

# Comp 7082: Software Engineering

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Fatemeh Riahi

# General introduction

Who am I?

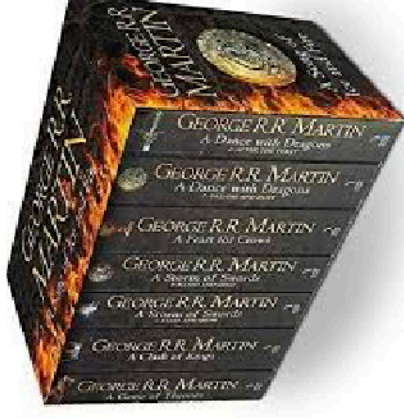


- 24 years student!
- Software Engineer/ Data Scientist/ Team Lead
- But new to the teaching!



Fun fact about me:

- A hardcore fan of song of ice and fire series
- An active member of the ASOIAF subreddit until 2019 contributed to hundreds of conspiracy theories





# My vision for the course?

- A way to prepare you for what is out there.
- I want to make you confident to enter job market.
- Setting you up for success and not break you!



# What am I to you?

- Instructor
- Product manager
- Customer
- Team lead
- Friendly but not a friend, at least not this semester.

# Course outline and office hour

- Engineering Software Products: An Introduction to Modern Software Engineering, 1st edition
- [Outline](#)
- Office hour via video conference
  - Please book your appointment in advance.
  - I will announce the designated day and time when I will be online and available. Although I am online frequently, I may not be able to answer questions outside of the scheduled office hours.

# Course grade components

Criteria	%	Comments
In Class Exercises and Labworks	30	Each in class exercise is between 3 to 5 marks and may involve written answers and/or lab work
Quizzes	10	two Quizzes
Project	30	
Final Exam	30	
Total	100	

# GenAI chatbot

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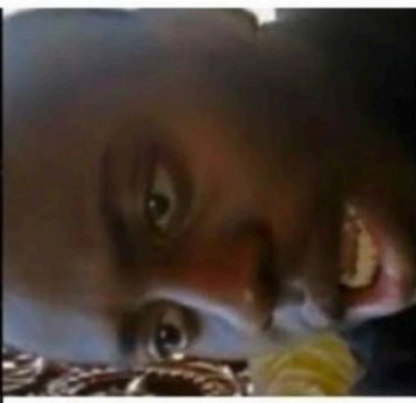
- Use it to revise/review your document
- Use it where you have a coding question
- Do not copy and paste from any GenAI chatbot to your project or assignments
  - Understand the solution and use your own code.

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When I  
realize ChatGPT  
can do my job




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# What are we covering in the lecture/labs?

- Lectures: Project proposal/the actual lectures/quizzes/final project demo
- Labs: general or coding exercises, case studies, team discussions, sprint demos.
- Quizzes and exams: Closed books.
- Assignments and lab works, most of them are in form of teams, some of them individual.





