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Unleashing Intrinsic Motivation and Creativity

By Douglas Wood, PE, Douglas Wood & Associates Inc.

Engineering is no less creative than artistic endeavor. Engineering is, however, so much more challenging because our creations must be elegant solutions, satisfying all the constraints of function, the physical laws of nature, a multitude of mandatory codes and standards, available materials, viable construction methods, cost and scheduling. Our creativity is so very gratifying because it overcomes all of these constraints and results in objects that are tangible, durable, large and beneficial to society. We are artists and much more—we are engineers!

I was asked to write this article about motivating engineers, and frankly, I feel I could stop with that first paragraph. It says most of what needs to be said. We engineers are intrinsically creative people, and most of us were originally drawn to engineering because it satisfied our innate needs to explore, solve, create and accomplish great things. Wow! How much more motivation does one need? The motivation is within us. The real challenge for engineering management is to enable the creative process and—get out of the way!

Before we go any further, let me say that I am an engineer. I am not a human resources specialist, economist, psychologist or any other “...ist” that would credential me as an expert in human management. I have, on the other hand, been an engineering manager for more than 20 years. Also, for the past two years, our firm has participated in *Structural Engineering and Design* magazine’s “Best Structural Engineering Firm To Work For” survey. Last year, we were ranked the 11th best structural engineering firm to work for in the country, and this year, we rose to number five. Both years, we were

further singled out as the firm with the #1 highest employee survey score in the country, and last year, we were also honored as the firm with the #1 best collaborative environment. Finally, just in case you’re thinking that this “feel-good stuff” is all well and good, but you’re wondering about the bottom line; our firm was also named to this year’s *ZweigWhite* Hot Firm Honorable Mention List, putting us in the top 175 of all engineering, architectural and environmental consulting firms in North America (based on growth of gross and net revenues over the past three years).

So, let’s get down to the issue of managing engineers. There is a large and growing body of scientific evidence showing that the traditional carrot-and-stick approaches to motivation may have some positive effect relative to simple, repetitive tasks, but that they are counterproductive relative to the creative process. For a thorough review and engaging discussion of this evidence, I refer you to *Drive* by Daniel H. Pink.¹ My offer of an executive summary of Mr. Pink’s book is that, after primary needs are met, humans have innate drives for autonomy, mastery and

purpose. In my opinion, these drives are particularly strong in engineers and other creative types, and when allowed to flourish, the highest levels of performance and creativity are achieved. Examples of these innate drives being leveraged for incredible success can be found in the online phenomena Wikipedia and Firefox. They have both made huge contributions and affected millions of people while relying entirely on volunteered input. People contribute not because they’re getting paid, but because they want to contribute to something great and because they enjoy the challenge.

In addition to the scientific evidence showing that the traditional carrot-and-stick approaches to motivation are counterproductive to the creative process, it should also be recognized that these approaches can result in quite negative consequences. Intuitively, one can recognize that if employees’ rewards are heavily biased toward short-term financial performance criteria, then sustainable, long-term performance will be subordinated to short-term gain. Worse yet, unethical behavior is encouraged. For example, have you

ever paid your auto repair shop, but wondered if your car really needed that new water pump, or alternator? For the ultimate example of “carrots” gone bad, look at the causes of our current economic situation. The “bubble” leading up to the economic crash was rife with short-term thinking and unethical behavior at all levels, fueled by out-scaled monetary rewards.

So, what can engineering management do to maximize creative performance? Answer: support the engineers’ innate drives of autonomy, mastery and purpose. Here’s how we do it in our firm:

The Basics

As mentioned earlier, the drives of autonomy, mastery and purpose are strong after basic needs are met. Therefore, we set an environment that is collegial, supportive and fair:

- Collegial
 - Casual and open atmosphere, teamwork, respect
 - Birthday cakes, small celebrations, occasional office lunches and outings, coffee and occasional treats
 - Congratulatory notes
- Supportive
 - Collaboration: We like to say that when you hire our firm, you don’t get an engineer, you get all the engineers. We use everyone’s experience and expertise by brainstorming, bouncing ideas off one another and picking each others’ brains. Each engineer need not stand alone. Through frequent and casual collaboration, he/she is confident in his/her solution.
 - Effective quality management
 - Attractive, comfortable space
 - Quality tools (hardware, software, library)
 - Effective office support systems and staff
 - Regular recognition and appreciation (notes of thanks and praise and unexpected monetary bonuses for great work, anniversary notes, titles, promotions)
 - Clear and shared vision of who we are and what we do
 - Courage to do the right thing, all the time
- Fair
 - Salary and benefits packages set to attract and retain top talent

- Fairness of compensation and recognition within the office
- Complete authenticity and integrity

Autonomy

Intelligent, highly-educated, accomplished, creative engineers want and deserve autonomy. Within a supportive environment, they will be at their peak levels of performance and creativity when they feel a sense of self-determination. We foster such an environment in several ways:

- Flexibility
 - Thought processes: Everyone has a somewhat different way of thinking. (Example: Aren’t you always a little frustrated while peer-reviewing another engineer’s calculations?) As long as there is confidence in the outcome, each engineer is allowed to approach and solve a problem in his/her way.
 - Schedule: Everyone has a somewhat different clock, and some of our engineers have family obligations. At the same time, we’ve found that having everyone together fosters collaboration (which we highly value in our firm). To accommodate these somewhat opposing values, we introduced a limited flexibility for office hours. Each associate chooses from a list of possible schedules, all of which overlap most of the time, but which still allow each associate a degree of freedom to accommodate his/her preferences and obligations. We also accommodate vacation schedules and allow each associate to convert a portion of unused sick leave to personal time.
- Inclusion
 - We are open and participatory. We frequently communicate with all of our associates in formal and informal ways. All questions are answered. Our associates are aware of who we are, what we do, why we do it, what we’re planning and how we’re doing. In fact, our associates are not only aware of these things; they help shape them. We solicit participation from our associates on all major decisions and planning.
 - There is nothing more motivating and empowering than ownership. We have a comprehensive, broadly inclusive and professionally developed ownership transition

plan. Of our fourteen associates, six are currently owners.

