# Game Mechanics in Support of Production Environments

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## Abstract

In this paper we illustrate how we use gamification in *production environments*, such as call centres, in order to help agents and supervisors manage their performance. Our approach is based on the incremental introduction of game mechanics in the work environment to support situational awareness with respect to aspects such as current performance levels, goals, and related incentives. We illustrate our approach and the research questions we are investigating also considering related work on gamification and ongoing discussions in academic and commercial environments.

## Author Keywords

Game mechanics; gamification; situation awareness; agency.

## ACM Classification Keywords

H.5.m. Information interfaces and presentation.

## General Terms

Design, Human Factors, Theory

## Introduction

In recent times, there have been discussions about the use of games and game elements in non-game contexts, referred to as Gamification [4]. Gamification

can take several forms, from the layering of basic game mechanics onto routine performance tracking, to the full integration of productive tasks into a virtual gaming environment [6]. In either case, the primary objective is to increase the motivation and involvement of workers in activities such as training and work related tasks [2, 5]. However, significant amounts of research remains to be done in order to understand the effectiveness and level of acceptance that game mechanics have in the work environment.

More recently, there have been discussions about the pros and cons of gamification [7]. These discussions have raised the specific concern that replacing intrinsic rewards with explicit ones may actually reduce motivation over the long term [7]; or that games may be used as an additional layer of control, thus increasing pressure on agents rather than reducing it [1]. Given that real examples of the successful implementation of game mechanics in work environments (as opposed to learning or training environments) are hard to find, a certain measure of skepticism is fair.

While the concerns about the effectiveness of gamification are legitimate, we believe that used judiciously, it can provide benefits in particular work environments. We are building a technology [2] that uses elements of gamification [3] to support knowledge workers that operate according to a "production" model where work is organized as a process broken down into repetitive, measurable, tasks distributed across a hierarchically organized workforce with a rigid organization of labour (shifts, strict time keeping, and monitoring strategies). In this paper we use outsourced call centres as an example of this type of knowledge work.

Knowledge work is characterized by the complex reasoning that workers often bring to the activities they undertake. When this work occurs in a production environment, the push to routinize and distribute the tasks can have the effect of reducing the visibility and value of the skills that each worker brings to the job. This is compounded by a design of processes and information systems that may not facilitate the skilled part of the knowledge work in question.

In our research, we have focused on the organizational processes and information systems used in the performance management and monitoring of the call centre. Information Management Systems available to agents may provide access to phone switch data. However, to reflect the performance trends of specific agents or teams, the data needs to be aggregated into reports. The creation of these reports is time consuming and dedicated to specific organizational processes, such as reporting on the call centre's overall performance or in the course of coaching sessions with individual agents. The net result is that agents and their supervisors only periodically receive feedback on their individual and team performance and not in the course of taking phone calls, which is when this information would be the most salient to monitoring their own performance in relation to organizational and personal goals as their shift unfolds, as well as, in balancing customer demands (for example, in terms of time on the phone) with organizational policies. Agent team supervisors, on their part, have to spend a considerable amount of their time aggregating performance statistics and generating reports, when they should instead be available to help agents with

their phone calls. To address some of these issues, we have designed a system, Agentville [2], that offers the visualization of the salient information and its trends as it unfolds in as close to real-time as possible.

## Agentville: a platform for gamification

In a call centre, agent performance is typically measured through Key Performance Indicators (KPIs), which are metrics derived from the telephone switch and assessments performed by quality analysts. An example of a typical KPI is Average Handle Time (AHT), which represents the average time an agent spends on a phone call with a customer. Each call centre is expected to keep the average value for these KPIs within a certain threshold – agents are in turn expected to manage their phone calls so that their average values fall within those thresholds.

The Agentville widget (Figure 1) provides agents and supervisors with near real-time information on the values of their KPIs, which are already captured and processed in the call centre. As such, Agentville is not an additional level of performance tracking, but makes existing tracking transparent to agents and supervisors. This provides them with the information they need to manage their own performance in regards to the expectations of their organization [2]. The Agentville system provides a platform within which we plan to integrate elements of gamification, such as levels and leaderboards and more importantly challenges and competitions.

According to our observations of call centres, games, such as challenges and competitions, are typically implemented in a very low-tech manner. Scoreboards are typically wall displays which may or may not be visible to all agents from their workstations, and are

usually not updated regularly. The absence of more dynamic and accessible visualizations does not encourage engagement on the part of the agents, and it negates the potential for using the game mechanisms themselves to focus the agents' attention on particular aspects of their own and their team's performance.

