GSLIS: Information Cities

University Research Parks:
Inciting Corporate Engagement on Campus
University Research Parks

• More than 700 research, science and tech parks are in varying stages of development worldwide
  – 174 university research parks in the United States and Canada
    • 379,754 jobs, with 27% employment growth from 2007 to 2012
    • 74% of North American Research Parks had new buildings in the last 5 years

• University research parks are physical environments that can generate, attract and retain technology companies and talent in alignment with sponsoring research institutions (universities and public and private research laboratories).

• Mission of university research parks: The creation of an environment that encourages innovation and entrepreneurship and creates a catalyst of economic development

• Key activities:
  – University-industry collaboration services
  – Entrepreneurship Support
  – Live-work-play developments
  – Regional economic development
University Research Parks vs. Tech Parks

• AURP defines a university research park as a property-based venture which has the following attributes:
  1. A property master plan designed for research and commercialization
  2. Partnerships with at least one university or other research institution
  3. Encouragement of the establishment and growth of new companies
  4. Technology translation from the lab to the marketplace
  5. A focus on technology-led economic development

• The key factor differentiating a university research park from a technology or industry park is the meaningful interaction between the companies in the park and the affiliated research institution(s).
University-Industry Collaboration

- For the promotion of university-industry collaboration, the most common services offered were having park staff responsible for relationship building between industry and universities and offering industry tenants access to university research labs.

<table>
<thead>
<tr>
<th>Partnering Mechanism</th>
<th>Percentage of Parks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnership-developer staff or others charged with “relationship building” between</td>
<td>64%</td>
</tr>
<tr>
<td>industry and universities</td>
<td></td>
</tr>
<tr>
<td>Access to university research laboratories</td>
<td>63%</td>
</tr>
<tr>
<td>Human resources matching: internship or co-op programs, mechanisms for student and</td>
<td>59%</td>
</tr>
<tr>
<td>post docs hiring</td>
<td></td>
</tr>
<tr>
<td>University tech transfer/commercialization office</td>
<td>54%</td>
</tr>
<tr>
<td>University core user facilities (e.g., analytical lab, prototyping lab), open to</td>
<td>49%</td>
</tr>
<tr>
<td>industry</td>
<td></td>
</tr>
<tr>
<td>University educational course offerings to industry tenants</td>
<td>44%</td>
</tr>
<tr>
<td>Pilot plants or demonstration labs, open to industry</td>
<td>33%</td>
</tr>
<tr>
<td>Workforce advanced-technology training facilities</td>
<td>27%</td>
</tr>
</tbody>
</table>
The University of Illinois Research Park
Visioning Future Excellence

- Economic Development
- Education
- Energy and Environment
- Social Equality and Cultural Understanding
- Health and Wellness
- Information and Technology
The Research Park at the University of Illinois provides an environment where technology-based businesses can work with the research faculty and students on collaborative research and access UI services.

- 200 Acres adjacent to campus, developed with a private partner, 14 buildings
- 1574 employees including 474 students

The Research Park has 91 companies and employs people in high-tech jobs

- Fortune 500 firms: Yahoo, Caterpillar, State Farm, ADM, Grainger, Raytheon, Abbott, Dow, Deere
- 45 companies currently in the EnterpriseWorks startup incubator (160 startups since it opened)
UI Research Park Area
Research Park at the University of Illinois

From Agriculture Sites and Fish Ponds in 2000...

To construction each year annually over 14 years...

The Research Park now includes 14 Buildings and 90 Companies
Impact on Local Economic Development

Jobs from Operations
1432 Direct Jobs
241 Indirect Jobs
508 Induced Jobs

Current total annual payroll
$81,220,179

Economic Output
$169,549,000

Total construction over 10 years has contributed $7.2 million in tax revenues to the state of Illinois.

