Systeemontwikkelingsmethoden
Introductie

Hans Philippi

September 9, 2019

A good start ... (bron: nrc.nl)

ICT-project basisregistratie totaal mislukt

Modernisering bevolkingsregister

Minister Plasterk stopt groot project voor modernisering van het bevolkingsregister, na vele waarschuwingen en advies van een commissie. 90 miljoen lijkt weggegooid.

Liza van Lonkhuyzen 7 juli 2017

A good start ... (bron: nrc.nl)

Wéér faalt een ICT-project van de overheid

Minister Carola Schouten stopt met het zoveelste geflopte ICT-project van de overheid. De Raad van State vindt dat de politiek te veel goochelt met termen. En Hugo de Jonge houdt van het debat.

Wouter van Loon 16 april 2019

Leestijd 1 minuut

ICT-FLOP: Weer een ICT-project van de overheid dat mislukt. Het ging eerder mis bij de rechtspraak, de

Introduction

Question: why do ICT-projects fail so often?

Introduction

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- Bad programmers?
- Bad management?
- Bad . . . ?

Introduction

So you have done some programming ...

Levels of abstraction

- You already know how to write individual lines of code:

  ```
  for(i=0; i<n; i++)
  ```

- Code is organized into methods:

  ```
  public bool isEmpty()
  ```

- Methods are organized into classes:

  ```
  public class Student...
  ```

Beyond the `for` loop

In this course you will learn how to design great software:

- that is clearly structured

Beyond the `for` loop

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- that is easy to modify and maintain

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- that is clearly structured
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- that makes your customers happy ...

Beyond the `for` loop

In this course you will learn how to design great software:

- that is clearly structured
- that is easy to modify and maintain
- that makes your customers happy ...
- ... which is not that obvious

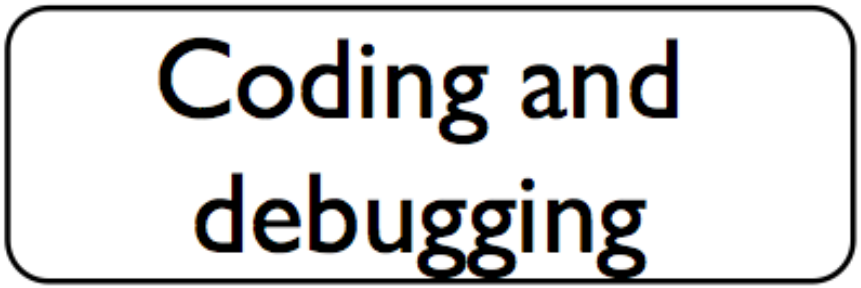
Introduction

Question:

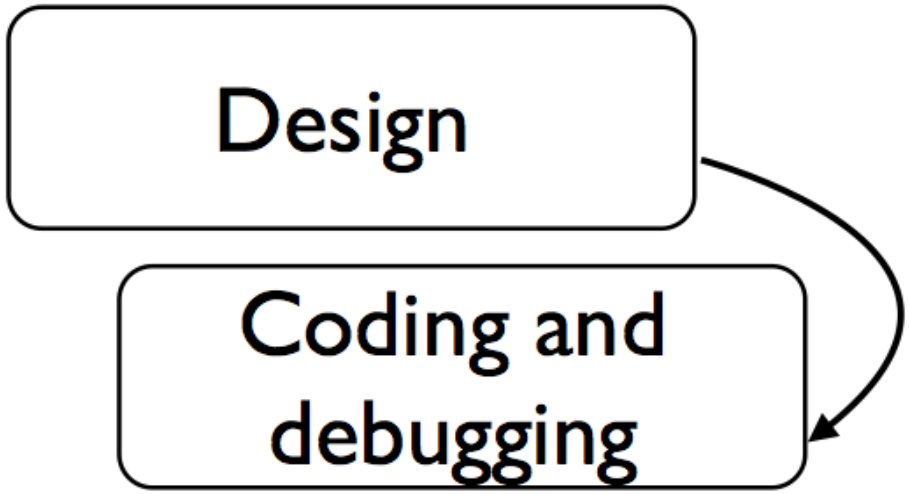
which phases may we identify in an ICT-project . . . ?

. . . and where could/will things go wrong?

