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LIFE AFTER THE PHD: WHAT I WISH I HAD KNOWN SOONER

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ABSTRACT

For most who do it, completing the PhD is the hardest thing they've ever done. There is a tendency to think that life will only get easier afterwards. The truth is that while life may get better, it doesn't necessarily get easier. It is possible, however, to ease the transition, if you pay attention to some basic truths.

1 INTRODUCTION

There must be an unwritten law that says that completing the PhD must involve sometimes painful lack of sleep, the exhilaration of the last result, the terror of the defense, the relief of approval, and the excitement of starting a career with new colleagues in a new city. It happens to everyone who goes through the process. We start the new job thinking, "Life will be so much easier now." Maybe that's true for some, but it's not been my experience, nor my observation.

I can only report on life as a faculty member, because that's where I went, and that's the experience I draw from. But having spent a large part of my professional life in the academy working with companies, I think the differences for the new PhD between academic life and business life are not that great. In both, long term success is more likely if you understand certain truths and apply certain lessons.

So, with the purpose of stimulating you to think about "life after the PhD," this paper will state what I hold to be four fundamental truths, and *some* of the lessons to be drawn from those truths. The four truths address the business you are in, time management, direction management, and self management. Be warned, however, that my viewpoint is widely regarded by my colleagues as perhaps not perfectly aligned with the majority of the profession.

2 THE BUSINESS YOU ARE IN

To be successful in any business, you need to understand the business. And believe me, you are in a business.

> **Truth:** *As a newly minted PhD, you will enter the intellectual capital business, where success mandates that you either create, or you synthesize, or you package intellectual capital in a way that customers will desire to consume it.*

Figure 1 summarizes your position in this business: you start with an initial inventory of intellectual capital, you may replenish that store either through your own efforts or by "harvesting" the intellectual capital created by others. You package intellectual capital—in the form of papers, presentations, books, lectures, software, databases, or other forms—and deliver it to customers, who may be students, colleagues, sponsors, or other consumers.

There are several lessons that may be drawn from this "truth." Perhaps the most important is:

> **Lesson:** *You, as an individual intellectual entrepreneur, need to understand your strengths and weaknesses in this business.*

Success usually comes from playing to your strengths and protecting your weaknesses. Are you a great lecturer, for example? If so, then you want to be in a place where that form of intellectual capital packaging is highly valued, because if it is not, then you can't be successful by playing to your strength. Are you a brilliant researcher? If so, then you need to be in a place where research productivity is highly valued, because it allows you to play to your strength. By the same token, if you discover that you are a horrible lecturer, then you should immediately seek help to improve your skills. Not many of us are naturally great lecturers, but almost anyone can learn some basic skills that will get you to the acceptable performance level.

Make no mistake, the transition from PhD student to individual entrepreneur in the marketplace for intellectual capital is a major transition. Instead of simply needing to please your dissertation advisor and your committee, who will usually tell you exactly what you need to produce, you need to please customers in this market place who will give you much more ambiguous signals. And there will be more of them to deal with. Life will be better, because it is richer, but not necessarily easier, because you have to manage your growing business, rather than simply follow someone's directives.

