Managing software projects

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What is a project?

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A temporary endeavor undertaken to create a unique product, service, or result.

A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Seventh Edition and The Standard for Project Management, Project Management Institute, Newtown Square, PA, 2021.

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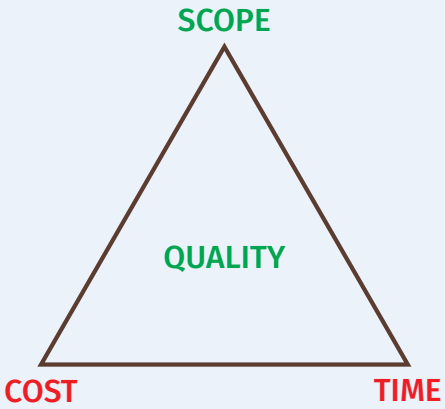
A project must have

- **beginning** and **end**
- clear **goal**

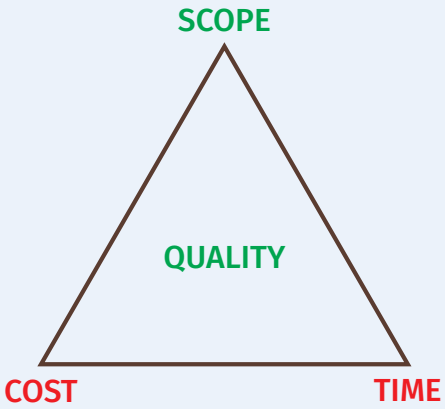
The golden/iron/project triangle

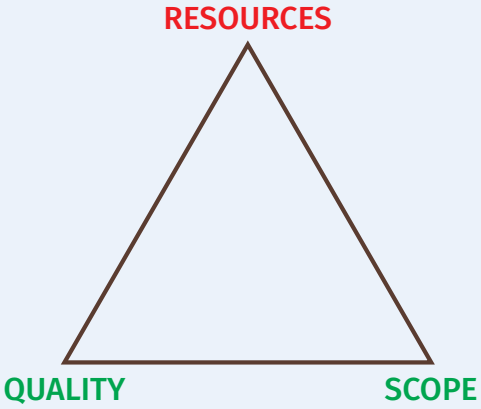


- **QUALITY**: non-functional requirements
- **SCOPE**: functional requirements
- **COST**: budget/human constraints
- **TIME**: delivery constraints

Model: SCOPE $=$ TIME $\times$ COST

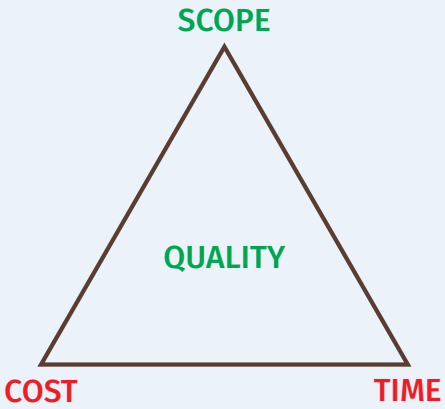
Good, fast, cheap: choose two





Difference: All constraints are now in **RESOURCES**

The iron triangle in software projects



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Requirements

Non-functional (QUALITY)

Functional (SCOPE)

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Non-functional (QUALITY)

- performance
- reliability
- scalability
- security
- documentation
- extensibility

Functional (SCOPE)

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Functional (SCOPE)

- features of the software
- data software can handle
- required user interactions

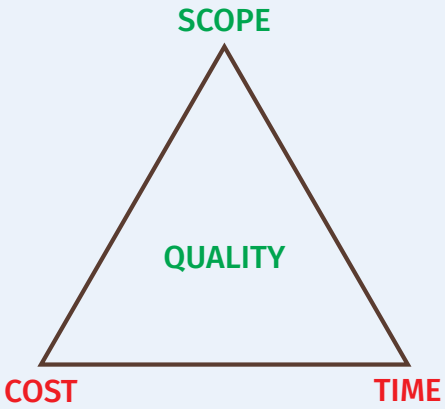
Constraints

- software
- hardware
- peopleware
- delivery deadlines

P. G. Neumann. *Peopleware in systems*. in Peopleware in Systems. Association for Systems Management, Cleveland, OH, 1976, pp. 15-18.

T. DeMarco and T. Lister. *Peopleware: Productive Projects and Teams*. Addison-Wesley, 2013.

Iron triangle—messages



- Constraint/requirements **can** change
- Any change requires adjustments
- Tool for analysis, **not** assessment
- Impact on stakeholders is missing

Model: SCOPE $=$ TIME $\times$ COST

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Engineering is about getting results of the required quality within schedule and budget. This often involves making compromises—engineers cannot be perfectionists.

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Core **hard skills**, but **soft skills** are also involved!

Summary

1. What falls under **QUALITY**?

2. What falls under **SCOPE**?

3. What falls under **RESOURCES**?

4. What is **SOFTWARE ENGINEERING**?

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   *All constraints (**COST** and **TIME**).*
4. What is **SOFTWARE ENGINEERING**?
   Techniques for managing software projects.

Questions?