

Gamification

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Plan

- Main topics: Gamification and Acceptance Requirements
- (2 hours) 15th May: Gamification
- **(3 hours)** 17th May: Acceptance Requirements through Gamification Solutions
- **(3 hours)** 29th May: Tutorial as an experiment

What do we learn in this part of the course?

- **How to analysis and design a system maximizing the probability that the user will accept and use it**
- **Acceptance:**
 - **Acceptance Requirements Analysis** -> Human Behavior, Psychology, cognitive, Organizational Behavior factors and strategies -> **Acceptance Factors** and **Acceptance Strategies**
- **Gamification:**
 - **Gamification Analysis and Design:** gamification concepts, guidelines, best practices

What do we learn in this part of the course?

- (2 hours) 15th May -> **Gamification:**
 - how to gamify a system
 - gamification design: concepts, strategies and best practices
- (3 hours) 17th May -> **Acceptance Requirements:**
 - actually, there is even more than gamification -> different solutions
 - Acceptance Factors
 - Acceptance Strategies
 - Systematic Acceptance Requirements Analysis

What do we learn in this part of the course?


- **(3 hours) 29th May -> Tutorial on Agon: an Acceptance Requirements Framework**
 - Acceptance Requirements Elicitation and Analysis
 - Operationalization by using Gamification
- **Tutorial details:**
 - Case study -> simple system to gamify
 - Acceptance Model
 - Gamification Model
 - Visio 2016

Visio 2016 Instructions

- Go here: <https://icts.unitn.it/microsoft-imagine>; in the bottom of the page there is the link to **Microsoft Imagine** where you can download **Visio 2016**
- You (as UniTn student) are affiliated with Microsoft and you can download Microsoft software for free
- Try to login in the Microsoft Imagine website with your UniTn account. It could not work the first time because, probably, your account needs to be activated by UniTn technicians in relation to the Microsoft Imagine website.
- If you cannot login, ask the UniTn technicians to provide you with a Microsoft Imagine account or enable your UniTn account. You can do this by opening a ticket in the **OTRS widget** in **MyUniTn** (if the widget is not available, search it and add it in your dashboard).
- **ATTENTION:** UniTn technicians could answer you also with a delay of 1 week, therefore, do this in advance in order to have Visio 2016 ready for the **experiment of 29th May**.
- When you are able to login in Microsoft Imagine download **Visio 2016**
- You will receive also a license key
- Install Visio 2016 and run it -> Enter in the software your license key -> DONE



Why OIS and gamification?

- **(Some/Most) (Crucial) system features are to be carried out by users**
 - Strategic factors:
 - User's motivation
 - Software Acceptance
 - (Traditional) solutions:
 - to improve usability
 - to introduce more flexibility in the system, add more features
 - ...
 - Innovative solutions (fun, surprise, achievement, socialization):
 - Serious Games
 - Game Metaphors
 - **Gamification**
 - ...
- 

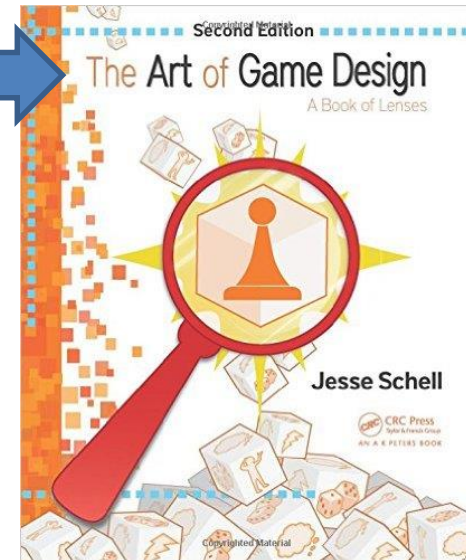
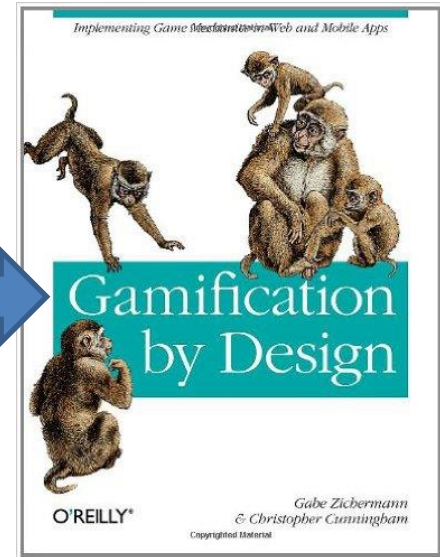
Outline



Lecture Materials

■ Books:

- G. Zichermann and C. Cunningham, **Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps**. "O'Reilly", 2011.
- J. Schell, **The Art of Game Design: A book of lenses**. CRC Press, 2014.



■ References:

- Publications
- Links



Acceptance, motivation, behavior change



- Speed limit



- Environmental respect



- Attention and collaboration

How to motivate people? ➡ Gamification



- Visual feedback
- Unpredictability and Curiosity
- Potential achievement
- Avoidance of potential loss

- The Speed limit problem
- The speed camera lottery:
 - Stockholm (Sweden), 2010
 - Game
 - Fun road signs
 - Honest drivers are rewarded by speeders' fines



Video above: <https://youtu.be/iynzHWwJXaA>

How to motivate people? ➡ Gamification



<https://youtu.be/iynzHWwJXaA>

How to motivate people? ➡ Gamification



Gamification

- “The use of game design elements in non-game contexts” [1]

- Gamification concepts:

- Core:



- Advanced:

- Levels, paths, challenges, stories, feedback, progress, ...

- Case studies:



- Success cases:



Outline



Success case: Foursquare



Objective

- Company: free advertisement, more visits and profits
- Player: benefits, fun and useful tools



Success Cases



Green goose: tries to give to the user a complete control of his life. In the daily life, thanks to some sensors (for instance applied to toothbrush), you can monitor every actions of your day with targets and completion percentage.



4Food: you can invent new type of sandwiches (using web tools with the composition of ingredients). Your creation is visible to customers that can buy your sandwich and for each one sold you receive a royalty of 25 cent



Keas: it gives to employees a wellness program with tasks that aim to improve their health motivating them with goals and rewards. In this way employees become healthier, more motivated and productive.

Game Metaphors

Game Metaphors: Taskville [14]

- results representation based on metaphors
- context → company teams



- metaphor → city building
- cities → company teams (every completed tasks of a company team)
- a building → a completed task

Game Metaphors: EcoIsland^[15]

