

A Practical Model for Evolutionary Computation Market Introduction

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Workshop on Future Directions in Evolutionary Computation
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Workshop Topics

- Conditions / Assumptions
- Challenges
- New Technology Introduction
- Model
 - Objectives
 - Issues
 - Key Components
- Actions

Conditions / Assumptions

- EC solution usually in the form of software
- High-tech sectors usually include several smaller domains
- Applicable domain expertise is critical to compete in semiconductors and other high-tech industries

Joint Academia-Business Challenges

- Making the introduction of EC tools economically feasible
- Timing, market, and resources
- Intellectual property (IP) ownership / assignment
- Finding ways for academia and business to work effectively together on these issues

New Technology Introduction: Tasks (Leaders)

- **New Technology Validation (academia)**
 - Lead work to show which techniques and tools are ready for implementation
- **Solution Development (business)**
 - Embed new technologies into marketable product and service solutions
- **Market / Domain Penetration (business)**
 - Convert marketable solutions into sales and returns on the investment in validating technology and developing solution

New Technology Introduction: Solution Development and Domain Penetration

SOLUTION DEVELOPMENT

- Development
 - Architecture
 - Programming
- Product Management
 - Sales and marketing support
 - Product management
 - Product economics
- Product Support
 - Documentation
 - Quality control

DOMAIN PENETRATION

- Sales and Marketing in Relevant Industry Domain
 - Market penetration
 - Account management
- Product Development
 - Domain and customer specifications
 - Market readiness criteria
- Customer Service
 - Factory support
 - Field support

