



Perceived and Actual Role of Gamification Principles

@First Workshop on Crowdsourcing and Gamification in the Cloud (CGCloud) held in conjunction with the 6th IEEE/ACM International Conference on Utility and Cloud Computing December 9-12, 2013, Dresden, Germany

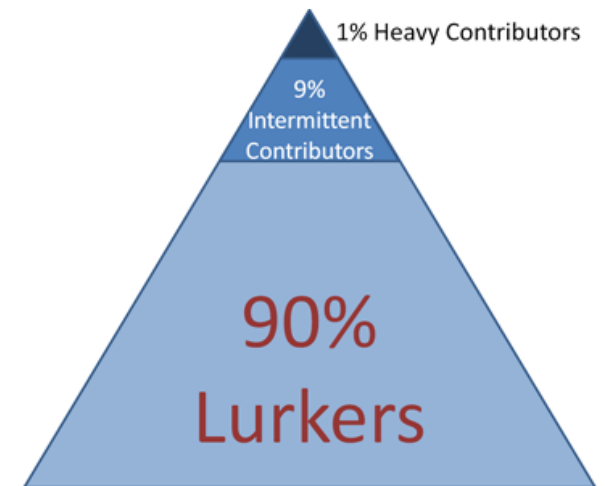
Michael Meder, Till Plumbaum, Frank Hopfgartner

Competence Center Information Retrieval & Machine Learning

- ▶ Introduction
- ▶ Research Questions
- ▶ Experiment
- ▶ Results
- ▶ Shortcomings
- ▶ Conclusion

► Online Communities

- **90-9-1 Rule** (Nielsen, 2006)
 - 90 % never contribute
 - 9% contribute a little
 - 1% account for almost all the action



<http://www.nngroup.com>

► Crowdsourcing

- **33-66-1 Rule** (SCOUT Model, Stewart et al. 2010)
 - Super Contributors (1 %)
 - Contributors (66 %)
 - Outliers (33%)

Gamification - Definition

Gamification refers to

- **the use** (*rather than the extension*) **of**
- **design** (*rather than game-based technology or other game-related practices*)
- **elements** (*rather than full-fledged games*)
- **characteristic for games** (*rather than play or playfulness*)
- **in non-game contexts** (*regardless of specific usage intentions, contexts, or media of implementation*).

Deterding, S., Dixon, D., Khaled, R., and Nacke, L. From game design elements to gamefulness: defining gamification. Proc. Int. Academic MindTrek Conference (2011), 9–15.

Gamification refers to: a process of enhancing a service with affordances for gameful experiences in order to support user's overall value creation.

Huotari, K., and Hamari, J. Defining gamification: a service marketing perspective. Proceeding of the 16th International Academic MindTrek Conference (2012), 17–22.

- previous research reports an **increase of users' activity** in an enterprise due to diverse game mechanics [1,2,3,4]
- studies also indicate that **individual behavior** has a significant influence on the success of gamification [6,7,8,9]
- to the best of our knowledge, there currently exists **no study about employees' perception of gamification**

[1] Farzan, R., DiMicco, J., and Millen, D. Results from deploying a participation incentive mechanism within the enterprise. In Proc. SIGCHI conference on Human factors in computing systems (2008), 563–572.

[2] Farzan, R., and DiMicco, J. When the experiment is over: Deploying an incentive system to all the users. In Persuasive Technology, ACM (2008).

[3] Farzan, R., DiMicco, J., and Brownholtz, B. Spreading the honey: a system for maintaining an online community. Proc. ACM GROUP'09 (2009), 31–40.

[4] Thom, J., Millen, D., and DiMicco, J. Removing gamification from an enterprise SNS. Proc. CSCW'12 (2012), 1067–1070.

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[6] Hamari, J., and Koivisto, J. Social motivations to use gamification: An empirical study of gamifying exercise. Proc. ECIS'13 (2013), 1–12.

[7] Khaled, R. It's Not Just Whether You Win or Lose : Thoughts on Gamification and Culture. In Workshop on Gamification: Using Game Design Elements in Non-Gaming Contexts, co-located with CHI2011 (2011), 1–4.


