

How do I know if my idea is a good one?

Kit Needham

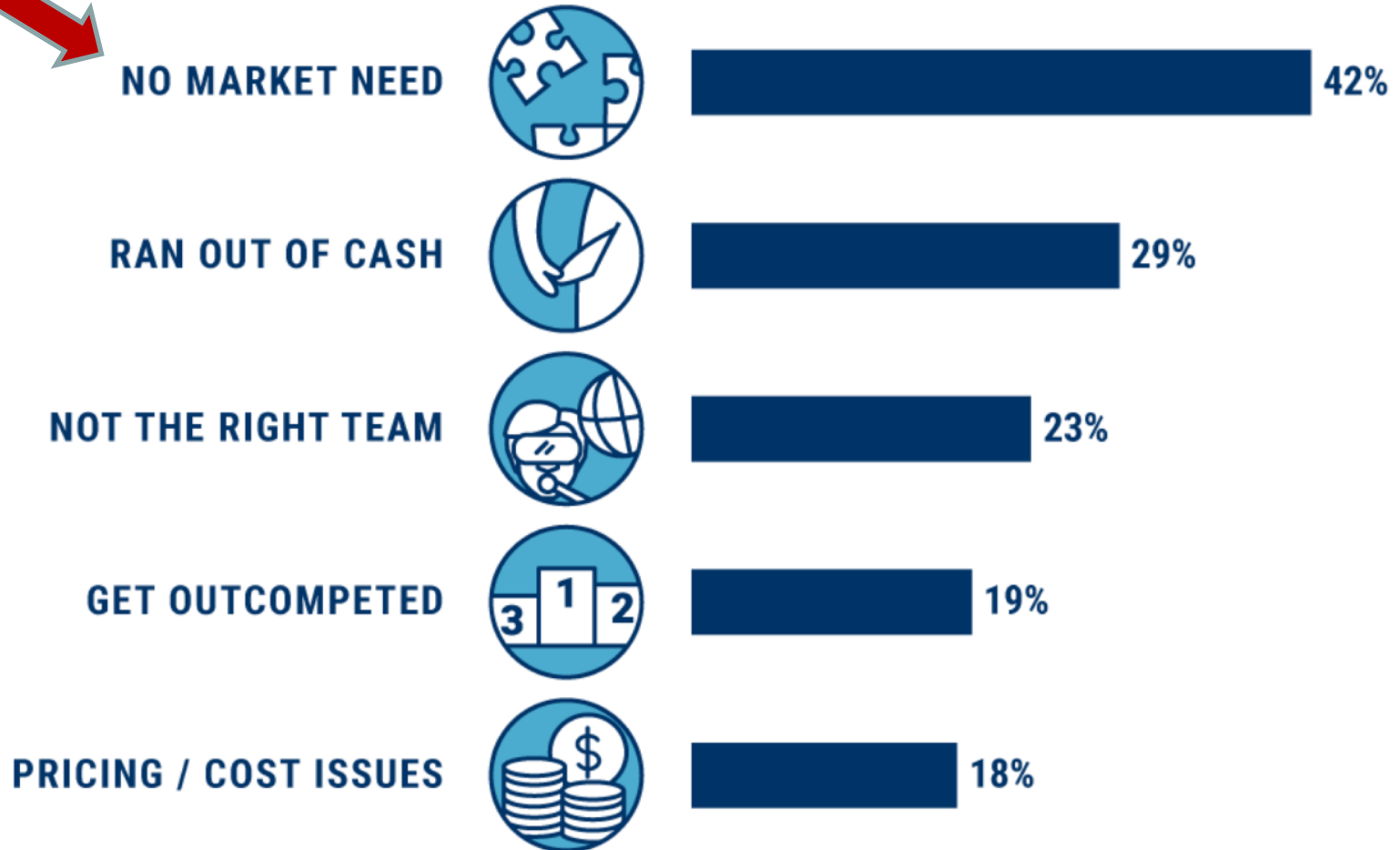
**Carnegie
Mellon
University**

Swartz
Center for
Entrepreneurship



**Ask
your
Customer!**

Top 5 Reasons Startups Fail



<https://www.cbinsights.com/research/startup-failure-reasons-top/>

Wrong Way

“Death by Demo”

“Here’s my idea. What do you think?”

“How would you solve the problem?”

Right Way

This is called

Customer Discovery

What is Customer Discovery

- **What** is the **pain/problem**
- **Who** is having the pain/problem
- **How bad** is the pain
- **How** are the “who” currently dealing with it
- **How** is that solution working for them

Why this is Important

Your idea is.....

a

Hypothesis

at this stage

Best Way to Validate your Hypothesis

“Get out of the Building!”

Steve Blank

- **Face to face interviews – Best**
- Skype
- Shadowing
- Telephone

On line ~~X~~ surveys

The technique

15 Minutes

5-7 questions

**Rule: You are not allowed
to talk about your idea!**

How to do this

- Identify key hypotheses/assumptions
- Brainstorm possible questions to prove/disprove hypotheses/assumptions
- Prioritize **5-7 questions** and at least 5-10 backup questions (see Customer Interview Guide)
 - Use questions that are **measurable**
 - E.g. “on a scale of 1-10...”; “how many times in the past three months...”
 - Include questions that are **qualitative**
 - “What do you like most about; Least about....”

Sample Hypotheses

What assumptions do we have that if proven wrong would cause us to fail.

