

A Generic Platform for Enterprise Gamification

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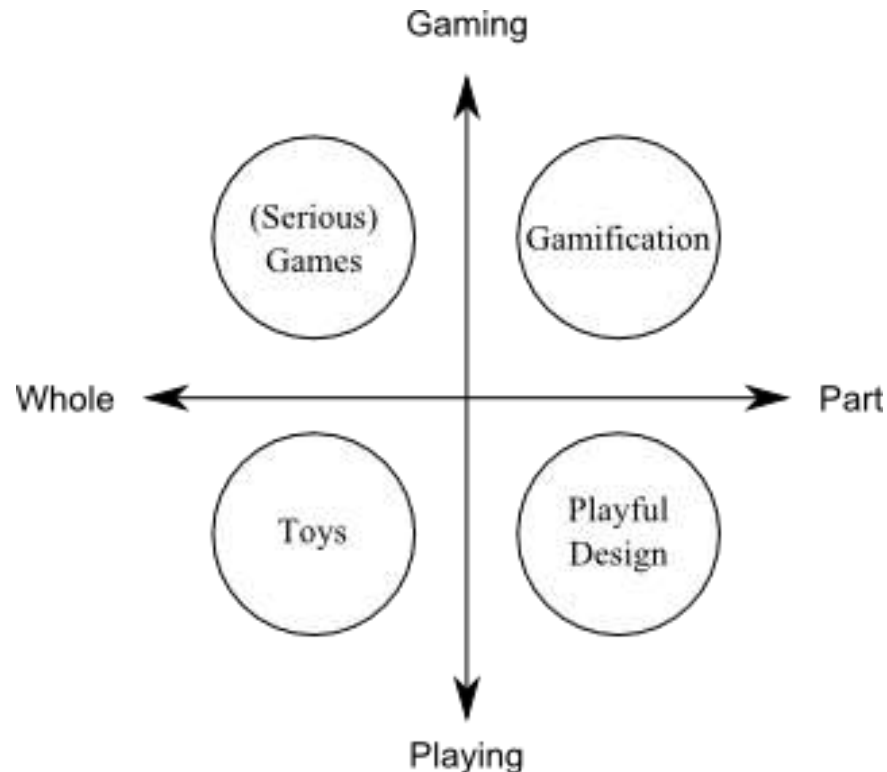
Alexander Schill / Technische Universität Dresden



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.

