Stretch Goals: Gamification of SLINKYs

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Abstract

Gamification has been successfully applied in many fields, including learning, crowdsourcing, and physical exercise. In this paper we demonstrate Stretch Goals, a novel application of the principles of gamification to the operation of a helical spring toy. We project that this yields increased engagement and decreased boredom, positioning helical spring toys squarely in the center of the digital entertainment landscape.

1 Introduction

Gamification is the application of game design and gameplay elements, such as competition, challenges, and rewards, in non-game contexts in order to enhance enjoyment and engagement. It has been successfully applied in many fields, including learning, crowdsourcing, and physical exercise. In this paper, we apply the principles of gamification in a previously overlooked domain, namely, the operation of a helical spring toy.

The original helical spring toy, Slinky, was invented by Richard T. James in 1943 and was first sold in 1945. It was an immediate hit, selling out its first production run of 400 units in just 90 minutes. In its first 60 years, about 300 million units were sold. Today helical spring toys are also manufactured and marketed under several competing names, including Sproing!, Giant Springy, and Coil Springy. They are produced in both metal and plastic, in a variety of colors, and in shapes other than the traditional circular form, such as stars and squares.

In order to avoid reference to any particular brand name, in this paper we shall refer to a helical spring toy as a Spring-LIke Nonlinear Kinetic toY, or SLINKY.

Today's youth are too absorbed in their electronic phones and tablets to have time for such analog toys. To rekindle interest, we seek to gamify the experience of operating SLINKYs in order to make them more fun.

Figure 1: The Stretch Goals splash screen.

2 Methodology

SLINKYs have many modes of operation. We chose to focus our preliminary work on the task of descending flights of stairs. The obvious metric to drive gamification is the number of steps descended, and so a method of counting steps is needed.

We solved this problem by connecting a Bluetooth pedometer to a SLINKY. This transmits a step count to a Web app, which then sends the data to a backend service. The backend manages user accounts, total step counts, leaderboards, streaks, and so on. The frontend presents this data to users, along with challenges. We call this app Stretch Goals. Figure 1 shows the splash screen.

2.1 Hardware

We obtained a Slinky® brand SLINKY and a Puck.js Bluetooth sensor. We tested various methods of attachment, including adhesive tape and suspending a foam circle in the center of the SLINKY, which did not achieve the desired results. We found that a bent paper clip worked pretty well.

After a few test slinks, the Bluetooth sensor fell apart. Upon closer examination, we learned that the jostling forces had broken the battery clip off the main circuit board. Fortunately, all that was required for complete repair was some very clumsy soldering and a small zip tie for reinforcement.

Figure 2: Slinko, the Stretch Goals mascot.

2.2 Challenges

The main focus of Stretch Goals are the challenges. When a user selects a challenge, they are presented with a task such as "Descend 14 steps!" The user can then send an appropriately Bluetooth-connected SLINKY down a flight of stairs to complete the challenge. Multiple attempts will be accepted. When the user completes the challenge, they are rewarded with positive audiovisual stimuli, and their steps from the challenge are added to their total step count.

2.3 Daily goal

Many eminent authorities recommend a daily step count goal of 10,000 steps, so we have set this as the daily goal in Stretch Goals. We admit we were surprised by this number, which seems somewhat high, but we are not in a position to argue with experts. According to 10Best et al. [1], this daily goal can be achieved by sending a SLINKY down thirty Big Bens, or six Eiffel Towers plus one standard flight of house stairs, or three Burj Khalifas plus six Christ the Redeemers. The Niesen mountain in the Swiss Alps has the longest stairway in the world, at 11,674 steps, so a typical Swiss child will just need to perform one SLINKYing per day.

2.4 Levels and leagues

Levels and leagues are a common feature of gamification apps, often with a metaphor such as climbing a ladder or reaching a higher league. However, this is clearly the wrong direction for a SLINKY app, so in Stretch Goals the levels go the opposite way. When a user first registers for Stretch Goals, their beginning level is the top of Mount Everest, and the levels go downward from there.

Leagues in Stretch Goals are closely tied to levels. When a user's SLINKY has descended a total of three miles, i.e., one league, the user is promoted to the next lower level. Mount Everest, the first level, has an elevation of 29,032 feet, or approximately two leagues. Consequently, the second level is Mont Blanc,

with an elevation of 15,774 feet, approximately one league; and the third level is the ground.