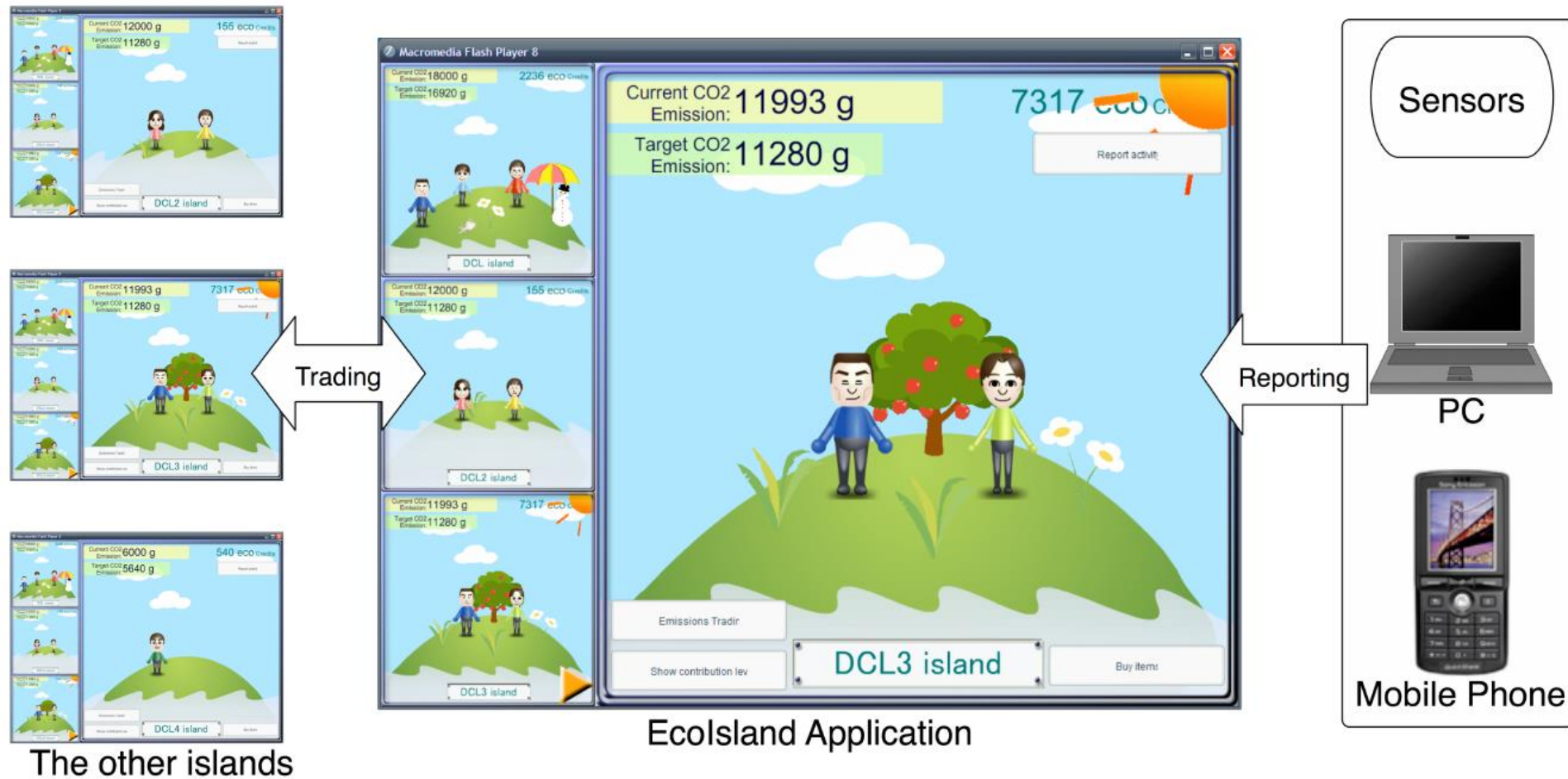


Figure 1: The EcoIsland System

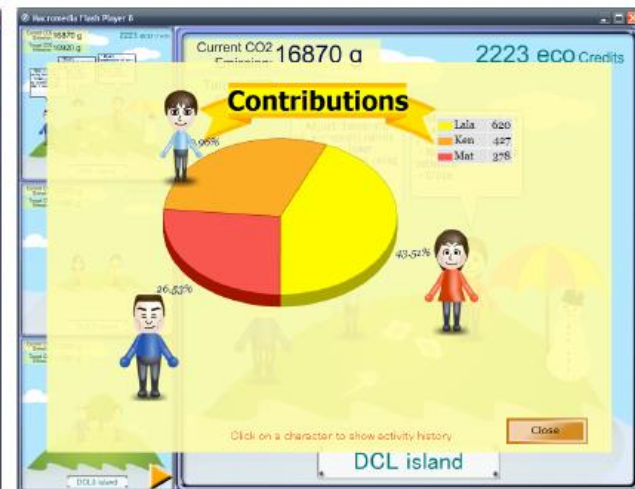
Game Metaphors: Ecoland [15]



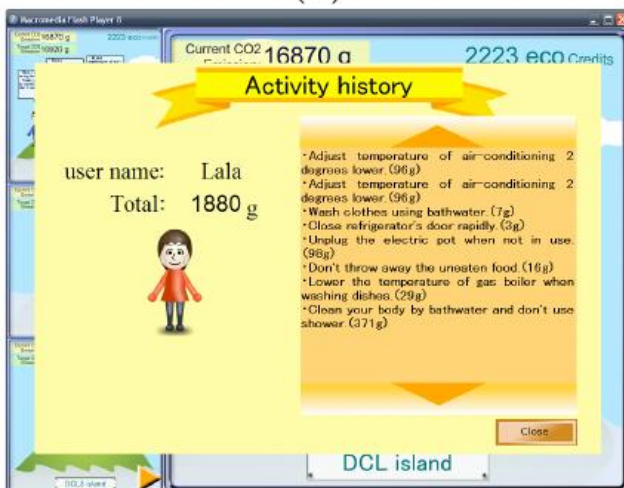
(a)



(b)



(c)



(d)



(e)



(f)

Outline



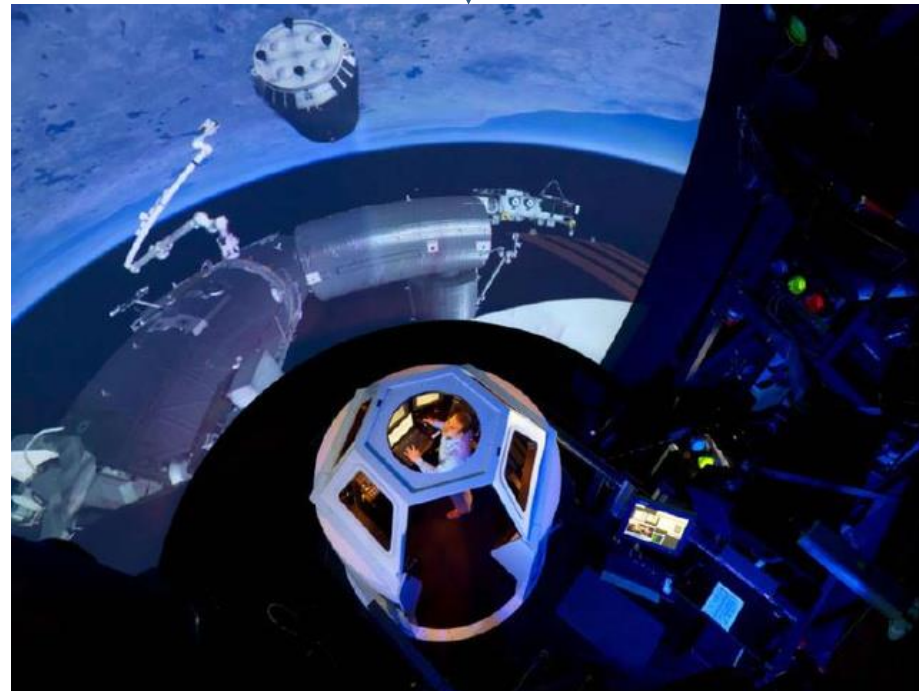
Game Inspired Design: the Twitter Fail Whale



Games, Virtual Simulation, Serious Games

- **Traditional Game**
- **Virtual Simulation**
 - very specific; the aim is to try simulating a specialized task train somebody
 - fields:
 - Health
 - Technology
 - Education
- **Serious Games**
- **Gamification**

Simulator



Game Taxonomies

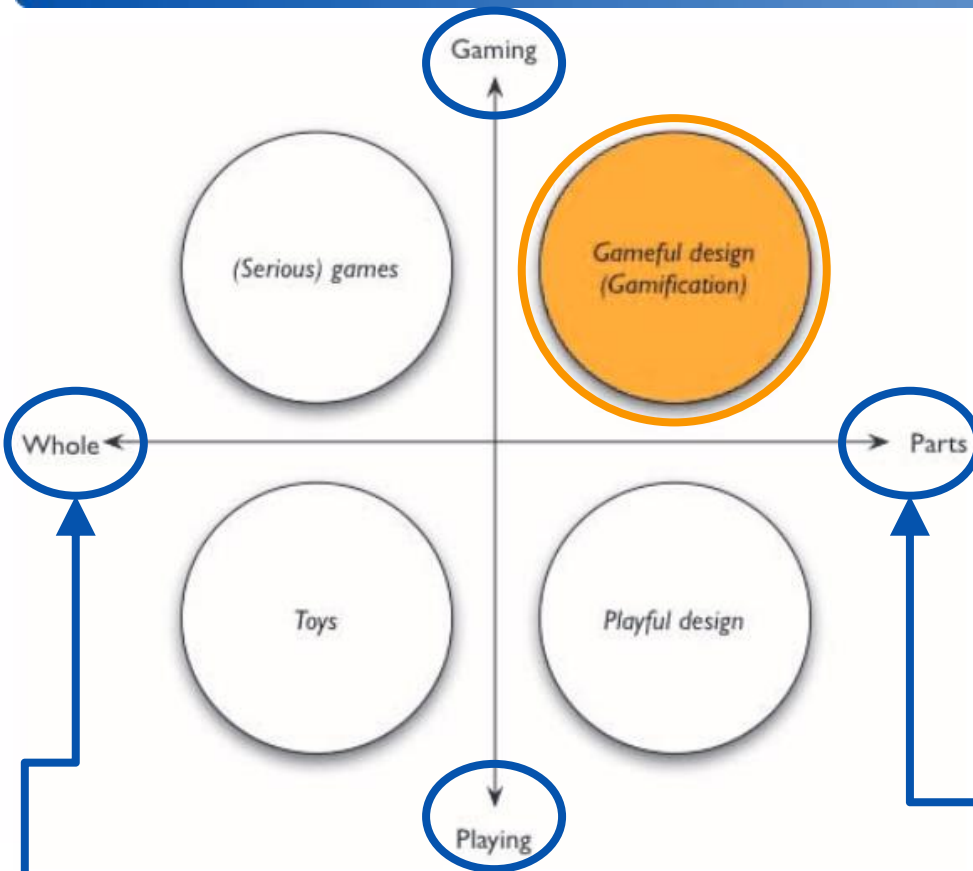
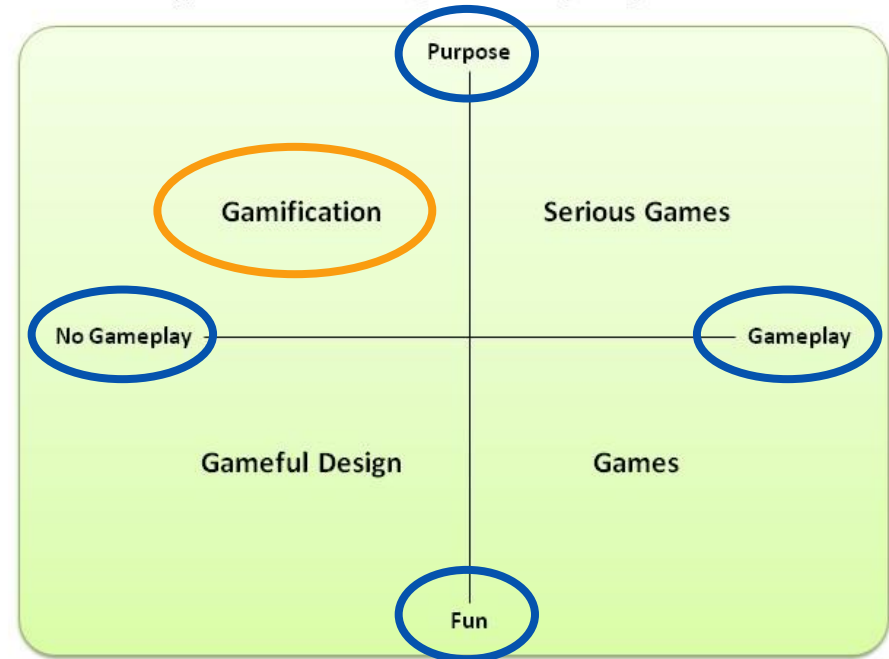


Figure 1. “Gamification” between game and play, whole and parts [17]

