

Global Career Pathways

Fostering Innovation and Entrepreneurship

An Overview of Career Possibilities for Chemistry Professionals



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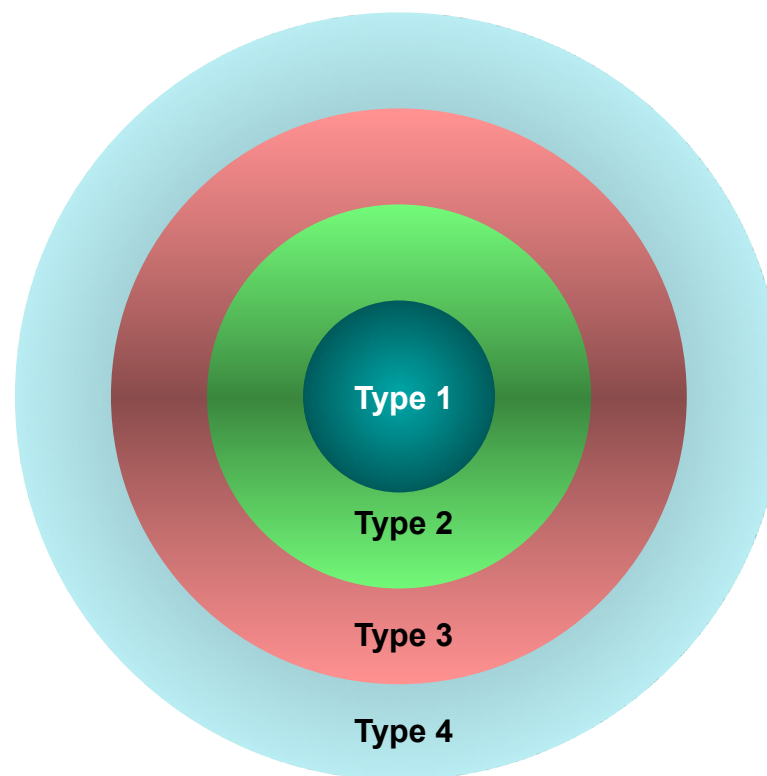
“Do you know what job you want
in the future ?”

Alternative:

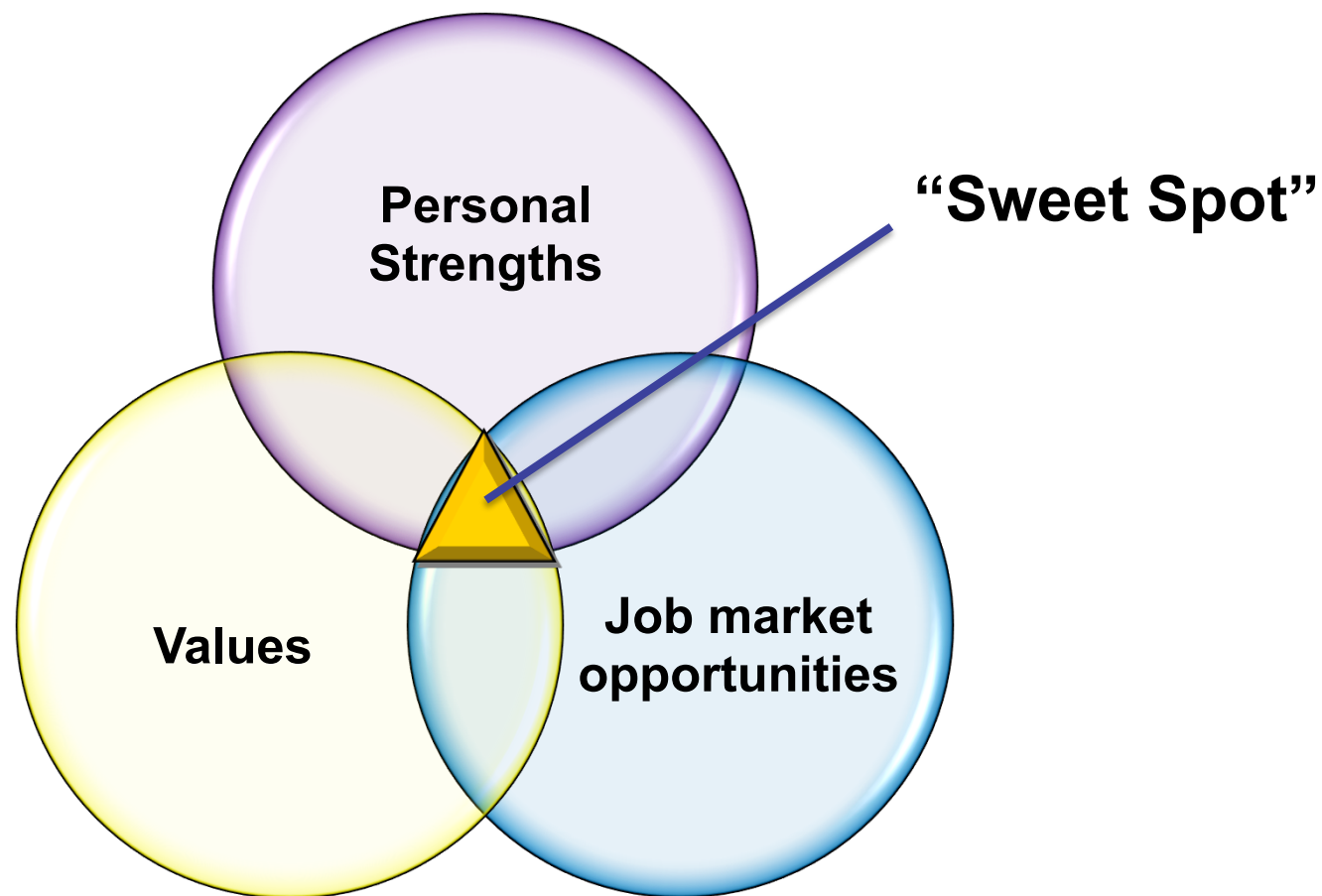
Do you know exactly what you want to do in life?