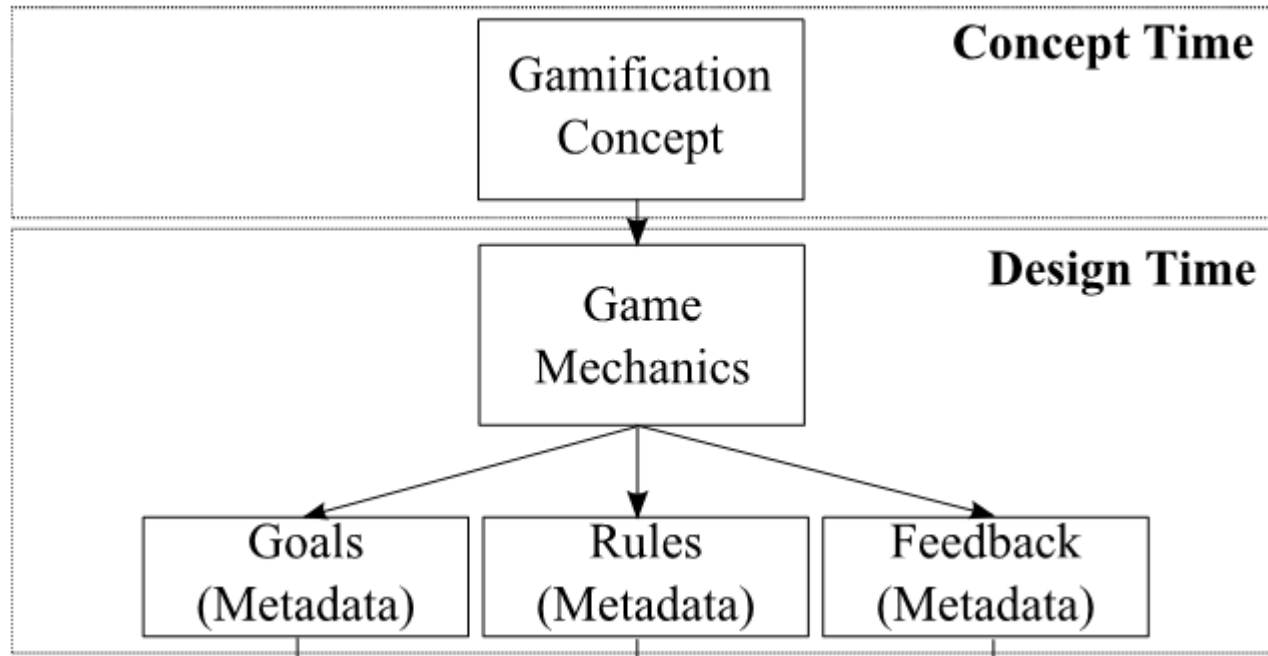
Gamification Platform

Enterprise Requirements

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

Gamification Platform

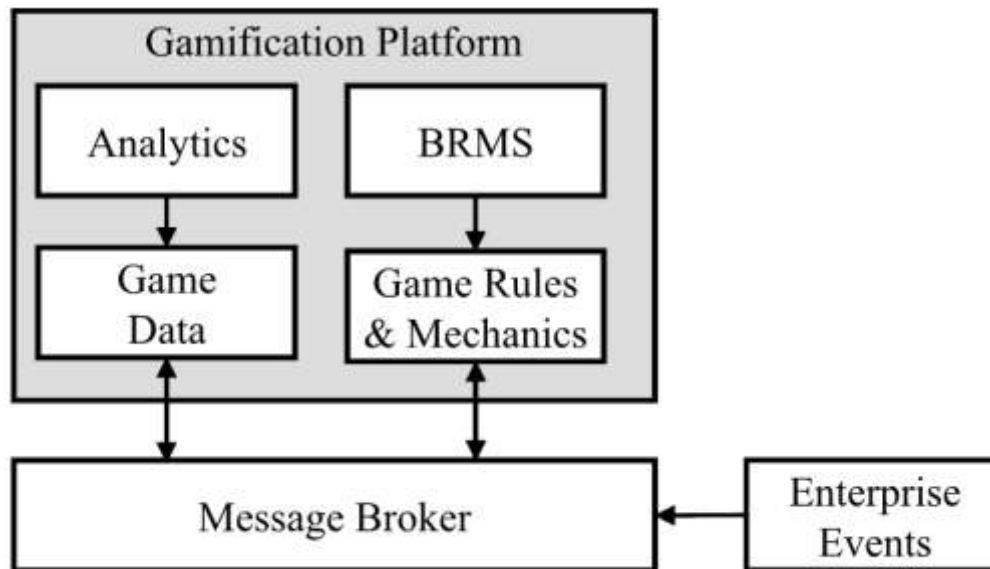
Gamification Requirements



- **Non-Functional**
 - Fast Feedback (at least < 1s, better <500ms)
 - Voluntariness of Use