Total operations in the Research Park are annually contributing $4.1 million in tax revenues to the state of Illinois.
Best practices have been shared by leading corporations with centers at the University of Illinois Research Park

- ADM Sustainable Bioenergy Modeling Center
- Caterpillar Simulation Center
- Citrix, Bytemobile operation
- John Deere Technology Innovation Center
- Dow Innovation Center
- Raytheon, Trusted Computer Solutions operation
- State Farm Research and Development Center
- Yahoo, Hadoop Center of Excellence
- Grainger
- Abbvie
- Abbott Laboratories
- Neustar Innovation Center
- Littelfuse
- Riverbed
- Sony Biotechnology
- Anheuser-Busch InBev
- Foxconn Interconnect
Why do Corporations Locate in the Research Park?

- **Students**: Employ student Interns year-round as a low-cost workforce with a high potential for full-time recruitment after graduation
- **Tech Talent**: Recruit engineering talent from campus and community
- **Scout**: Early awareness of technology and research trends and innovations
- **UI Relationships**: Proximity to sponsored research and engagements
- **Startups**: Corporate venture groups engage and partner with UI startups
- **Intrapreneurship**: Entrepreneurial environment for open innovation
- **Sharing**: Peer-to-Peer Learning from other corporations located here
- **Skills**: Continuing professional and technical education for employees
- **Facilities**: Access to University labs, computing, and facilities
- **Ease**: UI staff dedicated to helping companies setup and run operations
Entire industries like social media, gaming, and oil/minerals are currently involved in a war for talent, as are top-rated firms like Facebook, Google, Apple, Zynga, and most startups in social media, mobile phones, medicine, and technology. Here in the Silicon Valley, talent competition has already returned to near 1999 levels.

Employers in Silicon Valley increasingly cite talent recruitment and retention as their top business obstacle.
Competition for Engineering Students is Fierce: Proximity as Solution

- 6,748 employers recruited from Illinois last year, a 47% increase from the prior year, employers working hard to stand out and win talent
  - Engineering is the most recruited job area
  - Computer Science students had the highest salaries for a BS degree, $90,000 median salary (vs. $60,900 nationally)

- Year-round workforce model is unique in the Research Park, allows corporations to tap tech talent early, and create a recruiting pipeline, part-time during school year and full time during summer

- 450 students working in Research Park, but only scratching the surface of 10,000+ engineering students on campus

The University of Illinois at Urbana-Champaign had 74 of the top Fortune 100 companies recruit on campus.
Students Working in the Research Park
Student Year-Round Employment

• 474 students intern with Research Park companies part-time during the school year and full-time in the summer
  • 1/3 of the total employees in the Research Park
  • Internships typically hired by semester, seek a one-year employment commitment

• Students Employment examples:
  • Modeling and Simulation
  • Business intelligence
  • Mobile app development
  • Technology research
  • Software development
  • User interface design
Typical Student Recruitment

Typical Majors

• Computer Science
• Computer Engineering
• Electrical Engineering
• Mechanical Engineering
• Statistics, Math, Actuarial
• Graphic & Industrial Design
• GSLIS, Informatics
• Other Examples: Aerospace, MBA, Nutrition, Materials, Communications

Desirable Skills

• Programming languages: MATLAB, html, CSS, C/C++, Java, php, iOS
• Hadoop, R, R-Studio, SQL, Machine learning methods, social media analytics and sentiment analysis
• User interface, front-end development, wireframe design, data visualization techniques
• Simulation, Computational Chemistry, CFD
• Market Research, Patent search
Student Interns Hours Worked

Typical schedule: 10-20 hours during the school year and full time during the summer
## Student Interns Hourly Wages