How Specific Is Your Career Objective?

- Type 1: Very specific about pathway and type of job
- Type 2: Specific about career pathway, general about job type
- Type 3: Relatively sure about career pathway, uncertain about job type
- Type 4: Uncertain about career pathway



Mapping Your Career Pathway: Finding Your “Sweet Spot”



Mapping Your Career Pathway: Agenda



- Understanding yourself
- The four main career pathways
 - Working in industry
 - Working in academe
 - Working in government
 - Working for yourself
- Identifying the next steps in your pathway

What are your Personal Values?

- Advancement – getting ahead in life
- Goal orientation – getting things done
- Autonomy - nobody tells me what to do
- Challenge – I like to handle difficult problems
- Discovery – I want to discover new things
- Security – I want job security
- Balance – work versus life
- Perfectionism vs. Pragmatism
- Altruism – Doing good things for mankind



Assessing My Values

Individual activity – Write your values on a sheet of paper

What are your personal Strengths?

Personal Effectiveness

- Taking initiative
- Attention to detail
- Flexibility

Problem Solving Skills

- Research
- Analysis
- Creating and innovating

Interpersonal Skills

- Communication (oral and written)
- Teaching and training
- Counseling and advising
- Leading and providing direction

Operating Skills

- Dealing with money
- Planning and organizing
- Managing
- Administering



Assessing My Personal Strengths

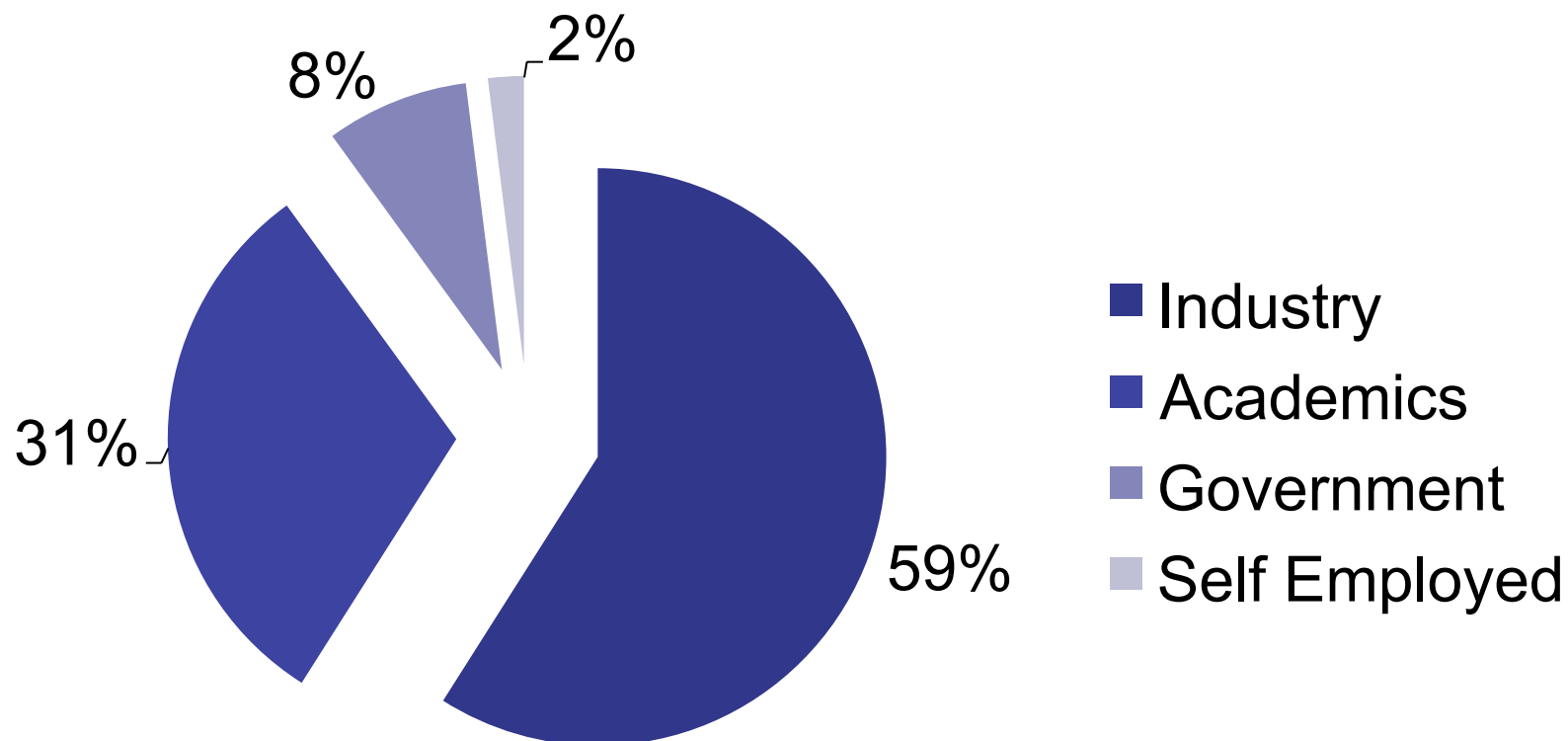
Individual activity – Write your strengths down on paper.

