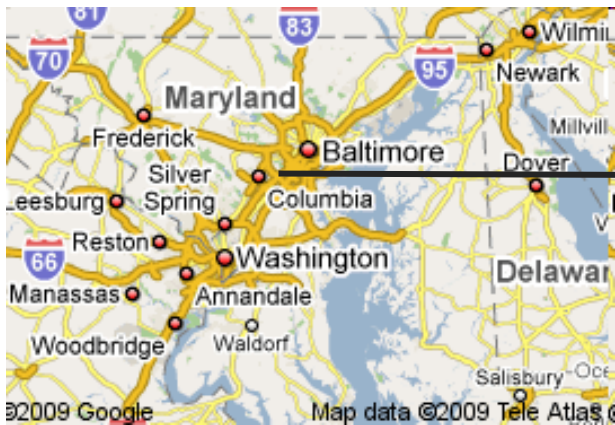


Market Research, Technology Forecasting and Opportunity Assessment

5th Workshop on Entrepreneurship for Physicists and Engineers from Developing Countries ICTP, Trieste, Italy

March 31- April 4, 2014



About Me

Ph.D. Mechanical Engineering

Academics – State University of New York, Stony Brook

Industrial Scientist – Automotive and Consumer Products

6 Products: Invention to commercialization

Entrepreneur: Started Advanced Fluidics (Small Company)
in 2001

About Advanced Fluidics

Research and Product Development in

1. Aerospace Sciences – Aerodynamics, combustion
2. Micro/Nanofluidics/nanotech-based biosensors
3. Medical Instrumentation
4. Technology Roadmap Development and Training

Outline

Your Inventions and Product Ideas

The Market Need

Looking for opportunities

Evaluating your ideas – feasibility studies

Why do we need inventions and new products?

- Improve quality of life – “useful”
- Commercialization for economic benefit – rewards for inventors and entrepreneurs
- Economic development of regions and countries

What are you inventing?

New Technology? (Method and Apparatus or Process)

“Technology is a capability that can be used in a product.”

Example: Laser

(When lasers were invented in 1960, they were called "a solution looking for a problem")

OR

A New Product? (Apparatus)

“makes use of existing or new technologies”

Optical readers/scanners, laser-based eye surgery systems, laser pointer, measurement systems, golf trainer, laser machining, etc.

A new product has a **customer** and a **market** in mind

An idea is not an invention

An invention is not a product

Not done before \neq Necessarily useful invention!

**Useful Invention = Successful Product *only* if
marketed well**

The Market?

Your Idea

Solution **to** a problem or a solution looking **for** a problem?

Market Pull and Technology Push

(Market pull - technical solution)



3nethra – An intelligent pre-screening Ophthalmology device
<http://forushealth.com/forus/products>

Market Pull and Technology Push

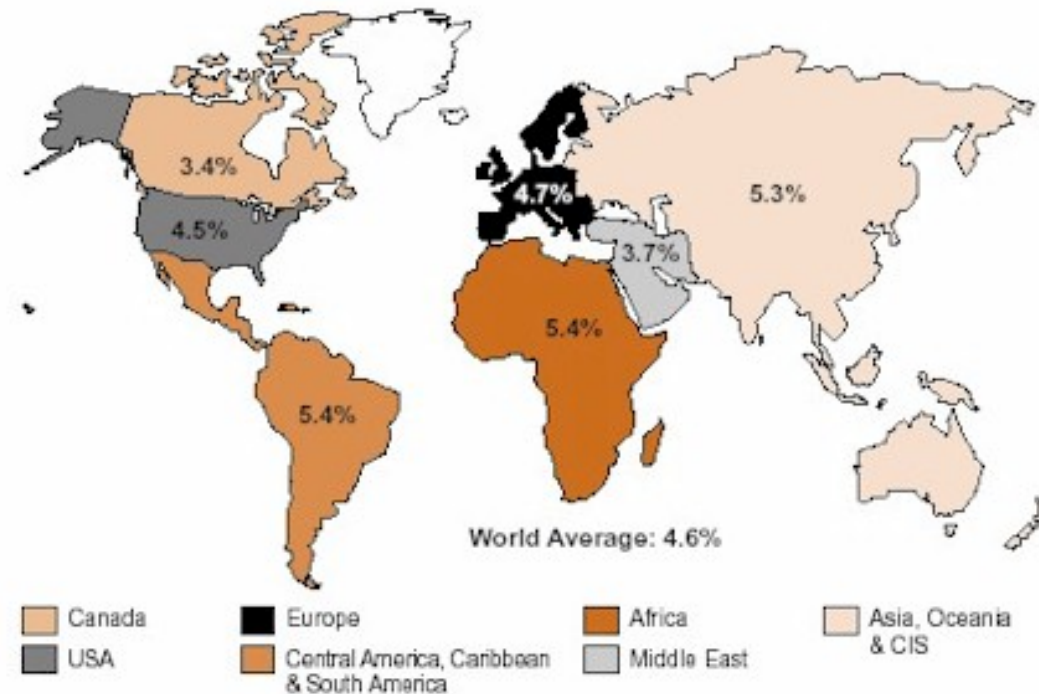
Technology push? (new or changed market))



"I'm OK... just a little too much 'push' technology."