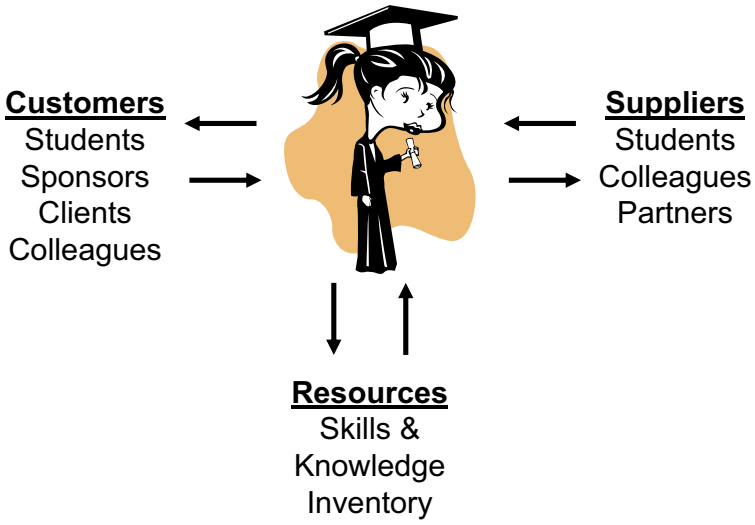

Figure 1. The business you are in

Your career as a PhD student is pretty short (no matter what it seems like), especially compared to your career after the PhD. Things don't change much during a PhD student career—what you know at the end is not terribly different in kind from what you know after the first year. However, a second very important lesson is:

> **Lesson:** *Over the course of your post-student career, the marketplace will change dramatically*

Everything will change—the customers will change in terms of what they need and how they want it packaged, the technology will change, and the specific kinds of intellectual capital that have great value will change.

When I began my career, we still used punched cards to prepare computer programs, so I have been through the initial "real time" systems, which involved teletype machines, the first personal computers, with 5 megabyte floppy disks, to the powerful personal computers we have today, and now to "cloud computing." Each of those changes required me to retool my store of intellectual capital, because customers for my intellectual capital expected it to be packaged appropriately.

As you look ahead, to a career that spans 40 years or more, it is impossible to know exactly how the marketplace for your intellectual capital will change. Some trends are clear, e.g., the student body will become more diverse in terms of age, nationality, race, and gender, and may even become "virtual". The problems that drive external sponsors to seek your help also will change, as contemporary problems are

"solved" and new problems become important, so you will constantly need to learn about new problems and to come up with new solutions. But nobody is able to tell you exactly what changes will occur and when, so you will have to be able to adapt, and you will probably have to manage that adaptation on your own.

3 TIME MANAGEMENT

Every day, you have "opportunities" to invest your time and energy—some of these opportunities are important, and some are urgent. As a PhD student, usually the urgent and important are pretty well aligned. However, in the post-PhD world, the truth is:

Truth: *Not every opportunity that is urgent is also important*

In fact, you can usually categorize your opportunities, based on importance and urgency, as shown in Figure 2. If an opportunity has high importance, and high urgency, then it's probably a good idea to do it soon. By the same token, if it has low importance and low urgency, then you can let it slide to the bottom of your to-do list. The critical lesson is:

Lesson: *Don't be overly generous in the use of the "high" designation.*

The biggest mistake of many new PhDs is assigning a "high" level of importance and a high level of urgency to opportunities that are, in reality, neither. I think the reason is that during the PhD program, we tend to be very narrowly focused, so that we don't develop very good discrimination regarding urgency and importance. Treating too many opportunities as either highly important or highly urgent means that too little time is spent on those opportunities that truly are highly urgent or highly important, or both.

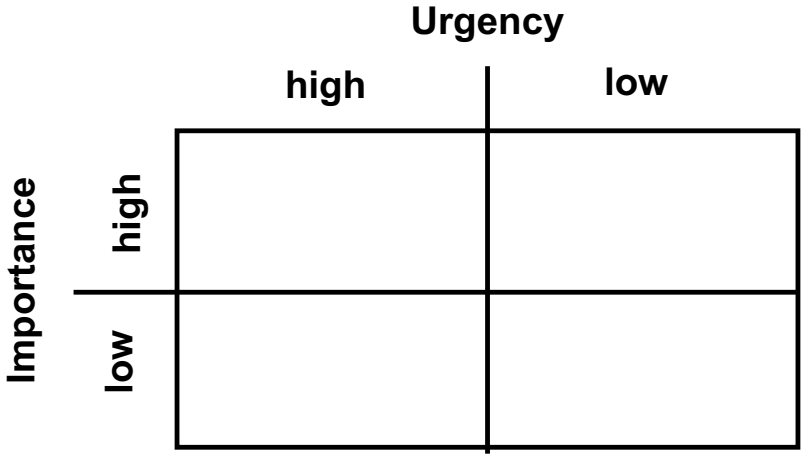

Figure 2. Classifying Opportunities

There is a second lesson, which is really important to master:

Lesson*: If unconstrained, the urgent opportunities will overwhelm the important ones.*

Mastering this lesson requires nothing less than blocking time on your schedule for the things that truly do have high importance. This can be time to write papers or proposals, even when you have "regular" tasks that need to be done, like teaching. It can be quality time with your family, even when you are feeling the pressure of returning graded exams. If it is truly of high importance, it deserves sacrosanct blocks of time on your schedule.

Time management enables you to be successful in your career, but it doesn't guarantee success. If you understand the business you are in, and your strengths and weaknesses, time management will make it possible for you to go in the direction you've identified. Provided you have identified a direction.

4 DIRECTION MANAGEMENT

Success in this business generally requires you to distinguish yourself in some way—to make a contribution that others in your chosen field will recognize as both important and significant. There are many ways to achieve that success, but each of them requires purpose. The truth is:

Truth: *If you don't know your long term destination, any short term destination seems ok.*

Developing a personal vision for a career is extremely difficult, especially at the very beginning of a career. As a PhD student, the goal is to please the advisor and the committee, and success in doing so does not necessarily give one the experience or knowledge for deciding what the research should be after graduation. As a result, there is a real danger that the new PhD will be somewhat "aimless" in terms of direction. For example, the initial research will add a few flourishes to the dissertation work, perhaps, rather than identifying new research opportunities. Or the collaboration with the advisor will continue, preventing the new PhD from establishing a separate identity.

One lesson from this truth is:

Lesson: *If you have no long term direction, then either you won't go anywhere, or somebody else will pick the destination.*

The "somebody else" could be a colleague who co-opts you to their research agenda, a boss who needs a particular capability developed, or just colleagues who influence you to do what they are doing. Each of these outcomes might be successful, but it might not, and you should recognize the risk in allowing someone else to set the direction for your research. Ideally, you will spend the time and effort after completing the PhD to take stock, and begin to imagine where you want to be in your career after ten years, twenty years, thirty years. Those destinations don't have to be immutable, but they establish reference points for you to use in managing your direction and your time.

Without a reference point it is hard to implement this lesson:

Lesson: *Take frequent sightings to make sure you are on course, or at least you like where you are going.*

Even you don't have a required annual review for salary purposes, you should do an annual self-assessment that looks at what you've accomplished in the past year, and identifies what you want to accomplish in the coming year. You will be amazed at how fast a year can go by, with nothing accomplished because no accomplishment was planned.

You should also recognize that you are not the first person to pass this way—others have gone before you, which leads to the third direction management lesson:

Lesson: *Learn from those who have been successful already.*

Study the activities and practices of those who have been successful already, and be willing to emulate their successful behaviors. Develop relationships with successful colleagues, because they are the ones most likely to have an influence on future decisions that affect you, such as proposal review, promotion and tenure recommendations, etc.

Finally, it's time for you to recognize that:

Lesson: *You are the master of your career; understand that you <u>can</u> change directions.*

Perhaps the most wonderful aspect of a career in the academy is that you can change directions, and have new experiences. In my own career, I've done the standard academic job, I've helped launch and run a major interdisciplinary industry sponsored consortium, I've run an interdisciplinary graduate education program, and I've had a major role in campus wide faculty governance. In addition, I've changed my research emphasis from applied optimization, to material handling systems, to enterprise manufacturing, and model-based systems engineering. Some might think the "lack of focus" has limited my success, and in some ways that might be true. On the other hand, it's given me a wealth of experience; and it has been fun. Which leads me to the fourth truth.