[8] Yang, J., Morris, M. R., Teevan, J., Adamic, L. A., Ackerman, M. S., and Way, O. M. Culture Matters: A Survey Study of Social Q & A Behavior. In International AAAI Conference on Weblogs and Social Media (2011), 409–416.


[9] Yee, N. Motivations for play in online games. CyberPsychology & Behavior (2006), 772–775.


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What's new: See the most recent bookmarks

 Displaying 555 bookmarks.

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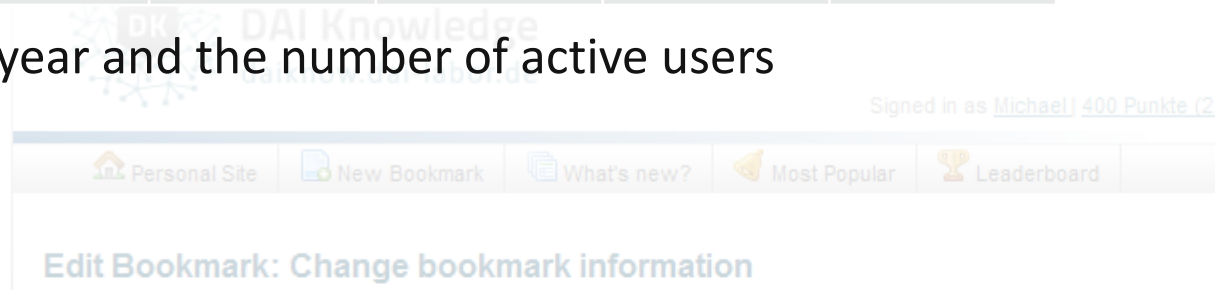
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- nowadays, bookmarking and tagging typical workplace task
- developed as VW Know in close cooperation with  in 2009
Das Auto.
- also used at our research institute since 2009 (DAI Lab, TU Berlin)
- **Participation Inequality** on DAI Know even **worse** than 90-9-1

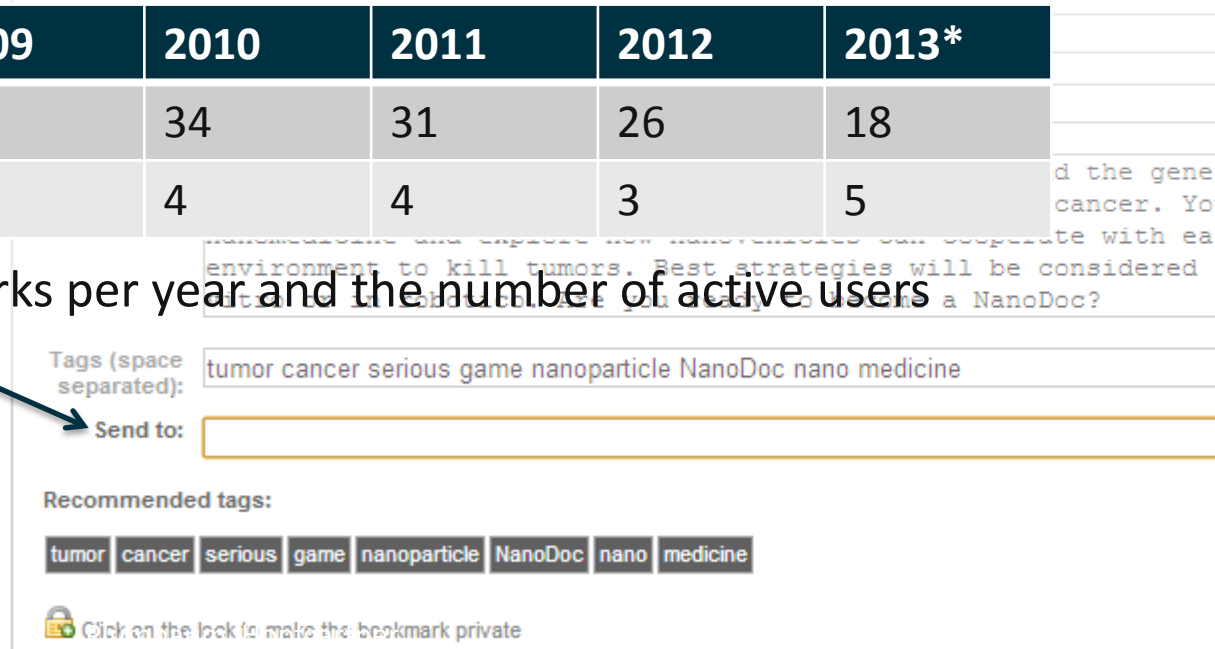
	2009	2010	2011	2012	2013*
Bookmarks	291	29	30	13	26
User	30	4	4	3	5

Created bookmarks per year and the number of active users
 (* = until June 1st).



