

ENGG 683 - Innovation and Entrepreneurship

Introduction

Dr. Ghada Nafie
Schulich School of Engineering

Winter 2022



Teaching Team

Dr. Ghada Nafie
Instructor | Entrepreneur



Inspiring Energy



Handbook of Functionalized Nanomaterials
for Industrial Applications

Micro and Nano Technologies

2020, Pages 731-774



UNIVERSITY OF
CALGARY

Chapter 23 - Natural
nanomaterials: an

Gerardo Vitale, Ghada Nafie, Afif Hattab



I&EC
research

Industrial & Engineering Chemistry Research

Cite This: Ind. Eng. Chem. Res. 2019, 58, 4988–4996

Oxy-Cracking Reaction for Enhanced Settling and De-watering of Oil Sands Tailings

Ghada

Departm

T2N 1

ABSTRACT



Teaching Team



FLORIAN ISUFAJ

PhD Candidate
Chemical Engineering

Education

- **BSc in Industrial Chemistry, University of Tirana (Albania)**
- **MSc in Chemical Engineering, ENSIC (France)**

Research Interest

- **Working on development of a cost-friendly Refinery Desulfurization Process for Transportation Fuels**

Teaching Team



Mehrsa Ehsani

Ph.D. Student

Entrepreneurship & Innovation
Haskayne school of Business

Education

- **B.Sc. in Industrial Engineering**
Isfahan University of Technology, Iran
- **M.Sc. In Industrial Engineering and Management Systems**
Amirkabir University of Technology, Iran

Experience

- **Senior Manager**
Textile Industry, Iran

Research Interest

- **Entrepreneurial Strategies in Resource-Constrained Environments**
Effectuation, pivoting, agility
- **Life Cycle of Businesses**
Different strategies at different stages of life cycle
- **Business Survival**
Prosperous Longevity

Teaching Team



Andishe Ashjari
Ph.D. Candidate
Entrepreneurship & Innovation
Haskayne school of Business

Education

- **B.Sc. in Mechanical Engineering (2008 – 2013)**
Sharif University of Technology, Iran
- **MBA- Strategy (2015-2018)**
University of Tehran, Iran

Experience

- **Business development expert (2014-2017)**
Various companies in Oil & Gas industry, Iran

Research Interest

- **Crowdfunding**
Dynamics of crowdfunding, serial-crowdfunders' behaviors and strategies
- **Digital Entrepreneurship**
AI and entrepreneurship, inequality in digital age

Course Format

- Two 75-minute Lectures per week
- One 2h and 45 minutes Lab once a week
- No midterm or final

Course Delivery

- Synchronous lectures online
- Breakout rooms

ZOOM

Learning Outcomes

- Innovation and Creativity
- The entrepreneurial mindset and opportunity recognizing mind
- Entrepreneurial Leadership
- Entrepreneurship Fundamentals
- Communication for Impact
- Startup team creation, roles, and teamwork



Commitment & Participation

- Active learning environment with many activities performed during the sessions to better explain and reinforce the concepts delivered.
- Attendance online is crucial.
- Students are expected to attend the sessions on time and be prepared to engage with their classmates, teaching assistants, and course instructor.



Breakdown

- *Quizzes*
 - Quiz #1
 - Quiz #2
 - Quiz #3
 - Assignments
 - Project
- 25% 40% 35%
- Mainly in groups* *1 project*



25%



40%



35%

Assessment Rubric

- Grading done in numeric
- Letter grade converts to a percentage
- Final percentage will convert to final letter grade

Letter Grade	Total Mark (T)
A+	$T \geq 98.0\%$
A	$92.0\% \leq T < 98.0\%$
A-	$89.0\% \leq T < 92.0\%$
B+	$85.0\% \leq T < 89.0\%$
B	$82.0\% \leq T < 85.0\%$
B-	$79.0\% \leq T < 82.0\%$
C+	$75.0\% \leq T < 79.0\%$
C	$68.0\% \leq T < 75.0\%$
C-	$60.0\% \leq T < 68.0\%$
D+	$55.0\% \leq T < 60.0\%$
D	$50.0\% \leq T < 55.0\%$
F	$T < 50.0\%$

Professional Email Communication

- Key communication format in industry
- Professional tone - not the same as texting!
- Clear subject line – Always start with **ENGG 525**
- Greeting and sign-off

Subject: ENGG 525 – Assignment 1 question

Hello Dr. Nafie,
Please... [polite inquiry here].