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Employment of ACS Members in the Four Main Pathways



Source: ACS Research and Member Insights (2011)

Current Trends to Consider

- Economic (for the desired region)
 - How is the economy in the short term? Longer term?
 - Is the manufacturing sector growing? Hiring people?
 - Are small businesses doing well? Any incentives?
- Scientific
 - What are the hot areas?
 - Do research get funded? Which areas get funded?
- Political
 - Any special fields that the government likes or dislikes?
- Others



Reading on Trends for Chemistry Professionals

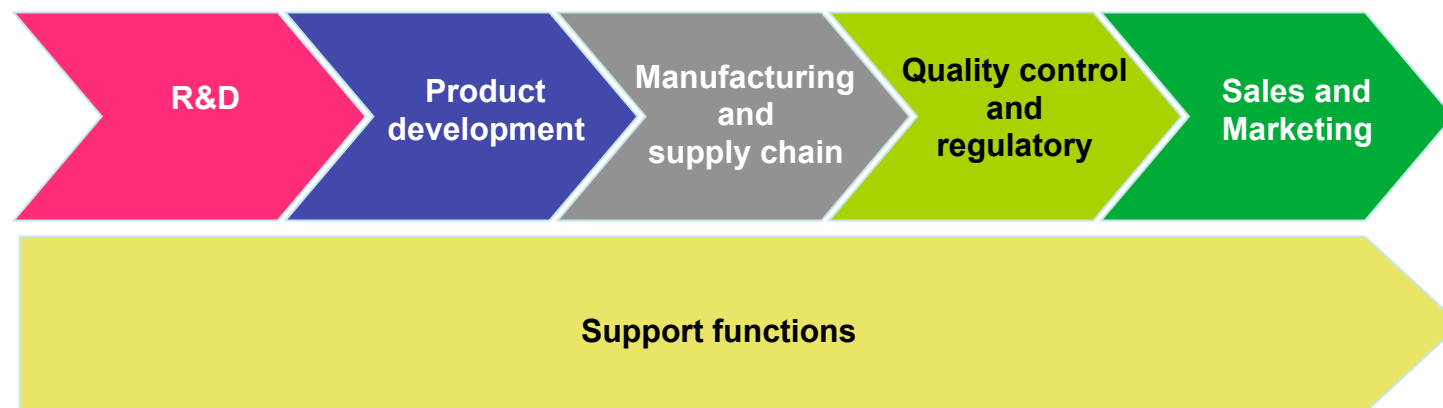
Group Discussion – How do you get information?

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Careers in Industry: The Value Chain



From Michael Porter's *Competitive Advantage*

What Counts in Industry

- Technical competence (the essentials)
 - Depth and breadth
 - Ability to define and solve problems
 - Often postdoctoral experience
- Leadership, motivating others, and teamwork
- Working hard and working smart
- Ability to communicate orally and in writing, and to influence others
- Ability to work well in teams
 - Interactions with people of diverse backgrounds
 - Ethical behavior and personal integrity



Resources for Exploring Careers in Industry

Any information to share with one another?

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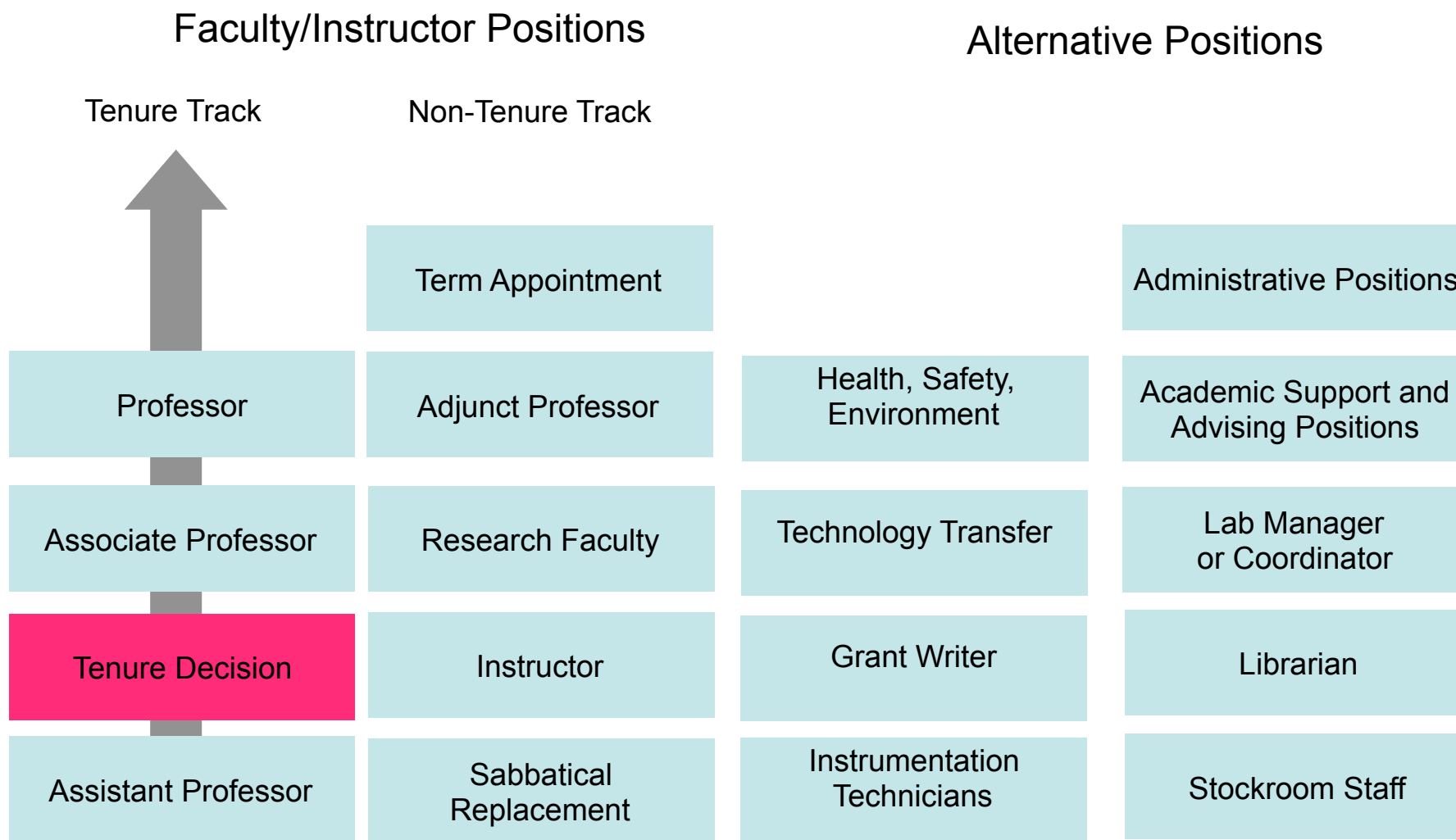
Classification of U.S. Colleges and Universities



