

Good
Morning

PDMA

UN's Sustainable Development Goals

Data & Funnels

O₂ Cube Case Study

PDMA Special Interest Group

Why am I Here Today?

Hypothesis: PDMA's community of product innovators and managers have the immense opportunity to leverage innovation to improve the lives of billions of people by focusing our skills and energy on the underserved regions of the world.

PDMA & Our Community



PRODUCT DEVELOPMENT &
MANAGEMENT PRACTITIONERS,
ACADEMICS and SERVICE PROVIDERS



WE SERVE NATIONS, ORGANIZATIONS
AND INDIVIDUALS

Connecting Innovators Worldwide



PDMA Community – Industries



Product Development & Management Concepts and Best Practices are ***UNIVERSAL***. They transcend industry, product or service.

PDMA Community – Geographies



Our Global Footprint



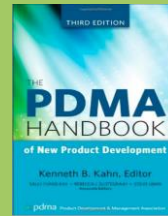
Members in 47
countries

PDMA Offerings

CERTIFICATION & PROFESSIONAL DEVELOPMENT

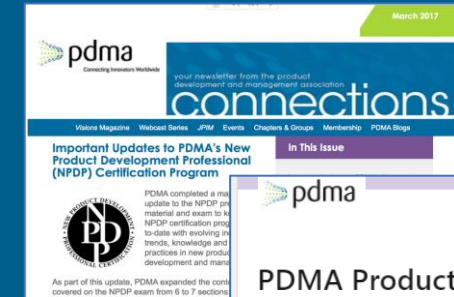


BOOKS, JOURNALS & CUTTING EDGE RESEARCH



PDMA Best Practices Survey

NEWSLETTERS & SOCIAL MEDIA COMMUNITIES



PDMA Product Development and Management Association Group

Listed group

ONLINE WEBCASTS, WORKSHOPS & KHUB



GLOBAL, REGIONAL & LOCAL EVENTS



JPIM Research Forum



PROFESSIONAL RECOGNITION



Crawford Fellow Award

Allan Anderson Ambassador Award

United Nations Sustainable Development Goals



The State of the World (in numbers)



689 Million
EXTREME POVERTY^[1]



780 Million
GO TO BED HUNGRY^[4]



773 Million
ILLITERACY IN
ADULTS^[3]



2.2 Billion
NO SAFELY MANAGED DRINKING
WATER^[5]



1.1 Billion
NO ACCESS TO
ELECTRICITY^[6]

The State of the World (in images)

Poverty



Hunger



Illiteracy



Clean Water



No Electricity

How Much Money is Spent in These Areas? (U.S.)



**\$328B on
Startups [6]**



**\$20.7B On
Food [10]**



**\$67.6B by Higher
Education [7]**

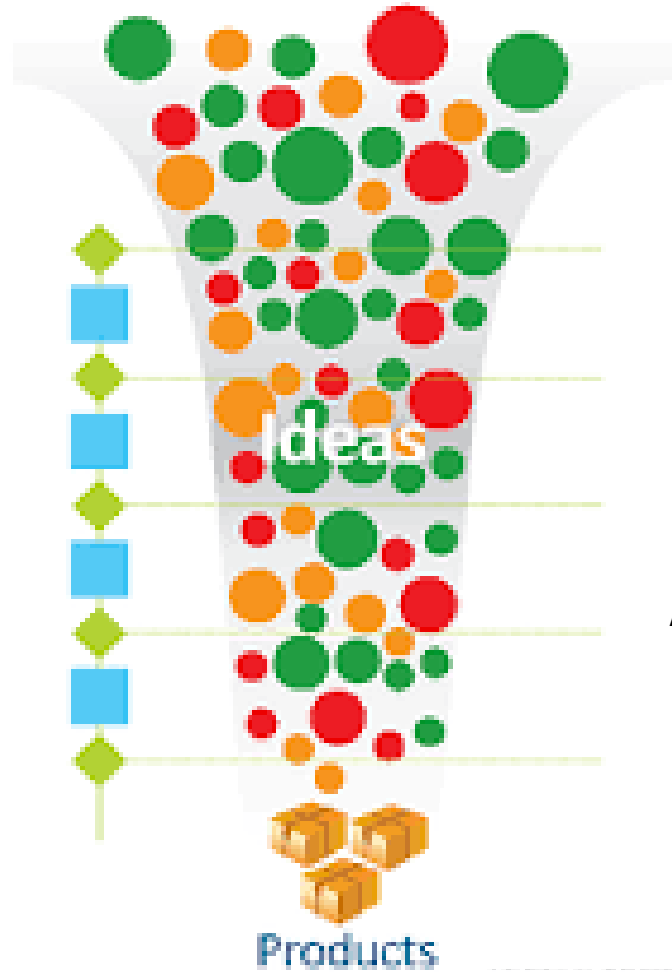


**\$50B On
Clean Water [9]**



**\$8.8B on Grid
Power [8]**

The Innovation Funnel



It's my belief that R&D focused on higher income consumers must be translated through innovation into viable, valuable products and services for low-to-middle-income countries (LMIC's).

