Smart Farming

mcn 2020

Open vs **Closed** Source

IoT Network Management

Farm Data Processing

Cultivation Management


Host: Compute Performance
CPU Cores
8
Processes
182
Users
0
Total Memory
CPU Utilization
12.8%
CPU Load - 5min (norm)
0.16
CPU Nice Utilization
8.1%
CPU I/O Wait
0.5%
CPU Utilization Details
CPU Load (normalized)
Sensors: System Environment Health
Temperature - core_3
38.0C
Temperature - core_3
Fan Speed - fan2
1,495 RPM
Fan Speed - fan2
vcore - in_input
0.89
vcore - in_input
Net: Interface Performance
Total Traffic (bytes) - enp0s3
1,674,844,092 B
Total Traffic (packets) - enp0s3
2,770,882
Total Discards (packets) - enp0s3
441
Total Errors (packets) - enp0s3
0
Traffic Volume (bits) - enp0s3
Traffic Volume (packets) - enp0s3
Dropped Packets - enp0s3
All Features

Currently, our goal is to find our first customer.

Beyond this, our goal is to to see our software implemented across the UK.

To reach these goals, we have some exciting news to share…

… At the end of our presentation.

Reduce waste

Use land previously unsuitable for growing, reduce resource use, wastage, **reduce food miles**

Increase profits

Maximise yield per unit area, making smart farming more **economically viable**

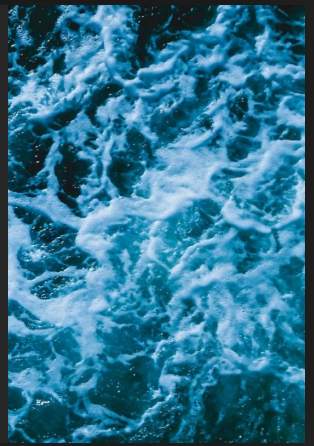
£ / tonne / m^2

Encourage youth

Reduce the average age of farmers in the industry which will **drive innovation** and benefit the sector

Water

Reduce high water usage from traditional farming in water-scarce areas up to **95%**



Primary Research

"Agnostic systems and open protocols are the way forward."

- Tony Gale

1.	**Tony Gale**	PhytoPonics & DBfW - Board Director
2.	**Kevin Morgan**	NatWest - Regional Director
3.	**Victor Lambert**	Hortimax Group - Ex. Managing Director
4.	**Chris Nelson**	GrowStack - Director
5.	**Sarah James**	Royal Welsh Agriculture Society - MD
6.	**David Summerfield**	Bridge Greenhouse - Project Manager
7.	**Peter Lane**	Vertical Farming Network - Chairman
8.	**Rebecca Yee**	Urban Farmer
9.	**Eric Roth**	Agritecture - Developer / Consultant
10.	**Dan Siego**	Vertical Farm Developer

Problems in the Industry

High fragmentation

Hardware/software almost always unique to each farm/device, very little cross-compatibility between companies

Low innovation

Re-inventing the wheel means the same problems are solved over and over

High Capital Expenditure

Large team of developers required to get system up and running

>£100k setup costs

Vendor lock-in

No option to use 3rd-party hardware unless support directly added by developers

Value Proposition

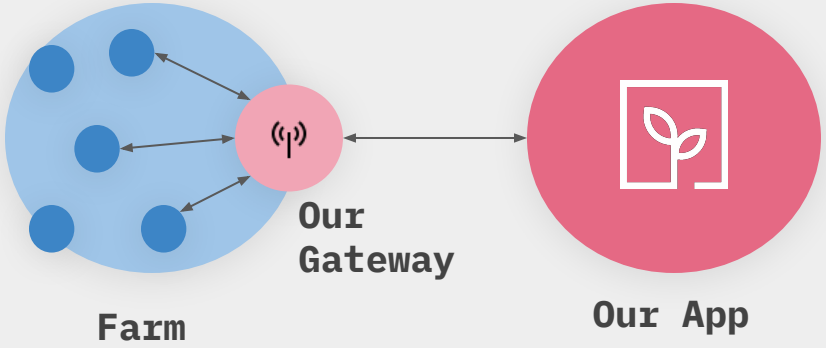
Decrease CapEx when building a smart farm
Provide an all-in-one solution for cultivation & device management
Remove vendor lock-in & open the doors to younger farmers

IoT Cultivation Management System

Communicate over any protocol,
with any data format

Using our **IoT Gateway**

Provides local redundancy



Farm Management

Oversee entire operation, harvest scheduling, projected earnings, stock count, reporting, weather coordination...

