

Hardware

Intro to Hardware Management

Startup Management (IPIRI 63749B), Aleš Špetič, 2024

Learning Objectives

Understanding Hardware Startup Management

- Differences between hardware and software startups
- Investment criteria for hardware ventures
- Unique challenges and opportunities in hardware

Fundamental Differences

Hardware vs. Software Startups

- Physical production vs. digital development
- High initial capital vs. lower software startup costs
- Longer development cycles in hardware

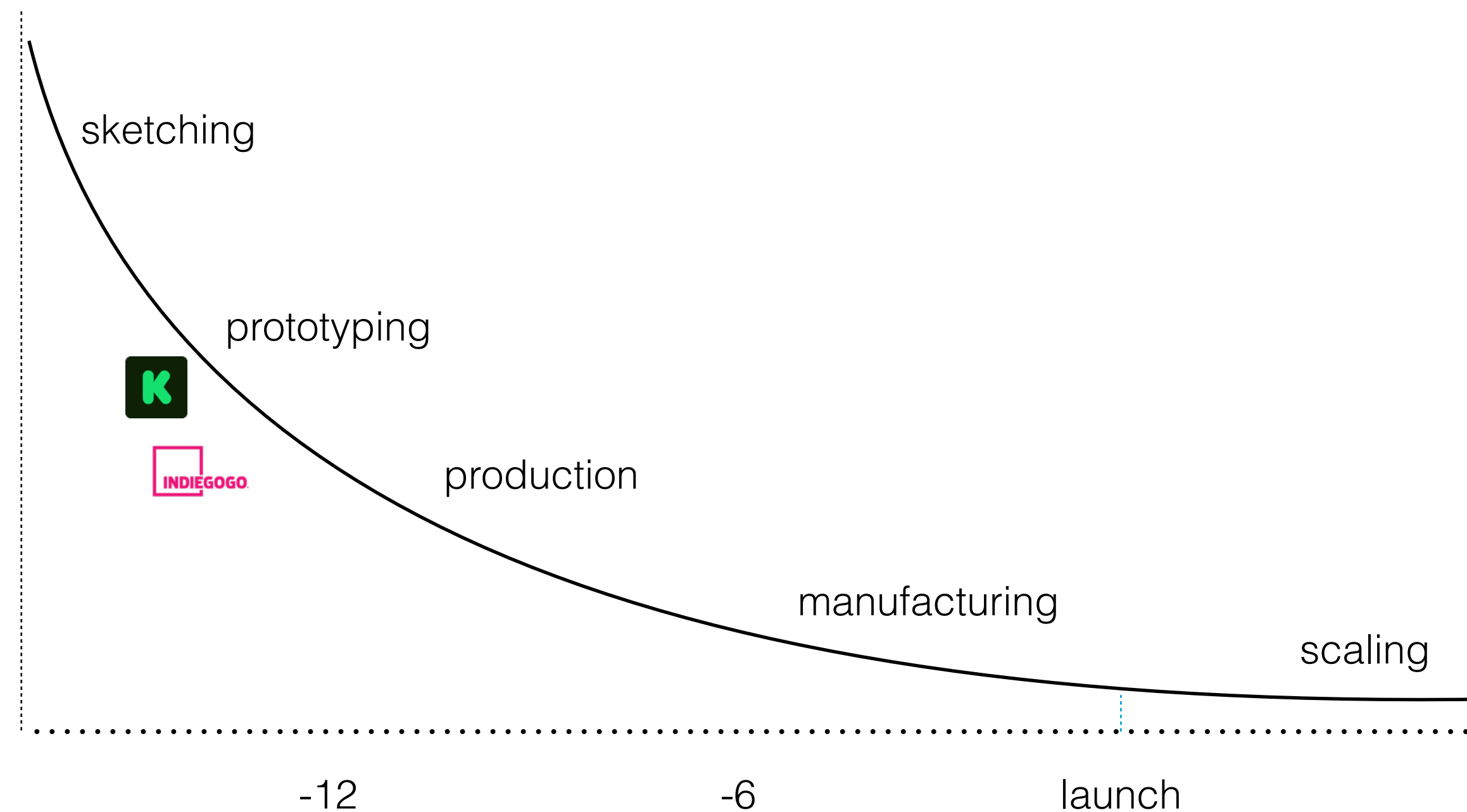
Fundamental Differences

Hardware vs. Software Startups

building a HW product is as
if you could compile your SW only 4 times
and every compile would costs 100k

