

## TOWARD MEANINGFUL ENGAGEMENT: A FRAMEWORK FOR DESIGN AND RESEARCH OF GAMIFIED INFORMATION SYSTEMS

## De Liu

Carlson School of Management, University of Minnesota, Minneapolis, MN 55455 U.S.A. {deliu@umn.edu}

### Radhika Santhanam

Price College of Business, University of Oklahoma, Norman, OK 73019 U.S.A. {Radhika@ou.edu}

#### Jane Webster

Smith School of Business, Queen's University, Kingston ON K7L 3N6 CANADA {jane.webster@queensu.ca}

## **Appendix A**

## **Organizational Gamification Examples I**

Successful Gamification Examples						
Organization and Application Area	Goals	Gamification Elements	Outcomes			
University College London's Transcribe Bentham project <sup>1</sup>	Motivate volunteer transcribers worldwide	Points for every edit made, leaderboard, progress ladder from "probationer" to "prodigy," recognition (virtual gifts from editors to users), avatars, com- munity features (profile page, personal message board, "add friends," discussion forum).	1000+ handwritten documents transcribed in a six-month period.			
Liveops Inc.'s gamified virtual community for call center agents <sup>2</sup>	Convert 20,000 call center agents into brand ambassadors, mea- sured by shorter call times and improved cus- tomer satisfaction rates	Badges and points for completing additional training modules and certification, points for increased call conversion and demonstrated skill attributes, public daily leaderboards, "LiveOps Learning" social forum, badges for knowledge sharing, coaching, networking, and feedback.	80% of agents opted in and three quarters of them returned on a bi- weekly basis. Participants outper- formed peers by 23% in call- handling times and boosted cus- tomer satisfaction by 9%.			
Microsoft's Ribbon Hero for Office 2007 and 2010 <sup>3</sup>	Training customers to use ribbon features in Word, Excel, Power- point, and One Note	A time-traveling narrative by an animated avatar Clippy, short, relevant challenges, progress tracking, fantasy-based visuals, background music and sound effects, points and leaderboards, integration with Facebook for sharing achievements.	Although there are no specific statistics, it is a fan favorite and as a result, a sequel (Ribbon Hero 2) was launched. Sixty percent of users who completed two chal- lenges went on to play all 10.			

Organization and Application Area	Goals	Gamification Elements	Outcomes	
Verizon Wireless' community web site <sup>4</sup>	Create a community of socially connected Verizon wireless users	With a third-party vendor's help, it provides users with Social Login—a service that allows users to easily log in using their existing social network accounts. It further uses achievements, points, levels, contests, and a leaderboard to reward users for logging-in, commenting, sharing, uploading photos, entering sweepstakes, etc.	More than 50% of the site's users participated, and users who logged in via Social Login spent 30% more time and generated 15% more page views.	
Less Successful Gamification Examples				
Organization and				

Application Area	Goals	Gamification Elements	Outcomes
Omnicare's gamification initiative for helpdesk <sup>5</sup>	To improve long helpdesk waiting times and enhance efficiency	Reward employees with cash if they achieve the fastest time. Introduce a scoring system with a leaderboard.	Employees felt like "Big Brother" was watching and that the gamified system was too intrusive.
JetBlue's JetBlue Badges program <sup>6</sup>	To engage the airline's customers and motivate spending	Badges for sharing on social media, purchasing from partners ("Hertz Hotshot"), and other travel and loyalty activities. Leaderboards, personalized interactive travel map, over 25,000 achievements to unlock.	Failed to take off. Customers felt that it asked for too much personal information. It failed to incorporate existing travel, had unattractive badges, and was intrusive (e.g., "post tweets for you").
Adobe's LevelUP for Photoshop <sup>7</sup>	To increase revenue with gamified on- boarding training to new Adobe Photoshop customers	Guided levels and step-by-step tutorials, points and badges, extra points for sharing on social media, quiz questions for each level, leaderboard, monthly drawing for every 400 points earned.	Although gamification was found to change user behaviors, it did not meet the company's goals: that is, to drive immediate conversions and revenue.