Any device, any protocol

Define data input & output, no software developer required

Web interface

View data & control from around the globe

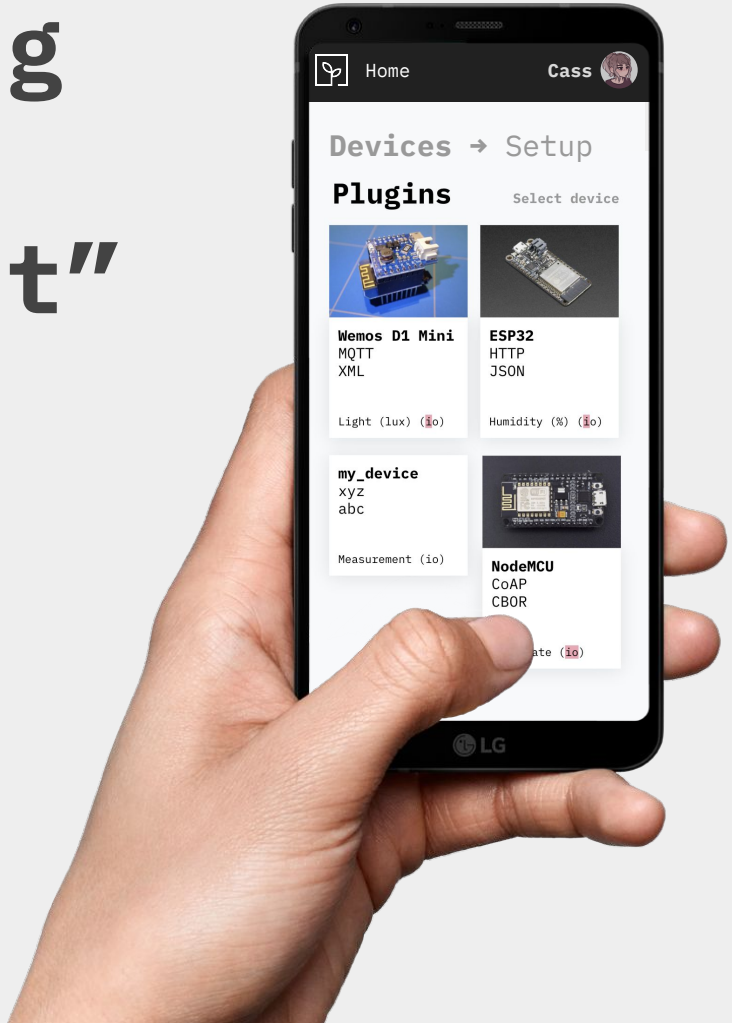
Machine Learning

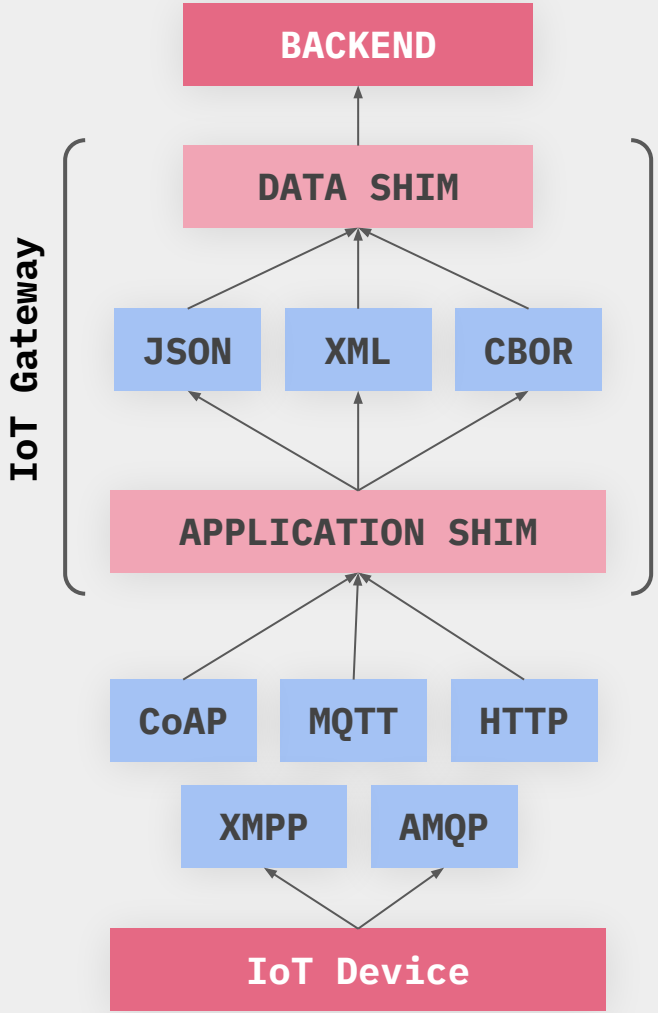
Optimise plant growth recipes
Maximise yields ↑ minimise resources ↓