<table>
<thead>
<tr>
<th>Internship area</th>
<th>Average hourly salary reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business planning/strategy/competitive intelligence/market research</td>
<td>$17.00</td>
</tr>
<tr>
<td>Chemistry/chemical engineering</td>
<td>$13.90</td>
</tr>
<tr>
<td>Computer applications/software development</td>
<td>$16.39</td>
</tr>
<tr>
<td>Computer networks/hardware</td>
<td>$17.50</td>
</tr>
<tr>
<td>Electrical engineering</td>
<td>$18.20</td>
</tr>
<tr>
<td>Finance/accounting</td>
<td>$14.31</td>
</tr>
<tr>
<td>Marketing/business development/sales</td>
<td>$14.33</td>
</tr>
<tr>
<td>Mechanical engineering</td>
<td>$14.85</td>
</tr>
<tr>
<td>Research &amp; development (scientific/technical)</td>
<td>$19.00</td>
</tr>
<tr>
<td><strong>Average Student Wage (not weighted):</strong></td>
<td><strong>$18.19</strong></td>
</tr>
</tbody>
</table>
Types of Student Positions in the Research Park

- Determine how students will be employed to work for the firm (e.g., direct or indirect hires)
- There are generally four options for hiring students in the Research Park, and these have varying costs and administrative requirements associated with them. Additional consideration should be given when hiring international students.
  1. **Direct hire at an hourly rate**
  2. **Indirect hire at an hourly rate through Research Park Internship Program**
  3. **Indirect hire through a graduate assistantship**
  4. **Private contractor as a third party employer**
International Students Working in the Research Park

International students can be hired to work in the Research Park under the following scenarios:

1. Hire a student through the Research Park Internship Program as an hourly employee or graduate assistant
2. Sponsor an F-1 student for Curricular Practical Training (CPT) during their studies or Optional Practical Training (OPT) upon graduation
3. Sponsor a J-1 Exchange Visitor for Academic Training. Research Park is considered on-campus for a J-1 student
Sample Innovation Center organizational chart

Corporate offices
- Market Research
- Information Tech Team
- Product Development

Research Park at University of Illinois operations
- Business Development Research
- Data Analytics Lead
- Regulatory Filings or White Papers

GSIS, MBAs
- Student Interns
- Grad Students

Site Director:
- Develop and operationalize the business plan
- Establish relationships on campus
- Manage operations
- Enable cross-discipline coordination
- Report performance

Tech, Business Leads:
- Mentor students
- Apply technical skills
- Understand tools and project implementation in the company
- Provide business research needs

Student Interns (6-8 per team):
- Support project work
- Lead other students
Sample Planning Process for Center

**Project Selection**
- Choose projects for new Innovation Center
- Create "syllabus" for projects and milestones
- Determine skill needs for recruiting students
- Student Projects Begin with input from business corporate leads
- Initial Project Results presented to corporate leads

**Student Recruitment**
- HR planning for interns (Direct or Indirect Hires)
- Recruiting strategy (Faculty Referrals & Career Fairs)
- On-campus recruiting events and info session
- Student interviews and offers completed
- On-board students and training begins

**Office Planning**
- Choose UIRP Location
- Design Space
- Lease Completion
- Construction, Furnishings, Computing, Office Setup
- Occupancy at UI RP

**Site Management**
- Define Position & Goals
- Recruit from within company or consider external candidates
- Selection Process
- Briefing on key issues, introductions to UI key contacts
- Site Director Begins

**Student Engagement**
- IBC, OTCR, MS Tech, ISE Senior Projects
- Plan 1 Project per Semester
- Plan 1 Project per Summer

**Sponsored Research**
- Targeted Projects with Faculty
- Example: $150k to $500k
- Target a Key Interest Area
- Projects begin after initial operations open

---

*Cycle Repeats each Semester

**Multi-Year Commitment

Optional
EnterpriseWorks Incubator

- EnterpriseWorks (EW) is a 43,000 sq ft startup business incubator in the University of Illinois Research Park for early stage tech and science-based start-up firms. It is operated by the University of Illinois at Urbana-Champaign to launch successful startups primarily from the University.
- Inc. Magazine listed EnterpriseWorks as a top 3 College Town incubator in 2013.

**Founders:** Over half of our current client companies were founded by UIUC faculty members. 90% of our clients have founders affiliated with the university.