# Class rules

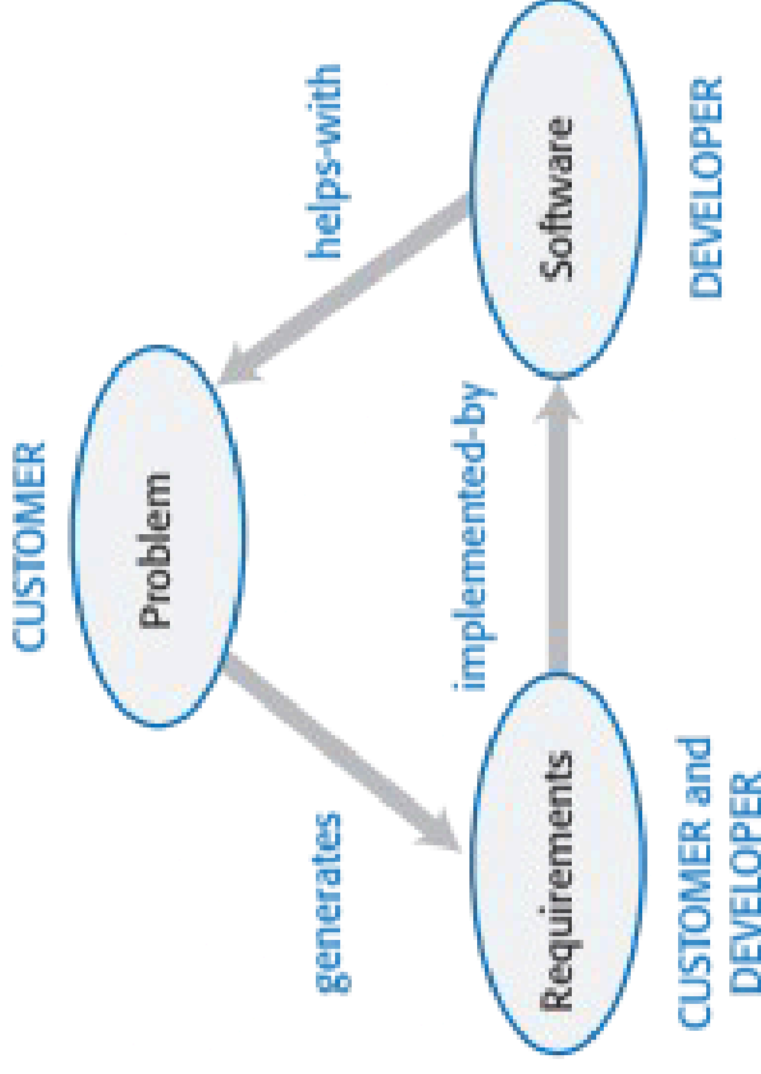
- Attendance in labs and classes are tracked.
- If you are a team, make sure everybody in team is participating, I review your planning meetings outcome and make sure everybody is assigned tasks. Each student in team will be assessed individually.

# Software Products

- Generic Software systems
  - Large scale business systems : excel
  - Personal products: Evernote
  - Mobile apps or games
- Different types of software engineering:
  - Project based software engineering
  - Product based software engineering