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Market Size and Geographical Distribution of Market



<http://www.tc.gc.ca/eng/civilaviation/publications/tp13549-chapter5-2143.htm>

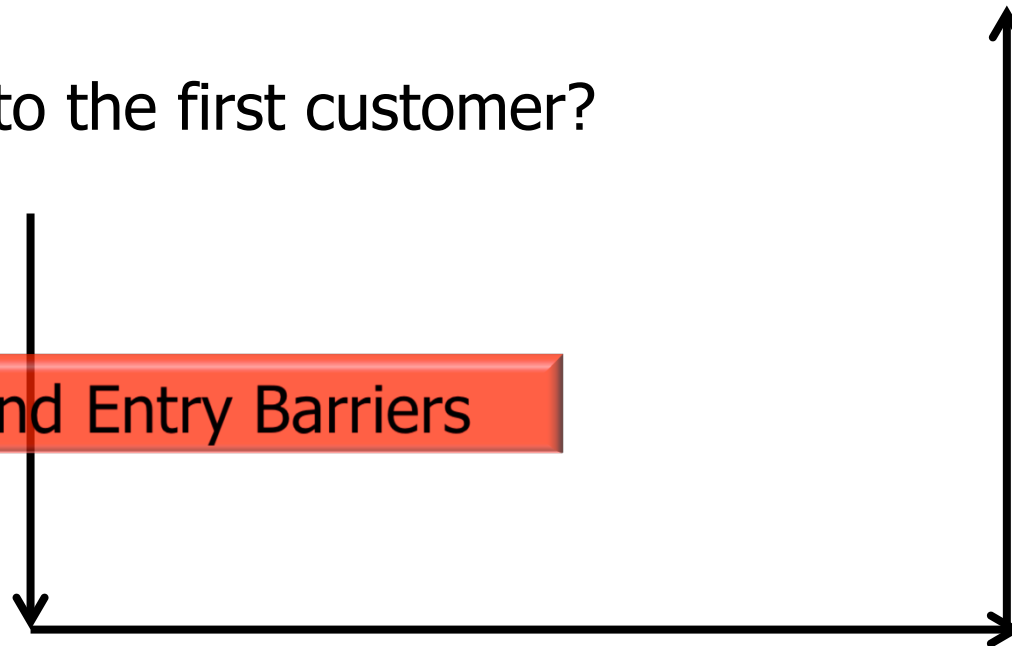
The First Customer

First customer / First adopter?



Route (access) to the first customer?

Competition and Entry Barriers



Why New Products Fail

Inadequate Market Analysis	32%
Bad Product	23%
Higher Costs than Anticipated	14%
Weak Marketing Program	13%
Poor Timing	10%
Competition	8%
TOTAL	100%

<http://www.bioplanassociates.com/services/newproduct.htm>

Summary: The Market?

Your Idea (solution to a problem) --→ Your Product?

Why does the market need this? (Market pull (technical solution) or Technology push? (new or changed market))

Who will buy it (customer profile – age group, profession, field of application, decision levels, geographical distribution...?)

how many people/organizations will buy it? (Market size?)

Market Trends – is this a growing market?

Looking for Opportunities

Technology Road Maps
Technology Mind Maps
Technology Intersect Maps
Technology Extrapolation



