

Creating Valuable Internship Experiences *for* Product Development

DEVELOPING THE 21ST
CENTURY WORKFORCE

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The Association of
Technology,
Management, and
Applied Engineering

Introduction

College internships used to be exploited by the few, most often the best and brightest, the ones who understood the importance of work experience and professional development. Today, collegiate internship programs have grown into one of the most important part of a students' educational journey. Certain internships are coveted, such as a summer at Google, which has approximately a 20% acceptance rate (Wu, 2008) or the White House, with only a 3.6% acceptance rate (Wu, 2008). This extreme competitiveness for a three- to six-month temporary job even inspired Hollywood to recently produce a comedy titled *The Internship (2013)* starring Vince Vaughn and Owen Wilson. Not all internship journeys include gourmet meals on a beautiful campus or shaking hands with the United States President; however, they do continue to be a vital part in developing the next generation of young minds.

Many students have never stepped foot inside a conference room or onto a manufacturing floor until their first day as intern, which is filled with emotions—most often anxiety, nervousness, and excitement—and often the buildup in his/her mind that the internship will be the gateway to a successful career. The new intern is excited about how much more money he/she will make this summer compared to their non-intern friends, and thinking about all the cool things he/she will do and see. The intern will make it through the typical mundane human resources (HR) introduction, and finally hear the coveted words, “let me show you where you will be sitting.”

Millennial interns are aware that Google employees have bean bag chairs and couches in the office. Millennials are also aware that YouTube employees have a mini golf course in the middle of the floor and some Red Bull employees have swings in their offices. So one can imagine the surprise when an intern is directed to a closet-sized office that is already occupied by two other interns or when the intern discovers that his/her temporary workspace is in the back, right cubicle inside a gigantic cube farm! These examples are the first-hand experiences of the authors and similar stories have happened within all industries and corporations.

Problem Statement

It is not uncommon for an intern at a large-scale engineering company to be assigned menial tasks. These unchallenging and unproductive periods of time are often viewed by the intern as a waste of time, which may stunt his/her career and restrict possible innovation a fresh young mind can bring to any engineering group. The unchallenging nature of non-engineering related tasks may bring about

dislike for engineering disciplines and may even motivate students to leave a STEM (Science Technology, Engineering, Mathematics) related field of study. That is the last thing STEM fields wants when they are desperately in need of new graduates as prior generations continue to retire.

Young engineering students anticipate their first internships. The students nervously send out resumes to potential employers and sit through interviews at career days. This is all in the hopes of finding the one company that does more than just give out free coffee mugs and pens if hired. Top students desire to be challenged to pursue tasks that are representative of what future full time employment will entail. Internships should be a place where students will finally answer the commonly asked question in many classrooms, “when will I ever use this?”

Internship Experiences

Dr. Rustin Webster’s first internship was at a large Fortune 500 company (>10,000 employees), and his second was at a smaller company (<150 employees). Mr. Jonathan Owen is currently an intern at *INTUITIVE*® Research and Technology Corporation (<300 employees). The experiences and paths taken in obtaining these internships could not be more different.

Webster could be considered your typical overly driven student. He enrolled in a four-year engineering program at a large university and by the end of the first semester he was already trying to secure a summer internship with a large government defense company that had recruited at the school earlier that year. He utilized his university’s career services to polish his resume and tune his interview skills. Webster was first on the sign-up sheet for interviews and purchased his first suit for the big day. He knew he was competing against sophomores, juniors, and seniors but had the confidence needed to secure one of the two spots.

Webster can still remember receiving the call with the offer to work as a computer aided design (CAD) analyst intern. Maybe it was the surprise that he actually won or the fear of living alone for the first time, but he turned down the offer. To his surprise, the very next year he was able to secure the same previously offered internship. This time around he was edgy to get started, to make a difference, and to kick start his career. He can still remember the shiny



Internship
Experiences

blue coffee mug, note pad, and pen that HR gave him during orientation. Webster remembers walking the hallways in awe of the marketing posters lining the halls with past CAD designs. Finally, he will never forget how if he was to lean back in his chair, the back of his head would hit his fellow intern and closest mate.

That summer was memorable for Webster for various reasons. First, he was exposed to big business and the government defense culture. A culture that is often rooted in cubicles, closed doors, and butts in seats. Second, he will never forget the mind numbing work of stitching infrared and color images together. Day after day, hour after hour, minute after minute he stared at an outdated and undersized monitor. It was not until the end of internship that he realized the only task given to him that summer was a task that no sane employee would do on a fulltime basis. Webster also realized that often times interns are simply cheap labor.

The next summer he was offered the opportunity to return and even had discussions with supervisors about full time employment upon graduation. However, because of the lack of challenges, Webster searched and found a new opportunity for his second summer internship. In contrast this was a small company that was only seven years old and had fewer than 150 employees. Webster did receive the company's embroidered messenger bag from HR, but for this internship he worked in a room that had a brand new CAD workstation and showed no signs of holding a trio of interns. The guided excursion of the military base and show and tell did not happen during the first week, even though it did eventually occur. A mentor (senior engineer) was assigned to him; however, because of the open door culture another senior engineer heard of his CAD background. From that moment the experience was one of the most challenging, fast paced, and exciting three months of his career.