The Neglect Funnel

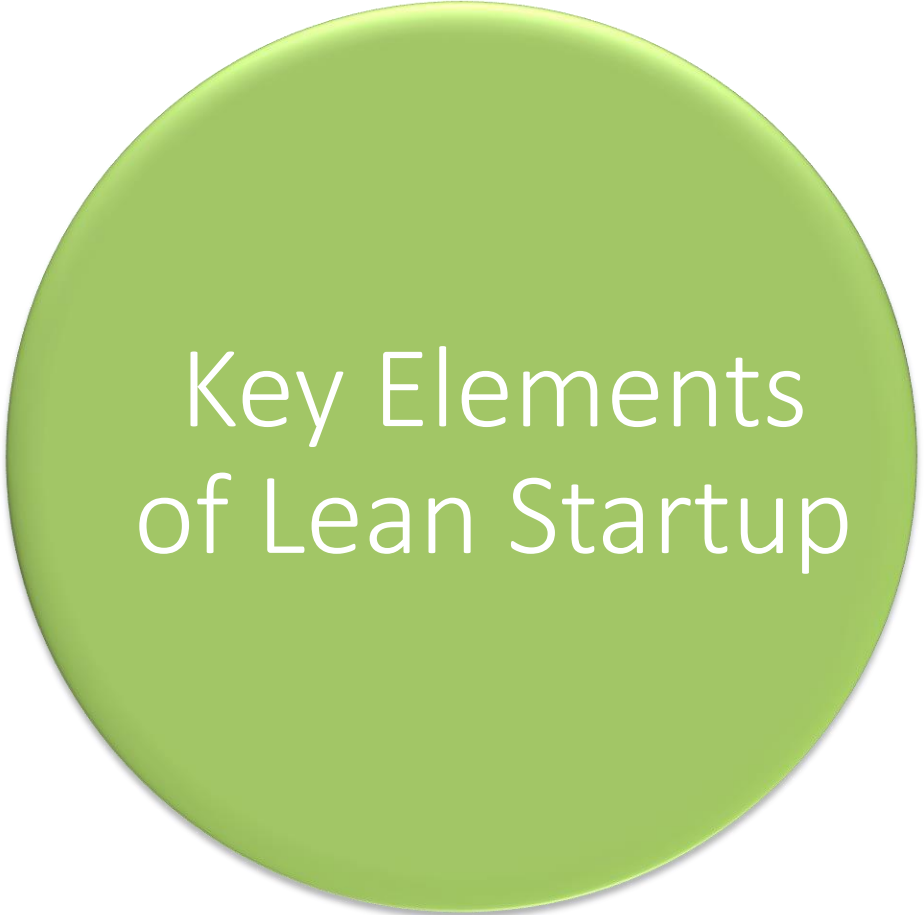




LEANMED

A CASE STUDY

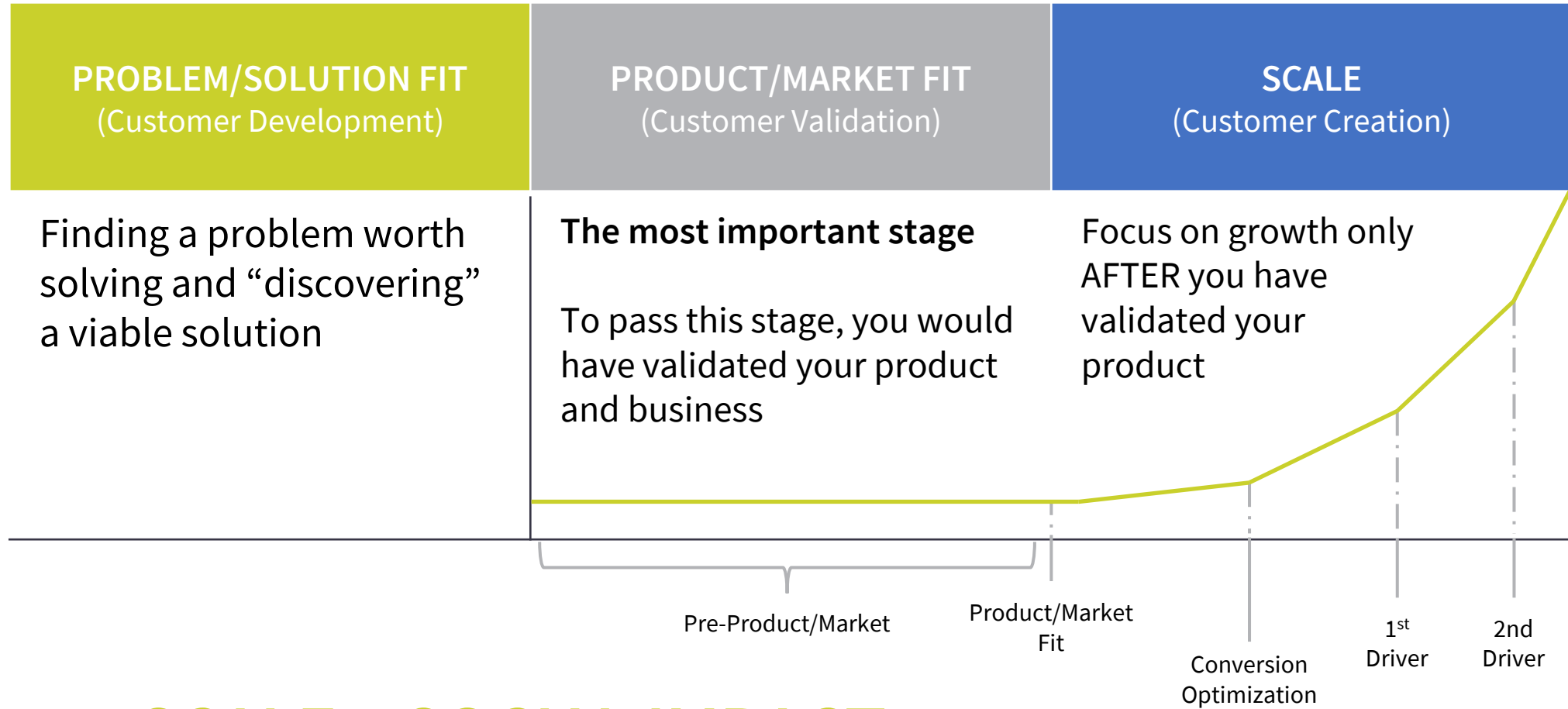
Leveraging Lean Startup methodology
in Product Innovation



