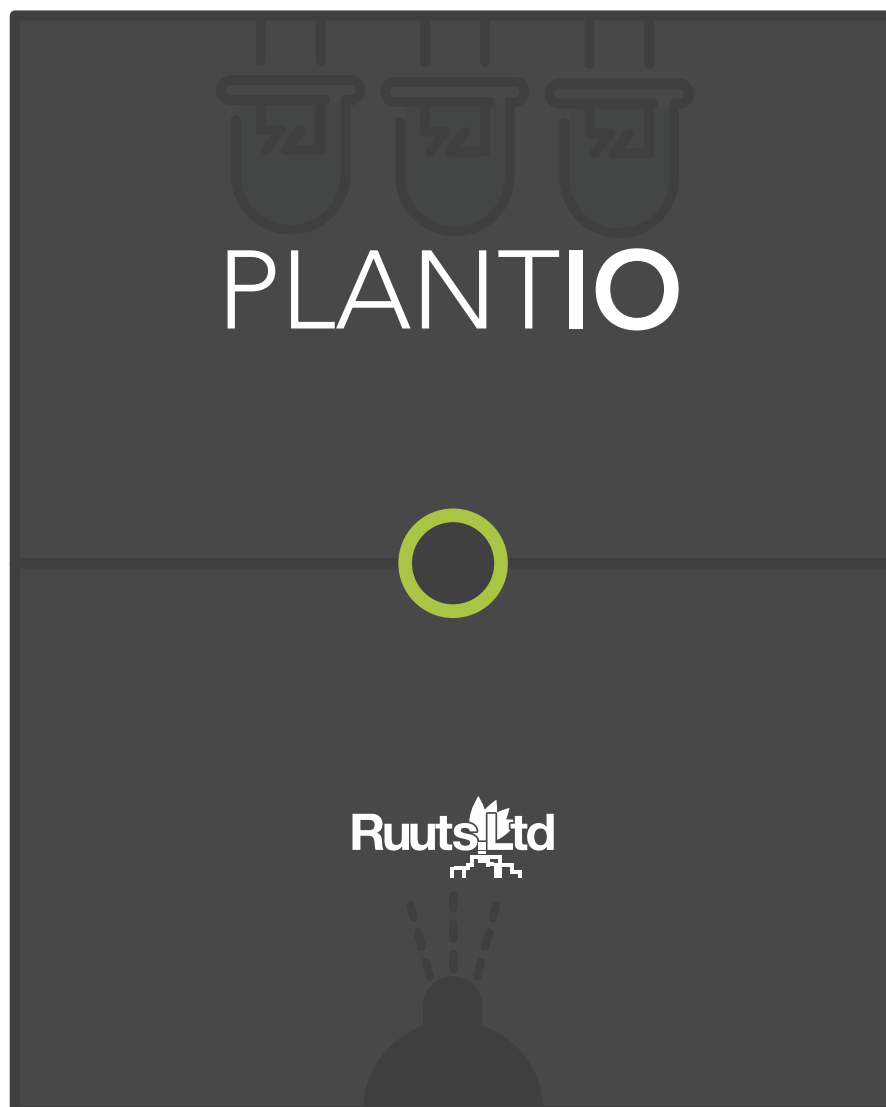# PROJECT PROPOSAL

PLANT**IO**

A conceptual captology design by Phillip David Penny

To design a complete food growing system to encourage public growth.

6 months (1 month invested so far)

PLANT**IO**

PERSUASIVE PURPOSE

- To automate food growth to such an extent that it allows public growing to become a habit of people's lives with minimal effort.

- To enable global growing to move from the hands of the few to the hands of the many through open source technology.

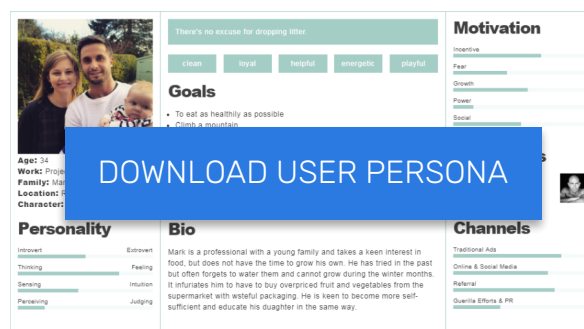- To raise awareness about the environmental impact of industrial farming methods.
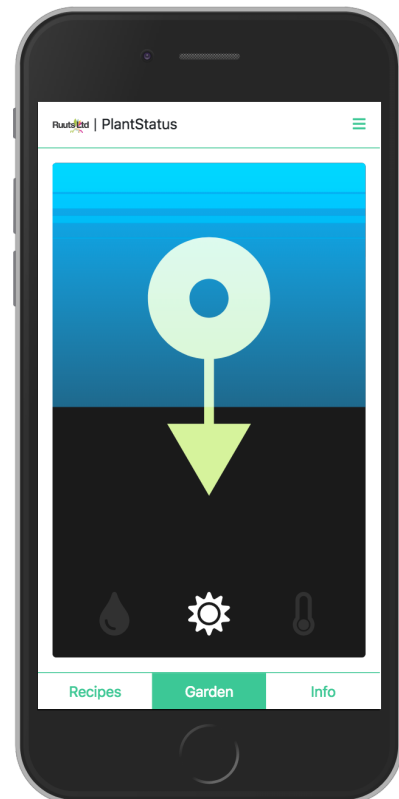
USER DESCRIPTION

