Professor Hausi A. Müller PhD PEng FCAE
Department of Computer Science
Faculty of Engineering
University of Victoria

http://www.engr.uvic.ca/~seng321/
https://courses1.csc.uvic.ca/courses/201/spring/seng/321

How was your reading break?

- Tue, Feb 16 (today)
  - Deliverable S1 due
- Thu, Feb 18
  - Deliverable C1 due
- Marks for S0 & C0
  - Will be posted tomorrow
- Quiz 1
  - Wed, Feb 24 in class
  - Class attendance must increase
- Midterm
  - Fri, Feb 26 in class
  - 3 mid questions today

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SENG 321 Calendar

Deliverable S0 due	Fri, Jan 22	S0 Related work	5% of project
Team website due	Tue, Jan 26	Website	5% of project
Deliverable C0	Fri, Jan 29	C0 RFP2 informal req spec	5% of project
Reading break	Feb, 8-12	No class	No labs
Deliverable S1 due	Tue, Feb 16	S1 formal req spec	10% of project
Deliverable C1	Thu, Feb 18	C1 feedback on S1	5% of project
Midterm	Fri, Feb 26	In class	14% of project

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BSENG Accreditation

- Sun-Tue, Feb 21-23
- Mon, Feb 22 – 4-5 pm in ECS 227
  - Need 10 students to talk to Canadian Engineering Accreditation Board (CEAB) site visit team
  - Sign up list

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SOFTWARE ENGINEERING

Visitor:
- Professor Behrouz Far
  University of Calgary

Site visit coordinator:
- Professor Hausi Müller
  SE Accreditation Coordinator

Back up coordinator:
- Professor Margaret-Anne Storey
  BSENG Program Director, CSC
- Kin Li, ECE

Electrical and Computer Engineering

Behrouz Far

Position:
Professor

Phone:
(403) 210-5411

Address:
ICT 543

E-mail:
far@ucalgary.ca

Biography:
AITF Research Chair in Smart Multimodal Transportation Systems,
Co-Director of AMA's Active Traffic and Demand Management Laboratory

Research Activities:
Intelligent Software Systems, Distributed Artificial Intelligence, Software Engineering

TO PROBE FURTHER — CEAB WEBSITE

Working documents for accreditation

The following documents are for higher education institutions preparing for accreditation visits.

- Complete questionnaire 2014 (Accreditation Visit Cycle 2015 - 2016)
- (ZIP file – Microsoft Excel and Word documents)
  This ZIP file is a complete package that includes the questionnaire and all required Excel data tables.
- Calendar of Events for Accreditation Visits (Accreditation Visit Cycle 2015 - 2016)
- [redacted] (Accreditation Visit Cycle 2015 - 2016)
- [redacted]
- [redacted]
- Evaluation of the Accreditation Visit Process Form
- Visiting Team Member Performance Evaluation form
- General Visitor Data Form
- Dossier Assessment Form - Notice of Significant Change
- Dossier Assessment Form - Reports
- Dossier Assessment Form - Visits
- Request for Accreditation Form
- Tracking of Program Issues: Working document
- General Visitor Manual
- General Visitor Report to the constituent association
- Visiting Team Report Template

http://www.engineerscanada.ca/accreditation-resources?page=/e/files/guideline_admission_with.pdf&from=

Accreditation Visit to University of Victoria Feb 21-23, 2016

Dr. Pemberton Cyrus, FEC, P.Eng.
Associate Dean of Undergraduate Studies
Dalhousie University

OBJECTIVES OF THE VISITING TEAM

- Conduct fact-finding on behalf of the Accreditation Board
  - Review, validate and/or add to the information provided by the host institution
- Review of materials, meetings, and facility tours to corroborate program strengths and weaknesses and bring forward issues to the CEAB
  - Describe progress toward use of graduate attributes in program assessment and improvement
- Collaborate in preparing a report of the team's findings
- **The visiting team or its members do not make any recommendations ~ accreditation decisions are made by the CEAB**

TASKS AND TOOLS

- Interviews with appropriate senior administrative officers, including the president, the dean of engineering and the chairs of the departments responsible for the programs
- Interviews with individuals and groups of faculty members to evaluate:
  - professional attitudes
  - motivations
  - morale
  - the balance of opinions concerning theoretical and practical elements of the curriculum
- Interviews with individuals and groups of students. Ask open-ended questions to get them talking
- Examine compliance with graduate attribute criteria

TASKS AND TOOLS ~ CONT'D.

