



National Research  
Council Canada

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# Commercialization Success in Early Stage Technology Companies

## Rocket Builders, Vancouver, BC



# Public Presentation

## June 8<sup>th</sup> 2004

Project Overview: Reg Nordman

Research & Analysis: Geoffrey Hansen

Recommendations: Dave Thomas

## Thanks to ...

- *Funding from NRC*
- *Direction from ASI*
- *Coordination By Rocket Builders*
- *Research and Analysis By:*
  - Thealzel Lee
  - Noulan W. Bowker
  - Catherine Crucil
  - Geoffrey Hansen
  - Reg Nordman
  - Dave Thomas
- *Research Contributions By:*
  - Malcolm Collings
  - Catherine Forrester
  - David J. Roughley



## Questions of Interest

- As small companies transition from research to commercialization:
  - What are the milestones that are involved in surviving this transition?
  - What are the best practices used by successful companies?
- How can companies in the early stages of commercialization leverage these best practices?
- What other roles should government and industry play in stimulating or supporting these commercialization activities by small technology companies?

## Approach

- Examine 3 sectors of interest to discover how they are unique and how they are the same in terms of commercialization challenges
- Through experience and success stories, the study will identify the best practices used by technology companies through their formative years.
- Successful companies are surveyed *retrospectively* on past critical success factors and obstacles when the company was in early commercialization stages.
- Findings were compared against known models of commercialization.

# Methodology

- For each of the 3 sectors of interest:
  - successful, or succeeding, companies were identified
  - a senior management representative from each of these companies was approached to provide their input.
  - each company representative was interviewed to determine:
    - how products were developed
    - the key success factors and obstacles experienced in product commercialization
    - lessons learned in the process.
- Over 70 companies were approached to participate in the study with 41 companies participating

## Sectors Chosen for Study

Wireless	Security	Medical Devices
Research Conducted By: Noulan W. Bowker	Research Conducted By: Catherine Crucil	Research Conducted By: Thealzel Lee
Interviewed <b>16</b> companies	Interviewed <b>13</b> companies	Interviewed <b>12</b> companies
<b>11 – 142</b> employees	<b>5 – 85</b> employees	<b>6 – 260</b> employees
Subsectors: <ul style="list-style-type: none"> <li>• Infrastructure service</li> <li>• Infrastructure systems</li> <li>• Infrastructure components</li> <li>• End-user software</li> <li>• Consumer products</li> <li>• Application software</li> <li>• End-user hardware</li> </ul>	Subsectors: <ul style="list-style-type: none"> <li>• Information security</li> <li>• Perimeter security</li> </ul>	Subsectors: <ul style="list-style-type: none"> <li>• Consumer diagnostics</li> <li>• Clinical diagnostics</li> <li>• Clinical equipment</li> <li>• Clinical implants</li> <li>• Clinical devices</li> </ul>