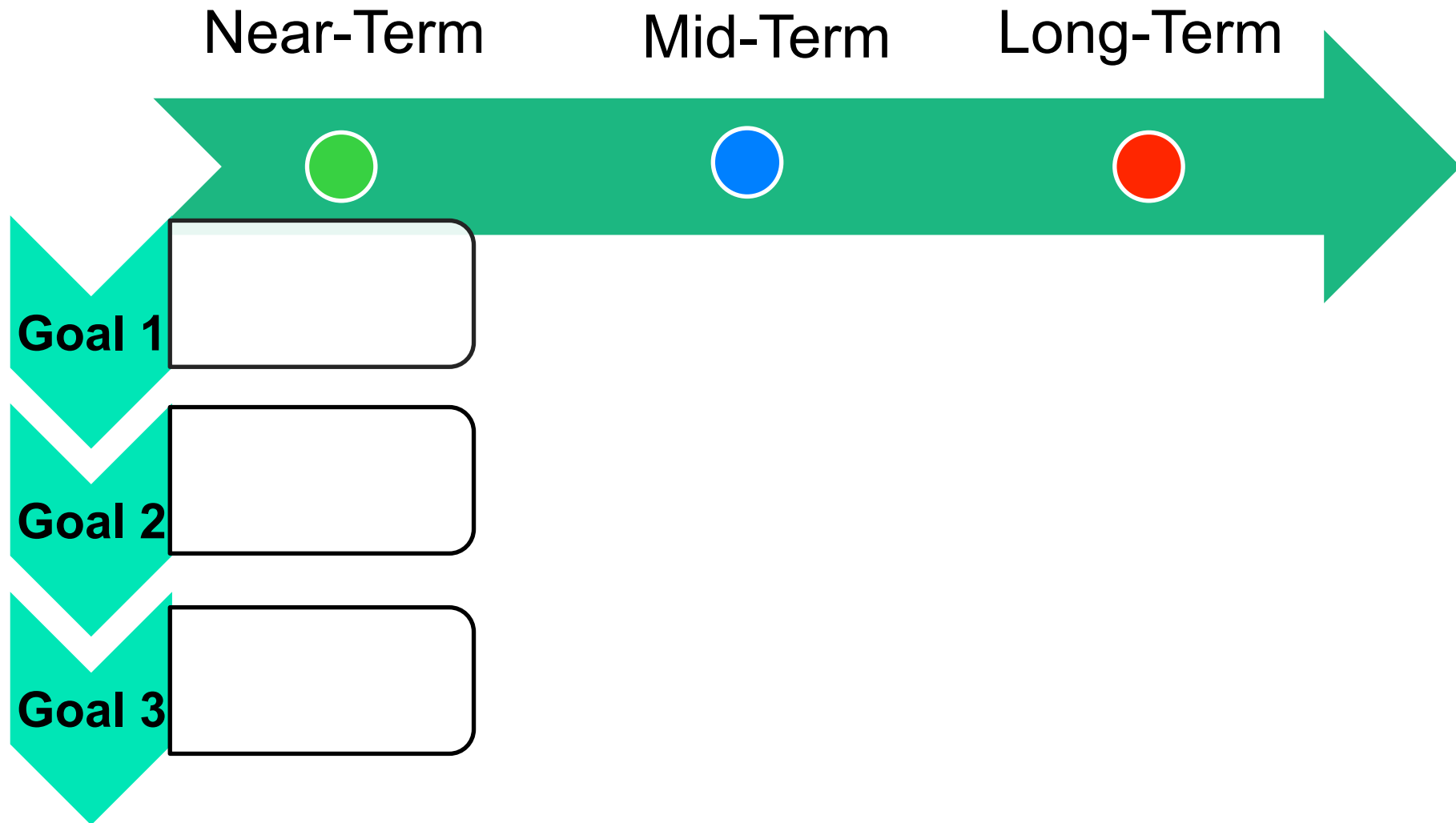
**Finding
Opportunities**

Technology Roadmaps

Technology Roadmap

- shows us opportunity for inventions in selected fields.

Technology Road Map



Technology Roadmap

Example: Climate Change

Your niche?



<http://www.climatechange.gov/library/2006/testimony20sep2006.htm>

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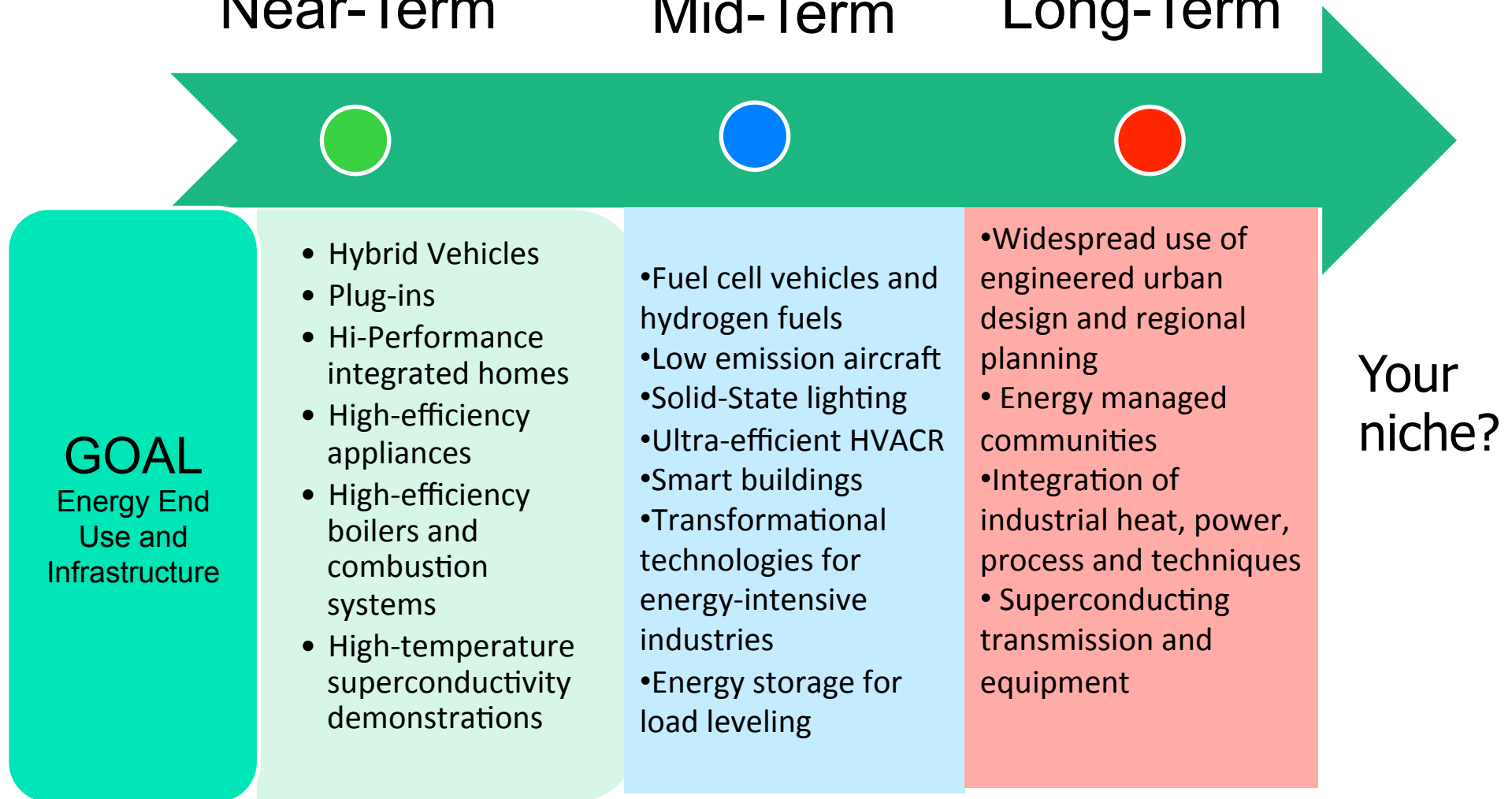
Technology Road Map

