Carrots and Sticks:

Human Motivation in the 21st Century Corporate World

In 1993, Microsoft Corporation published the first edition of a digital encyclopedia called Encarta (Pallardy). Encarta was written by a team of well-paid, professional authors who wrote thousands of articles covering a vast range of subjecs. These authors were supervised by a team of managers who oversaw the production of Encarta to ensure that it was finished on budget and on time (Pink, 2009). Microsoft sold early versions of Encarta as a set of compact disks and later versions as a website subscription (Pallardy). In every sense, Encarta was based on a classic 20th-century business model.

On January 15, 2001, internet entrepreneur Jimmy Wales and philosopher Lawrence Sanger launched a new online encyclopedia called Wikipedia (Fletcher, 2009). Wikipedia's business plan differs from Encarta's in almost every way. Wikipedia is a collaboratively authored, open-source repository of reference information created by users who contribute by adding articles and editing the work of others. All of Wikipedia's authors are volunteers; they do not receive monetary compensation for their time or effort. Furthermore, they do not receive credit for their work or recognition of any kind. Last, while there are rules for writing articles on Wikipedia, there is no editorial review (Terms of Use, 2009).

Despite its unorthodox operational paradigm, by January 2009, Wikipedia was the most popular online encyclopedia, with 97 percent of the total visits to online encyclopedias in the United States. Encarta took second place with 1.27 percent. No longer able to compete with Wikipedia's sheer volume of articles and the rapidity with which those articles were updated, Microsoft announced that it had "made the decision to exit the Encarta business" (Cohen, 2009).

Just a decade prior to Wikipedia's creation, no economist would have predicted its success (Pink, 2009). Contingent motivators, those in which performance is incentivized, are the cornerstones of almost all corporate organizations in the world today. Usually, employees are offered raises to their salaries or bonuses for exceptional performance. However, a large and growing body of research over the past 50 years is revealing that this contingent-incentive system not only is ineffective for all but the most rudimentary tasks but also can actually impair performance. Instead, these studies are showing that intrinsic motivators, rather than extrinsic motivators, are far more effective for inspiring human activity within the workplace than material rewards. Unfortunately, a disparity exists between advances in motivational science and business practices.

For the entirety of human history, people have recognized the importance of motivating others to perform important tasks for various organizations. The oldest and most widely used motivational approach is the carrot-and-stick method (La Oberhauser, Egea, Gilbert, & Lopez). This method derives its name from a strategy for coaxing stubborn donkeys to move by dangling a carrot from a stick in front of the donkey's nose. For thousands of years, the mentality that people could be coerced into action in the same way a donkey could dominated the management of organizations (La Oberhauser, Egea, Gilbert, & Lopez). The carrot-and-stick method is founded on two assumptions: that performance-contingent incentives will increase focus and effort on a given task and that this increase in focus and effort will increase performance (Ariely, Gneezy, Loewenstein, & Mazar, 2008).

However, in the early 20th century, the emerging field of psychology began scientifically examining the carrot-and-stick method of motivation and the validity of its underlying assumptions (La Oberhauser, Egea, Gilbert, & Lopez). In 1932 Elton Mayo conducted an experiment in a textile mill in Philadelphia designed to test the effectiveness of the carrot-and-stick method relative to other motivational techniques. Specifically, Mayo tested his theory that improving the work environment

would more effectively increase worker productivity than would an increase in the monetary incentives offered to the workers (La Oberhauser, Egea, Gilbert, & Lopez). The plant, which operated on a pure carrot-and-stick operational model, had failed to increase productivity by increasing financial incentives. Mayo's experiment involved the introduction of two ten-minute breaks during the work day in an attempt to change the atmosphere of the workplace. As a result of this change, Mayo observed a dramatic increase in factory output which he attributed to an equally dramatic increase in morale among the workers (La Oberhauser, Egea, Gilbert, & Lopez). This experiment began a new era of cooperation between management and psychology (La Oberhauser, Egea, Gilbert, & Lopez).

It was not until the 1960s that other psychologists began to study the actual effectiveness of the ubiquitous carrot-and-stick method to motivate workers. In 1962, Sam Glucksberg conducted an experiment to test the impact of incentives on participants engaging in creative tasks. Glucksberg's experiment was based on the "Candle Problem," devised by psychologist Karl Duncker (Camerer & Hogarth, 1999). The Candle Problem charges the participant with the following task: fix a lighted candle to the wall (a cork board) so that the melting wax does not drip onto the table below. To accomplish this task, the participant is supplied with a book of matches, a box of thumbtacks, and a candle (Pink, 2009). Participants attempt many creative but ineffective strategies to accomplish this task. For example, participants may try to pin the candle to the wall using the thumbtacks. This approach does not, however, prevent the wax from dripping on the table. Another common strategy is to use a match to liquefy the wax on the side of the candle and then use the melted wax to adhere the candle to the wall, but the adhesive properties of the wax are not sufficient to support the weight of the candle (Pink, 2009). In order to successfully complete the Candle Problem the participant must recognize that the box in which the thumbtacks are housed can serve a purpose beyond simply being a container. The solution involves removing the thumbtacks from the box and using them to affix the box to the wall.