Classification (highest degree offered)	Number of institutions
Doctoral Universities	261
Master's Colleges and Universities	611
Baccalaureate Colleges	549
Associate's Colleges	1669
Specialized (faith-based, medical schools, other health professions, engineering, other technology, business and management, law, other special focused)	766

Source: Carnegie Foundation for the Advancement of Teaching, 2010
classifications.carnegiefoundation.org

Academic Positions in the U.S.



Basis for Evaluation and Tenure Decisions



Service

- Department
- College
- Community
- Profession

Teaching

- Classroom
- Lab
- Office hours
- Mentoring
- Using new pedagogies

Research

- Directing undergraduates and graduate students
- Publications
- Grants



Resources for Exploring Careers in Academe

Any information to share?

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Chemistry Jobs in Government

- Environment: Food, Air, Water
- Regulatory Policies and Practices
- Military/Defense
- Forensic Analysis
- Quality Control and Safety
- Intellectual Property/Patents
- Medical and Public Health



Resources for Exploring Careers in Government

Any information to share?

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Developing a Business

- Step 1: Describing the Market
 - Find a market need
- Step 2: Describing the Product/Service
 - Find a solution
- Step 3: Developing the Marketing and Sales Strategy
 - How to get the solution to the market
- Step 4: Describing the Organization
 - Whom do you need to help you
- Step 5: Describing the Financing

What Counts When Working for Yourself?



- Business acumen
- Goal orientation
- Access to capital (intellectual and financial)
- Network of professional and personal contacts
- Sales experience or ability to market to new customers and contacts

Willingness to take risks!

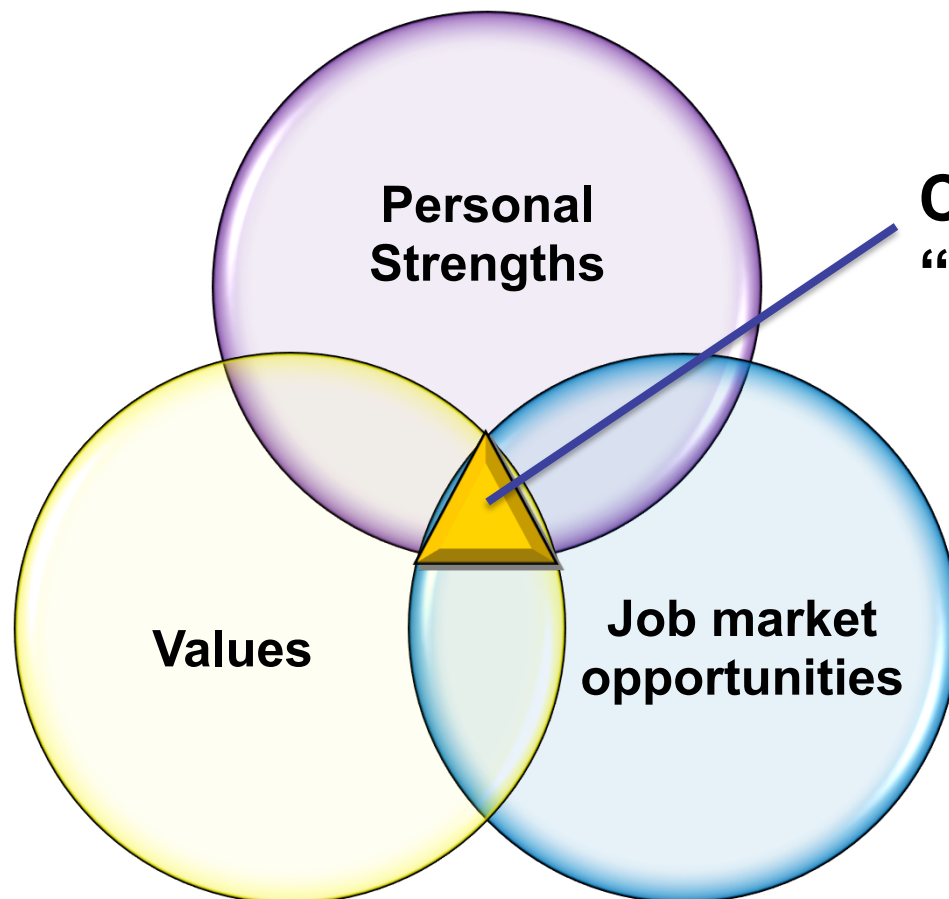


Resources for Exploring Working for Yourself

Any information to share?