<http://www.climate-technology.gov/library/2006/testimony20sep2006.htm>

Near-Term

Mid-Term

Long-Term



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Technology Roadmap

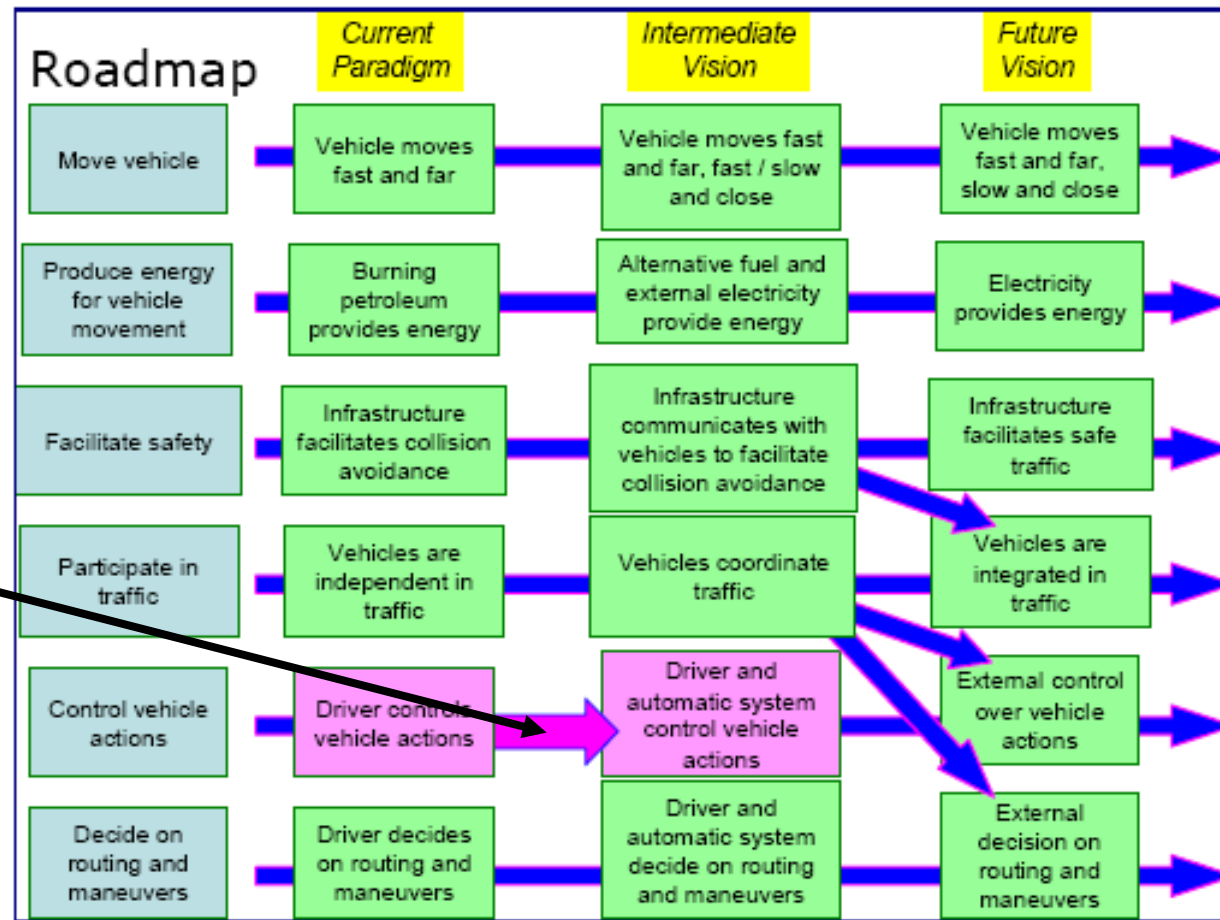
Example: Intelligent Vehicles



Technology Roadmaps

Roadmap for automobiles

Paradigm shifts offer opportunities for inventions?