5 SELF MANAGEMENT

No matter what business you are in, but especially in the intellectual capital business, you need to manage yourself and your interactions with others. The importance of relationships in comparison to intellectual products is captured in this truth:

Truth: *For the vast majority of us, our legacy is not the books or papers we've written, it is the lives we have touched and changed—for good or ill.*

In other words, despite the fact that our professional efforts are directed toward creating these intellectual products—books, papers, monographs, software, etc—the real impact we have throughout our careers comes from how we interact with others, not as intellectual capitalists, but as human beings.

There are some terribly important ramifications of this truth. One is:

Lesson: *Your students will look to you for more than knowledge, they will want and need wisdom as well.*

Students want to understand meaning and values as well as content. Yes, they want to know how to generate random variates, but they also want to know what it means to conclude that the workforce can be reduced by 20%, and what the value is to society from the work they will do. If you don't have the wisdom to meet this need, then it is your responsibility to develop that wisdom as quickly as possible. They also will look to you as a role model for how a professional acts. One of the most humbling, and at times the most gratifying experiences you will have is when a student whose name you have forgotten approaches you at a meeting or event, and relates how something you said fifteen years before really changed his or her life. These are not the results of the carefully planned and rehearsed intellectual products you produce, but rather the result of the way you live your life as a professional and as a person.

The ramifications aren't limited to your students:

Lesson: *You can't always identify a potential sponsor or patron*.

You will spend a significant part of your life in the academy (and in the corporate world) pursuing new sponsorship or new sales. Almost always, when we write a proposal, we already know who it will go to. But I've had more than one experience in which a funding opportunity arose, not because of a proposal I'd written, but because of a relationship—and a relationship that I didn't even remember that I had! In one case, it was a relationship created by my willingness to talk to some international visitors that appeared on a Friday afternoon with no preliminary contact, and simply wanted to learn about Georgia Tech and our capabilities in logistics. A year later, they returned with a proposal for a major funded collaboration. The opportunity knocking at your door may be disguised as just another waste of time.

The lessons about self management, in fact, are lessons about how we interact with the other people we come in contact with. There is a difference that you should recognize between infrequent and incidental interactions, and the interactions that are continuous and intense, such as those between PhD student and advisor, or between long term collaborators:

Lesson: *You don't have to love the people you work with regularly, but you had better like them.*

One of the most painful experiences you can have is to be bound to a working relationship—e.g., as advisor to a PhD student, or co-director of a research center—with a person that you do not like. Choose your colleagues and students carefully.

The implicit assumption in this paper is that you are planning to actually <u>do</u> something, in which case it is important to recognize the next lesson:

Lesson: *Unless you never do anything, ever, you are going to make mistakes.*

Mistakes are very hard to accept and deal with for those of us in the intellectual capital business, perhaps because we are culturally conditioned to view things mathematically. But life is more than mathematical rigor, and we are not mathematical abstractions. When you make those inevitable mistakes, admit to yourself that you did it, accept responsibility, plan to not make the same mistakes again, and apologize to those who need apologies.

The final lesson is not so much a lesson as an admonition:

Lesson: *Take time to appreciate the opportunity you have to learn and grow, and to influence so many young people.*

The primary expectation of our profession is that we constantly learn, either about problems or models or algorithms, and that we constantly grow in both in knowledge and in wisdom. We also go to work every day with the opportunity to interact with other people who are similarly motivated, and certifiably intelligent. How wonderful is that? My personal observation is that those in our profession who understand this opportunity and appreciate it are generally much happier than those who don't.

6 CONCLUSION

Based on my experience, life does not get easier after the PhD is completed, but it does get better, especially if you pay attention to the basic truths, and absorb the lessons others have learned the hard way. Understand that you are in the intellectual capital business, be discriminating in managing your time, have a plan for success, and respect all of your interpersonal relationships. But most importantly, recognize that your chosen profession is one that is rich in both intellectual and interpersonal stimulation and reward; I guarantee that if you take advantage of both, life won't be easier, but it will be better.

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