Alerts

Be aware of anomalies, send notifications via SMS or email, fix faults fast

“Plug and Plant”





Case Study

Mid-size 1000m^2 indoor farm

CapEx costs from initial development
Reduce from 10 → 5 developers

£2,500 * 5 * 3 months = £37,500

Operations,

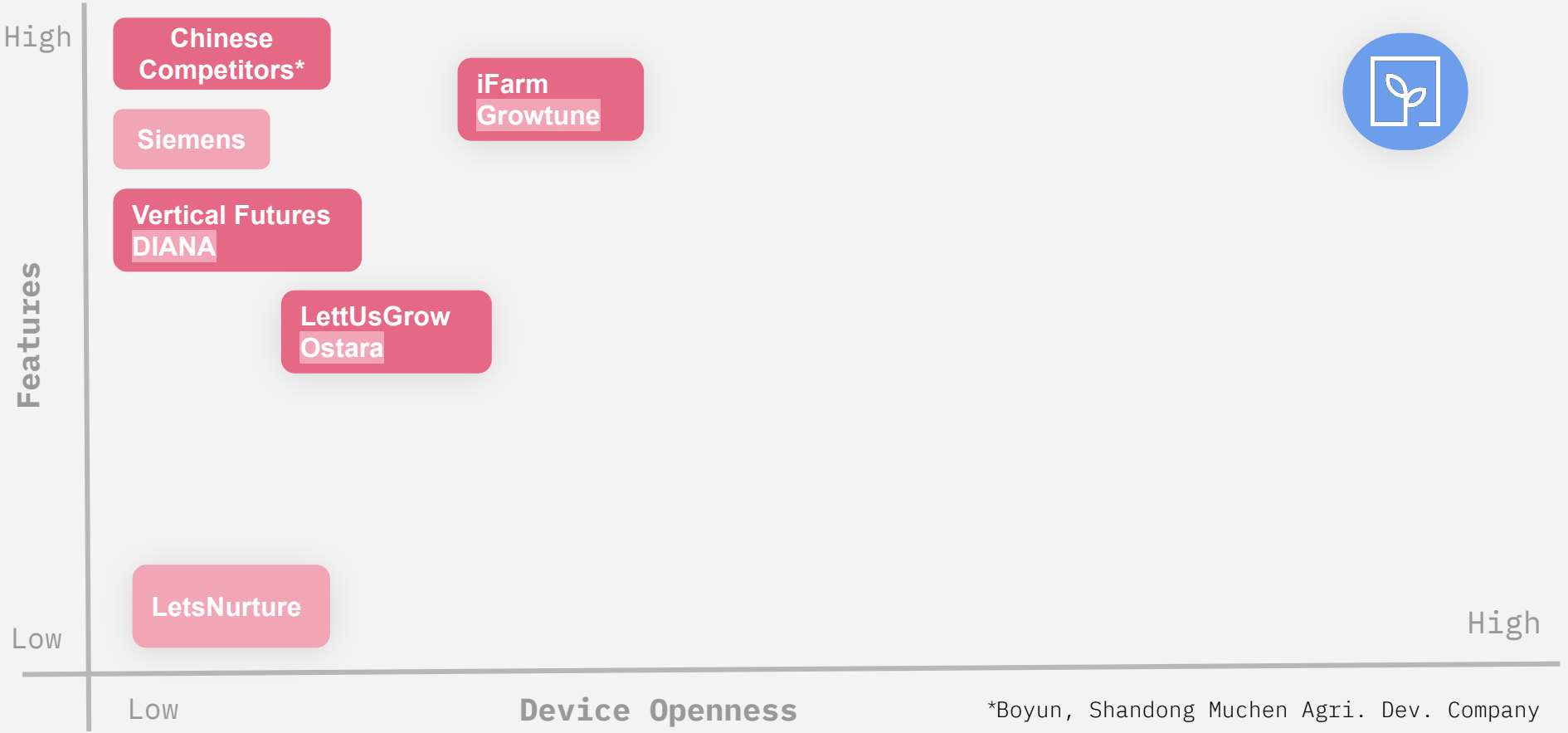
Labour	→	**-20%** work
Oversight	→	**-5%** losses
ML optimisation	→	**+5%** yield