Lifecycle of a HW Product

The 5 phases in a hardware startup's life



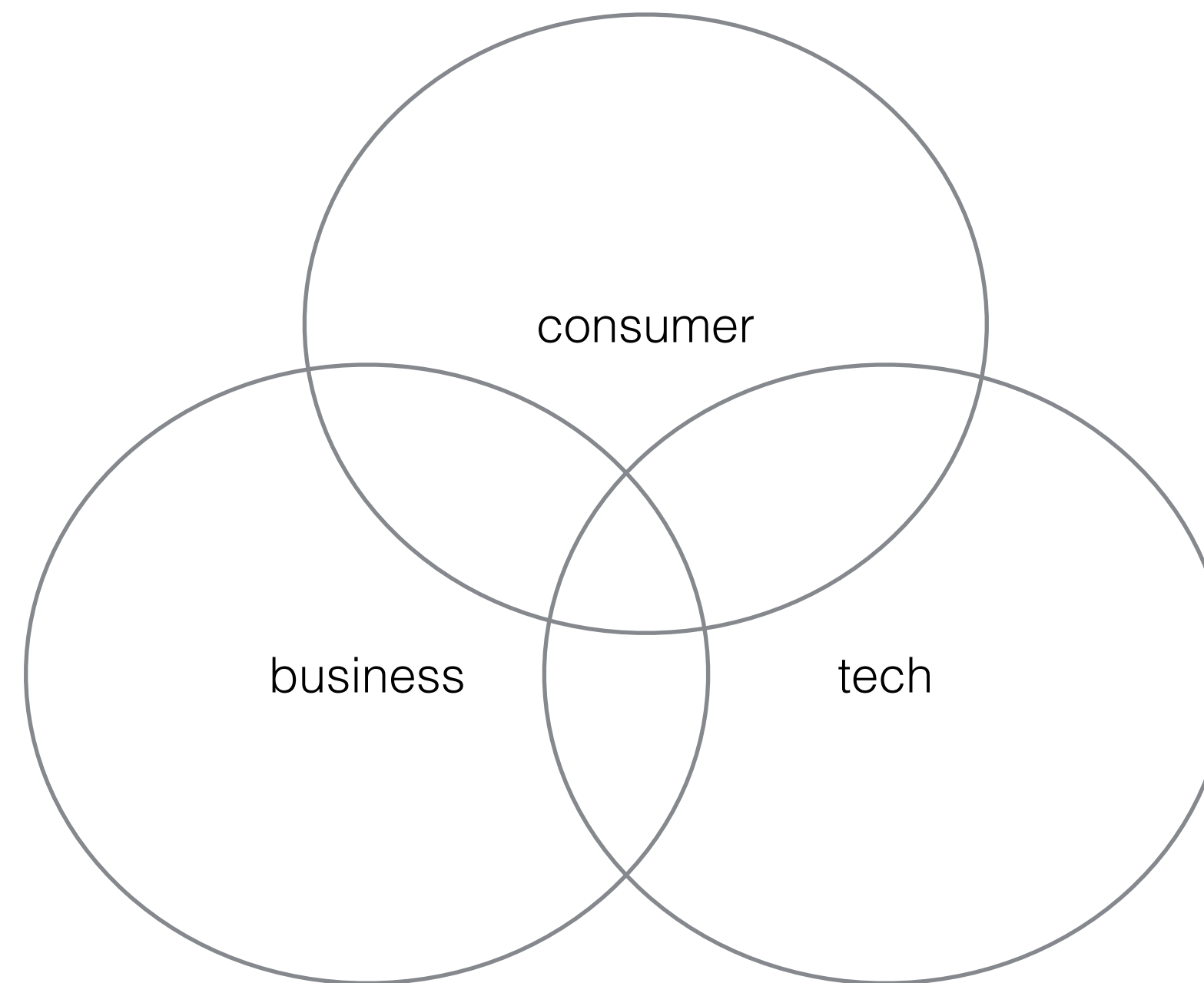
HW vs. SW

Key Differences



Target Markets

For Whom are you Developing the Product?