- Tours of physical facilities such as laboratories, libraries, and computing facilities, to evaluate their effectiveness
- Note that the Accreditation Board does not require any Faculty to spend money - the question is whether the equipment, supplies, etc. are adequate
- A review of recent examination papers, laboratory instruction sheets, student transcripts, student reports and theses, models or equipment constructed by students and other evidence of student performance
  - Are performance expectations and grading standards appropriate?

TIMELINE AFTER VISIT

- Chair submits report to CEAB Secretariat
- Report is edited, formatted and returned with any questions to chair
- Chair may contact team members with questions
- Report finalized, sent to institution
- Institution responds and sends update
- Accreditation decision made (June or Sept mtg)
- Institution and Team members notified of decision (within month)

IF YOU SEE AN ISSUE WITH A PROGRAM

- Visit Team is on a fact-finding mission
- Institution's documentation will emphasize the positive but your direct observation may differ
- You need to verify documentation and identify discrepancies if any, to inform CEAB decision
- Add something about editing process.
- If there is an issue, the institution still has multiple opportunities to address it and improve
- Do not hesitate to dig for the full picture and describe it accurately in your report

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Download from Accreditation Website

Slide Deck includes 67 slides

Dr. Pemberton Cyrus, FEC, P.Eng.
Associate Dean of Undergraduate Studies
Dalhousie University

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Customer-Developer Links

- Mark Keil and Erran Carmel
  Customer-Developer Links in Software Development
  Communications of the ACM
  Vol. 38, No. 5, May 1995, pp. 33-44
- http://doi.acm.org/10.1145/203356.203363

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Motivation

- Why establish customer-developer links?
  - Source of good ideas for product improvements or new products
  - Mutual understanding is an important factor for project success
- How to select and establish these links?
- How to leverage and manage these links effectively?

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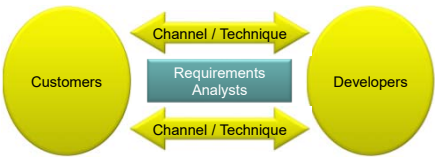
Customers, Developers & Links

- **Customer:** Users of the system
- **Developers:** People involved with the design and production of the software system
- **Links:** Techniques and/or channels that customers and developers use to exchange information



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Examples of Links

- Channels
- …
- Development techniques
- …

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Examples of Links

- Channels
  - Phone support lines
  - Email
  - Online surveys
  - Focus groups
  - Trade shows
- Development techniques
  - Rapid prototyping, participatory design, user-centered design
  - XP: on-site customer (or proxy)
  - Shared (Google) docs

"The issue that software development managers must grapple with is not *whether* customers should participate in the development process, but *how* they should participate."

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Types of Projects

➔ Impact on customer-developer links

- Package (**P**)
  - (C)OTS
  - External sale
- Custom (**C**)
  - In-house development or contracted
  - Internal use
- Many shades of gray ...

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Types of Projects

- Impact on Requirements Engineering?
  - Target customers
  - Requirements elicitation
  - Software requirement specification (SRS)
  - Criteria for project success
  - …

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Types of Projects

Development Dimension	Custom	Package
Goal	Software developed for internal use (i.e., usually not for sale)	Software developed for external use (i.e., for sale)
Typical point at which most customers are identified	Before development begins	After development ends and the product goes to market
Number of customer organizations	Usually one	Many
Physical distance between customer and developer	Usually small (e.g., customers are in same building as developers)	Usually large (e.g., customers are thousands of miles from developers)
Common types of projects	New system project; "maintenance" enhancements	New products; new versions (major and minor)
Terms for software consumer	User; end user	Customer
Common measures of success	Satisfaction; acceptance	Sales; market share; good product reviews

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Case Study

- Conducted in 1994
- 14 companies
  - Variation along industry, application area, and company size
- Structured interview of project managers
  - 2 hours, tape-recorded, later transcribed
  - 2 projects: one relatively successful, the other one relatively unsuccessful
  - 14 pairs

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Custom and Package Companies

- Custom (6):
  - Large telecom
  - Large computer company
  - Major airline
  - Major hotel chain
  - Beverage producer
  - Large manufacturer of electrical products
- Package (8):
  - Software tool developer
  - CASE tool developer
  - IDE developer
  - Producer of Unix tools
  - Financial SW developer
  - Manufacturing SW developer
  - Office automation developer
  - SW branch of large hardware vendor