# Background Research on Commercialization

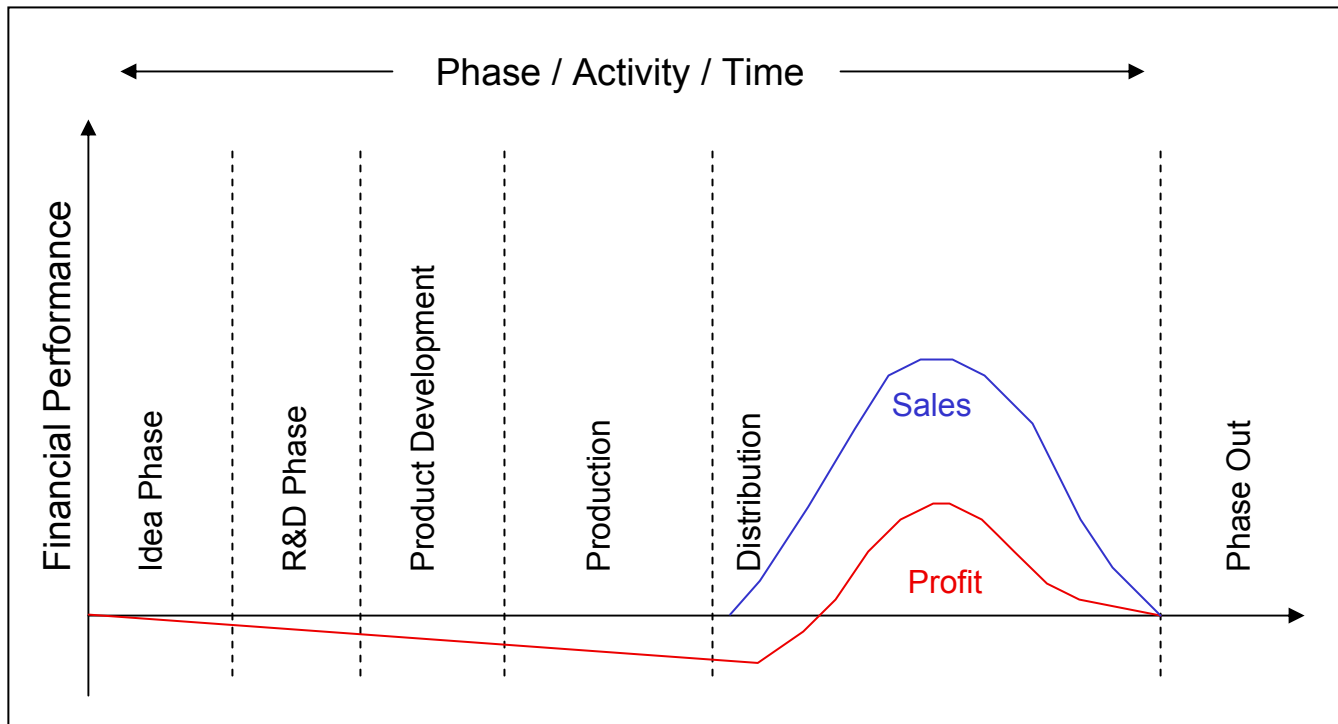
Geoffrey Hansen

## Sources of Commercialization Insight

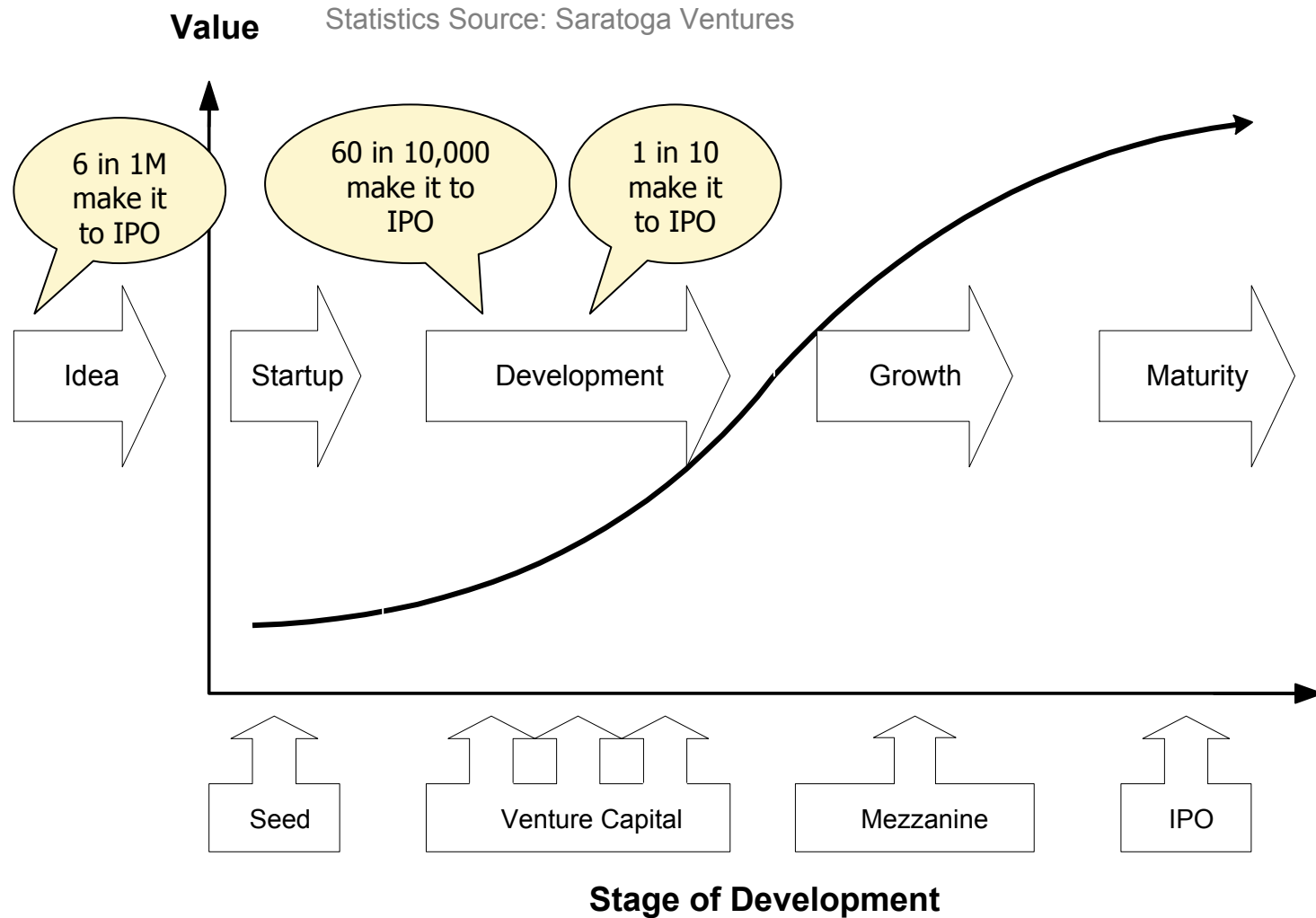
- Insight & Methodology Authors
  - Geoffrey Moore
  - Denzil J. Doyle
  - John L. Nesheim
  - Robert G. Cooper
  - Clayton M. Christensen
  - Everett M. Rogers