	2009	2010	2011	2012	2013*
Recommendations	61	34	31	26	18
User	14	4	4	3	5

Recommended bookmarks per year and the number of active users
 (* = until June 1st).



1. Do employees perceive gamification as positive or negative factor (on the enterprise and its staff)?
2. How is the perceived role of gamification reflected by actual usage patterns?

1. 1st Questionnaire (Gamification)
2. Announcement (DAI Know Gamified)
3. One Week of Usage

- not anonymous (authentication with institute account)
- 53 attendees (of 140 potential employees), with age of:
 - 18-29: **23**
 - 30-39: **26**
 - 40-49: 3
 - > 49: 1
- 47 male and 6 female
- **5 questions/statements** to judge with five point likert scale:
 - 1. **How often** do you share or **contribute** content on enterprise systems like enterprise wiki, enterprise content management or enterprise content sharing applications?
 - 2. How **familiar** are you with the term **Gamification**?
 - 3. Gamification would **motivate me to** participate even more on enterprise systems like enterprise wiki, enterprise content management or enterprise content sharing applications.
 - 4. Game mechanics like points, badges and leaderboards have a **positive effect** on the enterprise and its staff.
 - 5. There are **negative effects** on the enterprise and its staff caused by game mechanics like points, badges and leaderboards.

5. Gamification [\(info\)](#) would motivate me to participate even more on enterprise systems like enterprise wiki, enterprise content management or enterprise content sharing applications.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

[PREVIOUS](#)Participation on Enterprise Systems
5/7[NEXT](#)

5. Gamification [\(info\)](#)
more on enterprise systems
content management
applications.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

PREVIOUS

Participation on Enterprise Systems
5/7

NEXT

Gamification is the use of game thinking and game mechanics in a non-game context in order to engage users and solve problems. Gamification is used in applications and processes to improve user engagement, Return on Investment, data quality, timeliness, and learning. *source: wikipedia*

...te me to participate even
enterprise wiki, enterprise
e content sharing

1. Points
2. Badges
3. Leaderboard
4. Feedback

DAI Knowledge
daiknow.dai-labor.de

Signed in as [User Name]

Personal Site | New Bookmark | What's new? | Most Popular

Personal Site: Your Badges

- Newbie**
You earned at least 1 point for actions like adding a bookmark.
- First Bookmark**
You added your first public bookmark.
- Beginner**
You earned at least 500 points for actions like adding a bookmark.

Top Users - All Time

- Benjamin Kille**
75800 Punkte | 20 Badges
- Michael Meder**
39035 Punkte | 49 Badges
- Till Plumbaum**
26750 Punkte | 18 Badges

Points 100 Added one public bookmark.

Points 50 Bookmark with three or more tags.

- gamification (25)
- linked_data (12)
- semantic (10)

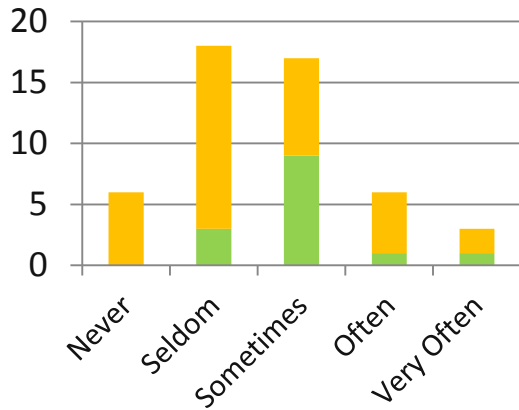
Points 100 Daily Bonus: 1st bookmark.