Write down your preference for career type.

Mapping Your Career Pathway: Finding Your “Sweet Spot”



**Can you find the
“Sweet Spot”?**

Mapping Your Career Pathway: Agenda



- Understanding yourself
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 - Working in industry
 - Working in academe
 - Working in government
 - Working for yourself
- Identifying the next steps in your pathway
 - If you know your “sweet spot”, you are ready !
 - If not, try this exercise later. You may have more information or better ideas later.

Path Forward: Getting Started

- Identify your priority career pathway and begin the process of further investigation.
- Begin your job search 12 to 18 months in advance.
- Start developing your personal network.
- Develop a resume (or vita) portfolio that can be used as the basis for tailoring documents for a specific position.



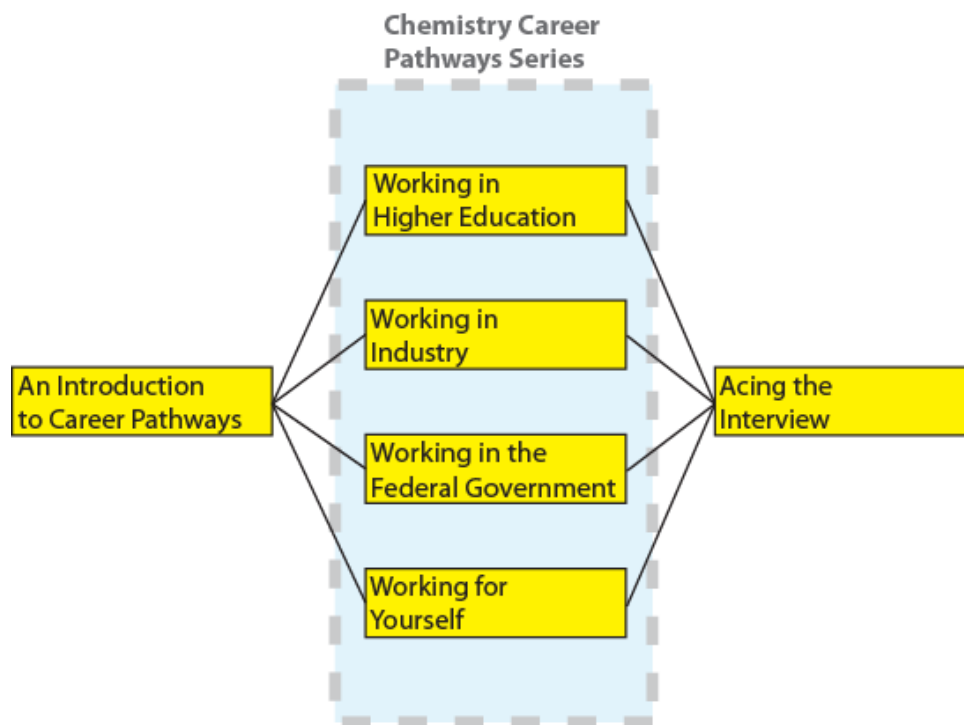
Identifying the Next Steps in My Pathway

If you are an ACS member, there are many resources available.

Career Services Available from ACS

- Employment services
- Personalized career assistance
- Workshops and presentations
- Workforce analysis
- Local career programs
- Career-related publications
- Website: acs.org/careers

ACS Careers Pathways™ Series



Occupation Specific and Skill Set Training





Elements of Innovation

Adapted from the ACS Leadership Development Course
on “Fostering Innovation”

What is innovation?

- Innovation can be viewed as the application of better solutions that meet new requirements or existing market needs.
- In economics and management science, it is generally considered a process that brings together various novel ideas in a way that they have an impact on society.
- Innovation differs from invention
 - Invention refers to the creation of idea or method
 - Innovation refers to the use of idea or method that is relevant to market or society