Below sea level, following Verne [2], a league becomes three nautical miles. The next two levels are RMS *Titanic* and the Mariana Trench. Later levels include the Mohorovičić discontinuity (level 10) and the diamond league (level 30). Verne [3] provides further details.

2.5 Stories

As another form of engagement, Stretch Goals offers SLINKY-themed stories, including "Slinko's first step" and "Jack and Jill fall down the hill." In these stories, two or more characters engage in captivating dialogue such as "I'm going to go down ten steps!" and "I'm going to go down twelve steps!" The user must send a SLINKY down the corresponding number of steps in order to progress the storyline.

2.6 Stretch+

We recognize that it is not always possible to play with a physical SLINKY. For example, it would be difficult to make progress in the app while flying in economy class, while bedridden due to illness, or while living in a yurt on the vast treeless steppes of Mongolia. It would be demotivating for a user to lose their streak just because they were temporarily unable to meet their daily step goal (or even their steppe goal) by sending a real SLINKY down a flight of stairs.

In order to accommodate users in such situations, a paid version of Stretch Goals, called Stretch+, offers a virtual SLINKY feature. With the virtual SLINKY, a user can achieve their daily step goal purely in the Stretch Goals app. For the initial prototype, the virtual SLINKY feature is simply a playlist of SLINKY videos on YouTube, but we expect that this feature can be expanded in the future into a fully immersive SLINKYing experience. For just a bit of extra money, a user won't have to play with a real SLINKY at all!

3 Analysis

Due to the unforeseeable soonness of the SIGBOVIK conference, we did not have a working prototype of the Stretch Goals app by the paper deadline. However, based on highly scientific methods, we were able to estimate the decrease in boredom provided by Stretch Goals, illustrated in Figure 3.

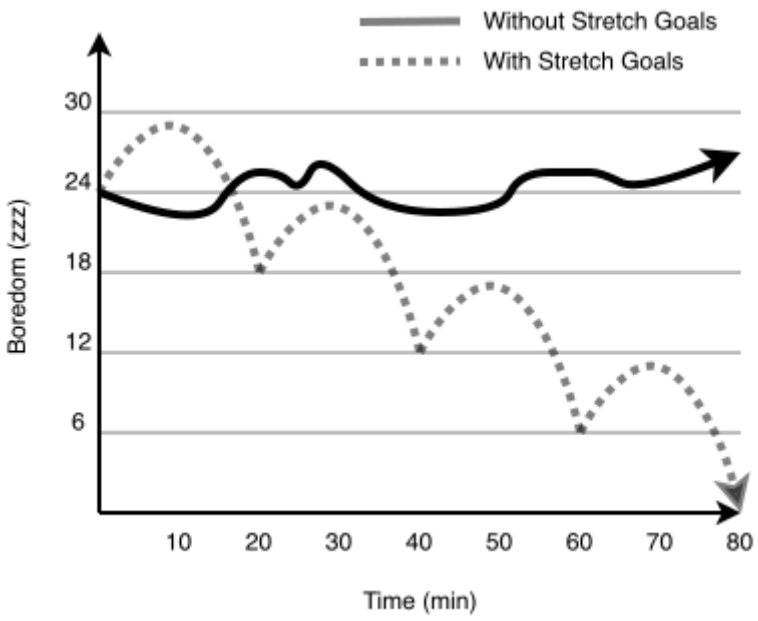

Figure 3: Projected decrease of boredom with Stretch Goals.

4 Conclusions

We presented Stretch Goals, a novel application of gamification to the operation of a helical spring toy, or SLINKY. We highlighted the compelling features of the new app and projected that it increases engagement and decreases boredom. This promises to make a SLINKY a viable entertainment alternative to currently popular digital pursuits such as TikTok, Fortnite, and Yahoo! Backgammon.

References

[1] 10Best Editors for USA Today. How many stairs to the tops of these iconic tall places? `https://www.10best.com/web-stories/how-many-stairs-to-the-tops-of-these-iconic-spots/`.

[2] Verne, J. Vingt mille lieues sous les mers. *Magasin d'éducation et de récréation*, Paris, 1869–70.

[3] Verne, J. *Voyage au centre de la Terre*. J. Hetzel et Cie, Paris, 1864.