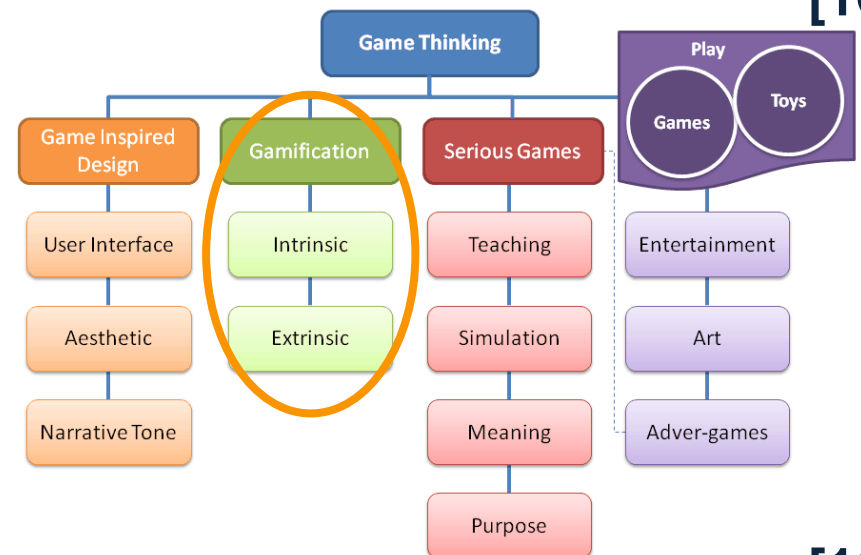
■ Whole games

■ Partial games

Types of Game Thinking and Primary Design Goal













[16]



[16]

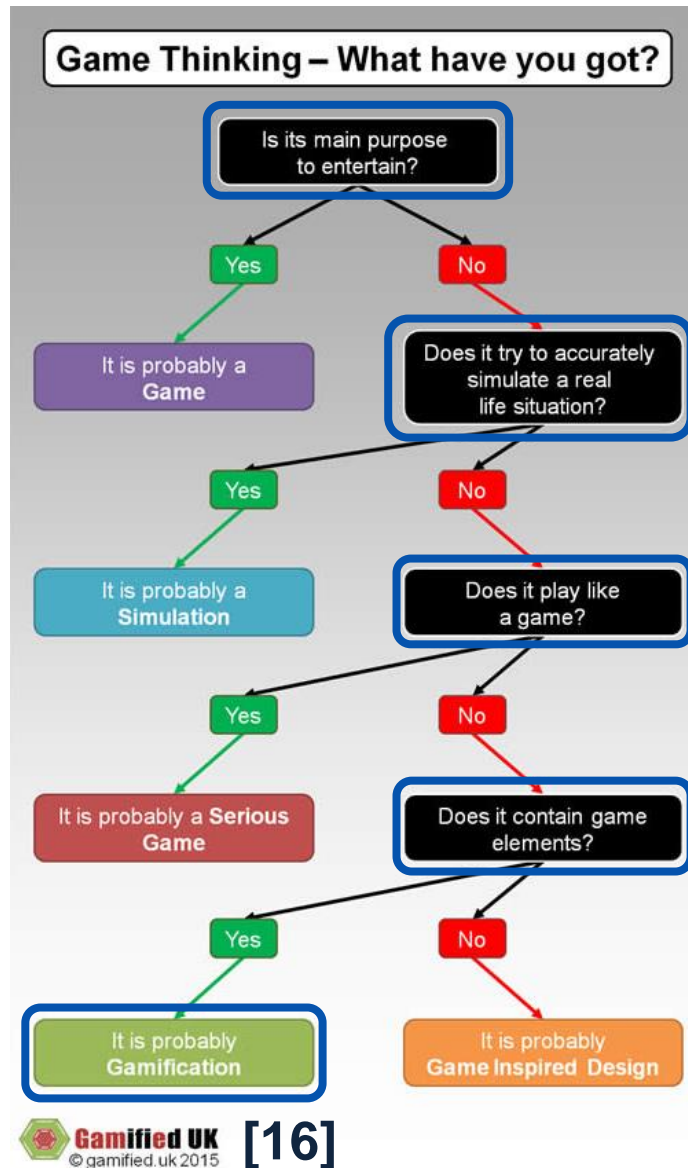
(c) Andrzej Marczewski 2013

Basic Game Taxonomy

	Game Thinking	Game Elements	Game Play	Just for Fun
Game Inspired Design				
Gamification				
Serious Game / Simulation				
Game				

[16]

How to choose?



Outline



Basic Gamification Concepts

Badges:

- are a type of reward
- are a status

Levels:

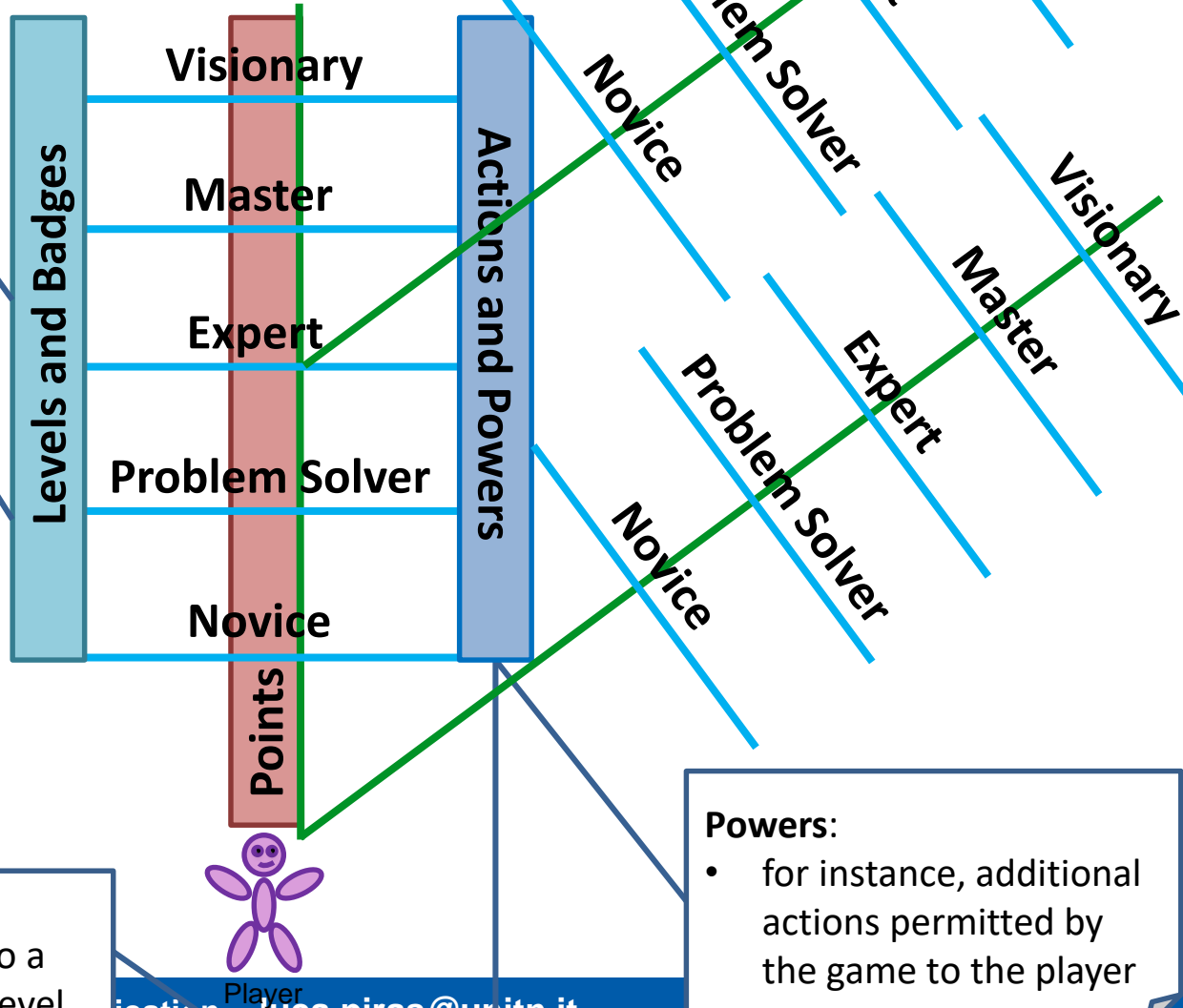
- define the necessary Difficulty elements to reach that step

Leader boards:

- transversal
- show only the part of the rank where the player is (a slide of the whole leader board)
- Global, Geo-localized, Social or Dynamic in relation to time

Actions:

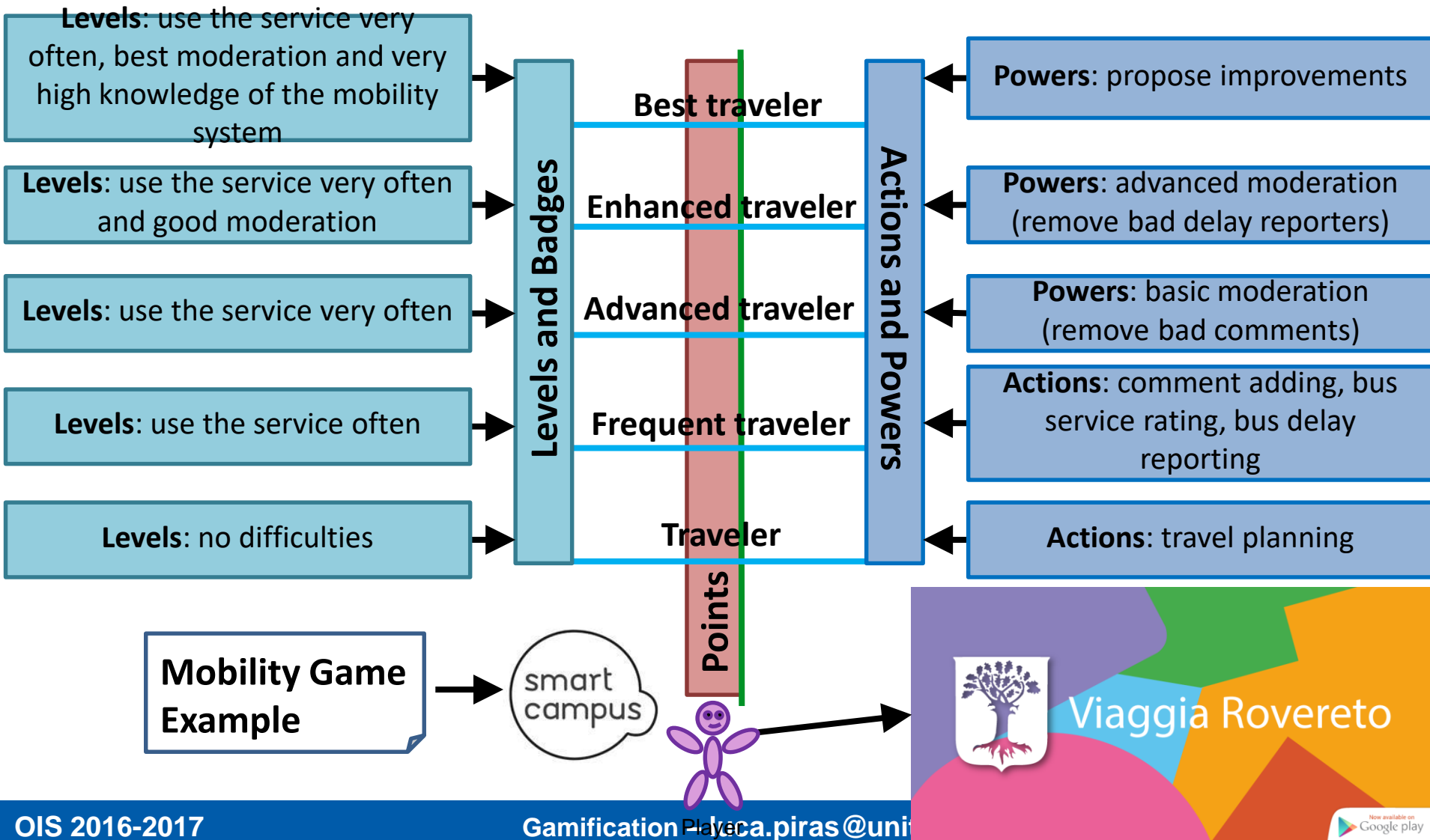
- activities permitted by the game to a Player in relation to the acquired level



Powers:

- for instance, additional actions permitted by the game to the player

Basic Gamification Concepts: Example



Core Elements: Point Systems

Experience points

- Invisible indirect points (by the Player perspective)
- Points for every activity of the system
- Not redeemable points
- **Useful to monitorate the Player in order to design a good Schedule of Reinforcement**

Redeemable points

- Visible direct points
- **Useful to be exchange for things**

Skill points

- Visible direct points
- **Assigned for specific actions in order to direct the user to achieve particular goals, to gain experience for particular aspects of the game, growing up in relation to a carrier (best reviewer, best shopper, best advisor, etc.)**

Karma points

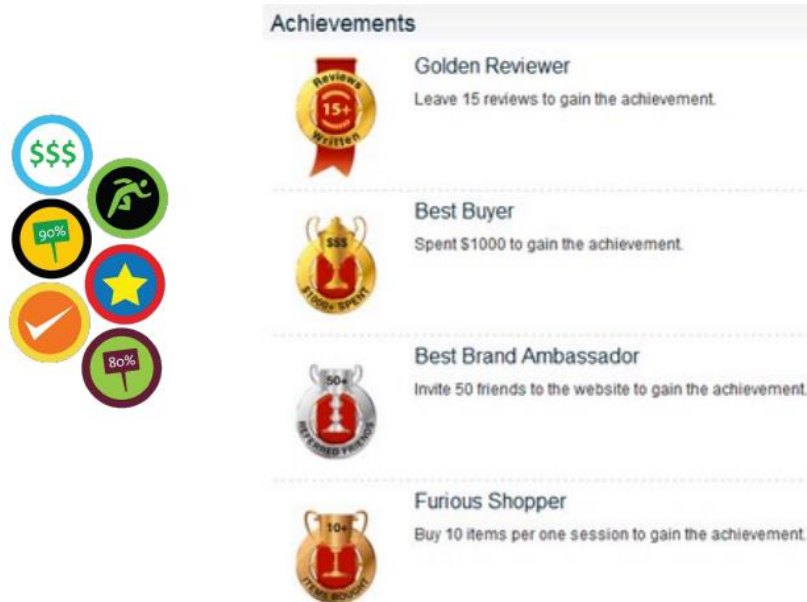
- Visible direct points
- **Points to give them away in order to obtain powers or to direct the user in a behavioral path (Ethical or Social Goal)**

Reputation points

- Visible direct points
- Points to be used in system that can't explicitly guarantee trust among two or more parties
- **The goal is to earn as much as possible points to be defined trusted**

Core Elements: Badges and Badge Policies

- **Badge Collections (progression and paths)**
- **Single Badge (surprise the user)**
- **Policies:**
 - **Points Independent:**
 - One action -> Badge
 - **Points Dependent:**
 - One or more actions -> Points -> Badge



Core Elements: Leader-boards

Single_Leader-boards

Team_Leader-boards

Private_You_Vs_You_Leader-boards

Social_Leader-boards

Time_Dependent_Leader-boards

Geo-localized_Leader-boards

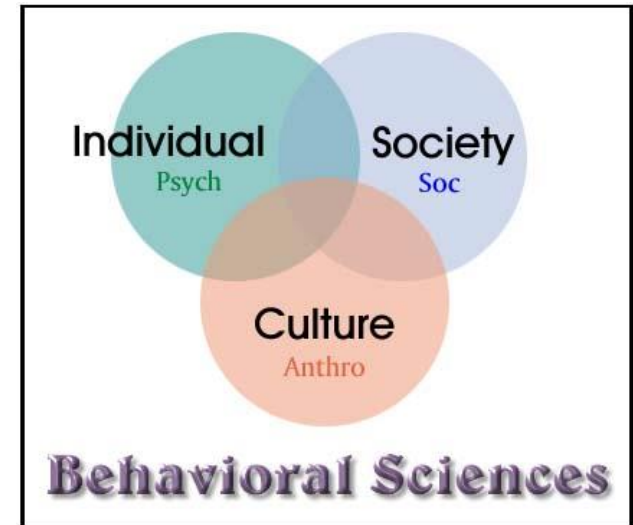
Outline



Main Areas Involved

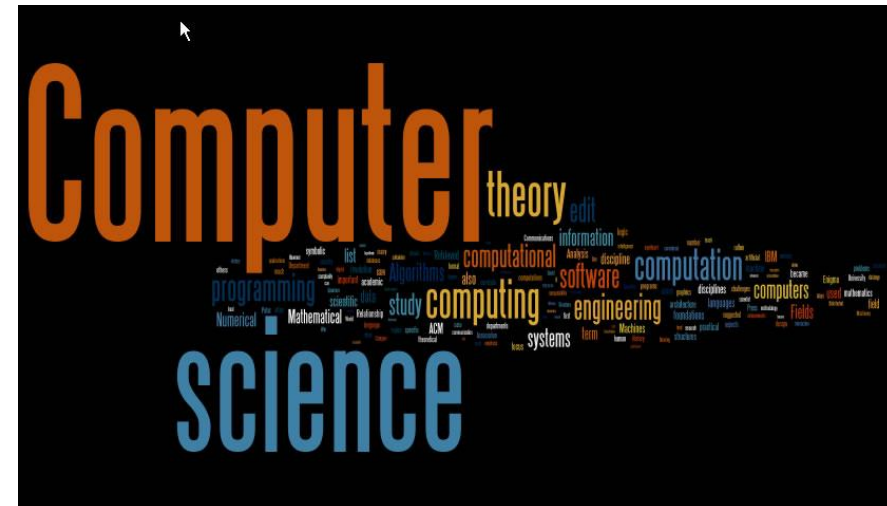
- **Social and Behavioral Sciences:**

- Sociology
- Psychology
- ...



- **Computer Science:**

- HCI
- Software Engineering
- ...



Players: Bartle's Taxonomy

- **Explorer:**
 - the whole game environment
- **Socializer:**
 - relationships, community
- **Killer:**
 - very competitive, eliminate their enemies
- **Achiever:**
 - as many goals as possible

- **Other taxonomies**

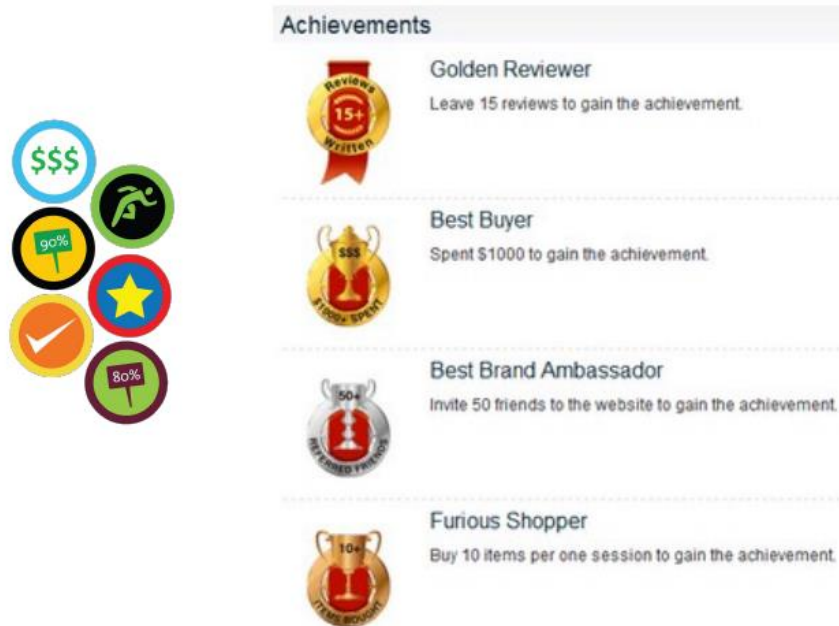
- **Goals, Actions, Players, Design**
- Identify your **Goals**
- Identify **Actions**, to be carried out by players, needed to achieve your Goals
- Identify kinds of **Players**
- Identify most suitable gamification **Design** strategies for gamifying your system

Life Cycle and Engagement Loop



Rewards

- Points/Badges/Achievements/Levels/Status
- Powers
- Virtual/Real goods/money



Badges



You just unlocked the Golden Ticket badge

"I found a Golden Ticket!" Pepsi MAX and foursquare invite you to attend a MAXed out Big Boi concert on Monday night. Zero time to waste, so hustle over to the Pepsi MAX Lot (11am-6pm) and show this badge to pick up your ticket. 21+ and space is limited, so get on it! #25790873



Community and Gamification Strategies

- Parallel goals among players
- Community collaboration
- Team collaboration
- Collaborative/Social rules/targets
- Leadership/Mayors/Leaderboards
- Fast feedback
- Endorsement
- Time-based dynamics with deadlines
- Progress bar
- Percentage completion profiles



GOOGLE+ PROFILE



View your profile to see a few changes we've made.