**EnterpriseWorks Company Industry Sectors**

- Biotechnology
- Business/Consulting
- Materials/Nanotech
- Clean Technology
- Information Technology

Number of Current Firms

- 62% Faculty
- 18% UI Student
- 5% UI Staff
- 5% UI Alumni
- 10% External
$722,062,357 in equity-based capital raised by EnterpriseWorks incubated companies

Pre-Incubation Pipeline

- NSF I-Corps Lean Startup Training
  36 teams in first year
- I-Start professional services funding
  33 startups selected, raised $11 million
- Cozad new venture competition for student startups, 110 teams annually
- Tech transfer office (OTM) has 200 disclosures annually, key partner

Entrepreneurs-in-Residence

Number of EIR Consultations by Year:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of EIR Consultations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>123</td>
</tr>
<tr>
<td>2011</td>
<td>173</td>
</tr>
<tr>
<td>2012</td>
<td>270 (86 companies/individuals)</td>
</tr>
<tr>
<td>2013</td>
<td>436 (169 companies/individuals)</td>
</tr>
<tr>
<td>2014 (so far)</td>
<td>290 (106 companies/individuals)</td>
</tr>
</tbody>
</table>

Research Park SBIR/STTR Awards 2001-2014

<table>
<thead>
<tr>
<th>Agency</th>
<th>No. of Awards</th>
<th>Award Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOD</td>
<td>89</td>
<td>$25,013,266.00</td>
</tr>
<tr>
<td>EPA</td>
<td>7</td>
<td>$929,653.00</td>
</tr>
<tr>
<td>NSF</td>
<td>42</td>
<td>$9,401,553.00</td>
</tr>
<tr>
<td>HHS</td>
<td>25</td>
<td>$10,409,473.00</td>
</tr>
<tr>
<td>NASA</td>
<td>17</td>
<td>$3,641,032.00</td>
</tr>
<tr>
<td>DOE</td>
<td>5</td>
<td>$1,199,842.00</td>
</tr>
<tr>
<td>ED</td>
<td>5</td>
<td>$1,850,000.00</td>
</tr>
<tr>
<td>USDA</td>
<td>3</td>
<td>$628,409.00</td>
</tr>
<tr>
<td>DOC</td>
<td>2</td>
<td>$344,477.00</td>
</tr>
<tr>
<td>DHS</td>
<td>2</td>
<td>$1,149,976.39</td>
</tr>
<tr>
<td>TOTAL</td>
<td>197</td>
<td>$54,567,681.39</td>
</tr>
</tbody>
</table>
LEAN STARTUP TRAINING: NSF I-CORPS

University of Illinois is one of 10 US sites in NSF I-Corps.

36 teams, launched in 2013

Listen to Customers

During customer development, a start-up searches for a business model that works. If customer feedback reveals that its business hypotheses are wrong, it either revises them or “pivots” to new hypotheses. Once a model is proven, the start-up starts executing, building a formal organization. Each stage of customer development is iterative: A start-up will probably fail several times before finding the right approach.

1. Customer Discovery
   - Founders translate company ideas into business model hypotheses, test assumptions about customers’ needs, and then create a “minimum viable product” to try out their proposed solution on customers.

2. Customer Validation
   - Start-up continues to test all other hypotheses and tries to validate customers’ interest through early orders or product usage. If there’s no interest, the start-up can “pivot” by changing one or more hypotheses.

3. Customer Creation
   - The product is refined enough to sell. Using its proven hypotheses, the start-up builds demand by rapidly ramping up marketing and sales spending, and scales up the business.

4. Business Model
   - Business transitions from start-up mode, with a customer development team searching for answers, to functional departments executing the business.
I-START ENTREPRENEUR SUPPORT

The Enterpriseworks I-Start program helps support and launch new companies from the University with professional services and assistance. I-Start competitively awards 50-90% of the cost of startup professional service costs in the first year of a business. No equity is taken.

