

TE 250: Week 7 Market Validation

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Agenda

- • Assignments – Past/Present/Future
- Ecosystem Mapping
- Market Validation
- Examples
- Team Work Time

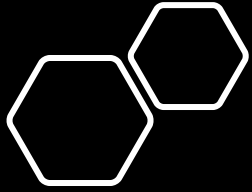
Homework policy

- Receiving a lot of late submissions – getting too confusing
- Late assignments accepted but at 50% penalty to grade would have received if on time.
 - 8/10 becomes 4/10 etc
- Missing in-person class presentation results in 50% penalty unless absence is excused according to university policy (assumes you participate online)
- Missing in-person class presentation completely results in 0 unless absence is excused according to university policy
- Excused absences will be made up with additional assignment

Assignment #3 – Individual Assignment

- Build a petal diagram to highlight your strengths and weaknesses.
- Perform a SWOT analysis for your business idea.
- This is an individual assignment, not a team assignment.
- Submit your assignment in the format you prefer, graphic or list.

FEEDBACK




Assignment #4 – Individual Assignment

Miro Tutorial Review

Draft 3 value propositions for each of the 3 stakeholders within the same business model canvas (9 total). Use the VP Canvas as a guide.

Identify the VP that best represents the PRIMARY VP for your business. Now complete a Business Thesis in the format as provided in class (Elevator Pitch).

The Business Thesis Template is available in the Resources Tab in Compass as well.



Assignment #5 – Individual Assignment

- Build a Customer Interview Plan Template
- Use the provided Customer Interview Plan Template as a guide
- Completing it as a guide for your first 2-3 team interviews
- In subsequent weeks, your team will "divide and conquer" to complete more interviews.
- At this point, use the template individually to prepare for your own personal interviews.
- Note due date extended to Saturday Mar 5

Interview plan example

- **INTERVIEW TOPICS (you won't cover all of these in any given interview)**

- **CURRENT ECOSYSTEM/MARKET UNDERSTANDING**

- Process (Information, \$'s, Product/Materials or Service): typical day, steps, dependencies, flows, timing, bottlenecks, things that go smoothly, interruptions/pauses. Place in overall system/ecosystem, key equipment, important system resources.
- Question 1: Tell me about your school.
- Question 2: Tell me about a typical day in your classroom.
- Question 3: Tell me about a typical lesson or lab that utilizes microscopes in the lesson.
- Question 4:
- Question 5:
- People: roles, titles, interactions, key players
- Question 1: Tell me about how your microscopes are purchased and maintained.
- Question 2: Who decides how much can be spent on microscopes? When is that decision made?
- Question 3: Who decides where to purchase microscopes?
-
-

- **CURRENT HYPOTHESIS/ASSUMPTIONS TO TEST**

- **Problem/Needs**: You are trying to uncover problems that are big enough that they **MUST HAVE** your solution. Think about: satisfaction, dissatisfaction, problems, needs, quality, delays, excessive costs, what best performance looks like, what upsets the system?
- Pains (with detail about magnitude and who else is affected)
- Question 1: What is the hardest part of teaching a lesson that uses microscopes?
- Question 2: How often do microscopes get damaged during class?
- Question 3: What is the hardest part of maintaining and storing microscopes in your school?
- Question 4: What happens if the students can't finish their work during class because of limited supply of microscopes?
- Potential Gains (with detail about what a better system might look like)
- Question 1: If you could make one change to teaching lessons or labs utilizing microscopes that would have the biggest positive impact on student learning, what would it be?
- Question 2:

Interview plan example

- **Value Proposition** Test/validate hypotheses on the value your product or service provides. When you can connect pains and gains with your value proposition statements, ONLY THEN have you figured out how to communicate the value of your product/service.
- **Value Prop A: unlimited microscope availability** Question 1: We have been talking to teachers like you about having enough microscopes in classroom so that each student has their own device. How do you think this might change learning outcomes?
- **Value Prop A: unlimited microscope availability** Question 2: How would having the ability to have microscopes for your classroom for only the time you need them impact your classroom space or layout?
- **Value Prop A: unlimited microscope availability** Question 3: How would eliminating microscope repair costs and hassles free up time in your schedule?
- **Value Prop B: utilize smart phone for microscopy** Question 1: Tell me about your students smart phone use.
- **Value Prop B: utilize smart phone for microscopy** Question 2: How do you incorporate technology like smart phones, tablets and the internet in your teaching plans?
- **Value Prop B: utilize smart phone for microscopy** Question 3: How might your teaching plans change if student had access to microscopes at home when doing their homework?

Team Assignment: Critical Analysis Project in-class March 9

Each team will give an 8-10 minute (max) presentation in class on March 9.

- The presentation might cover:
 - 1. Market Validation
 - 2. Competitive Analysis
 - 3. Target Customer Segment(s)
 - 4. Key Value Prop(s)
 - 5. Business Model Canvas (focus on VP & CS) or Value Prop Canvas
 - 6. What's next? Advance, pivot, redirect, etc.
- It's a good idea to address all topics listed above, but the order and format for presenting is up to you.
- The team can break up the material or you can elect one or two individuals to deliver everything.
- You may include any additional information that you feel is relevant, such as an ecosystem map.
- There is no rubric. I'm not concerned with you completing a checklist, but instead making a case for what you feel is important to your analysis.
- You MUST be concise since timing is limited and you will be cut off if you run over.
- Time will be provided in class on March 2 to work on this project.

Team Presentation Order

Lottery Draw

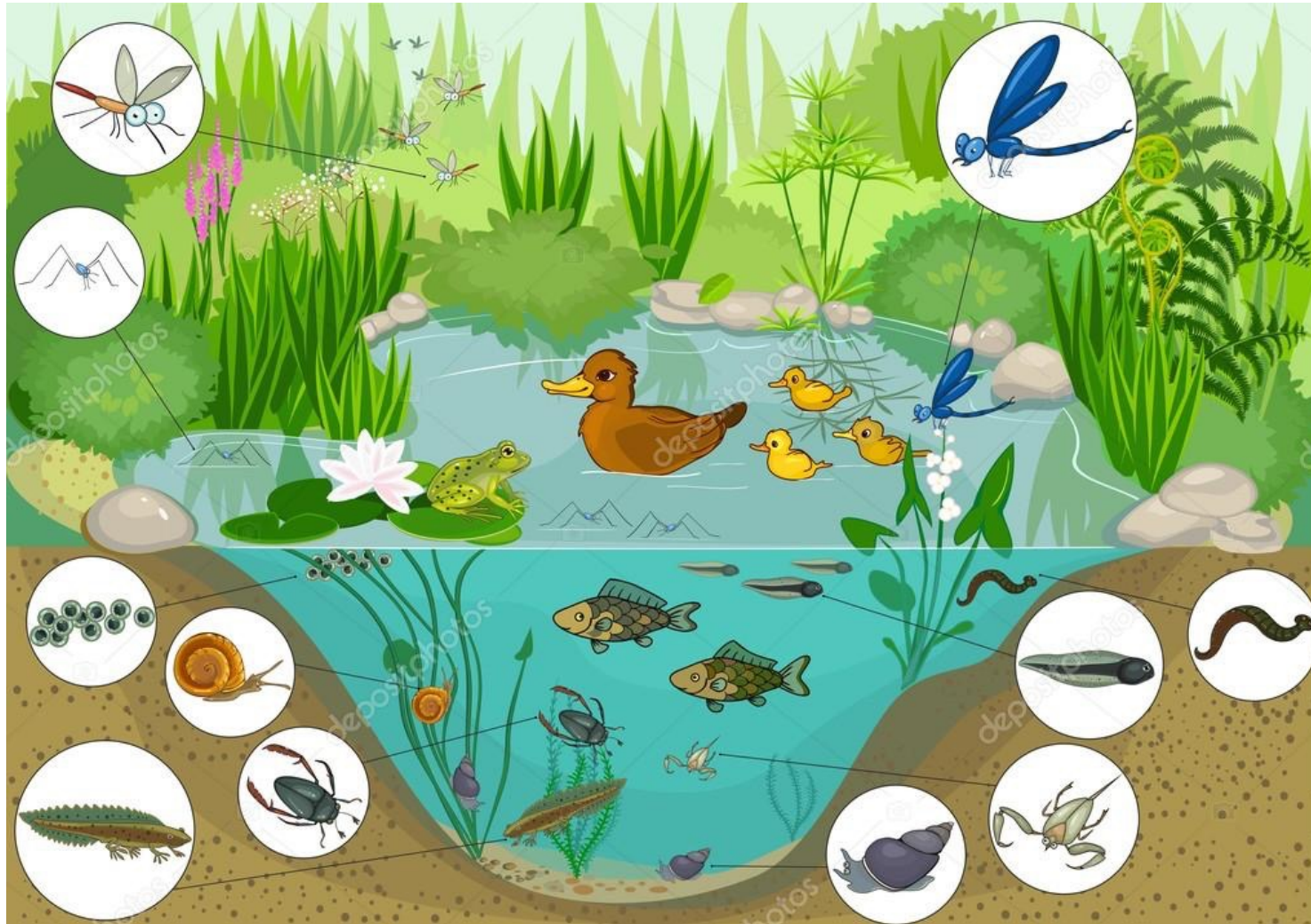
Case Study; Due March 22, Individual Assignment

- Read the Trexel case study found in the appendix of BDN (Resources folder).
- Appendices --> B. Cases --> Trexel (PDF p.539)
- At the end of the case study, answer Question #3 (PDF p. 558): What criteria should you use to evaluate the projects at Trexel? Which project (molded structural foam, injection molding, blow molding, PVC extrusions, or meat trays and food packaging) should Bernstein recommend to the board? Why?
- Be sure to support your position. There is a strong case to be made for all options and no choice is right or wrong. I'm most concerned with your rationale supporting the application you chose, as well as why you declined the other options. 1-2 total pages should be sufficient. Due March 22.

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This is the first ecosystem map most of us saw



Ecosystem – Our working definition

How your product interacts with the world once it is in the hands of the customer.

So how do we build one?

- Start with a list of anyone who you think might play a role in your ecosystem (your stakeholders)
 - Customers
 - Suppliers
 - Distributors
 - Servicers
 - Infrastructure/platform providers
 - ...
- Learn how they interact

An example from the agricultural equipment industry.
Equipment sellers like to show harvest running like this:



However... there are logistical, equipment and traffic challenges...



Grain Harvest Logistics Ecosystem – who should we consider?

- Farmers
- Combine Operators
- Grain Cart Operators
- Grain Truck Drivers
- Public Grain Elevators
- Farmer Owned Grain Storage
- Grain Originators (*learn the vernacular!*)
- ...