#### Notes:

<sup>1</sup>http://www.digitalhumanities.org/dhq/vol/6/2/000125/000125.html

<sup>2</sup>http://www.wsj.com/articles/SB10001424052970204294504576615371783795248

<sup>3</sup>http://www.gamification.co/2011/04/26/microsoft-ribbon/

<sup>4</sup>http://venturebeat.com/2012/07/23/verizon-wireless-gamifies-its-site/

<sup>5</sup>http://www.cio.com/article/2453330/careers-staffing/how-to-use-gamification-to-engage-employees.html

<sup>6</sup>http://www.webinknow.com/2013/07/jetblue-badges-gamification-marketing-fails-to-take-off.html

<sup>7</sup>http://www.cmo.com/articles/2012/10/24/game-over-for-gamification.html; http://www.slideshare.net/gzicherm/mira-dontcheva-learning-how-to-useadobe-photoshop-through-gamification

# **Appendix B**

## Inconsistent Descriptions of Commonly Used Gamification Terms

Term	Source	Description		
Game elements	Academic	<ul> <li>building blocks or features shared by games</li> <li>anything that is found in most games and readily associated with games</li> <li>game design principles, game mechanics, game dynamics and storytelling</li> <li>general term to encompass design features</li> <li>mechanics, aesthetics, and game-thinking in non-game contexts</li> </ul>		
	Practitioner	points, badges and leaderboards		
Game aesthetics	Academic	<ul> <li>emotions evoked by a game</li> <li>emotional responses the player experiences as a result of dynamics</li> <li>art, beauty, and visual elements</li> <li>graphics and sounds</li> <li>visual and aural characteristics of the game, including the general look and feel</li> <li>content that adds style and artistic depth to the player experience</li> </ul>		
Game mechanics	Academic	<ul> <li>recurring parts of the design of a game</li> <li>elements used by game developers</li> <li>instructions for a game</li> <li>functional components of a gamified application</li> <li>processes that engage players</li> <li>processes that drive action forward</li> <li>rules of the game</li> <li>rules that provide dynamics of game play</li> <li>rules and sequence of events in the game</li> </ul>		
	Practitioner	<ul> <li>elements such as points, badges and leaderboards</li> <li>tools and techniques used as building blocks for gamification</li> </ul>		
Game dynamics	Academic	<ul> <li>interactions of users with mechanics (gamification elements)</li> <li>emergent behavior of both the game and the player during player-game interaction</li> <li>high-level aspects of games that have to be considered and managed, but not directly implemented into games</li> <li>the big-picture aspects of the gamified system that include constraints, emotions, narrative, progression, and relationships</li> </ul>		
Game principles	Academic	<ul><li>evaluative guidelines</li><li>mechanics, dynamics and emotions</li></ul>		
Game play	Academic	<ul> <li>gameplay (experience) involves the interaction between the player and the game (artifact)</li> <li>the challenges, rewards, and decisions encountered by a player</li> <li>performance-oriented simulation</li> </ul>		
	Practitioner	<ul> <li>a term to rate or score the quality of the experience of the gamer while playing a particular game</li> <li>the specific way in which players interact with a game</li> <li>the pattern defined through the game rules, connection between the player and the game, challenges and overcoming them, plot and player's connection with it</li> </ul>		

