

TB141 – ICT System Engineering and Rapid Prototyping

Formative Assignment - Programming Languages

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Learning Objectives

- Identify the different steps in a software development processes
- Recognize the characteristics of the most used software development processes
- Recognize strengths and weaknesses of the different software development processes
- Identify the constraints related to practical implementation of the software development processes
- Identify the impact of a change in requirements on the software development process

Introduction

IT-Formativo, a company specialized in software development, has recently accepted two new development projects. However, as all their consultants are overwhelmed with work, they requested some assistance from TUDelft, in order to determine the best development process for the problem at hand.

Project Uno

The first project (codename Uno) requires the development of a budgeting application integrating the financial data of the end-users living in the European Union. As such, the application needs to comply with strict regulations from both the EU and the different countries in which the application will be launched. These regulations have been analyzed by the legal team of IT-Formativo, which produced a set of documents to be implemented. The stakeholder behind project Uno has already a clearly defined budget for the project, a defined graphic and brand identity as well as a precise roadmap for the launch of the application on different markets.

Project Due

The second project (codename Due) is developed in collaboration with a small non-profit association collecting second-hand clothes. The association would like to develop a small application to keep track of the inventory of clothes that have been gifted to them and to have an easy way to visualize its stocks as well as to track the shipping of the clothes to the warehouse. The members of the non-profit are non-tech savvy volunteers, which have provided some specifications for the application during an introductory meeting. Ideally, they would like to have access as soon as possible to the application, but they will be willing to tolerate some delays in the development.

0.1 Code examples

LISTING 1 – Python example

```
1  import numpy as np
2
3  def incmatrix(genl1,genl2):
4      m = len(genl1)
5      n = len(genl2)
6      M = None #to become the incidence matrix
7      VT = np.zeros((n*m,1), int) #dummy variable
8
9      #compute the bitwise xor matrix
10     M1 = bitxormatrix(genl1)
11     M2 = np.triu(bitxormatrix(genl2),1)
12
13     for i in range(m-1):
14         for j in range(i+1, m):
15             [r,c] = np.where(M2 == M1[i,j])
16             for k in range(len(r)):
17                 VT[(i)*n + r[k]] = 1;
18                 VT[(i)*n + c[k]] = 1;
19                 VT[(j)*n + r[k]] = 1;
20                 VT[(j)*n + c[k]] = 1;
21
22     if M is None:
23         M = np.copy(VT)
24     else:
25         M = np.concatenate((M, VT), 1)
26
27     VT = np.zeros((n*m,1), int)
28
29     return M
```

Assignment

We ask you to analyze the considered situations and determine the most appropriate software development process for the problem at hand among those presented during class.

Make sure to include in your solution:

- A schema describing the sequence of the different software development activities
- A brief text (1-2 paragraphs maximum) describing, for each activity in your solution, the details of the operations that need to be performed
- A paragraph motivating why the chosen approach is the preferred one for the considered problem
- A paragraph indicating at least one example of requirements change for the considered project, and how the proposed software methodology could react to it.

Self-evaluation grading rubric - 10 pts

Criterion	0 pts	1 pts	2 pts
Identify the different steps in a software development processes	Missing/wrong steps	Partial identification of the steps	Complete identification of the steps
Recognize the characteristics of the most used software development processes	Missing/wrong details in characterization	Partial characterization	Detailed and structured characterization
Recognize strengths and weakness of the different software development processes	Missing/wrong strength/weaknesses analysis	Partial strength-/weaknesses analysis	Detailed and structured strength-/weaknesses analysis
Identify the constraints related to a practical implementation of the software development processes	Missing analysis of the constraints	Partial analysis of the constraints	Detailed identification of the constraints
Identify the impact of a change in requirements on the software development process	Missing analysis of the impact	Partial analysis of the impact	Detailed analysis of the impact

Rules for the assignment delivery

To be read carefully !

1. The assignment must be developed in groups of 2 students.
2. The assignment must include **your name** and **student id**.
3. The assignment must be submitted in **Brightspace** as a **PDF report**.
4. You have to follow the:
 - Upload of a file `FamilyName1_StudentID1_FamilyName2_StudentID2.pdf` on the course Brightspace.
 - Date: **Wednesday 16 February 2022**
 - Time: **Before 23:59**

After these deadline the assignment will be considered as late and **will not be corrected**.

5. **Knock-off criteria:**

- Missing names and id on the document/document name.
- Document exceeding the number of requested pages.