Optional additional services: prototyping, immigration assistance, regulatory planning, crowdfunding campaign, branding
Entrepreneurs-in-Residence (EIR)

EIRs are local-experienced tech entrepreneurs that have commercialized technology, hired by the Research Park to consult startups.

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<td>2014 (so far)</td>
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</tr>
</tbody>
</table>

- 37% of requests from tenants of the Research Park/EnterpriseWorks.
- 34% of requests from University of Illinois students.
- 20% of requests come from University of Illinois faculty/staff.
- 9% of requests from local region.

Chad Stiening
Mentor
Management & CEO
of Kypha medical diagnostics firm

Tim Hoerr
Serra Ventures & Cbana, Immuven, Gameday Sports, CPA, Valuation expert

Dennis Beard
Serra Ventures & Open Prairie Ventures, UI Business Adj. Faculty - Finance

Jed Taylor
TEC, JLT Consulting and Pattern Insight, Siebel Scholar

Alan Singleton
Singleton Law Firm, specializes in tech startups and IP

Lori Patterson
Pixo founder and CEO, former Accenture consultant

Sultan Medgji
Vitrova Consulting Software, Financial Services

Number of EIR Consultations by Year:
EnterpriseWorks has engaged Dr. Deana McDonagh, Chair of the Industrial Design Program in the School of Art + Design as a Designer-in-Residence.

In this role, she assists University of Illinois inventors and entrepreneurs to incorporate product design in their technology development to help improve user experiences and performance of products to meet customer needs.

Clients include: Electroninks, PhiOptics, John Deere, Intelliwheels, Servabo, BioAnalytics, ABInBevAqueous Solutions, Abbott, MicronJet, TipTek
COMPLIMENTARY PROGRAMS

• UCAN: Urbana-Champaign Angel Network
• Cozad New Venture Competition – Student startup companies, $190K in prizes
  – 110 teams competed in 2014
• Patent Clinic for students
  – Free patents through the Law School
• Chicago Innovation Mentors (CIM)
  – Biotech industry, 6 partner universities
• Proof-of-Concept Funding program
• Campuswide Annual Entrepreneur Forum
RESEARCH PARK OFFERS 100+ EVENTS ANNUALLY

Social
Fire at Five
Research Park Tailgate
Table Tennis Tournament
Outside at Research Park

Education
Mobile Day
Pitch Party
StartUp Café
John Deere Day

Networking
Prototyping Fair
Research Park Career Fair
Women in Tech

Conference
Big Data Summit
Share the Vision
Software Skills Support

• Big Data Analytics
  – Hosted Big Data Summit in December 2013 with 250 participants
  – Next Big Data Summit is on November 5, 2014
  – Big Data Executive-in-Residence consulting companies

• Annual Mobile Day events for mobile applications

• CU Tech Showcase at Siebel Center for CS/CE students

• Host events for cuDBug, U-CHUG (Hadoop), CODE (developers), Agile Project Management, Mobile developers (CocoaNuts), GIS training
Startups in the Research Park
Creating gesture recognition software for wearable devices, real-time personalized analytics of activity data using algorithms developed at the University of Illinois Coordinated Science Lab.

- Adam Tilton, Co-Founder/CEO, is a UIUC graduate student in the Coordinated Science Laboratory
- Tools allow users to track physical activity and recognize movements as specific action, also robotics tracking
- NSF I-Corps Team
- Winner of Cozad 2014 New Venture Competition
AutoScout is developing automated computational algorithms suitable for the automated analysis of football video. Automated tasks include video editing and automated semantic analysis of game footage and statistic extraction.

- Shaunak Ahuja, Co-Founder/CEO, B.S. Accountany from University of Illinois
- Work closely with Advanced Digital Sciences Center (ADSC), center for research led by UIUC faculty, located at the Fusionopolis research facility in Singapore
- Other applications such as other sports (i.e. soccer) and security monitoring systems
- Algorithms include estimating camera location and motion, tracking player movements on the field, and understanding player actions.
  - Ultimately lead to automated inferences, and thus assist in the development of team strategies.
LUMINOUS CO.