A simple map for the farmer during harvest

Combine Operator



Grain
Originator

Private Grain Facility



Grain Cart Operator



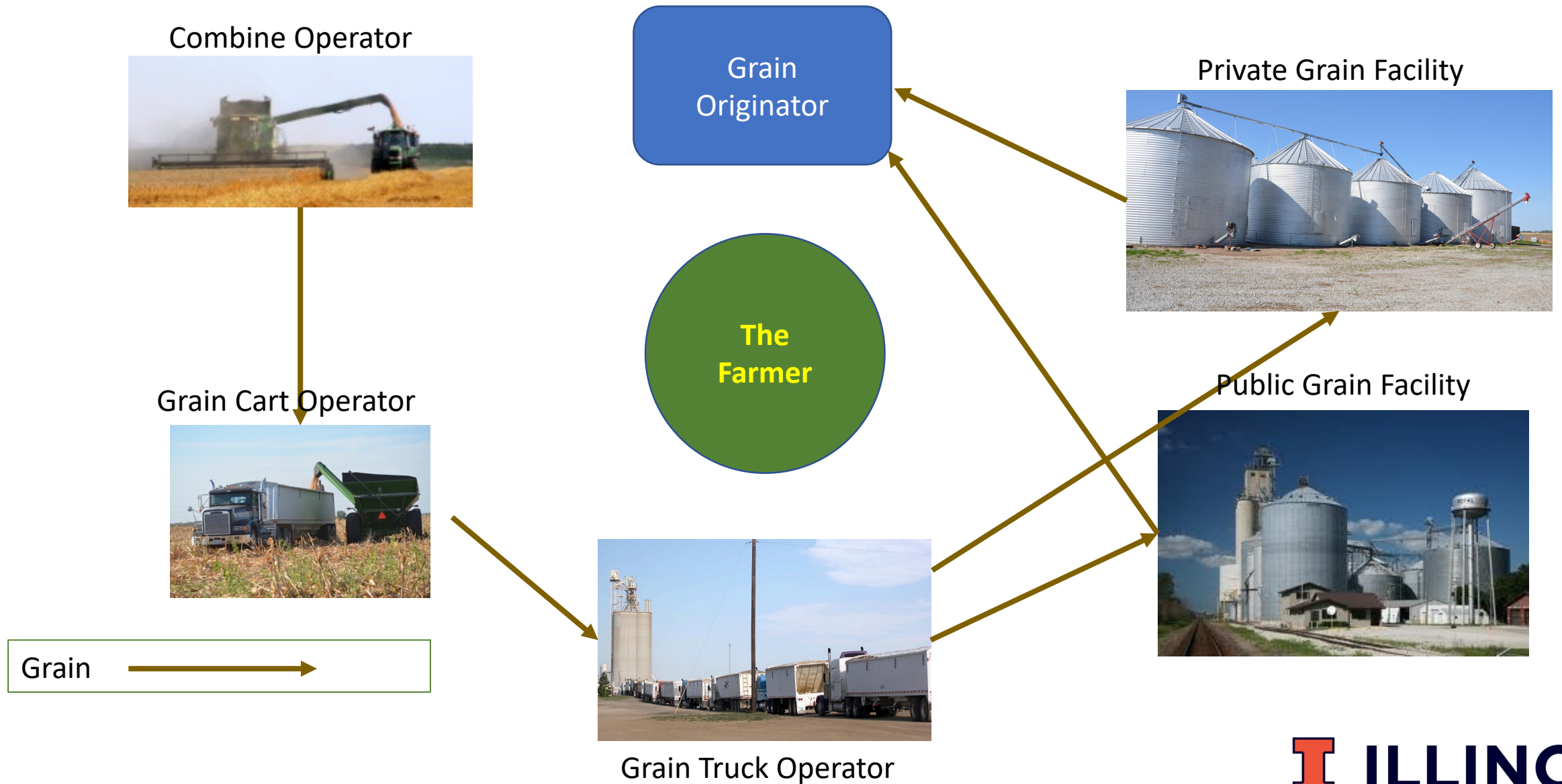
The
Farmer

Public Grain Facility

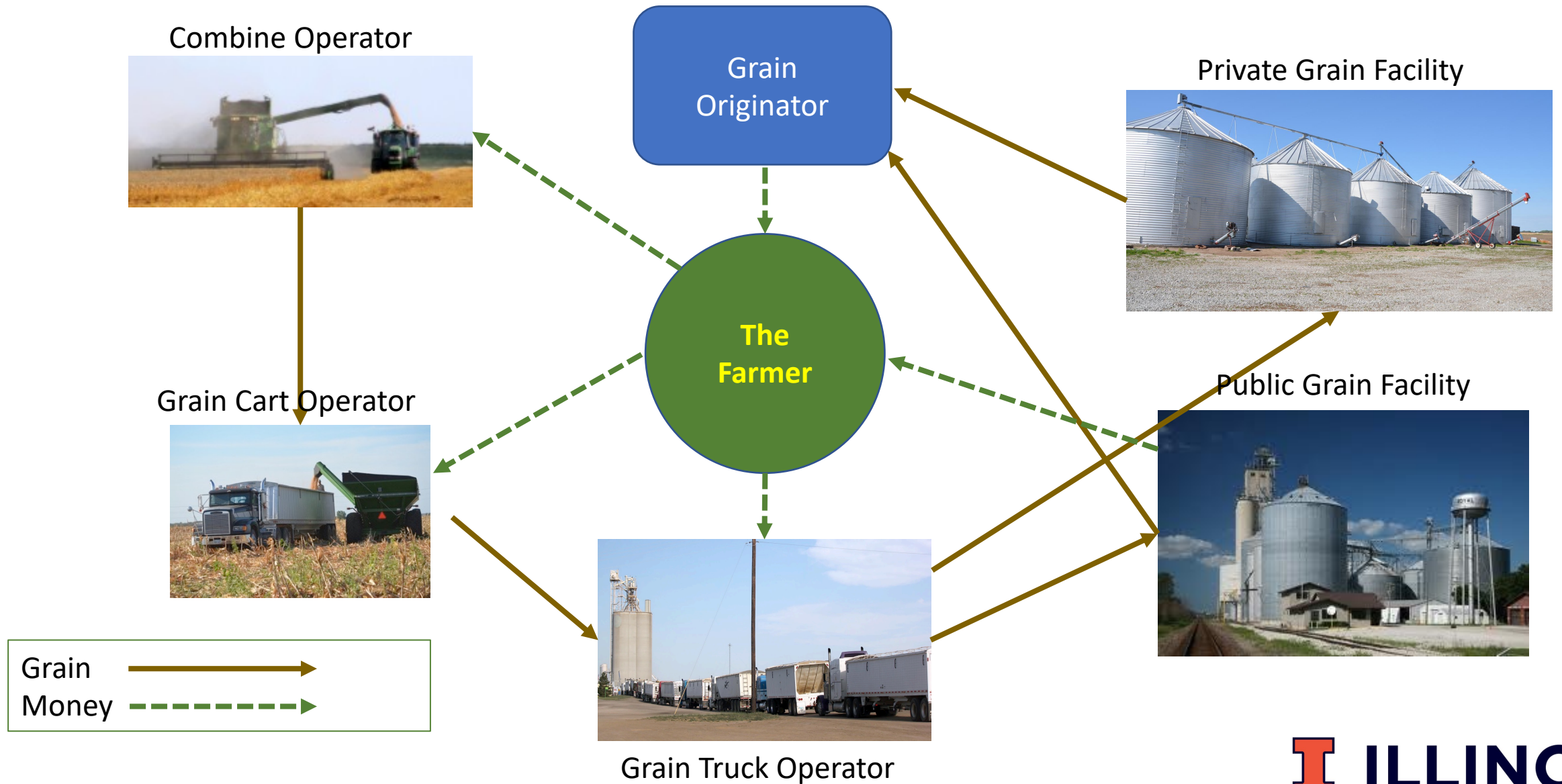


Grain Truck Operator

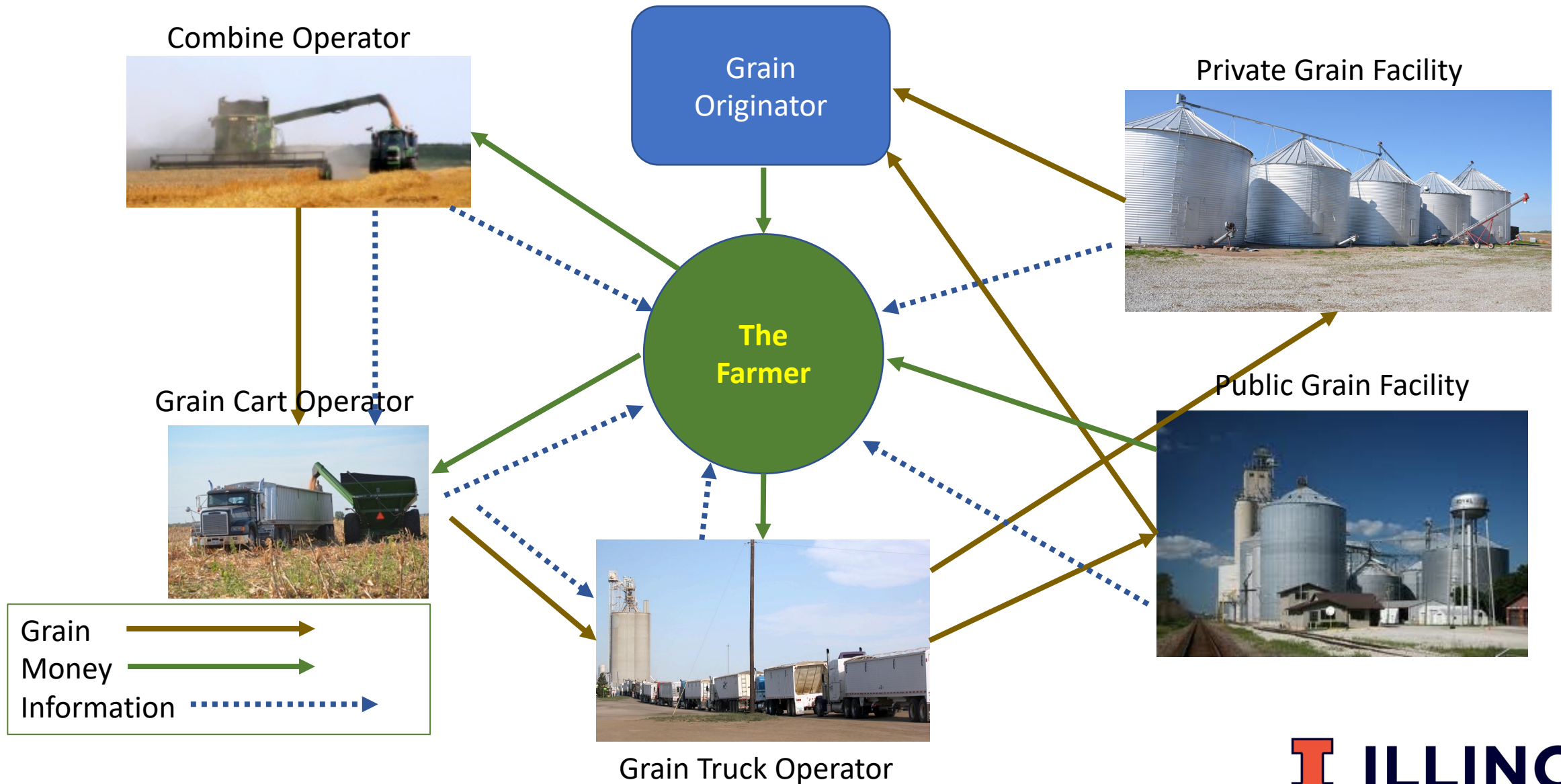
What goes where?



What goes where?



What goes where?



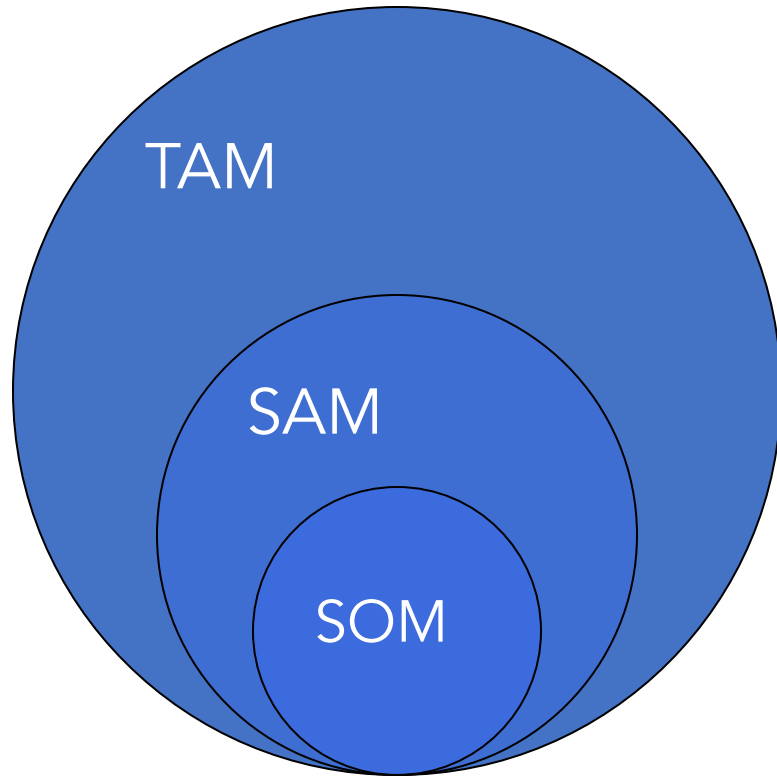
Insights and takeaways

- The map is a tool to help you achieve an understanding of your ecosystem by making it visible.
- Use it to help figure out
 - Who the players are
 - Who you need to interview
 - What to ask them about
- The map will change as you learn more

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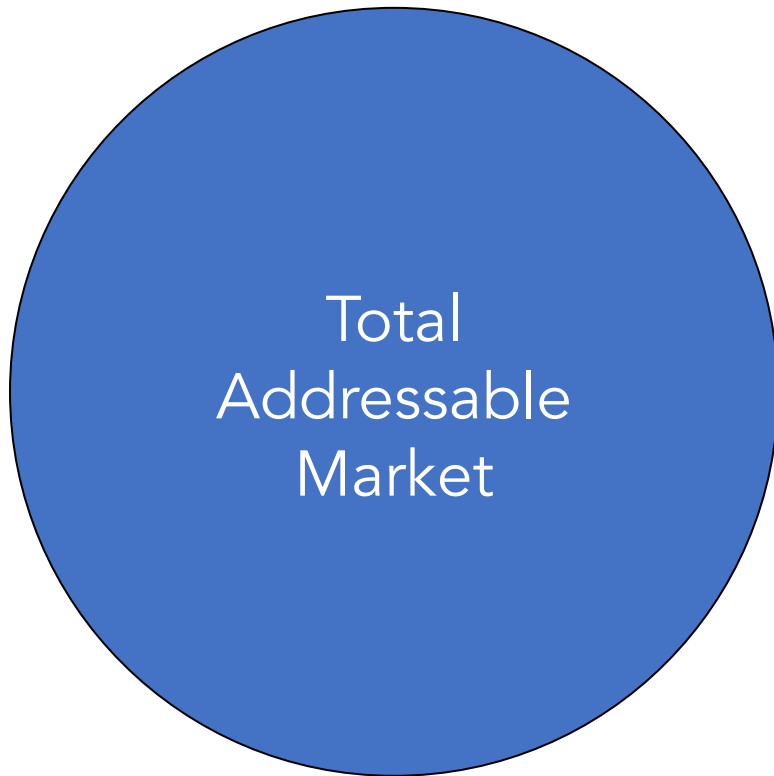
Define the Market



- Total Addressable Market
 - The entire universe
- Segmented/Served Available Market
 - Those in my channel
- Served Obtainable Market
 - AKA Share Of Market or Target
 - Likely buyers

How big is the pie?

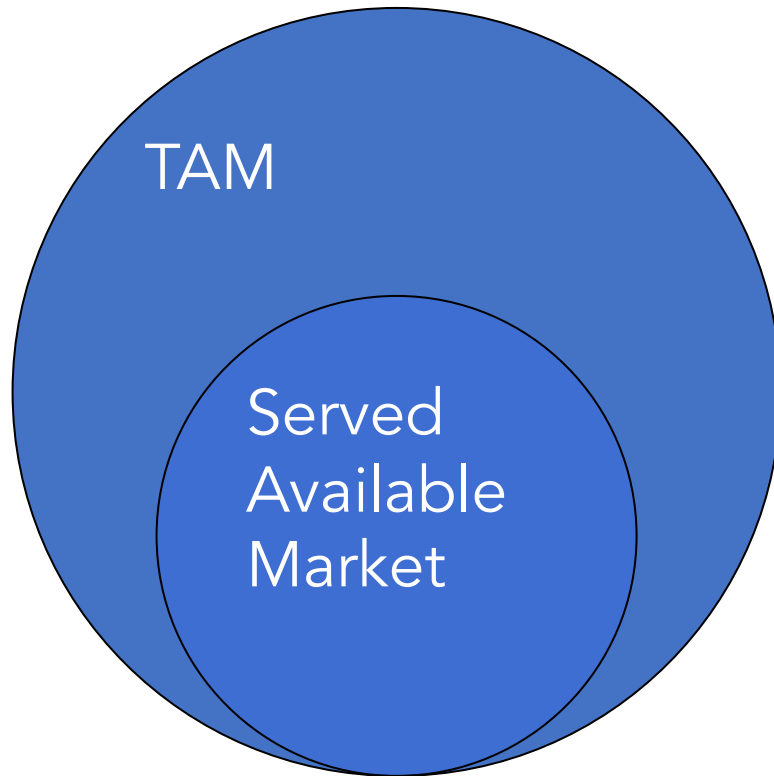
Assumes 100% of applicable customers adopt your solution



- How many people want/need the product?
- How large is the market (in \$\$\$s) if they all bought?
- How many units would that be?