## Example: Doyletech Innovation Chain

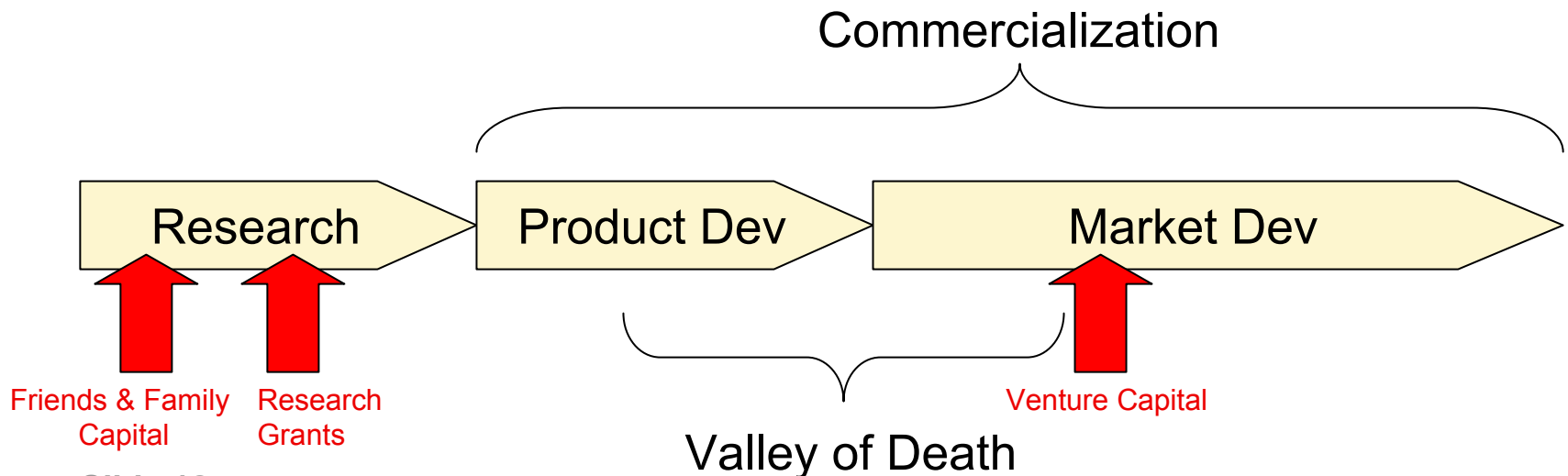


## Example: Rocket Builder's "Napkin to Nasdaq"



## Valley of Death Scenario

- Initial start-up capital and government support during R&D phases are readily available
- Early commercialization phases often take longer than anticipated so early capital is insufficient to secure early market validation
- Early market validation is important factor in securing venture capital.



# Sector Research Findings

Geoffrey Hansen

## Wireless

### Key Success Factors

- Depth of Management
- Depth of Knowledge & Contacts
- Customer Involvement in Product Definition
- Effective Partnerships
- Responsive to Market Dynamics
- Thorough Financial Planning

### Key Obstacles

- Bias Against Small Companies
- Reluctance by Carriers and OEMs
- Founder Issues
- Insufficient Capital for Complete Commercialization
- Limited Customer Interest Locally
- Unpredictable Markets

## Security

### Key Success Factors

- Access to Early Adopters
- Depth of Knowledge & Contacts
- Business Model Flexibility
- Strategic Partnerships
- Sales Focus
- Adapting to Changing Demands

### Key Obstacles

- Trust is Essential
- Bias Against Small Companies
- Insufficient Capital for Establishing Market Validation
- Unpredictable market demand

