FreshTRACK

"The affordable AI-powered food waste solution that fits every household"

Team 22

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Our Experience:

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KPMG

BOSCH

pwc

PORSCHE

an post

Table of Contents

1 Product Feasibility

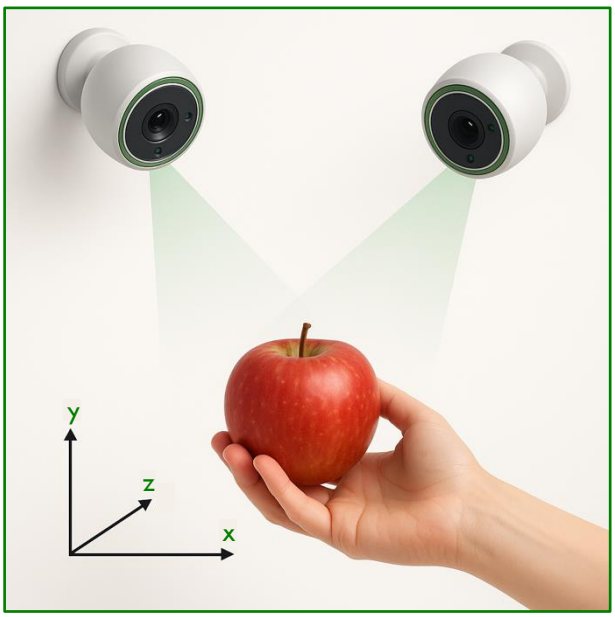
Overview

Fresh*TRACK* offers a fridge management system that combines compact IoT cameras with cloud-based AI recognition. The concept avoids the full cost and complexity of smart fridges while reducing the manual burden of traditional inventory apps. Feasibility depends primarily on three dimensions: whether cameras can consistently capture usable images under refrigerator conditions, whether cloud-based recognition combined with a reference catalogue delivers reliable product identification, and whether GDPR/AIA requirements can be met despite camera use in a private environment. Expert interviews highlighted that perfect automation is unrealistic, but constrained automation supported by user confirmation and catalogue learning is technically and behaviourally feasible. Early testing, therefore, focuses on verifying that at least one usable frame is captured during each door-opening, that the recognition pipeline performs reliably with user-supplied reference images and that all data transfers comply with EU regulations. The feasibility assessment below concentrates on the limiting factors and the achievable operating boundaries.

Hardware

The hardware feasibility centres on whether a compact, refrigerator-mounted camera can consistently capture clear frames suitable for cloud-based recognition. Refrigerators present a hostile imaging environment: low temperatures, humidity, reflective surfaces, and frequent occlusion. Research shows that condensation significantly reduces image sharpness once water layers on the lens exceed sub-millimetre thickness, degrading the Modulation Transfer Function below object-recognition thresholds (Zhang et al., 2025). As temperature gradients occur every time the door opens, condensation cannot be eliminated fully; instead, optical-structural optimisation is required.

Increasing lens thickness, improving curvature, reducing internal cavity volume, and using hydrophobic coatings delay condensation and help maintain clarity long enough to extract usable frames (Zhang et al., 2025). Electronics face similar risks: moisture causes leakage and corrosion, making conformal coating and sealed housings essential (Suppa, 2007; Hunt *et al.*, 2006). Experts confirmed that full-video capture or continuous monitoring is infeasible. Also, continuous multi-frame uploads consume substantial energy, as wireless transmission is the dominant source of power drain in IoT devices (Akmandor, Yin and Jha, 2018). High data volumes also strain household bandwidth and can cause delays during periods of peak use (Al-Ghaili et al., 2023). Feasibility therefore hinges on edge-filtered image capture: the camera activates only when the door opens, captures a short burst of frames, selects the clearest locally, and transmits only a few. This reduces energy use, bandwidth load, and cloud costs. A dual-camera configuration in the upper corners offers the highest likelihood of capturing unobstructed views during item transfer, though blind spots and occlusion remain unavoidable limitations.



Mounting must remain non-invasive to preserve fridge warranties; suction-based fixtures meet this requirement and withstand humidity if designed with robust geometry. Battery feasibility aligns with competitor benchmarks: a rechargeable Li-ion battery is sufficiently stable for low-duty-cycle operation, provided deep-sleep modes and efficient trigger mechanisms are implemented. Overall, the hardware is feasible if expectations remain bounded: Fresh*TRACK* can capture a usable frame in most, but not all, door-opening events, and performance depends on careful optical protection, selective frame capture, and stable mounting.

Software

Software feasibility depends on reliably transforming uploaded images into inventory updates using Google Cloud services. The pipeline is straightforward: filtered frames are uploaded to a Cloud Run ingestion endpoint, stored immutably in Cloud Storage, analysed by Vision API for Barcodes, labels and text, and matched through Vision Product Search against a household-specific reference catalogue (Google Cloud, 2025b, 2025e, 2025f). This catalogue is critical and connected to an internal Database, as it also contains crucial product data (e.g. recommended consumption times). Experts emphasised that general object detection cannot reliably distinguish similar supermarket products in cluttered, reflective refrigerator scenes. Requiring users to upload reference images for new products creates a narrowing problem space in which Product Search can operate with higher confidence. When confidence remains low, a human-in-the-loop workflow asks the user for clarification, ensuring correctness and gradually improving the household model.

This software architecture aligns with existing, well-documented Google Cloud components rather than custom ML training, reducing technical risk.

See Appendix A for a more precise AI/IT-Architecture.

