How I learnt Hardware is Hard.

Journeyman Story of an Engineer

What is this about?

Story of Soumyadeep Mukherjee
co-founder, dashtoon

- Failed Startup Attempt
- 0 to 1 journey in pre-seed
- 0 to 1 in funded mid-stage

Saturncart

What?

Pick-up and Go Experience for Indian Retail

How?

IoT + Phone Camera Setup on Cart

Real time Object Recognition to map item to SKU

Why?

Story
- Talked to Retailers for Pain
- Built MVP and Started Sales
- Lost to operations led non-hardware solution

White Haired Collection

Throw the Kitchen Sink

MVP should be Minimum. [Hardware is Slow]

Morphle Labs

What?
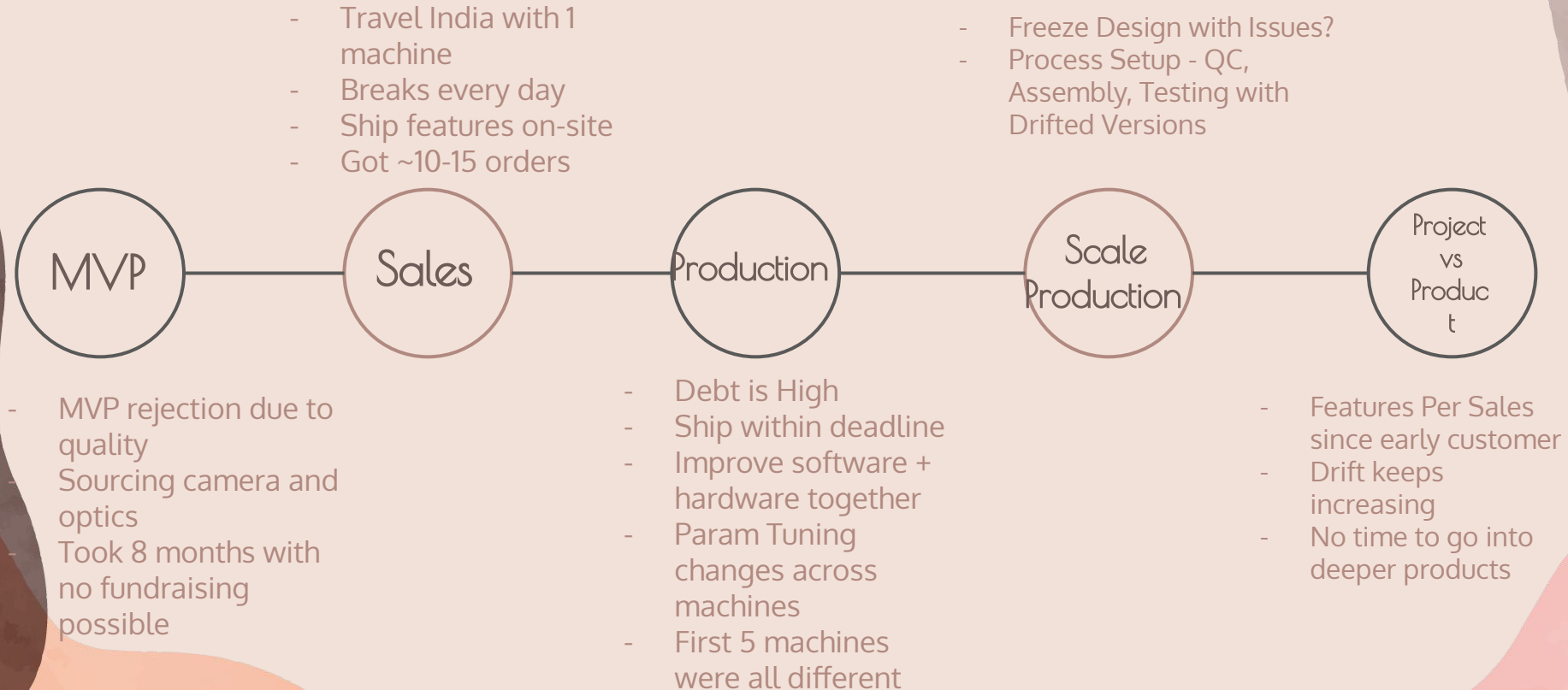
Digital Pathology Scanner

Why?

Painful Manual Effort

- Pathologists use microscope with no digital storage
- No way to see architecture of tissues
- No assistive tools for diagnosis

How?