## Medical Devices

### Key Success Factors

- Proprietary Technology, Differentiated Product
- Early Adopters
- Management Experience
- Early Partnerships
- Timely Development
- Thorough Financial Planning

### Key Obstacles

- Lengthy Development Drains Funds
- Difficult to Establish Distribution Channels
- Difficult to Compete with Incumbents
- Insufficient Capital for Regulatory Process
- Limited Access to Experienced Advisors

# Cross Sector Best Practices

**Common Best Practices****Customer**

- First customer was key
- Early adopters/champions introduced customers

**Product**

- Market/customer validation prior to product development
- Business model development prior to product development

**Partner**

- Key to market acceptance
- Key to product development
- Enhanced financing credibility

**People/Management**

- Access to experience and networks with ability to execute

**Financial**

- Seed/angel investments enabled early growth
- Focus on sales growth and controlled operating expenses

**Infrastructure**

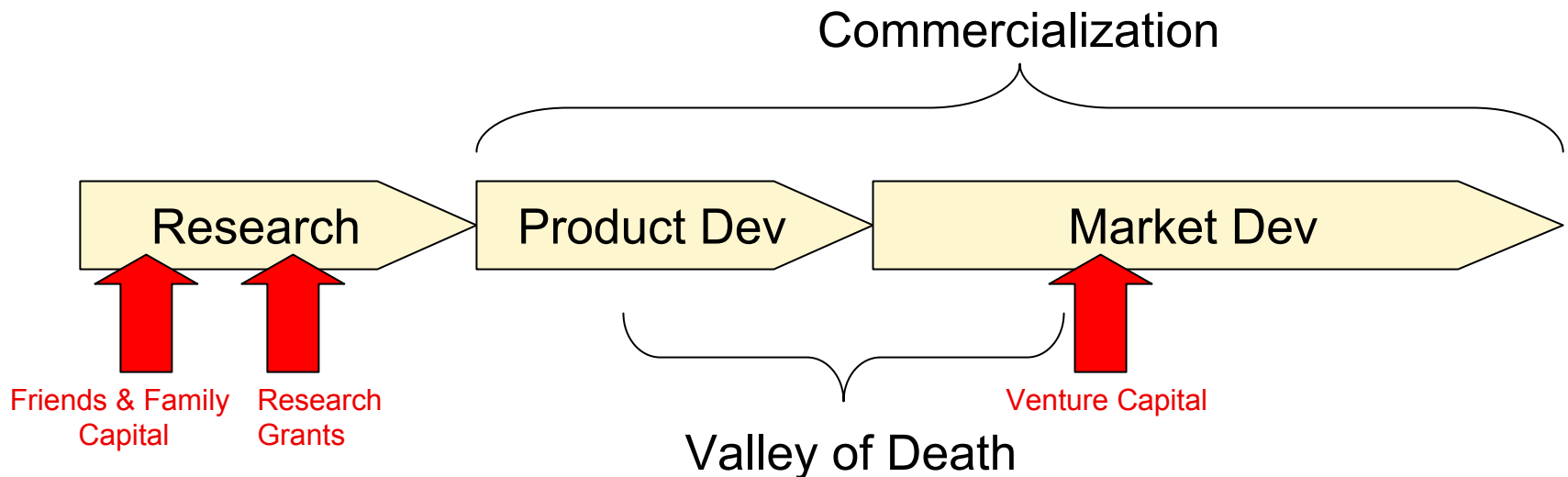
- Integrated key people/partners for product and marketing channel development
- Implemented customer-centric company infrastructure to support sales growth

## Other Interesting Observations

- Customer first, product second.
- External advisors can be critical to commercialization decisions.
- Intellectual property is not a critical success factor.
- Cluster of similar customers led to growth.
- Although “access to capital” is a common obstacle identified, it was less clear what “additional capital” would enable.

## “Valley of Death” in Each Sector

- The commercialization funding gap we refer to as the “Valley of Death” had different characteristics for each of the sectors studied.



## Challenges Unique to Wireless

- Carrier endorsement is critical in some product segments.
- Certification with a Carrier is only one part of selling product through carriers.
- Market timing is especially hard to predict.
- Buying cycles may follow specific annual timelines.

## Challenges Unique to Security

- Education of market is key to credibility that is needed for adoption.
- Perimeter security systems and Network security products have different sales cycles and customers.
- Whole solution often requires contributions from many vendors.