Key Elements of Lean Startup

1. The Three Stages
2. The Business Model Canvas
3. Build/Measure/Learn
4. Minimum Viable Product

The Three Stages of a Startup



SCALE = SOCIAL IMPACT

The background image is a blurred photograph of a child lying in a hospital bed. The child is wearing a patterned blanket and has medical equipment, including a nasal cannula and a small white device, attached to their face. The room appears to be a hospital ward with other beds and equipment visible in the background.

Problem:

Pediatric pneumonia is the #1 killer of children in developing nations, averaging 800,000 deaths per year

Rural hospitals lack reliable electricity to produce life saving medical oxygen.

Solution: Bring Oxygen to the People

The *O2 Cube* is a solar-powered, cloud connected production system that brings *life-saving oxygen* to the over *one billion* people that live without it today.



Five Years of Product/Market Fit

2018

Winner of the University of Pittsburgh 2018 Blast Furnace competition

Developed functional O₂ Cube prototype at Duquesne



2020

Duquesne University New Venture Competition Finalist

Acceptance into life sciences incubator, LifeX Labs



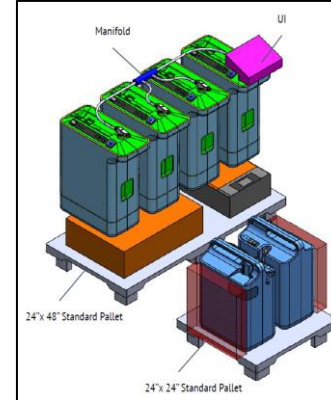
2022

Wefunder crowdfunding campaign started. \$85K raise.



2022 – O₂ Cube Pilot Operational in Nigeria

First Commercial 10 LPM O₂ Cube Designed



Idea Foundry Incubator Malawi Pulse Oximetry Project



2019

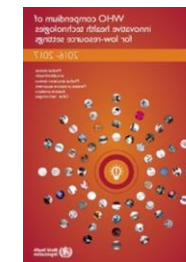


Finalist in PinCh Competition. \$50K award

Licensed UltraFill oxygen filling station from Philips



O₂ Cube included in 2021 WHO Compendium of Innovative Health Technologies for Low-Resource Settings



2021

Commercial O₂ Cubes Ship to Uganda and Nigeria!