How big is my slice?

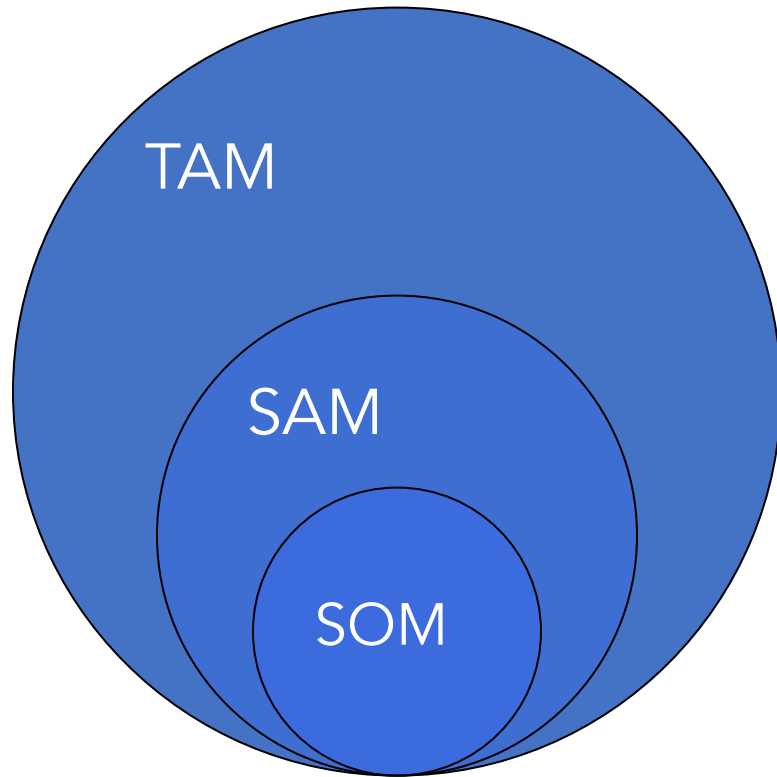
Assumes all customers buying either a competitors solution or a substitute



- How many people need/can use *my* product?
- How many can afford it?
- How large is the market (in \$\$\$s) if they all bought?
- How many units would that be?

How much can I eat?

the initial market you hope to address where your solution has the strongest value proposition and competitive advantage assuming everyone purchases



- Who will I sell to in first years?
- How many customers is that?
- How large is the market (in \$\$\$s) if they all bought?
- How many units would that be?

Key Points

- TAM must be relevant
- Must be congruency between TAM/SAM/SOM
- Don't just assume a certain percentage
- SOM/Target is the MOST critical
- SOM/Target will be bigger than the sales you project to achieve

Two Approaches Market Sizing

Top Down

- Secondary Research Anchored
- Most applicable to existing (similar), re-segmented, clone products/markets
- Similar or adjacent market data available
- Process – Guess/Assume
 - Smallest addressable segment matching product attributes
 - Market share and growth rate (how many?)
 - Pricing relative to available competition (how much?)
 - Market growth rate
 - Resource constraints

Often Misused

Bottom Up

- Primary Research Anchored
- Only option for new products/markets
- Limited or no specific market data available
- Process
 - Starts (and ends) w/ Customer Discovery
 - Defining your Archetypes Demographics, Psychographics, Behaviors & Reqt's
 - Insights into how to define segments
 - Enables identification of beachhead market - “must have” reason to buy
 - Validates value pricing, full product offering, competitive differentiation
 - Allows for better assumptions on market sizing (how many) and financial model (how much)

Often ONLY and best option

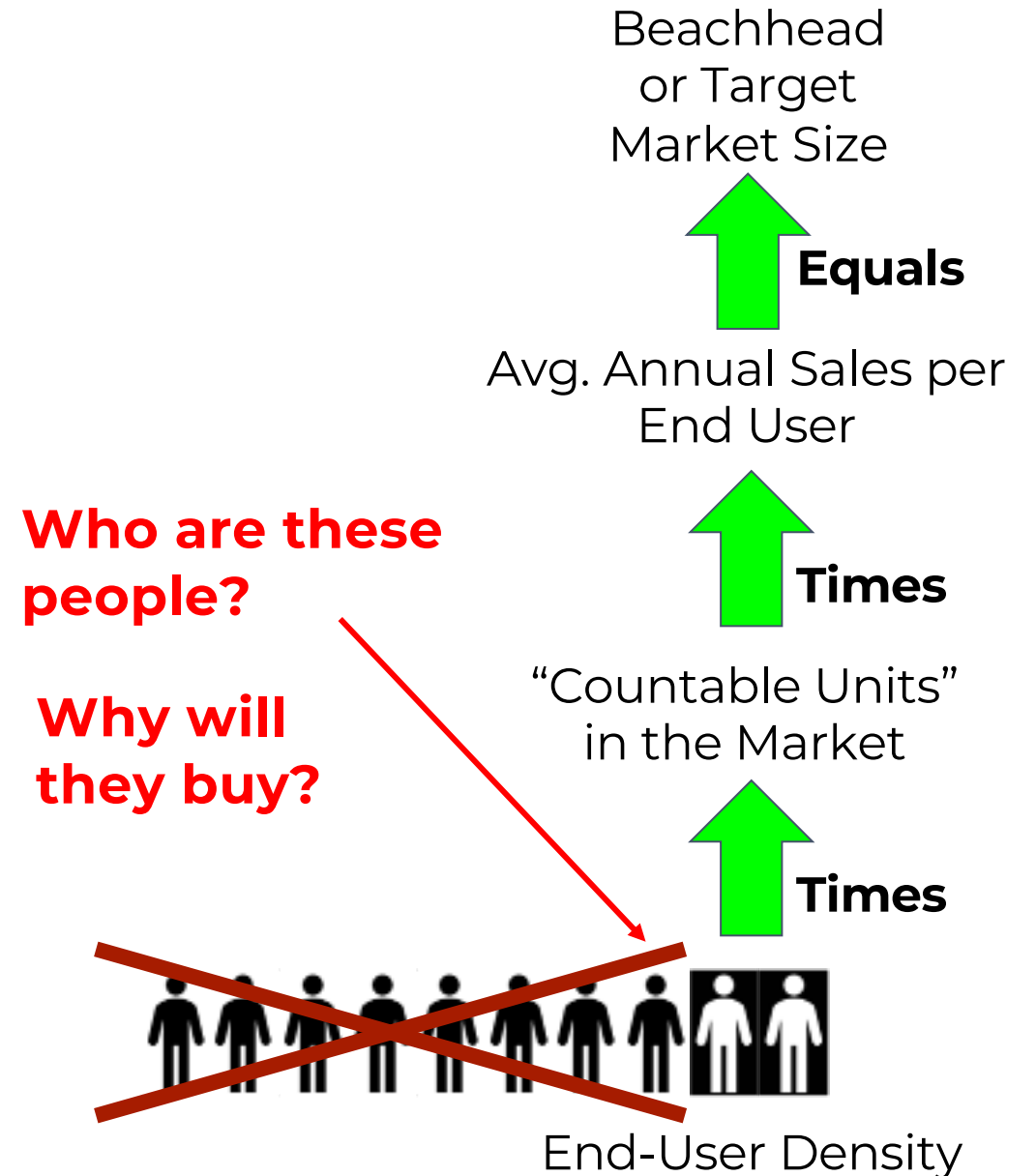
Top Down Market Sizing aka Market Research (Smell Test)

| Step 1 | Step 2 | Step 3 |
|--|--|--|
| <p>Industry / market profiles for overall picture</p> <ul style="list-style-type: none">• Market research databases, OneSource (Library) in Business Information Services (http://guides.library.illinois.edu/c.php?g=347372&p=2343225)• Market stats – US, plus exports: http://www.census.gov/mcd/<ul style="list-style-type: none">◦ Current Industrial Reports (CIR)• Other statistical tools for world data – Statistical Universe (Library) | <p>Patents</p> <ul style="list-style-type: none">• R&D leaders, emerging players• USPTO.gov, patents.google.com <p>Trade journals</p> <ul style="list-style-type: none">• Additional stats, filling in report gaps• Aggregators: OneSource; ABI/INFORM Trade & Industry (Library) | <p>Trade Associations</p> <ul style="list-style-type: none">• Tech overviews, companies, markets, etc.• Association publications indexed in Statistical Universe (Library)• Find association Web sites through Associations Unlimited or Google query <p>Key player lists and profiles</p> <ul style="list-style-type: none">• OneSource, Hoovers, Buyers Guides |

Bottom-Up Market Sizing

Starts (and ends) w/ Customer Discovery

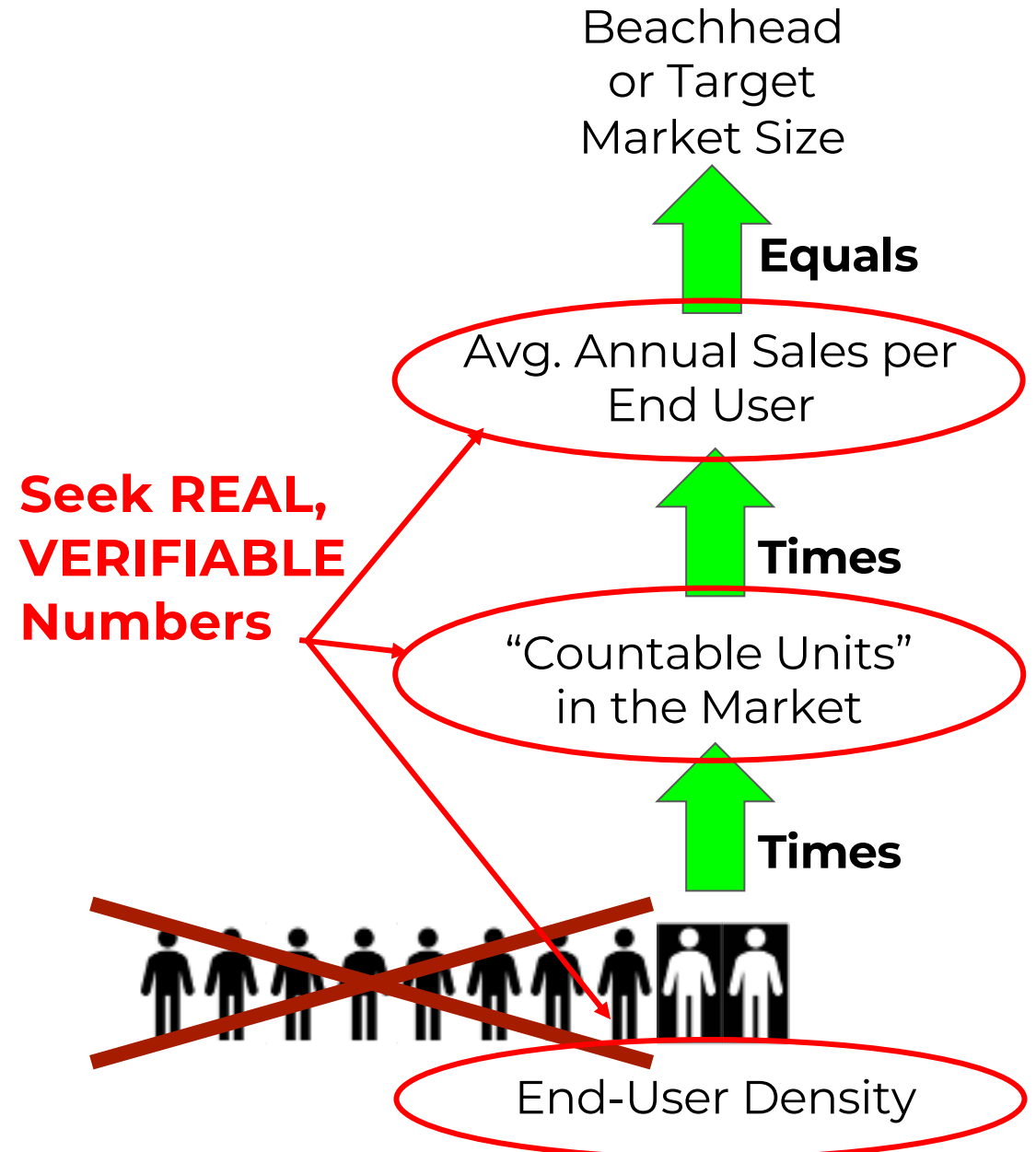
- Defining your Archetypes
Demographics, Psychographics, Behaviors & Reqts
- Insights into how to define segments
- Enables identification of beachhead market - “must have” reason to buy



Bottom-Up Market Sizing

Starts (and ends) w/ Customer Discovery

- Countable units
- End-user density
- Avg. annual sales per end-user
 - Units (use) and \$'s/countable unit
- “Typical #’s” via customer discovery w/ “select” sources - or- “instances”
- Total # of countable units in the market can be from secondary sources



Bottom-Up Market Sizing

Additional Benefits

- Citing real market examples build credibility
- The exercise will force a better understanding of your market segments and how to reach them
- Validates value based (vs. cost-based) pricing, full product offering, competitive differentiation
- Allows for better assumptions on market sizing (how many) and financial model (how much)
- Learn more about:
 - Where your customers reside
 - What easily findable information correlates to a concentration of customers?

Overall Factors to Consider

What is the Landscape?

Current state of the industry

- Size
 - Compare to historical
 - Is it nascent or mature?
 - Expanding or contracting?
- Historical pricing & profit characteristics
- Existing channels

Industry trends?

- Seasonality, cyclicalities
- Regulatory affairs
- What's new, hot desirable?