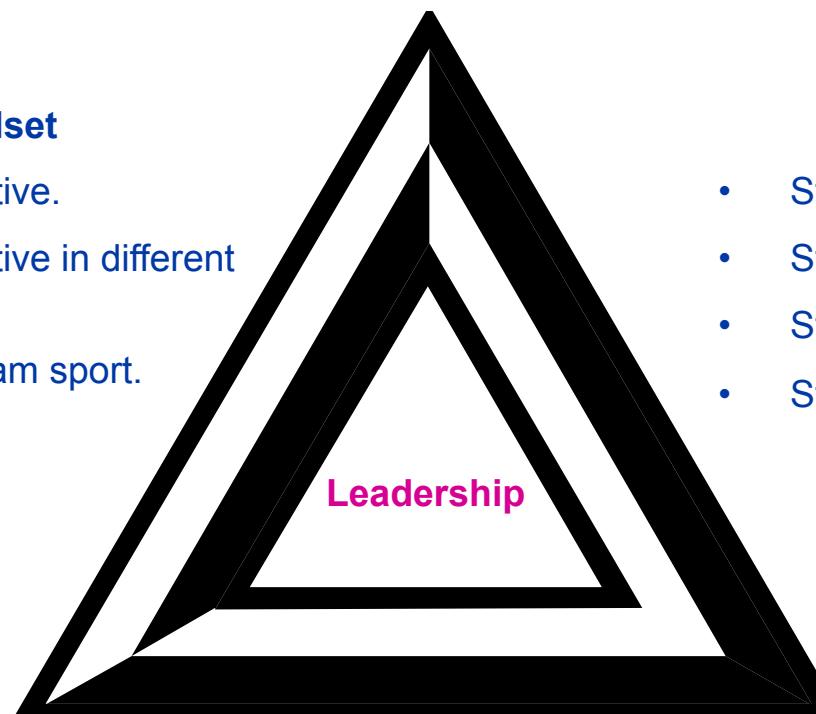
Innovation in a Nutshell

The Mindset

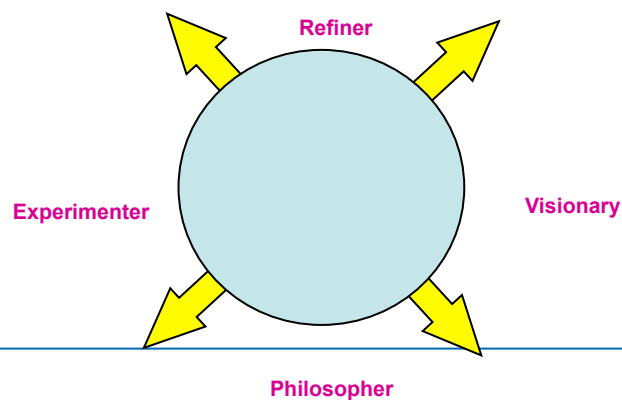
- We are all innovative.
- We are all innovative in different ways.
- Innovation is a team sport.

The Process

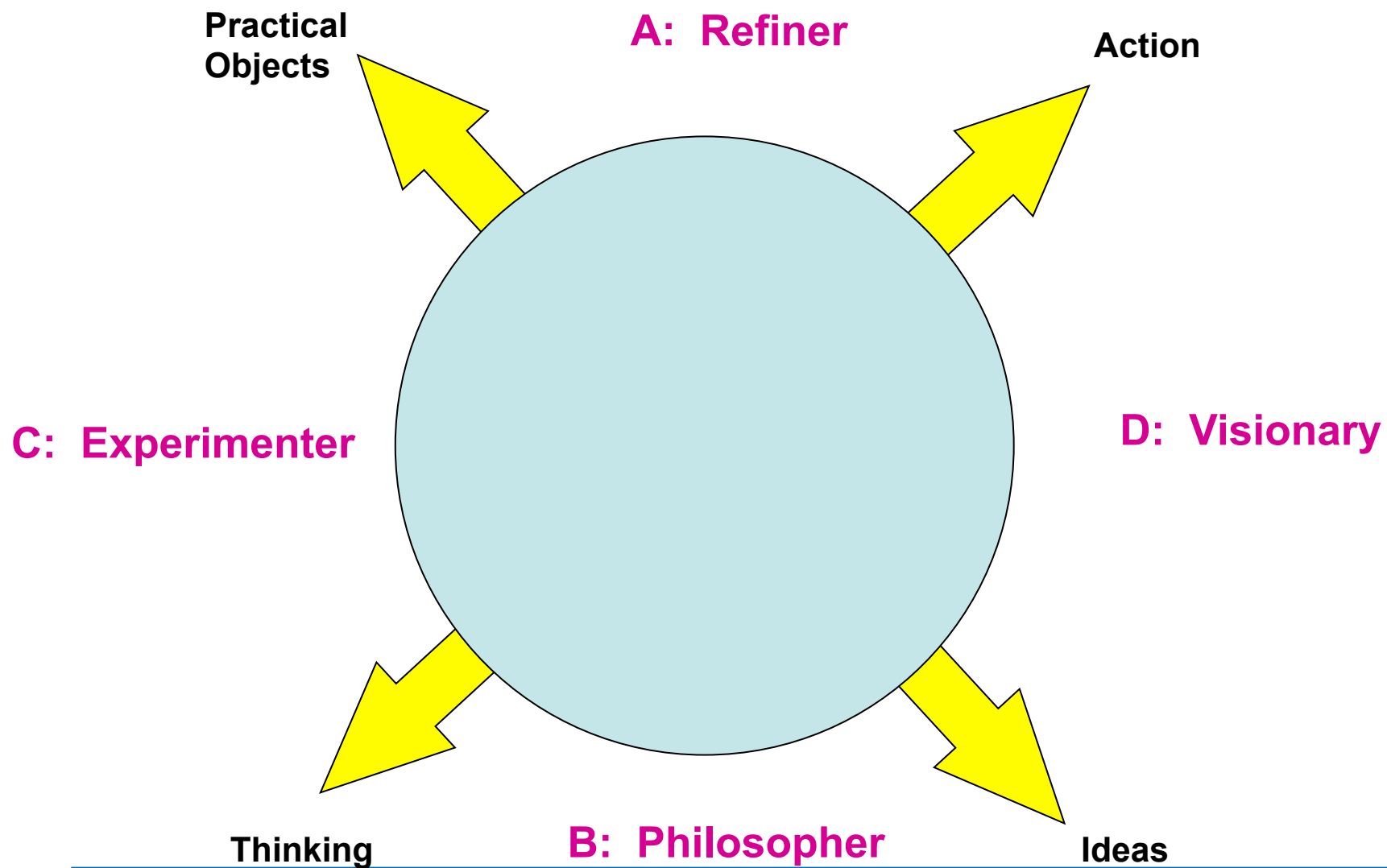
- Step 1: Define the benchmarks
- Step 2: Generate alternatives
- Step 3: Evaluate alternatives
- Step 4: Implement



The Skills



Innovation: The Skills



The Innovation Process

- **Step 1: Define the benchmark**
 - What do we want to accomplish
 - How is it working? What's wrong with status quo
 - Produce an outcome statement
- Step 2: Generate Alternatives
- Step 3: Evaluate alternatives
- Step 4: Implement

