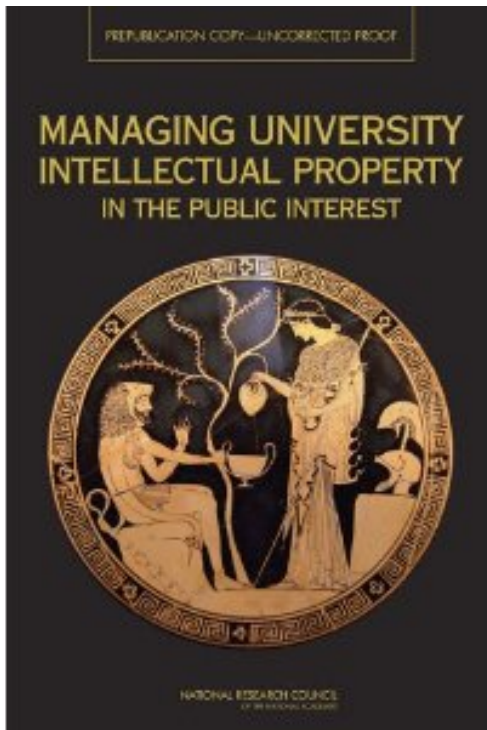


## UNIVERSITY MANAGEMENT OF TECHNOLOGY TRANSFER IN PERSPECTIVE

Universities have a lengthy track record of providing dynamic environments for generating new ideas and spurring innovation, and for moving advances in knowledge and technology into the commercial stream where they can be put to work for the public good; these endeavors collectively are referred to as “technology transfer.” Given that public investment in research has been an explicit national priority for more than six decades, and given the level of that investment, universities arguably have an obligation to organize themselves effectively to facilitate the transition of knowledge into practice. This transition takes place through a variety of mechanisms,<sup>3</sup> including but not limited to



1. movement of highly skilled students (with technical and business skills) from training to private and public employment;<sup>4</sup>
2. publication of research results in the open academic literature that is read by scientists and engineers in all sectors;<sup>5</sup>
3. personal interaction between generators and users of new knowledge (e.g., through professional meetings, conferences, seminars, industrial liaison programs, and other venues);
4. firm-sponsored (contract) research projects involving firm-institution agreements;
5. multi-firm arrangements such as university-industry cooperative research centers; and
6. personal individual faculty and student consulting arrangements with individual private firms
7. entrepreneurial activity of faculty and students occurring outside the university without involving university-owned IP, and
8. licensing of IP to established firms or to new start-up companies.

Of the eight mechanisms of technology transfer listed above, the first seven offer significant contributions to the economy, yet it is the eighth (licensing of IP<sup>7</sup>) that is more often discussed, measured, quantified, and debated than the other mechanisms combined.<sup>8</sup>

**“It’s the people, stupid!”**



Moreover, most inventions—even those that have high social value when put into practice—do not generate significant licensing revenue. For example, in the past 40 years, Stanford’s Office of Technology Licensing has received more than 8,000 invention disclosures. Half of these have resulted in patents, and one-half of those have been licensed. However, less than 1 percent of the Stanford disclosures have generated \$1 million or more in cumulative royalties. Furthermore, many highly successful “Stanford startups” involved the participation of Stanford faculty, staff, and students, but not the licensing of any university intellectual property in order to launch the start-up. Examples include CISCO, Sun Microsystems, Rambus, Yahoo!, and VMWare.<sup>32</sup>



# UW CSE Entrepreneurship: A Snapshot of People



Brian Pinkerton, as a UW CSE Ph.D. student in 1994, developed *WebCrawler* – the first successful full-text full-page Web search engine, which he took to AOL and later to Excite



Jeremy Jaech, co-founder of Aldus (invented desktop publishing with PageMaker), then co-founder and CEO of Visio (object-oriented constraint-based drawing)



Jeff Dean, Google Fellow, responsible for 4 generations of Google's crawling and indexing service, MapReduce, BigTable, etc.; Member of National Academy of Engineering



Loren Carpenter, created the first computer-generated film ("Vol Libre"), Chief Scientist at Pixar, Academy Award winner



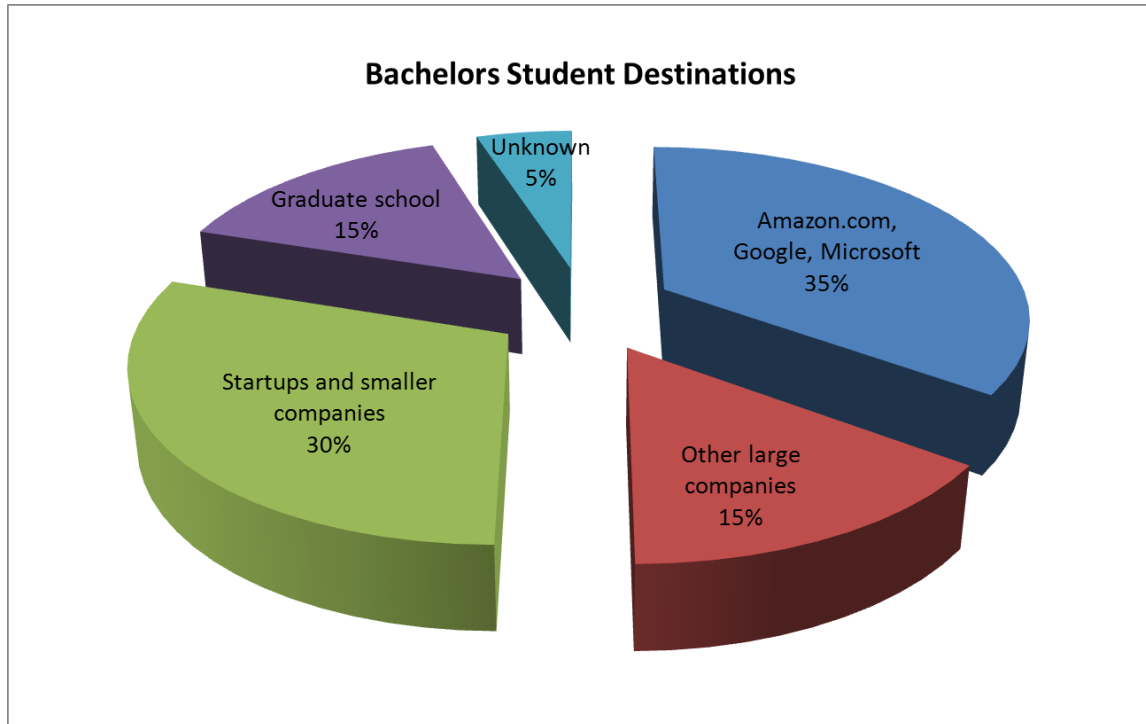
Udi Manber, Google VP of Engineering, world leader in search technology as a professor (Wisconsin, Arizona), then at Yahoo!, Amazon.com, A9, and Google