# Project Based Software engineering

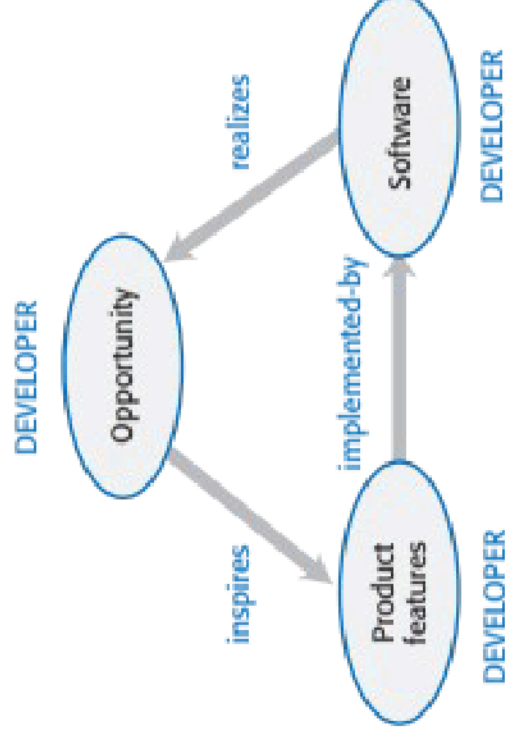
From: Ian Sommerville 2018



# Product based software engineering

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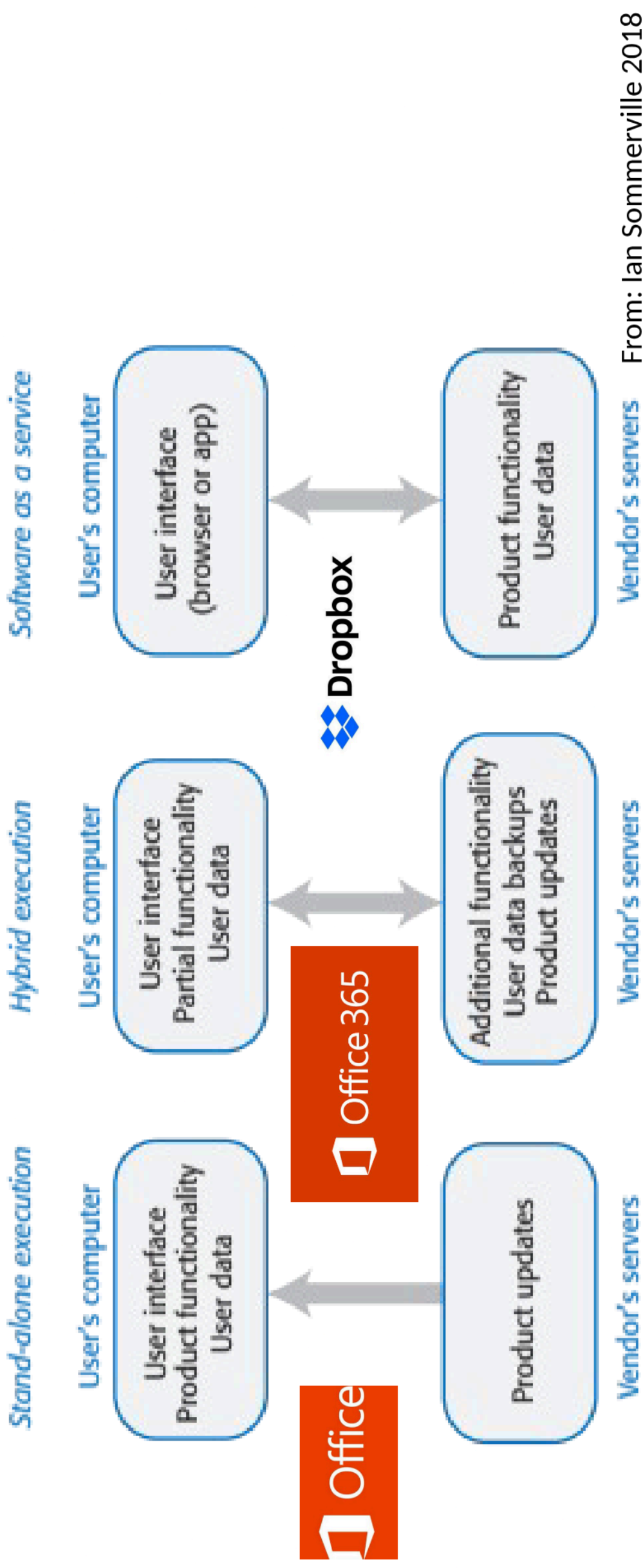
From: Ian Sommerville 2018



# Product Line and Platform

- Product line: a group of related products offered by a company that share features and characteristics.
  - Offer verity within a category
  - Apple iPhone product line: Iphone SE, iPhone 14, iPhone 14 pro
- Platform: A foundational environment to enable development
  - Often support multiple products and services
  - Microsoft Windows or Azure

# Software Execution Models





# Other type of software Development

- Student Projects
- Research Software
- Internal tool development

# Product Vision

- The starting point for software product development is a 'product vision'.
- The product vision should answer three fundamental questions:
  - What is the product to be developed?
  - Who are the target customers and users?
  - Why should customers buy this product?



