Serious game: Knoco's Bird Island, making the point for KM

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Abstract

Purpose – Knowledge management really does make a difference; it is not just an academic idea. There are lots of case studies and examples of knowledge management activities having a significant impact on the results of an organization, and some examples will be cited in the body of the paper. However, Knoco's Bird Island serious game is one of the quickest, easiest, and most enjoyable ways to make the point. The paper aims to discuss these issues.

Design/methodology/approach – This paper will review how Knoco's Bird Island serious game is played. It will also discuss the results of over the almost 20 years that it has been played: what participants have experienced, what has been learned, and most importantly, the data that have been collected that help prove that sharing knowledge is a very powerful thing to do.

Findings – By using three different KM processes (after action reviews, peer assists, and best practice sharing) results of the activity go from abysmal to unbelievable, increasing by an average of 258 per cent, all because of reflecting, sharing, and learning. Even if participants want to continue to be sceptical of the results that making better use of their organization's knowledge can have and they think they can only attain a fraction of this, 10 per cent of the demonstrated result is still almost 26 per cent. Isn't that worth at least giving it a try?

Originality/value – Knoco has been running their serious game for almost two decades and have the data to prove it.

Keywords Innovation, Gamification, Knowledge management, Case study, Change management, Serious game

Paper type Case study

1. Introduction

There are many case studies published that document the successes and failures of knowledge management initiatives; one of the authors of this paper has been involved in publishing nine of them in an earlier publication (Barnes, 2011). However, case studies take time: time for the actual events to happen, time to document and make sense of those events.

At the beginning of a KM implementation it is often unknown if the events that will comprise the case study will support or disprove the hypothesis that knowledge management can help in a situation.

Additionally, in case studies it is difficult to isolate the impact of knowledge from other things that may be happening within an organization. The longer the period of time encapsulated in the case study, the more outside factors can influence the outcome.

Running a simulation can help address these issues because they are run over a few hours, and can control variables more easily. As a reminder, "serious games are simulations of real-world events or processes designed for the purpose of solving a problem. Although serious games can be entertaining, their main purpose is to train or educate users, though it may have other purposes, such as marketing or advertisement" (Anonymous, 2016).

Knoco's Bird Island is such a game. In a period of two hours it takes participants from sceptics or non-believers to KM proponents. By using children's toys and a story to provide context, the participants are led through a series of activities and knowledge management processes to illustrate the value of using knowledge management within the organization.

Bird Island was developed at British Petroleum (BP) in the late 1990s as a means of quickly and easily demonstrating the value of knowledge management. Instead of sitting in a lecture

or classroom training, trying to understand knowledge management from a conceptual, academic, or theoretical perspective, game participants actually get to experience common knowledge management activities: after action review, peer assist, and best practices sharing first-hand. Participating in these activities makes knowledge management very real rather than intellectual: the benefits of knowledge management become immediately apparent.

Because it started in the late 1990s data have been collected since that time, recording participant's outcomes, providing hundreds of data points to review and analyse. The game has been played by a wide variety of people including both management and front-line staff, and across sectors, including manufacturing, resource extraction, not-for-profit/NGO to name a few.

During the first two years of playing the game, participants were provided with more materials and more "tries", but for various reasons after two years a decision was made to reduce the materials and the number of "tries" that game groups were provided with. And while it took a bit of time, the results of the game, as it is currently run, surpassed the results of the first couple of years, illustrating innovation and creativity, two outcomes often associated with KM.

For the data from the game to be collected and included in the data set, the exercise has to be facilitated by a Knoco-trained facilitator, using a standard set of materials, i.e. wooden blocks, elastics, wooden skewers, etc. Facilitators are provided with instructions, a slide deck and background information as well as a set of knowledge assets to use in the delivery of the game.

This paper presents an instrumental case study (Baxter and Jack, 2008) of Bird Island in order to understand the impact that playing the game has on knowledge management, and to provide support for playing such a game in order to gain support for KM initiatives. It is hypothesized that playing Bird Island has a positive impact on both propositions.