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Case Study

- Hypothesis: Greater customer participation leads to more successful software projects
  - Count the number of links involved in a project
  - Estimate the success of a project
- Inventory of 15 C-D links
  - Fairly comprehensive
  - All links discussed in interviews

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Identified C-D Links (1/2)

Link	Custom	Package
Facilitated Team	√	
MIS intermediary	√	
Support line	√	√
Survey	√	√
UI prototyping	√	√
Requirements prototyping	√	√
Interview	√	√
Testing	√	√

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Identified C-D Links (2/2)

Link	Custom	Package
Email/bulletin board	√	√
Usability lab	√	√
Observational study	√	√
Marketing and sales		√
User groups		√
Trade show		√
Focus group		√

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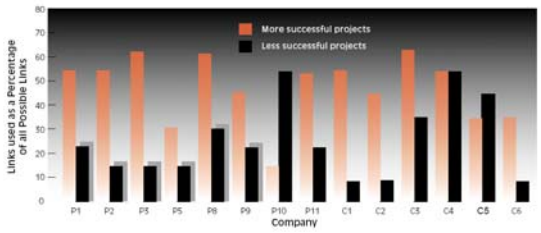
Project Success ↔ C-D Links



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Lessons Learned
More Links Are Better

- More links are better
  - Err on the side of providing more rather than fewer links
- But each additional link adds less value
  - Law of diminishing marginal returns

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Lessons Learned
More Links Are Better

- Successful projects: 5.4 C-D links
- Unsuccessful projects: 3.2 C-D links
- Statistically significant: paired t-test, $p < 0.01$
- Anecdotal evidence from project managers
- Rule of thumb: 4..7 C-D links

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Direct vs. Indirect Links

- Direct links
  - Direct contact between customer and developer
  - Decreases filtering and distortion
  - Richer communication (body language in face-to-face communication)
  - Particularly important when there are high levels of ambiguity

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Direct vs. Indirect Links

- Indirect links
  - Customer and developer do not deal directly with one another
  - Communication through intermediaries or customer surrogates
  - Some C-D links are inherently indirect
    - Marketing and sales link

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Ex: Supervisors as Surrogates

- Customer support system for centralized distribution center
- Developers were instructed by the customer to gather requirements only from supervisors rather than workers

> *We had union issues to deal with. We were actually shutting down shipping facilities and consolidating them into one distribution center. Plants were losing certain jobs. It was all very hush hush…a secretive project. So the core group [of supervisors] that continued to meet was instructed to keep this under their hat and not to let it out [to the workers]. Unfortunately, we never involved the people who would be using the system. They were not aware of the project and there was no ability for them to come back and say: "Hey, you haven't thought about this or that." It was shoved down their throats.*

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Lesson
Reduce Reliance on Indirect Links

- Problems of indirect links
  - Intermediaries intentionally or unintentionally filter and distort messages
  - Intermediaries may not have a complete understanding of customer needs
  - Meetings are less effective if attended by
    - Customers: buyers rather than users
    - Suppliers: marketers rather than developers

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Lesson
Reduce Reliance on Indirect Links

- Anecdotal evidence from interviews:
  - Use of indirect links were seen as a significant factor in explaining why projects failed

> *The person who helped us define the requirements was an MIS intermediary who had been involved with the programming of [another application on the same hardware] in a different area of the business. From a usability/functionality standpoint, the MIS intermediary didn't have much knowledge…**she wasn't a very good user** [emphasis added] because she didn't understand the complexities of what they were asking for.*

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Lesson
Reduce Reliance on Indirect Links

- Web of intermediaries
  - As many as 6 layers
- Despite the problems with indirect links they are frequently relied upon
  - MIS intermediaries used in 7 of 12 projects
  - Unsuccessful projects: 10 of 14 companies used 0 or 1 direct link
- Rule of thumb: Have multiple direct links

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Rating of C-D Links

Custom Company

Customer-developer Link	Mean Rating	Number of Projects
Facilitated Teams	5.0	4
User-Interface Prototyping	4.0	5
Requirements Prototyping	3.6	5
Interviews	3.5	4
Testing	3.0	3
MIS Intermediary	2.8	4
Email/Bulletin Board	2.5	3

Package Company

Customer-developer Link	Mean Rating	Number of Projects
Support Line	4.3	8
Interviews	3.8	6
User-Interface Prototyping	3.3	3
User Group	3.3	4
Requirements Prototyping	2.8	4
Testing	2.8	6
Marketing and Sales	2.8	9
Trade Shows	2.5	4

Rating: 1 = very ineffective; 5 = very effective

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