- The problem my customer wants to solve is?
- My target customer will be....?
- Why can't my customer solve this today?
- The measurable outcome my customer wants is...?
- I will make money/revenue by doing....?
- I will beat my competitors because.....?
- My biggest financial/technical/engineeringrisk is...?

Sample Questions

- What are the top 3 challenges related to _____? How often do they occur?
- How much time do you spend on those challenges?
- Can you tell me a story about the last time that challenge happened and what you did?
- What, if anything, have you done to solve these challenges?
- What don't you like about the solutions you tried? OR On a scale of 1-10, how would you rates each solution? Why did you give it that number?
- Who has to approve purchases? Do you need any approval to try them?
- Who else should I talk to?

Customer Interview Guide

Segment:

Title/Job:

Key Hypotheses to test (what assumptions do we have that if proven wrong would cause us to fail)

Key Questions to ask (to prove/disprove the hypotheses)

1 – 5 questions per hypotheses

Where the magic happens #1

Always ask

“How are you solving it now (or tried to solve the problem in the past)”

“On a scale of 1-10, how would you rate that solution?”

“Why did you give it that number”.

Write down

- everything they say,
- In the order they are saying it
- In their words.

Here's Why

- They are giving you the **feature list** – what they view as really important.
- They are giving you the **feature priority**
- They are giving you **marketing language**
- They are giving you deeper **knowledge of the competition**

Where the magic happens #2

Listen for the **unexpected**.

- If they said something you weren't expecting but seems relevant, ask "tell me more".
- If there seems to be substance
 - Include it in future interviews
 - Go back and ask past interviewees

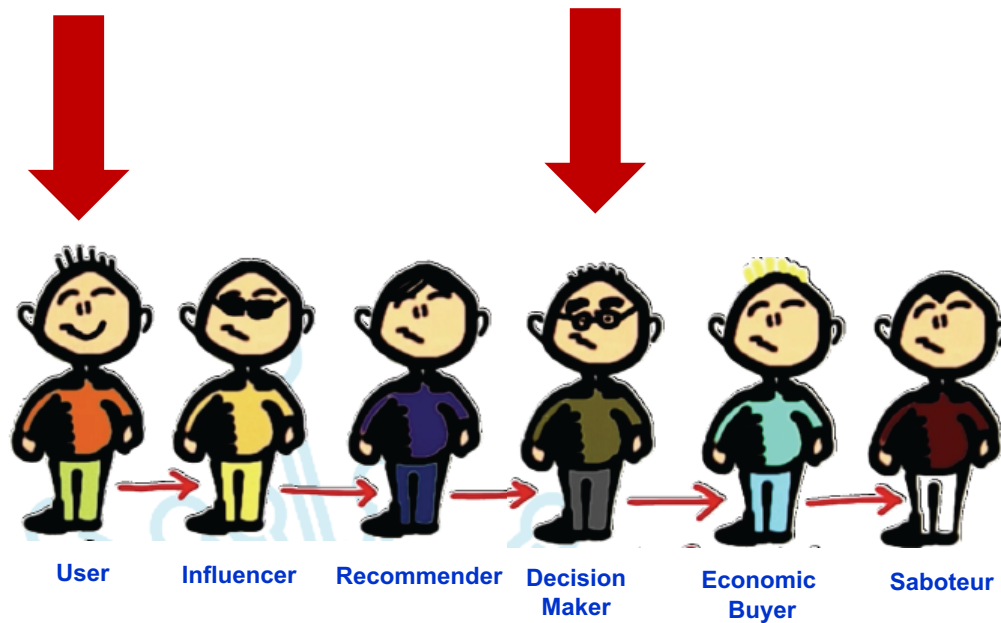
Here's Why

This is where **pivots** happen!
(before you've wasted time and money)

How to interview

- Plan who you want to interview
 - Demographics that describes your **stakeholders**
 - **Buyers/Decision-makers**
 - **Users**
 - **Influencers (including possible saboteurs)**
 - Who are they
 - Where will you find them

Who Is Your Customer?



Ecosystem of people you need to understand
, satisfy and appeal to in order to buy your
product

D R O N E S

Military

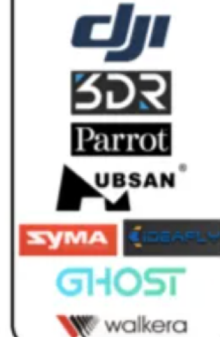


Commercial

Agriculture, Construction, Infrastructure, Oil & Gas, Utilities, Mining, Inspection, Wildlife, Environment, Humanitarian, Public Safety Mapping, GIS, Surveying, Cinematography, Videography, Advertising, Law Enforcement, and Maritime.