2. Current state of gamification in KM

There are few games or game-like activities that are being played in the field of KM in order to facilitate KM's adoption and use in organizations. One such game that tries to make organizational change more fun is "Organizational Zoo" developed by Shelley (2007). This game uses a series of plant and animal caricatures to represent the different types of people who exist within an organization. The objective is to understand the behaviours and learn how to improve relationships between them. Because a significant part of the success of a KM initiative is understanding people and motivating them to change their behaviours, this game can be used to facilitate the change necessary to make KM (and other organizational change initiatives) successful.

Another game-like activity that can make KM planning more enjoyable is the use of the book and cards developed by Lambe and Tan (2008). The book and cards they created can be used to facilitate brainstorming and ease the development of a KM strategy. These materials can also be utilized in KM training and education.

While both of these activities are game-like and are meant to make some aspect of KM more enjoyable and more successful, neither one of them is a game in the traditional sense of the word and neither one demonstrates the value of implementing KM in an organization, which is what Bird Island does and which will be described next.

3. Bird Island: how to play

3.1 Set-up and process

The game is best preformed in teams of four or five, with a total of three to four teams, for a total of 20 people. Certainly more can participate, but it is necessary to ensure adequate materials and space, as each team needs its own private breakout room, in addition to the room where the plenary sessions are held.

The following are the high-level steps for the game:

(1) All participants attend plenary briefing to explain what the exercise is about, and select teams.

(2) Each team constructs a tower in their own breakout room and measures its height.

(3) Each team performs an After Action Review (AAR) on how they performed (providing knowledge input 1) and estimates the height they could build the tower if they were to build it again with the extra knowledge they now possess from the AAR.

(4) Each team exchanges knowledge with other teams to learn from them (providing knowledge input 2) and estimates the height they could build tower if they were to build it again with the extra knowledge they now possess from the peer assist.

(5) In a plenary session, all participants examine a knowledge asset on tower building constructed from past workshops where the game was played (providing knowledge input 3), and once back in their own breakout rooms estimate the height they could build tower with the extra knowledge they now possess from the best practice sharing.

(6) Each team now possesses much more knowledge than when they built their first tower. They now build a second tower in the breakout room and measure its height.

(7) All participants attend plenary debriefing for a look at achieved heights and a review discussion on what the exercise has taught them.

3.2 The story

To set the context of the game, the facilitator explains to the participants that they are Bendi people in the land of Bendi. In this land, the Bendi people live by eating birds which they catch from the sky. The higher the Bendi people can be positioned the more birds they can catch so they need to hold their invisible bird nets whilst standing on the top of towers.

There are two challenges the participants need to face, both of which come from the environment in the land of Bendi. The first is hurricanes, which are simulated by a hairdryer; the second is earthquakes, which are simulated by dropping a significant weight next to the tower (a telephone directory, or a pile of five or six course manuals is often used). Both of these hazards are demonstrated during the briefing so that participants understand the nature of the testing. The towers need to survive both these tests without collapsing.

3.3 The rules

The tower must be free-standing and made solely of the materials provided: 40 Jenga Blocks, 1 Bendiperson, 1 sheet of Flipchart paper, 20 rubber bands, and 4 skewer sticks. Each team also receives a tape measure so that they can measure and/or monitor their progress.

The teams have 30 minutes to go to their breakout rooms, design the tower, build it, test it against the earthquake and hurricane tests and measure the height from the base of the tower to the Bendiperson's invisible net, keeping in mind that the higher the net, the more birds they will catch.

Each team has a facilitator with them to help them if they have any questions. The facilitator has been briefed on the rules of the game and can only answer questions about the rules; he/she cannot help build the tower or disclose any building knowledge before it is time to do so, as per the instructions the facilitators were given. The only exception to this rule is that if the team has not realized that they can use a sheet of chart paper, the facilitator can make them aware that it can be used as a construction material, but this can only be mentioned to them towards the end of the construction period.

3.4 After action review

At the completion of the first tower design and build period, each team performs an AAR led by the facilitator. The following questions are asked:

- What was supposed to happen?
- What actually happened?
- What were the good and bad factors of the design?
- What is the learning for next time?

The facilitator records the answers on a single flipchart (this is best done on a single sheet of flip chart paper and dividing it into four with one question in each quadrant – this keeps the process short and focussed).