COMPLETE YOUR PROFILE

45% complete



Help your classmates find you on Google+.



Add school



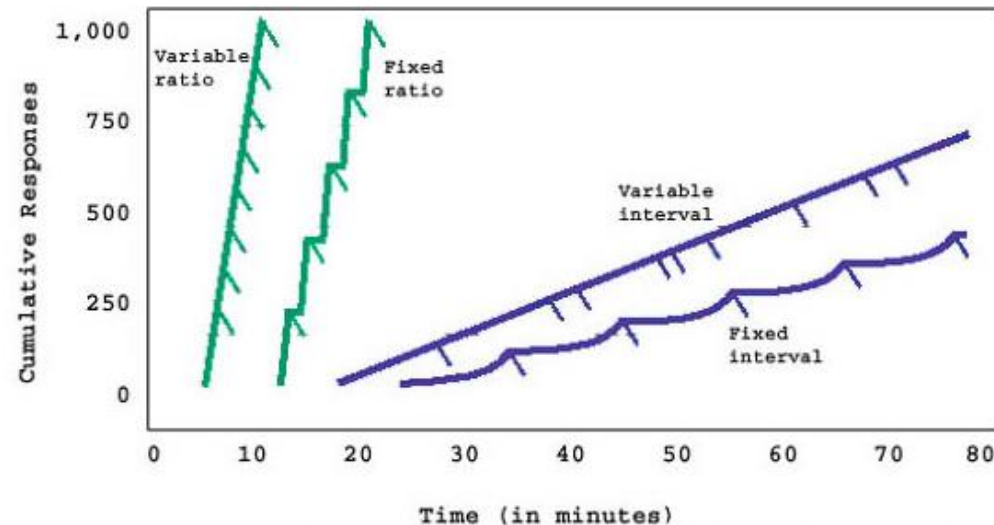
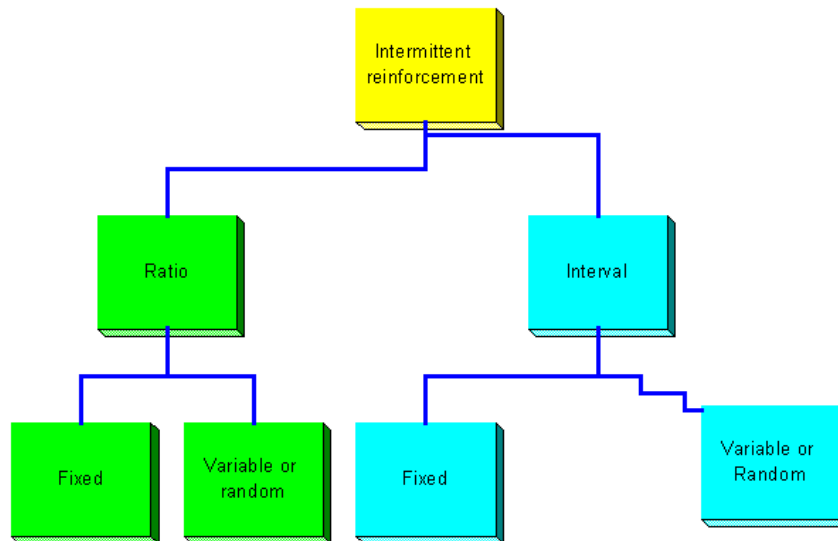
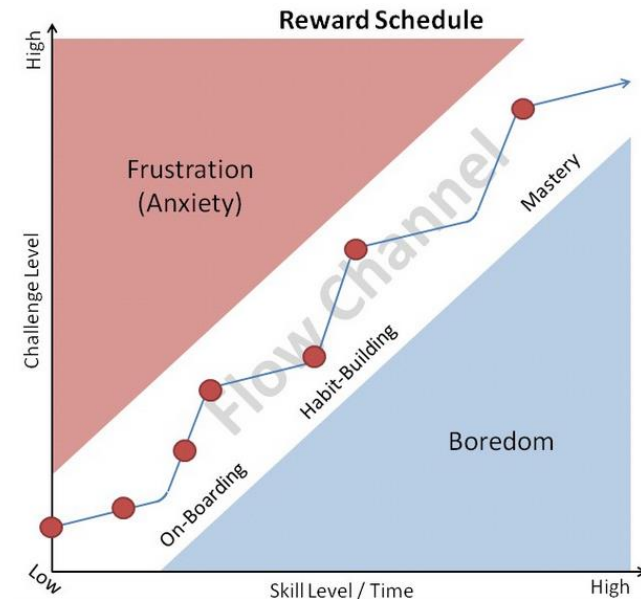
Welcome to Dropbox. Complete these quests and become a Dropbox guru!

- 1  Take the Dropbox tour complete!
- 2  Install Dropbox on your computer complete!
- 3  Put files in your Dropbox folder complete!
- 4  Install Dropbox on other computers you use complete!
- 5  Share a folder with friends or colleagues complete!
- 6  Invite some friends to join Dropbox complete!



Design Strategies

- Good system design (before applying gamification)
- Accelerate cycle of response
- Learning by doing, continuous feedback to the user
- Very clear goals and rules
- Diversify experiences and goals
- Create a community and tools that can be personalized
- Surprise the player after each achievement, badge, level with unpredictable mechanisms, goods
- **Reward Schedule and Schedule of Reinforcement (continuous or intermittent)**

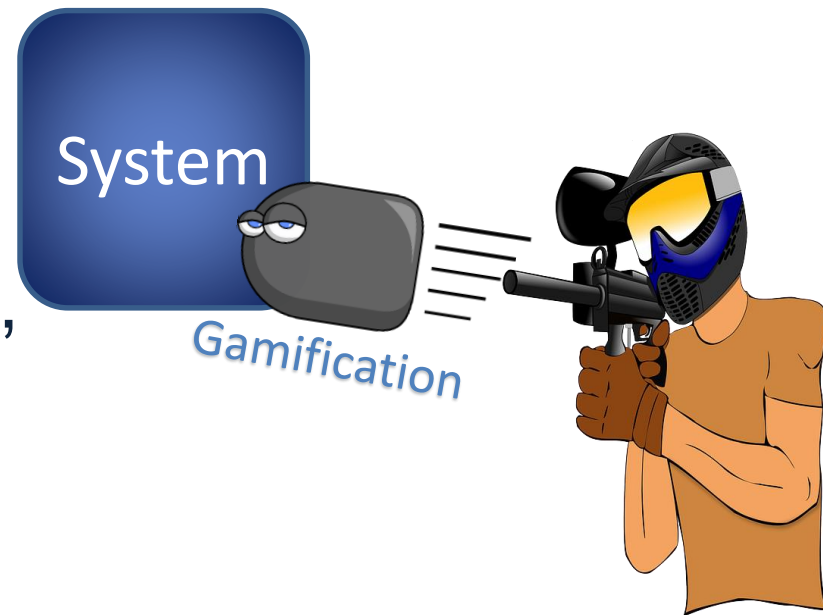
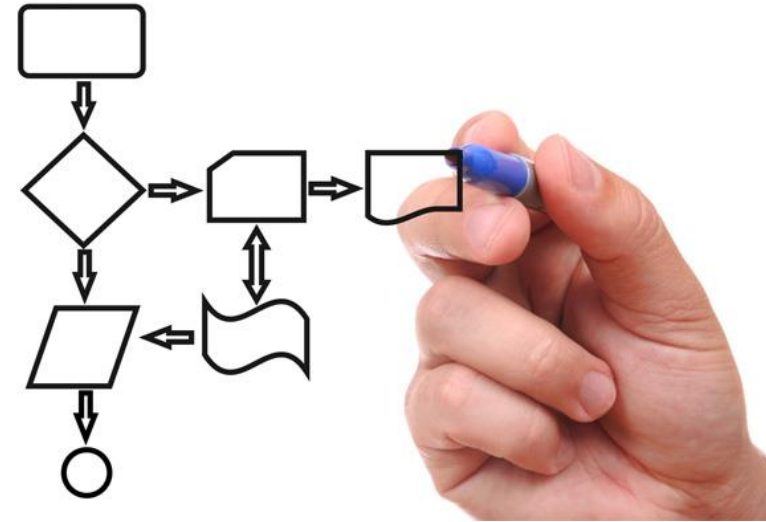


Outline



Applying Gamification: Problems

- **Process**: complex, difficult, heterogeneous professionals, time-consuming, not automatized, high-costs -> **expensive**
- **Method**: **One-shot**
 - solutions produced: ad hoc, non-reusable, nor generic, nor flexible