The Innovation Process

- Step 1: Define the benchmark
 - What do we want to accomplish
 - How is it working? What's wrong with status quo
 - Produce an outcome statement
- **Step 2: Generate Alternatives**
 - **Refiner – action-oriented, focus on detail**
 - **Experimenter – empirical, analytical**
 - **Visionary – vision-oriented, future-leaning**
 - **Philosopher – idea-oriented, lateral thinking, good with analogs**
- Step 3: Evaluate alternatives
- Step 4: Implement

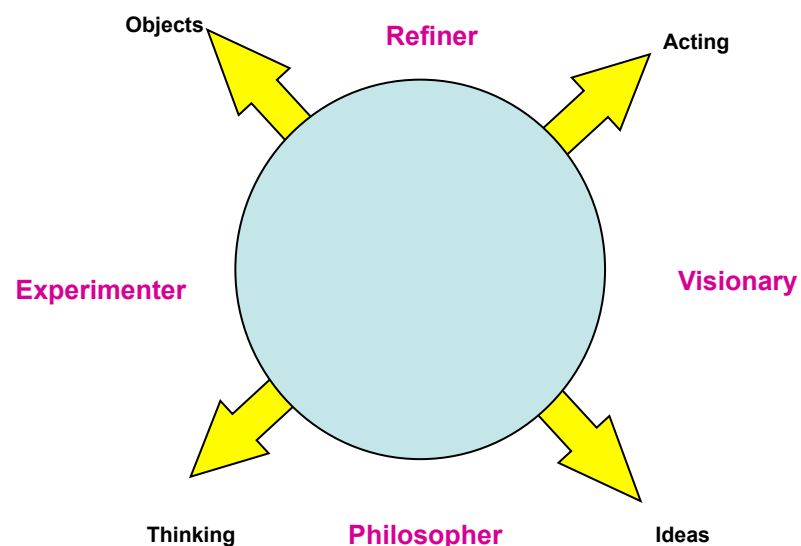
Innovation: Generating Alternatives

Refiner Style

- What's wrong with the way things are now?
- How can we improve what we're doing?
- Who is doing this better than we are?

Experimenter Style

- What are the main components of the current situation?
- How can we combine the current elements in new ways?
- What elements could we borrow from elsewhere?



Visionary Style

- What is the ideal approach?
- What would our wish list look like?

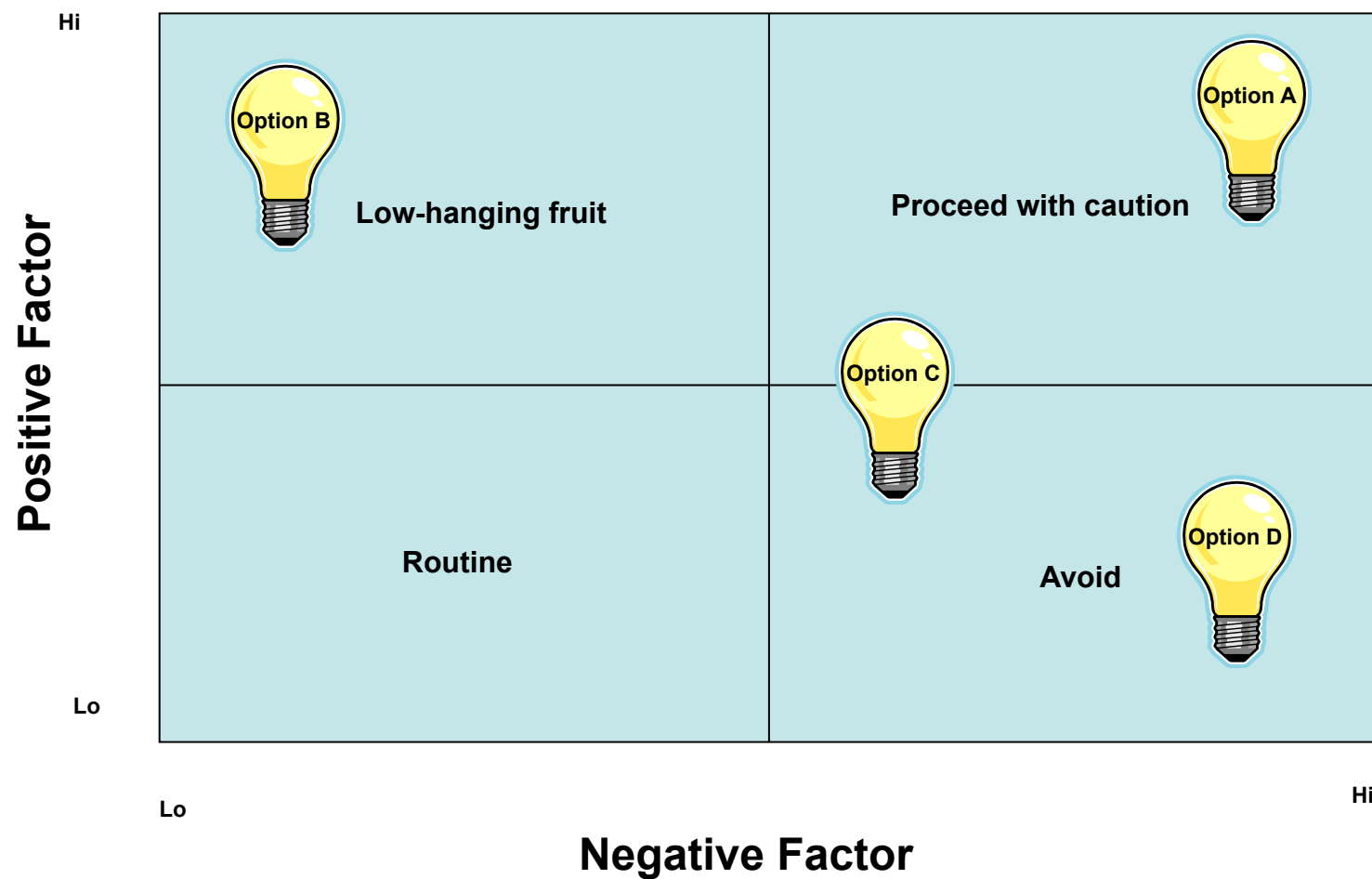
Philosopher Style

- What are our assumptions? What if we reversed those?
- What is this situation like? What are the analogues?