The candle can then be placed into the box, which both supports the weight of the candle and catches the wax drippings (Pink, 2009).

In Glucksberg's experiment, the participants were divided into two groups. The first group was presented with the Candle Problem and the times required for each member of the group to solve the problem were measured. These times were then averaged to establish an experimental control for the second group (Pink, 2009). The second group was promised rewards based on the participants' performance. The participants who were among the fastest 25% of the group would receive five dollars. The participant who solved the problem the fastest would be awarded twenty dollars (Pink, 2009). The times required for each member of the second group to solve the problem were measured and averaged so that they could be compared to the control (Pink, 2009). This experiment revealed that, not only had the second group failed to outperform the first group but also, the second group was, on average, significantly *slower* than the first group (Pink, 2009). These results provided direct evidence against the carrot-and-stick model; however, Glucksberg's findings were so contradictory to economic theory, to contemporary business practices, and to the general view of society that they were largely ignored.

In an attempt to contextualize his results, Glucksberg repeated his experiment with a slight modification to the Candle Problem. Instead of presenting the participant with a box full of thumbtacks, as Duncker's original problem prescribed, Glucksberg supplied the box and the thumbtacks to the participant separately (Pink, 2009). New participants were assembled and were again divided into two groups, one acting as a control and the other incentivized. This time, when the average times required for each group to solve the modified Candle Problem were compared, it was the incentivized group that significantly outperformed the control group. Glucksberg had demonstrated that for mechanical, effort-responsive activities, like recalling items from memory, clerical tasks, procedure-based tasks, or physical

tasks, the carrot-and-stick method was highly effective. However, assuming that basic survival needs (food, shelter, water, et cetera) are met, for tasks requiring creativity or divergent thinking, the carrot-and-stick method undermined productivity.

In 2008, economists Dan Ariely, Uri Gneezy, George Loewenstein, and Nina Mazar conducted an experiment in Madurai, India to investigate more fully the conclusions drawn from Glucksberg's experiments (Ariely, Gneezy, Loewenstein, & Mazar, 2008). In the experiment, a large group of participants (residents of Madurai) were presented with a series of six challenges. These challenges included memorizing strings of digits, solving word and spatial puzzles, and completing physical tasks (Pink, 2009). Each of the challenges required the participants to use primarily creativity, memory, or motor skills. The participants were incentivized with three levels of monetary rewards with increasing value; the first level had a maximum value of 4 Indian Rupees (Rs), the second level, 40 Rs, and the third level, 400 Rs. Participants were randomly assigned to one of these three levels for each of the challenges. For each level, the participants earned a fraction of the maximum reward based on their performance for each challenge; a low performance earned no reward, a "good" performance earned fifty percent of the maximum reward, and a "very good" performance earned the maximum reward (Ariely, Gneezy, Loewenstein, & Mazar, 2008). This hierarchical reward structure was designed to mimic the pay structure in almost all businesses in capitalist societies. In these businesses, the most productive employees are paid the highest salary, while the least productive employees are paid minimum wage and a gradient of salaries exists between these two extremes.

Ariely, Gneezy, Loewenstein, and Mazar compared the performance of the participants in each of the reward levels for each challenge in terms of a fraction of earning out of the total possible earnings (Ariely, Gneezy, Loewenstein, & Mazar, 2008). Analysis of the data revealed that the participants in the medium incentive level performed no better than the participants in the low incentive level; but more

surprisingly, the participants in the highest incentive level performed the worst. The researchers concluded the following:

> As long as the task involved only mechanical skill, bonuses worked as they would be expected: the higher the pay, the better the performance. . . . But once the task called for 'even rudimentary cognitive skill,' a larger reward 'led to poorer performance'. (Pink, 2009).

The experiment in Madurai, like Glucksberg's experiments revealed that, for tasks that demand a high level of intellectual capacity, the carrot-and-stick method of motivation by performance-contingent rewards is ineffective, and even injurious to productivity, assuming that basic survival needs are met.

Performance-contingent incentives narrow focus and enhance attentiveness. For this reason they are highly effective for simple tasks in which an increase in effort leads to an increase in productivity. But, for creative and non-obvious tasks, an open mind is critical; thus, material incentives greatly limit productivity for the kinds of tasks represented by the original Candle Problem. In the 21st century, an ever-increasing portion of the workforce is engaging in these kinds of tasks, as automated production processes perform, to an ever-increasing extent, tasks more similar to Glucksberg's modified Candle Problem (Pink, 2009). But, a disparity exists between these findings and business practices. Almost all businesses in the world today still operate under the second assumption of the carrot-and-stick method, that an increase in focus and effort will increase performance. This assumption is true, and was effective, for businesses operating in the 18th and 19th centuries, but in the 21st century, this assumption is damaging to productivity.

