | 8 | **Milestones** | **70 days** | **Mon 1/30/17** | **Mon 5/8/17** | | **Anusha Malineni** |
| 59 | | | 8.1 | **Assignments** | **70 days** | **Mon 1/30/17** | **Mon 5/8/17** | **27,49** | **Anusha Malineni** |
| 60 | ✓ | | 8.1.1 | Assignmnet 1 | 0 days | Mon 1/30/17 | Mon 1/30/17 | 50 | Anusha Malineni |
| 61 | ✓ | | 8.1.2 | Assignmnet 2 | 0 days | Mon 2/6/17 | Mon 2/6/17 | 51 | Anusha Malineni |
| 62 | ✓ | | 8.1.3 | Assignmnet 3 | 0 days | Mon 2/13/17 | Mon 2/13/17 | 52 | Anusha Malineni |
| 63 | ✓ | | 8.1.4 | Assignmnet 4 | 0 days | Mon 2/27/17 | Mon 2/27/17 | 53 | Anusha Malineni |
| 64 | ✓ | | 8.1.5 | Assignmnet 5 | 0 days | Mon 3/13/17 | Mon 3/13/17 | 54 | Anusha Malineni |
| 65 | ✓ | | 8.1.6 | Assignment Demo 1 | 0 days | Thu 3/9/17 | Thu 3/9/17 | 54 | Anusha Malineni |
| 66 | ✓ | | 8.1.7 | Assignmemt Demo 2 | 0 days | Thu 3/23/17 | Thu 3/23/17 | 71 | Anusha Malineni |
| 67 | ✓ | | 8.1.8 | Assignmnet 6 | 0 days | Mon 4/17/17 | Mon 4/17/17 | 55 | Anusha Malineni |
| 68 | ✓ | | 8.1.9 | Assignmnet 7 | 0 days | Mon 4/24/17 | Mon 4/24/17 | 56 | Anusha Malineni |
| 69 | ✓ | | 8.1.10 | Assignment 8 | 0 days | Mon 5/8/17 | Mon 5/8/17 | 57 | Anusha Malineni |
| 70 | | | 8.2 | **Exams** | **0 days** | **Thu 3/16/17** | **Thu 3/16/17** | | **Anusha Malineni** |
| 71 | | | 8.2.1 | Midterm | 0 days | Thu 3/16/17 | Thu 3/16/17 | 39 | Anusha Malineni |