Applying Gamification: Supporting Technologies

- Modeling techniques
 - Behavior Modeling
 - Gamification Modeling language (**GaML**) -> gamification concept modeling
- **Gamification Engines:**
 - Industry
 - Literature

Gamification Engines

Strategies for Applying Gamification

■ The strategy from scratch:

- Related problems:
 - heterogeneous professionals
 - complex process (long, slow, hard, high costs)

■ The strategy with Gamification Engines:

- Advantages:
 - ready-to-use tools
 - a few professionals involved
 - reduced costs

■ Current Gamification Engines:

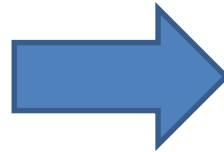
- Deficiencies/limitations:
 - ad-hoc solution
 - specific fields
 - reduced set of gamification elements
 - no opportunity for extensions
 - third-party dependence
 - presentation layer integration
 - few service based solutions
 - domain replication



Generic and Extensible Engines for Gamification Design

■ Current Gamification Engines:

- Deficiencies/limitations:
 - ad-hoc solution
 - specific fields
 - reduced set of gamification elements
 - no opportunity for extensions
 - third-party dependence
 - presentation layer integration
 - few service based solutions
 - domain replication



■ Literature:

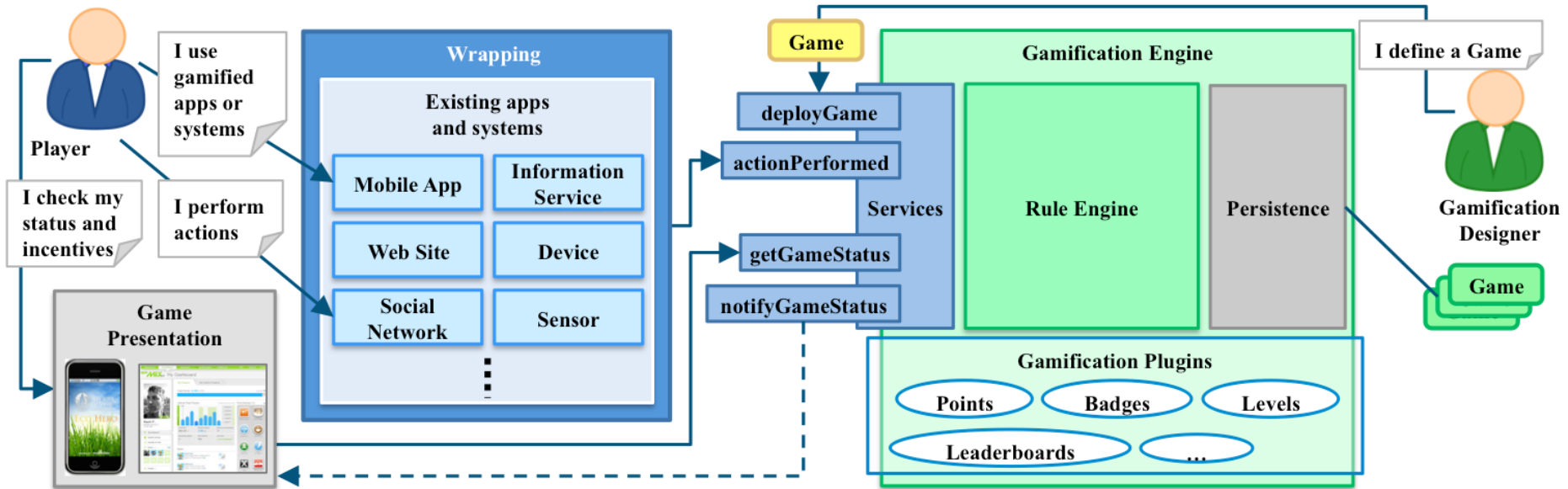
- Advantages:
 - generic solution
 - domain independent
 - no domain replication
 - specific field independent
 - most of the gamification elements
 - extensible solution
 - no third-party dependence
 - service based solution
 - ready-to-use tools
 - reduced costs

Advantages

- guided design with suggestions
- gamification patterns
- gamification tools for gamifying a specific domain
- simplification of the complex process of applying gamification, making it as short as possible, easy and low cost

A Real Case Study using a Gamification Engine: Using Gamification to Incentivize Sustainable Urban Mobility

Gamification Engine



[11] R. Kazhamiakin, A. Marconi, M. Perillo, M. Pistore, G. Valetto, L. Piras, F. Avesani, and N. Perri, "Using Gamification to Incentivize Sustainable Urban Mobility" in Proc. of the 2015 International Smart Cities Conference (ISC2). IEEE, 2015

On-the-field Case Study



- European Project
- Rovereto (Fall 2014) - 40 participants:
 - reside outside the center
 - pay a yearly fee
- 3 phases (5 weeks):
 - 1 - App usage
 - 2 - Only recommendations
 - 3 - Gamification



- RQ1: Gamification -> App
- RQ2: Gamification -> Sustainable Mobility

Viaggia Rovereto App (Google Play)



[11] R. Kazhamiakin, A. Marconi, M. Perillo, M. Pistore, G. Valetto, L. Piras, F. Avesani, and N. Perri, "Using Gamification to Incentivize Sustainable Urban Mobility" in Proc. of the 2015 International Smart Cities Conference (ISC2). IEEE, 2015

Outline



Gamified Smart Assistants

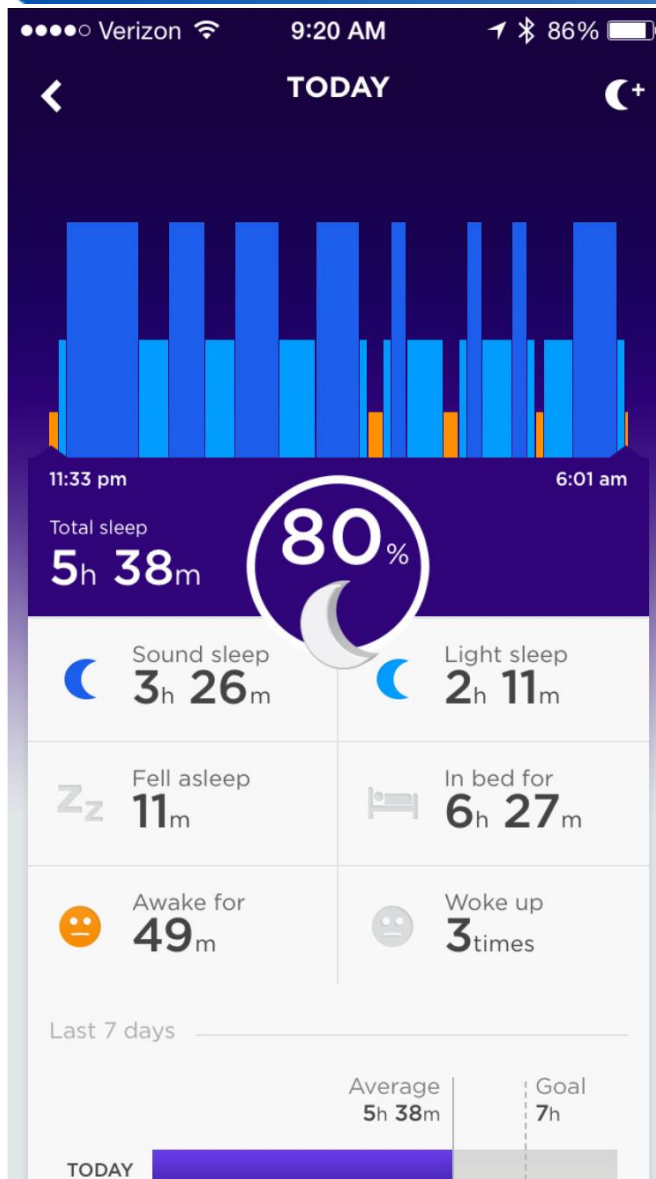
- Virtual Assistants/Coaches
 - virtual agents
 - visible/invisible
 - direct/indirect suggestions
 - Offline/online gamification
 - initial/continuous characterization (player, context)
 - behavior analysis (affect characterization, suggestions)
- Domains:
 - Automotive (vehicle exploration, eco-driving style, save fuel)
 - Physical Activities and **Health** (Exergames)
 - Mobility:
 - **Smart Traveling and Smart Working**
 - **Children Independent Mobility**
 - ...

