



The Association of
Accountants and
Financial Professionals
in Business



Improving Employee Performance through
Tournament Design

IMA Research Foundation

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The IMA Research Foundation is dedicated to funding relevant, thought-provoking research that furthers the knowledge and scope of accounting and financial management. To date, the Foundation has bestowed more than \$1 million in research grants to academics and doctoral students.



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Table of Contents

Overview..... 5

Executive Summary 6

Introduction 7

Tournament Design Choices 8

The Study 9

Results 10

Applying the Results: A Practical Example..... 11

Alternative Practical Example: Fostering Innovation 12

Conclusions 13



Overview

More than 33% of U.S. firms use some form of tournament to improve employee performance. Organizations generally consider tournaments successful when they increase sales or output, or generate innovative ideas. Managers, however, are often unaware that a tournament's design directly affects its success. Consequently, managers will find this article useful because it discusses how tournaments can be better designed.

Based on a study funded by a grant provided by the IMA® (Institute of Management Accountants) Research Foundation, we investigated (1) if employees should be grouped together based on their ability and (2) whether smaller but more frequent or larger but less frequent rewards should be offered. We found grouping employees of similar ability improves employee performance most. That being said, if employees of varied ability are grouped together, employee performance is improved when the tournament is designed to provide smaller but more frequent rewards. In other words, the frequency of rewards only matters when individuals of relatively varied ability compete against each other.

This C-suite also contains a practical example illustrating how the results of this study can be implemented. Additionally, we discuss how organizations can use tournaments to foster innovation.



Executive Summary

Although more than 33% of companies use tournaments, many managers are unaware that a tournament's design directly affects its success. For example, a company that implements a tournament resulting in a 5% production gain may consider the tournament a success without ever realizing that production could have increased by 8% if the tournament was better designed. We examined the effect that two specific tournament design choices had on tournament success:

- Grouping together individuals of similar ability vs. grouping together those of varied ability
- Offering smaller but more frequent rewards vs. offering larger but less frequent rewards

The most significant findings of this IMA-funded study are:

1. Groups of individuals with similar ability outperform groups of individuals with varied ability.
2. When larger but infrequent rewards (for example, yearly) are provided, groups of individuals with similar ability outperformed groups of individuals with varied ability.
3. When smaller but frequent rewards (for example, monthly or quarterly) are provided, there is no performance difference between groups of similar or varied-ability individuals.

The results of this study have significant implications. For example, if a company plans to deploy a sales tournament, managers should analyze employees' sales records to group together those with similar abilities. Doing so increases the level of competition, leading to improved employee performance. If groups of varied abilities are used in a tournament, however, the manager should use smaller, but more frequent, rewards to improve the desired output.

Introduction

Smoothie King sells a wide variety of milk shakes and fruit smoothies. The owner of a relatively new Smoothie King franchise tried to increase sales by having her employees compete in a tournament. The owner randomly placed her employees into two different groups and offered a reward to the employee in each group who had the most sales at the end of a one-month period. The owner considered the tournament a success because it yielded a 6% sales increase.

The franchise owner's attitude quickly changed at the franchisees' annual meeting when she discovered that numerous other owners deployed tournaments that yielded sales increases greater than 6%. What quickly became apparent was that there was little consensus as to how a tournament could best be designed. For example, most of the other owners held tournaments lasting a week, while others held tournaments lasting only a day or as long as a month. Of particular interest, some owners assigned their employees to tournament groups based on their sales ability. These owners chose to do so because they felt that placing employees into separate groups based on their sales ability led to increased competition between the employees, ultimately translating into higher sales. The owner left the annual meeting unhappy with her tournament's 6% sales increase and also found herself wondering how much sales could have increased if she had designed the tournament differently.

Tournaments are a potentially effective organizational tool. Besides increasing sales, tournaments can also be used to increase product innovation. For instance, design teams can compete head-to-head with the winner moving on to the next level or receiving funding for its idea. Not all tournaments are designed in the same manner, however, and not all tournaments yield the same performance improvements. Regardless of the type of firm or the industry in which it operates, there are a number of design choices that a manager must make when deploying a tournament. These choices must be made with great care because they directly affect the tournament's success.

