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Exploring RE Knowledge for Gamification: Can RE Achieve a High Score?

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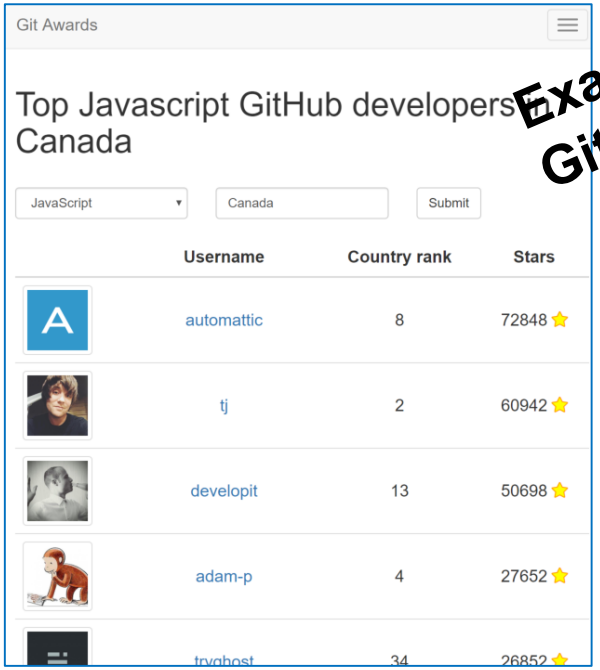
SUPERSEDE

Gamification is a trending tool for affective computing in professional tasks, including software engineering and requirements engineering tasks



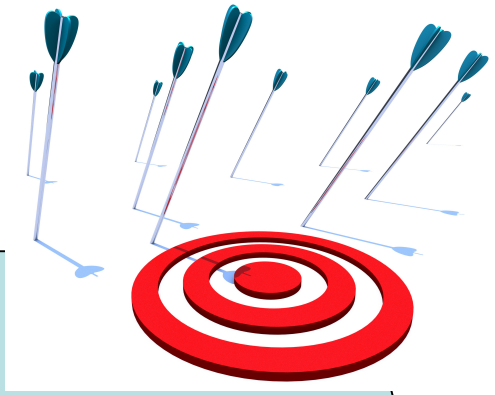
Example GitHub

http://git-awards.com/users?country=united+states

“Poor game design is one of the key failings of many gamified applications today.”

“80% percent of current gamified applications will fail to meet business objectives…”

Gartner Press Release, Nov. 27, 2012, http://www.gartner.com/newsroom/id/2251015



DMGame example

Home Dashboard SUPERSEDE Decision Making App Welcome, test_game_int test_game_int 4 Logout

Votes	Accomplishment Percentage	Position in voting	Status	Agreement Index	Total Points	
5	25 %	1	Not complete	1		
+5pt	+2pt	+5pt	-20pt	+20pt	12	

Filter by criteria:

Available actions | Finished actions

Comparison Criteria	First Requirement	Select your vote	Second Requirement	
Development effort	L'utente può visuali...	9 7 5 3 1 3 5 7 9	In caso di problemi...	Vote
Development effort	Per meglio discrimi...	9 7 5 3 1 3 5 7 9	In caso di problemi...	Vote
Development effort	Sarà possibile per l'...	9 7 5 3 1 3 5 7 9	Per meglio discrimi...	Vote
Development effort	L'utente potrà sceg...	9 7 5 3 1 3 5 7 9	Per meglio discrimi...	Vote
User value	L'utente potrà sceg...	9 7 5 3 1 3 5 7 9	In caso di problemi...	Vote
User value	Per meglio discrimi...	9 7 5 3 1 3 5 7 9	L'utente può visuali...	Vote

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Existing approaches for gamification…

…make use of aspects from different disciplines, but have a strong focus on design

…ignore requirements knowledge (e.g., “emotional requirements”)

…lack requirements validation capabilities

Need for structured process for performing requirements elicitation and analysis that supports gamification design and consider requirements knowledge

But: **Effort** for inventing a new approach?!?!