Open-ended software system allows the use of cheaper, 3rd party hardware - lowers costs further

Gross revenue increase of 30%

Labour accounts for 56% of an indoors farms operational costs

Competitor map



*Boyun, Shandong Muchen Agri. Dev. Company

Feature Comparison

Feature	LetsNurture	Ostara	DIANA	Growtune	
Farm management	Yes	Yes	Yes	Yes	Yes
Dashboard	Yes	Yes	Yes	Yes	Yes
Machine Learning	No	No	No	Yes	Yes
Alerts	Yes	Yes	No	Yes	Yes
Custom recipes	Yes	No	No	Yes	Yes
Order management	Yes	No	No	Yes	Yes
Event routines	Yes	No	No	No	Yes
Measurements	4	4	?	7	**>15**
3rd Party Hardware	**No**	**No**	**No**	**No**	**Yes**

Market

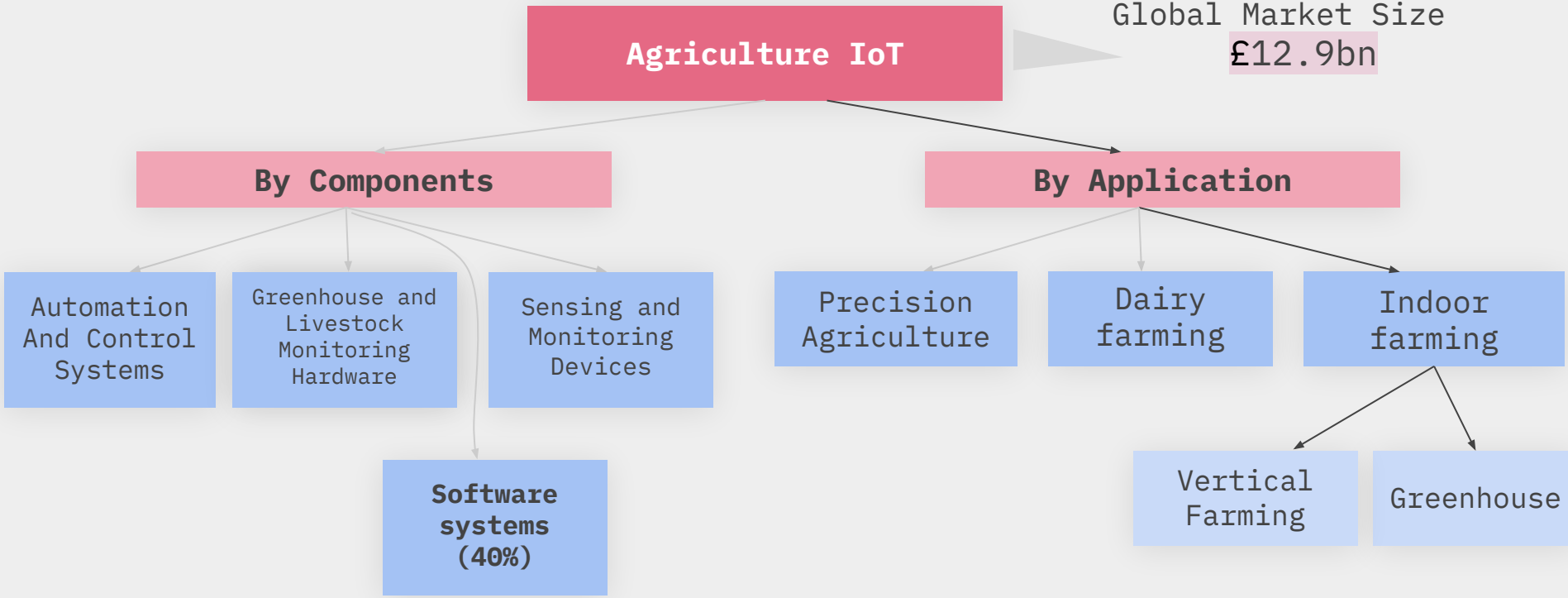
Global Agriculture IoT

2019: £12.9bn

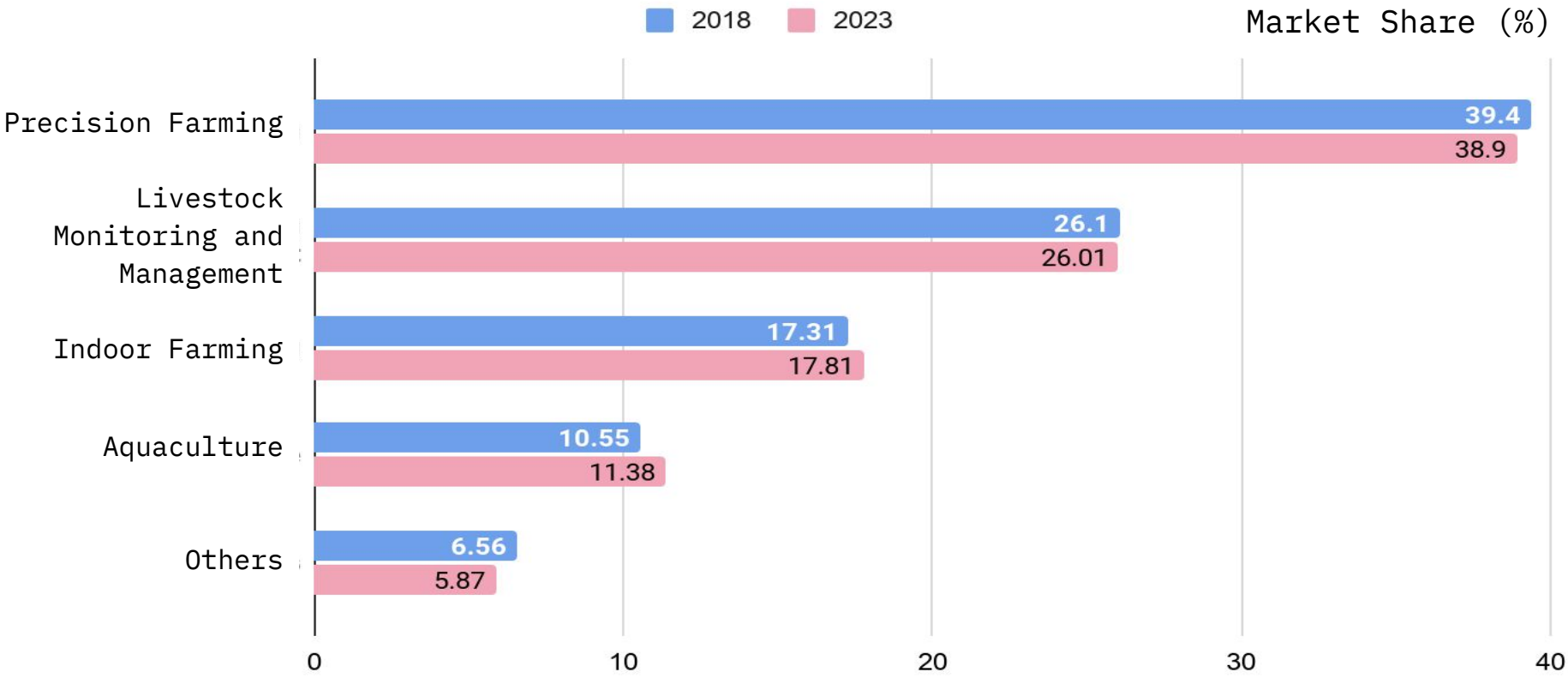
2025: £28.7bn

CAGR of 15.6% from 2019 to 2025

Lay of the land



Agricultural IoT Market Share by Application



Addressable Market Size

Vertical Farms + Glasshouse Farms

UK market = 30-35% of European IoT agriculture Market

= **£2.4bn** * 32%
= £775.2 mln

Software = 40% of IoT agriculture
= £311.6 mln