The AAR is focussed on the design and build of towers, not reviewing teamwork, or personal performance; however, if dysfunctional behaviours were observed, e.g. competitiveness or sabotage, the facilitator for the whole workshop needs to make note of such behaviours to be discussed at the final de-briefing.

3.5 Peer assist

For the purposes of the game, the peer assist is simulated by bringing in someone from another team, for a 5-minute brain-picking session. It is important for the facilitator to watch the dynamics carefully at this step. There can be reticence to share or other dysfunctional/counter-productive behaviours exhibited, in which case these behaviours will need to be discussed in the final debrief. The facilitator needs to make sure that the person from the other team is sharing knowledge freely and that the team receiving the knowledge is doing so respectfully.

3.6 Knowledge asset/best practice sharing

This activity is done in a plenary session after the first build and other two knowledge management activities and recording of the actual and estimated heights from each stage.

The sharing is started by explaining that there is a third source of knowledge because the game has been played by other people before. During this step the participants learn the history of the game (how many times it has been run and for how many years) and that it is possible to achieve more than 300 cm in height with exactly the same materials as was supplied to the teams.

This often leaves the teams surprised and amazed, but once they see the images of the highest towers and how they were put together, the teams often become very eager to try it for themselves, although sometimes participants are sceptical that the towers pictured in the knowledge asset passed the hurricane and earthquake tests, but they have.

At this point the full knowledge asset is shared with the teams. There is a lot of detail which can be accessed as required: photographs, diagrams, and instructions illustrating how pieces are constructed, put together, and attached to one another in order to maximize the height of the tower.

The game facilitator stresses to the participants that the knowledge asset is a collection and assimilation of the best performance from the past 10+ years. The facilitator asks them to consider what it would be like if their organization had access to this depth of knowledge for all key activities. This is a key learning moment for many game participants.

Each team then gets a paper copy of the knowledge asset for them to use in the construction of their second tower (the knowledge asset must be returned at the end of the game) and returns to their breakout room.

Back in the breakout room, the team facilitator records the third estimate for the height of the tower now that participants have seen the best practices captured in the knowledge asset.

3.7 Second build

The second last step in the game is to allow participants to build a second tower. The purpose of the second build is for participants to improve their performance by using what they have learned in the AAR, peer assist, and best practice sharing. At the end of the second build the height is again measured and recorded.

3.8 Final plenary debrief

This is a very important session. The game facilitator needs to help the participants disengage from the emotion of the tower building process and focus on what they have learnt about learning and sharing what they know in order to improve performance in their organizations.

This process is initiated by showing a graph or table of all five data points from all the teams that participated. The graph/table facilitates an easy comparison among all the teams and illustrates consistency among their individual experiences.

The game facilitator also points out how the various knowledge interventions increased the confidence of the teams in terms of target heights and how the final build is much higher than the original build. The percentage improvements achieved are stressed; these may be extremely high (more than 350 per cent increase in performance has been seen in past games).

The game facilitator also encourages brief discussions on the following questions:

(1) How did the knowledge interventions of AAR, peer assist and knowledge asset/best practice sharing help the participants?

(2) Did the teams design change radically after the AAR? After the peer assist? After the knowledge asset?

A common learning point is that the teams made incremental improvements to their existing design through the AAR; it is not until the peer assist that they start to "think outside the box" and make radical design changes, which often comes after seeing the knowledge asset.

(3) How did it feel to give away knowledge to other teams during the peer assist?

Often participants find it difficult to share openly with other teams, or to accept help from others. Even though there should be no competition or scepticism, there often is; thus there is a need for careful facilitation of the peer assist step.

(4) What were the important bits of the knowledge asset?

Participants often like the benchmark data and the photographs: the photographs give credibility and help make the point that the value is in the detail, not just in knowing how high the tallest tower was.

(5) Think about how it felt during the first build, and how it felt during the second build. What were the differences?

Generally, the first build feels a lot more chaotic, and there is a lot of wasted time arguing over design and how to put the components together to maximize the height and pass the hurricane and earthquake tests. The second build feels pressured, but organized; participants know what they need to do, but are concerned they will not have time or that they have not understood the details from the knowledge asset.

(6) How pleased were the participants with the first tower? With the second tower?