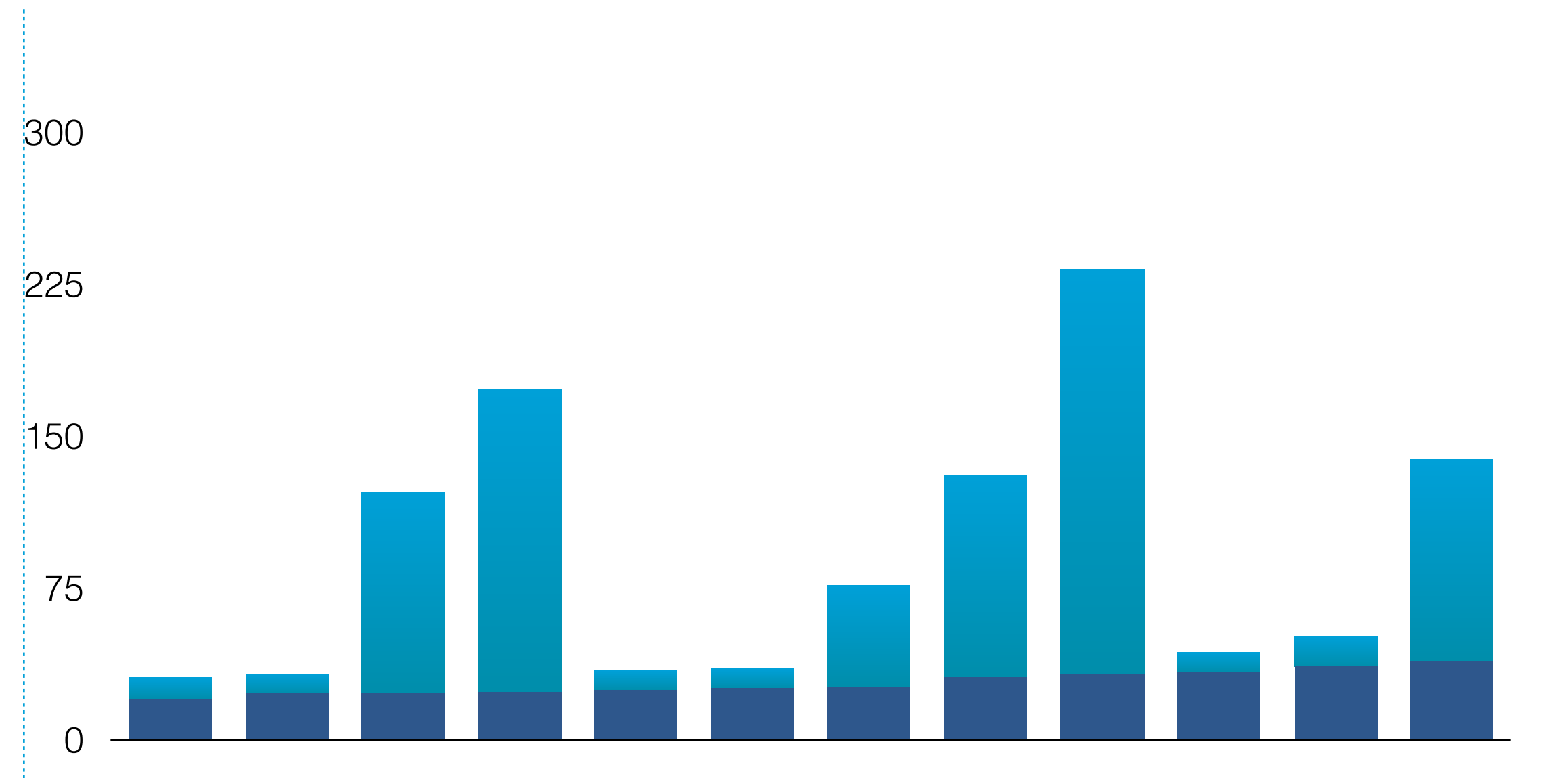
Adoption

What do the numbers mean?