Consumer



Auto-Follow Drones / Computer Vision



Transportation / Delivery



Drone Marketplace



Insurance / Tracking / Safety



OS / Deploy Systems / Programmable



Education / Training / Certifications

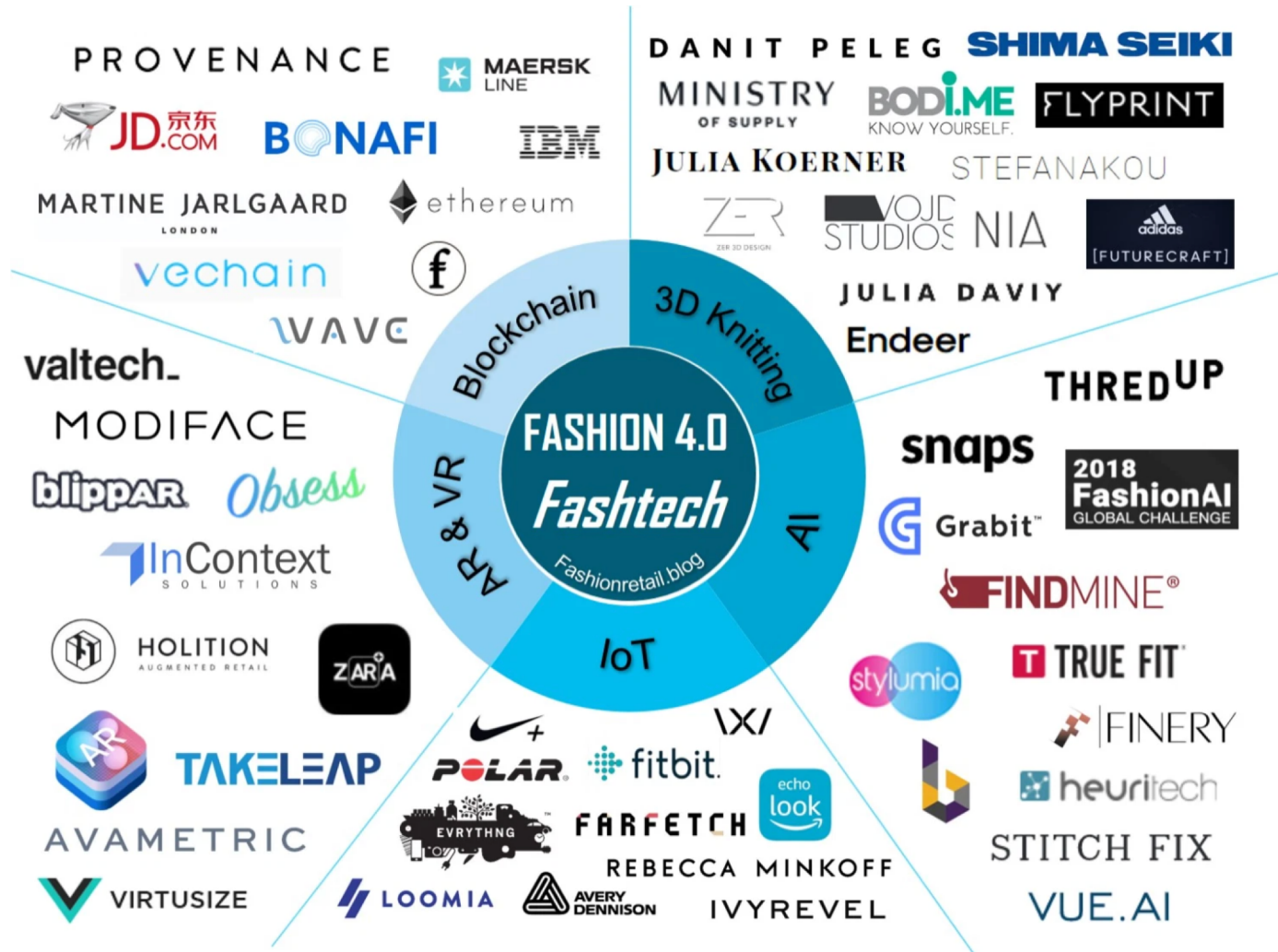


Drone Data / Analytics / Mapping



FASHION

The Fastech Ecosystem



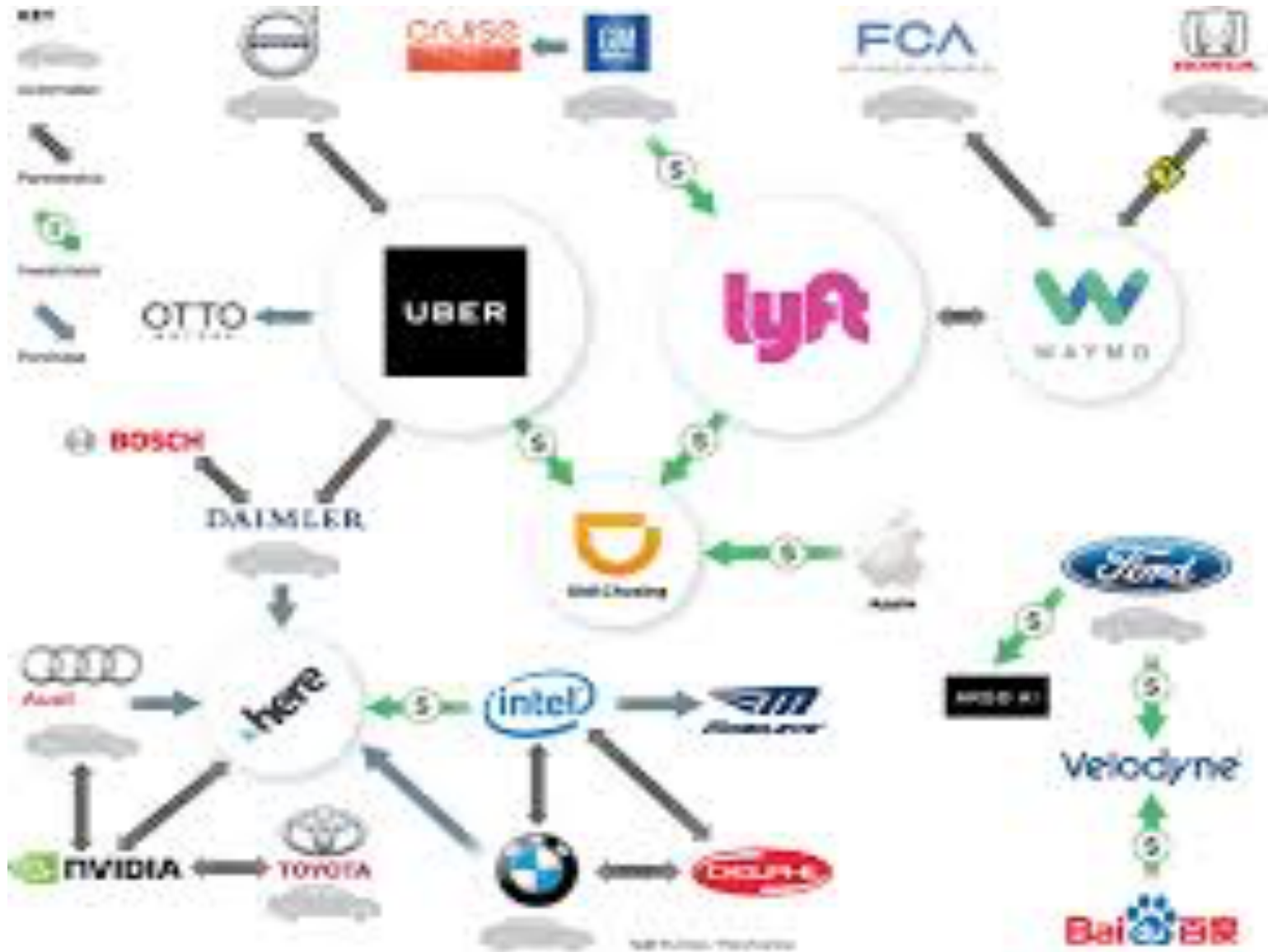
CHEMICALS

The chemical industry value chain

The chemical industry enables our modern living standards through the conversion of basic energy into consumer products. The underlying factors that lead to success for companies in the chemical value chain are low-cost feedstocks, high levels of operational efficiency, continuous innovation of products and processes, and robust growth in the end markets the industry serves.



SELF-DRIVING AUTOS



Renewable Fuels Association



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- + Absolute Energy, LLC
- + Ace Ethanol LLC
- + Adkins Energy LLC
- + Aemetis, Inc.
- + Al-Corn Clean Fuel, LLC
- + Badger State Ethanol, LLC
- + Big River Resources West Burlington, LLC
- + Butamax Advanced Biofuels, LLC

Associate Members

- + Advanced Fuel Dynamics
- + AgMotion, Inc.
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- + Barchart
- + BASF Enzymes LLC
- + BetaTec Hop Products, Inc
- + Bion
- + Buckman

NAATBatt International

Advanced Battery Business Directory

Search for products and services from the leading companies in the North American advanced battery industry

INSTRUCTIONS

Use this page to search for advanced battery-related products and services in which you have an interest from among NAATBatt member companies. You may search by any or all of the following methods:

1. In Part 1, check any or all of the Product Category boxes that are relevant to your search.
2. In Part 2, enter in what you are looking for. You may leave Part 2 blank.
3. Hit the "Submit Search" button at the bottom of the page.

Check any or all of the following boxes that may be relevant to your search:

Materials and Composites

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|--|---|---|--|
