CS5702
Software Engineering Requirements
Lecture 1

Prof Ita Richardson

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Lecture recordings

- Please note this lecture will be recorded and will be available on Brightspace following the lecture (this does take some time – be patient!)
- You should not copy, modify or distribute recordings of a lecture/tutorial/education session to which you have access, without first seeking permission to do so.
- The lecture pdf which will also be made available after each lecture.

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Lecture Summary

- Introduce Me – Ita Richardson!
- Introduce Module
- Requirements Engineering
- Assessment – due week 3
- Wrap-up

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Who am I? Ita Richardson

- Professor of Software Quality in Dept of Computer Science & Information Systems
- Lecture to Undergraduate / Postgraduate classes
- Deputy Director of Lero – the Irish Software Research Centre
- Lead Research students - PhD students, Post-doctoral researchers
- Roles in Equality, Diversity and Inclusion

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My Research Interests

- Lero – the Science Foundation Ireland Research Centre for Software
- Software Quality through:
  - Health and Medical Software Development
  - Software Process Improvement
  - Global Software Development
- Women in STEM
  - Encouraging more female students
  - Understanding the success of interventions
- Industry focus:
  - Small software development companies (HomeSafe Care)
  - Large companies (Ocuco, IBM, JnJ)
- Health Organisations (Health Service Executive, CCIO)
- International Conferences / Journal Publications

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My Teaching Interests

- Software Engineering
  - Professional Issues
  - Analysis and Design of Information systems (Requirements engineering)
- Software Quality
  - Software quality in healthcare
  - Software processes
  - Global software development
- Apart from CSIS students: Healthcare professionals, People working in industry on Medical device quality
- Final Year and MSc Project supervision
- Teaching internationally: Uganda, Finland, Ghana.

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Module – CS5702

- M.Sc. in Software Engineering, MSc in Software Development: International Systems
- All lectures will be
  - Recorded and available
  - Uploaded as pdf file post-lecture
- Group work: lectures include discussion exercises which will help your understanding of the topic

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Lecture Schedule

Lectures face-to-face

- One double lecture per week (recording will be available if possible)
  - Thursday 14h00-16h00, SG18 or Friday 11h00-13h00, room to be advised
  - Please keep Monday 16h00-18h00 free weeks 6, 7, 9, 10
  - See Brightspace for current lecture days and times
  - Timetable is subject to change

You will have notice of lectures both in lectures and through Brightspace announcements

- Office hours on request on-line (9h00-10h00 Thursdays)

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Use of Brightspace

Brightspace : Virtual Learning Environment

- Announcements
- Submission of Assignments
- Resources
- Forums
  - Queries, unless personal, should be submitted here
  - Allows all students to participate in the conversation
  - Allows all students to get answers to questions
- Personal queries: ita.Richardson@ul.ie

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Module Outline

- Aims and Objectives:
  - To provide an understanding of the processes and techniques used to develop and maintain quality software
- Course Topics
  - Requirements Process
  - Sources of requirements
  - Roles of stakeholders
  - Uses of modelling
  - Management of requirements
  - Verification and validation of requirements

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Module Assessment

Project in 3 assessments, 3 per group

- Due week 3 (10%), starting today
- Due week 5 (5%), commencing week 3
- Due week 12 (35%), commencing week 5
- Final examination 50% will be based on lectures and project work
  - Individually, you can only receive a grade at maximum 2 grades above your individual grade: e.g. if you score C3 in your exam and your group scores A1 in your group assignments, then your grade will be C1. You will have the opportunity to appeal this decision through the provision of evidence.
- Repeat Assessment
  - This will take the form of a 100% examination based on lectures and project work

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Let's take some time to form your teams

M.Sc. in Software Engineering
MSc in Software Development: International Systems

3 in each team

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Problem solving

- Solution to a problem to be developed through problem-based learning
- Problem based learning - PBL
  - Starting point for learning is a problem to be solved
  - Constructing and teaching courses using problems as the motivation and focus for students' activity.

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Problem-Based Learning

- Learning is student-centered
- Learning occurs in small student groups
- Tutor is present as a facilitator or guide
- Authentic problems are presented at the beginning of the learning sequence, before any preparation or study has occurred
- Problems encountered are used as tools to achieve the required knowledge and the problem-solving skills necessary to eventually solve the problems
- New information is acquired through self-directed learning

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PBL requires you to Read

- Books
- Published journal / conference papers available through library web pages
- Papers notified in class
- Reading outside class is important for your assignments and your individual reflective journal

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Discuss the module

- Why should you be taking this module?
- Comparing to other modules
  - What is different about this module?
  - What is similar about this module?
- Have you any concerns at this point?

