A Requirements Engineering Framework for Analyzing and Designing Acceptance through Gamification

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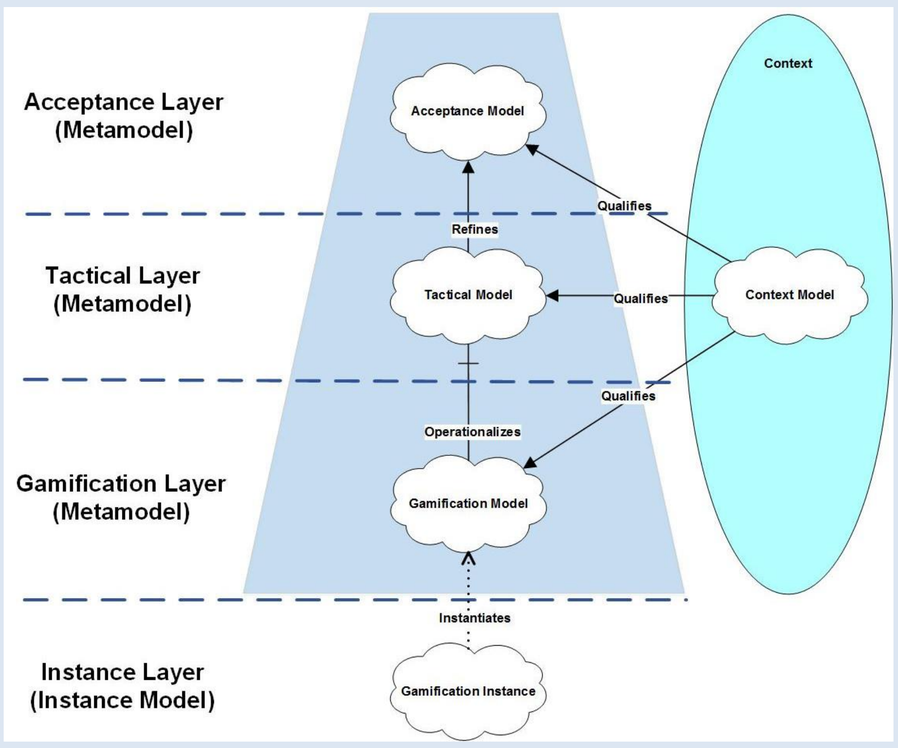
Agon: An Acceptance Requirements Framework for designing gamification solutions

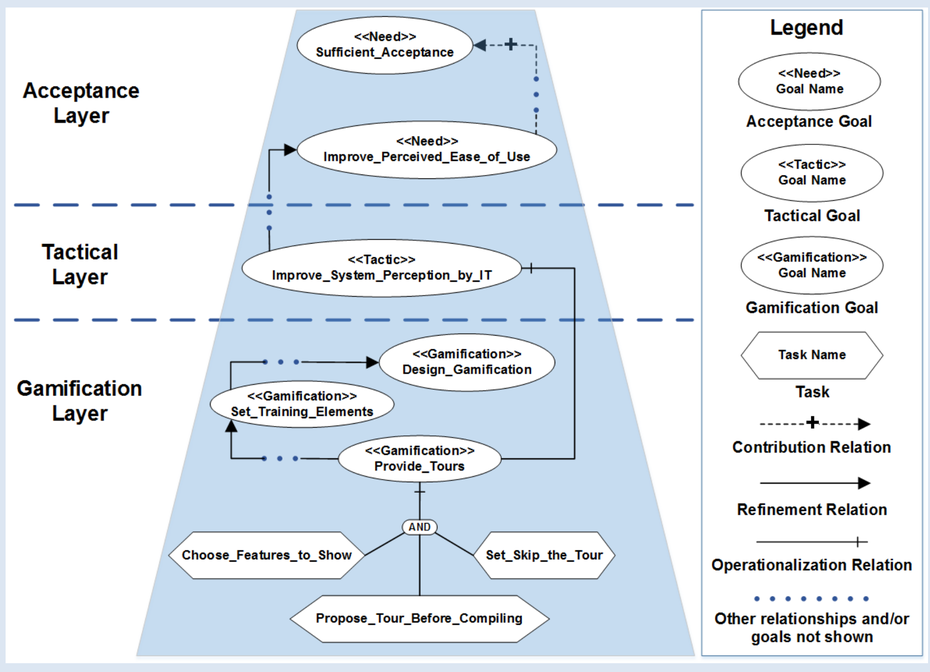
We live in the days of **social software** where **social interactions**, from simple notifications to complex business processes, are supported by software platforms such as Facebook and Twitter. But for **any social software to be successful, it must be used by a sizeable portion of its intended user community**. Usage requirements are usually referred to as **Acceptance Requirements** and they have been studied in the literature both for general technology as well as software. Operationalization techniques for such requirements often consist of making a game out of software usage where users are rewarded/penalized depending on the degree of their participation. The game may be competitive or non-competitive, depending on the anticipated personality traits of intended users. Making a game out of usage is often referred to as **Gamification**, and gamification has attracted huge attention both in the literature and in the market for the past few years because it offers a novel approach to software technology usage.