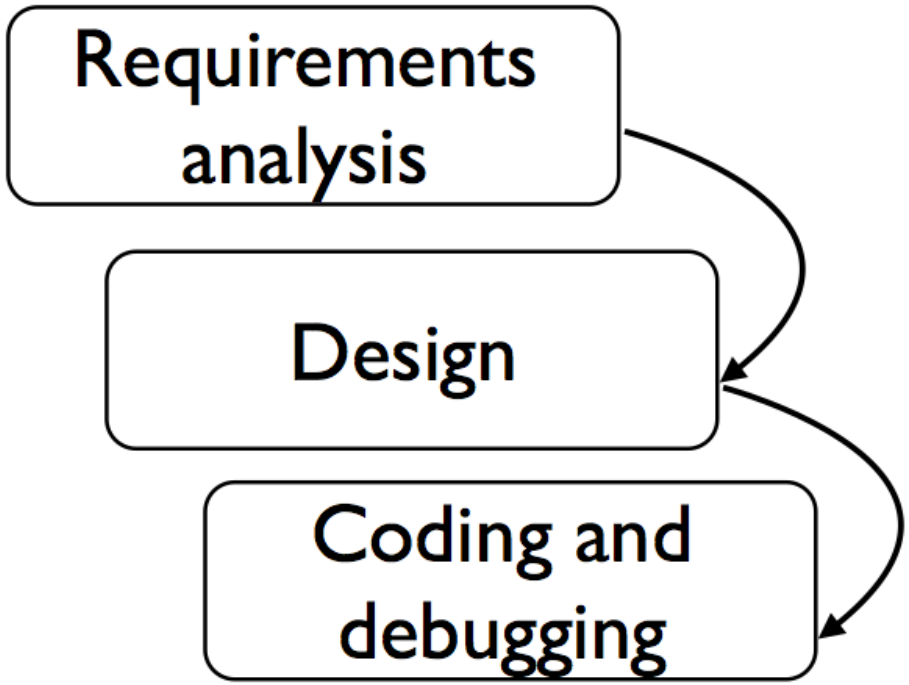
Phases



Phases



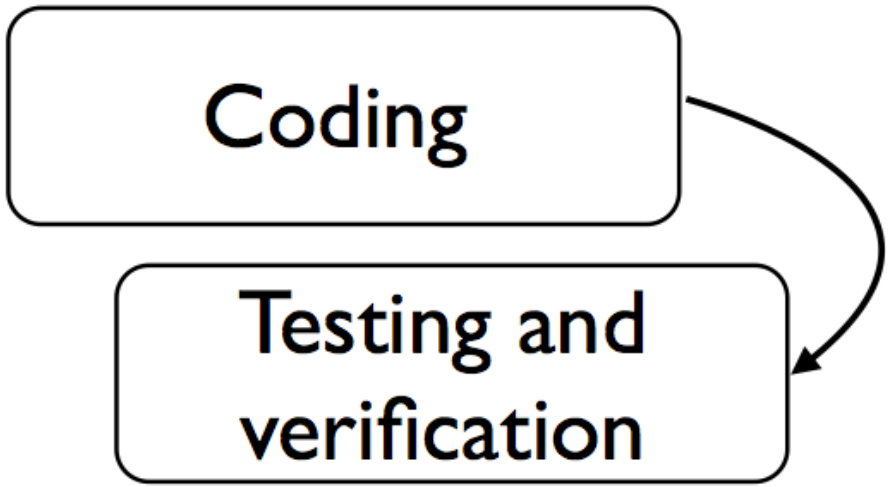
Phases



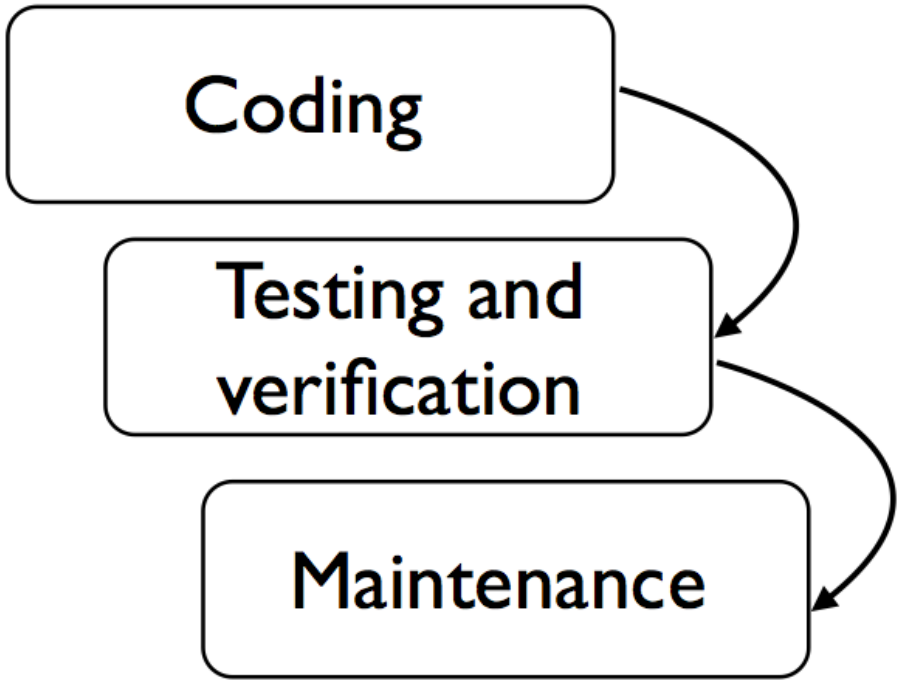
Phases

But once I've finished coding something, I'm done. Right?