Model: Academia-Business Partnership Objectives

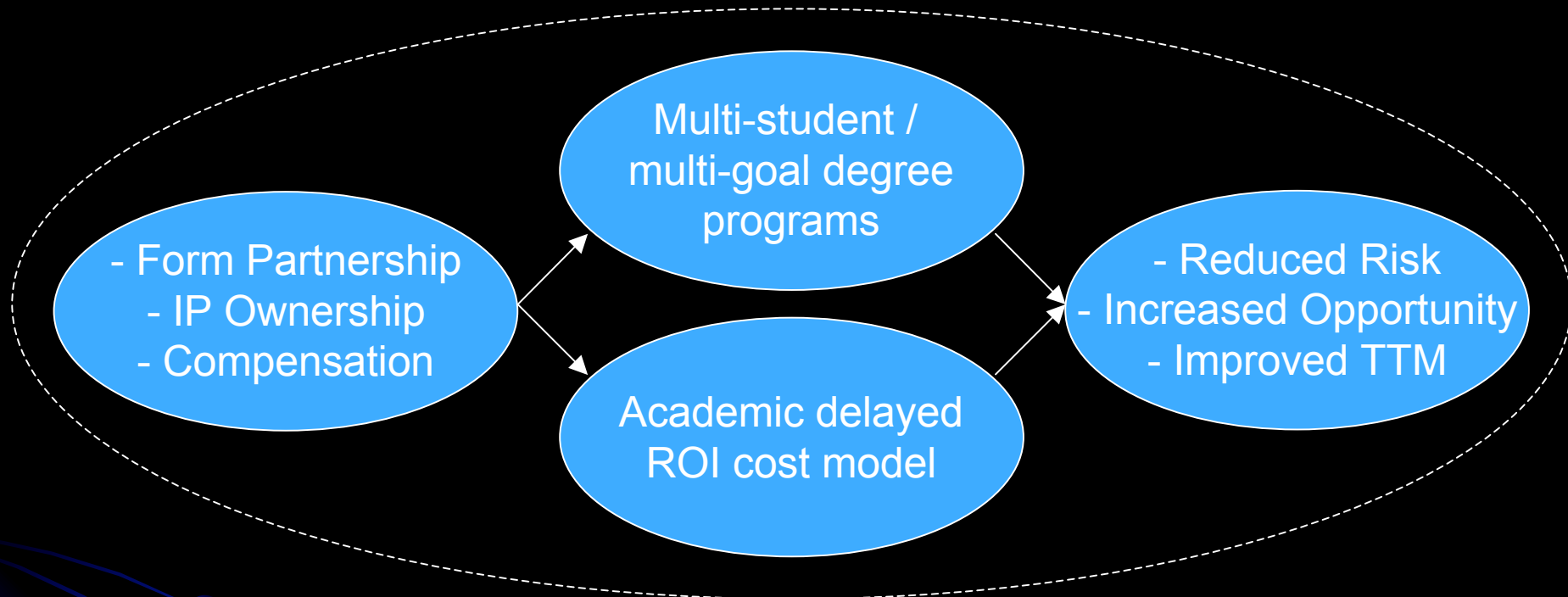
Academia

- Access to top research talent
- Attract long-term, unrestricted funding for research
- Talent development
- Leadership in disciplinary field
- Recognition in field
- Knowledge expansion
- Student placement

Business

- Commercial-ready technology ahead of competition
- Control access to solution
- Control access to market
- Market leadership
- Leverage technology for sales increase
- Make money

Model Overview



Critical Objectives

- IP Ownership / assignment
- Multi-student / multi-goal degrees
- Academic and Company cost management
- Faster ROI / reduce risk

Model: Academia-Business Partnership

- Form:

- Contractual JV

- IP ownership

- Academia owns rights to technology assessment and methodology
- Academia owns technology IP
- Business owns unlimited exclusive transferable rights to technology
- Business owns customer access and exclusive commercial rights

- Compensation

- Academia: Technology license revenue (some up-front funding)
- Business: Product license revenue, fees, or product sales
- Risk Sharing (some talent and up-front cash invested)