Participants are often proud of the first tower. This illustrates that just because they are proud of an achievement, it does not mean that it is an achievement worth being proud of. Participants are often very proud of the second tower, even though they were re-using the existing best-practice design. There is a satisfaction from executing the design well.

(7) The final question to ask in the final debrief is: "if you had had access to the knowledge asset before the first construction, how tall would your first tower have been?"

Generally, people accept that, if they had 30 minutes and the knowledge, they would have produced a tower nearly as high as their second build. There are obvious conclusions to draw with this acknowledgement that "learning before doing to deliver best in class performance" is key, rather than waiting until during or after an activity or project to perform an AAR or peer assist.

4. Results
The results of the game are discussed both from a qualitative and quantitative perspective; the qualitative results are just as important as the quantitative results as they can inform the KM strategy and change management activities for the KM programme.

4.1 Qualitative
There are four expected outcomes for the game. Participants learn:

(1) that increasing their knowledge in specific and tangible ways does increase performance – often by significant margins;

(2) that KM processes are not overly complex or demanding, but they do require planning and investment in time and resources;

(3) seeing the best practices of what has been achieved previously encourages results that otherwise may have been thought impossible or improbable; and

(4) there is a tension between collaboration and competition which has implications for organizational culture.

Of these four outcomes, the first and fourth are worth paying the particular attention to during the debrief, although it also depends on how a particular group of participants has performed.

In leading the game, it is the first outcome that is so exciting to see register on participants' faces: that realization of the value of KM. From the data that Knoco has collected, the increase in outcomes averages 258 per cent. When participants realize what this means for their organizations, KM is no longer the hard-sell it may have previously been, but an idea whose time has come. In the experience of the authors, without exception, we have never experienced participants not "get it"; there is truly a shift in beliefs and perspectives.

The realization that KM processes are not overly complex or demanding is beneficial to reducing or eliminating what is often one of the main barriers to KM. People new to KM believe that it is a significant additional burden, and that they do not have time for anything extra in their roles and responsibilities. Experiencing first hand that the AAR, peer assist, and best practice sharing are relatively easy to execute as long as they take a little planning into consideration helps address the barrier that may exist when participants did not experience these activities first hand.

In one of the organizations that one of the authors worked with, the realization that the lessons learned and sharing process could be done easily and, without significant costs, helped them to understand that they could adopt these activities in their operations and have a significant impact on the outcomes of their programmes.

Using the knowledge asset and recognizing the benefits of identifying and using best practices helps address issues that organizations may have around "not invented here" or innovation. It helps them to imagine what is possible and may even spark additional ideas for improvements when they add their existing knowledge to a previously identified best practice.

In one organization that one of the authors worked with, the idea that a best practice could be utilized from another organization, or even another industry, was foreign. However, after completing the Bird Island serious game, they were willing to consider that they could learn from others outside of their own organization and that this could greatly improve their outcomes.

The fourth point, the tension between collaboration and competition, can be problematic. The game facilitator and participants may see this manifest at any or all stages of the game. Participants may not allow everyone to participate in the AAR, may shout over each other, or defer to an actual or de facto leader who happens to be on the team. For this reason, it can be beneficial to separate managers from subordinates in the creation of the teams, but it will depend on the existing culture of the organization.

In the peer assist phase, the peers may not share or may try to sabotage the other team's knowledge by providing incorrect or inaccurate information. These kinds of counter-productive behaviours should be monitored and discussed in the debrief.

And in the best practice sharing session, participants may try to distract other participants, or otherwise not pay attention, thinking somehow that they know better. These are also behaviours that can be discussed in the debrief.

Other manifestations of counter-productive behaviour that can be observed during the game include:

- strong sense of individualism rather than collectivism (knowledge management/ organizational learning wants sharing and collectivism, not everyone out for themselves, maximizing their own outcomes, this leads to sub-optimal results);

- everyone thinks their idea is best/better, fighting to be heard rather than listen;

- unable to change plans/design when provided with new information; and

- unable to execute best practices solution when it is provided.

If Bird Island is being used as part of the roll-out for KM, as an education and buy-in activity, the knowledge manager responsible for the KM programme needs to be aware of any detrimental behaviours observed during the game and be prepared to address them in the KM programme's change management activities.