Games are also designed to drive performance on particular metrics or services according to organizational requirements. If these do not change on a regular basis, they tend to always target the same skill set, favouring the same subset of agents. This means that they can be perceived as unfair to agents who do not feel they have any realistic chance to win. These games may also drive certain metrics too hard at the expense of others, as certain qualitative metrics (customer satisfaction measures) are inversely (or non-linearly) related to certain quantitative measures (for instance, the amount of time an agent spends on the phone with a customer).

Given a platform that provides near real-time, shared performance data visualizations to agents and their management, we see the potential to integrate additional game mechanisms in a manner that increases their agility and realizes their original intent more effectively. That is, primarily, through the more dynamic focusing of agents' attention towards these goals with added incentives.

More specifically, the forming of the competitions involves the viewing of the various KPIs over a period of time to support the decision of what type of competition should be formed. The viewing of this data, coupled with the visualization of the occurrences of past competitions, supports learning for the creators of the
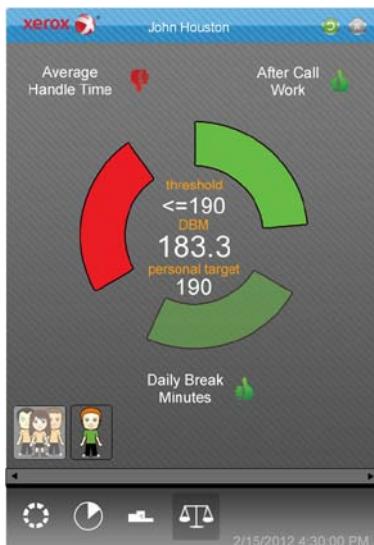


**Figure 1. An agent's widget in Agentville.**

competition. Through this process the creator will reason on any changes in the KPI and the capacity of agents to change. As for supporting the learning and development of the agents, through the participation in these competitions, we believe, they will come to better understand the priorities of the call centre.

Additionally, we see the use of competitions and challenges as a way to facilitate the sharing of both the changing goals of a call centre and the contribution to these goals by the agents. Currently, call centres respond to either long term goals (keep a metric under a certain threshold) or individual exceptions (an agent being on the phone too long). Long term goals are addressed with a set of best practices, while individual exceptions are handled by dispatching 'runners' or calling the agent directly. There is a lack of ability in recognizing trends, coupled with a lack of agility in responding to unfolding situations. The game mechanics of competitions and challenges enable the more efficient communication of both goals and the progress towards reaching these goals.

## Conclusion

We see gamification as a means and not as an end. We do not make assumptions that introducing a game in a workplace will systematically make work fun and we do not make assumptions about the impact of reward mechanisms (which are not introduced by game mechanisms themselves but rather by pre-existing performance-based management and compensation mechanisms) on intrinsic motivation. We do "assume" (as a working hypothesis) that in the context of a tightly monitored work environment it may be more "motivating" for agents to:

- Have more transparency into the organization's performance management strategies and expectations, and where their current performance is in relation to them;

- Have a sense of what they contribute to their team and the organization through their individual efforts;

- Understand what their opportunities for improvement are and have more agency in monitoring and managing their own performance.

## References

[1]   Bogost, I. Exploitationware. Gamasutra, 2011. http://goo.gl/jK1VR.

[2]   Colombino, T., Castellani, S., Grasso, A., and Willamowski, J. Agentville: supporting situation awareness and motivation in call centres. In *Proc. Of COOP'12,* Springer (2012), 291-307.

[3]   GamificationEncyclopedia. http://gamification.org/wiki/Encyclopedia.

[4]   Deterding, S., Dixon, D., Khaled, R., and Nacke, L. Gamification: From game design elements to gamefulness: defining "gamification". In *Proc. Of MindTrek 2011*, ACM (2011).

[5]   Nikkila, S., Linn, S., Sundaram, H., and Kelliher, A. "Playing in Taskville: Designing a Social Game for the Workplace". *CHI 2011* Workshop on *Gamification: Using Game Design Elements in Non-Game Contexts*, (2011).

[6]   Reeves, B. and Read, J. L. Total Engagement: Using Games and Virtual Worlds to Change the Way People Work and Businesses Compete. Harvard Business School Press, Boston, MA, 2009.

[7]   How 'Gamification' Can Make Your Customer Service Worse, K. Finley. http://www.wired.com/wiredenterprise/2012/11/gamification-customer-service/, 2012.