Company Risk and Investment Dynamics

1. Technology

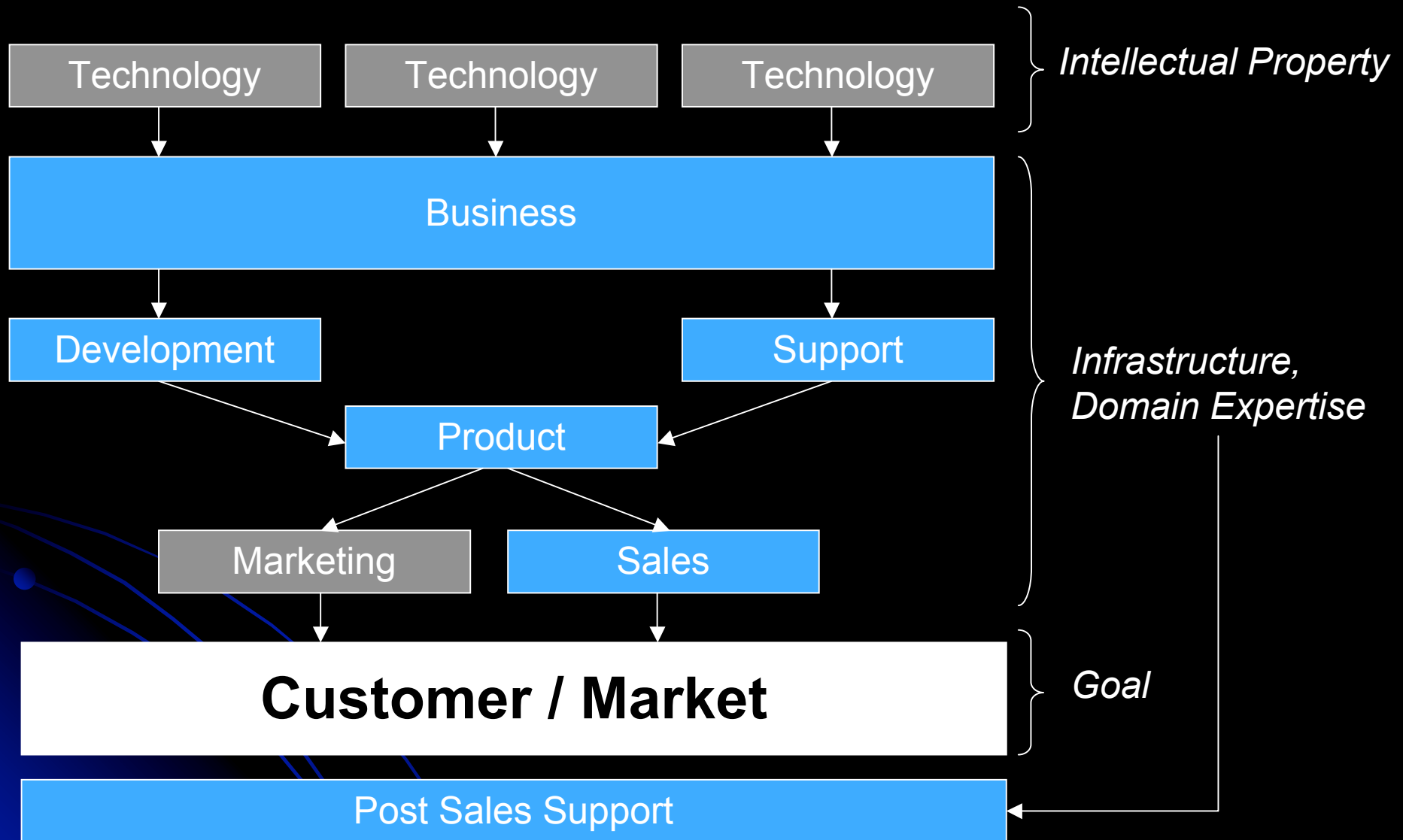
2. Development

3. Support

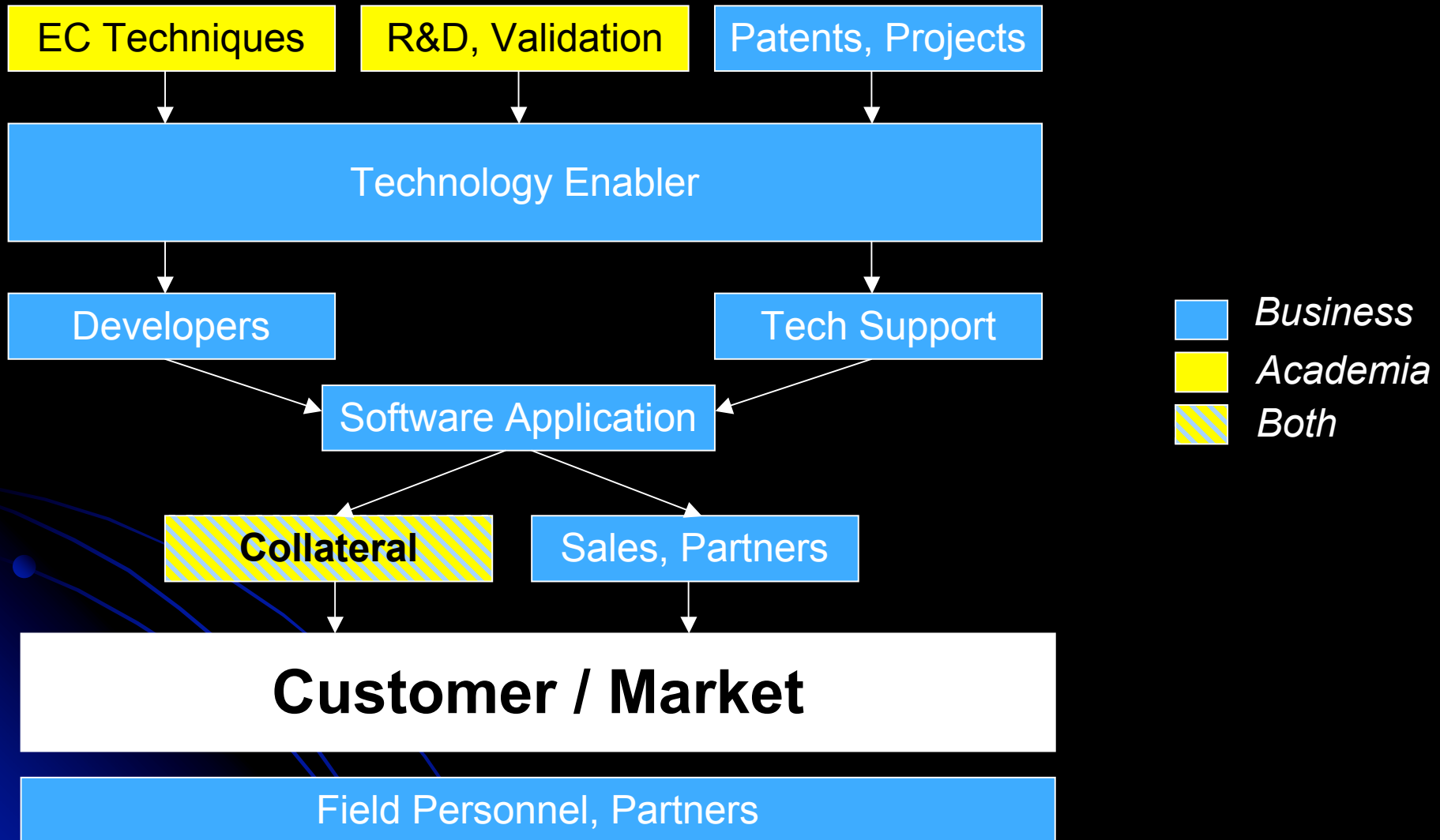
4. Marketing

5. Deployment

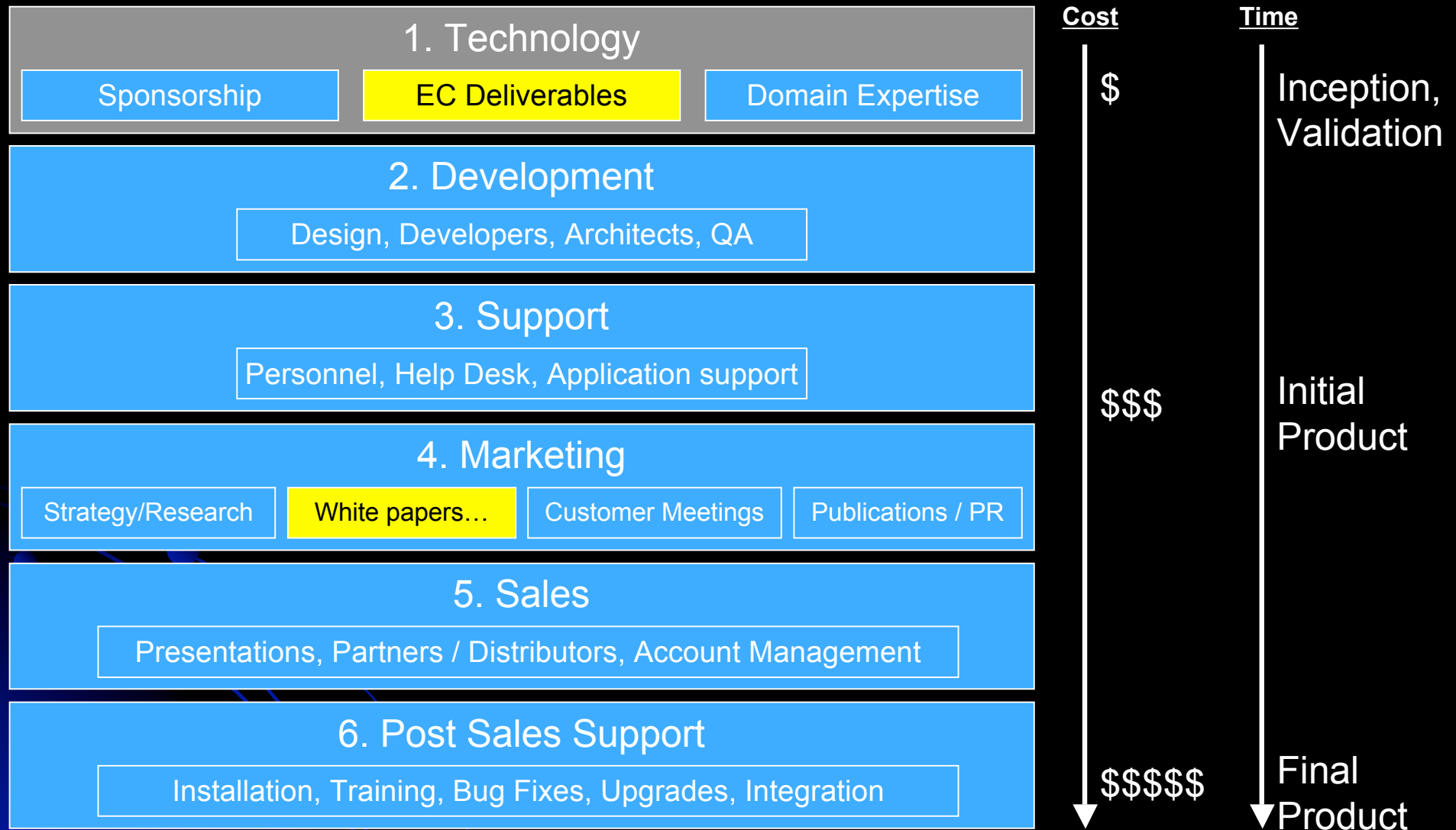
