

PENNSSTATE

**VOLVO**



Strong Partnerships:  
A new paradigm for  
collaborative research

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# An Ancient Paradigm

## Universities

- Fundamentals
- Disciplines
- Public benefit

## Industry

- Applications
- Problems
- Commercial profit



# The 21<sup>st</sup> Century: A World of Wicked Problems

- Complexity: reductionist approaches fail
- Interdisciplinary approaches are required
- Dynamic situations and relationships evolve
- Unintended consequences proliferate
- No easy solutions!



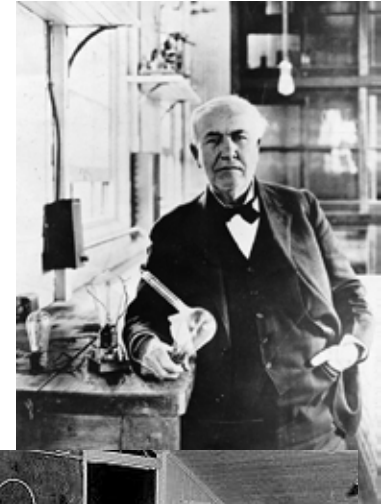
# A New Paradigm for Research

- Integrated multidisciplinary teams
- Entrepreneurship and innovation
- Long-term relationships
- Meeting the grand challenges of our age

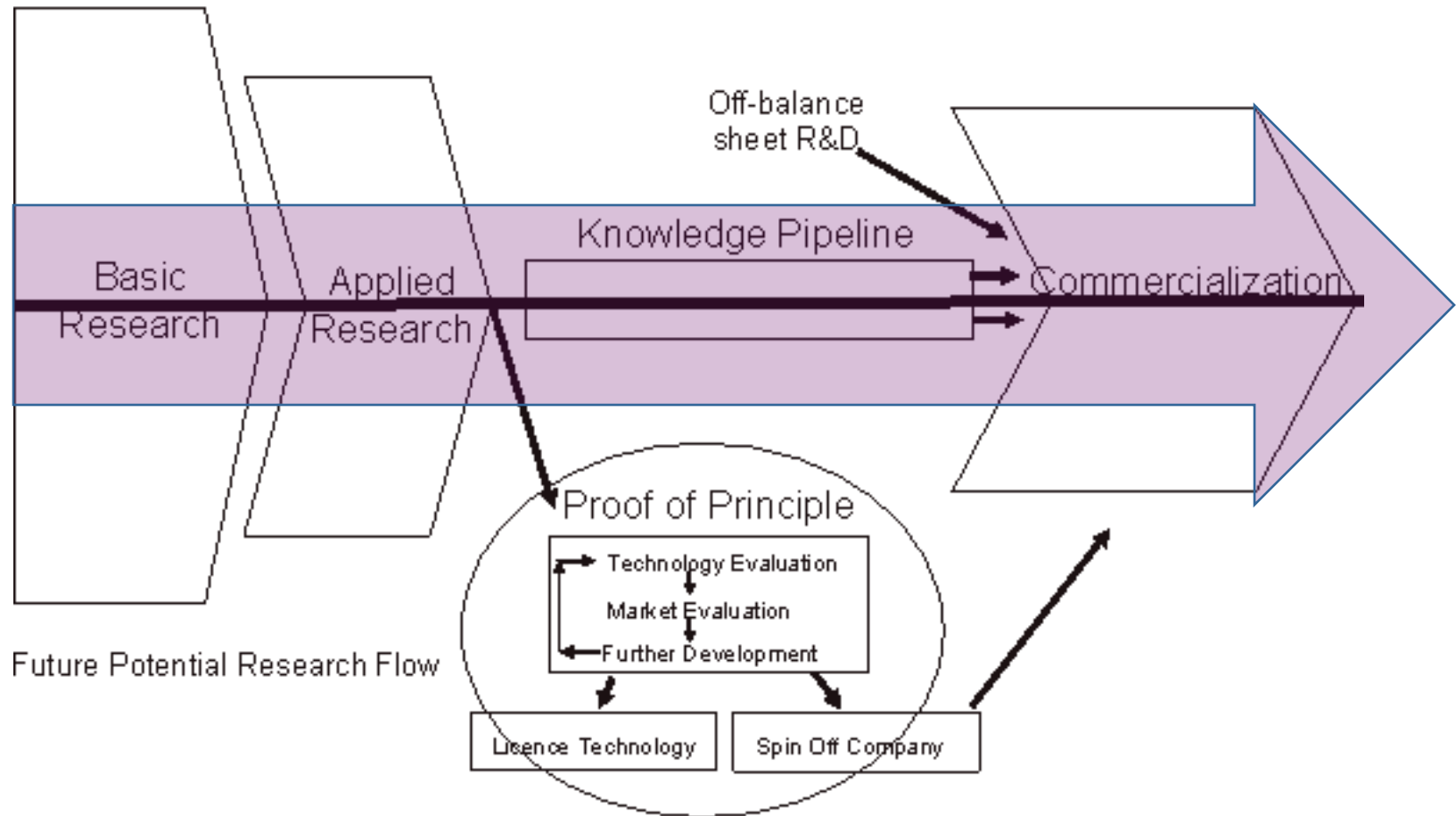


# Actually – not entirely new

- Thomas Edison – Menlo Park (NJ)
- George Westinghouse - Pittsburgh
- Alfred Lee Loomis – MIT Rad Lab
- Bob Taylor – Xerox PARC
- Steven Jobs - Apple
- Craig Venter – TIGR, Celera



# Pipeline Confusion: Innovation flow left to right?



# But Demand Pull is Right to Left!



## Characteristics of Problem-driven R&D:

- Connected research across all levels
- Small, flat organizations
- Ideas are owned by people, not organizations
- Face-to-face relationships are key
- Sunset – the end of each project is The End
- Shared Need, Complementary Capability, and Passion!

# A New Paradigm for Education: Connected Learning

- Interns and co-ops: Experience, recruiting
- Team experiences: Co-learning, leadership
- Continuing education: Life-long learning



# Strong Partnerships have Joint Stakeholders

- Industrial partners and consortia
- Academia and research institutes
- State and federal agencies
- Legislators and policy advocates
- Environmental and other NGOs
- Students, alumni, customers, citizens