- Every one of our engineers is a project manager. Even recent graduates are given the responsibility of project management. Of course, we start them off on smaller, simpler projects, and they are coached and mentored throughout the project. They always quickly catch on to client service, team collaboration and financial management, and they embrace the personal responsibility for a successful project.



Mastery

Why do people solve puzzles and play challenging games for fun? It sounds a bit like work. On the weekends, I’ll bet some of you play golf. Why, in the face of all those slices and duffs, do you keep going back? Why do you practice your swing at the driving range? Why do you strive for a lower score and for that elusive perfect stroke? You do it because you enjoy it, and a lot of what you’re enjoying is the sense of improved mastery at a difficult endeavor. All people enjoy this sense of mastery. Again, though, I believe this enjoyment is especially strong in engineers. Engineering theory is complex, and the techniques are deeply involved. They take many years and intense effort to master, and there is forever a new challenge—and we love it. Aside from a fair and appropriate package of salary and benefits, the most important factor in most engineers’ selection of a firm to join is the opportunity for professional development.

At our firm, we provide a comprehensive program of professional development for all associates. This program includes a variety of opportunities, accommodating a variety of needs and preferences:

- Monthly in-house and vendor-sponsored lunch-and-learn seminars
- Technical presentations at professional meetings
- Occasional professional seminars, webinars, online courses, conferences and conventions
- Financial assistance with university tuition and textbooks (and flexibility for class schedules)
- Financial assistance with EI and PE preparation courses and materials

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	Have you ever been through anything like this before?	Do you remember what made you realize that things were "back to normal"?	What do you do to help you cope with stresses due to job uncertainty?	If unemployed, how did/do you maintain a positive attitude?
 <p>Aage G. Schroder III, PE Transportation Services Leader —Florida, MACTEC Engineering and Consulting Engineer Schroder has dedicated his 37 year career to transportation engineering, specializing in transportation planning. Much of his career was spent in several staff, supervisory, and administrative assignments at FDOT including District II Secretary (2001-2005). He received his bachelor's and master's from the University of Florida.</p>	No. For 35 of the past 40 years I worked in the public sector, so my perspective was different. There were lean years with hiring freezes and no pay increases, but I have never seen anything as severe as the past several years.	No. Not really. In the public sector it was typically a pay raise or termination of a hiring freeze that signaled "back to normal."	Convince yourself and others that life will get better. This recession is different because of the housing situation. Many have the added stress of worrying about losing their home and/or their savings, much of which is tied up in home equity.	NA
 <p>Wayne Waters VP and Central/North Florida Regional Manager, BCC Engineering Inc. He has over 32 years of transportation engineering and design experience, 16 of which were at FDOT District V. Waters has been married to Jan-Marie for over 25 years and has two sons, Justin and David, and twin grandsons, Ethan and Nathan.</p>	Yes, a couple of times, but never this bad.	There's a "normal" in this industry now? Please show me where.	Take more antacid and work even harder, but then that ends up taking a toll on the family life as well, even though they may claim to understand. The competition in Central Florida is tremendous and growing every day.	I had a very helpful support group, in my wife (after the initial shock had worn off), and at church where I had enormous prayer support from my church family. It really does work!

Unleashing Intrinsic Motivation and Activity Continued From Page 15

- Fees and paid leave for EI and PE exams
- Paid memberships in appropriate professional societies
- Informal, in-house coaching and collaboration.

Of course, we promote our engineers as their professional expertise grows. We have big ambitions, and each associate knows that he/she is a part of the plan. We set for ourselves the highest standards of performance and

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achievement, and it is the mastery of these that drives our team.

Purpose

People want their work to have purpose. They want to know that their work makes meaningful contributions to the greater good of society. There is no doubt that engineering should easily provide fulfillment of this drive, but in the midst of our daily challenges, it is possible to lose sight of the greater importance of our work. At our firm, we assure fulfillment by:

- Connecting our daily work to the community
 - All articles about our projects in newspapers, magazines and books are posted on the bulletin board or web-links are distributed, so that everyone can see how the community benefits from and values our accomplishments.
 - For the same reasons, we attend groundbreaking, topping-off and opening ceremonies.
- Serving the community
 - We have donated our engineering services to several worthy community groups, and we will continue to do so on occasion.
 - We routinely support a community athletic organization with our time, money, expertise and leadership.
 - We maintain memberships in and

donate money to several community groups.

- Contributing to the profession
 - We support our professional organizations with membership and participation.
 - We offer monetary bonuses for professional presentations and publications.
 - We value and pride ourselves on technical excellence.

Like our engineering endeavors, management is complex and deeply involving, and this article is far too short to give it its due. I hope, however, that I leave you with some concepts to contemplate and possible policies to implement. If you'd like to share your ideas or continue this discussion, please feel free to contact me at solutions@douglaswood.biz. ■

About the Author:



Douglas Wood, PE, SECB is a structural engineer with 33 years of experience, and is president of Douglas Wood & Associates Inc., located in Coral Gables.

Footnote:

1 Daniel H. Pink, *Drive*. New York: Riverhead, 2009.