One of the authors played the game with an organization and witnessed many of these detrimental behaviours first-hand. Teams were competitive, trying to spy on each other and sabotage their towers. The peer assist exchanges were dismissed by the groups being visited, i.e. if the visitor's team built a shorter tower in the first build activity, then the visitors were shouted over and prevented from adequately sharing their experiences. Even the best practices were dismissed as being impossible to achieve, because the teams believed they did not have the skills and could not learn. The teams did improve their second builds, but at a fraction of what can be and has been experienced with other organizations. The organization did go ahead with its KM initiative, but has been challenged in overcoming these detrimental behaviours in order to achieve the desired outcomes.

4.2 Quantitative

Five data points are collected by the games' facilitator for discussion during the debrief and have been collected in a spreadsheet so that there are more than ten years of data to analyse. The following information is collected by each team and complied each time game is run:

(1) first tower height, after first tower build;

(2) first estimate, after the after action review;

(3) second estimate, after the peer assist;

(4)   third estimate, after viewing the best-practice knowledge asset; and

(5)   final tower height, after second tower build.

From the data that have been collected over all the years that Knoco has been using the Bird Island serious game, we have the chart, shown in Figure 1, displaying the results of each measurement activity.

From the chart, the actual experience of building the tower the first time results in relatively short towers, with most between 80 and 120 cm and the average being 94 cm. The curve shifts to the right as each knowledge activity increases the knowledge of the teams and therefore the estimate of how high they think they can build the tower.

The final estimate and second tower build have similar heights and number of results. The height of the estimated and actual towers centred between 260 and 340 cm; the highest tower ever built was 355 cm. The average height of the third estimate is 278 cm and the average actual height is 299 cm. The actual second towers are on average 258 per cent higher than the first towers that participants build.

The results are the same regardless of sector or the role of the participants as is shown in the selected data in Figure 2. The height of the towers increased as knowledge increased and the heights of the first and second actual towers built were in the same ranges: 100 cm or less for the first towers, and 250 cm or taller for the second towers.

5. Conclusion

Serious games are meant to train or educate people, ideally while they have some fun, although fun is not a requirement. Bird Island does that. It takes two hours and brings people together in small teams to meet a fictitious challenge using children's toys, office supplies, and miscellaneous other items.