Where do you fit?

- Leader: dominant position
- Follower: me too
- Challenger: attempting to unseat incumbent leader
- Niche: specialty product or service

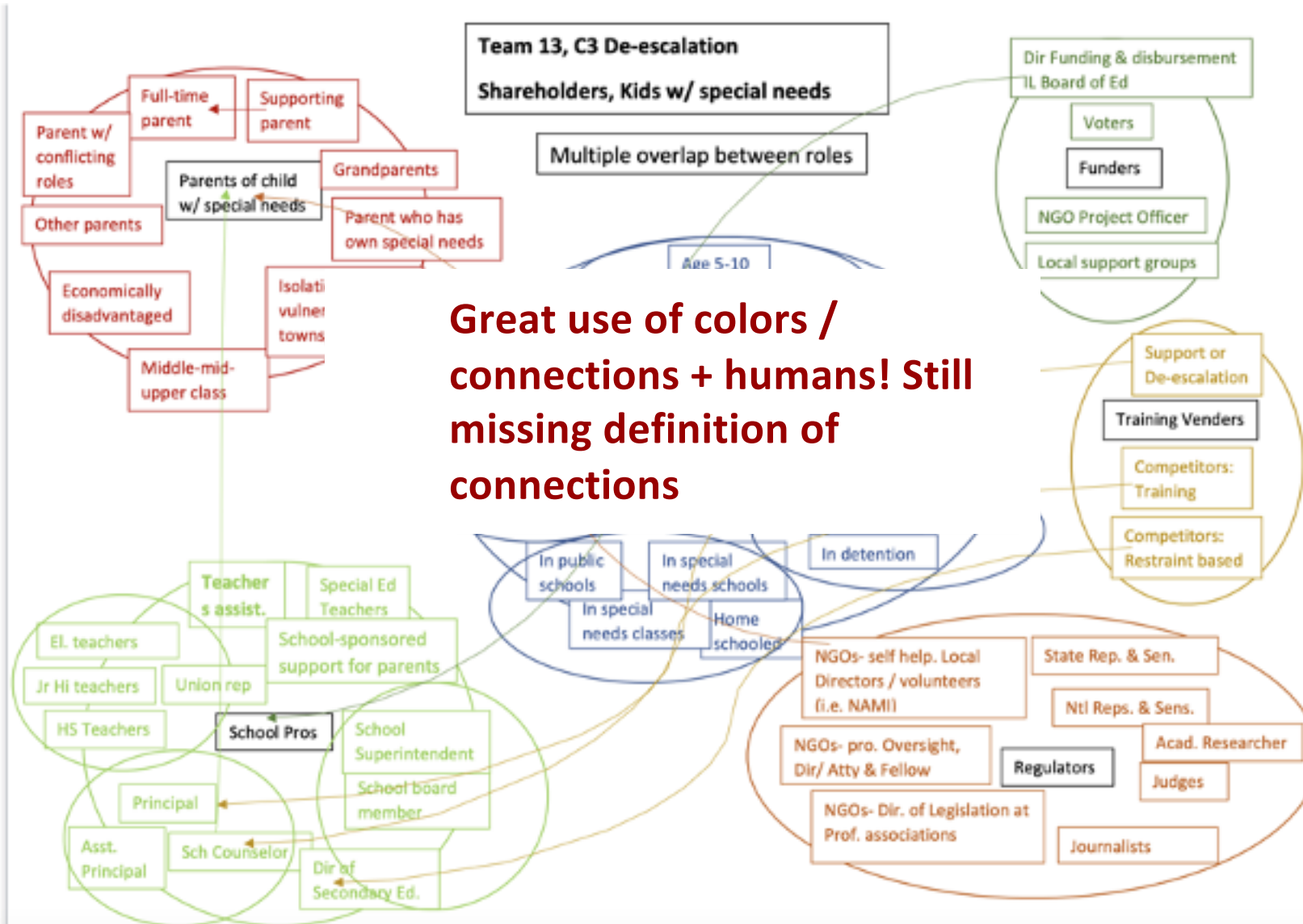
Who is the Competition

- Direct
- Indirect
- Inertia

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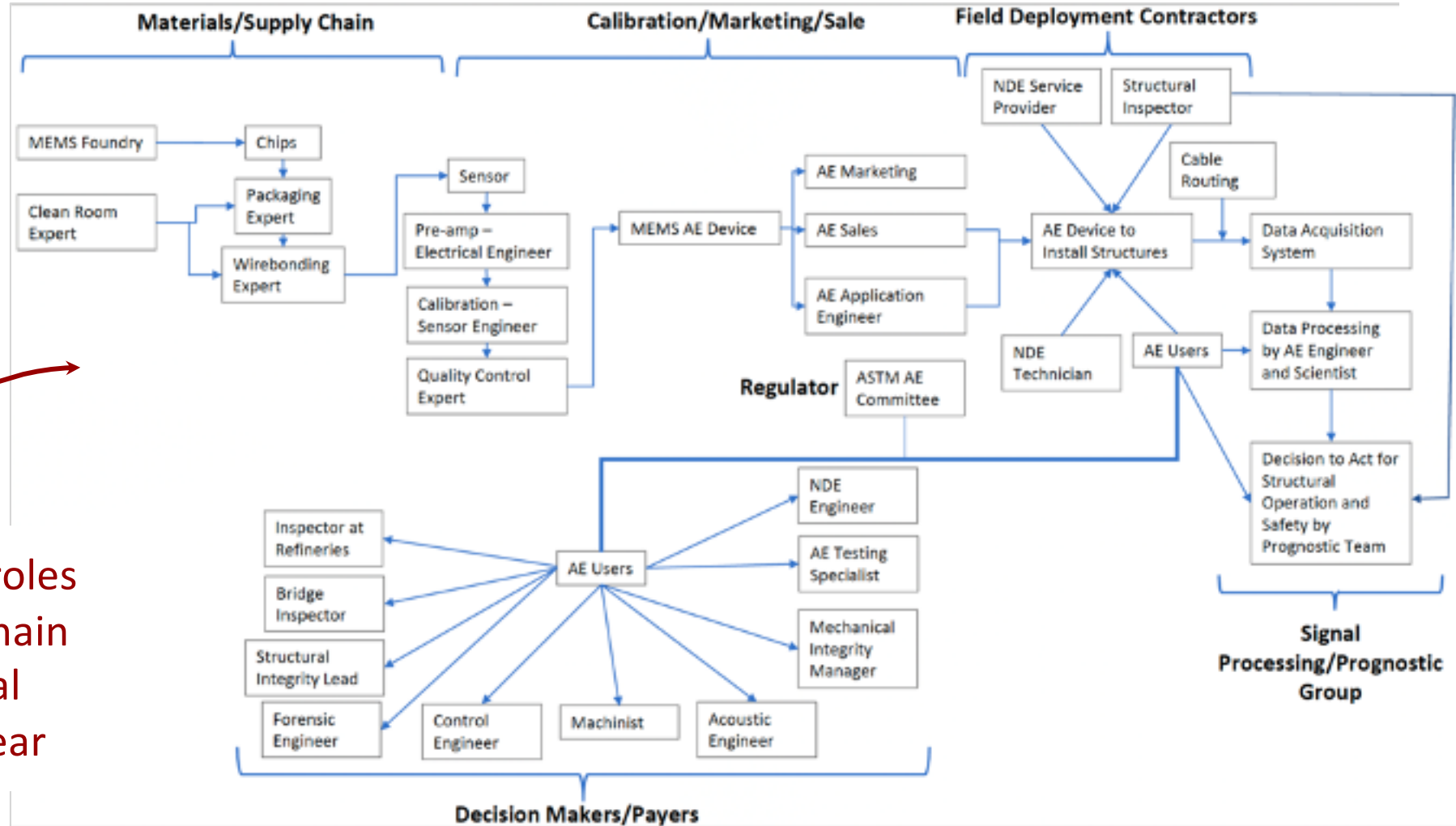
Assignment Deliverables





Assignment Deliverables

Great job!