Thank you,
Student Name
Student ID #



Team Formation

- We will work in groups in this course – 5 members per group
- Zoom break out rooms – students collaborate with their teammates on project activities



ACTIVITY – Icebreaker

M U R A L



What is Entrepreneurial thinking?

- A different way of thinking
- Can be developed or improved
- Constant need to improve your skills
- Encourages you to overcome challenges
- Embracing failure or failing wisely
- Accept responsibility for any outcomes



Creative Process



Imagination



Creativity



Innovation

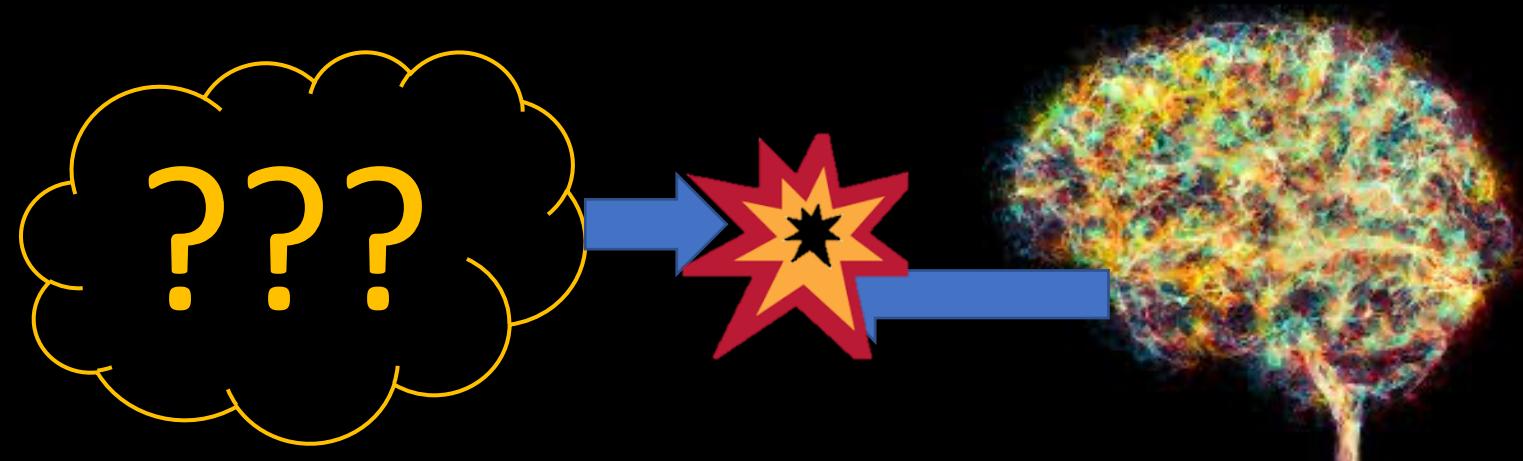


Entrepreneurship

Creativity

“ Creativity is the collision of two apparently unrelated frames of reference ”

- Arthur Koestler



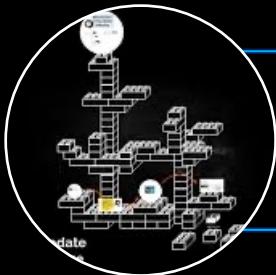
Innovation requires



Technology, Product or Service
Background



Knowledge of Engineering and
Science.