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Problem for you to solve……

- You are working in a software development company, SDC, whose business is to develop, test and implement software packages which are required by your customers.
- A hotel manager, who knows very little about software engineering, but has used software packages in the past, has come to SDC looking for a new software system.
- The hotel are opening a restaurant and they want SDC to develop, test and implement a new system for them.
- You are the management team:
  - Name 5 stakeholders interested in this project?
  - Take 3 stakeholders and list 5 requirements for each

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Feedback to class: List these stakeholders and requirements

- Waiting staff
  - Concise orders
  - Reseravations done conveniently
  - Available to all
- Manager Restaurant
  - Updated real-time information
  - Birds' eye veiw
- Restaurant Software Manager

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Feedback to class: List these stakeholders and requirements

- On-line customer
  - Delivery information
  - Order information
  - Payment info
  - Feedback from customers
  - Menu checking
- Marketing staff
  - Customer preferences
- Stock manager

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Feedback to class: List these stakeholders and requirements

- Investors
  - Risk management
  - Performance indicators
- Housekeeping
  - Waste management
  - Easy to use
- Finance
  - Revenue / Expenditure weekly/monthly
  - Budgets

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Feedback to class: List these stakeholders and requirements

- HR
  - Qualifications
  - Experience
  - Salaries
  - Hotel policy
  - Safety measures
- Restaurant customer
  - Menu for today
  - Coupons or offers
  - Prices
- Catering staff
  - Dish information (how many, waiting time)
  - Equipment

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In summary

- You have just developed requirements for a Restaurant system
- Variety of users means
  - Variety of requirements
  - Variation in priorities

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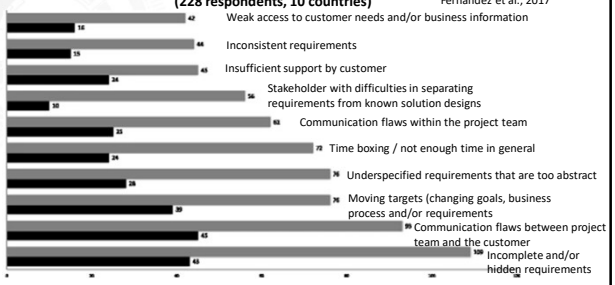
Most cited top 10 RE problems

Overall frequency (Grey)
Cause for project fail (Black)

(228 respondents, 10 countries) Fernández et al., 2017



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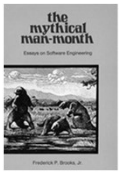
Fred Brooks

"The hardest single part of building a software system is deciding precisely what to build."

Frederick J Brooks, The Mythical Man Month, 1975, 1995, Addison-Wesley, ISBN 0-201-00650-2 (1975 ed.), 0-201-83595-9 (1995 ed.)



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Requirements information Jones, 2009

- Initial requirements are seldom more than 50% complete.
- Requirements grow at about 2% per month during development
- About 20% of initial requirements are delayed until a second release.
- There are more defects in requirements and design than there are in source code.
- About 35% of projects > 10,000 'function points' will be cancelled.
- About 50% of projects > 10,000 function points will be one year late.

But, some things never change…

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Assessment 1 (10%): What system do you want developed?

- You will work in groups of 3 people
- You are employing a contractor to develop, test and implement a system for you.
- This can be any system of your choice – your group should discuss this. It can be an information system or an app. This system will solve an existing problem for you.
- From the customer perspective, you are required to write a summary in 1200-1500 words (2-3 pages) describing (1) what currently happens (2) what the current problems are and (3) why you believe that developing a software system would solve this problem.
- You should include at least 3 diagrams
- This should be uploaded to Brightspace by 5pm, Friday Week 3.
- This summary will be given to another group for the second part of this project.

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PBL requires you to Read

- Book

https://ebookcentral.proquest.com/lib/univlime-ebooks/detail.action?docID=6927367

- I will identify chapters and sections for you to read
- There may also be papers / articles notified in class
- Recommended reading outside class is important for your assignments
- If you are not on the UL network, you need to use Forticlient

- **Software**: You can choose any Diagramming / Modelling software e.g. Diagramo.com

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Reading

Chapter 1, read to top of page 4

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Suggested reading: any one of these papers

- Daneva, M., Herrmann, A., Condori-Fernandez, N. and Wang, C., 2019. Understanding the most in-demand soft skills in requirements engineering practice: Insights from two focus groups. In *Proceedings of the Evaluation and Assessment on Software Engineering* (pp. 284-290).
- Melegati, J., Goldman, A., Kon, F. and Wang, X., 2019. A model of requirements engineering in software startups. *Information and software technology*, *109*, pp.92-107.
- Chen, F., Power, N., Collins, J.J. and Ishikawa, F., 2019, April. Contemporary requirements challenges and issues: an empirical study in 11 organizations. In *Proceedings of the 34th ACM/SIGAPP Symposium on Applied Computing* (pp. 1592-1599).
- Rodrigues da Silva, A. and Olsina, L., 2022. Special Issue on Requirements Engineering, Practice and Research. Applied Sciences, 12(23), p.12197.
- …… and the papers in this Special Issue

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References

- Jones, Capers (2009), Positive and Negative Innovations in Software Engineering, International Journal of Software Science and Computational Intelligence 1(2):20-30. DOI:10.4018/jssci.2009040102
- Fernández, D.M., Wagner, S., Kalinowski, M. et al. Naming the pain in requirements engineering. Empir Software Eng 22, 2298–2338 (2017). https://doi.org/10.1007/s10664-016-9451-7

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- Reflective Journal

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Questions? Discussion?

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Thank you

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