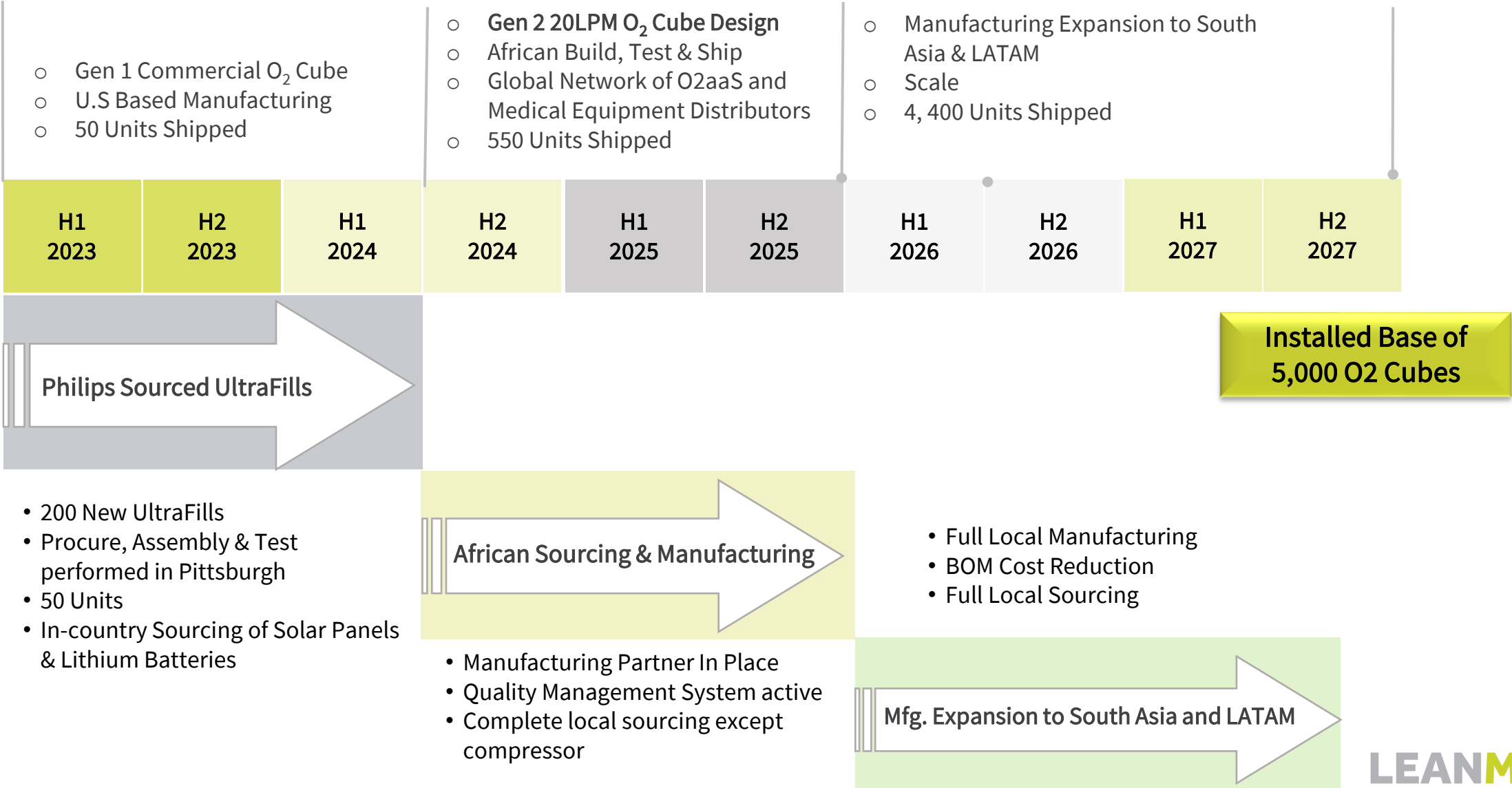
2023

Five Years of Product/Market Fit

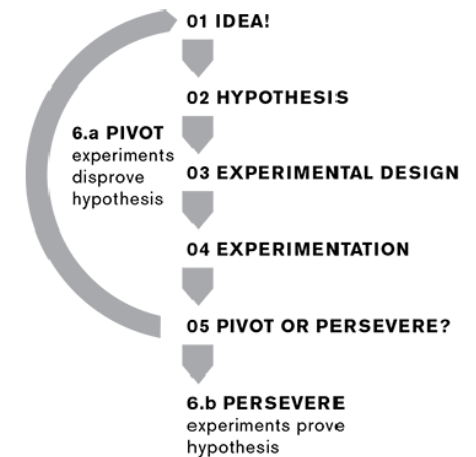
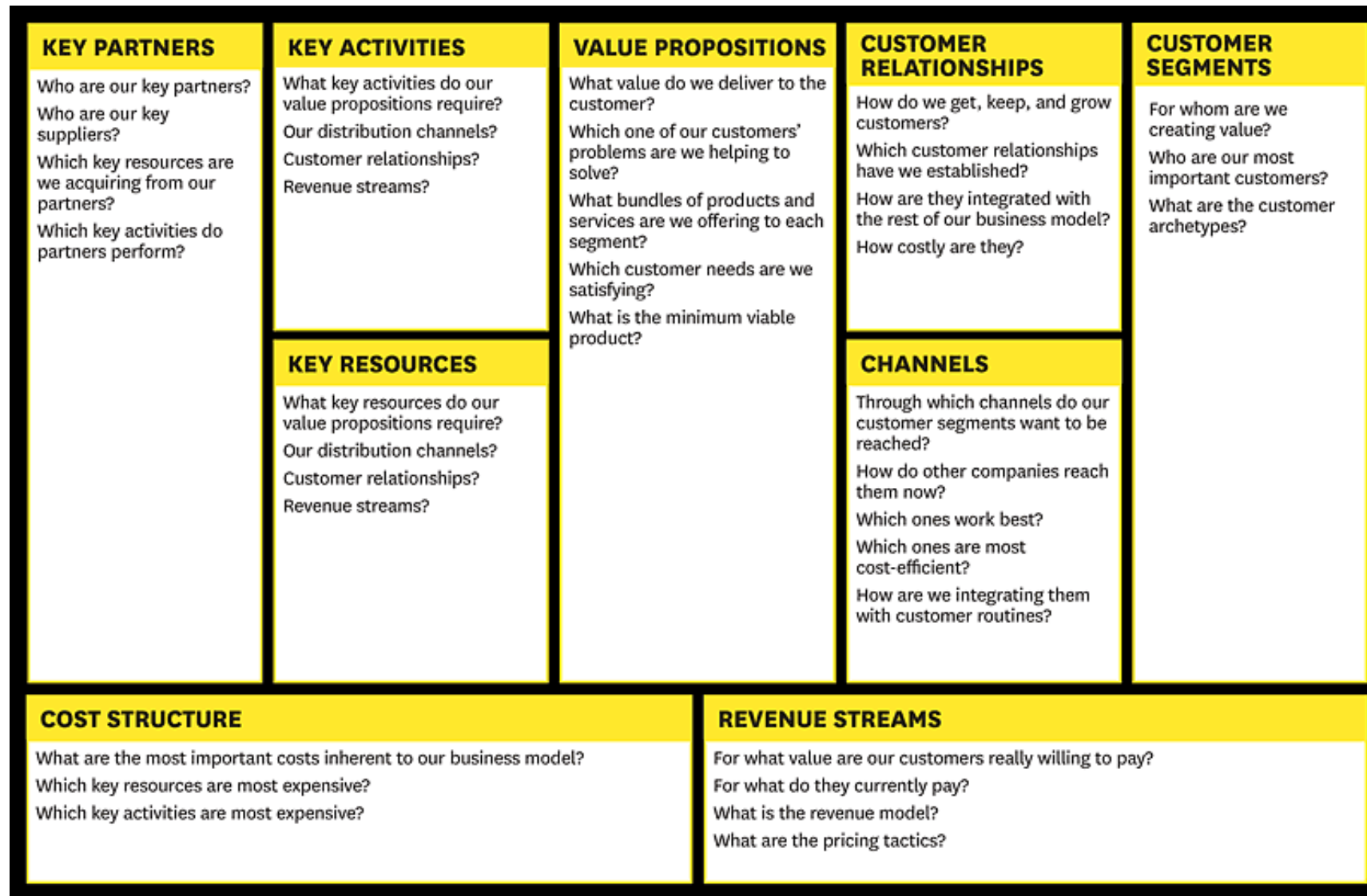