- Specific roles
- Supply chain
- Relational
- Clean/clear



Assignment Deliverables

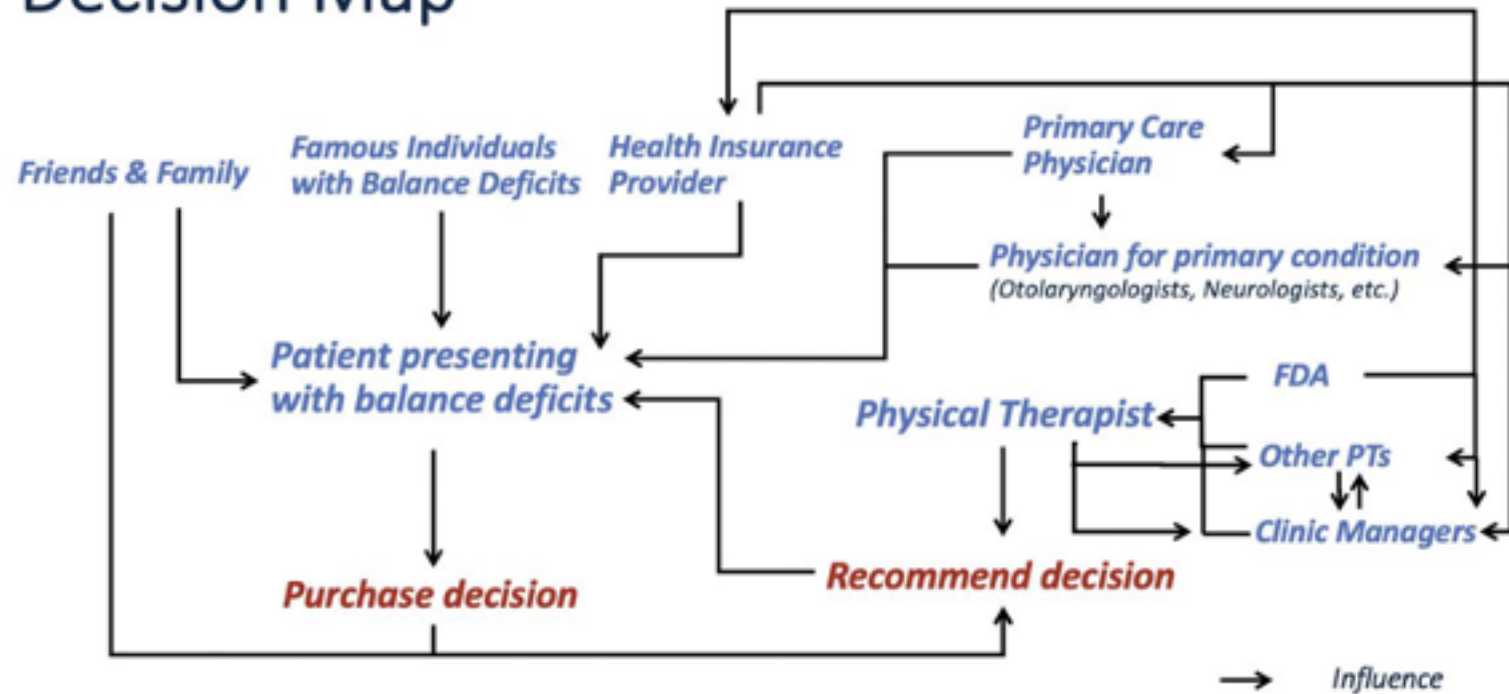
End-User Workflow Map



Identifying Insurance Company as the payer

Assignment Deliverables

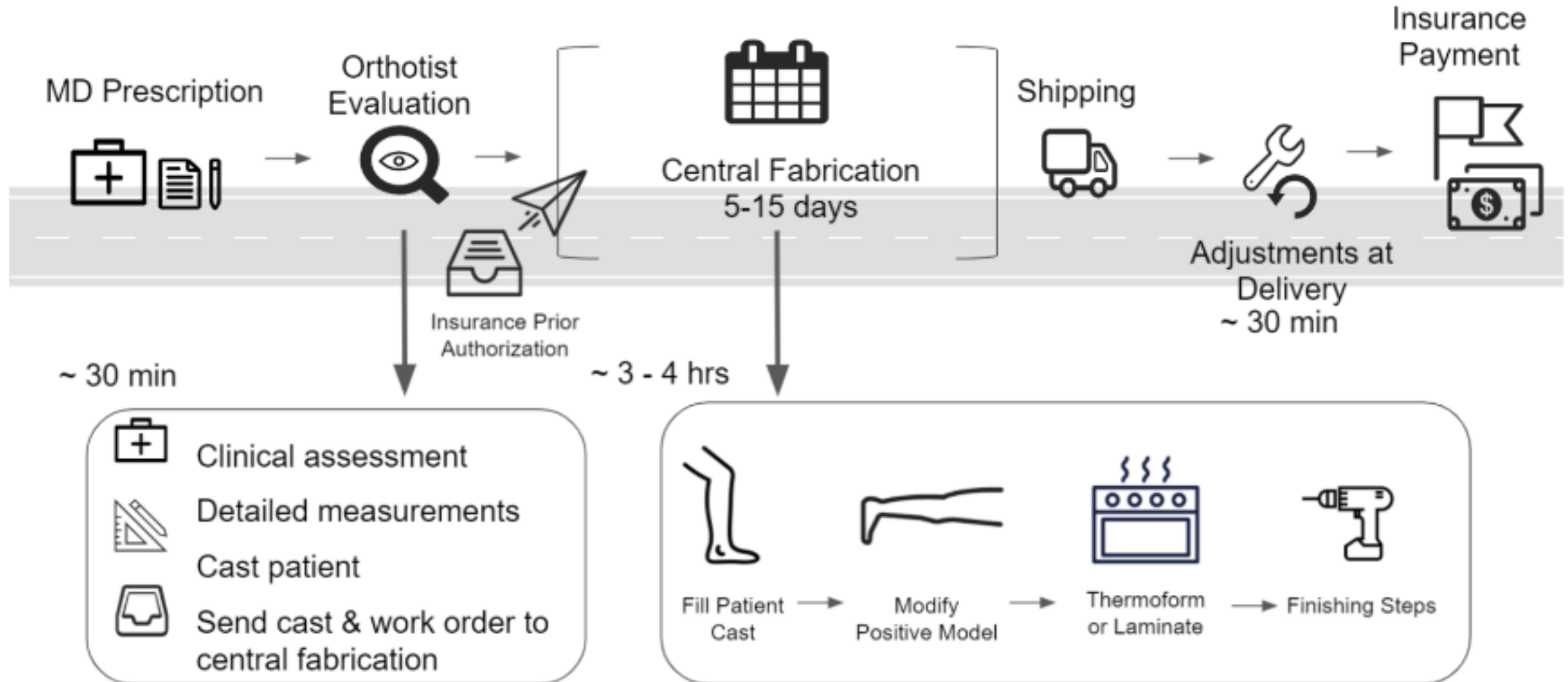
Decision Map



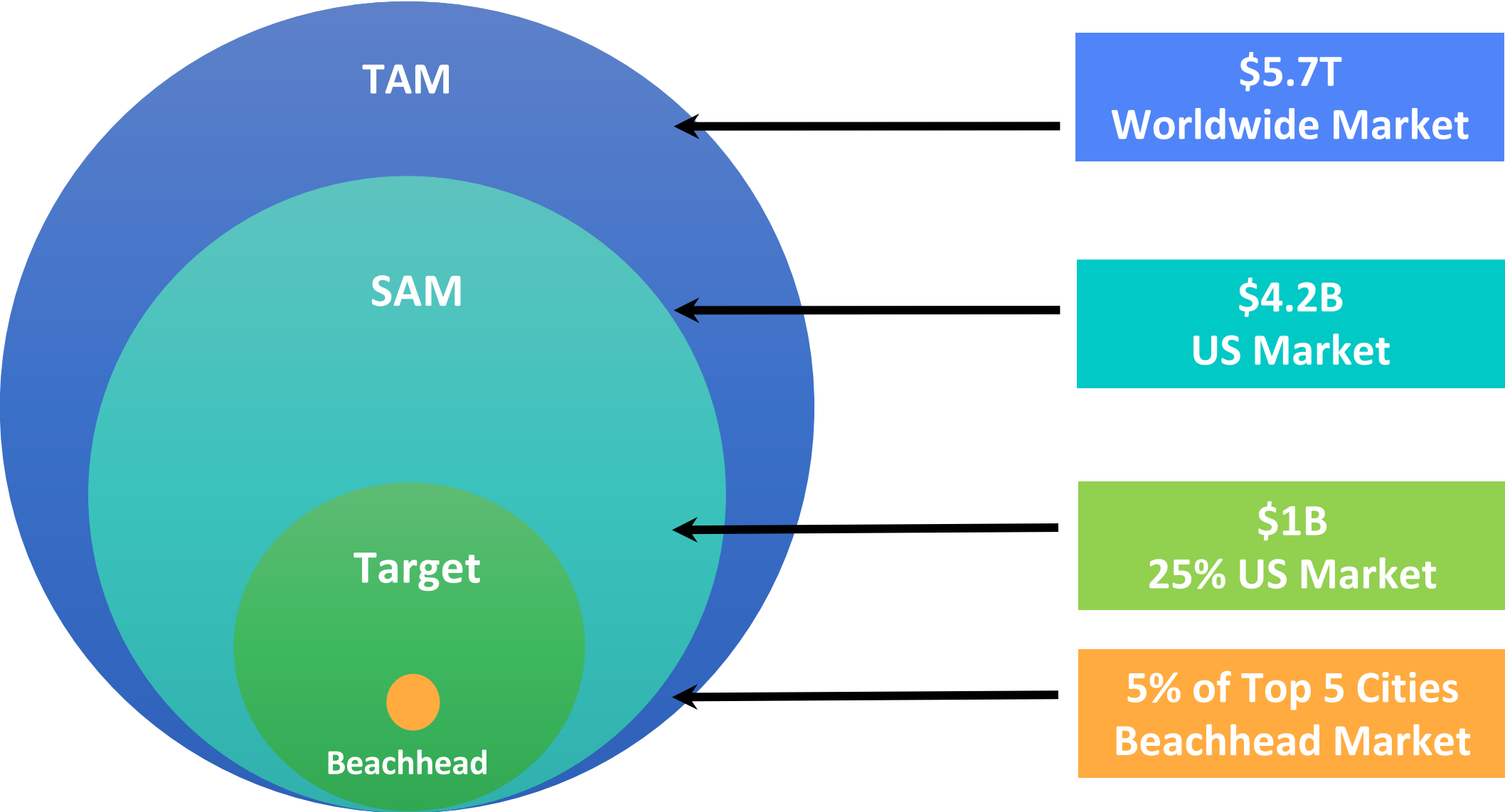
Identifying patient as the decision maker

Timeline style -
different way of
visualizing flow

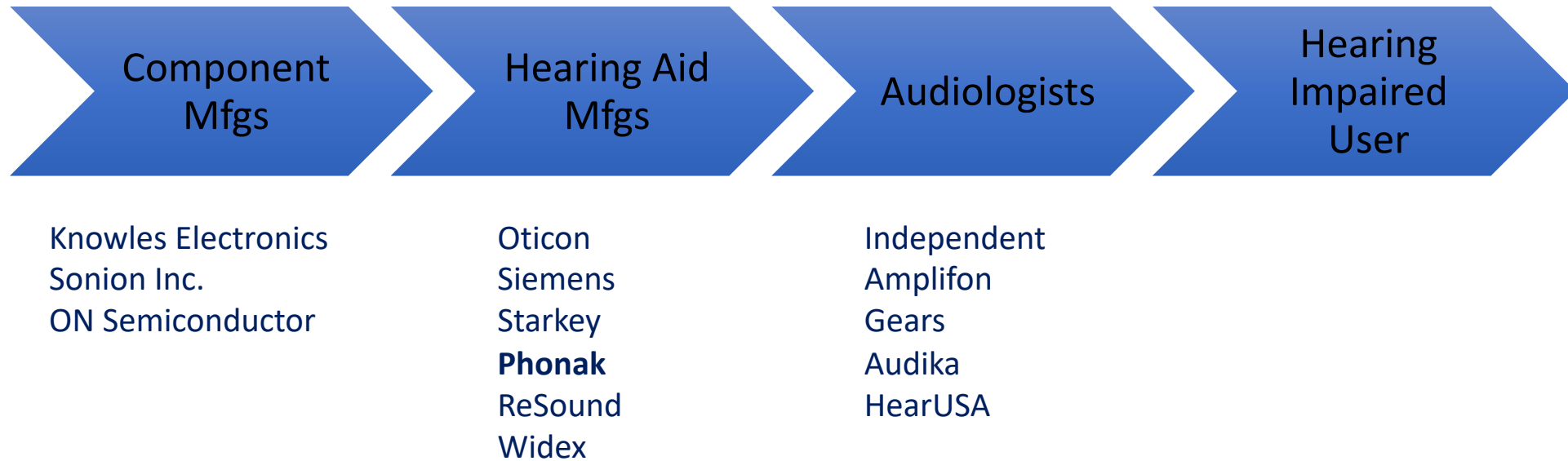
Assignment Deliverables



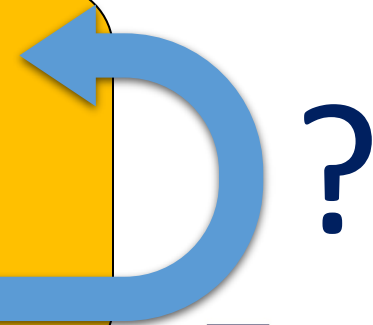
Market Opportunity - UBER



Top Down – Hearing Aids



Citibank Market Report: \$5bn Hearing Aid Market
Citibank Market Report: Phonak 20% market share
Phonak Reported Revenue \$300m
Total hearing aid market: \$1.5bn



?

Bottom Up – Hearing Aids Retail

Data

- 31 million hearing impaired
- 6 million hearing aid purchasers (installed base)
- 80% bilateral fitting rate
- 2.5 million hearing aids sold annually
- Average sales price ~\$1800/unit
- Market size = \$4.5bn

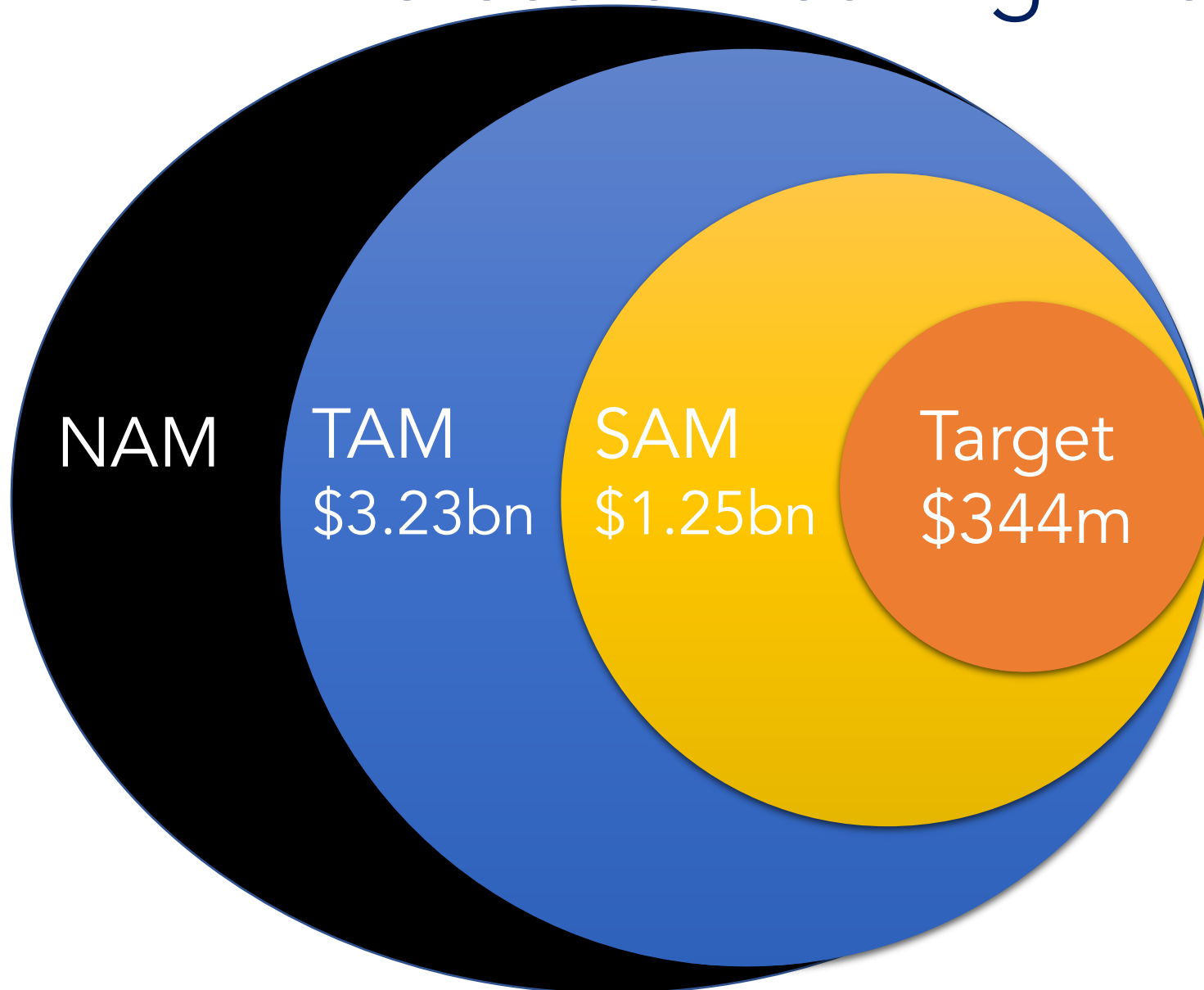
Bottom Up – Hearing Aids Wholesale

Data

- 31 million hearing impaired
- 6 million hearing aid purchasers
- 80% bilateral fitting rate
- 2.5 million hearing aids sold
- ~~• Average sales price ~\$1800/unit~~
- ~~• Market size = \$4.5bn~~
- Average wholesale price ~\$500/unit
- Market size = \$1.25bn

Retail (\$4.5bn) vs. Wholesale (\$1.25bn)

Wholesale Hearing Aid Market



- Total Addressable Market
 - Assume all aid-able hearing-impaired purchase (50% of all HI, 31m)
 - 4.32-year service life (calc from data)
 - 80% bilateral fitting rate
 - Wholesale \$500/unit
- Served Available Market
 - TAM x Buyer Adoption x 1.8 units/person
 - Adoption = $6m \div 31m = 19.35\%$
 - SAM = \$1.13bn
 - Using Bottom Up = \$1.25bn
 - Using Top Down = \$1.5bn
- Target = Premium Hearing Devices
 - Assume 25% – 30% of market
 - SAM Bottom Up x .275 = \$344m
 - Using Top Down = 20% is \$300m revenue