| <input type="checkbox"/> Zinc | <input type="checkbox"/> Lithium Brines | <input type="checkbox"/> Spodumene | <input type="checkbox"/> Lithium Carbonate |
| <input type="checkbox"/> Lithium Hydroxide | <input type="checkbox"/> Graphite-Natural | <input type="checkbox"/> Graphite-Synthetic | <input type="checkbox"/> Silicon Anodes |

- [Advanced Battery Concepts](#)
- [American Battery Solutions](#)
- [American Manganese Inc.](#)
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- [Bitrode Corporation](#)
- [American Battery Solutions](#)
- [Amphemol Advanced Sensors](#)
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- [Electric Applications Incorporated](#)
- [Everledger](#)
- [Forge Nano Inc.](#)
- [Global Battery Solutions LLC](#)
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- [Lithion Recycling](#)



Get Started

“I am doing some research for XXX. “Do you have **15 minutes** to answer a few questions” or I have 5-7 questions...”

- May need to say “this is **not a sales call**”
- **‘Student Card’** works well
- Start with a few Friends/Friendlies to practice
- Then go after people you don’t know
 - For B-B, C-level is not always the best
- Consider asking
 - **Who else should I talk to?**
 - **What else should I have asked?**

Hints for Questions

- Try to **avoid “Have you ever....?”** **Use**
Better - “How often in the past (pick a relevant time period) have you....?”
- **Careful of “Would you ever....?”** type questions.
Instead, try to **frame your question on past behavior** which is a much more reliable predictor of how the customer will actually act. “When was the last time...? How many apps do you have that you have paid for...?”
- The questions are **not a checklist**. They are a prompt to possibly explore another aspect.
- Be open to iterate or **follow up and explore more deeply** on what the interviewee is saying.

Hints for Questions

- **Asking job title/position and how long someone has been in the job/position or status** helps you to judge the level of experience (and doesn't count in the '5-7 question' quota).
- You will need **a different set of questions** for the different stakeholders.