# Moore's Vision Template

- FOR (target customer)
- WHO (statement of the need or opportunity)
- The (PRODUCT NAME) is a (product category)
- THAT (key benefit, compelling reason to buy)
- UNLIKE (primary competitive alternative)
- OUR PRODUCT (statement of primary differentiation)

# Example

Tesla Model S

- **For**
- **Who**
- **The**
- **Is a**
- **That**
- **Unlike**
- **Our product**

# Example

## Tesla Model S

- **For** environmentally conscious drivers who demand high performance
- **Who** want a luxurious, eco-friendly vehicle
- **The** Tesla Model S
- **Is a** premium electric sedan
- **That** delivers both long-range capability and exhilarating acceleration
- **Unlike** traditional gasoline-powered luxury cars
- **Our product** offers zero emissions, cutting-edge technology, and the ability to upgrade software over-the-air, providing a futuristic driving experience.

# Sources for Product Vision

- Domain Experience
- Product Experience
- Customer Experience
- Prototyping and Experimentation

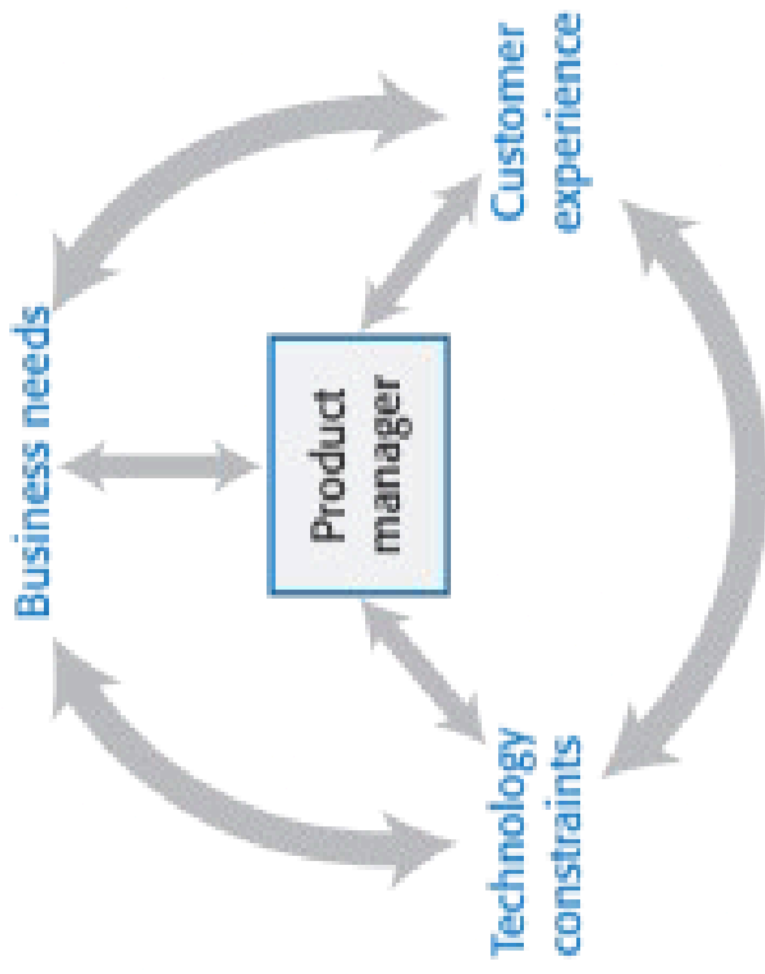
# Software Product Management

- A business activity focused on software that are sold by the business
- PMs are responsible for product and are involved in planning and development marketing it
- Interface between the organizations: customer and development teams.