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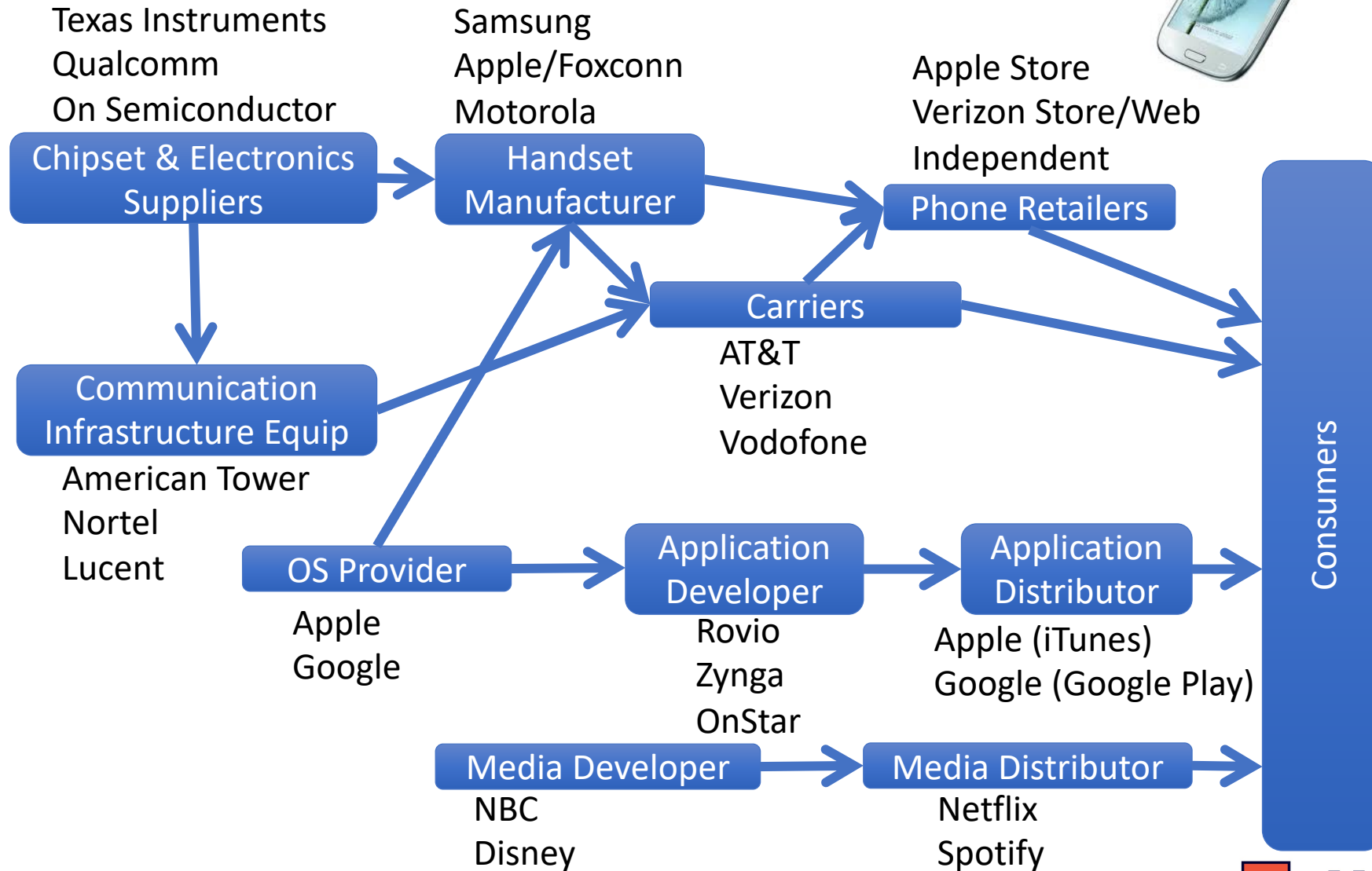
Backup

Value Chain = WHO

The chain of steps a product
takes from FIRE and EARTH
to the END USER

A value chain map traces the flow of
money, materials, personnel, and data

Example: Wireless Phones



Value Chain – Key Takeaways

- Who supplies whom?
- Each block is a key STEP in the process NOT a company
 - Companies will often do multiple blocks
 - Which block(s) do YOU do?
- Who is your customer(s)?
- Get the detail where you need to
- What is your Value Prop for every step of the chain?
- Is the industry's organization changing?

Informs WHO to talk to

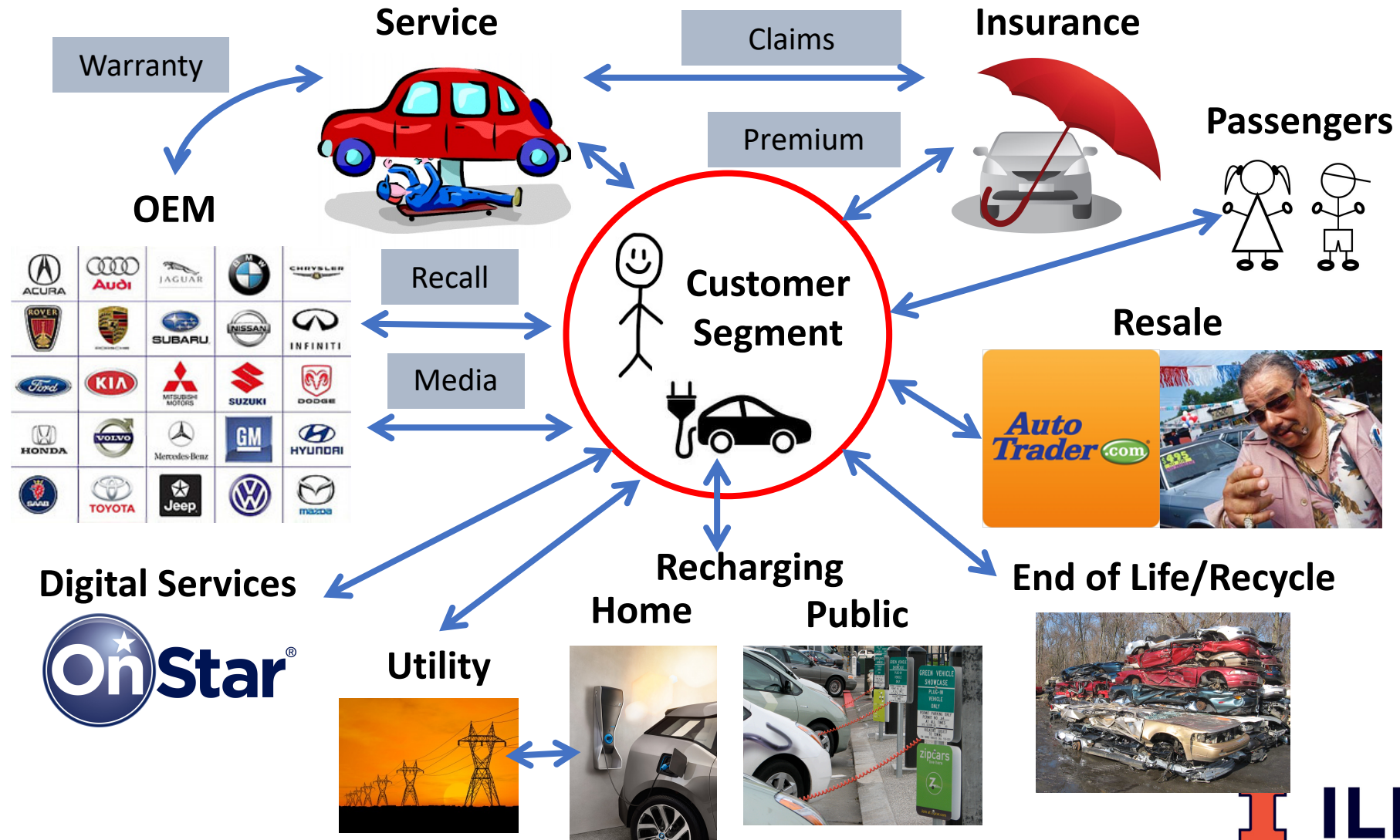
Ecosystem Map = WHAT

How your product interacts
with the world once it is in
the hands of the customer.

Helps you identify the value to the end
user.

Eco-System Map

Battery Supplier into the Electric Car Industry



Eco-System Map – Key Takeaways

- When in use ...
 - How does money flow?
 - How does information flow?
 - What actions are associated with your product?
 - What other services/products are associated with your product?
- Questions to ask
 - Service, maintenance, repair, upgrades, ...
 - End of life, disposal, recycling, resale
 - Data associated with the product/service?
 - Liability
- How does your innovation affect this system (pro or con)?

Informs WHAT to ask

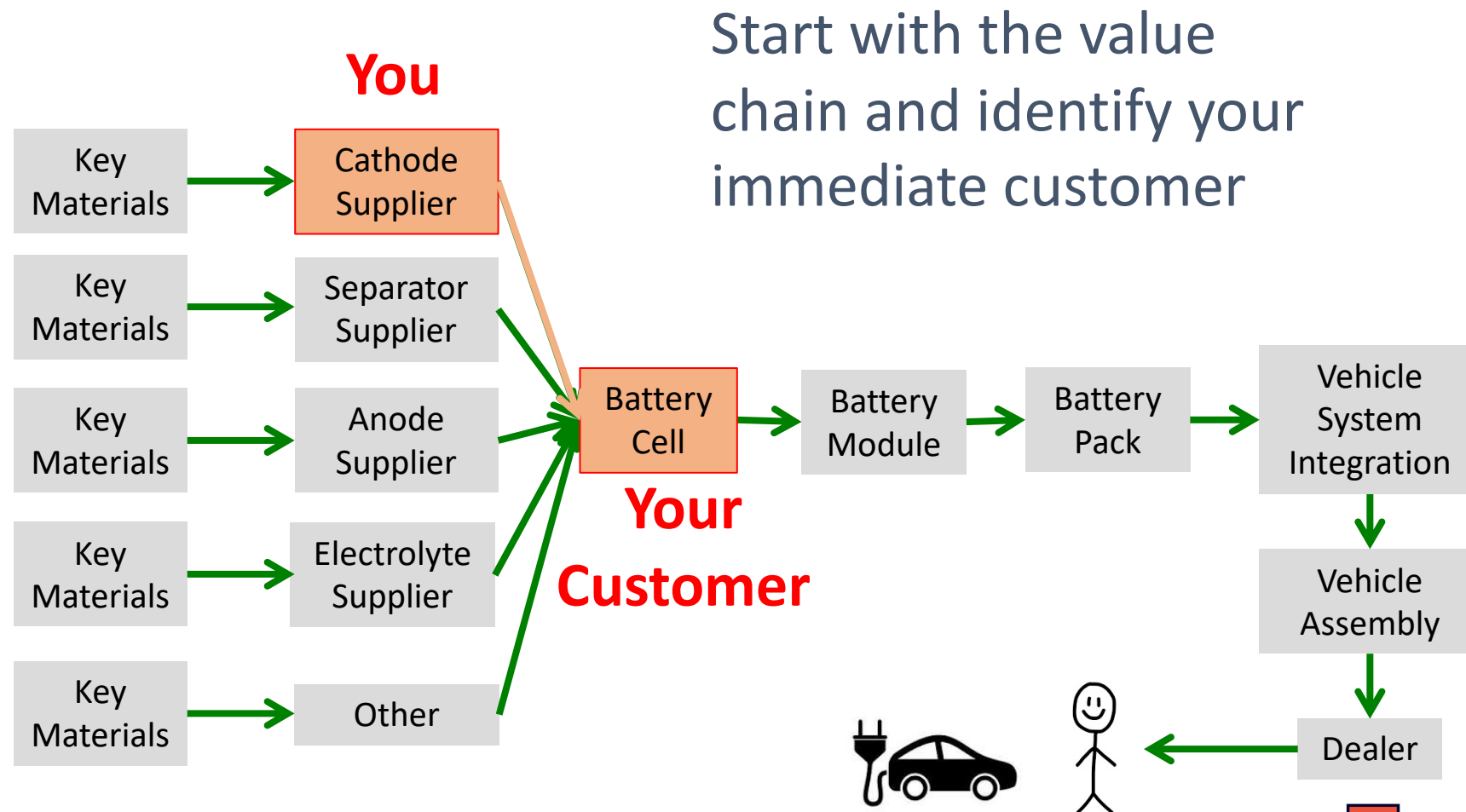
Work Flow Map

How does your immediate customer solve the problem today?

- What are the steps in the process?
- What materials/data/people are needed when?
- What are the key decision points and how do they get made?
- How does this workflow change when your solution is adopted?

Work Flow

Cathode supplier -> Battery Cell Manufacturer



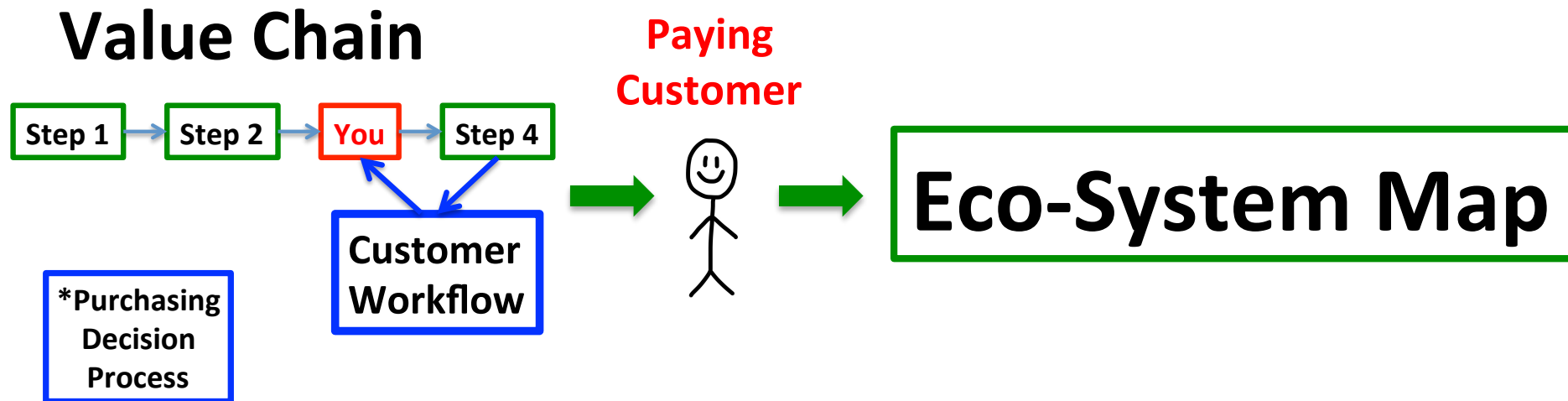
Work Flow – Key Takeaways

- How do people, information, materials and money flow? Who does what/when?
- Where does your product come in?
 - What form should it be in?
- Will your customer have to change their process?
 - If so, how much will that change cost?
- Does everyone have the ability/desire to do what you need them to?

