Visual Analytics for Software Requirements Engineering

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Take-Away Messages

Visualizations by themselves are not sufficient; What is also needed is to make the visualizations truly interactive so that the requirement's analyst can directly manipulate them in real time during the decision making process.

Objectives

1. Development of an RE-oriented Visual analytics framework
2. Evaluation of existing VA approaches by applying the framework
3. Advancement of the literature through building VA capabilities that can produce end-to-end values.

Contributions

1. Visual analytical framework for requirements engineering
2. ReCVisu+ tool that helps to keep requirements on track
3. Industrial case study

Problems

1. Most of the existing visual analytics techniques are still not capable of delivering end-to-end (from data to decision) values to the practitioners.
2. Lack of understanding about how visual analytics solves RE practitioners needs.

Visual Requirements Analytics Framework
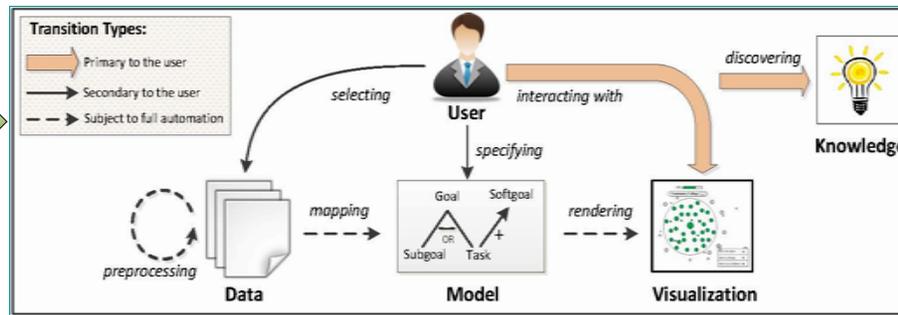
Problems addressed

1) Keeping requirements on track.
2) Data-to-decision making.
3) Requirements management.
4) Assessing existing VA techniques for RE.
5) VA support for RE tasks.
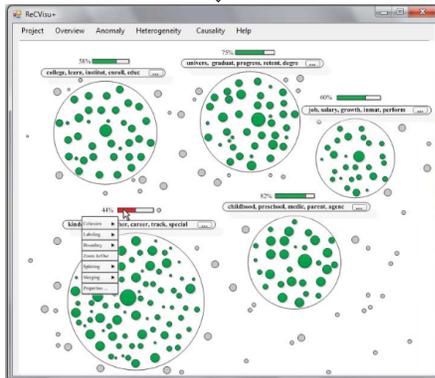
ReCVisu+

Case Study Results

We identified four RE tasks that are need of VA support.
1. Overview
2. Anomalies handling
3. Heterogeneity
4. Causality reasoning

Progress

1. Identified three categories of automated labeling techniques: cluster-internal, differential, and hybrid.
2. Developed a tool for clustering-based visual exploration of requirements.
3. VA framework of RE.

Future Work

1. Refinement of the ReCVisu+ design and developing more advanced features to perform causality reasoning.
2. To conduct more empirical studies to quantify the costs and benefits of VA supports for RE.

References

[1] N. Niu, S. Reddivari, and Z. Chen, "Keeping requirements on track via visual analytics," in Requirements Engineering Conference (RE), to appear, 2013.

[2] S. Reddivari, Z. Chen, and N. Niu, "ReCVisu: A tool for clustering based visual exploration of requirements," in Requirements Engineering Conference (RE), 2012, pp. 327–328.

[2] N. Niu, S. Reddivari, A. Mahmoud, T. Bhowmik and S. Xu. Automatic Labeling of Software Requirements Clusters. In *SUITE, 2012*, pp 17-20.