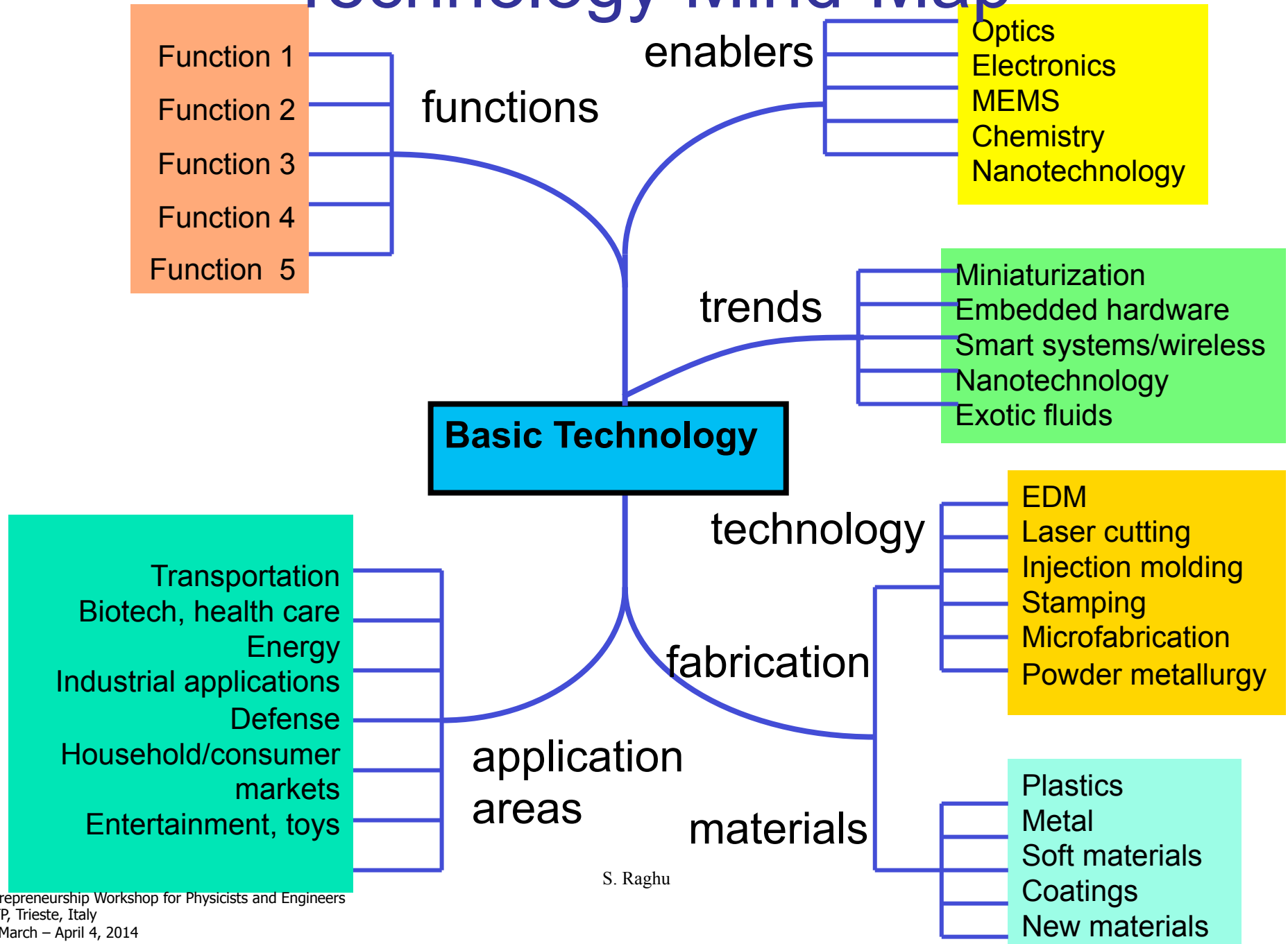


Your niche?

(http://www.ceeti.org/technology_roadmap/pdf/Roadmapping_Final_Report.pdf)