The goal of this article is to provide managers with specific recommendations to improve tournament success. For instance, our results could be applied to help the Smoothie King owner realize greater sales improvement. Because not all tournaments are created equal, this article provides specific guidance regarding how to group employees and the frequency by which rewards should be offered in a tournament.



Tournament Design Choices

We tested two tournament design choices in our study. The first choice is whether to group employees with similar abilities or varied abilities. Tournaments are designed to increase the level of competition among all employees. Typically, tournaments fail to increase productivity when only a few employees are motivated to increase their performance for a chance to win the tournament. In the Smoothie King example, employees were randomly placed into two groups; therefore, it is likely that employees in each of the two groups were of varied ability. In this scenario, high-ability employees who are able to win the tournament easily won't be forced to improve their performance, thus leading to lower productivity from high-performing employees who aren't challenged. Conversely, there may be some employees who feel there is no chance for them to win the tournament based on who they are competing against and will decrease their efforts. In order to avoid both of these scenarios, we propose that grouping together employees of similar ability rather than varied ability increases the overall level of competition within a tournament and thereby improves employee performance.

The second choice is whether to offer smaller but more frequent rewards vs. larger but less frequent rewards. In the Smoothie King example, the tournament lasted for one month and the employee in each group who had the most sales in this period were given a relatively large reward. In this scenario, there is considerable time for high-ability employees to build an insurmountable lead and too much time for average- and lower-ability employees to fall so far behind that they may actually decrease their efforts once the possibility of winning the tournament is removed. We propose that smaller but more frequent rewards be given to increase motivation and decrease the chance that participants will give up. For example, Smoothie King should consider using a weekly reward rather than a monthly reward. In this case, there would be greater competition on a weekly basis, thereby improving employee performance. To summarize, the less frequent rewards are given, the greater the likelihood that employees will feel they aren't able to win the tournament and thus decrease their efforts. Alternatively, the more frequently rewards are given, the greater the likelihood that employees will feel they have a chance to win the tournament and thus maintain or increase their efforts.



The Study

We placed 144 participants into 24 groups of six to perform a letter-decoding task, which was similar to those used by prior research in this area.¹ The task used a decoding key that showed 42 number-letter combinations. Participants were shown a number and were required to insert the corresponding letter into the entry box. Prior to the experiment, participants were familiarized with the experimental task, and each participant's inherent ability for the task was assessed. Next, the participants were placed into one of four types of groups and were required to perform the task over four five-minute quarters. Participants within each group were shown their performance, as well as the performance of those they were competing against, at the end of each quarter. The experimental steps are provided in Figure 1.

Figure 1: Steps in the Experiment
Step 1: Task tutorial and ability assessment
Step 2: Participants automatically assigned to one of four experimental groups (includes manipulations)
Step 3: Four main experimental sessions
Step 4: Post-experiment questionnaire

The four types of groups into which participants were assigned are presented in Figure 2 and were as follows:

- 1) a similar-ability group that competed for one \$20 reward paid to the participant having the highest performance across all four five-minute quarters
- 2) a similar-ability group that competed for four \$5 rewards paid to the participant having the highest performance during each five-minute quarter
- 3) a varied-ability group that competed for one \$20 reward paid to the participant having the highest performance across all four five-minute quarters
- 4) a varied-ability group that competed for four \$5 rewards paid to the participant having the highest performance during each five-minute quarter

¹ The extant accounting literature has numerous examples of a task similar to ours being used in experiments, for example: J. Fisher, J. Frederickson, and S. Pfeffer, "Budgeting: An experimental investigation of the effects of negotiation," *The Accounting Review*, Vol. 75, No. 1, January 2000, pp. 93-114; J. Fisher, J. Frederickson, and S. Pfeffer, "The effect of information asymmetry on negotiated budgets: An experimental investigation," *Accounting, Organizations and Society*, Vol. 27, No. 1-2, February 2002, pp. 27-43; J. Fisher, L. Maines, S. Pfeffer, and G. Sprinkle, "Using budgets for performance evaluation: Effects of resource allocation and horizontal information asymmetry on budget proposals, budget slack, and performance," *The Accounting Review*, Vol. 77, No. 4, October 2002, pp. 847-865.