Indoor farming = 17.3% of software IoT agriculture

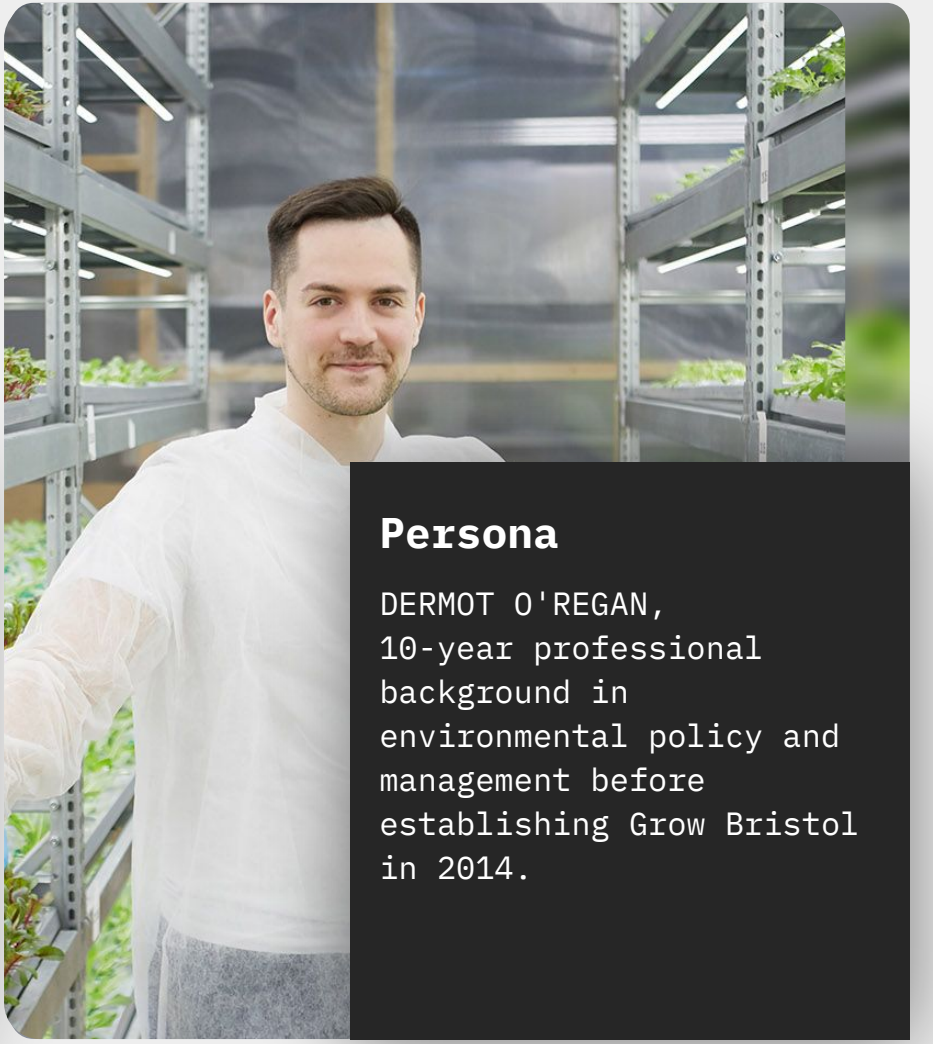
= £49-54 mln

https://www.statista.com/statistics/956934/smart-farming-market-size-europe-application-vertical/
https://www.prnewswire.com/news-releases/the-european-smart-farming-market-is-anticipated-to-reach-7-2-billion-by-2023--300704177.html

End User

SITE MANAGER,
concerned with keeping a smooth operation,
assessing for issues and increasing yields.

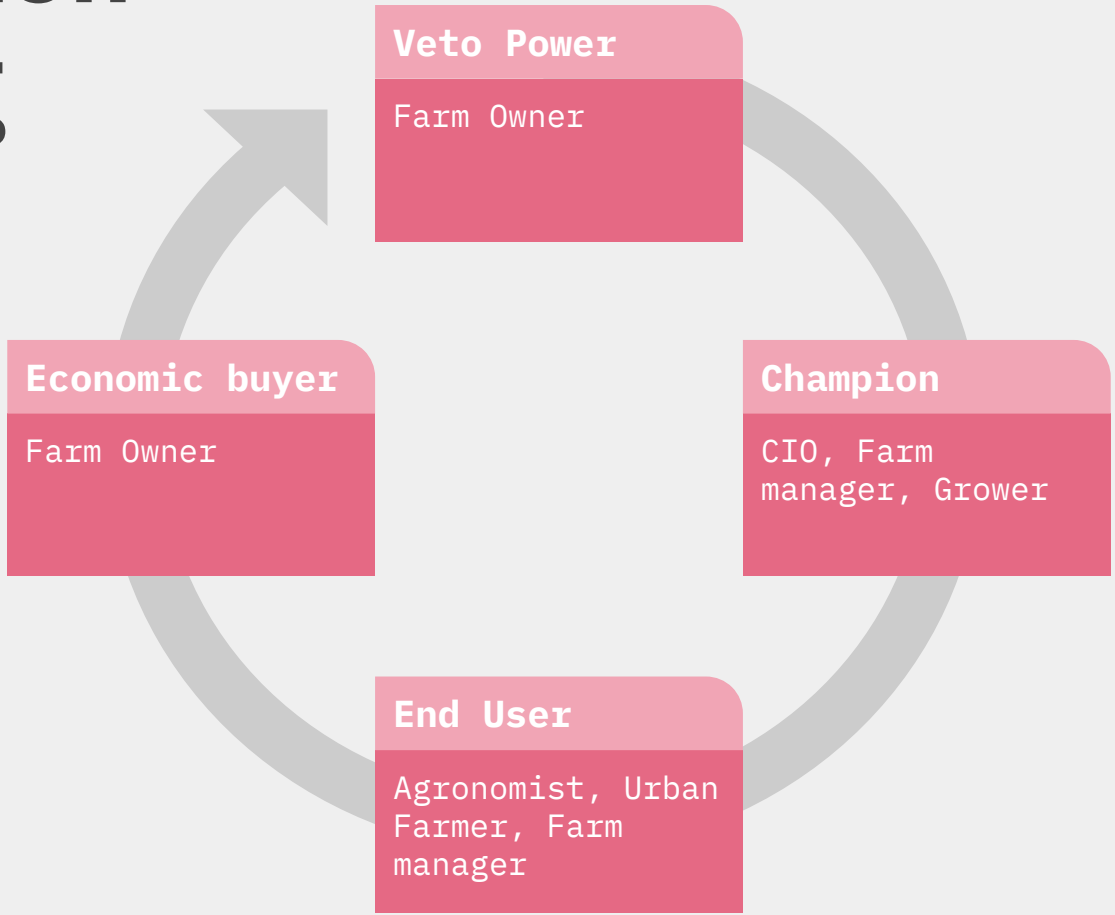
Profit margin matters above all.