The Innovation Process

- Step 1: Define the benchmark
- Step 2: Generate Alternatives
 - Refiner – action-oriented, focus on detail
 - Experimenter – empirical, analytical
 - Visionary – vision-oriented, future-leaning
 - Philosopher – idea-oriented, lateral thinking, good with analogs
- **Step 3: Evaluate alternatives**
 - **Matrix method**
 - **Table method**
- Step 4: Implement

Matrix Format (e.g., benefit versus cost)



Tabular Format

Question: Where is the best place to retire?

Ranking code: 1 = highest, 5 = lowest

Option	Cost of living	Cultural events	Climate	Sports	Total
Ft. Myers	2	3	4	4	13
Des Moines	3	4	2	3	12
Seattle	4	2	3	2	11
Minneapolis	1	1	1	1	4
Santa Barbara	5	5	5	5	20

Ranking Options

- Descriptive (H, M, L) vs. numeric (1 – 5)
- Forced-choice ranking or not?
- Weighted criteria or not?
- Sometimes, it's useful to include current situation as one of the options.

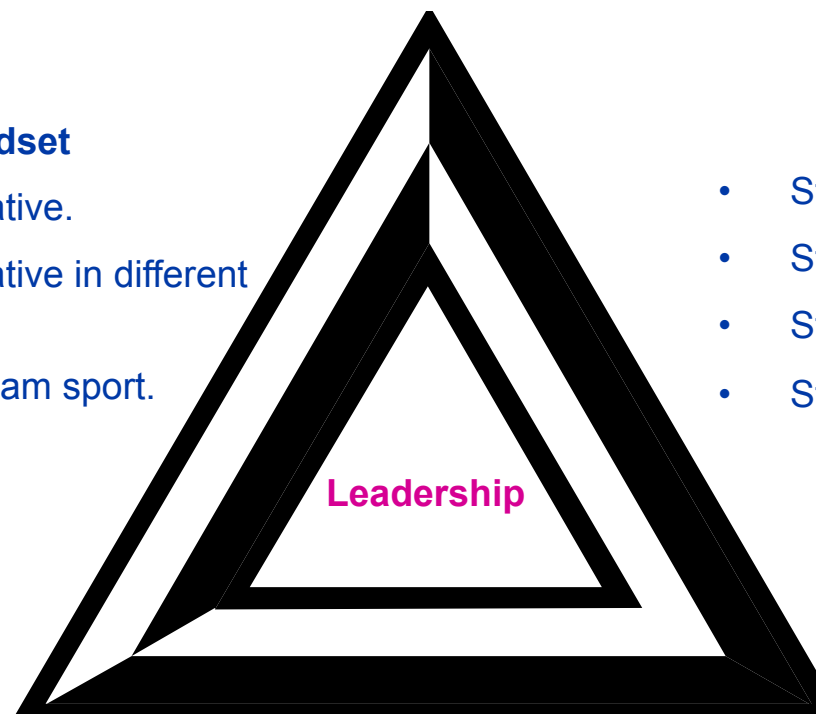
The Innovation Process

- Step 1: Define the benchmark
- Step 2: Generate Alternatives
- Step 3: Evaluate alternatives
 - Matrix method
 - Table method
- **Step 4: Implement**
 - **Don't try to do it all by yourself**
 - Find partner(s)
 - Include implementers in planning implementation
 - **Keep your outcome as the big picture**
 - **Use Gantt chart or work flow chart to organize work**
 - **Develop prototype, if possible**

Innovation in a Nutshell

The Mindset

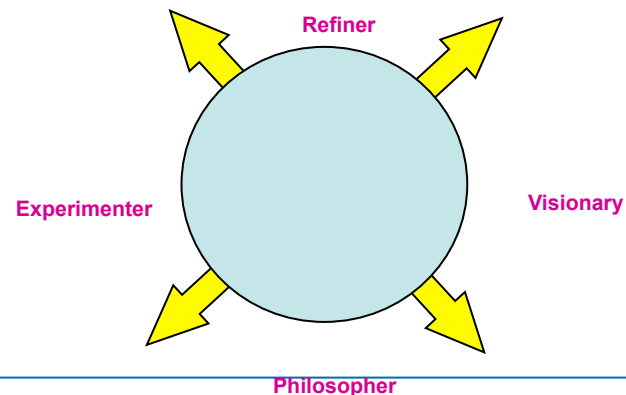
- We are all innovative.
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- Innovation is a team sport.



The Process

- Step 1: Define the benchmarks
- Step 2: Generate alternatives
- Step 3: Evaluate alternatives
- Step 4: Implement

The Skills



Backup slides

What is my style

- Refiner – action-oriented, focus on detail
- Experimenter – empirical, analytical
- Visionary – vision-oriented, future-leaning
- Philosopher – idea-oriented, lateral thinking, good with analogs

We actually need all 4 styles of people

- We may need them as a team
- We may need them at different phase of an enterprise

Where the Styles Work Best