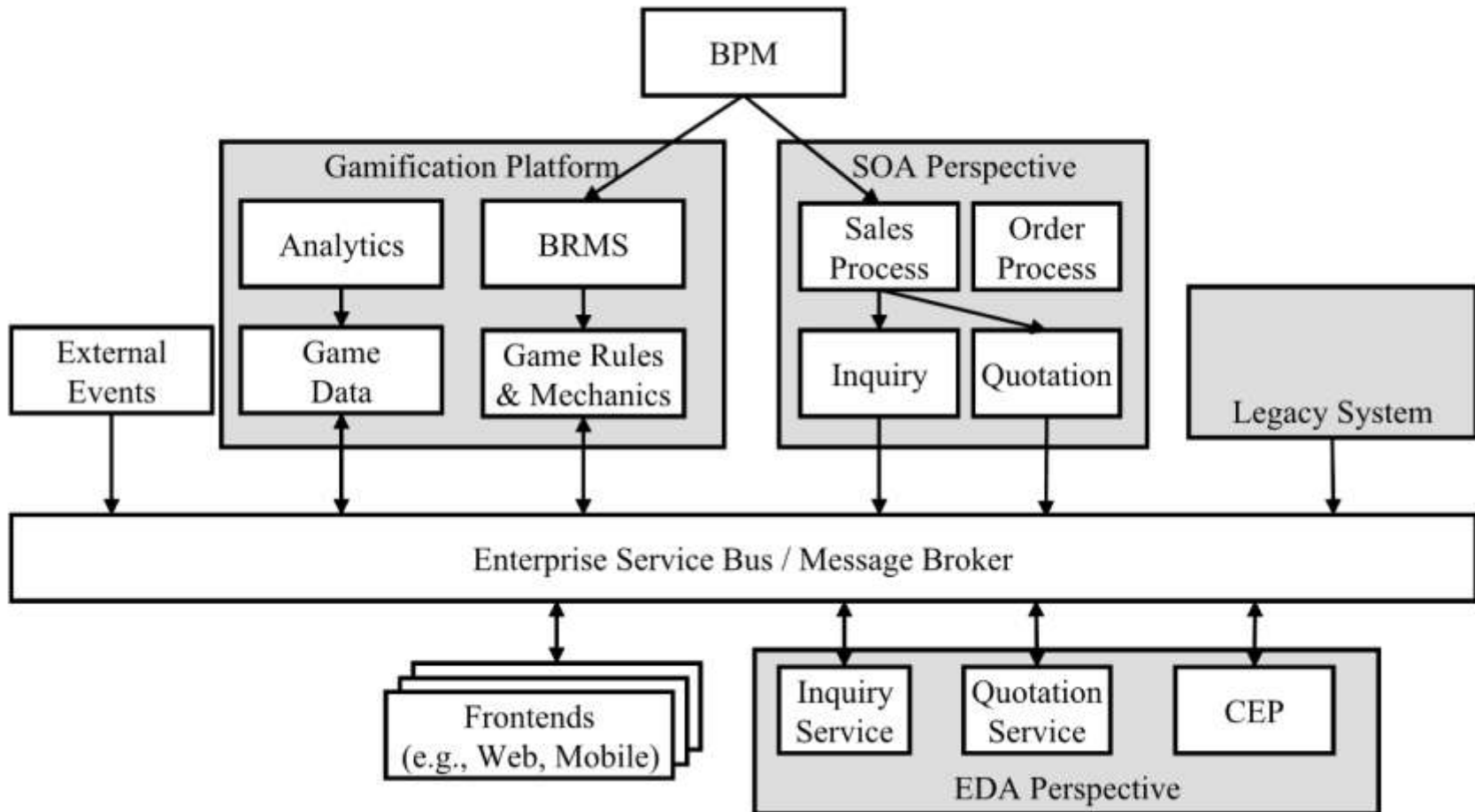
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Architecture (Single View)



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

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Appendix

Existing Platforms (Overview 1)

Feature	Bunchball	Badgeville	Bidgoor	Gigya	IActionable	Punchtab	OpenBadges	UserInfuser
Type	Proprietary	Proprietary	Proprietary	Proprietary	Proprietary	Proprietary	OpenSource	OpenSource
Simple Rules	YES	YES	NO	YES	YES	NO	NO	NO
Complex Rules	NO	NO	NO	NO	NO	NO	NO	NO
UI Widgets	YES	YES (Javascript)	YES (Javascript)	YES (Javascript)	NO	NO	NO	YES (HTML+CSS)
Mobile	NO	YES	NO	NO	NO	YES	NO	NO
Analytics	YES	YES	YES	YES	YES	YES	NO	YES
Communication	RPC	RPC	RPC	RPC	RPC	RPC	RPC	RPC
Reactive/-Asynchronous	NO	NO	NO	NO	NO	NO	NO	
Level of Integration	API and Modules	API	Modules	API	API	Modules	API	API
Delivery Model	SaaS	SaaS	SaaS	SaaS	SaaS	SaaS	SaaS	SaaS
B2B Interaction	NO	NO	NO	NO	NO	NO	YES	NO
Pre-integration	<ul style="list-style-type: none"> • Jive • Salesforce • IBM Connections 	<ul style="list-style-type: none"> • Bazaarvoice • Salesforce • Yammer • Lithium • Jive • IBM Connections • Omniture 	None	None	<ul style="list-style-type: none"> • Sales-force 	<ul style="list-style-type: none"> • Joomla • Blogger • Drupal • Ning • E-Mail 	None	None