Figure 2: Four Types of Groups Examined

Frequency of Rewards	Grouping of Employees	
	Participants with Similar Task Ability	Participants with Varied Task Ability
Infrequent One \$20 Reward	Condition 1: Participants with similar task ability compete for one \$20 reward	Condition 3: Participants with varied task ability compete for one \$20 reward
Frequent Four \$5 Rewards	Condition 2: Participants with similar task ability compete for four \$5 rewards	Condition 4: Participants with varied task ability compete for four \$5 rewards

Results

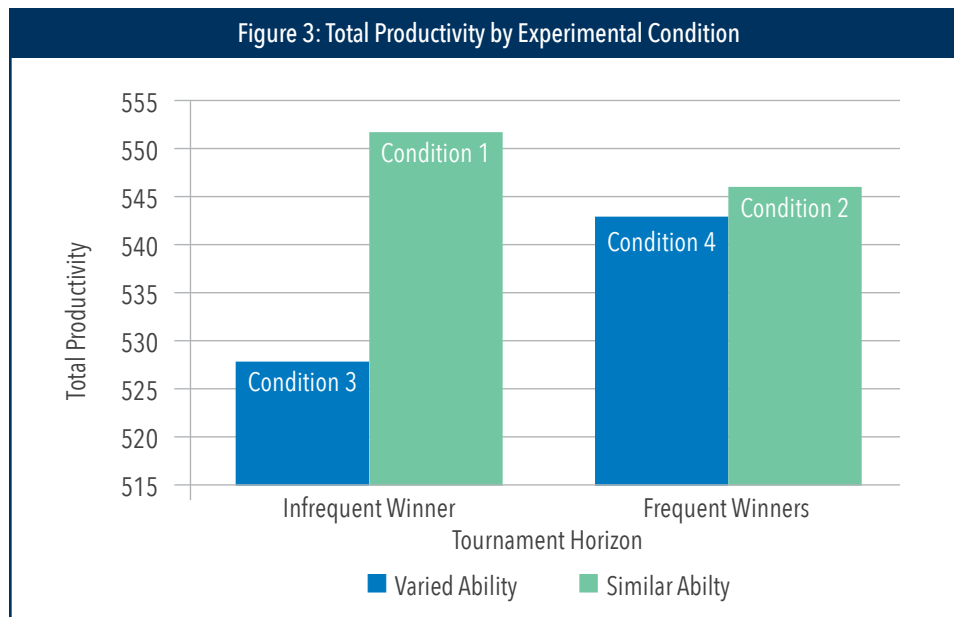
Analysis of the experimental data revealed that regardless of the frequency of rewards (smaller and more frequent or larger and less frequent), groups of individuals possessing similar ability performed better than those of varied ability. This result can be seen in Figure 3. Thus, perhaps the owner of Smoothie King should have taken the time to group together employees with similar ability to increase competition and increase sales by more than 6%.

Our analysis also revealed that the design choices—grouping based on ability and the frequency of rewards—have an interactive effect on employee performance. When rewards are given more frequently (for example, four \$5 rewards after each quarter), there is no difference in employee performance based on how employees are grouped together. When rewards are less frequent (such as one \$20 reward total), however, groups of employees with similar ability significantly outperform groups of varied ability.

The results suggest that the owner of Smoothie King should have grouped employees together based on ability. Otherwise, the tournament should have increased the frequency by which rewards were offered.

A summary of our results is presented below based on the labeling provided in Figure 2 and Figure 3:

1. Groups of similar ability (Condition 1 + Condition 2) outperform groups of varied ability (Condition 3 + Condition 4).
2. In the infrequent reward condition, groups of similar ability performed significantly better than groups of varied ability (Condition 1 > Condition 3).
3. In the frequent reward condition, there is not a significant difference between similar and varied ability (Condition 2 = Condition 4).



Applying the Results: A Practical Example

The results of this study suggest companies should use the following key practices to improve employee performance through tournament-style competitions:

- When possible, design tournaments so that employees of relatively similar ability compete against each other.
- When employees of relatively varied abilities must compete against each other, the tournament should feature smaller but more frequent rewards.

In this section, we provide a practical example that illustrates how a firm could implement these key practices. Let's say the production manager of a regional manufacturing firm has been instructed to increase output by 5% during the coming year. Although corporate headquarters feels that this goal is attainable, the manager isn't certain her team can accomplish it, especially since headquarters has allocated only \$24,000 toward accomplishing this goal. After some deliberation, the production manager decides to try to increase employee performance by holding a tournament with \$24,000 in prize money.