## Challenges Unique to Medical Devices

- Product development time to market launch is dependent upon satisfying regulatory requirements.
- Timelines are generally longer in medical device than wireless or security.
- The commercialization process in medical device is dominated by well entrenched large companies including; Pharmaceutical companies, HMOs, Medical Insurance Companies, Medical Equipment Distributors and Government. Credible partners are required for market access and successful commercialization.
- Effective channel partnering can provide access to the regulatory approval expertise and expedite the process.

# Analysis

Insights into Successful Early Stage  
Commercialization

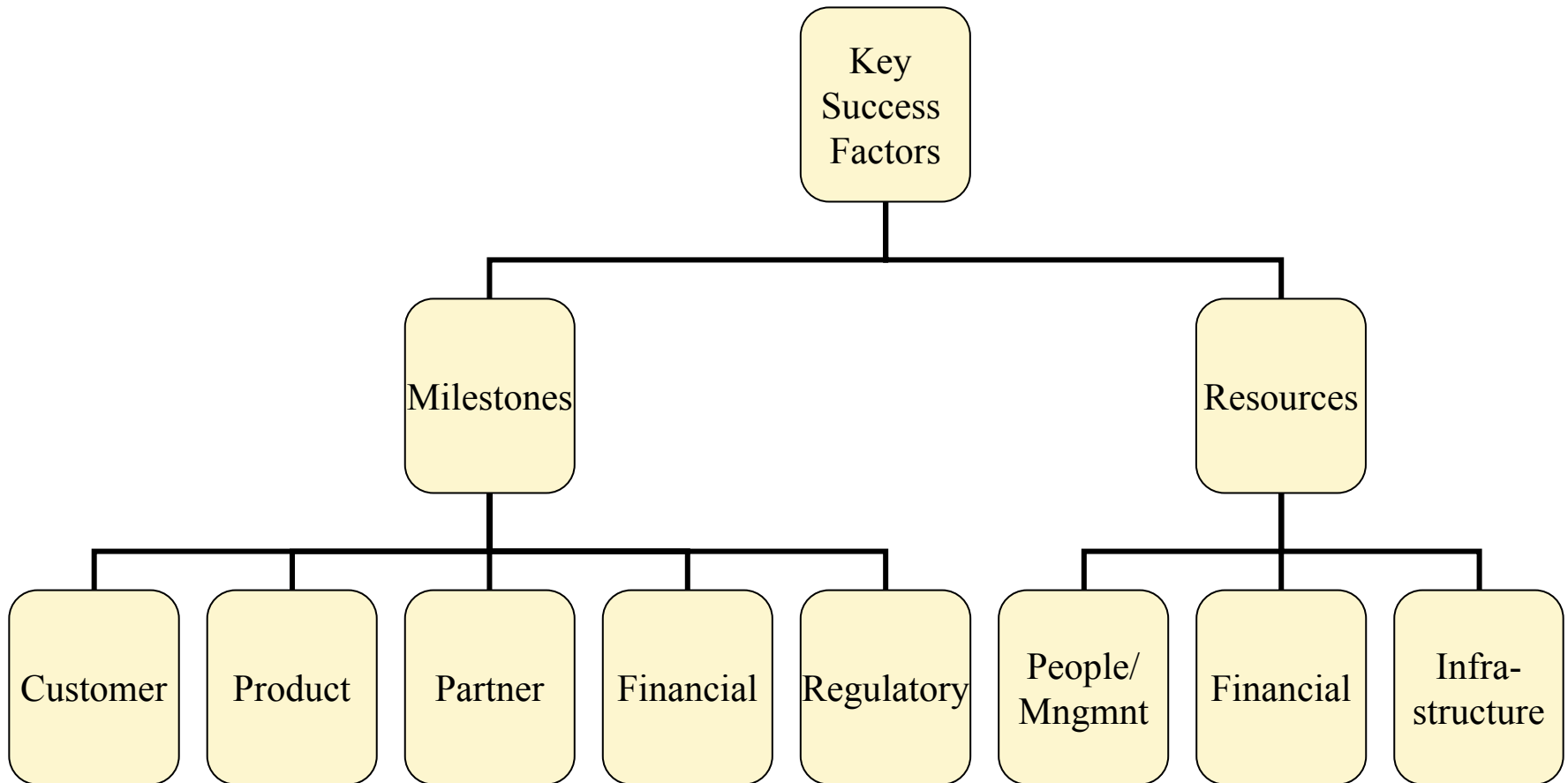
Geoffrey Hansen

## Factors in Commercialization

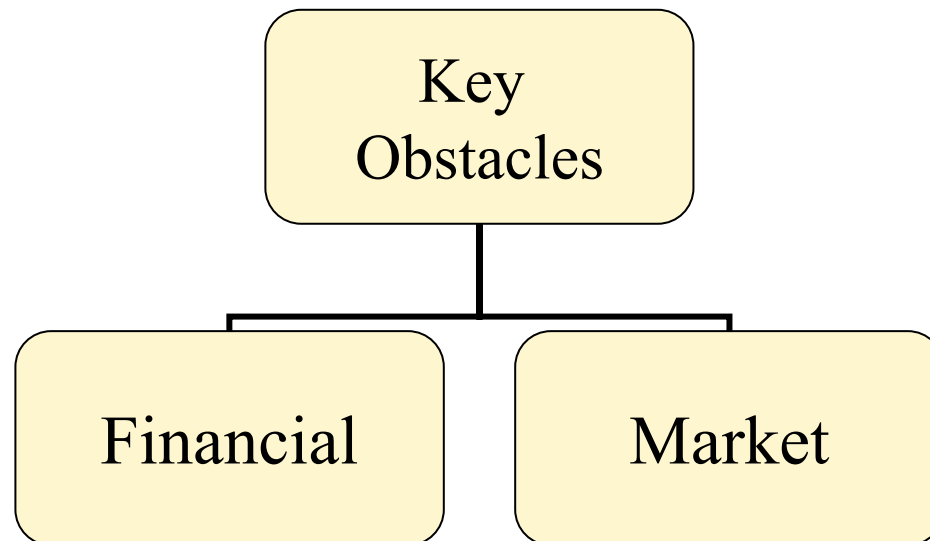
- Milestones – needed for acceleration/momentum
- Resources – needed for the engine of growth
- Obstacles – anticipated and unanticipated roadblocks

— Note: “Access to Capital” plays a role in all 3 areas

# Key Success Factors



# Key Obstacles



## Key Customer Milestones

● Getting first paying customer	59%
● Work with Beta customers	44%
● Input into product development	32%
● Input into business model development	32%

## Key Partner Milestones

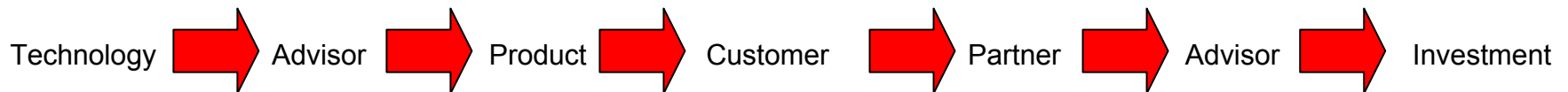
• Important to startup companies' acceptance into marketplace	68%
• Played key role in product development	49%
• Enhanced marketing and financing credibility	22%

## Key Resources

• Hired or engaged expertise in product development, finance, marketing and sales	69%
• Focused on sales growth and controlling operating expenses	32%
• Marketing and customer service infrastructure	29%
• Seed/Angel capital investments	27%