Model: Functional Overview



Model: Role Overview



Model: Risk and Investment Dynamics

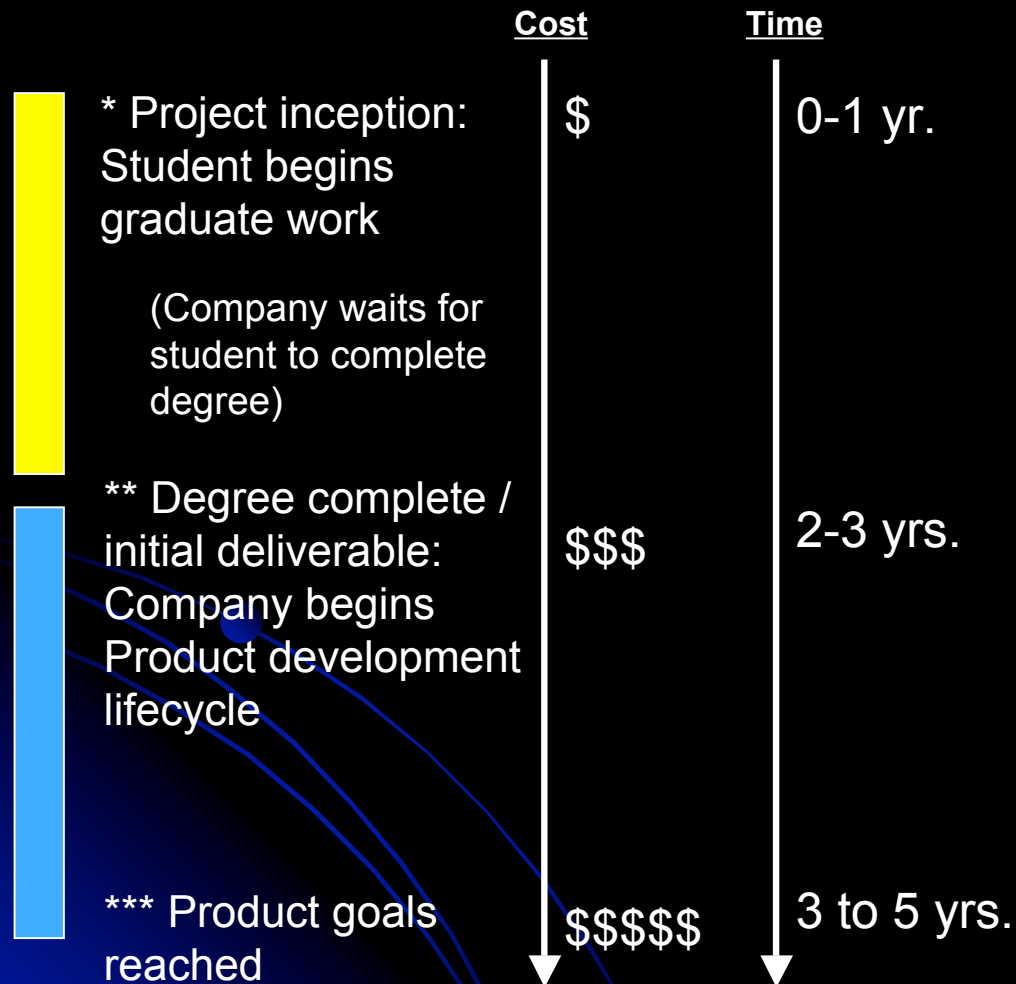


New Technology Introduction: Validation Challenges

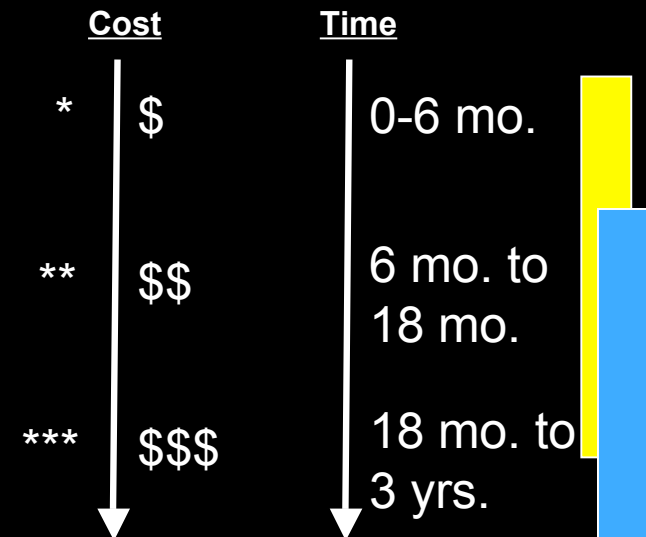
- Difficult to engage with University for current market needs / problems / projects:
 - Concept Definition
 - Problem statement
 - Parameters / constraints
 - Technology Assessment
 - Commercial readiness
 - Utilization economics
 - Technology Review
 - Road map
 - Solution timing

Reduce Risk, Increase Opportunity: *Time to market (TTM)*

Traditional University / Corporate Model



Desired Model (from Corporate standpoint)



Question:
How is this achieved?