MILLENNIAL MAN MARK

Millennial parents who take a keen interest in their environment and the quality of life for their young family. They are acutely aware of their presence on social media and create classy, inspirational posts that highlight their achievements.

There's no excuse for dropping litter

clean   loyal   helpful   energetic   playful

Motivation

Incentive

Fear

Growth

Power

Social

Goals

- To eat as healthily as possible
- Climb a mountain

Age: 34
Work: Proje
Family: Mar
Location: F
Character:

Personality

Introvert   Extrovert

Thinking   Feeling

Sensing   Intuition

Perceiving   Judging

Bio

Mark is a professional with a young family and takes a keen interest in food, but does not have the time to grow his own. He has tried in the past but often forgets to water them and cannot grow during the winter months. It infuriates him to have to buy overpriced fruit and vegetables from the supermarket with wsteful packaging. He is keen to become more self-sufficient and educate his duaghter in the same way.

Channels

Traditional Ads

Online & Social Media

Referral

Guerilla Efforts & PR

DOWNLOAD USER PERSONA

STORYBOARD: WINTER WITH THE JONESES

The Jones family have a two-year-old daughter called Grace. Charlotte and Kevin, Grace's parents, both work full-time and are conscientious people, with a keen interest in environmental issues as well as human health.

Charlotte tried to grow some strawberries during the summer to teach Grace and provide her favourite fruit, however, she did not have time to maintain them and they eventually succumbed to pests in the garden.

Grace wants some strawberries. After eating them all summer, it is now October. Strawberries are not in season in the UK.

Kevin picks some Spanish strawberries from the supermarket on his way home from work. After checking the packs, he finds the best of the bunch which are smaller and blander than those they enjoyed in the summer. Kevin takes a keen interest in the environment and shudders

at the thought of a truck driving food halfway across Europe.

Kevin invests in the Ruuts Plantio single plant growing system and sets up his free online account.

After germinating a batch of strawberry seeds in their home, Kevin, Charlotte and Grace transfer them to the Plantio system once they begin to sprout.

The Jones family then go on with their everyday lives, checking in on the plant daily via the app to show Grace how it is doing.

The Plantio system tells the family when the fruit is ready to harvest and suggests they begin to germinate a new batch of seeds ready to go straight into the system.

INTERACTIVE PROTOTYPE

The user can access the status of their plant at any point using the Plant**IO** app. A simple push-button pairing process connects their system to their account. The user then adds a seed to the system, waits for it to germinate, thins out unwanted seeds, then simply waits for their harvest.

Above: cardboard prototype to enable the user to visualise the process.
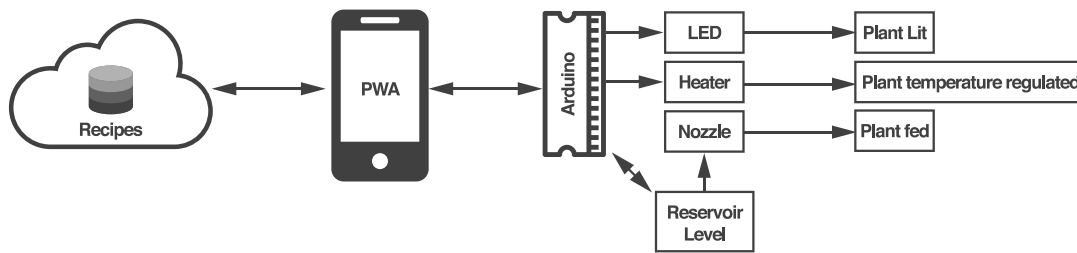
Right: interactive paper prototype (link to original).

Click through the interactive prototype above (link to original) to get a feel for how the app will work.