Gamified Smart Coaches for Improving the Health

Jawbone UP: Tracking



Jawbone UP: Tracking and Statistics

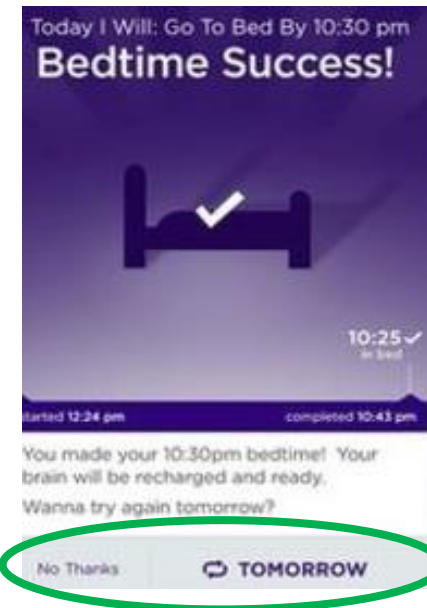
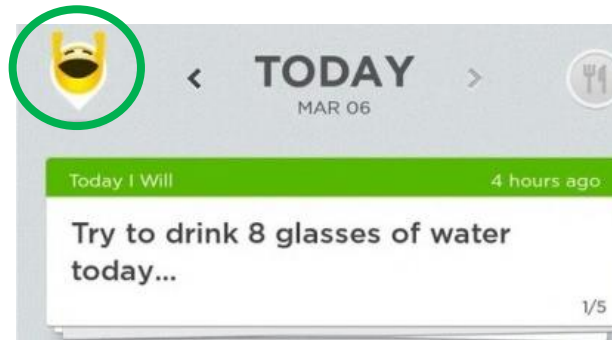
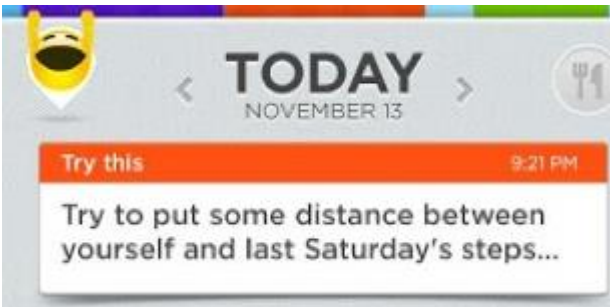


Tracking
Statistics

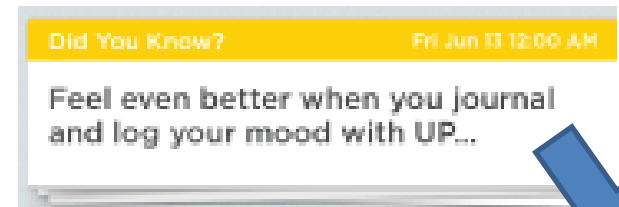
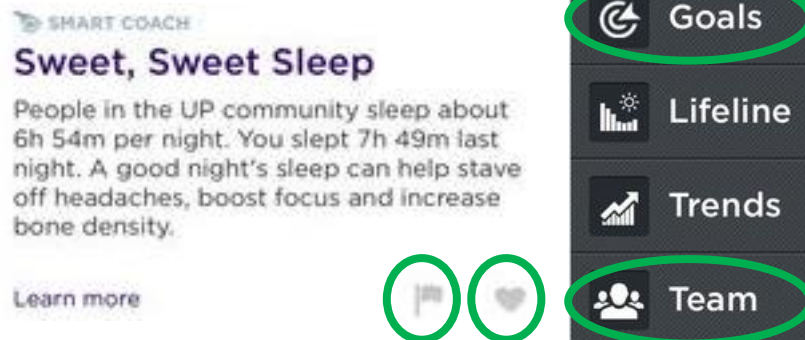
Data analysis
Characterization

Jawbone UP: Gamified Smart Coach

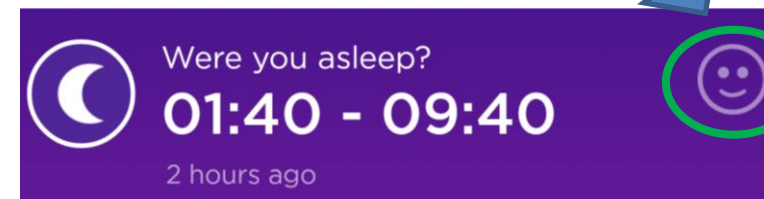
- Suggestions and challenges



- Community comparisons and teams for competition



- Feedback requests for improving personal reasoning



Jawbone UP: Gamified Smart Coach

- Feedback provision and personalized suggestions

SMART COACH 12 hours ago

Healthy Choices

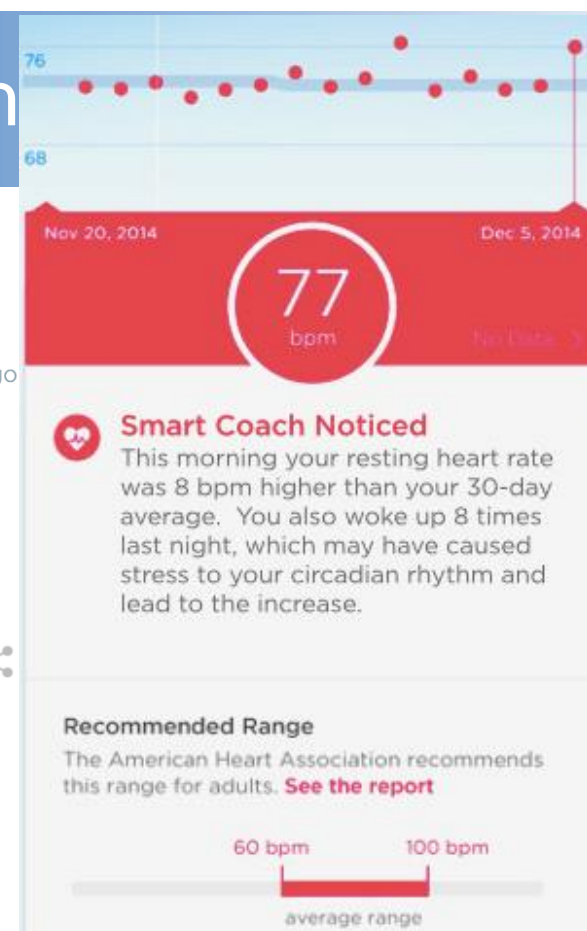
Your 7-day resting heart rate average is 58bpm. That's a decrease from your monthly average of 68bpm. This positive trend probably results from healthier diet, sleep, and exercise choices.

SMART COACH 12 hours ago

The Push Off

Read this article to prepare for your next walk. It discusses efficient Olympic walking form. One tip is to focus on pushing off with your back foot as you step forward.

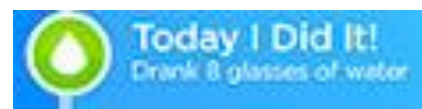
[LEARN MORE](#)



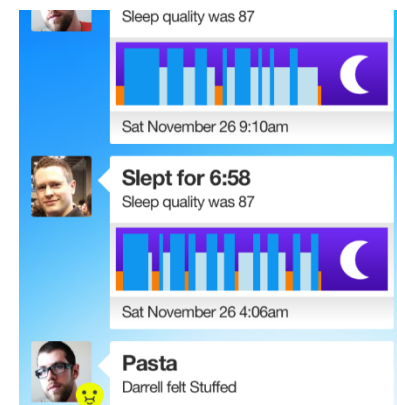
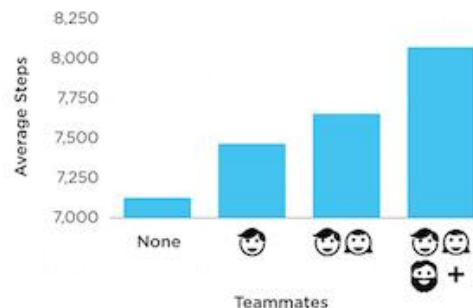
- Leader-boards, duels, community, badges

Food Score 8.7/10

	Sarah Barr	116	209
	IK Incrivell	110	187
	Corry Edwards Pumped UP	104	154
	Justin Armstrong	105	121
	gwendolyn smith	52	169
	Gernard Feril	106	103
	Michael Margolis	89	115
	Ronan Murphy	101	95
	Justin Hardcastle	59	129



WE STAY HEALTHIER WITH FRIENDS



Gamified Personal Coaches for Promoting Smart Traveling and Smart Working

From5to4: A Gamified Personal Coach[18]



- Goal → To avoid traffic congestion (very expensive for governments, companies and citizens)
- Solution:
 - Smart traveling/working
 - System with a Personal coach
 - Personal dashboard with checklist
 - Diversified score → Mobility choices
 - Leader boards and team collaboration
 - Rewards = Point → Virtual/Real goods

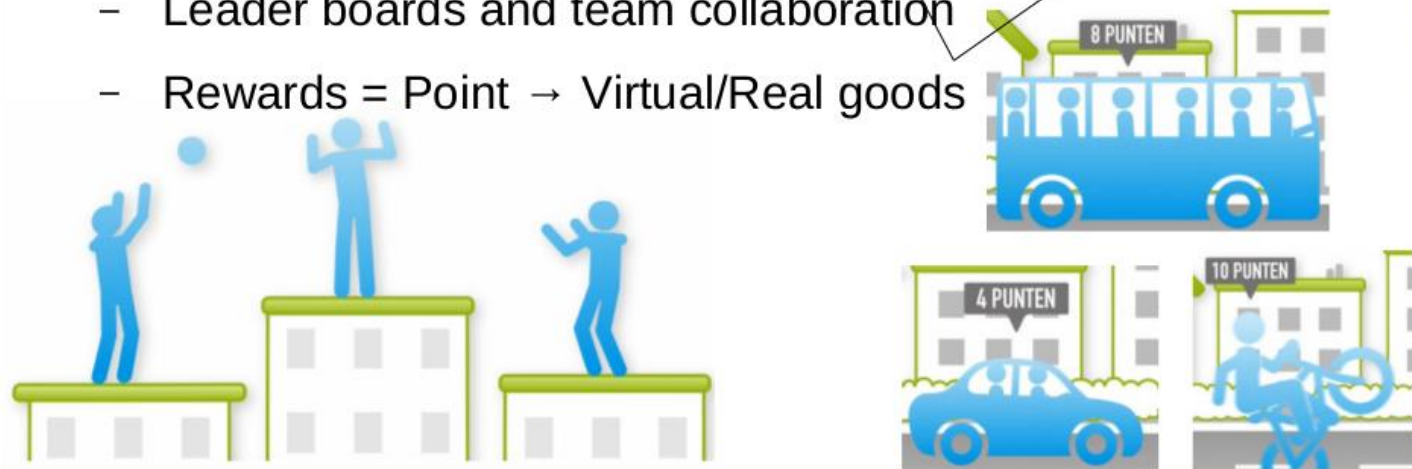
What is smart traveling / working?

Smart traveling or commuting

By bicycle, by train, by public transport, carpooling, company bus, ..

Smart working

Working on the go, working at home, flexible working hours, video conferencing, remote office centers, ..

