

# **SWE20001**

## **Managing Software Projects**

Extra Lecture

Why Project Fails?

Why Need Project Management?



# Overview

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- The need of Software Engineering
- The need of Software Project Management
- Why (software) project fails?
- Is Agile the answer?

# Software Crisis (back in late 1960s)

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- Projects running **over-budget**
- Project running **over-time**
- Software was very **inefficient**
- Software was of **low quality**
- Software often did **not meet requirements**
- **Projects were unmanageable** and **code difficult to maintain**
- Software was **never delivered**

# Software Engineering

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- The application of Engineering approach to **build** software
  - Process – [SDLC] Waterfall, Incremental, Iterative, ...
  - Quality – Reliability, Performance, Maintainability, ...
- AIM – **build** quality software (on time and within budget)

Engineering (civil, mechanical, electrical, electronic, ...)

- The application of scientific knowledge ... to the practical problems of design, construction, operation and maintenance of devices encountered in everyday life

# Software Project Management

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- The application of project management in building software
  - Need better techniques to **plan**, **track**, **monitor** and **control** the software development activities
- AIM – Manage the development of software to be **delivered on time** and **within budget**
- Project Management
  - The planning and organization of certain resources to move a specific task, event or duty towards completion

# Standish CHAOS Report (around 2000)



CHAOS stands for Comprehensive Human Appraisal for Originating Software

	1995	2001
Time overruns	222%	163%
Cost overruns	189%	145%
Requirements features	61%	67%
No. of successful projects (US) / total	28 000 / (~ 175 000)	78 000 / (~ 278 571)
% of project succeeded	16%	28%



# Why Project fails? (Pfleeeger, 2001)

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- **Incomplete** requirements (13.1%)
- Lack of **user involvement** (12.4%)
- Lack of **resources** (10.6%)
- **Unrealistic expectations** (9.9%)
- **Lack of executive support** (9.3%)
- **Changing requirements and specifications** (8.7%)
- Lack of **planning** (8.1%)
- System **no longer needed** (7.5%)

# Agile Manifesto (2021)

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## **Agile vs Traditional**

Individuals and interactions vs Processes and tools

Working software vs Comprehensive documentation

Customer collaboration vs Contract negotiation

Responding to change vs Following a plan





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Q1: Which of these can be solved by Agile Development Methodology such as Scrum?

Q2: Why?

# Standish CHAOS Report 2020 (2015)



Method	Successful	Challenged	Failed
Agile	42% (39%)	47% (52%)	11% (9%)
Waterfall	13% (11%)	59% (60%)	28% (29%)

Vitality Chicago (2021)

# References

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- Pfleeger, S.L. (2001) *Software Engineering: Theory and Practices*, 2<sup>nd</sup> ed., Prentice Hall.
- Vitality Chicago (2021) Why Agile is Better than Waterfall (Based on Standish Group Chaos Report 2020), <https://vitalitychicago.com/blog/agile-projects-are-more-successful-traditional-projects/>, reviewed 20 Feb 2022
- Wikipedia, Software Crisis, [https://en.wikipedia.org/wiki/Software\\_crisis](https://en.wikipedia.org/wiki/Software_crisis), reviewed 20 Feb 2022

# Why (Software) PM matters in Cybersecurity

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## Sample Cybersecurity projects

- ☐ To roll out your new end-point security solution to thousands of nodes
- ☐ To upgrade your infrastructure across your enterprise
- ☐ To perform a large scale penetration test
  - ☐ Involve many pen testers to write programs / scripts to automate the tests

## Benefits (to name a few)

- ☐ Better resources planning
- ☐ Better scoping and planning the schedules
- ☐ Mitigating and managing Cybersecurity project risks

# References (PM in Cybersecurity)

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- CompTIA (2019) *Why Project Management is important to Cybersecurity*, <https://www.comptia.org/blog/project-management-and-cybersecurity>, reviewed 25<sup>th</sup> Feb 2022
- Convergent Mission Solutions (2019) *Benefit of Project Management for Cyber Security Initiatives*, <https://www.convergentmissions.com/benefit-of-project-management/>, reviewed 25<sup>th</sup> Feb 2022
- LIFARS (2021) *Effective Project Management for Successful Cybersecurity Projects*, <https://lifars.com/2021/03/effective-project-management-for-successful-cybersecurity-projects/>, reviewed 25<sup>th</sup> Feb 2022