Persona

DERMOT O'REGAN,
10-year professional background in environmental policy and management before establishing Grow Bristol in 2014.

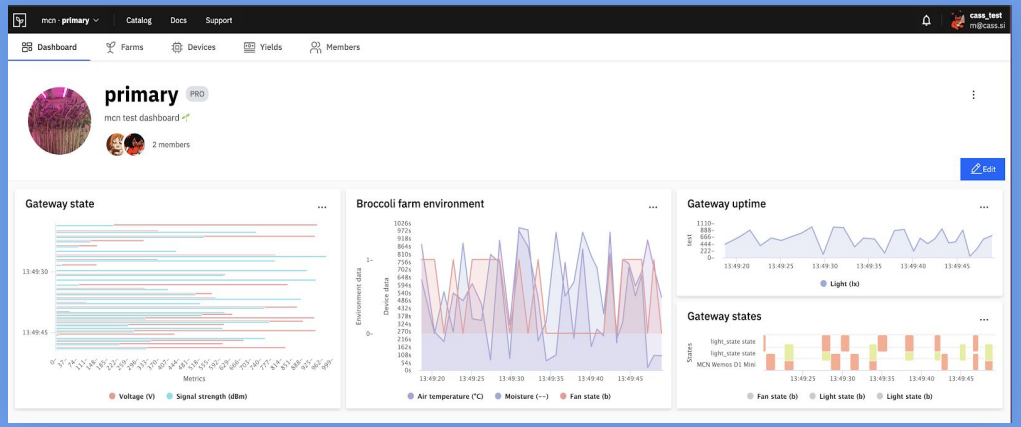
Decision Making Unit



Minimum Viable Product

Orchestrate, Monitor & Predict

- Cultivation Management
- Manage IoT devices, **send & receive** commands
- “Plug-and-Plant”
- Event queues to perform daily routines



Use Case

What is a farm’s catalyst to action?

- When setting up their farm
- They’re looking to simplify their IoT management / have more control
- They’re looking to integrate unsupported hardware into their farm

Use Case

How do farms acquire our software?

- Sign up & have a subscription to our web service
- They ***must*** have an IoT Gateway (IoTG) enabled machine locally in the farm
- For their IoTG, they can either:
  - Purchase an IoTG from us
  - Relay their current IoTG’s data to our service

Use Case

How do farms set up our software?

- On their computer, they access our web service
- They use a ‘plugin catalog’ to find their device types, and link them to our service
- They process & manipulate their IoT devices & data

Use Case

How do farms get value from our software?

- Simplification of Cultivation Management
- Freedom from **vendor lock,** Ability to use / add any hardware
- Precise control and oversight of operation
- Increase profits through automation & optimisation

Business Model

Monthly/Annual subscription

+ data throughput + optional modules

iFarm Growtune, Vertical Futures DIANA

Optional One-time-fee

Gateway cost & setup fee if unable to forward data

Siemens

Subscription

Base fee for access to the service

£20pm Hobby

+ data

- 20 devices
- IoT *Plugin Store* with robust support for **all IoT Devices**
- Device Management
- Access to growth recipes collection
- Free updates
- Online support

£250pm Smart

+ data

- 2,000 devices
- **ML optimised** plant growth recipes
- Data export & reporting
- Order Management
- Production Monitoring
- Rapid support

£500pm Pro

+ data

- Unlimited devices
- All modules included

Higher tiers include all features included on lower tiers. Optional modules not included.