Computer vision technology to make projection mapping easier, cheaper and more powerful in advertising

- Launched by three leading CS PhD students from the University of Illinois
  - Experience developing computer vision products for Microsoft, Adobe, and Disney
  - Lemelson Illinois prize winner and Cozad new venture competition

Examples of existing projection based advertising...

Our research is very visual

Go to: http://www.brettrjones.com/
http://www.kevinkarsch.com/
http://rsodhi.com/
VERIFLOW SYSTEMS

A software system to automatically in real-time verify whether computer networks are operating securely and correctly, and assist network operators in determining the cause of problems.

- Network security architecture startup founded by Computer Science professors Brighten Godfrey and Matthew Caesar
- Scans a network, constructs a formal model of the network's behavior, and uses formal logic algorithms to automatically derive whether the network contains inconsistencies, errors, or violations of specified invariants.
- Testing University of Illinois IT Security and industry partners
Agricultural Informatics is a big data technology and data products company, focused on providing innovative science that farmers and agricultural companies can use easily everyday to improve their production/efficiencies with cloud-based delivery systems.

- Products sold to independent growers, soil test laboratories, crop consultants, insurance agents, commodities companies, traders, and major ag chemical companies developing seed technologies and new production methods.
VERIFLOW SYSTEMS

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ELECTRONINKS

Circuit Scribe, a ballpoint pen with quick-drying ink that can draw circuits on paper

• Founded by Dr. Brett Walker, Materials Science & Engineering (UIUC), Materials Science research from the University of Illinois, Jennifer Lewis
• CircuitScribe Kickstarter Campaign:
  – 12,277 backers
  – $674K committed, goal was $85K
  – Shipping the new product from EnterpriseWorks, 18,000 units
• Press in TechCrunch, FastCompany, C|NET
• Shipped 18,000 pens from their office in EnterpriseWorks to the backers of their KickStarter Campaign
Large Corporations in the Research Park
DEERE TECHNOLOGY INNOVATION CENTER

- Network of Technology Innovation Centers in Moline, IL; Champaign, IL; Pune, India; and Kaiserslautern, Germany
- Act as hubs for Deere’s external linkage to technology innovation. It's responsibilities are:
  - Track key technology trends that have significant impact to John Deere: research, startups, faculty outreach
  - Build an Open Innovation strategy that fills the innovation pipeline with technologies of potential commercial value
  - Recruit talent for Deere
- Employ students from across multiple departments
  - Agriculture, Mechanical, and Electrical Engineering – systems, sensors, equipment design, electronics, robotics
  - Farm of the Future design, simulation and modeling
  - GSLIS students: M&A and business partnership research
- Work with student groups on campus, senior design, IBC
- Robotics lab added for equipment testing, demonstration
- 2014 doubled the size of JDTIC, Champaign to add data analytics, computing, mobile application teams
CATERPILLAR SIMULATION CENTER

The Champaign Simulation Center opened 15 years ago to cost effectively provide advanced analysis, design, and simulation services.

- Caterpillar has an “apprenticeship” model employing UI students on teams led by experienced Caterpillar engineers, who serve as mentors and they jointly deliver modeling and simulation services.
  - Identify the top students from campus, starting as freshman
  - Hire both Engineering graduate and undergraduate students
  - 300+ interns have worked at the Caterpillar Simulation Center
  - More than 100 interns have become full time engineers at Caterpillar


- Added electronics in 2012
- Announced opening of the Cat Analytics Lab September 2014
- Employing students from engineering, math, economics, industrial design
STATE FARM RESEARCH CENTER

- The work at the Research Center supports three State Farm departments:
  - Property & Casualty Actuarial: pricing and financial analyses
  - Systems: mobile application development, information systems
  - Strategic Resources: research, competitor analysis, knowledge management