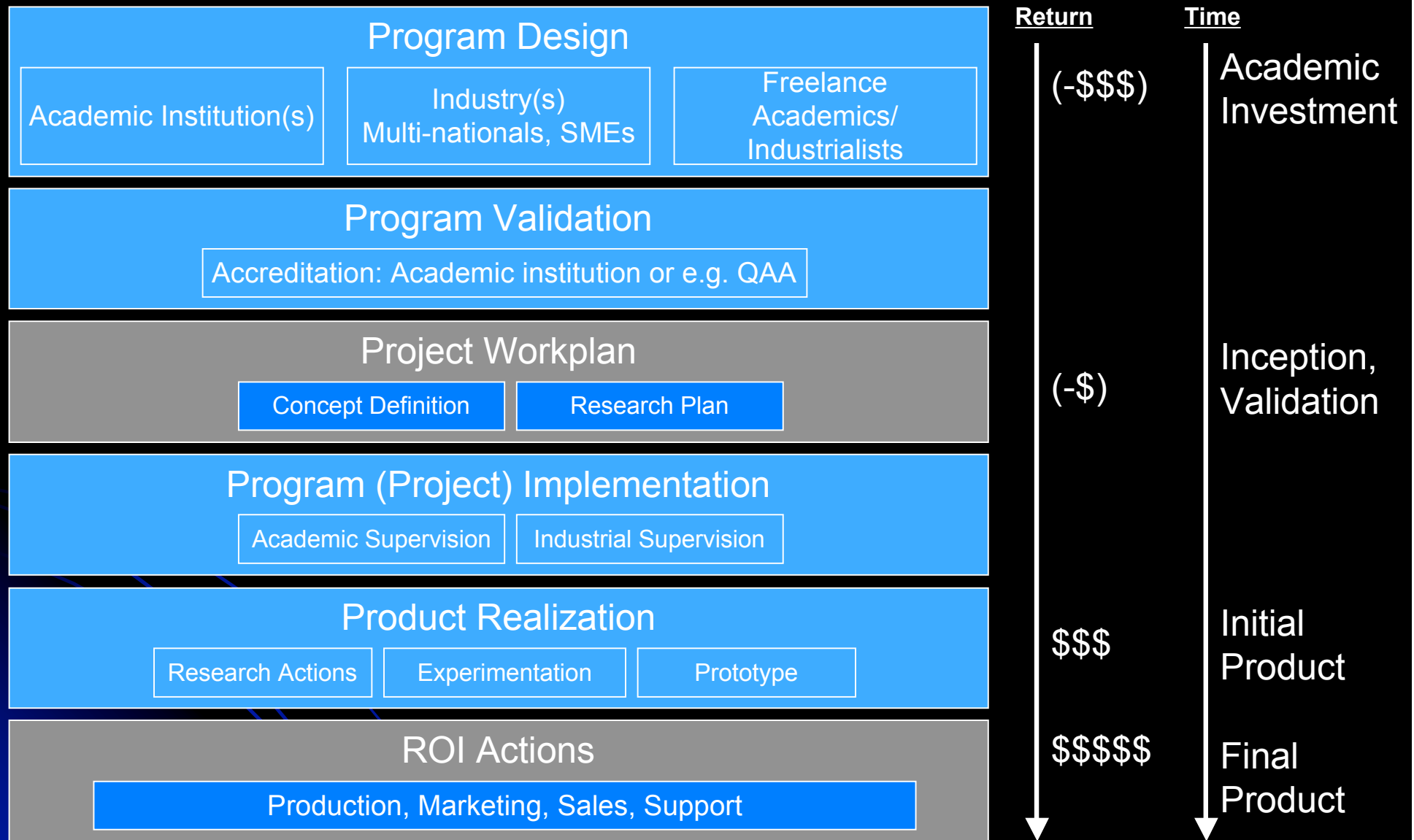
Possible Answer:
Through multi-goal / multi-student degree programs (see next slide).