Skills to build and develop

DO NEW THINGS

Definition of Innovation



INNOVATION

=

INVENTION

X

COMMERCIALIZATION

Apply creativity or creative solutions to problems, challenges or opportunities and developing them

DOING NEW THINGS!!

Some new technology or process you develop in a lab or computer simulation or other..

Truly innovative creates an impact has a value

Making money \$\$\$\$
Sales

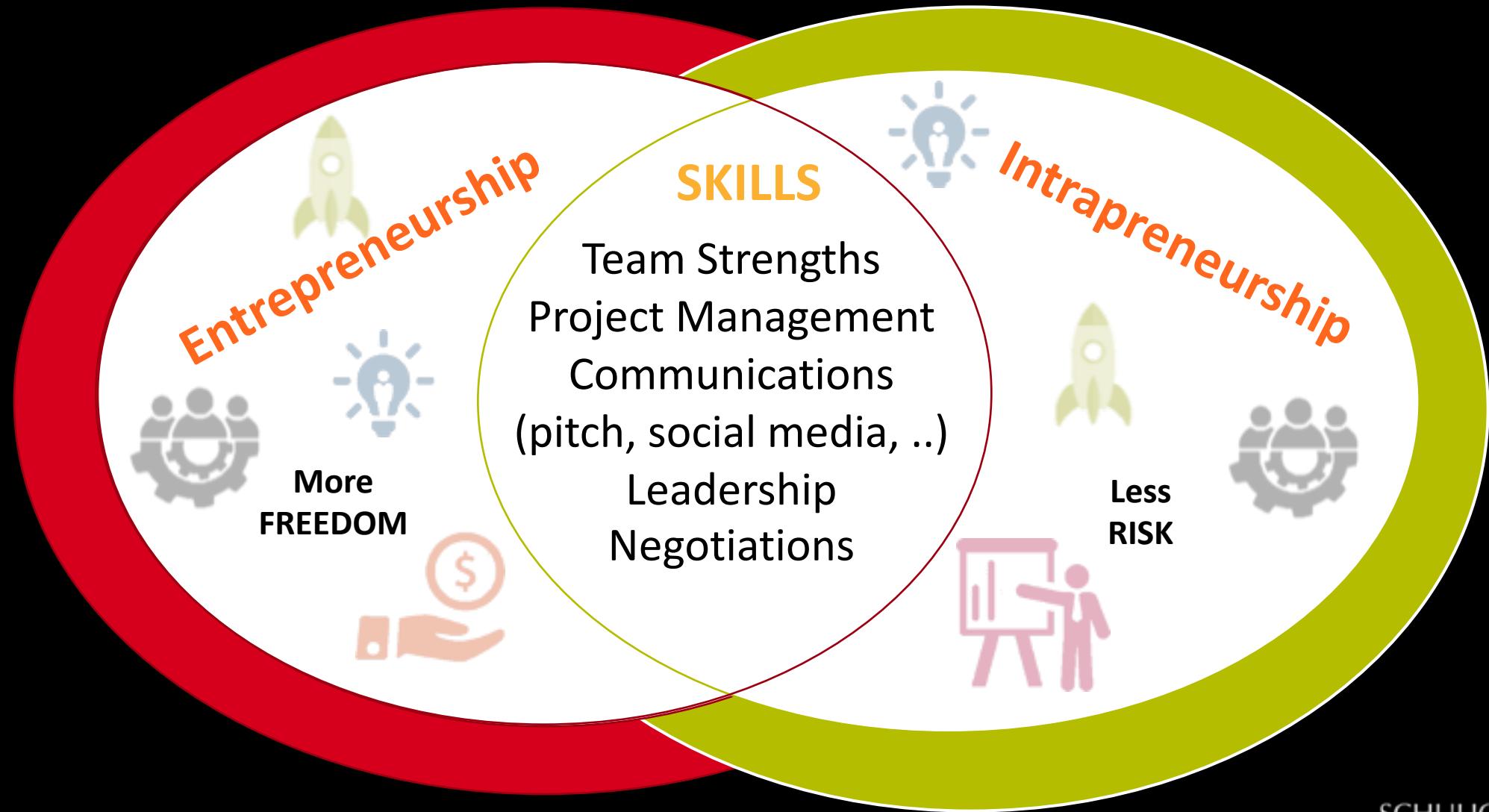
Having an idea is not enough!!