Mr. Jonathan Owen began his post-secondary education at a community college immediately after graduating high school. Many young minds consider attending college as a typical next step in life, where parents use their collegiate experiences to mentor their child and high school friends become college roommates. However, Owen was the first person on both sides of his family to graduate from high school, and attending community college made the most sense for him. Everything about college was uncharted territory for Owen; the only thing he knew about college was where it was located. He did not know how to apply for scholarships, gain tuition assistance, or which degree path to choose.

With the odds against Mr. Owen succeeding, he worked diligently through numerous meetings with advisors and professors, and managed his course work, all while working more than 60 hours a week to pay for his freshman year of education, Owen learned quickly that an internship was something he would have to achieve in order to leverage his education into a career path.

Owen applied for a small engineering firm's internship position at the beginning of his sophomore year of college. He was well aware of internship horror stories of fellow classmates who spent an entire semester scanning documents for eight hours a day with no opportunity to learn, much less grow into a young professional, but he decided to make the best of any situation; at the very least he could put a few extra bullets on his resume. After several interviews, including meeting with the company's chief executive officer (CEO), HR, and future work mates, Owen was hired as a part time provisional employee. His main duty consisted of ordering supplies for the small business operations division. Owen did not know at the time, but this part time position was only the beginning of many progressive life-changing opportunities.

Now, Owen utilizes his internship opportunity as an open door to build lasting relationships with professionals in all areas of the firm. He has been promoted from office supply purchaser to engineering support, where his duties range from CAD support to prototype research and assembly. Owen is enabled by all members of the firm to leverage his drive, soft skills, and hands-on technical skills into a forty-hour a week engineering support role. He is given a title and duties typically set aside for interns pursuing a STEM related degree.

Unconventional Intern Utilization

Webster's second internship was with *INTUITIVE*®, a small aerospace engineering and analysis firm that has a relatively small engineering and design group. Because of the autonomous and collaborative nature of *INTUITIVE*'s engineering and design group, interns are treated and utilized in a fashion much differently than interns in other engineering firms.

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Innovation is built around the idea of going where others dare not, which means no one has the answers to something that has not yet been accomplished. Most great feats in history are accomplished only after perseverance through failure. *INTUITIVE*® allows interns to embrace this concept and provides direct support to the engineering and design group. Interns at *INTUITIVE*® are granted opportunities to attain valuable work experience in both business- and engineering- related job functions. From day one, the primary focus instilled by management and mentors at *INTUITIVE*® is education first, career second. Interns are often faced with many challenges while working with the engineering teams. They are commonly treated as entry level engineers, which is both thought provoking, and highly rewarding.

Webster's task during his summer 2006 internship was to design and produce the technical data package for a health monitoring system, Tactically Ready Asset Condition Recorder (TRACR), which was initially created for the THAAD missile canister and funded under a Phase 1 and 2 small business innovation research (SBIR) contract (see Figure 1 and Figure 2). Starting day two and ending the week before classes began, he worked alongside entry and senior level engineers. He was challenged, while at the same time encouraged to challenge others. His supervisors made it known that he should not be afraid to fail, which in hindsight, pushed him even harder. The open door, collaborative, and innovative culture made the summer fly by. The internship went so well that he returned over Christmas break to work, and went on to accept a full time position.

Figure 1



Asset monitoring unit

Figure 2



Remote sensor module

It has been almost nine years since Webster transitioned from intern to full time employee. He was *INTUITIVE*'s first intern and first employee to obtain a doctorate degree while being a full-time employee. He has also been actively engaged in intern and co/op recruiting. *INTUITIVE*® implemented a

strategy to recruit from some of the best engineering schools in the South. When attending internship and co/op interview days, Webster recognized a major difference between *INTUITIVE's* style and that of other companies. The majority of the companies had sent HR personnel only and often interviewed students using a predetermined script. *INTUITIVE®* ensures that engineers are present during interviews and often direct the interviews themselves. This seems to ease students' nervousness, allows the interviews to flow more naturally, and provides professional development for current employees.

INTUITIVE® recognizes that even though they have achieved success in the past, there is continually room for improvement in their processes and strategies for the internship and co/op program.