How Many?

Recommended

100+

Stakeholders

Making it Work

- **Keep notes** – you'll forget.
- Stop and **assess periodically**
- **Adjust** questions and plan as needed

Benefits

- Avoids **unnecessary ‘pivots’** (lost time and money)
- Potential customers are ‘giving’ you the **compelling sales pitch**
- Helps **prioritize** what is most important
- Learn more about the **competition**

More Benefits

- Get **first hand knowledge** of your target audience
- Can measure degree of **enthusiasm and interest** through observation
- Starts to build the **relationship**
- Helps identify potential **reference customers/pilot participants** (for Customer Validation Phase)
- **Investors** will want to know.....

Words to Live By

Fall in love with the problem....

....not your solution!

Words to Live By

DON'T SELL WHAT YOU MAKE

MAKE WHAT YOU CAN SELL

- Steve Blank

Best Resource

“Talking to Humans”

“Testing with Humans”

Giff Constable

Ask yourself.....

...Is it a **REALLY Big**
Problem?

...Is it a **Really Big** Problem?

- **How many** people or companies have this problem? (Is it a big target market?)
- **How much time or money is spent (or lost)** each year because of this problem? (The more it costs them, the more they are motivated to pay for your solution)
- How well **is their current solution working** for them? (They will happily switch to your solution because their current one isn't working very well.)

Ask Yourself.....

- Is your solution **10X better** than the alternatives or **3X cheaper**?
- Is it a “**Need-to-Have**” vs “Nice-to-Have?”
- Will it be a big opportunity that **will attract investors**?

Ask Yourself.....

“..... will it scale?”

Ask Yourself....

- Do your product/service **margins increase with volume?**
 - COGs
 - Installation/Customization
 - Service/maintenance
 - Staff ratio to sales

Examples of Businesses/Products that Scale Well

- **Software** (MS Word, Excel, Quickbooks)
- **Apps** (Pandora, Twitter, BudgetSimple)
- **Mass Market** items (My Keepon, FitBit)
- **Hardware** that is standardized or uses standard parts (Air conditioners, remote controls)

Ask Yourself....

..... How will I **sell** this?

- **How** will this be done?
- **Who** will do this?

Start thinking about this on **DAY 1**

Customer Segments

Phase 1 Customer Discovery

Is this a big problem that a lot of people have where the current solution isn't working e.g. am I solving the right problem?

Phase 2 Customer Validation

I am solving the right problem. Am I solving it the right way?

Phase 3 Customer Acquisition

Strategy and methods for getting customers to buy your product or service at a price where you can be profitable.

Customer Validation

- Go back to those you interviewed who were the most interested or helpful
- Ask for their feedback on your proposed solution

At least one will ask if they can try it!

Business to Business Case Study

A Case Study: RistCall





RistCall Hypotheses

- Slow response leads to serious and expensive injuries
- Nurses are not responding faster because of lack of awareness that the patient needs help
- Hospital Administrators want (would pay for) data on # of requests and response time

How RistCall Tested the Hypotheses

Identified potential target segment(s)

- Hospitals
- Nursing Homes

Identified stakeholders in target segments

- Users: nurses and patients
- Influencers: Patient's families, Patient Satisfaction Manager
- Recommender: Nurses, patients, Nurse Administrator, Patient Satisfaction Manager
- Decision Maker/Economic buyer: CFO
- Saboteur (Potential): IT Manager

Used Industry Survey Data (size of the problem)

How RistCall Tested the Hypotheses

On site “shadowing/ observing”

Interviewing in-person using hypothesis-validating questions.

Asking who else to interview

Different set of hypothesis and questions for different **stakeholders**

- Patients
- Nurses
- Nurse Schedulers
- Patients’ family/caregivers
- Patient Satisfaction Managers
- Insurance companies
- Doctors
- Buyers/Decision Makers
- Hospital CFO/ Accountants
- IT Manager

Sample Hypotheses Testing Questions

Hypothesis: Slow response leads to serious and expensive injuries

Stakeholder: Nurse Administrator (Staffing scheduler)

- How do you learn that a patient needs help? (current solution)
- What do you like most? What do you like least?
- How often in the past week was the Response Platform unmanned because the nurse was helping a patient?
- Can you give me an example of a recent issue because no one quickly responded?

Sample Hypotheses Testing Questions

Hypothesis: Nurses are not responding faster because of lack of awareness that the patient needs help

Stakeholder: Nurses

- How do you learn when a patient needs attention?
- On a scale of 1- 10, how is that system working for you?
- Why did you give it that number? (what they like most/least about the current solution)

Sample Hypotheses Testing Questions

Hospital Insurance/Cost Manager: Slow response leads to serious and expensive injuries