O₂ Cube Scale-up

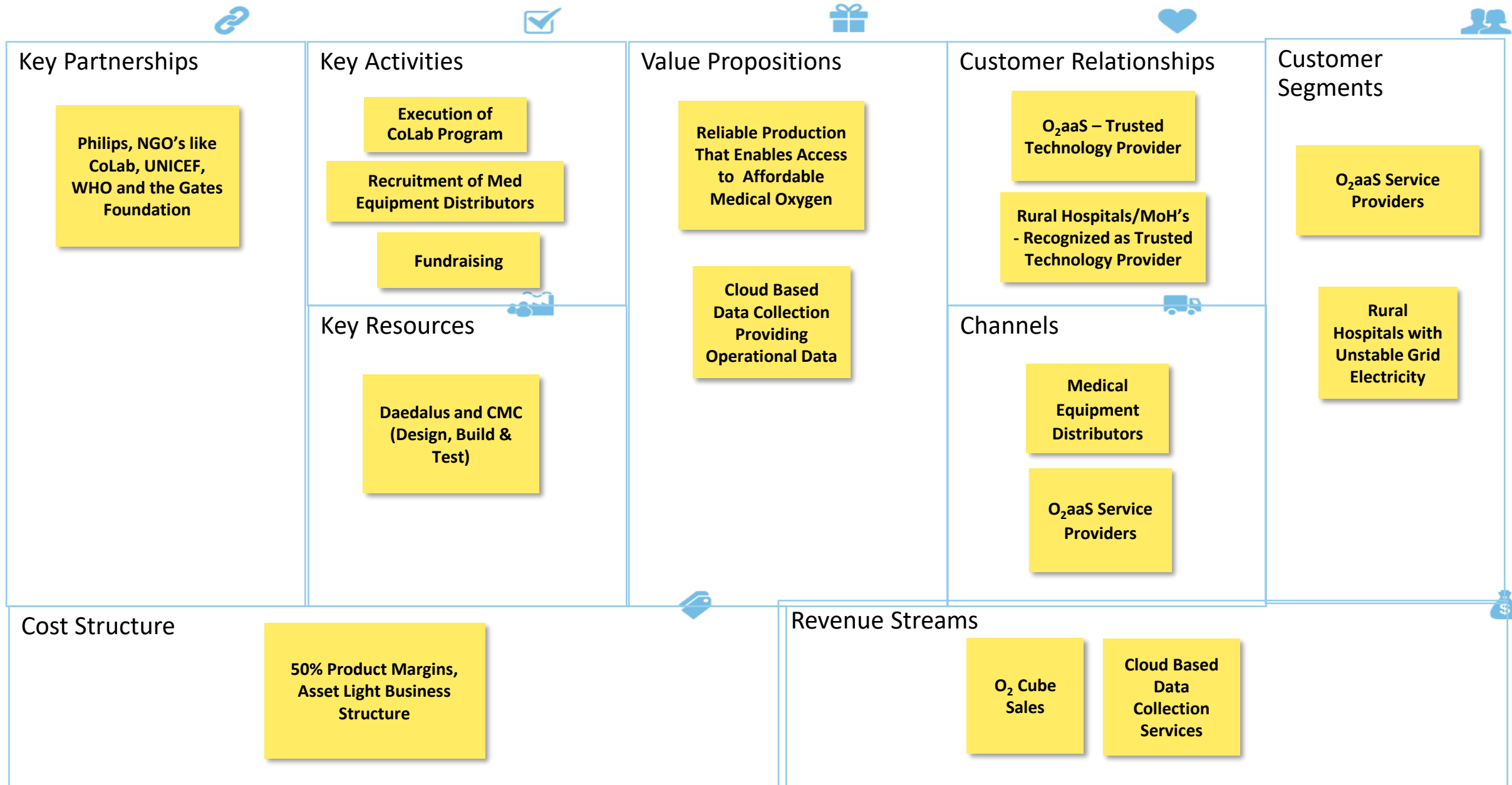
3 Stages:
Questions?