What is Entrepreneurship?

The process of starting and developing a new company, with the aim of delivering something new or improved to the market. This process is managed by entrepreneurs under considerable personal and financial risk. The new company captures value making it economically sustainable.

*Center for American Entrepreneurship - modified



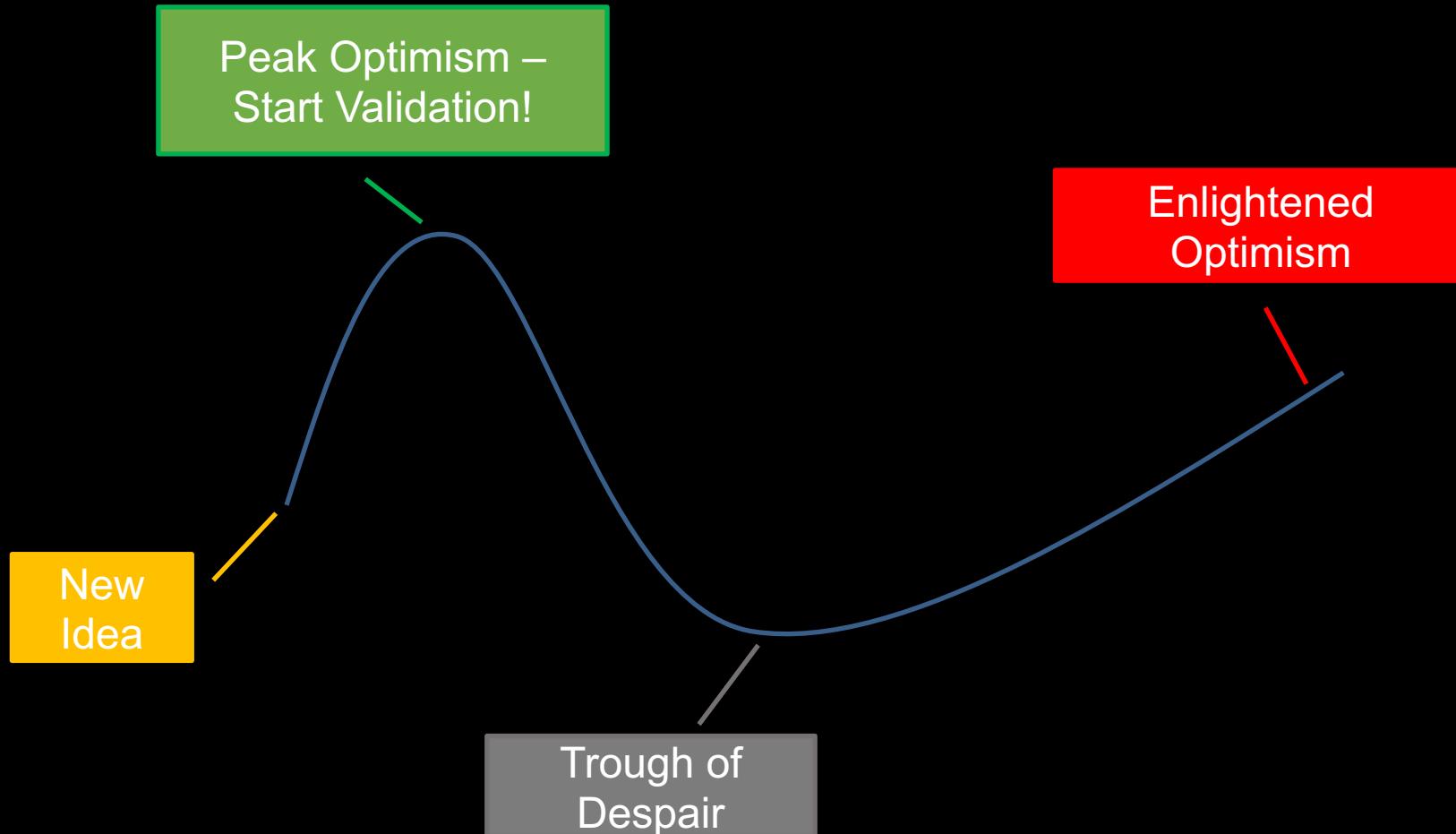
What motivates Entrepreneurs?