# FEATURES & FUNCTIONALITY

Above: systems diagram showing the interactions between the PWA, the cloud-based recipe database, the Arduino controlled PlantIO system and the plant.

- User links PlantIO machine with their free online account.

- User can select varying levels of automation on their recipe.

- User adds a seed to the system and waits for it to germinat.e

- PlantIO tells the user when it's time to thin out the seeds.

- From here, the system has full control of all growing conditions, regulating lighting, temperature, and nutrient feed according to the selected recipe.

- User can check the real-time status of their plant via the status page.

- The user can access a status page 24 hours a day from any browser-enabled device, providing reporting of water consumption, lighting, feeding and temperature patterns, and error notifications.

- PlantIO tells the user when it's time to harvest their plant.
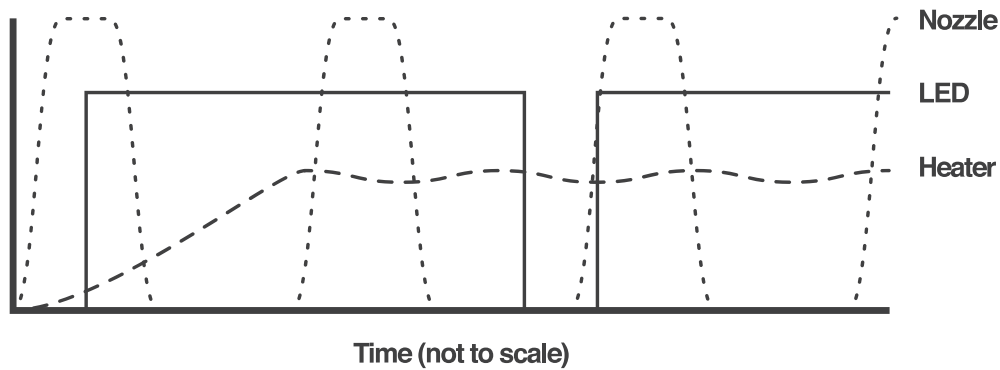
Above: *A typical behaviour pattern diagram showing actions over time. The atomiser nozzle feeds the plant in regulated short bursts. The LED lighting system is on/off according to the plants optimal day/night cycle. The heater maintains the ideal temperature with little variation.*

THEORETICAL JUSTIFICATIONS

VALUE PROPOSITION

Grow food, automatically.

Plant**IO** is the smartest way to grow. One tap and your plant is automatically grown. Our recipes know exactly how to optimise the conditions for perfect growth. All you have to do is wait.

MARKET SIZE

£800 Million UK Market Size.

Based on both top-down and bottom-up calculations; briefly, a £200 individual spend level in a demographic 4 million users strong. [1]

MARKET TIMING

Autumn 2020 launch into the most affected growing season.

27-month product development plan with the launch during the traditionally weak growing

season of Autumn. A staggered launch plan will be implemented allowing for the penetration of additional markets as the product gains traction. [2]

MARKET POSITIONING

Most advanced, automated consumer system available.

No other company provides a practical home solution that manages all aspects of growing. [3] Aeroponics provides incredible efficiency with optimal control, reducing land usage by 99% and water usage by 98% when compared to traditional farming methods. [4]

COMPANY GOALS

To improve the availability of quality, organic food worldwide and reduce the environmental impact of growing.

The overarching aim for Ruuts is to make a meaningful contribution to the human race in terms of our environment, sustainability, and the eradication of poverty. Our goal is to have global access to our systems, providing free food in the poorest of neighbourhoods through community growing programs.

RISK PROFILE

Changing consumer habits is the biggest barrier.

Once users begin to routinely use the PlantIO system, the benefits will escalate and adoption of the system will accelerate, enabling us to push into the second stage of our business plan—the SMB market.

COMPETENCIES

Ruuts have expertise in horticulture, electronics engineering and product design.

We combine the perfect mix of an experienced product designer in myself, with over 15 years of professional design experience, a horticultural expert in Brett Bartlett with a vast knowledge of plant growth characteristics and an aeroponic research program behind him, and electronics engineer Ashley Banner who specializes in designing electronic systems with off-the-shelf components to create bespoke products.

SOFTWARE TECHNOLOGY

A Progressive Web Application (PWA) is platform independent with instant updates from a single code base.

PWA technology opens up the market to anybody with an Internet connection. JavaScript application communicating with Arduino ran components using Johnny-Five, and Sockets.io real-time communication libraries.

RESULTS OF USER TESTING

LACK OF TIME

LACK OF ROOM

QUALITY IS VITALLY IMPORTANT

59% [5]   61% [5]   68% [5]

"...we will persist but perhaps a simpler solution to assist growing our own food would help make it easier for a family."

