A Generic Platform for Enterprise Gamification

Philipp Herzig / SAP AG / Technische Universität Dresden
Michael Ameling / SAP AG
Alexander Schill / Technische Universität Dresden
Gamification
Classification

- **Gamification** is the use of game design elements in non-game contexts.
- Introduce game mechanics into non-gaming applications in order to increase user engagement, motivation, and participation

*Deterding et al., 2011*
Introduction
Motivation

• Context **B2C** => Higher customer loyalty

• **Business** Context => **higher** employee **engagement** and **positive** organizational **effects**, e.g., Herzig et al. (2012)

• 70% of global 2000 organizations will have at least **one** gamified application by 2014 (Gartner, 2012)

• Predicted market size: **$4.2-5.3 billion** (Deutsche Bank, 2012))

⇒ Existing **enterprise applications** act as mediator.

⇒ Led to providers offering various platforms for gamification

  ⇒ **However**, designed for B2C purposes,

  ⇒ require high integration effort,

  ⇒ lead to applications silos.
Gamification Platform
Enterprise Requirements

- **Enterprise Requirements**
  - Agility
  - Flexibility
  - Reusability
  - Decoupling of Functionality
  - Scalability
  - Composability
  - ....
Gamification Platform
Gamification Requirements

- **Non-Functional**
  - Fast Feedback (at least < 1s, better <500ms)
  - Voluntariness of Use
Gamification Platform
Architecture (Single View)
Gamification Platform
Integration Landscape
Research Challenges (Selection)

- **Mobile Gamification**
  - Evaluate a set of rules directly on the mobile device for the sake of real-time feedback
  - Synchronize of progress events upon connection
  - Only valid for “single player“ rules

- **Rule Design and BPM Integration**
  - Easy to understand/write by business users => rule will change often => DSL
  - However,
    - Ambiguous terms / No unified ontology for game mechanics
  - Creation and Integration of DSL into BPM solutions
Research Challenges (Selection 2)

- **Privacy**
  - Each user action and behavior is tracked => increased transparency
  - Thus, increases the risk of privacy issues
  - Approaches
    - Users must explicitly agree on the collection of gamification data
    - Turn gamification off
    - Avatars as virtual identity
    - Public Flag
    - Aggregated Data Access for others only
    - Audit tables containing the cumulated points
Evaluation

- Four services in separated Tomcat instances
  - Rule Package with changeset descriptor
  - Rule Engine with Drools Fusion as CEP
  - Gamification Repository w/ query and update interface
  - LegacyWrapper
- ActiveMQ as MessageBroker in pub/sub mode
- Use Case: SAP Business Commuting Portal
rule "newRideIntent"
when
  Player($playerid : uid)
  $evt : EventObject(type=="new_rideintent",
  playerid==$playerid, eventDuration==0) from
  entry-point eventstream
then
  EventObject obj = new EventObject();
  obj.setType("delayed_rideintent");
  obj.setEventDuration(24*60*60*1000);
  obj.setPlayerid($playerid);
  obj.put("mrid", $evt.get("mrid"));

  retract($evt);
  entryPoints["internalstream"].insert(obj);
end

rule "RIAAfterDuration"
timer(expr:$duration ;)
when
  $p : Player($playerid:uid)
  $ri : EventObject(type=="delayed_rideintent",
  $duration: eventDuration, playerid==
  $playerid) from entry-point internalstream
then
  retract($ri);
  updateAPI.givePoints($p.getId(), "Point", 1);
end
rule "deleteRideIntent"
when
    $p : Player($playerid : uid)
    $ri : EventObject(type=='delayed_rideintent',
                     playerid==$playerid) from entry-point
        internalstream
    $ri_delete : EventObject(type=='
                              delete_rideintent',
                              playerid==$playerid,
                              data['mrid']==$ri.data['mrid'], this during
                              $ri) from entry-point eventstream
then
    retract($ri);
    retract($ri_delete);
end
Outlook

This Paper

- **First proposal** of a generic architecture for gamification
- Identified a general set of challenges in this domain

Future Research

- **Further construction** of Platform itself such as real-time feedback
  - Knowledge-based CEP
  - FactBase Partitioning based on Gamification Events
Thank you

Philipp Herzig
SAP AG / SAP Research
Chemnitzer Straße 48
01148 Dresden
Appendix
# Existing Platforms (Overview 1)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Bunchball</th>
<th>Badgeville</th>
<th>Bidgoor</th>
<th>Gigya</th>
<th>IActionable</th>
<th>Punchtab</th>
<th>OpenBadges</th>
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## Existing Platforms (Overview 2)

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<tbody>
<tr>
<td><strong>Game Mechanics</strong></td>
<td>Challenges-/Missions, Trophies, Badges</td>
<td>Achievements, Standard Points, Redeemable Points, Player Levels, Leaderboards</td>
<td>Virtual Currency, Badges, Player Levels</td>
<td>Single non-redeemable point metric, Player Levels, Leaderboard</td>
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<td>Leaderboard, Single redeemable point metric, Badges, Giveaways, Social Network Integration, Activity feed</td>
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Gamification Platform
Example Rule

```java
rule "newUser"
  when
    $evt : EventObject(type=="new_user") from entry-point eventstream
  then
    GamificationEvent ge = new GamificationEvent();
    ge.setType("createPlayer");
    ge.setPlayerId($evt.getPlayerId());
    ge.put("logonname", $evt.get("logonname"));
    bus.publish(ge);
    retract($evt);
end
```
Gamification Platform
Existing Types
• **Frontend Integration**
  • Support for various platform and technologies
  • Generic generation of UI widgets
  • Current solutions are limited to the generation of HTML5 „components“

• **Analytics**
  • Analytical support the monitoring phase of the gamification cycle
  • Simple measures
    • Revisits
    • Participation rate
  • Complex measures (Higher-order constructs)
    • Engagement Levels
    • Game-theoretical algorithms (estimate payoff matrices)
Related Work

- **OpenSource**
  - UserInfuser
  - OpenBadges

- **General Purpose Platforms (Closed Source)**
  - Badgeville
  - Bunchball

- **Specific Platform (Closed Source)**
  - IActionable
  - Gigya
  - Bigdoor
  - Punchtab
  - etc…
Current Approaches

- **Open source**
  - Simple game mechanics programmatically
  - Remote storage for game mechanics
  - Translation of traditional achievement systems, e.g., Xbox Live, iOS GameCenter

- **Closed source space**
  - Hardly documentation available
  - Striking marketing promises
  - However projects report large integration projects
  - Tight coupling of application with gamification platform
  - Data Silos
  - SaaS offerings
  - Strong focus on consumer and web applications