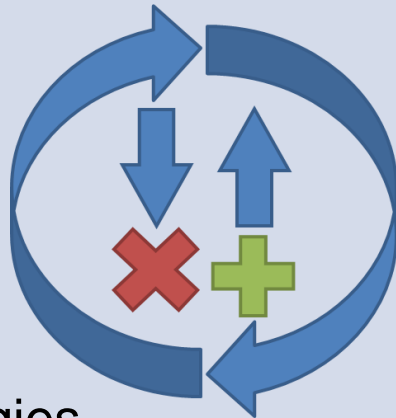


Virtual Coaches for Mission–Based Gamified Smart Communities

Smart Communities

Smart Cities

- Elements:
 - IT systems
 - Sensors
 - Services
 - Smart devices
 - Smart objects
 - Apps
 - New technologies
- Characteristics:
 - Dynamic
 - Open environment



Smart Communities

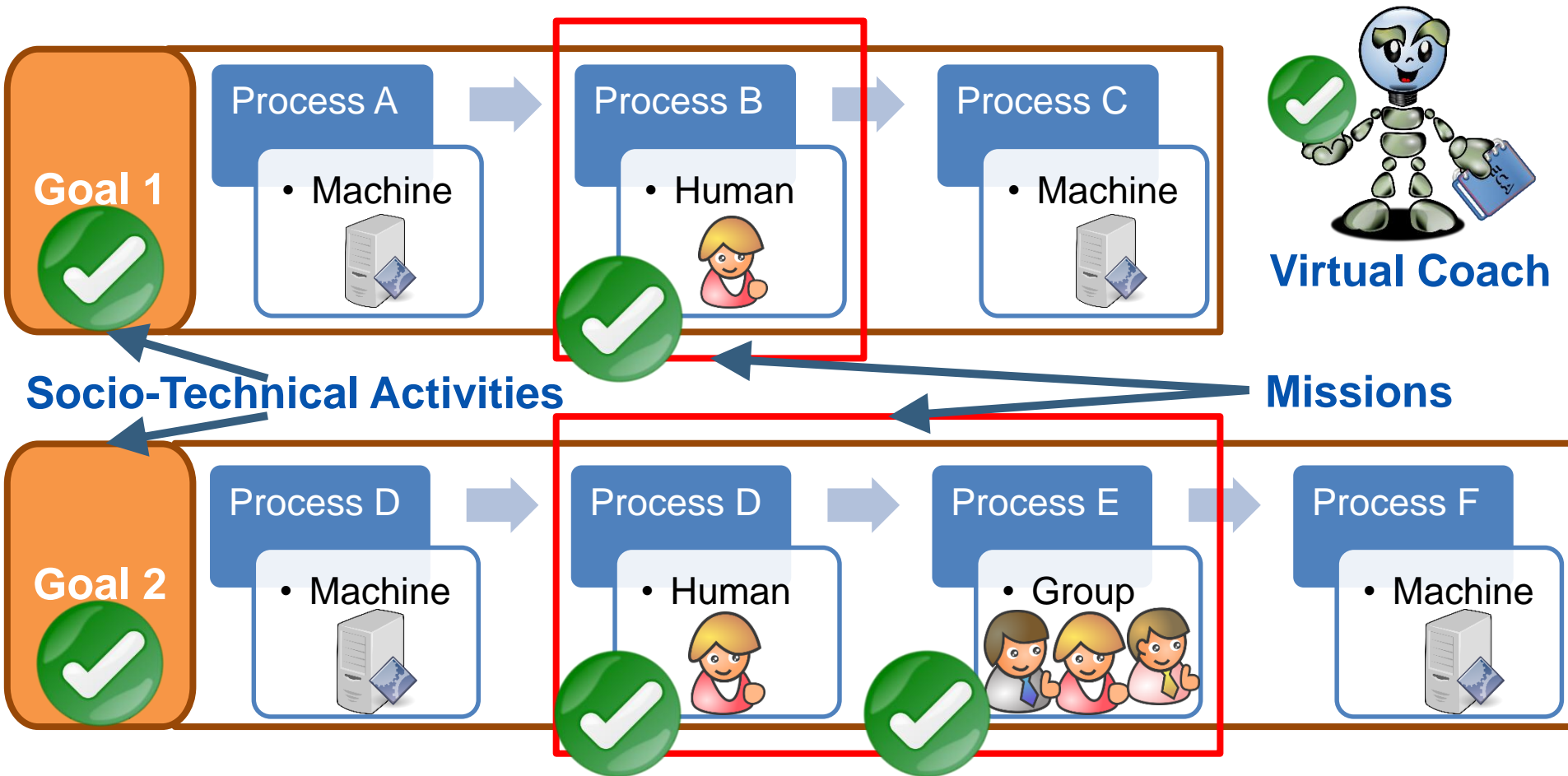
- Elements:
 - People
- Characteristics:
 - Goals:
 - Personal
 - Societal
 - Interests
 - Problems
 - Participation
 - Collaboration

Challenge

- Cooperation
- Citizens
- Devices

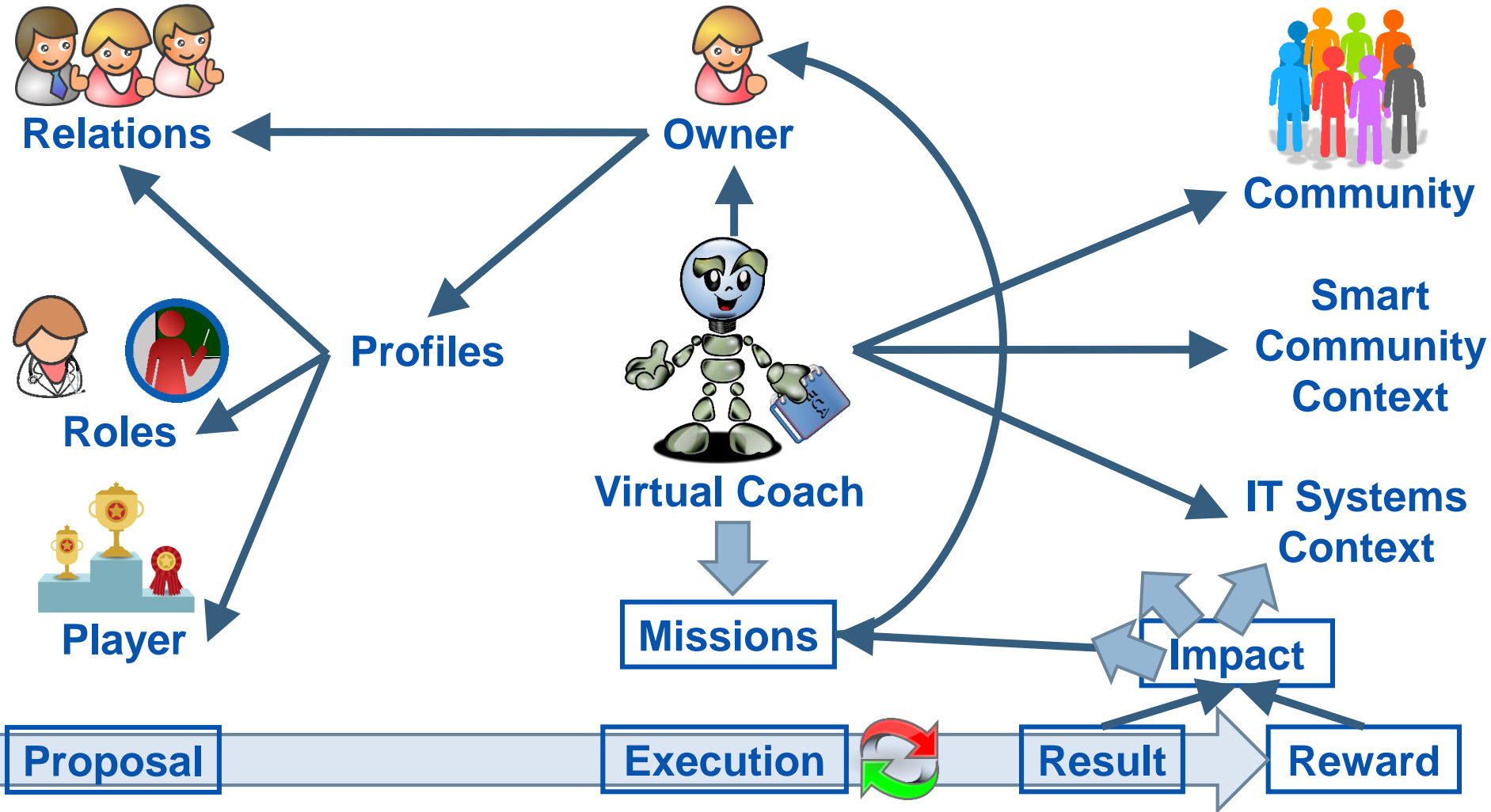
[12] L. Piras, G. Valetto, A. Marconi, M. Pistore, “Virtual Coaches for Mission–Based Gamified Smart Communities” in Proc. of the 2015 CHI-PLAY Workshop on Personalization in Serious and Persuasive Games and Gamified Interactions (CHI-PLAY). ACM, 2015

Processes, Goals, Gamification and Missions



[12] L. Piras, G. Valetto, A. Marconi, M. Pistore, "Virtual Coaches for Mission-Based Gamified Smart Communities" in Proc. of the 2015 CHI-PLAY Workshop on Personalization in Serious and Persuasive Games and Gamified Interactions (CHI-PLAY). ACM, 2015

Virtual Coaches for Mission-Based Gamified Smart Communities



[12] L. Piras, G. Valetto, A. Marconi, M. Pistore, "Virtual Coaches for Mission-Based Gamified Smart Communities" in Proc. of the 2015 CHI-PLAY Workshop on Personalization in Serious and Persuasive Games and Gamified Interactions (CHI-PLAY). ACM, 2015

References (1)

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2. D. Merugu, B. S. Prabhakar, and N. Rama. An incentive mechanism for decongesting the roads: A pilot program in bangalore. In Proc. of ACM NetEcon Workshop, 2009.
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