- Modeling and Analytic Graduate Network (MAGNet) is a graduate program in applied statistics with 50% graduate assistantships
  - Created MS degree to fit skill needs, State Farm sponsors students if they work for State Farm for 3 years following graduation

- The Research Center has 70-90 interns and 28 full time employees
  - Innovation Ready projects each summer allow students to work in interdisciplinary teams to create enterprise level innovations across departments. These are presented to State Farm leadership each summer. Recruit against project needs.
  - Each intern works 10 hours per week during school and full time in the summer
  - 700+ students have gone through the internship program since 2005
  - Hiring students full time after completing internships, “cherry pick” the best

- State Farm expanded for the 4th time in 2012, adding robotics
ANHEUSER BUSCH INBEV

• Bud Analytics lab opened in Fall 2013
• The Bud Lab focuses on data analytics:
  – Assortment optimization using algorithms for market prediction
  – Conjoint modeling for price optimization and promotion selection
  – Social media analytics and sentiment analysis for distributors
  – Multi-domain analytics
  – Supply chain analytics and optimization
• Sponsored research agreements on campus:
  – Graduate School of Library and Information Science: Twitter analytics
  – College of ACES for agriculture forecasting and modeling
• Employ 28 students per semester
• 21 experiments running at once
• Lessons learned:
  – Clearly define the scope
  – Bring value to the organization, not value, increase complexity of projects
  – Integrate business units, and other global zones, regular visits by teams
  – Create challenging problems for the students
Yahoo! has 140+ full time employees in the Research Park office, highly skilled software development engineers.

New building under construction, space for 250 people.

Hadoop Center of Excellence for Yahoo.

Filed 50+ patents since opening for Yahoo on audience targeting, mobile applications, social networks, ad placement.

PhD level intern research on cloud computing.

98% retention rate of employees annually, vs. high turnover experience in Sunnyvale.

- Led Yahoo to place more critical projects in Champaign because of the stable and highly skilled workforce.
- Continue to move data pipeline, cloud computing, and high revenue projects to Champaign from California, which has increased the size of the operation locally.
- No attrition in the last 15 months.
- 30+ full time hires for software/data analytics in 6 months.
Students in computer science and related fields are working part-time to help develop data management solutions throughout Dow

- 21 students working on software projects, led by 2 full time on-campus staff
- Office opened in January 2013, working on expansion already and reported, positive ROI

Projects areas include:

- Software development
- User interface improvement
- High performance computing
- Math modeling
- Automation and Robotics

Referenced in Dow 2013 Annual Report

Compliments Dow research partnership on campus with Chemical Sciences, but serves a different role for R&D
The Research Park office employs graduate students to work on a wide range of research projects, focusing largely on pediatric nutrition product development

- Developing educational materials about nutritional ingredients like prebiotics, which are ingredients that aid in the healthy development of the immune system
- Students work on regulatory filing preparation including manuscripts and GRAS dossiers for new ingredients, replacing work previously outsourced
- Graduate students in nutrition and related fields are working on patent landscaping, writing manuscripts and white papers, completing literature searches, and technical writing. Disciplines include physics, biophysics, human health, engineering, kinesiology, MBA.
- Some new IT projects are being explored related to sentiment analysis and social media

Abbott made a 5 year investment in research to create The Center for Nutrition, Learning, and Memory (CNLM) to research nutrition’s impact on brain cognition. The Center is the first interdisciplinary cognition and nutrition research center in the country. Includes 86 researchers representing 15 Illinois departments or units, from 6 Illinois colleges, with collaborators from 15 national and international research facilities.
ADM’s Research Park center employs chemical engineering, agricultural sciences, and chemical engineering students.

Students at the ADM facility in Research Park perform computational work, conceptual engineering, and modeling.

Students model the use of glycerin to be made into glycol.
- Glycerin: a by-product of bio-diesel
- Glycol: a specialty chemical with high margins

Students evaluate the feasibility of manufacturing specialty chemicals, such as those proposed by ADM customers.