### Academic and Practitioner Sources for Appendix B

- Andersen, E., Liu, Y.-E., Snider, R., Szeto, R., and Popović, Z. 2011. "Placing a Value on Aesthetics in Online Casual Games," in Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Vancouver, BC, Canada, pp. 1275-1278.
- Beal, V. 2016. "What Is Gameplay? Webopedia Definition," Webopedia.com (http://www.webopedia.com/TERM/G/gameplay.html; retrieved May 26, 2016).
- Borges, S. S., Durelli, V. H. S., Reis, H. M., and Isotani, S. 2014. "A Systematic Mapping on Gamification Applied to Education," in *Proceedings of the 29th Annual ACM Symposium on Applied Computing*, New York: ACM Press, pp. 216-222.
- Bui, A., Veit, D., and Webster, J. 2015. "Gamification—A Novel Phenomenon or a New Wrapping for Existing Concepts?," in Proceedings of the 36<sup>th</sup> International Conference on Information Systems, Fort Worth, TX.
- Burke, B. 2014. "Gartner Redefines Gamification," Gartner.com (http://blogs.gartner.com/brian\_burke/2014/04/04/gartner-redefines-gamification/; retrieved May 25, 2016).
- Cheong, C., Cheong, F., and Filippou, J. 2013. "Using Design Science Research to Incorporate Gamification into Learning Activities," in *Proceedings of the 2013 Pacific Asia Conference on Information Systems*, Jeju Island, Korea, pp. 156-171.
- da Silva, D. G. 2016. "Points, Badges, and Leaderboards," *Agile Gamification* (http://www.agilegamification.org/gamification/points-badges-leaderboards/; retrieved May 25, 2016).
- Deterding, S., Dixon, D., Khaled, R., and Nacke, L. 2011. "From Game Design Elements to Gamefulness: Defining 'Gamification,'" in *Proceedings of the 15<sup>th</sup> International Academic MindTrek Conference on Envisioning Future Media Environments*, New York: ACM Press, pp. 9-15.
- Galli, L. 2014. "Matching Game Mechanics and Human Computation Tasks in Games with a Purpose," in *Proceedings of the 2014 ACM International Workshop on Serious Games*, Orlando, FL, pp. 9-14.
- "Game Mechanics." 2016. Badgeville.com (https://badgeville.com/wiki/Game\_mechanics; retrieved May 25, 2016).
- "Gameplay." 2016. Wikipedia (https://en.wikipedia.org/wiki/Gameplay).
- Hofferbert, S., Cahalane, M., and Finnegan, P. 2015. "Gamification as an Architecture of Participation: An Investigation of an Innovation Maker Community," in *Proceedings of the 23<sup>rd</sup> European Conference on Information Systems*, Münster, Germany, pp. 1-10.
- Hunicke, R., LeBlanc, M., and Zubek, R. 2004. "MDA: A Formal Approach to Game Design and Game Research," *Proceedings of the Workshop on Challenges in Game AI* (4), pp. 1-5.
- Khaleel, F.L., Ashaari, N. S., Meriam, T. S., Wook, T., and Ismail, A. 2015. "The Study of Gamification Application Architecture for Programming Language Course," in *Proceedings of the 9<sup>th</sup> International Conference on Ubiquitous Information Management and Communication*, New York: ACM Press, pp. 1-5.
- Nelson, M. J. 2009. "A Requirements Analysis for Videogame Design Support Tools," in *Proceedings of the 4<sup>th</sup> International Conference* on Foundations of Digital Games, Orlando, FL, pp. 137-144.
- Nummenmaa, T., Kultima, A., Alha, K., and Mikkonen, T. 2013. "Applying Lehman's Laws to Game Evolution," in Proceedings of the 2013 International Workshop on Principles of Software Evolution, Saint Petersburg, Russia, pp. 11-17.
- Ralph, P., and Monu, K. 2015. "Toward a Unified Theory of Digital Games," The Computer Games Journal (4:1-2), pp. 81-100.
- Robson, K., Plangger, K., Kietzmann, J., McCarthy, I., and Pitt, L. 2014. "Understanding Gamification of Consumer Experiences," Advances in Consumer Research (42), pp. 352-356.
- Shang, S. S. C., and Lin, K. Y. 2013. "An Understanding of the Impact of Gamification on Purchase Intentions," in *Proceedings of the 19<sup>th</sup> Americas Conference on Information Systems*, Chicago.
- Sicart, M. 2010. "Wicked Games : On the Design of Ethical Gameplay," in *Proceedings of the 1st DESIRE Network Conference on Creativity* and Innovation in Design, Aarhus, Denmark, pp. 101-111.
- Teh, N., Schuff, D., Johnson, S., and Geddes, D. 2013. "Can Work Be Fun? Improving Task Motivation and Help-Seeking Through Game Mechanics," in *Proceedings of the 32<sup>nd</sup> International Conference on Information Systems*, Milan, Italy.
- Thiebes, S., Lins, S., and Basten, D. 2014. "Gamifying Information Systems-A Synthesis of Gamification Mechanics and Dynamics," in *Proceedings of the 20<sup>th</sup> European Conference on Information Systems*, Tel Aviv, Israel.
- Tractinsky, N. 2004. "Toward the Study of Aesthetics in Information Technology," in *Proceedings of 25<sup>th</sup> International Conference on Information Systems*, Washington, DC, pp. 771-780.