- **Signups (5%)** - no cash exchanges hands
- **Reservations (20%)** - buyers reserve a slot in the queue
- **Preorders (90%)** - taking orders, though the customers can still cancel them
- **Done-Sales (100%)** - Selling the product

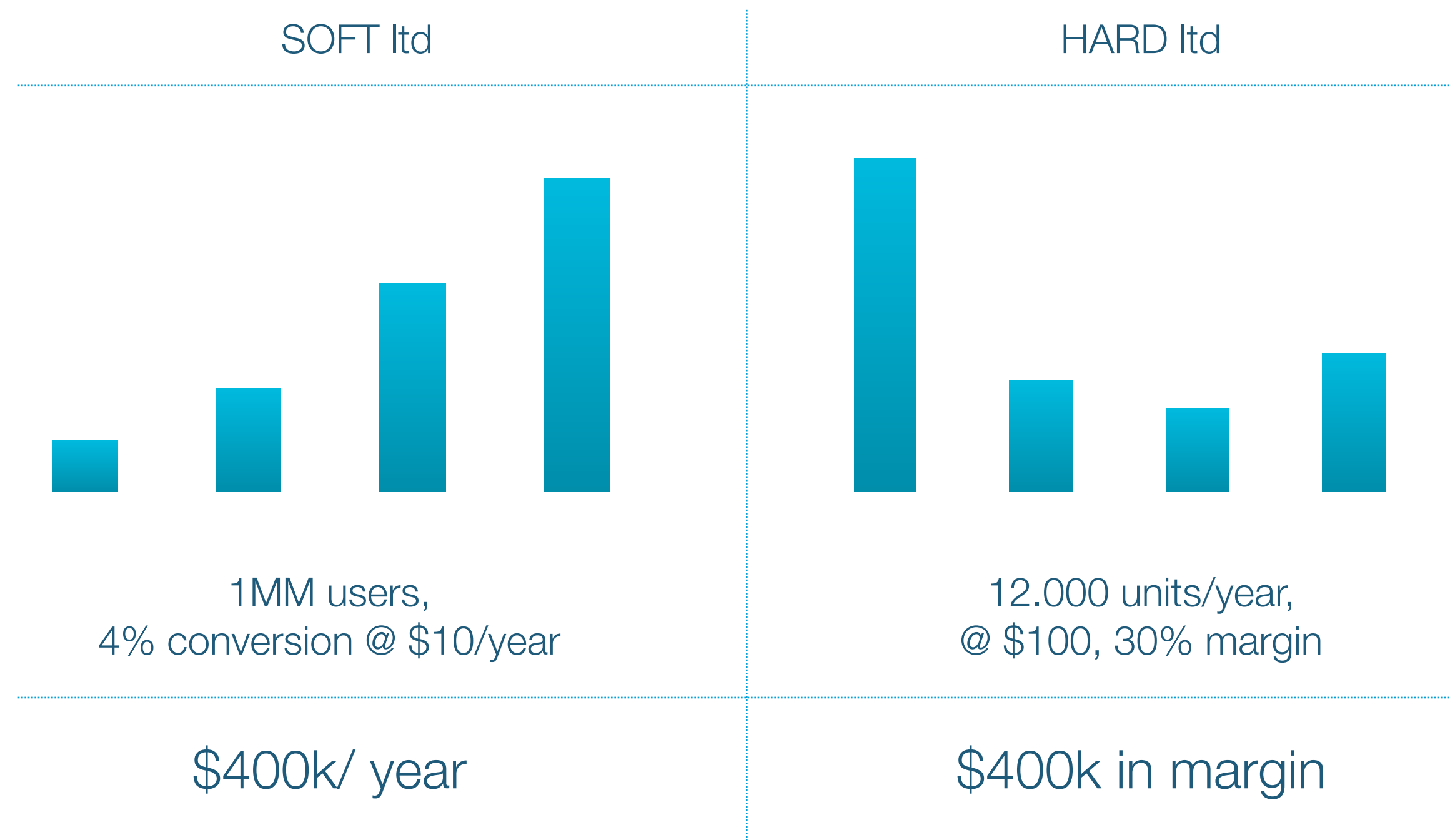
Traction

How does HW sales grow?