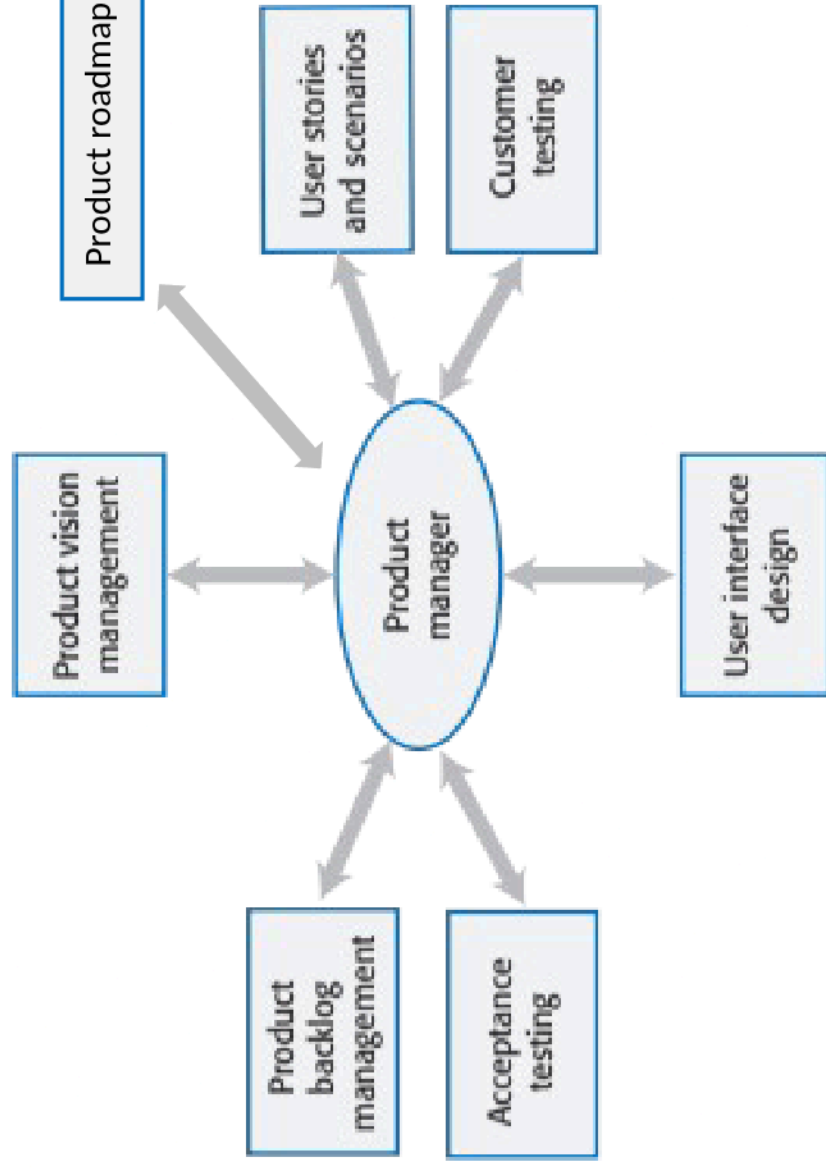
# Product Management Concerns

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From: Ian Sommerville 2018



# Technical Interactions of Product Managers





# Product Prototyping

- Early version of the product
- Helps identify fundamental software components
- Can be done in 4 to 6 weeks
- Throw-away





# Two stage Prototyping

- Feasibility Demonstration
- Customer Demonstration

# Takeaways!

- Software products are software systems that include general functionality that is likely to be useful to a wide range of customers.
- In product software engineering, the same company is responsible for deciding on the features that should be part of the product and the implementation of these features.
- Software products may be delivered as stand-alone systems running on the customer's computers, hybrid systems or service-based systems. In hybrid systems, some features are implemented locally and others are accessed over the Internet. All product features are remotely accessed in service-based products.
- A product vision should succinctly describe what is to be developed, who are the target customers for the product and why they should buy the product that you are developing.
- Domain experience, product experience, customer experience and an experimental software prototype may all contribute to the development of the product vision.

# Takeaways!

- Key responsibilities of product managers are product vision ownership, product roadmap development, creating user stories and the product backlog, customer and acceptance testing and user interface design.
- Product managers work at the interface between the business, the software development team and the product customers. They facilitate communications between these groups.
- You should always develop a product prototype to refine your own ideas and to demonstrate the planned product features to potential customers