Success is relative and personal

- Financial
- Positive Impact
- Career
- Legacy
- Reputation or status



The innovation Journey



*adapted from Uncommon Innovations

FOCUS

What benefits do you provide?

- New *technology, product or service*
- Improvement
- Lower cost
- Social or environmental benefits

Influential Factors

Personal

- Passion
- Motivation
- Personality
- Alertness
- Risk managing

Environmental

- Government policies
- Infrastructure
- Suppliers
- Transportation
- Culture

Different kinds of Entrepreneurship

Commercial Entrepreneurship

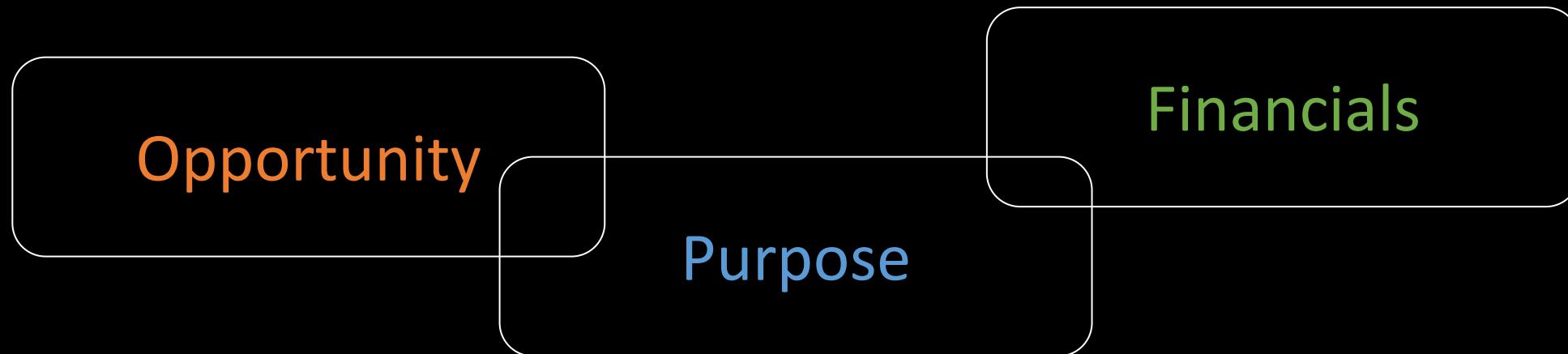
Profitable
Opportunities

Skilled Leaders

Social Entrepreneurship

Goal – To harness the power of entrepreneurs to develop novel solutions to societal problems.

Some differences between Commercial and Social Entrepreneurship



Think about this ...