Business Performance Recording

Comparing SW vs HW revenue



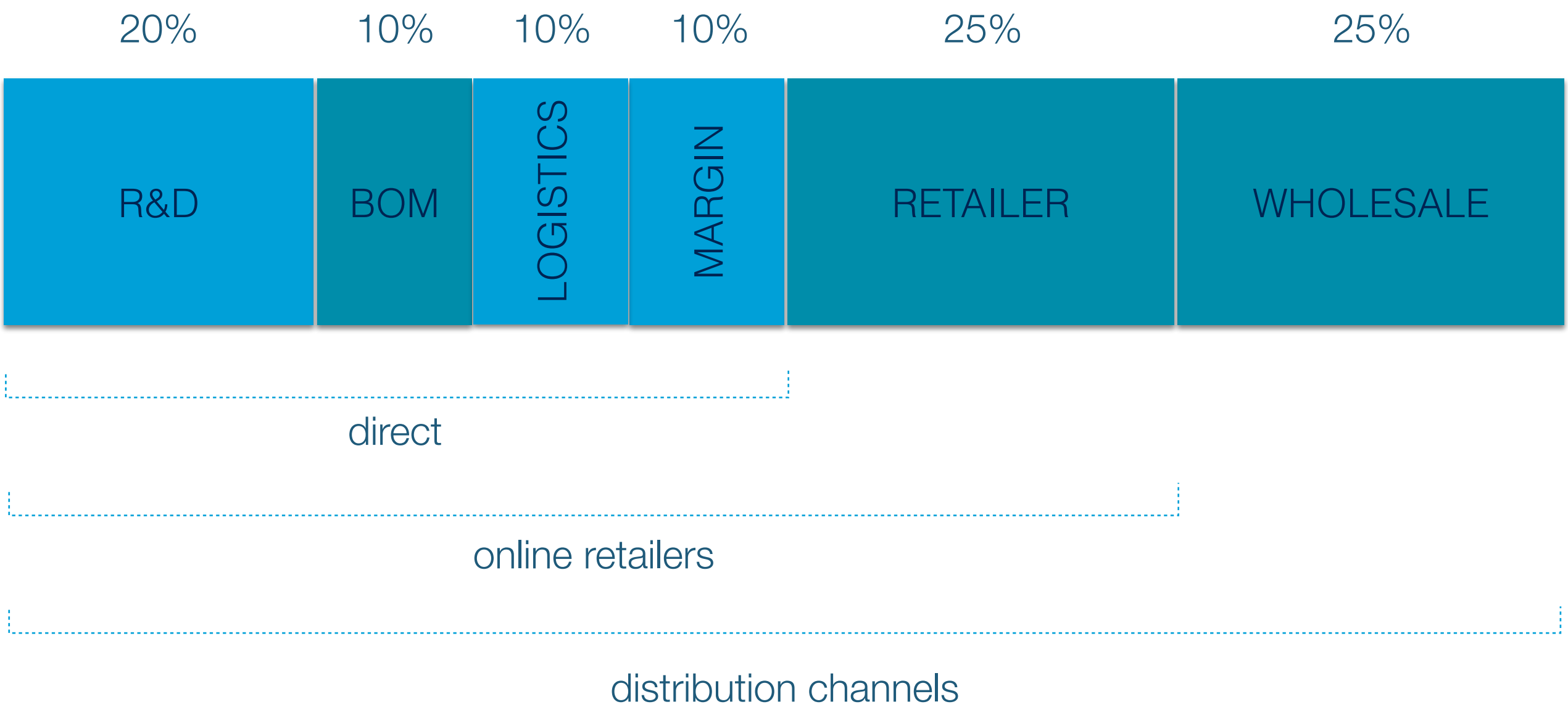
Margins and BOM

Economics of HW



Margins and BOM

Economics of HW



Returns?

Manufacturing

Process of making things

- **Iterations/time** - every run takes a few weeks to a few months
- **Quality control** - who guaranties control?
- **Volume** - every run is should support sales for the next few months
- **Supplier risk management** - what happens when the supplier fails?

Capital Requirements

What costs do we have?

- **Initial costs** - design, prototypes, tooling, casing, PCBs, firmware
- **Working capital** - financing each batch
- **Inventory** - storing the products until they are sold

Pricing

Models of charges in HW

- **One-off charge** - include customer LTV value in one price
- **Cheap replacements** - resell to the same customers
- **Recurring revenue** - SW protected HW charge

Competitive Advantage?

How to protect against competition?

- **Switching costs** - users don't change devices often
- **Software lock-in** - SW enabled HW where data offers lock-in
- **Barriers to entry for competition:**
 - Limited iterations
 - Working Capital
 - Production Risks
- **IP - Patents?**