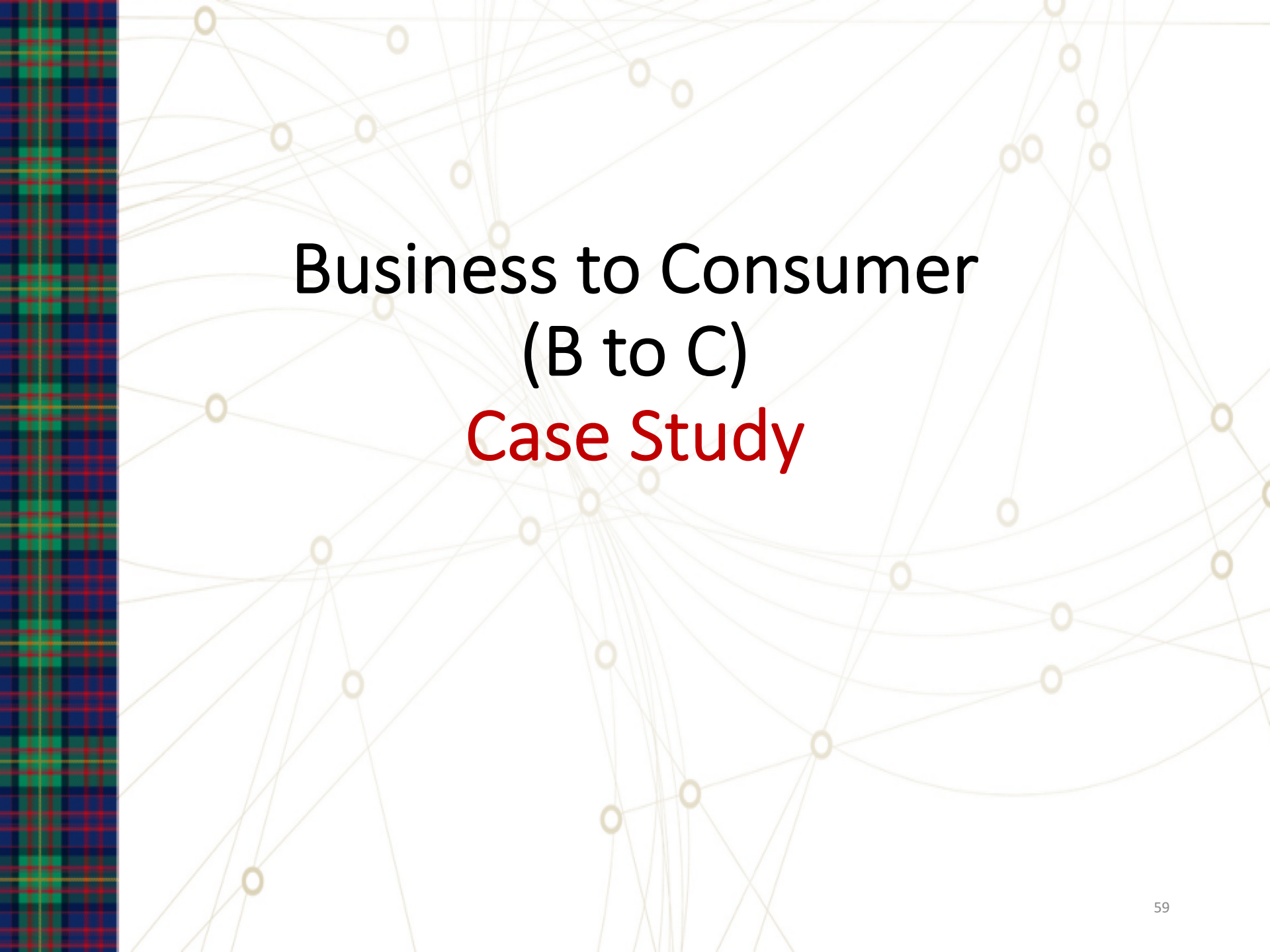
Stakeholder: CFO/Account Management

- What happens when patients injure themselves while in hospital?
- In the past month, can you give me an idea of how many times this occurs? Why?

RistCall Shadowing, Interview and Research Learnings from Customer Discovery

- It's a \$1.2B annual problem for hospitals (secondary research)
- Medicare is beginning to reimburse hospitals based upon Patient Satisfaction ratings.
- Nursing homes have the need but not the financial incentive
- IT personnel don't care – Ristcall only accessed existing Internet
- Patient Satisfaction Manager was a huge influencer/recommender
- The buyer/decision maker was the CFO

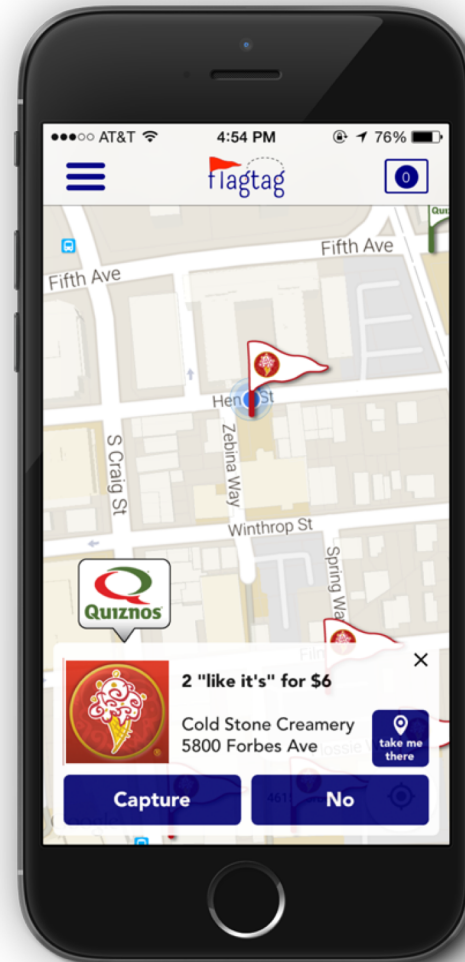
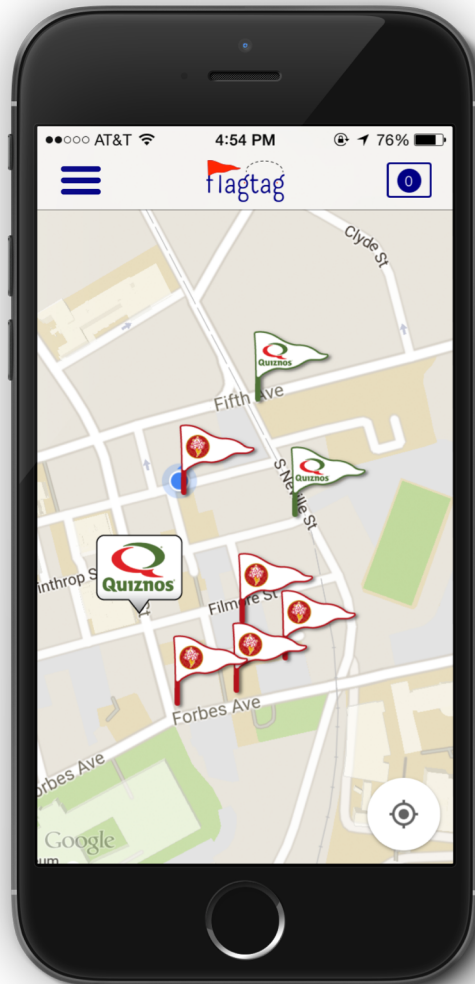
Hospitals were willing to pay \$5k to test Ristcall