## Models for Critical Success Paths

- Common “Best Practices” Model
  - Across Majority of Cases, Success Followed a Similar Path
  - Critical Input was Received to Guide Product Decision
  - Market Validation Gained from First Customer and First Partner
  - Critical Introduction was Made to Investors
  - Investment Facilitated Growth



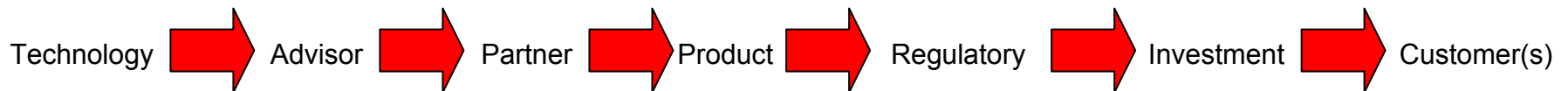
## Models for Critical Success Paths

- Exceptional Models

①



②



# Recommendations

Applying the Findings of this Research

Dave Thomas

## Commercialization Output Considerations

- If we want to have more companies that achieve commercialization success, then we need to examine efficiency and effectiveness as components in our drive to greater economic development.
- Commercialization Efficiency
  - Number of companies engaged in commercialization
- Commercialization Effectiveness
  - Percentage of companies successful in commercialization

## Commercialization Output

Constrained by  
availability of  
management  
and technical  
skill

$$\left( \begin{array}{c} \text{Commercialization} \\ \text{Efficiency} \\ \text{(\#)} \end{array} \right) \times \left( \begin{array}{c} \text{Commercialization} \\ \text{Effectiveness} \\ \text{(\%)} \end{array} \right) = \left( \begin{array}{c} \text{Commercialization} \\ \text{Output} \end{array} \right)$$

***“A Balanced Approach is Required”***

## Themes for Companies

- Companies should follow best practices path to reduce risk.
- Companies need to participate in Industry or Government led events that help to educate or train management on these best practices.
- Companies need to actively seek advisors who can help them with strategic milestones and direction.