Existing Platforms (Overview 2)

Feature	Bunchball	Badgeville	Bidgor	Gigya	IActionable	Punchtab	OpenBadges	UserInfuser
Game Mechanics	<ul style="list-style-type: none"> Challenges-/Missions Trophies Badges Achievements Standard Points Redeemable Points Player Levels Leaderboards Avatar Virtual goods Virtual rooms Team Competitions Social Network Integration 	<ul style="list-style-type: none"> Standard Points Redeemable Points Player Levels Badges Challenges-/Missions Social Network Integration 	<ul style="list-style-type: none"> Virtual Currency Badges Player Levels 	<ul style="list-style-type: none"> Single non-redeemable point metric Player Levels Leaderboard 	<ul style="list-style-type: none"> Points Leaderboard Badges Levels 	<ul style="list-style-type: none"> Leaderboard Single redeemable point metric Badges Giveaways Social Network Integration Activity feed 	<ul style="list-style-type: none"> Badges 	<ul style="list-style-type: none"> Points Badges Leaderboards

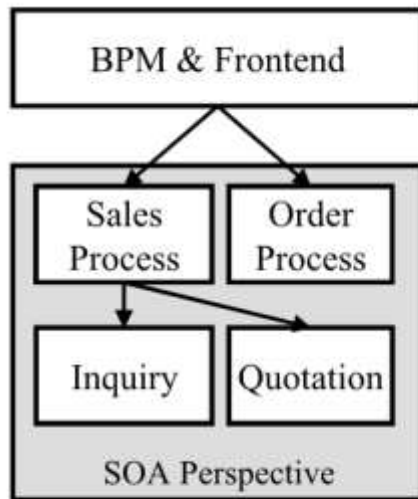
Gamification Platform

Example Rule

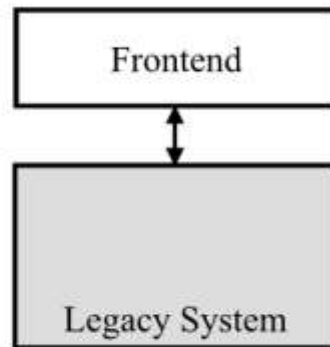
```
rule "newUser"  
  when  
    $evt : EventObject(type=="new_user") from  
      entry -point eventstream  
  then  
    GamificationEvent ge = new GamificationEvent();  
    ge.setType("createPlayer");  
    ge.setPlayerid($evt.getPlayerId());  
    ge.put("logonname", $evt.get("logonname"));  
    bus.publish(ge);  
    retract($evt);  
end
```

Gamification Platform

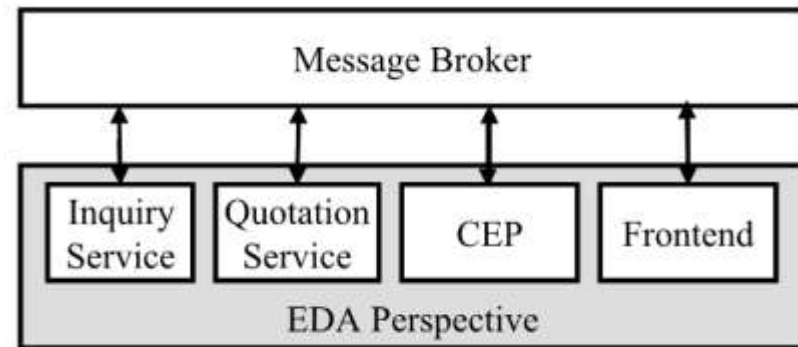
Existing Types



(a)



(b)



(c)

- **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