Phases



Phases



Software construction

There is much more to
software construction
than just programming

And it is hard to overestimate the volume and importance of *maintenance*

MSO

- This course assumes you know about for-loops, assignments, methods, and objects
- We will teach you to apply this knowledge to organize code into *great software* that makes your customers happy

Topics

- SOM is a course that used to be shared by Information Science and Computer Science students (under the name MSO)
- This historical fact will remain visible in the naming of material (clips, slides)
- What should this course cover?
- Technical? Sociological? Programming? Modeling?
- Object oriented *analysis* and *design* !

Object oriented analysis

- Before you start designing software, you need to determine what to build
- *Analysis* is the process of discovering, documenting and maintaining the requirements of a software system
  - Figuring out what the problem is
  - What does the customer want?
  - How can I translate a customer's wishes to a software design?
  - ...
  - By the way, who is the customer?

Analysis: who are the stakeholders?

- By the way, who is the customer in the case of the *bevolkingsregister*?

Analysis: who are the stakeholders?

- By the way, who is the customer in the case of the *bevolkingsregister*?
- The clerk?

Analysis: who are the stakeholders?

- By the way, who is the customer in the case of the *bevolkingsregister*?
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- The citizen?

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- The municipal authorities?

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- The national government?

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- The citizen?
- The municipal authorities?
- The national government?
- ... ?

Object oriented design

- How should I organize code into classes?
- Which classes are related?
- How are classes related?
- What are the properties of a good design?

Analysis and design

- This course teaches both *analysis* and *design*
- *Analysis* is a 'soft skill' – talking to customers and figuring out what they want
- *Design* is more technical – figuring out the right high-level structure of your code

SOM for IS students

Anonymous IS student:

"Why is this course interesting for me?
As a project manager, I'll never have to program myself."

SOM for IS students

Close your eyes and
picture your most beautiful memory

Now imagine having to commission an artist to paint that memory ...

To catch the atmosphere
of that beautiful memory,
you want an impressionist style painting ...

SOM for IS students

So you will have to communicate with that artist ...

in French

The metaphor

- There is a huge difference between having a great idea for a software product. . .
- . . . and implementing it
- The only way you will ever succeed in getting the implementation you want, is if you learn to *communicate* clearly with software developers
- Communication requires speaking the same language and requires knowing the same concepts

SOM for IS students

- This course will teach you how to translate a customer's wishes to a concrete design that developers can implement
- You will learn the *language* to communicate high-level ideas to developers
- It will teach you what constitutes good design and help you identify good developers

Course organization

- Lectures – theory
- ...

Course organization

- Lectures? What lectures?

Course organization

- Lectures ? What lectures?
- Clips!
  - Watch them when you want
  - Watch them again and again (if you want)
  - Go back a minute and watch again
  - Watch them slowly
  - Watch them quickly

Course organization

- Still questions after watching clips?
- Mail your questions to me (h.philippi@uu.nl) ...
- ... before Monday evening of the next week...
- ... so we can discuss your questions on Wednesday
- Take care of the subject format when emailing:
- ... [INFOMSO vragen week 37]
- In general, we have no classroom sessions on Friday 11:00 - 12:45 ...
- ... but there are few exceptions
- See course info on blackboard

Course organization: reflectiecollege

- What do we do on Wednesday?
- First we will discuss your questions about the topics of last week
- This might/will lead to an in depth treatment of the more advances issues
- Next we will do some quizzes ...
- ... that give you feedback about your level of understanding
- This approach can be very fruitful when you are participating actively ...
- ... but is far less effective when you don't
- The choice is up to you

Regular assignments: the carrot and the stick

- There are four exercises that you must submit
- Each exercise will be marked on the scale: A; B; D; F
- If you score AABB or better, you will receive an extra 0.5 on your final project
- If you have no F's, but you score BBDD or worse, you will lose 0.5 on your final project
- If you fail two exercises (F), you will fail the course
- If you fail one exercise, you will be given the opportunity to complete a remedial exercise (*'herkansing'*), provided your final mark (rounded) for the whole course is at least a 6

Final mark

- One midterm exam (20%)
- Final exam (50%)
- Design project (30%)

Material

- Shalloway and Trott, *Design Patterns Explained*, 2nd edition, Addison Wesley
  - Code uses Java (but there is almost no code in the book)
  - C# code available from the book's website
- Larman, *Applying UML and patterns*, Prentice Hall (slides and schedule refer to the second edition)
- Additional online resources
- Clips, slides, exercises, example code
- We will make use of a GitHub repository

Who, what, where?

- Lecturer and lab supervisor: Hans Philippi
- Lab assistants