Rob Short, former Microsoft Corporate VP for Windows Core Technology, inventor of Plug and Play, head of 600-person group responsible for Windows XP design



Wen-Hann Wang, VP Intel Labs, architect for Intel P6 and Xeon families



# UW CSE Entrepreneurship: A Snapshot of Startups



Global leader in RFID technology



Airfare price prediction (acquired by Microsoft as the foundation of Bing Travel)



Cloud computing for enterprise IT



Concurrent software quality assessment tools



Home energy monitoring (acquired by Belkin)

# UW CSE Entrepreneurship: A Snapshot of Technologies



First successful full-text full-page web search engine



Foundation of Intel's "Hyper-Threading"



Photo collection navigation



OneBusAway

Public transit usability software

# UW CSE Entrepreneurship: More Startups



1980  
Computer system performance analysis software  
Closed 2007



1986  
VLSI CAD software and VLSI components  
Acquired by Cypress Semiconductor, 1994



1996  
Computer-generated pen-and-ink illustration  
Closed 2000



1996  
Intelligent comparison shopping  
Acquired by Excite, 1997



1996  
Image creation and search  
Acquired by Microsoft, 1999



1997  
Enterprise application performance management  
Acquired by Tonic Software, 2003



1998

Online advertising effectiveness assessment  
Acquired by Media Metrix, 1998



1998

Understanding unstructured information  
Acquired by Thomsen Reuters, 2007



1999

Embedded system design tools  
Acquired by Intel, 2003



1999

Data integration  
Acquired by Actuate Corp., 2003



2000

Network security appliances  
Closed 2002



2000

Global leader in RFID technology  
Active



2000

Website performance analysis  
Acquired by Mercury Interactive, 2003



2002

Biomedical laboratory automation software  
Closed 2010





2003  
Airfare price prediction  
Acquired by Microsoft, 2008



2004  
Searching the deep web  
Acquired by Google, 2006



2006  
Cloud computing for enterprise IT  
Active



2008  
Concurrent software quality assessment tools  
Active

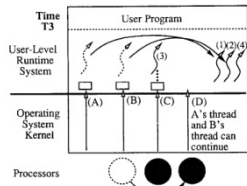


2009  
Home energy monitoring  
Acquired by Belkin, 2010



2010  
Consumer electronics price prediction  
Active

# UW CSE Entrepreneurship: More Technologies



1989/1992

Scheduler Activations and Lightweight Remote Procedure Call (LRPC)

*Used in most modern operating systems*



1994

First successful full-text full-page web search engine

*AOL, Excite*



**Simultaneous  
Multithreading**

1995

Dramatic processor performance enhancement

*Intel, Compaq, IBM, Fujitsu*



1994

First successful web meta-search engine

*Go2Net, InfoSpace*



1997

x86 binary rewriting

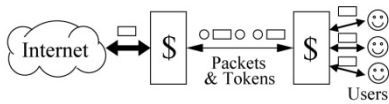
*AMD*



1998

Detour routing

*Akamai, Limelight*



2000

Network link optimization through de-duplication

*Key element of the \$1B WAN accelerator business of Riverbed, Citrix, Cisco, Bluecoat, Perabit, Juniper*



2007

Photo collection navigation

*Microsoft, Google*



2007

A strategic BitTorrent client

*Millions of downloads*



2008

Lost device tracking



OneBusAway

2008

Public transit usability service

*Metro Transit, Seattle Children's Shuttle, Sound Transit, Washington State Ferries, Google*



2008

Website reader for the vision impaired

*40 languages worldwide*



2009

Private peer-to-peer data sharing

*Tens of thousands of active users throughout the world*



2010

Community discourse on political issues

*Washington State ballot measures*

# UW CSE Entrepreneurship: A tiny sampling of alumni companies



1976  
CP/M  
Acquired by Novell, 1991



**ALDUS**®

1984  
Invented desktop publishing  
Acquired by Adobe, 1994



1984  
Computer telephony  
Acquired by Intel, 1999



1989  
Macintosh software  
Active



1990  
Object-oriented constraint-based drawing  
Acquired by Microsoft, 2000



2000  
Advanced avionics for experimental and sport aircraft  
Active



2001  
Highly scalable network-attached storage  
Acquired by EMC, 2010



2004  
Macintosh software  
Active



2005  
A social network for local businesses  
Acquired by Reply! Inc., 2010



2006  
Highly scalable clustered database system  
Active



2007  
Cloud-based disaster recovery  
Active



2008  
Enterprise-class parallel computing software (Hadoop)  
Active



2010  
A network for non-profits  
Active



2010  
Large-scale data analytics  
Active