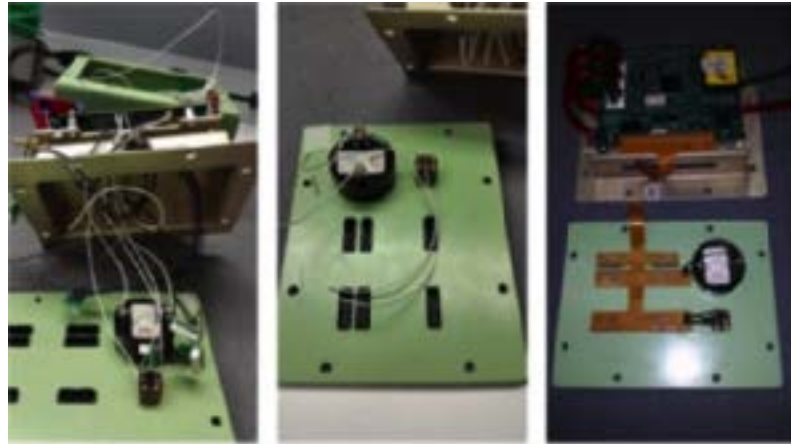
INTUITIVE® implements an open forum style of out-briefing for the interns in order to receive feedback needed for internal improvements. Each intern is tasked with creating a digital presentation that details their actions and thoughts. Each out-brief is provided to executives and managers, the personnel who can direct and implement needed changes in the program. The presentation also gives the interns an opportunity to practice soft skills like public speaking, which are often weak traits of engineering students.

Owen began his journey at *INTUITIVE®* in the spring of 2009 as a business operations intern; however, he gradually began to utilize much of his time supporting the engineering team. *INTUITIVE®* incentivizes all employees to continue education and training by giving full reimbursement upon successful completion. Owen takes advantage of *INTUITIVE's* reimbursement incentives by working to attain a bachelor's degree, and becoming a proficient solder technician. He utilizes his soldering skills to support the internal research and development (IRAD) team by completing various prototype designs. The experience gained by working autonomously alongside senior level engineers provides valuable experience that Owen will need to successfully compete in today's job market.

One particular project that Owen played an integral part of by acting as lead technician, alongside Webster, was the System Control Module (SCM) upgrade project (see Figure 3). His task was to ruggedize and improve portions of the SCM in order for the device to achieve greater efficiency in the field. Owen was encouraged by Webster to use critical thinking and hands-on technical experience to develop a new and improved version of the SCM. Although the SCM upgrade was Owen's first autonomous task, he was empowered by *INTUITIVE's* engineering staff to use his best judgment to make the device more

efficient. After several weeks of trial and error, the SCM upgrade proved to be a great success after full acceptance by the government customer. The SCM upgrade project was a high visibility project, which would typically be completed by a senior level team. However, *INTUITIVE*® proactively promotes all interns to consistently challenge themselves as professionals, which is the cornerstone for *INTUITIVE*'s internship program. The trust instilled in Owen by Webster and the engineering team greatly increased his confidence, skills and abilities, which led him to consistently take on high visibility tasks for the engineering team.

Figure 3



System Control Module project

Conclusion

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Question 1. “What makes *INTUITIVE*’s internship program successful?”

Juanita Phillips—Director of Human Resources

“*INTUITIVE*’s internship program is successful because of the vision and support from the top more than anything. That, and hiring the right people. Interns for us are individuals who are going to school full-time and work a full-day work schedule minus whatever time is needed to attend class. Upon meeting eligibility requirements, our interns can utilize our education assistance program, and we are very clear about grades requirements. Our interns meet occasionally as a group with our company president, and we help prepare them for their future path upon degree completion. A formal grades review is done with HR and the president at the conclusion of each semester. An offer of full-time employment upon graduation is dependent upon performance, and has heretofore always been the outcome”

(J. Phillips, personal communication, October 14, 2014).

Vergenia Shelton—Director of Engineering and Support

“I believe the program is successful because of: 1) the support from the engineering group; 2) seeing engineers on the team who have gone through the program and since been hired fulltime; 3) working relationships with quality universities; and 4) the word of mouth from past and current interns and co/ops” (V. Shelton, personal communication, October 13, 2014).

Question 2. “What makes *INTUITIVE*’s internship program unconventional?”

Juanita Phillips—Director of Human Resources

“What is described in question one is all too uncommon. Add to that the fact that our interns do real work—work that impacts our customers, in many cases, the warfighter. While their college friends working as interns or co-ops with other companies in town may be making coffee and copies, our interns, co-ops, and student hires are helping design engineering solutions for customers, providing drawing updates for other engineers, helping with analytics to solve real-world issues, etc. Co-ops come to us through our interaction with the co-op programs of several universities, and are generally engineering students. Student hires are usually with us for a defined period of time and come from a variety of fields. We are proud that we continue to meet our goal of having 10% of our workforce be a combination of interns, co-ops, and student hires”

(J. Phillips, personal communication, October 14, 2014).

Vergenia Shelton—Director of Engineering and Support

“Unlike many internship programs we give them (students) an opportunity to exercise many of the engineer skills that they wouldn’t normally get to use without experience. This is under direction from the technical lead for the project, but it brings a lot of new ideas to the table and gives the interns a true test of how they like the engineering field” (V. Shelton, personal communication, October 13, 2014).



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