My research proposes a generic framework for designing gamified solutions for acceptance requirements. The framework, called **Agon** (Agon in Greek means “game” or “competition”, as in Olympic Games), consists of **a generic acceptance goal model** that characterizes the problem space by capturing possible refinements for acceptance requirements, and **a generic gamification model** that captures possible gamified operationalizations of acceptance requirements. These models have been extracted from the literature and they are **highly dependent on context (cognitive and social) elements of the intended user community**. The proposed Acceptance Requirements Framework is illustrated with the **Meeting Scheduler exemplar** and validated by the **Horizon 2020 European Project called Participatory Architectural Change MAnagement in ATM Systems (PACAS, http://www.pacasproject.eu/)**.

Agon: the metamodel, abstraction layers and the context

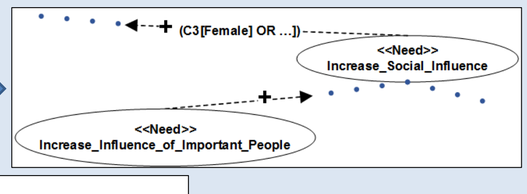


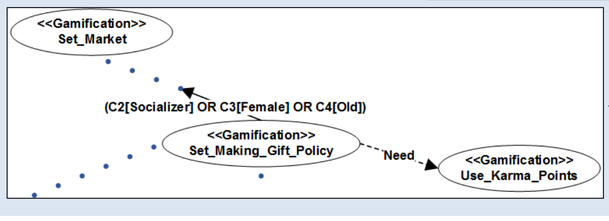
An example



Context Dependent Rules examples

Example from the acceptance model





Example from the gamification model

Models of the framework

- **Acceptance model –** encompasses several models from the literature: Unified Theory of Acceptance and Use of Technology (UTAUT), the Technology Acceptance Model 2 (TAM2), …
- **Gamification model –** point systems, badges, leader–boards, levels, paths, …; best practices/guidelines
- **Tactical model –** captures alternative tactics for fulfilling acceptance requirements by using gamification requirements; provides our framework with enough flexibility to add alternative solution models (serious games model, tangible incentives model, …)
- **Context model -** User Context Model and Context Dependant Rules: critical user dimensions, adopted from the literature that in the real life make difference in the way of people reacting to acceptance and gamification techniques
- **Statistics**: **270 goals**, **376 relationships** (refinements, operationalizations, positive/negative contributions, …)
- **Full models:** https://pirasluca.wordpress.com/home/acceptance/

The design process

- Initial Requirements Model
- Context Characterization
- Context–Based Reasoning over Acceptance
- Requirements Selection
- Context–Based Reasoning over Gamification
- Gamified Operationalization

On-going work

- development of a tool to support the design process
- improvement of models and process (https://pirasluca.wordpress.com/home/acceptance/)
- evaluation (PACAS European Project, classes, real case studies, heterogeneous fields)

Future work

- alternative operationalizations for acceptance requirements - serious games, tangible incentives, game metaphors, etc.)
- adaptive gamification solutions
- additional dimensions/characterizations

Conclusions

- **Preliminary contributions**:
  - Framework for systematically dealing with acceptance requirements by using gamification techniques
  - Metamodels: acceptance requirements, gamification requirements, tactical requirements, context model and context dependent rules (as annotations)
  - Design process for incrementally generating gamified solution
  - Preliminary evaluation with 2 case studies (i. Doodle-like meeting scheduler exemplar; ii. **P**articipatory **A**rchitectural **C**hange M**A**nagement in ATM **S**ystems (**PACAS**), http://www.pacasproject.eu/)

Acknowledgements

This project has received funding from the SESAR Joint Undertaking under grant agreement No 699306 under European Unions Horizon 2020 research and innovation programme. **P**articipatory **A**rchitectural **C**hange M**A**nagement in ATM **S**ystems (**PACAS**), http://www.pacasproject.eu/.

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