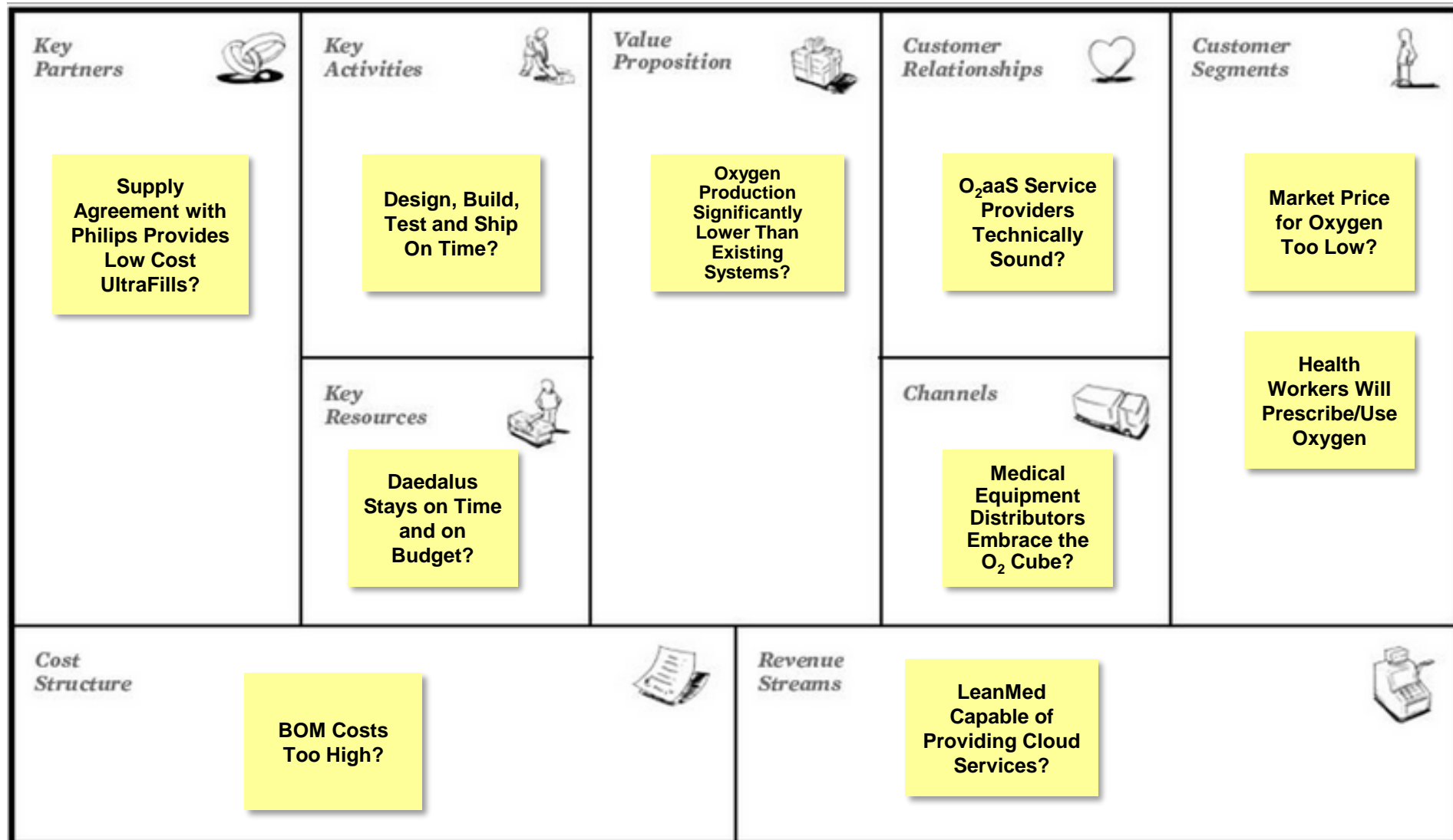
The Business Model Canvas



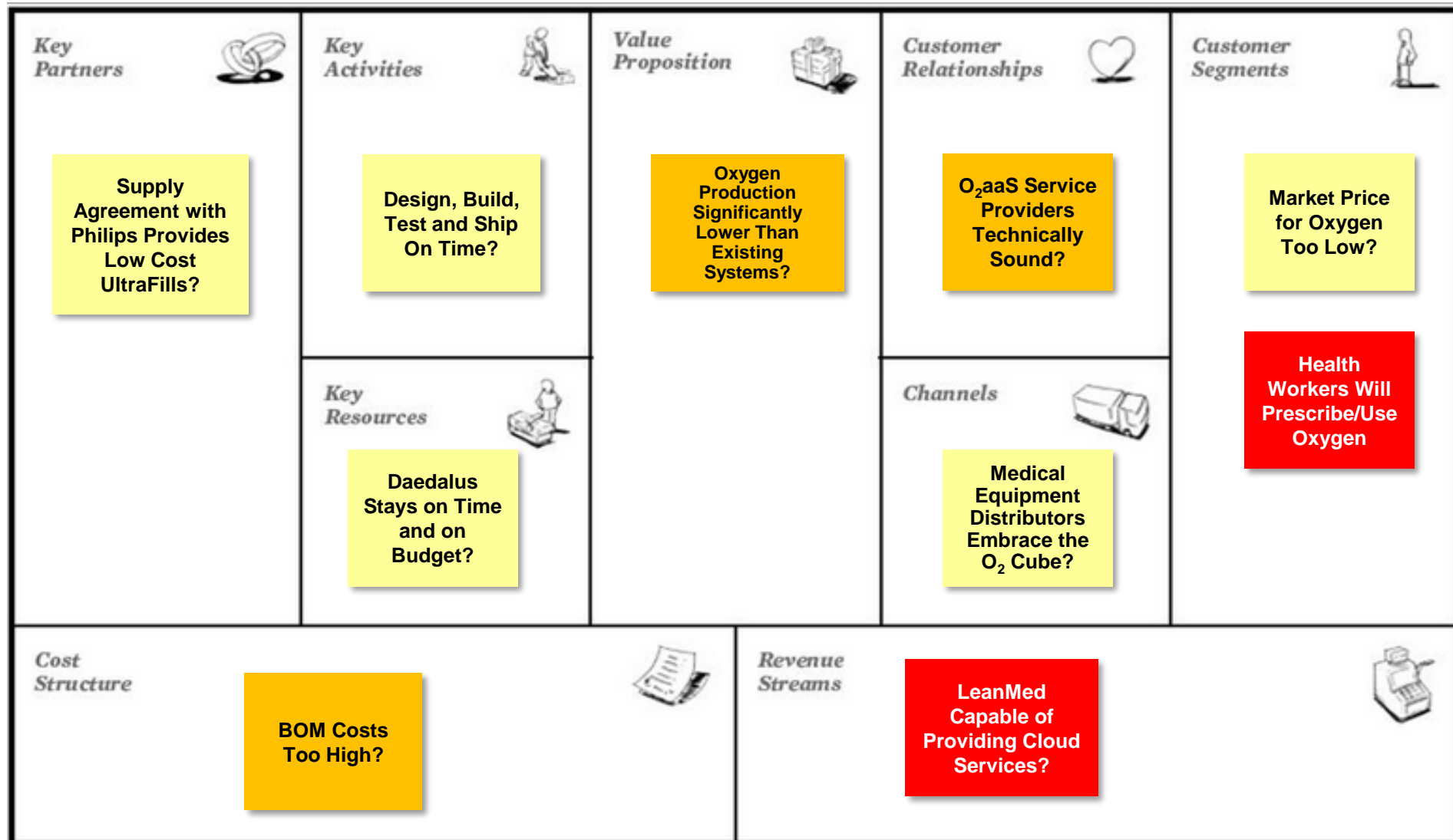
