HIKOMSYS

Learning About Java Dependencies Through Gamification

Bachelor thesis

Dominique Rahm
What do Foursquare, Zynga, Nike+, and Groupon have in common?

These and many other brands use gamification to deliver a sticky, viral, and engaging experience to their customers.
How I Know My System
Architecture

Front end
- HTML5
- CSS3 / Foundation
- JQuery, JSTree, KineticJS

Back end
- Laravel
- MySQL and MongoDB
- VerveineJ
- Moose / Quicksilver
Drawing - Corners

Package

Package 1

Package 2
Point Calculation (Example)

\[ \text{points}_{\text{total}} = \text{points}_{\text{correct}} + \text{points}_{\text{wrong}} \]
Point Calculation (Example)

\[ \text{points}_{\text{correct}} = u_{\text{correct}} \times p_{\text{correct}} + 25 \]

\[ p_{\text{correct}} = \frac{50}{\text{dep}_{\text{correct}}} \]

\[ \text{points}_{\text{total}} = 43.75 + \text{points}_{\text{wrong}} \]
Point Calculation (Example)

points<sub>total</sub> = 43.75 + 20.45 = 64.2
Point Calculation (Example)

- 5 correct, 3 missing, 2 wrong dependencies
- 6 packages
- 8 dependencies

```
java.util.*
java.math.*
```

Total points:

\[
\text{points}_{\text{total}} = 43.75 + 20.45 = 64.2
\]

Alternative formula:

\[
u_{\text{correct}} - u_{\text{wrong}} + \text{dep}_{\text{potential}} - \text{dep}_{\text{actual}}) \times 100 / \text{dep}_{\text{potential}}
\]

\[
(3 - 2 + 30 - 8) \times 100 / 30 = 76.66\
\]
Quantitative Case Study

23 ESE students

- goals:
  - usability
  - knowledge about dependencies
  - collect data

- results:
  - accurate thinking process
  - gamification aspect
  - wrong direction of dependencies
23 quizzes ordered by points
Distribution

![Distribution Chart]

- The chart shows the distribution of quizzes based on the percentage of correct dependencies.
- The x-axis represents the percentage of correct dependencies, ranging from 0.00% to 100.00%.
- The y-axis represents the number of quizzes, ranging from 0 to 6.

Key Findings:
- The highest number of quizzes (5) are in the 12.50% range.
- There are no quizzes in the 0.00% and 25.00% ranges.
- The 50.00% range has 4 quizzes.
- The 62.50% range has 3 quizzes.
- The 87.50% and 100.00% ranges both have 1 quiz.
Distribution

do they know their system?
Distribution

![Bar Chart showing distribution of wrong dependencies]
Qualitative Case Study

Michael Single

(Bachelor thesis about diffraction shaders)

- in-depth knowledge
- result: 72%
- usability flaws
- very interested
Future Work

Gamification
- new levels
- experience points

Social Aspects
- link to github
- share results
Future Work

Gamification
- new levels
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Social Aspects
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Back end
- MongoDB – MySQL

User Interaction
- Tutorial
- FAQ and help
Conclusion - Lessons Learned

- Full Stack Implementation
- Open Source projects!? 
- Iterative process with backlog 
- general interest in dependencies
Thanks!

- gamification
- platform
- data

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