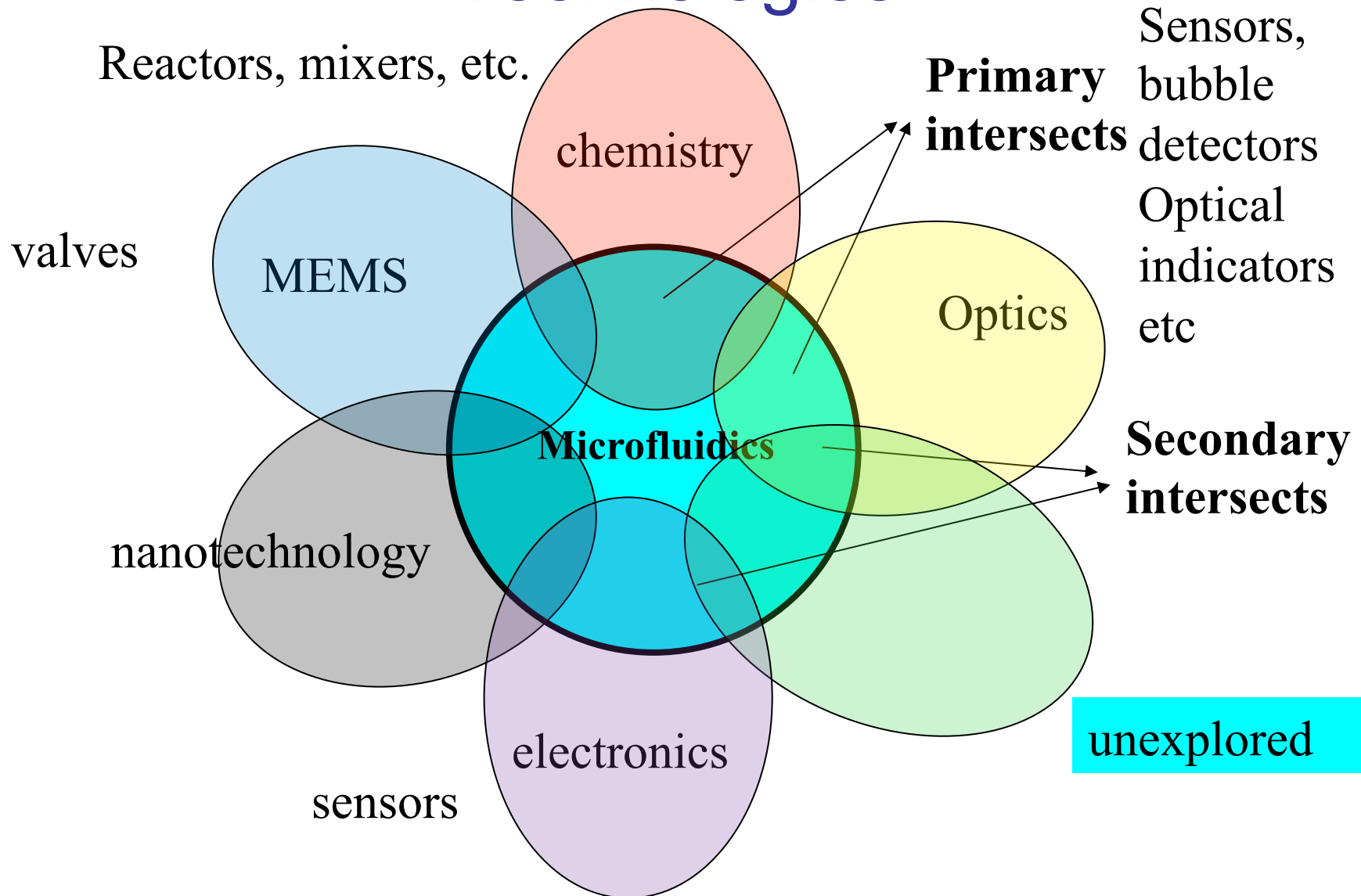
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Technology Mind-Map



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Technology Intersects with Emerging Technologies



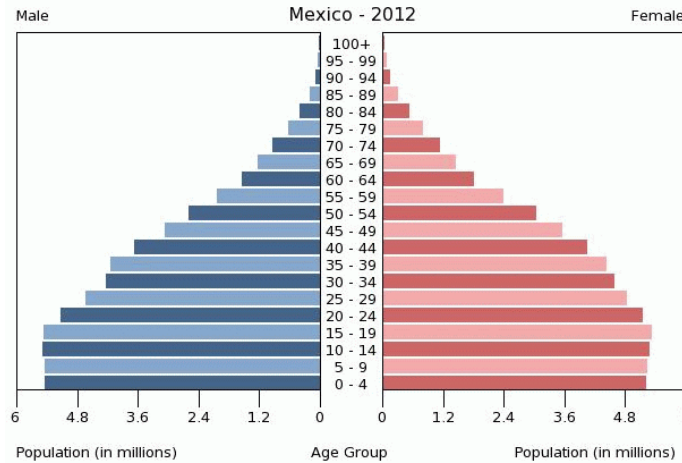
Technology Extrapolation

Points to consider for forecasting

- Observing/Studying Trends
- Economic factors
- Societal factors
- Technological Advances
- Political Action/Regulatory statutes



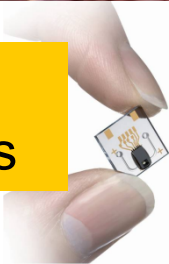
Technology Extrapolation



http://www.indexmundi.com/mexico/age_structure.html



Micro-sensors



<http://www.i-micronews.com/>

Health Monitoring

Generation-2 Internet

24-hour medical care

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Healthcare companies

MyLiveley

GlowCap

Qualcom Life

GE-Care Innovations

Optical fiber mat

4 Different Methods of Finding Opportunities

Next.....