Conventional motivational theories distinguish between two types of motivators: extrinsic and intrinsic. Extrinsic motivators are those described by the carrot-and-stick method, along with strict

schedules, or even threats (Monday, 2011). Intrinsic motivators include the desire for autonomy, for mastery, and for purpose. In the context of businesses, extrinsic and intrinsic motivators are represented by two different kinds of employee – employer relationships: a market relationship, in which an employee's time is traded for financial compensation, and a social relationship, in which an employee's time is traded for satisfaction (Monday, 2011). Intrinsic motivators are far more effective than extrinsic motivators at encouraging productivity for 21st century tasks. Again, however, there is a mismatch between the knowledge of motivational science and business practices. Almost all businesses still operate with market employee-employer relationships, under the carrot-and-stick method.

However, a few visionary companies are beginning to harness the power of intrinsic motivators. An Australian software company called Atlassian has adopted a seemingly radical approach to incorporating intrinsic motivators in their workplace. Once every quarter, the company holds a so-called FedEx Day. On this day, Atlassian's employees are given 24 hours to work on any project of their choosing, with anybody else in the company, in any way they wish to work. The only requirement is that, at the end of FedEx Day, the employees must reveal their work to the company (Pink, 2009). During these 24 hours out of each quarter, a vast number of fixes for exiting software and ideas for new products have emerged that, without FedEx Day, would never have been created (Pink, 2009).

Google uses a similar policy of harnessing the intrinsic motivations of its employees to increase productivity. Google's employees are, as a contingency of their employment, given one fifth of each day to pursue any project of their choosing. They are given the freedom to control their project, their team, their methods, and their time (Pink, 2009). During this "20 Percent Time," Google has produced some of its most successful products, including Gmail, Google News, Google's Instant Messaging Service, and Google Sky (Boulton, 2008).

Last, one of the great feats of intrinsic motivation in the digital age was created without the aid of any metaphorical carrots. Wikipedia, in just eight years, evolved from a radical idea by two scientists to one of the most heavily trafficked websites in existence. In the process, Wikipedia grew to encompass enough of the knowledge of humanity to be crowned as the largest encyclopedia ever; and Wikipedia is still growing (Fletcher, 2009).

For businesses striving for success in the 21st century economy, the solution is not to continue using the same businesses practices used thousands of years in the past. Enticing employees with a bigger or sweeter carrot will no longer be sufficient to increase productivity. The gap between motivational science and business practices must be closed in order to move forward. Extensive research has demonstrated that in order to increase productivity for the definitional tasks of the 21st century, business practices must shift their emphasis from extrinsic to intrinsic motivators. If the corporate world can abandon the worn-out carrot-and-stick model in favor of embracing intrinsic motivators, society will be able to solve some of the most important and challenging Candle Problems yet.

Bibliography

Ariely, D., Gneezy, U., Loewenstein, G., & Mazar, N. (2008, July). Large stakes and big mistakes. *The Review of Economic Studies* , 452 - 469.

Boulton, C. (2008, October 13). *IT & Network Infrastructure : Top 20 percent projects at Google*. Retrieved February 4, 2011, from eWeek: http://www.eweek.com/c/a/IT-Infrastructure/Top-20-Percent-Projects-at-Google/

Camerer, C. F., & Hogarth, R. M. (1999). The effects of financial incentives in experiments: A review and capital-labor-production Framework. *Journal of Risk and Uncertainty* , 7-42.

Cohen, N. (2009, March 30). *Microsoft encarta dies after long battle with wikipedia*. Retrieved February 1, 2011, from The New York Times: http://bits.blogs.nytimes.com/2009/03/30/microsoft-encarta-dies-after-long-battle-with-wikipedia/

Fletcher, D. (2009, August 18). *A brief history of wikipedia*. Retrieved January 30, 2011, from TIME: http://www.time.com/time/business/article/0,8599,1917002,00.html

Forte, A., & Bruckman, A. (2005). *Why do people write for wikipedia?* (Georgia Institute of Technology, College of Computing) Retrieved January 25, 2011, from http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=D72FD60867CD50A8BEE2F6B845847399?doi=10.1.1.120.7906&rep=rep1&type=pdf

La Oberhauser, C., Egea, M., Gilbert, S., & Lopez, A. (n.d.). *Motivation theory*. Retrieved February 2, 2011, from http://userwww.sfsu.edu/~gtarakji/engr801/wordoc/motivation.html

Monday, J. (2011). *Intrinsic motivation*. Retrieved February 4, 2011, from Irrationally Yours: http://danariely.com/2010/04/20/intrinsic-motivation/

Pallardy, R. (n.d.). *Encarta*. (Encyclopædia Britannica) Retrieved January 30, 2011, from Encyclopædia Britannica: http://www.britannica.com/EBchecked/topic/186436/Encarta

Pink, D. (2009, July). *Dan Pink on the surprising science of motivation*. (TED Conferences, LLC.) Retrieved January 30, 2011, from TED: Ideas Worth Spreading: http://www.ted.com/talks/lang/eng/dan_pink_on_motivation.html

Terms of use. (2009, July 8). (Wikimedia Foundation) Retrieved February 1, 2011, from Wikimedia Foundation: http://wikimediafoundation.org/wiki/Terms_of_Use