- semanticweb (10)
- javascript (9)
- linkeddata (7)
- dojo (7)
- linked_open_data (6)
- blog (6)

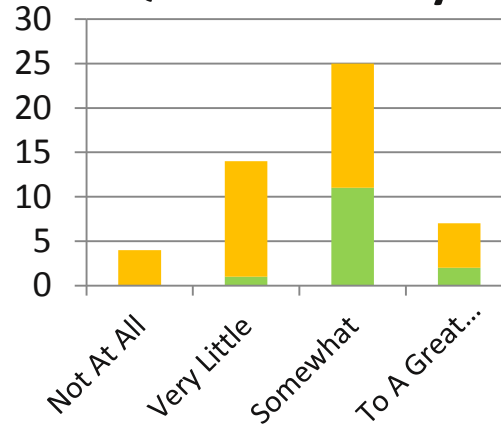
Leaderboard 2. Herzlichen Glückwunsch, dein Rang hat sich verbessert.

- enterprise (5)
- data (5)
- web (5)
- open (4)
- open_data (3)
- book (3)
- cc-irml (3)
- sameas (3)
- rdf (3)
- help (3)

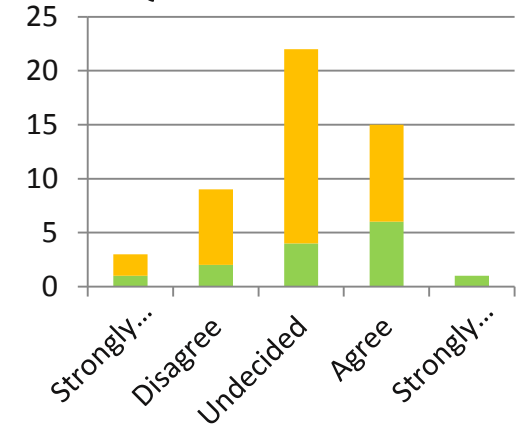
Q1 - Contribution



Q2 - Familiarity

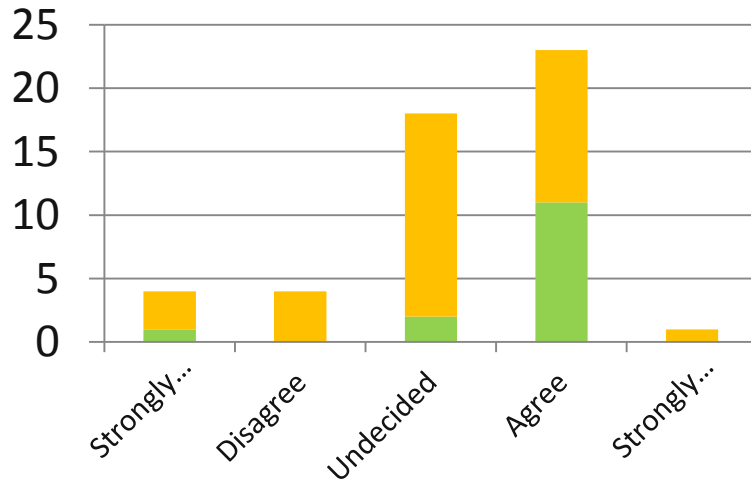


Q3 - Motivation

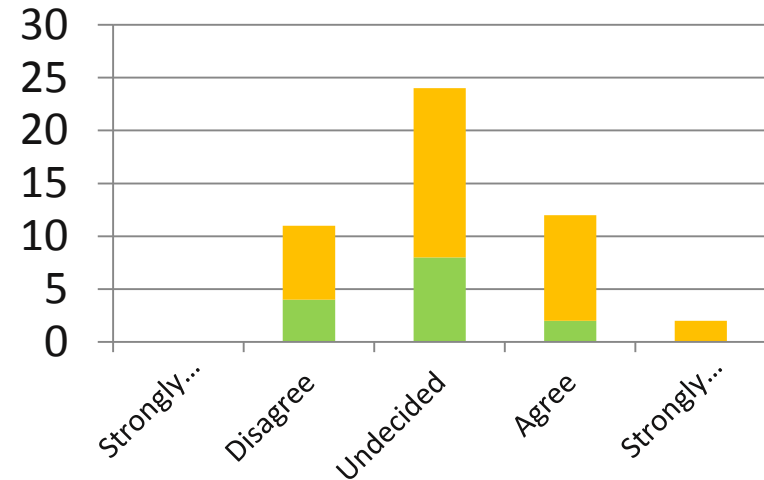


Active User Inactive User

Q4 - Positive



Q5 - Negative



day	# bookmarks		# request all pages and pages with game design elements					
	create/copy	recommend	all	leaderboard	my points	my badges	help points	help badges
1 (Wed)	13	1	371	32	19	9	6	11
2 (Thu)	25	1	135	26	1	0	0	0
3 (Fri)	11	6	126	12	3	4	1	1
4-5 (Sat/Sun)	0	0	7	0	0	0	0	0
6 (Mon)	4	3	72	16	0	0	0	1
7 (Tue)	4	0	58	10	3	1	1	1
8 (Wed)	9	0	32	4	3	0	0	2

TABLE IV: Bookmark contributions and page request over time.

- Leaderboard is the most visited gamified page (every day)
- Overall number of request declines => interest in the system declines as well

leaderboard			# page requests		
rank	points	# badges	all	has game design elements	
				leaderboard	other
1	5700	12	130	58	7
2	4300	9	230	22	14
3	2625	9	-	-	-
4*	2100	9	-	-	-
5	1675	7	51	0	13
6	1360	8	47	5	7
7	1150	5	24	2	0
8	1125	7	-	-	-
9	450	3	15	0	0
10	450	4	7	1	2
11*	450	3	17	3	6
12..19	200	2			

TABLE III: Leaderboard one week after email announcement of the gamified bookmarking system (* = user did not fill in the questionnaire, - = incomplete or no tracking data).

leaderboard			# page requests		
rank	points	# badges	has game design elements		
			all	leaderboard	other
1	5700	12	130	58	7
2	4300	9	230	22	14
3	2625	9	-	-	-
4*	2100	9	-	-	-
5	1675	7	51	0	13
6	1360	8	47	5	7
7	1150	5	24	2	
8	1125	7	-	-	
9	450	3	15	0	
10	450	4	7	1	
11*	450	3	17	3	
12..19	200	2			

noteworthy:

top contributor are more aware of positive but also negative effects

	Group A_1 (rank ≤ 8)	Group A_2 (rank > 8)
Q_1 (contribution)	3.14	2.86
Q_2 (familiarity)	3.14	3.00