- Kevin Jones, 34 [6]

USER RESEARCH PLAN

Interview home gardeners

Interview allotment owners

Analyse personal home growing tests

Film users with paper prototype

SHORTCOMINGS OF DESIGN

NOZZLE EXPENSIVE FOR SINGLE USE

The design will have to be modular to enable to use of less expensive alternatives such as low-pressure nozzles, bubbling atomizers or even basic D.I.Y. irrigation hoses.

DIFFICULT TO ENGAGE USERS EARLY ON

The first harvest requires patience—some form of distraction may be required to keep the user engaged until they reap the benefits of their first harvest.

INITIAL GERMINATION STAGE NEEDS CONSIDERATION

User interaction is required at this point to ensure a successful harvest—how can we minimise risk here?

DIFFICULT TO BALANCE ENGAGEMENT WITH AUTOMATION

Fully automatic recipes by their very nature have a huge disconnect—how can we maintain interaction and ownership without creating burden or distraction?

LARGE KNOWLEDGE BASE REQUIRED FOR RECIPES

Initial recipes can be created by our resident expert Brett, however, development trials will be required to create efficient recipes for all kinds of plants.

DIFFICULT TO ENCOURAGE DATA LOGGING FOR RECIPE DEVELOPMENT

In a world of GDPR—how do we convince the user to provide reporting after a harvest period, including some manual reporting? How can we ensure quality data?

EXPANSION – WHAT ELSE IS POSSIBLE?

Exclusively solar powered	Modular expansion	Augmented reality	Custom recipes
Artificial Intelligence	Scale to industry	Global reach	Charity creation

- Rail setup currently under development for larger installation - can work with a modular design.

- Tamagotchi-style live display, augmented reality side of the unit for children.

- Self-improving recipes through AI

NEXT STEPS IN DESIGN PROCESS

- MVP system to monitor a single plant
- Implement top level aeroponics for a single plant

- Gradually increase variables & automation with testing
- Research germination phase improvements
- Investigate partnership with seed suppliers

SUMMARY

FULLY AUTOMATED HOME GROWING WITH PLANTIO FROM RUUTS

BIG UNSATURATED MARKET

£800 Million in the UK alone, truly a global product.

COMPETITIVE ADVANTAGE

Multiple USP's places our product firmly ahead of the competition.

RAISING £250,000 FUNDING

for full product development and testing, 3 full-time staff and 1000 launch units.

MULTI SKILLED TEAM

Phillip Penny

Product Design
phil@ruuts.co.uk

Brett Bartlett

Horticulture Consultant
brett@ruuts.co.uk

Ashley Banner

Electronics Engineer
ash@ruuts.co.uk

APPENDIX

1. Based on a bottom-up analysis. Approximately 8 million UK users fit the persona, which equates to 4 million couples, placing one unit per family each with a potential unit spend of £200.
2. Approximate timeline of 6 months to MVP in December 2018, a 3-month alpha test, 6 months product development, another 3-month alpha test, 3-months product development, 3-months public beta test, and launch in Autumn 2020.
3. An initial competitor analysis reveals high-end systems aimed squarely at the business and industrial markets; or low end, hobbyist systems utilising low-technology, poorly thought out solutions for the affluent middle class. There is a distinct gap for a highly developed, affordable consumer system.
4. No consumer system exists that utilises aeroponic nozzles, the most advanced system for controlling molecular diameters of liquids. Coupled with the latest wif-fi Arduino Uno board and low energy LEDs shows the concept pushing technology in all boundaries.
5. Results obtained from my user study of 54 participants.
6. Mr Kevin Jones underwent a full growing experiment with his family and quoted:

We took the opportunity to experience growing our own food as a family. It's been fun introducing the process to our 2-year-old daughter who really enjoyed helping us start to grow our own food and has learnt about how food can be produced and what part nature plays in the process.

The instructions with the kit we used were a bit vague and missed a few vital elements (such as water occasionally) but with a little bit of improvisation and nature finally taking its course, we managed to start to grow some aubergines, peppers and green beans.

It has also encouraged us to grow our own tomatoes which took about 4-5 weeks before we could use them in a homemade lasagne and vegetarian pizza (the Tomatoes tasted noticeably stronger and fresher). It is taking a fair bit of time for the aubergines, peppers and green beans to grow and we will persist but perhaps a simpler solution to assist growing our own food would help make it easier for a family.

We will certainly try some new methods in the future and are now all excited at the prospects of growing our own food, we are also happy it has caught the interest of

our daughter and let us understand more about food as a family as we interact together.