Business to Consumer (B to C) Case Study



Users earn real-life prizes in a gamified, augmented reality, Easter egg hunt



How we add value



Consumers
(targeting students)

- Find discounts
- Discover new businesses
- Have fun while saving via gamified incentives



Businesses

- Leverage an efficient marketing scheme
- Bring new faces through the door
- Receive analytics with respect to user habits and coupon efficiency



Customer Discovery Survey Results

Key Demographics for Student Stakeholders

CMU: 100 Interviewed – 56 male, 44 Female

Pitt: 50 Interviewed – 25 Male, 25 Female

Chatham: 50 Interviewed – 3 Male, 47 Female

(Later interviewed 100+ more at Carlow,
Duquesne and Point Park Universities)



Sample questions

“On a scale of 1-10, how likely are you to deviate from your go-to restaurant for a better deal at a competing restaurant?”

“On a scale of 1-10, how difficult would you say it is for you to organize a bunch of your friends in a group activity or outing?”

“How many apps on your phone have you paid for?”

*“When was the last time you played CTF?”
(why not more often?)*

“Would you play CTF if it were an IM here?”



Key Findings

“On a scale of 1-10, how likely are you to deviate from your go-to restaurant for a better deal at a competing restaurant?”

- Takeaway: College students are more likely to seek a deal than commit to a restaurant.
- Product Design: Make sure a key component to the game is interaction with businesses.
- Marketing Message: “Capture the flag, but also capture great deals”



Key Findings

“On a scale of 1-10, how difficult would you say it is for you to organize a bunch of your friends in a group activity or outing?”

Takeaway: Organizing groups of friends is a pain point for college students

Product Design: The game setup in the app needs to be intuitive so it is a helper, not a pain.

Marketing message: “You make the friends; we’ll make sure they are organized.”



Key Findings

*“How many apps on your phone have you paid for?
What are they? (if answered yes).”*

Results:

No females at CMU, Pitt or Chatham paid for any apps.

22% of males at CMU and Pitt had any paid apps on their phones – all were for games

Takeaway: Fees from app is not part of the revenue model.
(nor were they planning on it –just wanted to check.)



Key Findings

“When was the last time you played CTF?” (why not more often?)

Takeaway: Students had not played recently and the reason was because of lack of time.

Product Design: Spread game over longer time period where you don't have to commit a block of time.

Marketing Message: “Play on your own schedule.”



Key Findings

“Would you play CTF if it were an IM here?”

Responses: CMU: 80% - yes, 10% - maybe
Pitt: 48% - yes; 24% - maybe
Chatham: 2% - yes, 98% - no

Conclusions:

- Key was Time, Friends, And Incentives
- Chatham was not an active group

Customer Discovery

What they did right:

- Interviewed a large number of students from a variety of campuses
- Results helped to significantly restructure initial game design
- Derived key marketing messages from the interviews that were successful in getting students to download the app



Customer Discovery

Where they missed the mark

- Misinterpreted the concern for time to mean 'design a shorter game time' rather than less time for games at all.
- Asked an 'aspirational' question i.e. "*Would you play.....?*" Responders meant well but simply didn't act as they said they would.



What They Learned

After going through AlphaLab and launching the app:

- Students:
 - Very willing to download the app and open it
 - Mostly interested in capturing the flag for the discounts but not at all in the game aspect.
 - A little slow to redeem the coupons (flagtag is paid a bonus for each redemption)
- Businesses
 - Very well received
 - Most effective of all the coupon options they had tried by 3X



End Result

Fall 2016

- Verified the business model
- Revised the app
 - Simply capture coupons – no game aspect
 - Provided an incentive to redeem the coupons more quickly

Relaunched Spring 2017

Folded Summer 2017

Business to Business (B to B) Case Study



Proposed Product

- **Add-on hybrid system** for tractor trailers
 - Uses **regenerative braking to capture power** when the vehicle is slowing down that can be reused to accelerate.
- **Value proposition to the customer:**
Reduces fuel consumption by over 30% with an **ROI of less than 1 year.**



Sample Questions

- **How much** on average do you spend on fuel? % of annual budget?
- Have you done **analysis on fuel usage** that you can share?
- What are you **currently doing now** to reduce your fuel costs?
- On a **scale of 1-10, how well** are those techniques working?
- **Why** did you give each that number?