Informs Value Proposition -

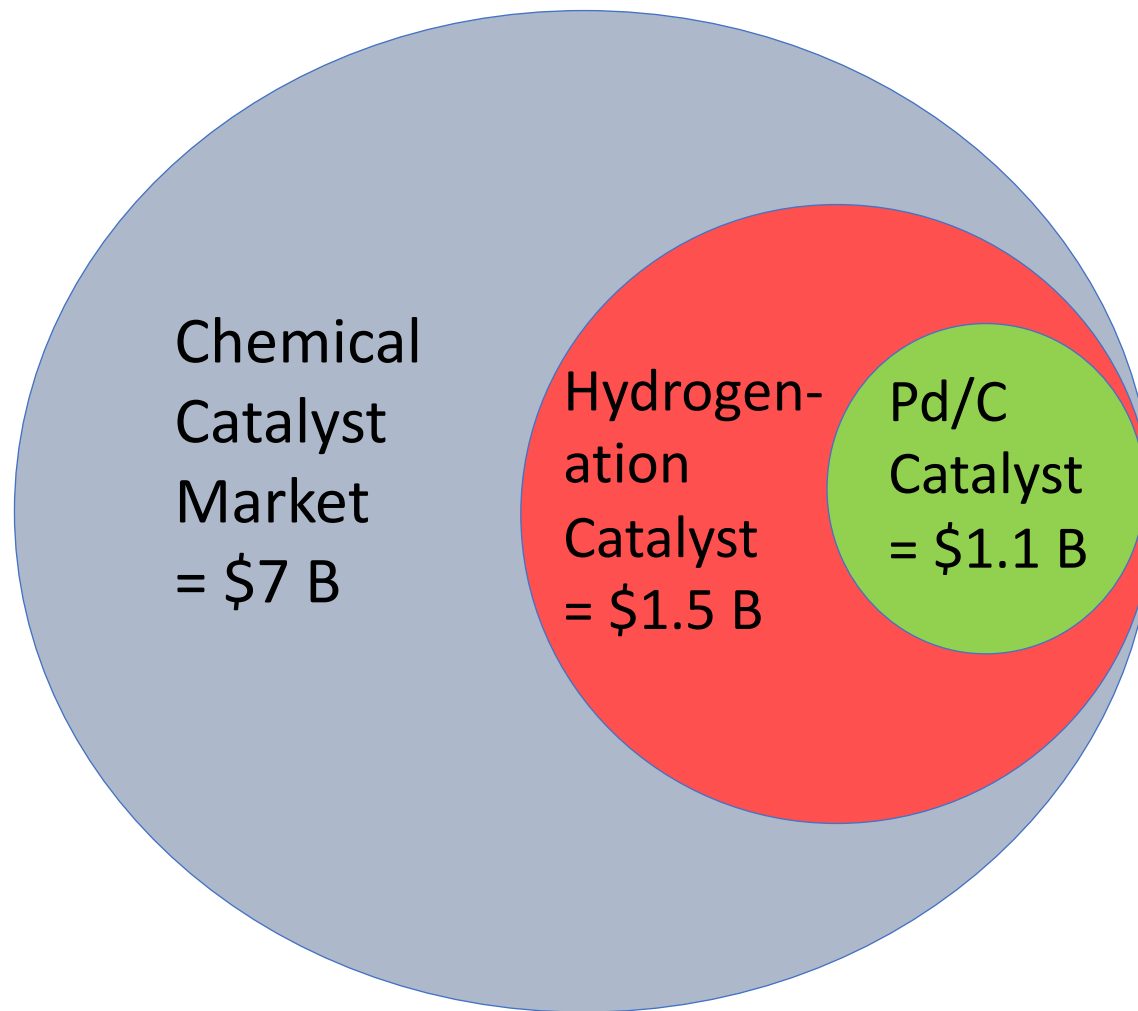
we'll talk more about this in two weeks

Hypothesis testing should be used to populate the tools with data.





Opportunity

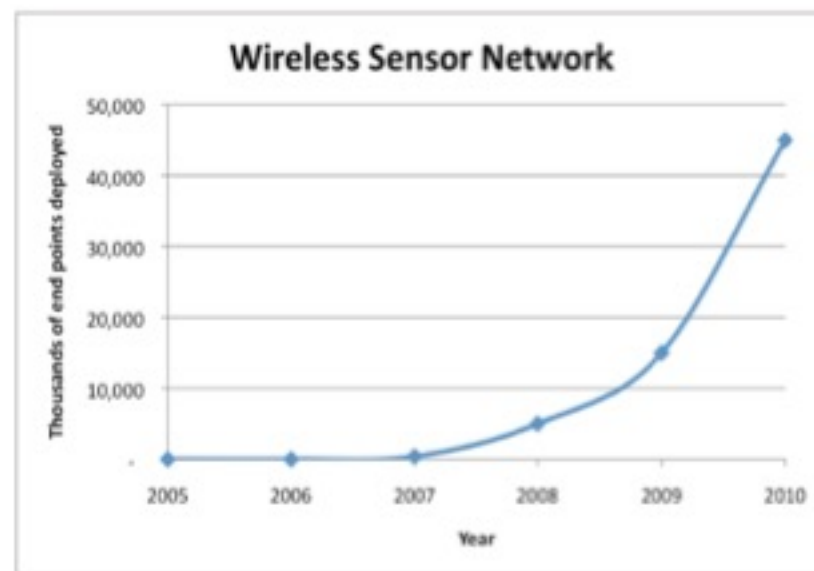
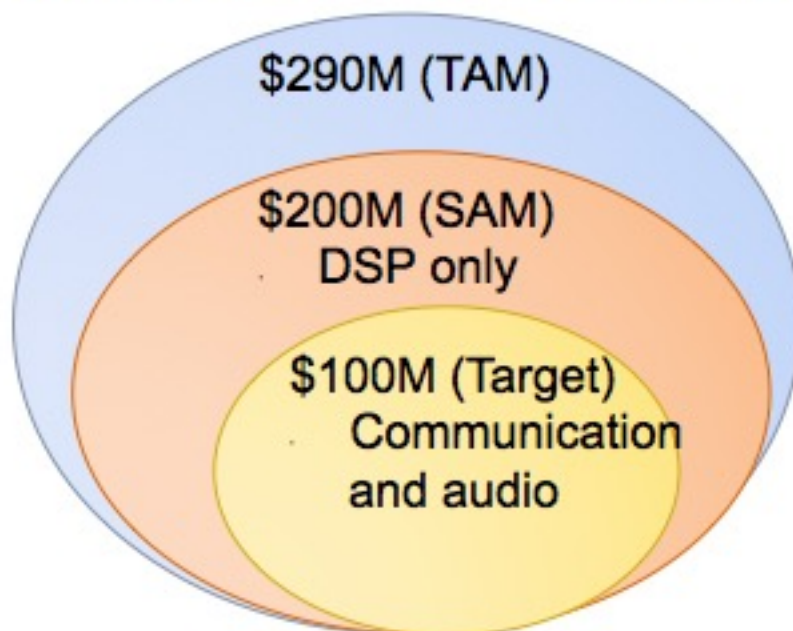


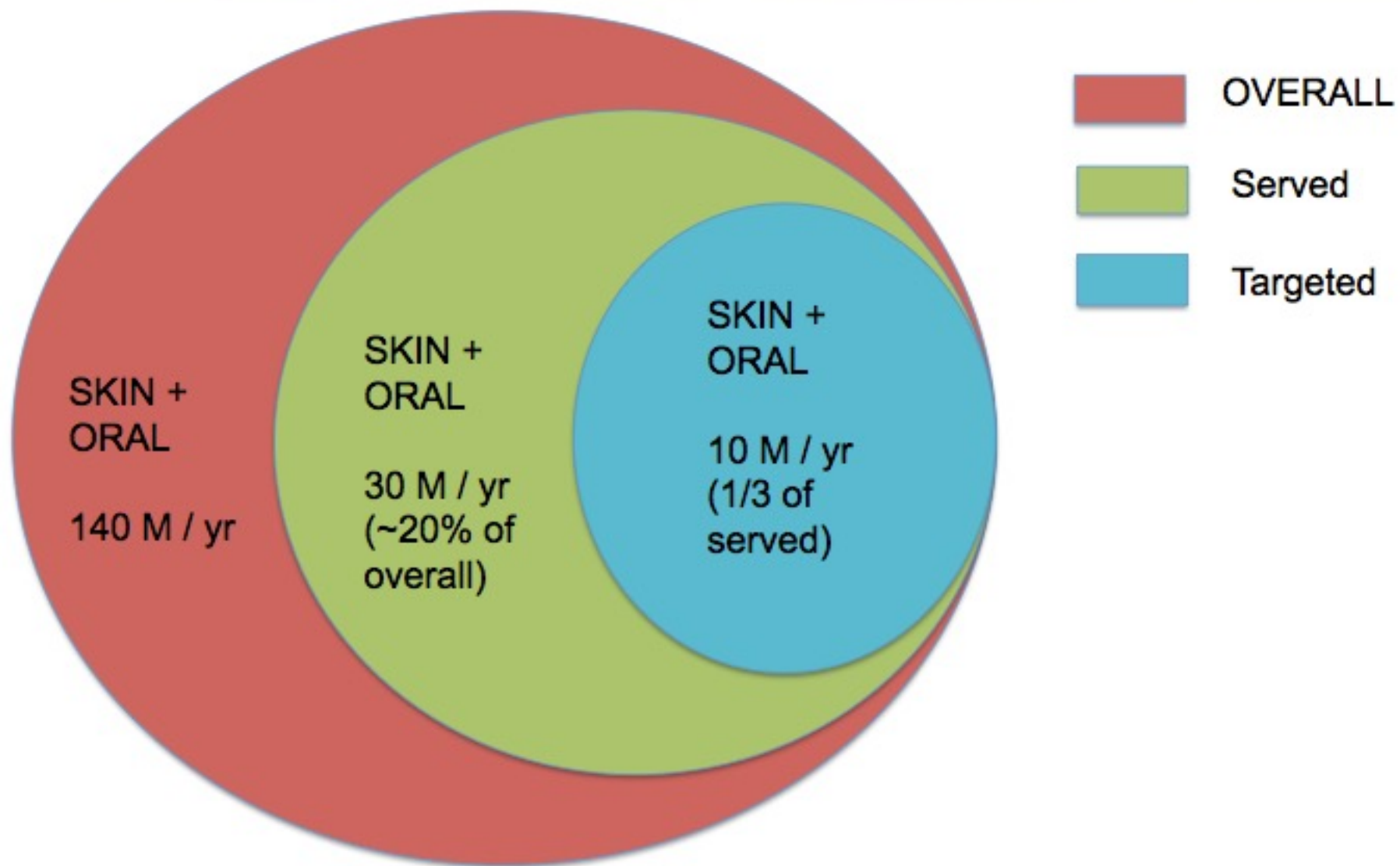
Global Catalyst Market =
\$29.5 B

- Emissions
- Refinery
- Chemical

MARKET SIZE

- Total embedded software market: \$2.5B (2010)
- Embedded software development tools: \$290M (2009)
 - Lack of data here – not confident in this number
 - Total addressable market (TAM): \$290M
 - Seems small, but # customers growing (e.g., wireless sensor network)
 - SET should raise average selling price – need to test this hypothesis
- How can we make our TAM \$2.5B instead of \$290M?





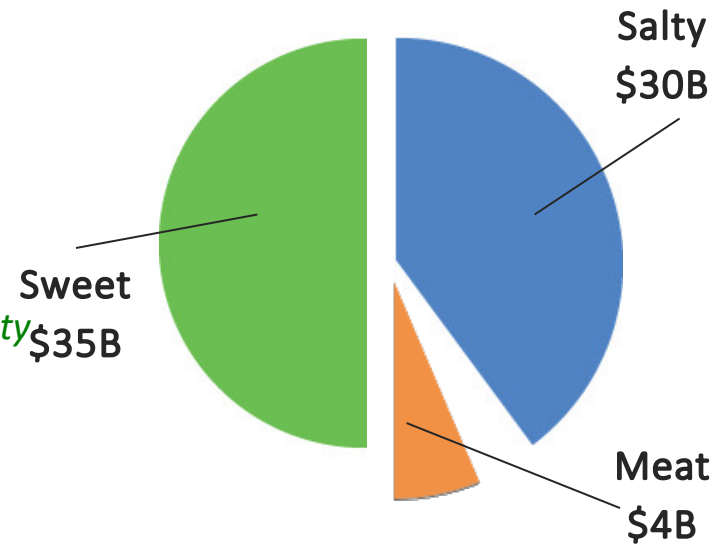
MARKET SIZE

Americans Love to Eat Meat and Snack

- **Giant Markets**
 - > Meat: \$160B / Snacks: \$70B
 - > Meat Snacks: \$4B
- **Varying Growth Rates**
 - > Meat: + 5%
 - > Snacks: + 15%
 - > **Jerky: + 5%**
- **Mega Consumer Trends Converging**
 - > Healthy, More Flavorful, Higher Quality
- **Snacks Driven by Innovation / News**
- **Meat Snacks / Jerky Generally Sleepy**
 - > Limited Innovation
 - > "Gut Stuffer" Image
- **Change Underway Driven by New Entrants**
 - > All-Natural
 - > 10% Growth Latest 52 Weeks Nielsen F/D/M

2009 US Snack Food

Retail Sales



Source: US Package Facts

\$50 Billion Dollar Protein Therapeutic Market

\$1.4 Billion Dollar
Cell Line Sales Market

\$140 Million
Dollar Target

SYNC: MARKET SIZING

TAM

- Grad students 20-27 yrs of age
 - Developed countries
 - Top 30% by income
 - 15% LDR
 - ~60 M individuals
 - Spend \$10/yr on tech
- Commuting couples
 - Developed countries
 - Top 20% by income
 - 2% LDRs in target industries
 - ~15 M individuals
 - Employers spend \$25/yr on tech

