PhD Research in an Entrepreneurial Environment: The Innovation Realization Lab

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PhD Research in an Entrepreneurial Environment

THE INNOVATION REALIZATION LAB

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Purdue University
Created With $2.5 Million from the National Science Foundation (NSF)

- Integrative Program in Graduate Education & Research Training (IGERT)

- Support for 30 MBA and 30 PhD students over 5 years

- Collaboration of 24 faculty from Schools of Agriculture, Engineering, Management & Science
IRL is Designed To:

- Graduate Technically Proficient S&E PhDs with Skills needed to Succeed in Innovation-Related Careers in Industry
- Produce Thesis Research of Scientific Merit and Market Relevance
- Provide MBA Students with Project Management Experience in a Technical Research Environment
• Why IRL?
Industry Survey on PhD Graduates:

• “Good”
  – Technical skills

• “Inadequate”
  – Ability to address new problems

• “Need Improvement”
  – Management skills
  – Communication skills
  – Teamwork skills

Source:
IRL Interviews with Industrial Leaders RE: University Education of Engineers and Scientists
Industry’s Biggest Problems in R&D

- Managing R&D for Business Growth
- Balancing LT and ST R&D
- Integration of R&D with Business Strategy
- Making Innovation Happen
- Assessing R&D Productivity

IRL Survey > 190 Responses
(4 of 5 years) “Top 5 ‘Top 3’ Problems”
It Helps if MBAs Understand the Technology

“A year’s subscription to Fruitfly Magazine? You idiot! We only live for two weeks!”
...and Scientists Understand Business

“I’m telling you – the market’s gotta be at least this big!”
IRL Team Composition

- MBA and Agriculture, Engineering or Science PhD Students

- Resources:
  - Program Directors
  - PhD Advisors
  - Krannert Faculty in Economics, Finance, Marketing, Org. Behavior, Strategy
  - Industry Partners
Traditional MBA & PhD Experiences

Engineering or Science Students → Classes → Lit. Rev. → Thesis Research → PhDs/Publications

Mgmt. Students → Classes → Cases → Internship → MBA Degrees
The IRL Experience

Engineering or Science Students


Innovation Realization Lab Activities:
- Core Seminars & Workshops
- Mgmt. Principles Short Course (PhD Students)
- Integrated Team Research

Mgmt. Students

Classes → Cases → Internship → MBAs
Traditional PhD Research

TRADITIONAL THESIS RESEARCH

Hypothesis formation

Hypothesis testing

Prototype

SCIENCE ISSUES

Scientific merit; technical feasibility

Validation of research results

Refinement and scale-up
## IRL Team Process

### INTEGRATED RESEARCH
- Hypothesis formation
- Market forecast
- Hypotheses testing
- Competitive analysis
- Prototype
- Commercialization strategy

### SCIENCE/BUSINESS ISSUES
- Scientific merit; technical feasibility
- Economic and social impact
- Validation of research results
- Risk, product and platform definition
- Patent or copyright
- Business creation or license
- Venture capital
- Refinement and scale-up
- Full market analysis (e.g. pricing, cost)
What is Unique About IRL?

- PhD Exposure to Business Issues and Methods
- MBA Immersion in a Research Environment
- Market Awareness Before the Research is Done
- Breadth of Disciplines & Team Activity
Value Added

• PhDs and MBAs *With Experience & Skills to Create Economic Value From Technology*

• Thesis Research of Scientific Merit & *Market Relevance*

• Recruit and Graduate the Best & *Enable Them to Succeed in a Competitive Entrepreneurial Environment*
Current IRL Enrollment

- Total of Thirty Students
  - Fifteen PhD Fellows Representing Eight Purdue Departments from Agriculture, Engineering, and Science
  - Fifteen MBA Students
Innovation Realization Lab

QUESTIONS?