Balancing Value and Modifiability when Planning for the Next Release

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MOTIVATION:

- Inevitable changes in requirements.
- Changing requirements is one of the major causes of software projects failure.
- Features dependencies can be used to predict systems’ modifiability.
- Current release planning techniques don’t consider future modification effort.

RESEARCH PROBLEM:

The research is conducted in the context of next release problem (NRP) of evolving systems by addressing two competing criteria:

1. Inclusion of the best set of features in terms of their balance between values, risk, and effort.
2. Inclusion of a set of features which are attractive in terms of their impact on system’s modifiability.

Research problem: “Perform a trade-off analysis between the added value provided by new features and their predicted impact on system’s modifiability”

OBJECT ORIENTED FEATURE MODELING (OOFEM)

1. In order to estimate features impact on system modifiability, we consider their intra- and inter-structural properties.
2. As a feature is a set of cohesive requirements, we apply the concept of object orientation to the features domain.

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R6.1 Effort estimation
R6.2 Product line RP
R6.3 Resource planning

O6.1.1 Create cases for effort estimation
O6.1.2 Provide cases to project manager

R3.1 Generating solution based on different criteria
R3.2 Generating plans based on features
R3.3 Ranking without release plan
R3.4 Trade-off analysis

O3.1.1 Generate solution based on individual stakeholder
O3.1.2 Generate solution based on risk
O3.1.3 Generate solution based on value

R1.1 Voting
R1.2 Enforced prioritization
R1.3 Standard prioritization

O1.1.1 Vote based on value
O1.1.2 Vote based on risk

R8.1 Archiving project data
R8.2 Restoring project data

O8.1.1 Select project data
O8.1.2 Download project data

Feature dependency
requires

UML artifact
Association (arrow)
Association with cardinalities
Inheritance

<<Feature>>

f(1)
Stakeholder voting

requires
RR-1 Voting
RR-2 Enforced prioritization
RR-3 Standard prioritization

<<Feature>>

f(6)
Extended planning

requires
RR-6.1 Effort estimation
RR-6.2 Product line RP
RR-6.3 Resource planning

<<Feature>>

f(3)
Planning

requires

RR-3.1 Generate solution based on different criteria
RR-3.2 Generate plans based on features
RR-3.3 Generate solution based on risk
RR-3.4 Trade-off analysis

RR-8.1 Generate solution based on individual stakeholder
RR-8.2 Generate solution based on value

RR-1.1 Create cases for effort estimation
RR-1.2 Provide cases to project manager

RR-6.1 Create cases for effort estimation
RR-6.2 Provide cases to project manager

RR-8.1 Select project data
RR-8.2 Download project data