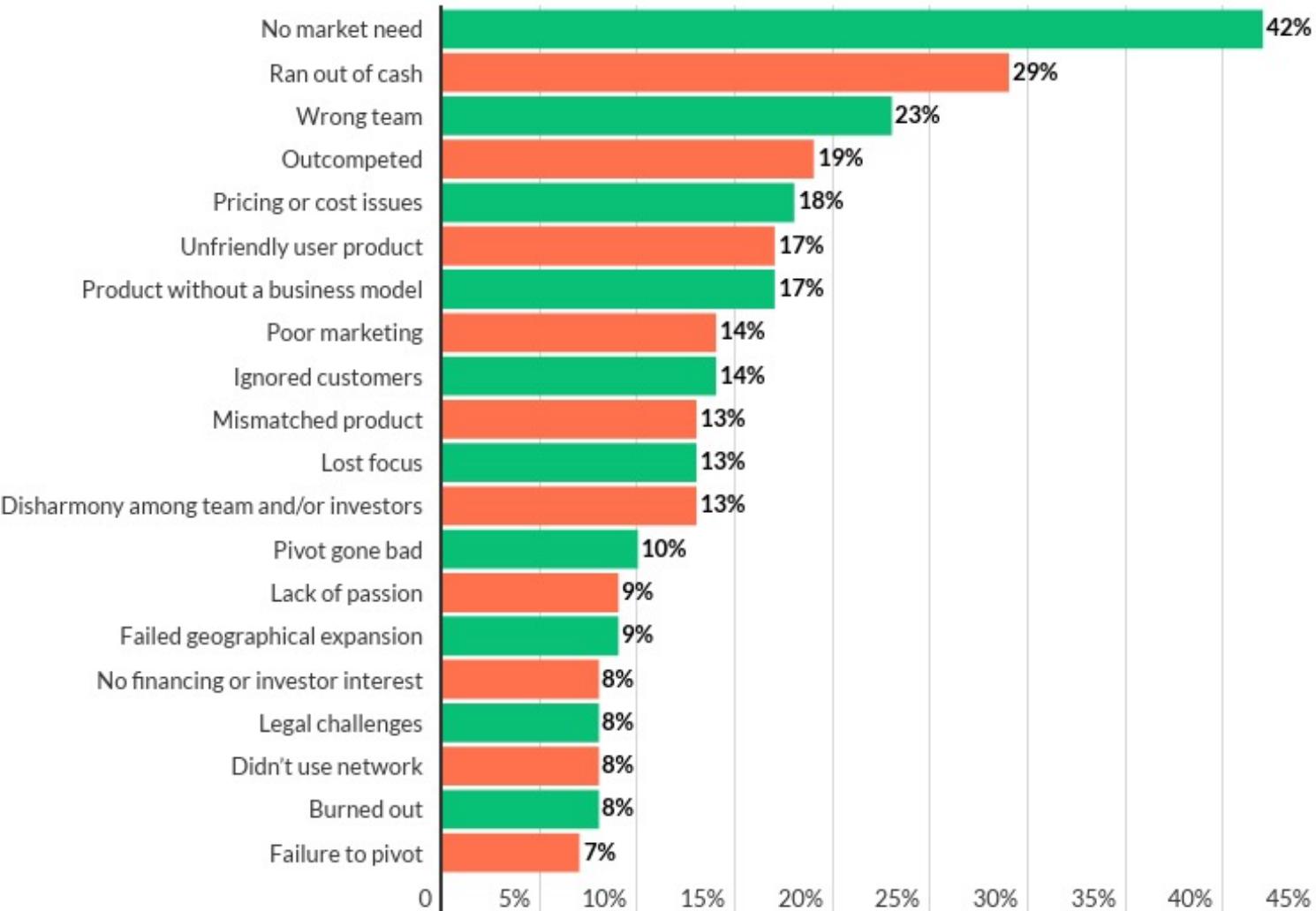
- Why is it that most people don't see new opportunities?
- Why do most people even when shown an opportunity not pursue it?
- Why do most people who do pursue and exploit an opportunity fail?

Percentage of businesses that fail



* Lending tree

20 Reasons Why Startups Fail



Source: CB Insights

Problems

Customers want to solve a problem



Customers buy **SOLUTIONS** to **PROBLEMS**

Don't necessarily care for your technology

Solutions vs. Disruptive Solution



Activity



**Find a
problem**



**What is
the
solution?**



**Who is the
Customer?**

ACTIVITY – Breakout rooms



THANKS!