Assessment and Feasibility Analysis

Assessing the idea

Technology feasible?

Is there a market?

Is there a business opportunity?

Feasibility Analysis

Feasibility Analysis: The process to determine if an idea is viable and worth pursuing for commercialization

Product/service feasibility analysis

Customer interest, desirability and purchase interest

Industry/market feasibility

Industry attractiveness

Market timeliness example: (Handwash tissues)

Identification of niche market

Feasibility Analysis

Organizational feasibility

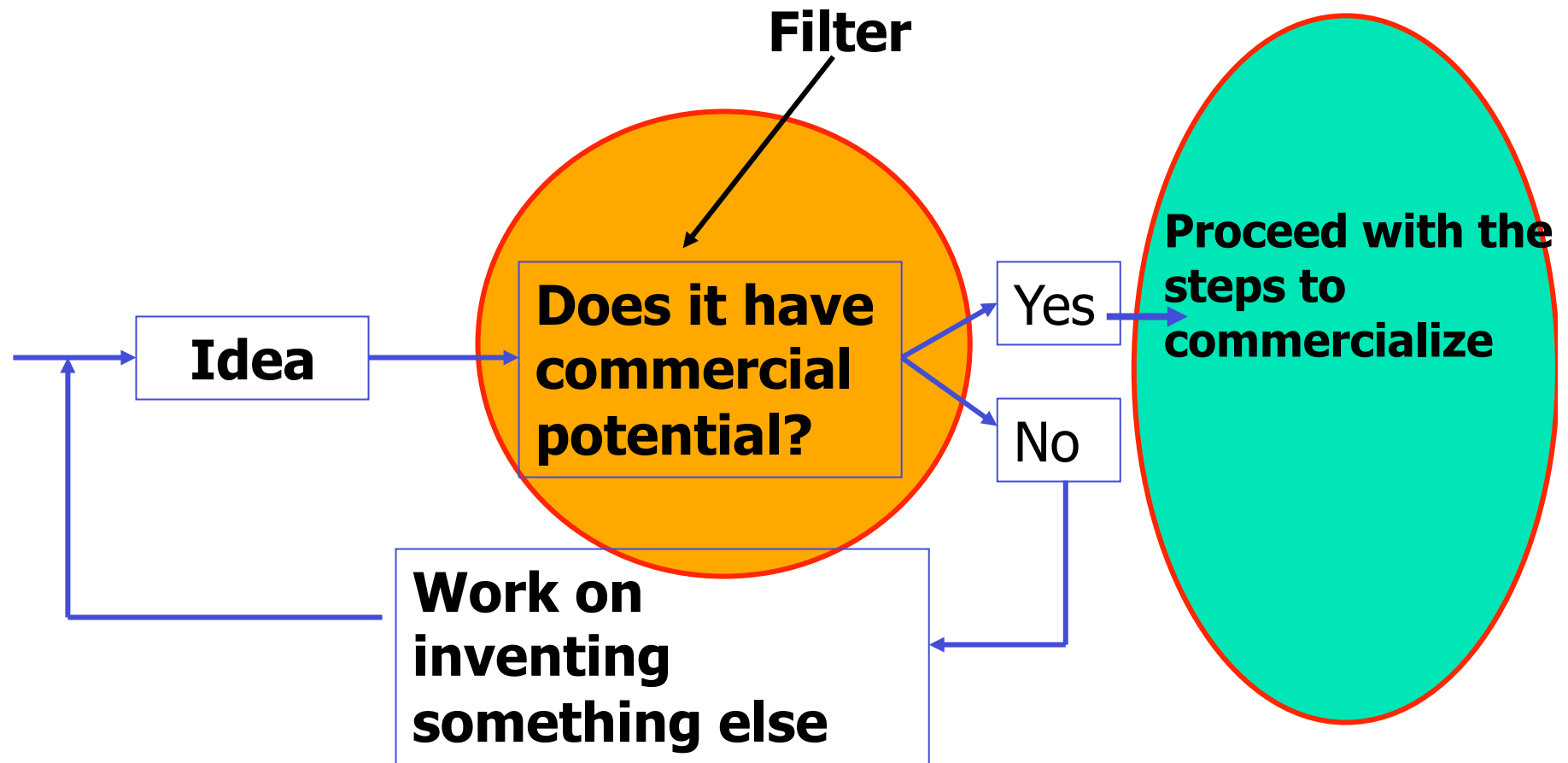
Sufficient management expertise, organizational competence & resources to successfully launch a business