~\$950

~\$500

~\$50

SOM

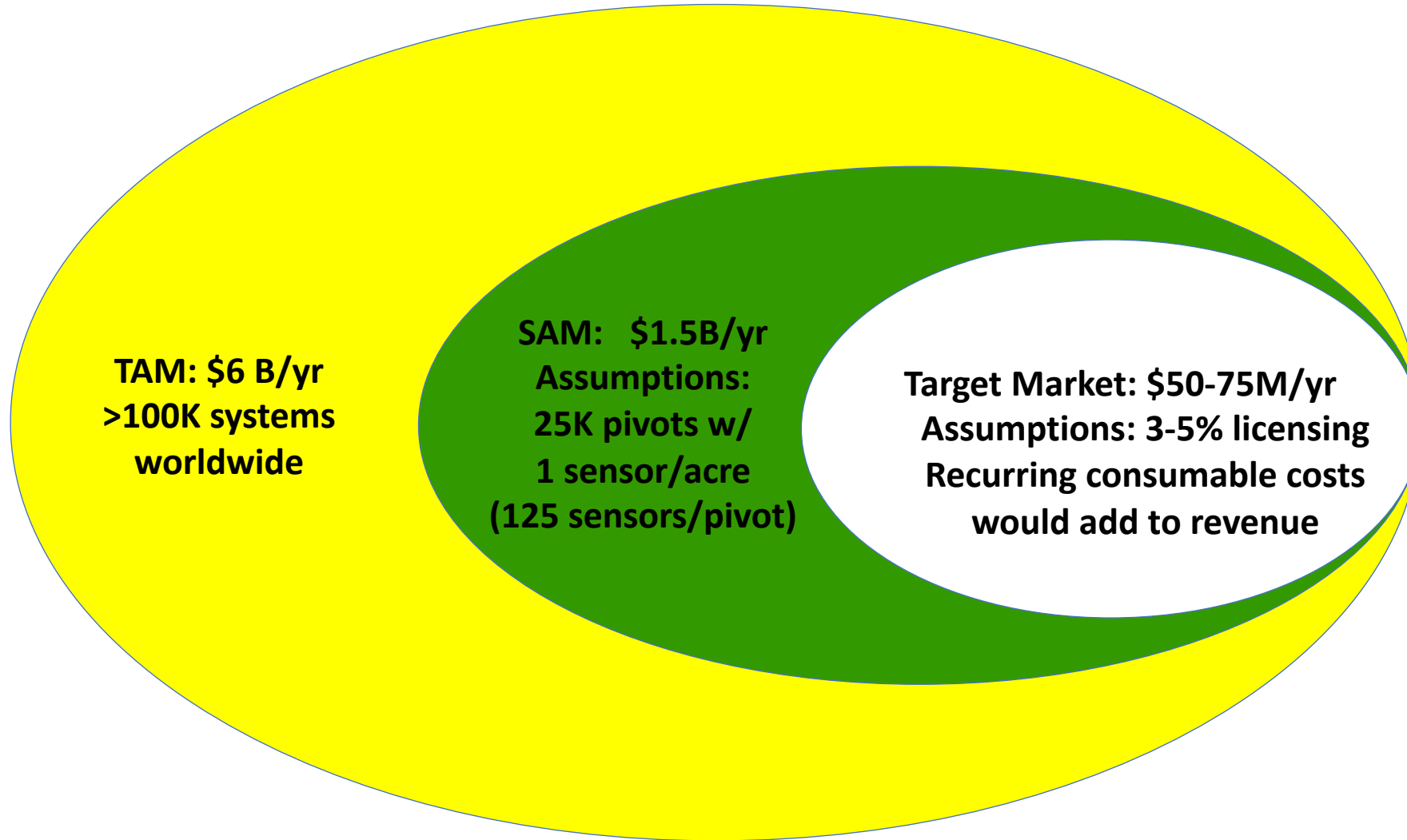
(Short term serviceable, obtainable, target market)

- Grad students from ~100 largest universities
- 100 largest enterprises with commuting employee base

SAM

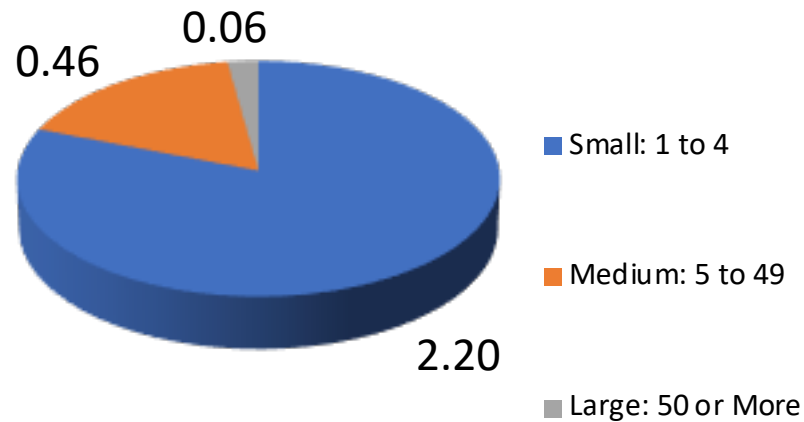
- US only, all states, higher average revenue/yr

Nitrate Sensor Market



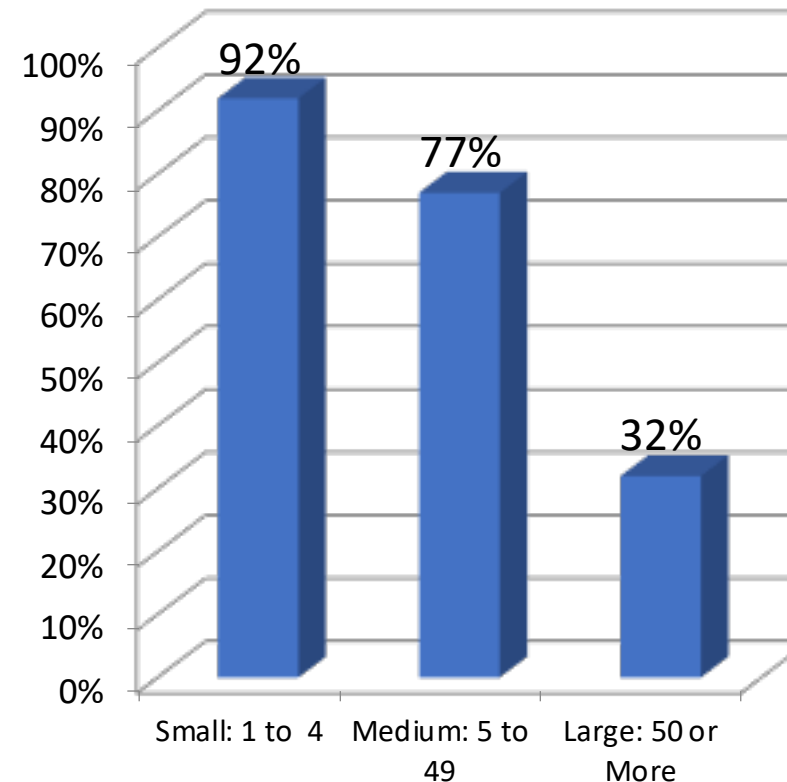
Market size - Landlords & Rental Units

Units by Landlord Portfolio Size in USA (millions)



50% of the "Small" landlords own just one unit.

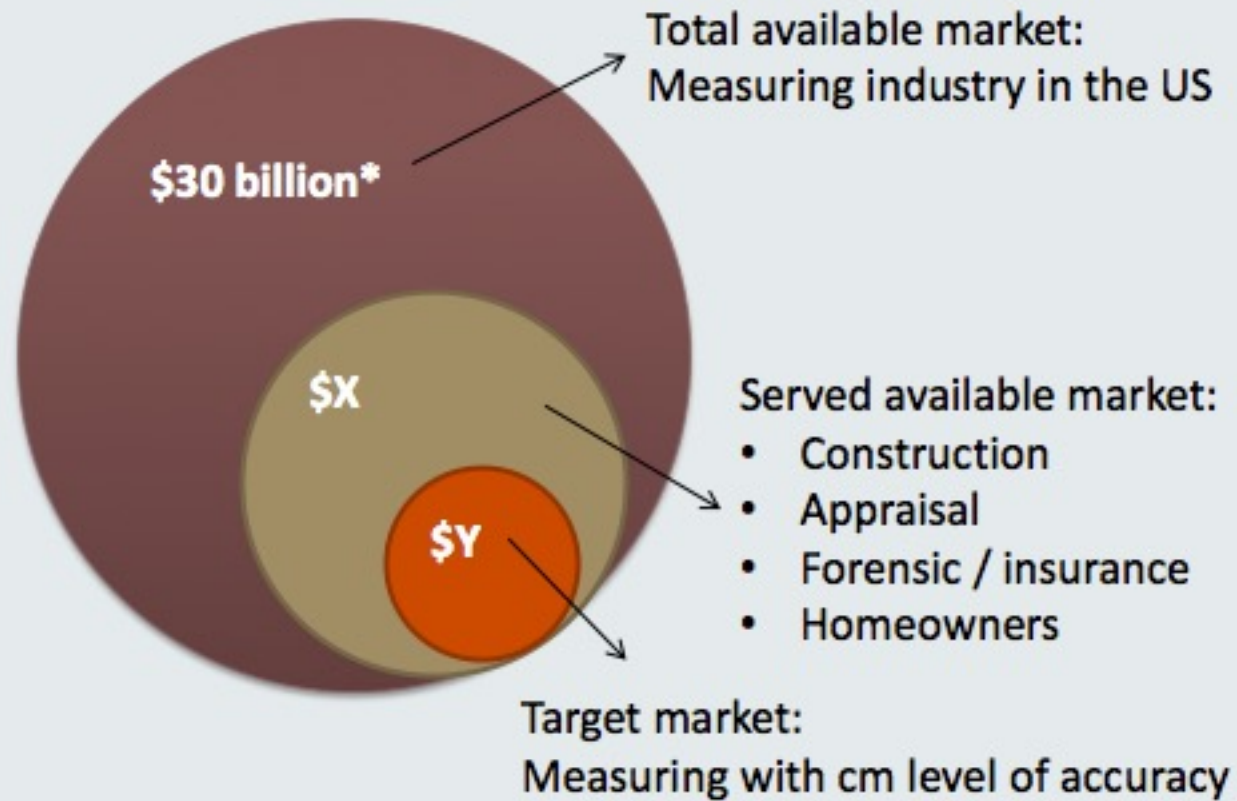
% of Units, by Landlord Portfolio Size, Owned by a Single Individual



Rental Real Estate is the Largest "Mom and Pop" business in America:
The vast majority of properties are owned by a single individual
that owns only one property.

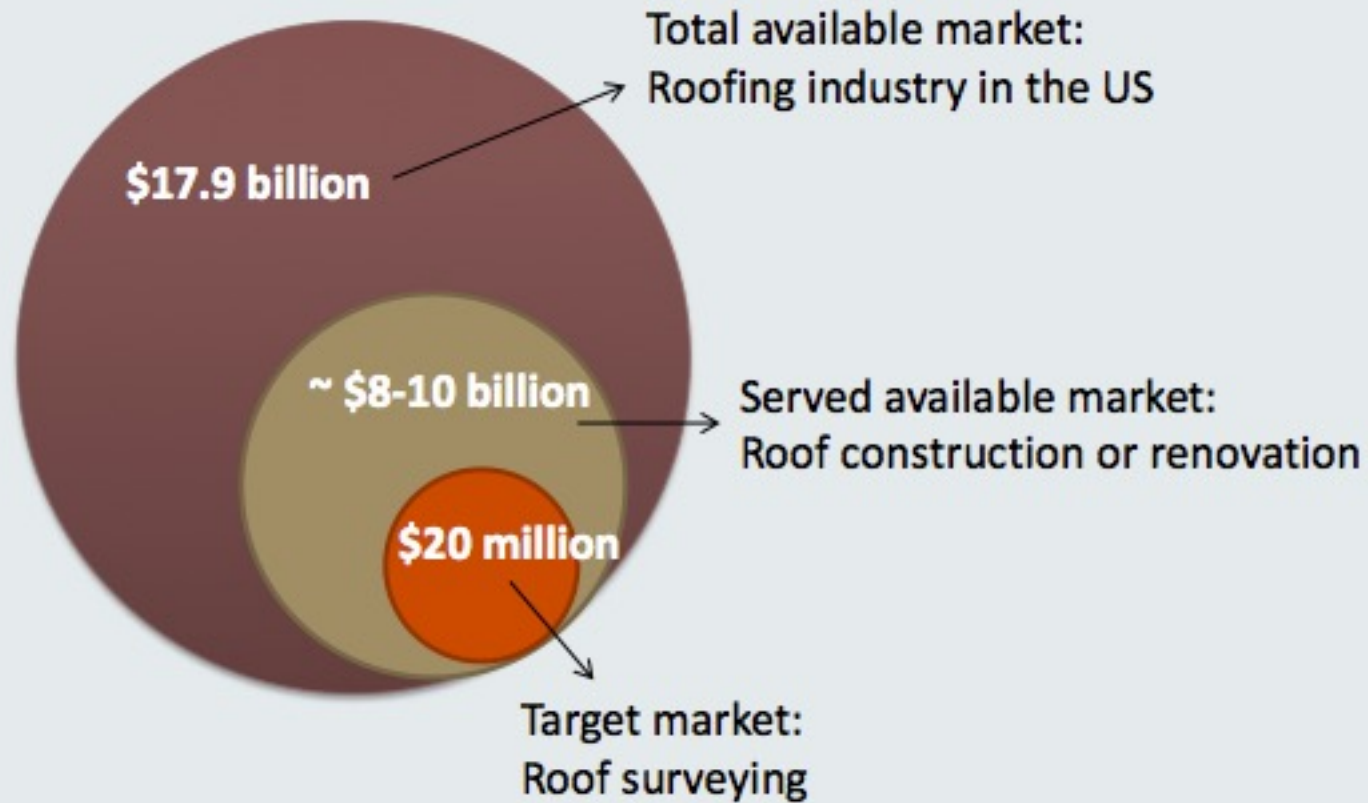
Source: US census data

Market size



* KPMG Construction Industry 2011 Annual Report
Assume 0.5% share of total construction spent

Market size (roofing industry)



Linear Lighting Market Size