Grouping employees together by ability

As in all organizations, the production department has some high-ability employees and some lower-ability employees. When designing the tournament, the manager must first decide if she will place employees into groups of similar or varied ability. To apply the results of this study, the manager should consider separating her employees into two groups based on previous performance: high-ability employees and lower-ability employees. Based on output, she could award \$12,000 to the individual winner from each group at the end of the year.



Smaller but more frequent rewards

The manager may not be able (or doesn't want) to accurately assign individuals to groups based upon their ability. In this case, she could randomly divide her employees into two groups. However, the frequency of the rewards provided is vital to improve employee performance when employees of varied ability compete against each other. Thus, the manager should consider providing more frequent rewards, such as a \$1,000 monthly reward, to the highest performer in each of her two groups.

Alternative Practical Example: Fostering Innovation

Although our study relates to an effort-intensive setting, tournaments can be used in noneffort-intensive settings as well. For example, tournaments can also be used to foster innovation within organizations. For instance, the X-Prize Foundation (a nonprofit organization founded by Peter Diamandis) sponsors the X-prize, offering the winner a private space flight; the Defense Advanced Research Projects Agency (DARPA) sponsors competitions to create autonomous vehicle technologies; and Netflix relies upon the use of contests to improve the company's movie recommendation algorithm.² In all of these examples, the tournament reward is provided to whoever creates the "best" entry.

Tournaments have also been used to foster innovation in the healthcare industry. In most hospitals, lowering costs and increasing patient satisfaction rates is the responsibility of senior managers. This can leave those possessing more intimate knowledge of healthcare practices and procedures out of the process, however.

Penn Medicine, a healthcare group, faced this dilemma.³ Specifically, the hospital sought new ideas and innovative thinking from front-line employees such as doctors, nurses, clerical staff, and orderlies. To be inclusive, Penn Medicine implemented an *American Idol*-style tournament competition. Ideas were submitted by employees, and then rounds were created where ideas either "advanced" or "had to go home." The most innovative ideas made it to a final round.

Penn Medicine's tournament involved more than 5,000 employees, who generated more than 1,700 new ideas.⁴ The company found innovative ideas from talented employees who had never before been asked to participate. Innovation tournaments, such as the one at Penn Medicine, are becoming more common as organizations recognize the valuable ideas that can be fostered.⁵

²T. Nicholas, "Cheaper patents," *Research Policy*, Vol. 40, 2011, pp. 325-339; L. Kay, "The effect of inducement prizes on innovation: Evidence from the Ansari Xprize and the Northrup Grumman lunar lander challenge," *R&D Management*, Vol. 41, September 2011, pp. 360-377; L. Brunt, J. Lerner, and T. Nicholas, "Inducement prizes and innovation," *Journal of Industrial Economics*, Vol. 60, 2012, pp. 657-696; F. Murray, S. Stern, G. Campbell, and A. MacCormack, "Grand innovation prizes: A theoretical, normative, and empirical evaluation," *Research Policy*, Vol. 41, No. 10, December 2012, pp. 1779-1792.

³Why Some Innovation Tournaments Succeed and Others Fail, *Knowledge@Wharton*, February 20, 2014, retrieved from <http://knowledge.wharton.upenn.edu/article/innovation-tournaments-succeed-others-fail/>.

⁴ibid.

⁵ibid.



Conclusions

The goal of this study was to provide specific recommendations to managers on how to design a tournament regarding two key design choices: grouping individuals based on ability and the frequency of tournament rewards. Accordingly, analyzing the data from our experiment yields the following recommendations that companies can use to improve employee performance:

- When possible, design tournaments so that employees of relatively similar ability compete against each other.
- When employees of relatively varied ability compete against each other, the tournament should feature smaller, but more frequent, rewards.

Returning to Smoothie King, the results of this study suggest that the owner could have improved the tournament's effectiveness by creating groups of similar-ability employees competing against each other. If she used groups of employees with varied ability, then our results would suggest increasing the frequency of the rewards to a weekly, rather than monthly, basis to foster increased employee performance.