## Recommendations for Companies

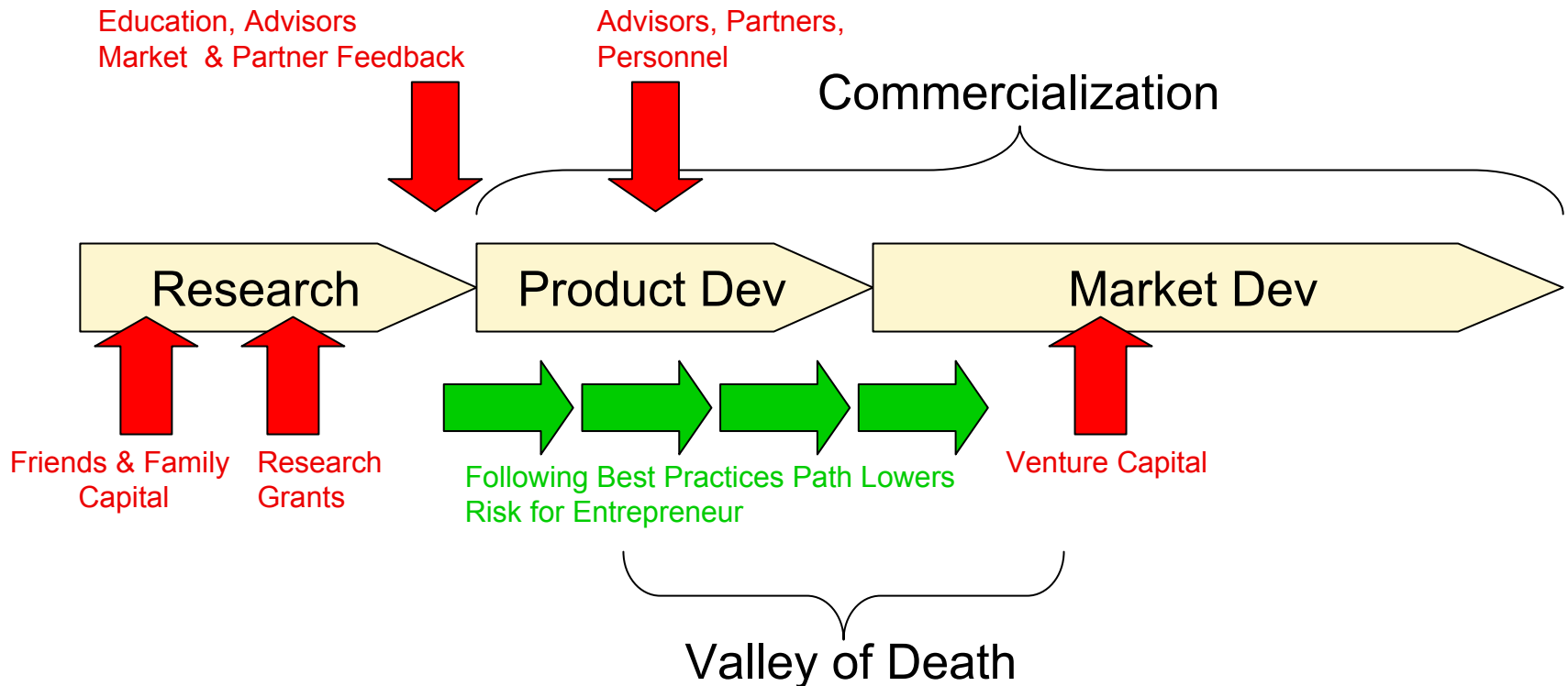
- In addition to Acquiring a First Customer, Companies should initially focus on:
  - Market Research
  - Engaging External Advisors
  - Acquisition of Additional Management Skills
  - Developing Relationships with the 'Right' Partners
- Effective execution will lead companies to:
  - Customer Driven Product Strategies
  - The Ability to Raise Capital to meet the market need
- Pursuit of growth will require Infrastructure Development as part of the evolution from technology-driven to market-driven organization.