- Management ability
- Resource sufficiency

Financial feasibility

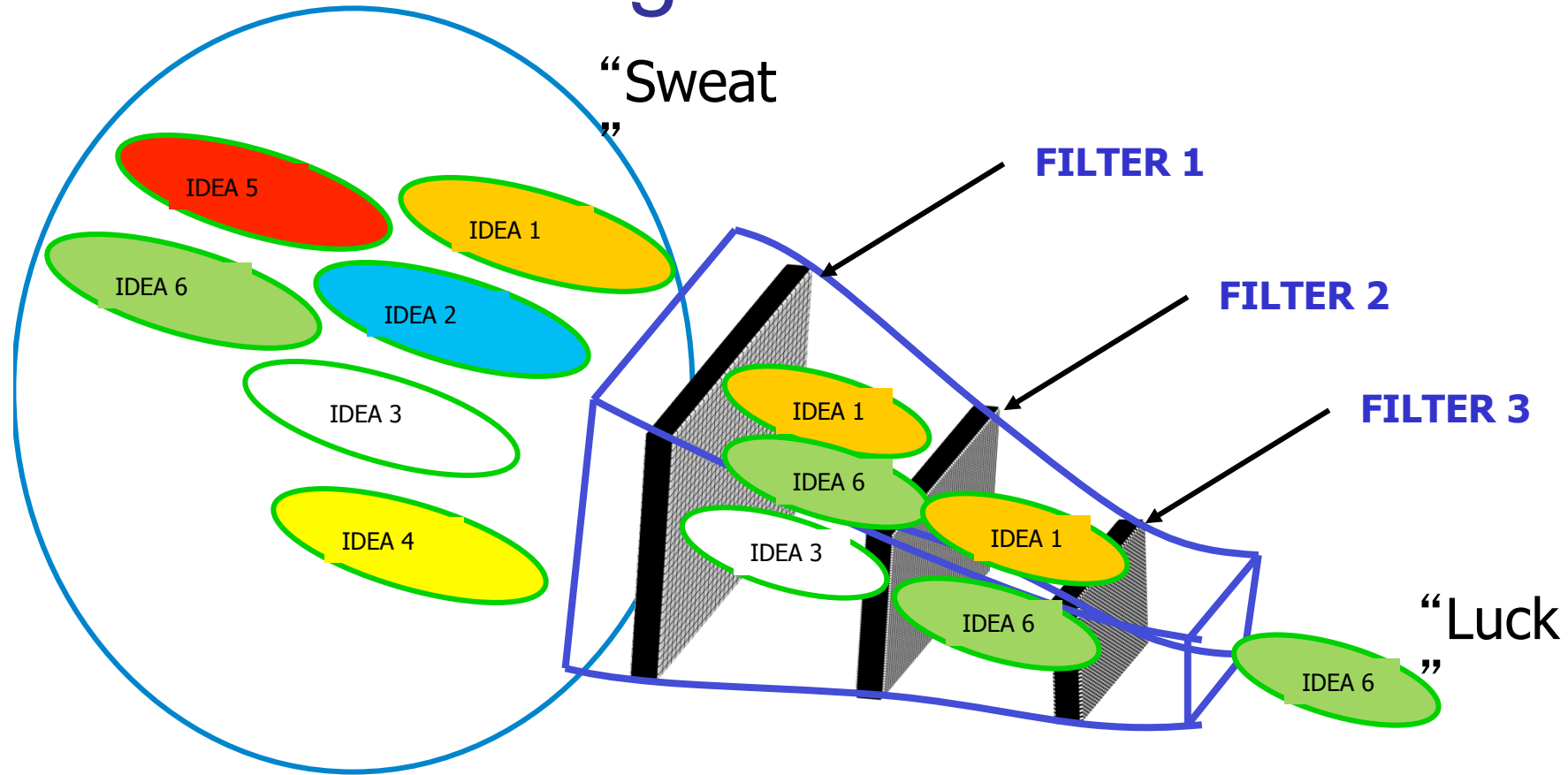
Total start-up cash needed (example)
Financial performance of similar businesses
Overall Financial Attractiveness of the proposed venture

Filtering Your Ideas



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Filtering of Technical Ideas



Just one idea at a time at the end helps focus

Filters

Filters: Can be used to sort out feasible ideas right at the very beginning.

Examples of filters:

1. Market Opportunity and Market Attractiveness
2. Do you have the background to proceed with this product
3. Sustainability of market (seasonal or year-round), time scales of sustainability of market interest and technology. [Give examples](#)
4. Regional and international competition

What are the other factors that can be used as filters?

Possible Filters

Cost
Weight
Size
Safety/Health
Speed
Ease of Use
Ease of Production
Durability
Repairability
Novelty
Convenience
Social Benefit
Reliability

Saleability
Appearance
Noise
Odor
Trend of Demand
Seasonal Demand
Market penetration
Market size
Competition
Quality
Life cycle

Legality
Obsolescence
Product Liability
Service requirements
Profitability
Learning & unlearning required

Summary

- Market analysis
- Finding Opportunities
 - Technology Forecasting
 - Technology mapping (Roadmaps, Mind-map, Intersects)
- Assessment and Feasibility analysis
 - Filtering your ideas

THANK YOU

Points to consider

1. Talk to some local entrepreneurs if they used such techniques (assessment and filters) for developing their products/services. What would they do if they were to do it all over again?
2. Prepare a roadmap for the technology you are developing for your project?
3. Prepare a set of filters for evaluating your project idea

Opportunities Based on Extending Existing Technologies