The ADM center in Research Park is used on a part-time basis for some ADM employees that work in the feed, IT, and fermentation groups.

ADM has published papers with students working in the center to provide validation and exposure to ADM technology.
- Example: Chemical Engineering student worked for ADM to review and model the most relevant open source cases in literature for second generation biofuels production. He evaluated the differences in operating conditions and performance that can be obtained when employing real feed compositions after using in-house data. His work helped determine the most relevant design features for a large scale reactor at an early stage of development.
LITTELFUSE

- Littelfuse is a multinational electronics manufacturing company based in Chicago, IL. Littelfuse provides circuit protection products to companies in the areas of over-voltage, over-current and integrated technologies in the automotive, electronics, electrical and silicon segments.
- The Littelfuse building is a 14,500 SF custom facility. Littelfuse is the sole occupant of the new building, which has a high-power lab and research staff for the POWR-GARD™ Products Division.
  - The lab test circuits for customers and employ electrical engineers
  - Prototyping and test lab to develop new products
- Littelfuse opened in March 2010 and it is staffed with 20 full-time employees and 3 students, expanded to an additional building in 2014
- Littelfuse “tech center is where theory and practice intersect” it is a “conduit for new solutions for emerging technology,” said Dal Ferbert, Vice President, General Manager - Electrical Business Unit of Littelfuse Inc.
ENGAGING WITH OUR STARTUPS

• Working with a faculty and student startups enables access to research and technology that is being commercialized, some ways to engage include:
  – Joint development agreements
  – Corporate venture capital funding
  – Support letter for SBIR funding
  – Market feedback
  – Product testing and early sales contracts
  – Consulting projects
  – Acquisitions
  – Sponsor student startup competitions

• The Research Park can assist with introductions to companies based on corporate interest areas
EXAMPLE: ABInBev Startup Days

• ABInBev Innovation and Entrepreneurship Days at EnterpriseWorks and 1871
• Met with 16 Startup companies at Enterpriseworks
• Met with 22 Startups at 1871 in Chicago
• Tech Talk presentations discussed areas for innovation collaboration:
  – Sales Training improvement through apps, gamification, engaging platforms
  – B2B web ordering for sales
  – Product Demand Forecasting Modeling
  – Analysis of unstructured data, social media
  – Digital marketing
  – Weather forecast modeling
  – Agricultural data analysis
  – Fluid flow analysis/sensors
  – New case designs to reduce stresses on the case during shipment and carrying
  – Sustainable packaging and shipping options
• Free Option for Caterpillar to also pursue with EnterpriseWorks
**KEY POINTS OF STUDY**

* Geography plays a significant role in the types of businesses incubators attract.

* Chicago based technology incubators are competitive and now come in public, not-for-profit and university-based forms. They provide specialized services such as wet labs, pre-incubation activities, and networking events.

* Small city incubators embrace flexibility because of economic challenges in their regions. These incubators rely heavily on local economic development organizations and inexpensive real estate.

* Best practices and approaches for incubators need to vary based on their location and institutional origin.

* Illinois incubators appear to be minimally networked which indicates they may benefit from an extension-type partnership with University of Illinois Research Park Incubator.
Key Conclusions from Incubators:

1. Competition rising in Chicago-based technology incubators
   - Public, not-for-profit and university-based forms
   - Provide specialized bundles of lab spaces, “pre-incubation” activities, accelerators and business connections

2. University-based incubators generally fit their sectoral focuses and operating plans to the unique opportunities of their region.
   - Benefit from stable funding from the supporting university, and prioritize strong relationships with local institutional stakeholders.

3. Small-city incubators embrace flexibility in response to the distinctive economic challenges of their regions.
   - Rely upon public funding, draw upon the advantage of inexpensive real estate, and demonstrate great flexibility in assisting tenants that span a broad range of industries.
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