HYLIION

Interviewed

- Fleet **managers**
- Fleet truck **drivers**
- Independent truck **drivers**
- Trailer **manufacturers**
- **Mechanics** that service the fleet
- Companies with **proprietary fleets**
- Industry **association staff**



HYLIION Where did they find them

- Industry conventions
- Truck stops
- Fleet owners' headquarters
- Trailer sales offices
- Telephone

Findings

- **6 million** trailers in the USA
- Each trailer averages 6.5 mpg = **\$85,000 fuel costs per year per trailer**
- **52 Billion gallons** of fuel consumed yearly
- **31% = \$46 B in potential fuel savings**
- **\$25k per unit x 6M trailers = \$150B potential market**



HYLIION

Findings

- Largest value/ROI for **long-haul fleets**
- 15% of fuel is used to **run the cab at night** for heat/AC and electronics
 - Shaking cab results in **poor sleep** – which can lead to accidents
 - (This was the ‘outlier’) that helped sell management
- **Less wear and tear** on the diesel engine
- **Reduced emissions**



HYLIION

Conclusion

Big Problem

Big Market

Great Product

Great Business

Pivot from B to B
to
B to C

Case Study

BeatBots



BeatBots

Initial Hypothesis

- Therapy tool for therapists who work with **severely autistic** children
- Price: \$25k (includes hardware and software)
- Target audience: **Clinics that specialize** in therapy for severely autistic children

BeatBots

Product worked extremely well as a therapy tool
to engage highly autistic children

However.....

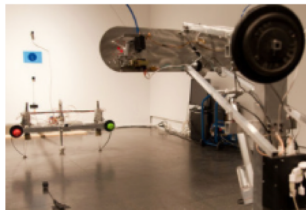
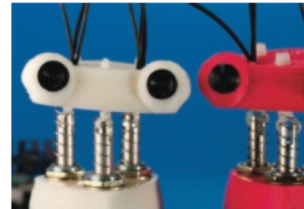
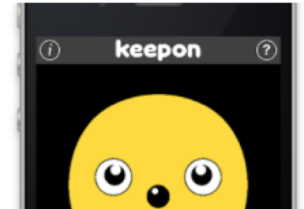
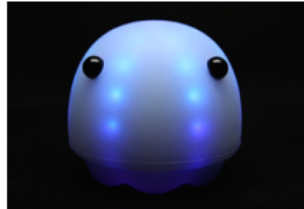
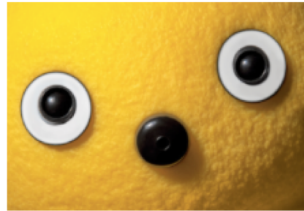
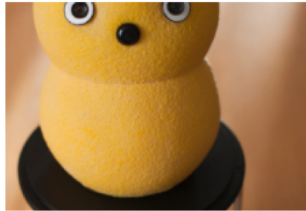
Size of Target Market: **100 clinics worldwide**

Great Product
Lousy Business

BeatBots



Pivoted to a retail product for mass market for \$50 and licensed it a toy company that would manufacture, package and get BeatBots on the shelves of major retailers.



What investors are looking for



Why wait[®] was a good investment

“ We want to **invest in large markets**, ...if you have a fantastic team with fantastic products but it's in a small market, there's a smaller type of outcome that can happen e.g they're swimming in a smaller pond. If you have a big and expanding market, it's great to have a great team and product, but if you don't, you still have a chance. “

“.....We focus on **investing in trends shaping the landscape** over the next 10 years. **Casual dining is a multi-hundred-billion business in the U.S. alone**. Everybody's got to eat.”

“.....What they're doing **solves an acute point**, waiting to get in line, waiting to get a check. They have a very elegant solution.”

Nick Solaro of Drive Capital, a Columbus, Ohio-based \$250M VC fund on their \$10M investment in NoWait in May 2014 (Source: Pgh Business Times)

Sold to Yelp for **\$40M**

Carnegie Mellon University

Swartz Center for Entrepreneurship

Programs

- **Project Olympus Incubator Program** (students, faculty, alumni, staff)
- **Innovation Scholars** (undergraduates)
- **James R. Swartz Entrepreneurial Fellows** (graduate students)
- **Innovation Fellows** (senior PhD students and postdocs)
- **NSF I-Corps Site** (research commercialization)
- **Venture Bridge Accelerator program** in S.V (all)

Workshops & talks

- **CONNECTS** (all students)
- **Inside-Out: Research Commercialization** (faculty, PhDs and postdocs)
- **Swartz Entrepreneurial Leadership Series** (all)

Events & competitions

- **Bootcamp** (September every fall)
- **LaunchCMU** (showcase for investors and entrepreneurial alumni)
- **Project Olympus Show & Tell** (showcase for community)
- **Global Entrepreneurship Week** (November before Thanksgiving)
- **McGinnis Venture Competition** (March every spring)

How to connect with us:



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@ProjectOlympus



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weekly bulletin

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Q&A

kit@cs.cmu.edu