Bird Island does not require any special skills or knowledge. The only thing that changes during the playing of the game is that knowledge is added; the materials and the people all
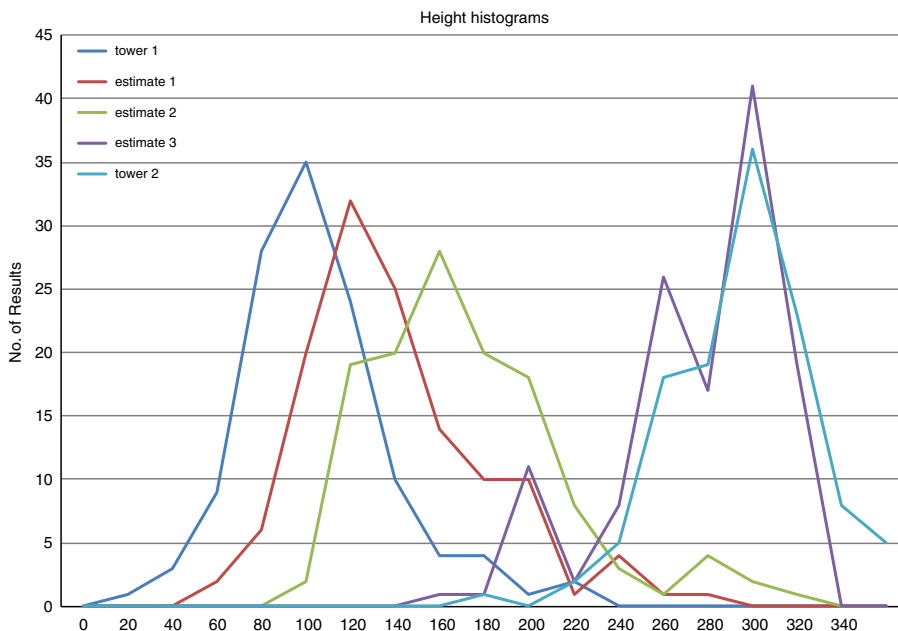
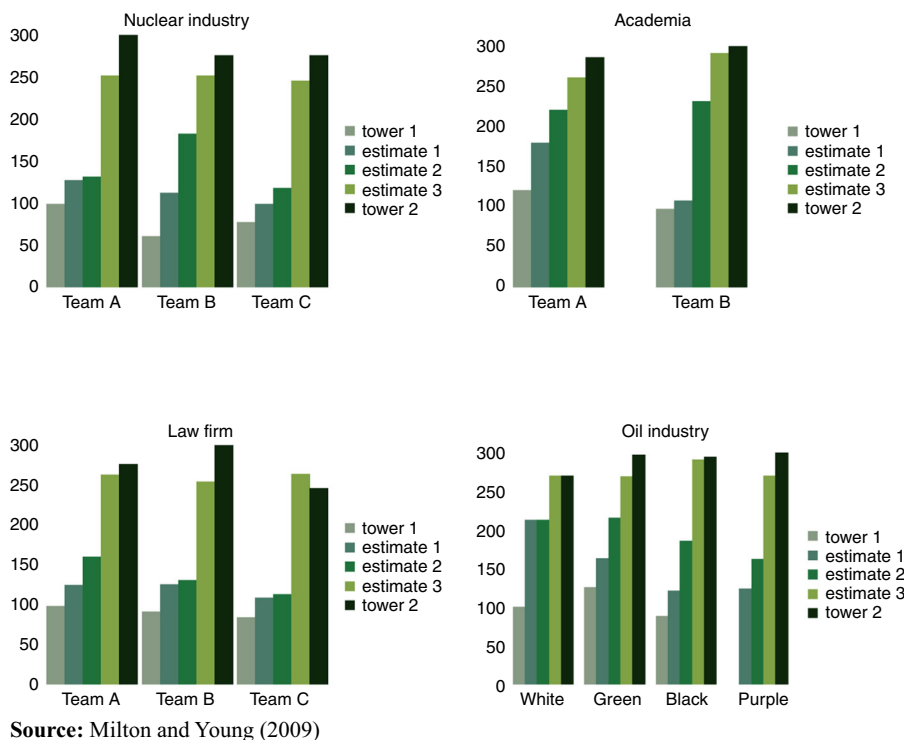

Figure 1.
Tower heights
histogram

Figure 2.
Performance data
from single teams

Source: Milton and Young (2009)

stay the same. There are no outside influences or competing initiatives that reduce resources; there is no IT system that complicates the execution of the knowledge processes.

Knowledge is added through an AAR; then more knowledge is added through a peer assist. Finally, even more knowledge is added through the use of a knowledge asset and best practice sharing. Through these three activities, the height of the tower increases, eventually becoming 258 per cent higher than when the participants started out (on average). It has been observed that this is more than enough to convince participants of the value of knowledge management.

The results of adding knowledge do not depend on the skill level, experience, sector, or anything else that may appear to differentiate participants. Adding knowledge increases height, improves the design, skills, and output of the teams participating in the game.

Bird Island not only illustrates the value of knowledge, through increasing tower height, but also provides insight into cultural issues that may arise in the implementation of KM.

Participants have to work together to achieve the goal. They have time pressure and some sense of competition. Participants are required to think critically, to have a willingness to learn, and to have an ability to collaborate in order to be successful, not dissimilar to their real jobs.

Bird Island illustrates these capacities and highlights where there are gaps. Tactics for bridging these gaps can then be incorporated in the change management plans for the KM programme.

Bird Island thus mimics not only the power of sharing knowledge, but also illuminates the cultural barriers. Bird Island helps to make a more successful implementation of KM by ensuring that the KM manager not only gets buy-in and support from the participants, but gains valuable insights into cultural barriers that will impact the KM programme.

These results mean that not only does Bird Island quickly and easily illustrate the value of knowledge management in an organization, but the ease with which it is played allows the management and staff alike to support the implementation of knowledge management within the organization, thus supporting the hypotheses that were set out earlier in this paper.

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