Lean Med Business Model Canvas



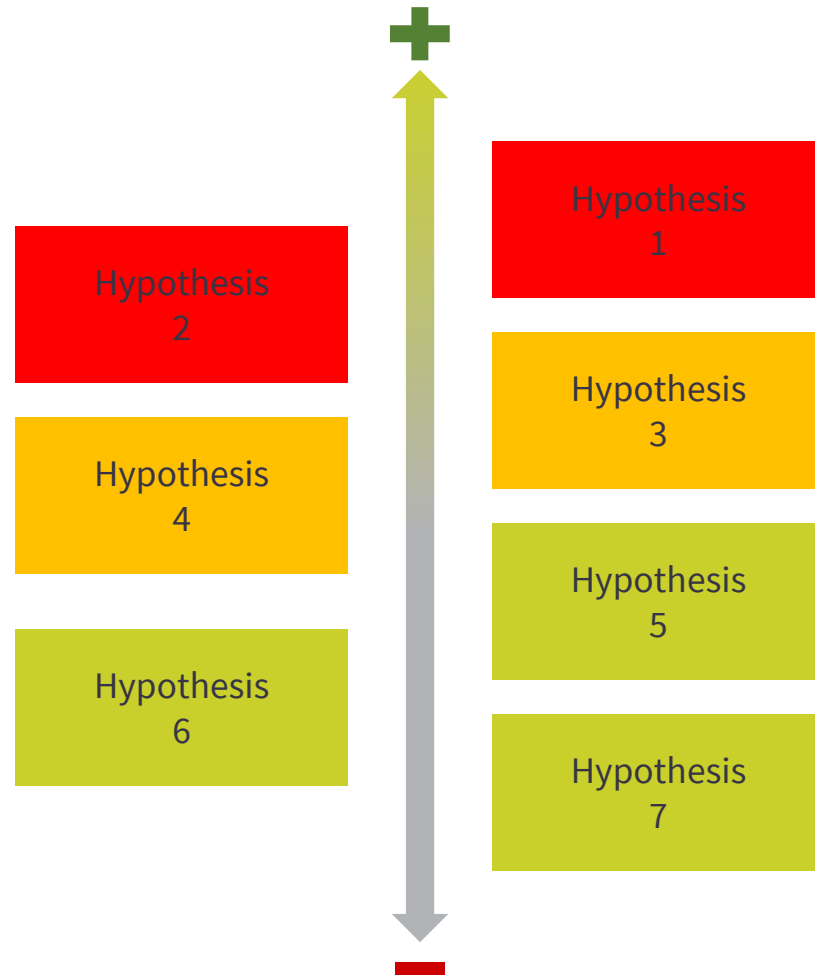
Identify Key Hypotheses



Where is the Risk?