3D Printer System + Camera Setup

Morphle Labs - Story Time

- Travel India with 1 machine
- Breaks every day
- Ship features on-site
- Got ~10-15 orders

- Freeze Design with Issues?
- Process Setup - QC, Assembly, Testing with Drifted Versions

MVP — **Sales** — **Production** — **Scale Production** — **Project vs Product**

- MVP rejection due to quality
- Sourcing camera and optics
- Took 8 months with no fundraising possible

- Debt is High
- Ship within deadline
- Improve software + hardware together
- Param Tuning changes across machines
- First 5 machines were all different

- Features Per Sales since early customer
- Drift keeps increasing
- No time to go into deeper products

White Haired Collection

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MVP should be Minimum [Hardware is Slow]

Component Sourcing to be First Class Citizen
- Many Components are not found in India
- High Lead Time

Feature Drift is Expensive
- Reconciliation of versions needs to be more often

Indian Fundraising Ecosystem
- Fundraising is hard without traction
- Traction is hard without funds

Hardware is 70% Ops
Sourcing to Production to Delivery is all Ops and needs to be run like a supply chain

Project to Product Transition
- Do you want the transition?
- What are the trade-offs?

Udaan Robotics

What?

Automation for Supply Chain

Why?

The Good

- Fixed customer with known problems.
- No fundraising complexities.
- Possible path to externalised business

How?

- Volumetric Weight Capture
- Goods To Person System
- Smart Quality Capture for Fresh

UDAAN - The Story

Product Discovery
- Found problems and products

Multi-Product Team
- Maintain and Build Multiple Products
- Heterogeneous Team Hiring and Running - Procurement, Operations, Product, Engineering
- Support Infrastructure

Covid
- Vendor Pause -> Shutdown
- Working Capital Problems for Vendors

Changing Business Needs
- Even mid-stage startup needs change faster than you can ship hardware.

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Timing Is Key

Does the market/customer segment have the time for hardware product iterations?

Will I do Hardware Again?

Hell Yes!

- No better gratification as an engineer when multiple different diverse subsystems work together to create user value.
- The process of moving Atoms with Bits is far too much fun.
- It is hard but it is hard for everyone! So once cracked, moat stays for long.
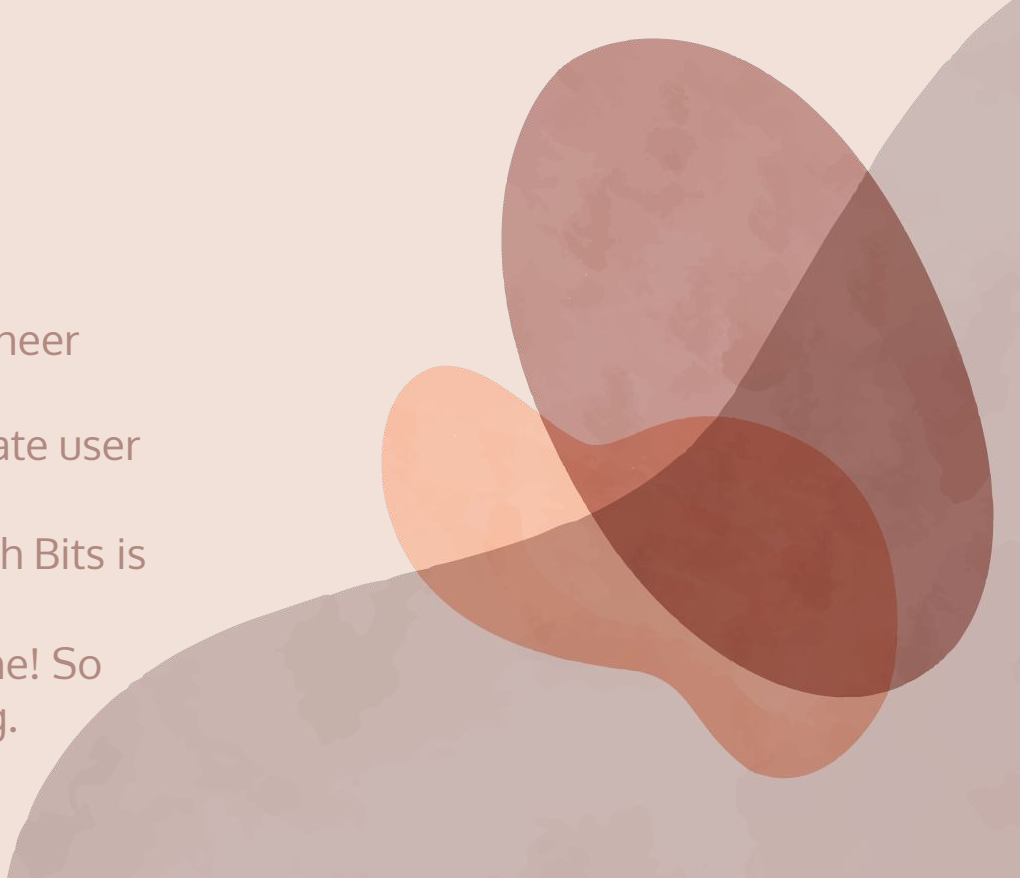
THANKS

Do you have any questions?
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