Q_3 (motivation)	3.71	2.86
Q_4 (positive)	3.71	3.57
Q_5 (negative)	3.14	2.57

TABLE VI: Mean average answers in online questionnaire of top eight users (Group A_1) of the leaderboard and users on position 9–19 (Group A_2). (higher value indicates higher assessment, higher frequency and stronger agreement)

- ▶ size of the experiment with respect to both
 - time (only one week)
 - the number of respondents/users (53/18)
- ▶ environment of experiment
 - research institute not a real enterprise
 - biased - authors also attended (even though omitted in the results)
- ▶ simple gamification approach (PBL – points badges leaderboard)
- ▶ none anonymous questionnaire (influencing?)

1. Do employees perceive gamification as positive or negative factor?
 - *most employees are convinced that it can have a positive effect on their workplace*
2. How is the perceived role of gamification reflected by actual usage patterns?
 - *employees with positive tendency towards gamification also interact more with the gamified system*

Site Metrics

06/19/13 - 12/06/13



Page Title	Page Views	Pages Views (including 1 st week)
Create New Bookmark	378	438
Leaderboard	334	534
... (user's personal sites)
Help Badges	0	38
Recommendations Inbox	24	36

Thank You



Call for Papers

We invite the submission of position papers as well as novel research papers and demos addressing problems related to gamification in IR. Topics include but are not limited to:

- Gamification approaches in a variety of information-seeking contexts
- User engagement and motivational factors of gamification
- Player types, contests, cooperative games
- Challenges and opportunities of applying gamification in IR
- Gamification design and game mechanics
- Game based work and crowdsourcing
- Applications and prototypes
- Evaluation of gamification techniques

Submissions from outside the core IR community and from industry are actively encouraged.

<http://gamifir2014.dai-labor.de>

Important Dates

- Submission: 5 February 2014
- Notification: 28 February 2014
- Camera-ready: 15 March 2014
- Workshop: 13 April 2014