Data throughput fees

Larger farm → More devices → More data

Number of Devices

IoT devices per unit area in a farm

Number of Requests

Requests per device

Type of Request

Ingress or Egress

Request Size

Message body (e.g. image / text)

Ingress £0.00002 / request

Egress £0.00004 / request

1000m^2 farm, devices every 0.5m^2 ingress of 30 req/hr = 21,900 req/month

egress of 5 req/hr = 3,650 req/month

(2,000 devices * ((21,900 * INGRESS_RATE) + (3,650 * EGRESS_RATE)) = **£1,168/month**

Lifetime Value

One-time fee
up to £500 for gateway

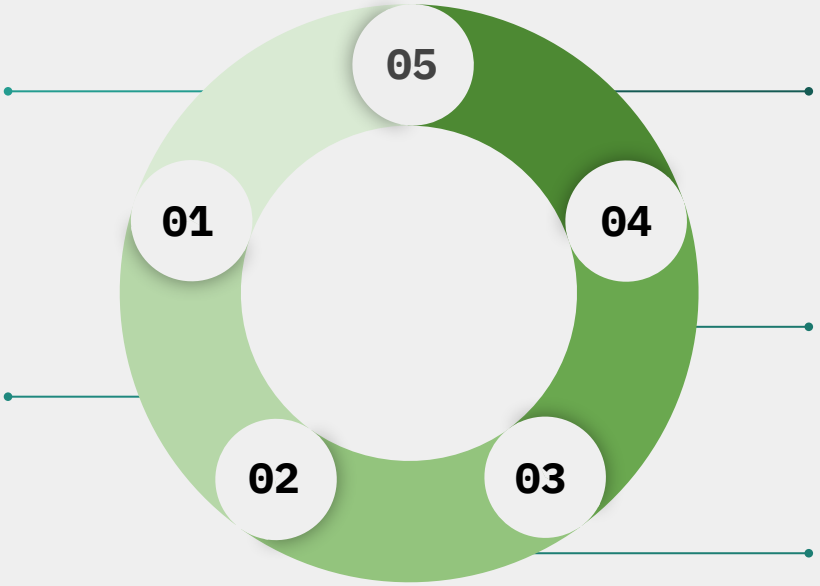
May not be necessary

Recurring revenue streams

Smart Subscription **£250pm**
£1,168pm for 2k devices

Gross margin = 80%

= **£1368pm**



Cost of Capital
50%

Life of product
5 years

Retention rate
100% in Year 1 and 90% in subsequent years

£24,825

Cost of Customer Acquisition

Assumptions

- Two (large) customers in Year 0
- **Market and Sales** (M&S) budget = 30% of annual revenue
- **Install Base Support** (IBS) = 5% of LTV
- Number of new customers = 2

Method

- Revenue from two customers: £35,032
- Marketing and Sales budget: £12,261
- COCA formula:
  - (M&S Expenses - IBS) / Number of new customers

£5,693

LTV:COCA = **4.36:1**

Windows of Opportunity & Triggers

	Window	Trigger	Outcome
1	A farm Owner sees new IoT devices that are **incompatible** with his current software	Finds our product that promises **compatibility** & better features than their current software	Enquires into our product to the enable the use of their new device and **all pre-existing devices**
2	New CTO, CIO or Manager hired	Offer to review inventory of software and produce a report on how to improve	New leaders want change and so are open to reviews and new solutions
3	A Farm is experiencing **high software development costs** due to IoT	Our team calls & explains how our software reduces their software development workload	When faced with expenses, the customer wants to **improve their profitability** so open to new solutions

Next Customers

AGRICOOL

GROW BRISTOL

Van VLIET Flower Group

Shockingly Fresh

Vertical Farming .space

agrilution

HortiMax

NUTRISHOOT

GrowUp URBAN FARMS

infarm

GROWING UNDERGROUND SW4

Next Market

Medicinal Marijuana

UK is the world's largest producer of legal cannabis

70% of world total

High level of Controlled Environment Agriculture used

£15.96 mln UK market size in 2020

£1 bln expected UK market size by 2024

https://www.independent.co.uk/news/uk/home-news/cannabis-legal-uk-worlds-largest-producer-marijuana-weed-un-body-findings-a8243921.html
https://prohibitionpartners.com/reports/#the-uk-cannabis-report

Conclusion

We are a SaaS solution that leverages the latest technologies for Cultivation Management.

Thank You

Any Questions?