Model Key Component: *Multi-goal / Multi-student degree programs*

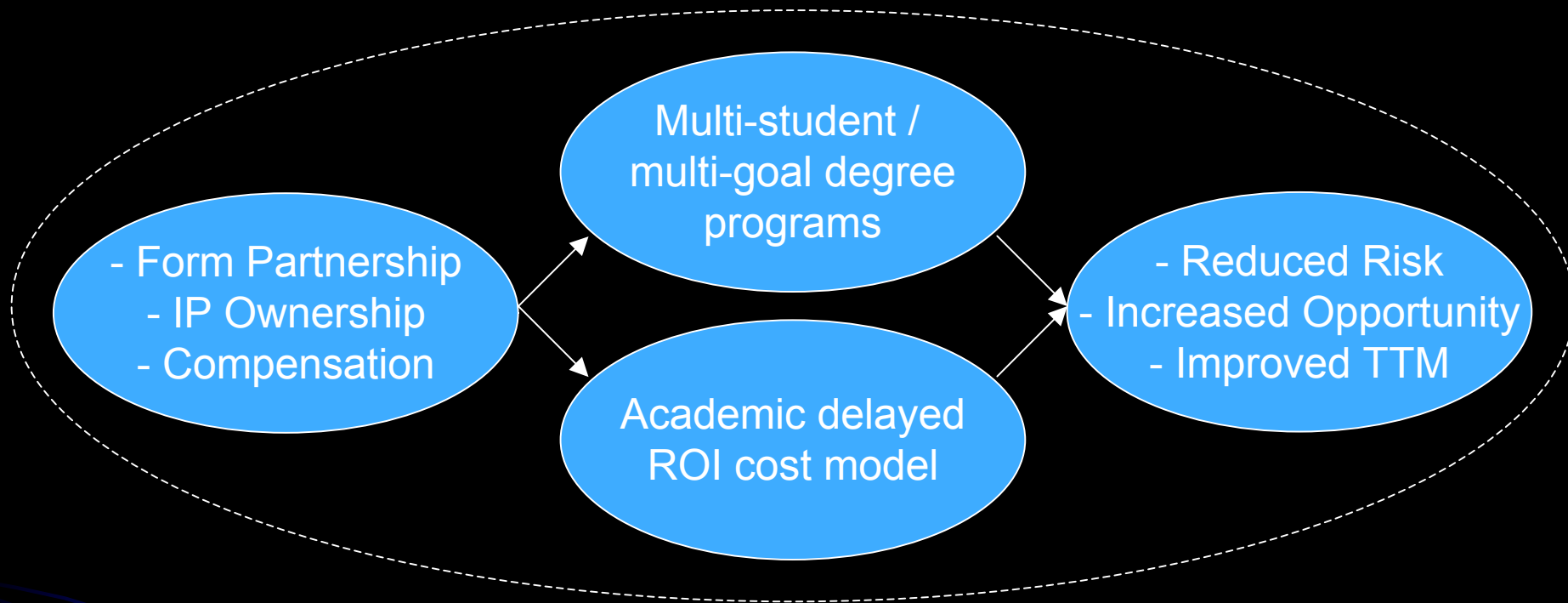
- Academic benefits include:
 - Broader appeal to business
 - Increased opportunity, scalable to take on more projects
 - Students work on current problems**
 - Increased job placement
- Business benefits include:
 - Quicker ROI, addresses validation concerns
 - Can align marketing goals with latest advances in academia (rather than wait until student completes degree)
 - Better qualified student-hires, students are trained in current company activities

** Important for EC proliferation due to product lifecycle concerns

Model: Academic Delayed ROI Approach



Model Summary



Academic Benefits

- Long-term, unrestricted funding
- Talent development
- Leadership in disciplinary field
- Recognition in field
- Knowledge expansion
- Student placement

Company Benefits

- Reduced risk / shorter TTM
- Commercial-ready technology
- Control access to solution
- Control access to market
- Market leadership
- Leverage technology for sales

Actions 1

Identify EC Market Introduction Taskforce volunteers

- a) Academic benefits
 - i. New program development
 - ii. New partnerships
 - iii. Recognition
 - iv. Financial returns
- b) Business benefits
 - i. Gain competitive advantage
 - ii. Industry recognition / leader in field
 - iii. Financial returns

Actions 2

Develop a white paper on multi-student / multi-project degrees
(Rizon Software will take lead on this action item)

- a) Outline design of such a program
- b) Review and impact on model (current examples, constraints, issues / benefits)
- c) Study of availability and feasibility

Incubator partnership for testing and refining model

- a) Define how to fund research and development until sales cycle catches up.
- b) Define how to convert intellectual capital generated through research into business.
- c) Outline traits of academia-business relationship
- d) Identify the academic “champions” driving these partnerships.

Taskforce Volunteers Contact Information

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