## Themes for Industry and Government

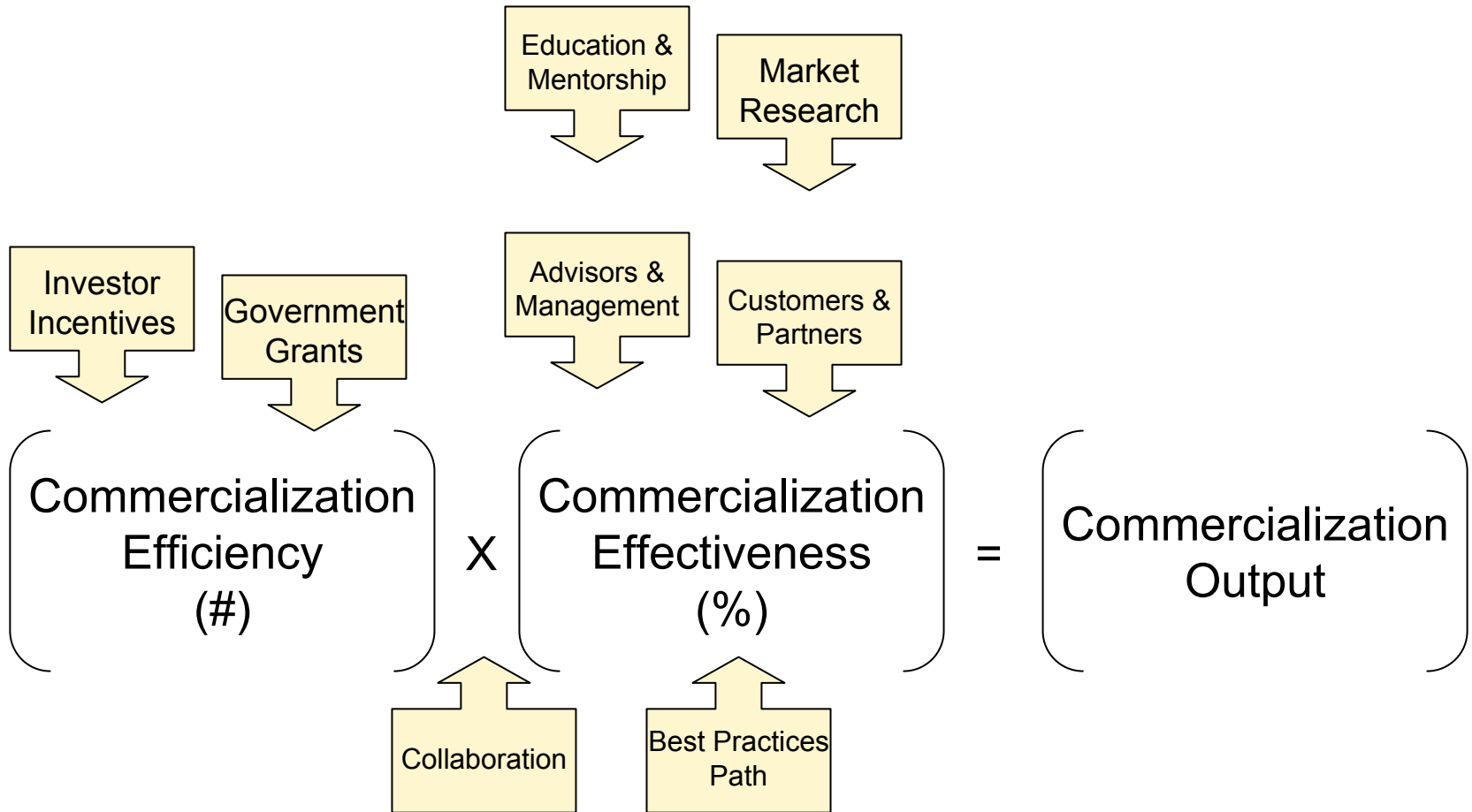
- Companies that follow the best practices models should be supported in those efforts
- Industry leaders, Industry associations, and all levels of government need to collaborate on offering educational and mentorship programs to improve commercialization skills.
- Industry Associations need to provide programs that specifically target the “Valley of Death” and utilizes best practices models as a benchmark for companies.
- Investors need to work with entrepreneurs to promote best practices models and increase the effectiveness of companies crossing the “Valley of Death”.

## Recommendations Map

- Companies follow best practices
- Government intercedes in commercialization rewarding best practices, cluster sales and commercialization investment



## Recommendations as Commercialization Output



## Questions

- Further questions after today, please contact us at:
  - Reg Nordman [rnordman@rocketbuilders.com](mailto:rnordman@rocketbuilders.com)
  - Geoffrey Hansen [gchansen@rocketbuilders.com](mailto:gchansen@rocketbuilders.com)
  - Dave Thomas [dthomas@rocketbuilders.com](mailto:dthomas@rocketbuilders.com)
- Visit <http://www.rocketbuilders.com>