You don't have to reinvent the wheel
RE provides processes, concepts, methods and tools that can support the gamification of software applications

Proposed Design Framework*

Phases (1-4)/Methods	1. Early exploration	2. Problem identification	3. Envisioning	4. Evaluation
UCD methods	Contextual inquiries	Definition of personas and scenarios	Participative workshops to develop envisioning scenarios	Scenarios discussion with the stakeholders, meCUE
Communication/ Integration tools	Descriptive table (narrative)	Personas and scenarios	Narrative technological scenarios and storyboards	Narrative description, storyboards, meCUE questionnaire
	Actor-Action-Resource-Goal Analysis	Critical aspects identified thanks to personas and scenarios	Positive-negative contributions	Positive-negative contributions, means-ends analysis
GO methods	Domain knowledge, early actor modeling	Early requirements phase	Late requirement phase	System goals operationalization refinement

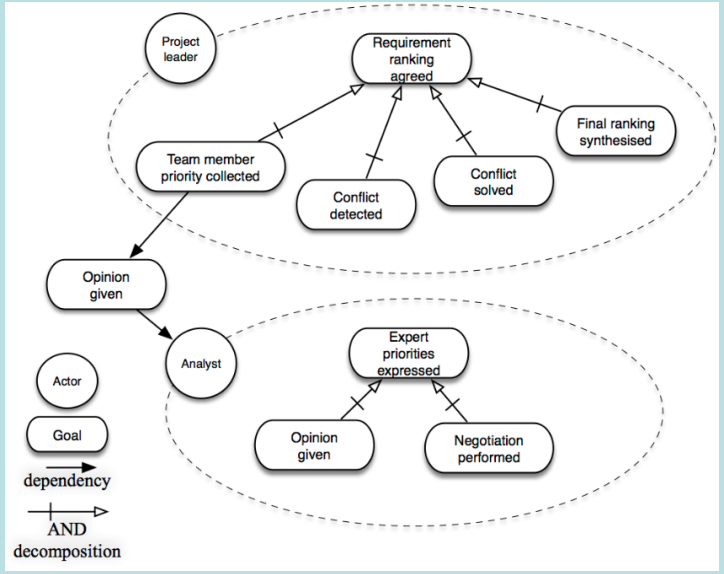
*adapted from: [15] C. Leonardi, L. Sabatucci, A. Susi, and M. Zancanaro, "Ahab's Leg: Exploring the issues of communicating semi-formal requirements to the final users," CAiSE 2010, pp. 455–469, 2010.

Proposed Design Framework
Phase 1: Early exploration

Phases (1-4)/Methods	1. Early exploration
UCD methods	Contextual inquiries
Communication/ Integration tools	Descriptive table (narrative)
	Actor-Action-Resource-Goal Analysis
GO methods	Domain knowledge, early actor modeling

UCD allows to define the context through contextual inquiries techniques allowing to discover the actors, goals, tasks in the domain.

GO DMGame example



Proposed Design Framework
Phase 2: Problem identification

Phases (1-4)/Methods	2. Problem identification
UCD methods	Definition of personas and scenarios
Communication/ Integration tools	Personas and scenarios
	Critical aspects identified thanks to personas and scenarios
GO methods	Early requirements phase

UCD to highlight the main domain problems the actors face ("as-is")

GO for representing the roles involved, their dependencies and the problems identified in the domain that can threaten the accomplishment of the goals.

DMGame example

"**boring nature** of the decision-making task might negatively influence to goal achievement"

Proposed Design Framework
Phase 3: Envisioning

Phases (1-4)/Methods	3. Envisioning
UCD methods	Participative workshops to develop envisioning scenarios
Communicati-on/ Integration tools	Narrative technological scenarios and story-boards
	Positive-negative con-tributions
GO methods	Late requirement phase

UCD to model and propose technological solutions ("to-be") that can achieve the goals and resolve the problems identified

GO modeling of the "to-be" system with its goals, tasks and resources

DMGame example

A "**countdown timer**" in the DMGame might make the decision-making task more challenging and produce more positive emotions for the players.

Proposed Design Framework
Phase 4: Evaluation

Phases (1-4)/Methods	4. Evaluation
UCD methods	Scenarios discussion with the stakeholders, meCUE
Communicati-on/ Integration tools	Narrative description, storyboards, meCUE questionnaire
	Positive-negative con-tributions, means-ends analysis
GO methods	System goals operatio-nalization refinement

UCD to evaluate the resulting set of requirements, and the envisaged gamified solution

Refinement of GO modeling of the "to-be" system with its goals, tasks and resources

DMGame example

Develop / Adapt questionnaire to test the **effect** of the countdown timer element on DM Game players' experience and behavior

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Conclusions and next steps

Existing approaches which allow for gamification mainly focus on design aspects and provide limited support for several issues which can be related to RE

We therefore recommend to use methods and tools available in RE to fill this gap as shown in the proposed design framework

Phases (1-4)/Methods	1. Early exploration	2. Problem identification	3. Envisioning	4. Evaluation
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GO methods	Domain knowledge, early actor modeling	Early requirements phase	Late requirement phase	System goals operationalization refinement

Application and refinement of the proposed framework in case studies needed

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