Prioritize Hypotheses



1. Break down the critical assumptions
2. Use an FMEA like approach
3. Estimate Probability and Impact
4. Rank them

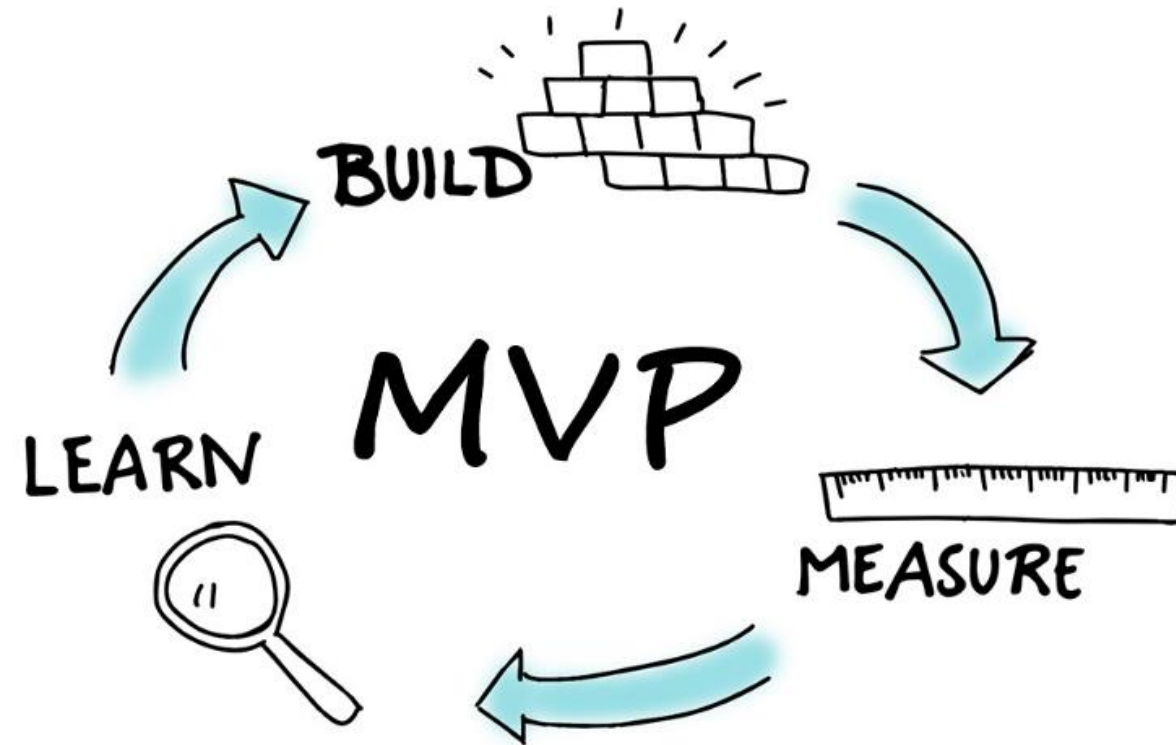
Design an Experiment and Measure Results

- 1. We Believe:**
Medical staff will use oxygen cylinders effectively
- 2. To Verify:**
Execute the Nigerian Fast Track program
- 3. And Measure:**
Satisfaction score and system usage
- 4. It Will Require:**
8 or higher satisfaction rating and 80% utilization
- 5. We Are Right if**
Scores and utilization exceeds targets



BMC
Questions?

Minimum Viable Product



A minimum viable product (MVP) is a version of a product with just enough features to be usable by early customers who can then provide feedback for future product development

Fast Track as MVP

What is it?

A pilot program initiated to better understand the demand for oxygen and learn how versatile the O₂ Cube is by implementing variations of the product in multiple locations with different needs.

How will it work?

The **Fast Track O₂ Cube** is the minimal viable product version of the O₂ Cube that uses already FDA-approved components donated by various organizations including Philips, Goal Zero, and Masimo.

The world can't wait
– so neither will we

**Fast Track
O₂ Cube**



Operational in
Nigeria. 26 Bed
Pediatric Ward

Goal Zero
Yeti 3000x

**Philips
UltraFill**



**Philips
EverFlo**



**Masimo
Rad-G Pulse
Oximeter**



Fast Track O₂ Cube



26 Bed Pediatric Ward Ota, Nigeria

One Pilot Program Using an MVP

O₂ Cubes Deployed at Scale



800,000 Deaths per Year Due to Pediatric Pneumonia

Multiple Clinical Studies Show a 33% Reduction in Mortality Rate When Oxygen Treatment is Available

$800,000 / 3 =$ ***266,000 Lives Saved Every Year***

In Addition, An Enormous Reduction in Medical Complications and Hospitals Stays

In Summary

- PDMA's community of product managers and developers have an **ENORMOUS OPPORTUNITY** to make the world a better place to live, work and play. Let's use our innovation resources and skills to improve healthcare, eliminate poverty and protect the environment.
- Product and service **INNOVATION IS REQUIRED** to invent the technologies that will allow us to achieve the challenging price-performance objectives and operational requirements for new products to work properly under specific constraints found in low to middle income countries (LMIC's)
- The LeanMed journey is demonstrating the impact that comes when new product development becomes **MISSION DRIVEN INNOVATION**.

Thank you!



 **o₂cube™**

every breath counts

References

1. Measuring Poverty. World Bank
<https://www.worldbank.org/en/topic/measuringpoverty>
2. UNESCO Institute for Statistics
<https://uis.unesco.org/en/topic/literacy>
3. Action Against Hunger
<https://www.actionagainsthunger.org/the-hunger-crisis/world-hunger-facts/>
4. The World Health Organization
<https://www.who.int/news/item/18-06-2019-1-in-3-people-globally-do-not-have-access-to-safe-drinking-water-unicef-who>
5. Access to Energy
[https://ourworldindata.org/energy-access#:~:text=940%20million%20\(13%25%20of%20the,100%2Dfold%20across%20the%20world](https://ourworldindata.org/energy-access#:~:text=940%20million%20(13%25%20of%20the,100%2Dfold%20across%20the%20world)
6. [6] <https://www.cnbc.com/2022/01/13/vcs-invested-more-money-than-ever-into-start-ups-last-year.html>
7. [7] <https://www.foodengineeringmag.com/articles/98793-public-budgets-for-foundational-research-decline>
8. [8] <https://nces.nsf.gov/pubs/nsf22312>
9. [9] <https://www.who.int/news/item/13-04-2017-radical-increase-in-water-and-sanitation-investment-required-to-meet-development-targets>
10. [10] <https://www.iea.org/reports/world-energy-investment-2020/rd-and-technology-innovation>