Ph.D. vs. Startup

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ABSTRACT
How should we decide between the conflicting demands and resource drains of startups and Ph.D. programs? This panel discusses some of the current issues facing students, professors and employers, from the panelists' varied perspectives. We do not advocate any one single solution but rather seek to illuminate important issues that affect the CHI community now and will likely continue to do so in the future, both in the US and in other countries promoting high-tech startups as major parts of their economies.

Keywords
Startup, Ph.D., employment, career choice

INTRODUCTION
Today's high-tech economy presents an ongoing dilemma for students, professors, recruiters, and those considering advanced degrees. We can oversimplify this dilemma as "Do I join/create a startup?" versus "Do I complete a doctorate?"

Of course these are not polar opposites, and all the panelists have experience with doing both a doctorate and working for at least one startup. However, there is a fundamental dichotomy appearing in the CHI community between the demands of acquiring/educating Ph.D. students and the lure of possible wealth, influence and prestige that can come from the creation of a successful startup company.

The goal of our panel is to illuminate some of the important aspects of this dichotomy and engage the CHI community in a discussion of these issues. Naturally, educators and students (or potential students) must face this issue most directly, but it also has effects on employers and even on

research labs, which are increasingly being pressured to act like incubators for startups, or to produce results that will permit their funding parents to compete with the latest startup innovations.

THE INNOVATOR'S DILEMMA
We expect doctoral candidates to be creative in a significant way. We expect that dissertations make a real contribution to the HCI field. In the past, this has been somewhat removed from the business world, in that human-computer interaction was a sidelight even in high-tech companies. Thus, doctoral work could proceed with little thought of immediate commercial application. Professors occasionally consulted "on the side" for companies, but it usually had little or no impact on their students' research.

The Internet and the rise of the so-called digital economy have changed all that. The Web, in particular, has brought issues of user interaction and experience to the forefront. Computers are now in more homes, in more forms, and are being used by more people than ever before. Software is being used by, and must appeal to, audiences that never existed before or that were considered marginal at best. The challenges of human-computer interaction in a commercial setting have never been more complex, nor have answers to these challenges ever been more critical to business success or failure.

In the past five years, hundreds of significantly creative efforts have happened that have made real contributions to HCI and indeed changed the way much of the economy functions. We have, along the way, changed the perspectives and opportunities for HCI graduate students and professors. This has not happened in an academic setting, however. Instead, it has happened in converted warehouse and back rooms in places like San Francisco, New York, Amsterdam, and Haifa. Every technologically sophisticated country has been affected, and the HCI field will likely never be the same.

As a result, bright creative potential students are now pulled in at least two directions. In either the context of a Ph.D. or in the context of a startup company they have the

opportunity to do innovative work. Each context presents very different demands and expectations however.

THE EDUCATOR'S DILEMMA

The change in climate has also significantly affected professors and those who supervise doctoral students. Consulting by professors these days may often mean serving on the boards of startup companies. As a result, the demands in terms of time and attention may be much more significant. Because of the intensely competitive nature of these companies, it may also mean much more stringent restrictions on disclosure, which can affect the open exchange necessary in a learning institution. This can be particularly acute when a startup comes out of work done by a professor's former student. It is quite likely this startup will use elements of the professor's ongoing research program. As a result, current and future students may risk being shut out of access to certain aspects of a research program, lest information leak out or the new students end up in competition with the startup formed by the previous students.

Even if a professor does not directly get involved with startups, students may find themselves pulled away from studies by startup opportunities. In the extreme they may leave a doctoral program to work at a startup.

In cases where students do not fully leave an institution before finishing their degrees, there is an incentive for them to hold back their best ideas or most creative work in order to protect it for an eventual startup company. If they publish early they may find a degree that has taken four years of hard work trumped by a startup that can implement a commercial form of the same ideas in four months. As Universities become more aggressive in requiring students to give up stakes in companies they start with ideas developed while studying, the incentive to hide or hold back increases. The danger, of course, is that these incentives to hold back information may lead to poorer quality in degrees that are completed.

Finally, we cannot forget that almost all university research is sponsored, either by governments or industry. Sponsor companies may also provide pressure as they may depend on university associations to provide innovative research ideas for them, and they are themselves in competition with fast-moving startups. Intellectual property agreements negotiated with sponsors may limit what students can do

with their research ideas. Even if the sponsor does not wish to own the ideas, investors may be scared off by the prospect of a big corporation poised to "swoop in and take control" if the idea proves profitable.

Universities may – or may be forced to – see themselves as businesses providing the "service" of education to students of an increasingly diverse set of ages and potentially over vastly expanded distances. The meaning of a Ph.D. to a 35-year old student with 10 years of industry experience is vastly different from the meaning of a Ph.D. to a 21-year-old who has just completed undergraduate studies.

CONSEQUENCES

There are no easy answers to these dilemmas. At one end of the spectrum we find ourselves asking the question of whether it makes any sense for bright, talented students to pursue Ph.D.'s at all in today's economy. If it does not make sense, what does that say about where the CHI field will be in ten years? Are we starving the future by encouraging short-term gain at the expense of long-term investment in HCI research? As Konstan has directly experienced and other professors will agree, CS departments all over face a pressure to expand and accommodate more students at the same time as they face a shortage of talented Ph.D. students looking for professorships.

At the other end, we must ask whether there needs to be a stronger separation between commercial concerns and university research. We wonder how it is possible to carve out a meaningful long-term research program in human-computer interaction while resisting commercial pressures. Can such a separation be achieved without academic research becoming increasingly irrelevant to the business world that will, eventually, employ the majority of academic graduates?

CONCLUSION

We believe that no single panel can produce answers to questions that are this fundamental to our entire field. We do not propose to give such answers. Instead, we expect to open topics of discussion and engage the CHI audience in what we hope will be an ongoing dialog. We believe that the positions taken in this dialog and the responses we collectively formulate to these questions will be important in shaping CHI in the coming years.