Limitations remain: reflective packaging, occlusion, poor lighting and condensation can reduce detection reliability, unpackaged items remain difficult to classify without user confirmation, and overall performance still depends on stable Wi-Fi connectivity. Current AI recognition also cannot reliably distinguish, for example, whether a milk carton is new or already in use, or whether it is sealed or opened, so this level of categorisation still relies on the human-in-the-loop process.

GDPR & AIA

Fresh*TRACK* must operate under stringent GDPR and AI Act (AIA) obligations because refrigerator interior images constitute personal data with heightened sensitivity. Such data may reveal hands, faces, medicines, consumption patterns, or indicators of lifestyle and health, placing them under strict data-protection principles of minimisation, purpose limitation, and proportionality (Jørgensen and Ma, 2025). Expert feedback stresses that imaging inside private domestic spaces triggers a higher degree of user inhibition than typical IoT sensing, making perceived intrusiveness itself a compliance-relevant factor. To remain lawful and acceptable, the system must function as a narrowly scoped, event-triggered sensor rather than a monitoring device.

To meet GDPR's minimisation requirements, Fresh*TRACK* uploads only a few filtered frames selected on-device rather than continuous video footage. This directly addresses Prof. O'Connor's warning that sending raw footage out of the household heightens regulatory and user-acceptance risks, a concern reflected by the 34% of respondents whose willingness to use the product depends on privacy (Fresh*TRACK* Team, 2025). Automated cropping techniques further limit exposure of human features wherever possible.

Transfers are encrypted end-to-end, and all data is stored exclusively within EU regions (Chellu, 2025). Storage-limitation obligations require raw images to be retained only briefly for correction and auditing before automatic deletion.

Under the AIA, Fresh*TRACK*'s behaviour-adaptive features, as personalised recipe generation, fall into a regulated category that requires transparency and proper documentation of model behaviour (Novelli et al., 2025). This includes providing users with explanations for AI-generated suggestions, maintaining traceability logs, and documenting model limitations. The system may never commercialise fridge-content data or share behavioural insights with third parties, as this violates purpose-limitation rules and undermines user trust. Fresh*TRACK* must therefore implement explicit consent flows, user-controlled data access and deletion rights, secure firmware, and strict role-based access controls. When these privacy-by-design elements are integrated consistently, GDPR/AIA feasibility is achievable while maintaining operational viability.

Ease of Use

User acceptance depends on keeping interactions lightweight while ensuring accuracy through a clear human-in-the-loop workflow. Experts stressed that full automation is unrealistic due to occlusion, condensation and visually similar packaging; however, households typically purchase a stable cycle of recurring items. This means user effort is concentrated at the point of first use rather than being repeated continuously. Each new product requires only a single reference image, after which catalogue-based recognition quickly becomes more reliable.

The Fresh*TRACK* app interface plays an essential role in enabling this minimal-burden workflow.

During onboarding, users follow a guided setup that pairs cameras, explains the image-capture process, and demonstrates how to upload reference images. As part of this process, users are prompted to place products so that expiry dates and/or barcodes are visible to at least one camera. The interface avoids technical jargon, relying instead on visual prompts, short instructions, and intuitive button layouts.

Notifications appear only when necessary (as when an unfamiliar product is detected) to avoid notification fatigue and preserve user trust.

When recognition confidence is low, the user receives a cropped image with two simple actions: confirm the suggested product or correct it by selecting an existing catalogue entry or adding a new one.

This human-in-the-loop flow ensures accuracy while keeping effort predictable and minimal. The main dashboard presents an organised inventory view with freshness indicators, expiry alerts, and a clean visual layout that supports quick scanning rather than detailed reading.

As the catalogue grows, confirmation requests decline significantly, and the system's behaviour-adaptive features (recipe suggestions and shopping-list updates) add value without increasing effort.

Overall, Fresh*TRACK* provides a low-interaction, high-utility user experience that aligns with expert recommendations for practical deployment in complex domestic environments.

Resource Requirements

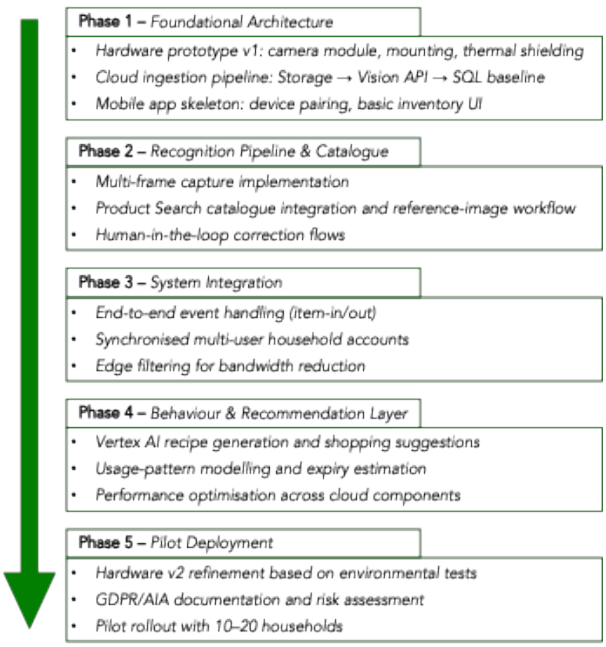
Hardware Development feasibility depends on the ability to assemble the required resources and complete an MVP.

re development requires:

- *camera-module integration*
- *protective optical design*
- *sealed housings*
- *mounting mechanisms*
- *iterative environmental testing*

Software development requires backend engineers to build the ingestion pipeline, connect Google Cloud services, and implement the recognition -› catalogue -› inventory logic. Mobile developers create the pairing flow, correction interface, and real-time inventory view, supported by UX designers and compliance specialists.

Development Roadmap



Cost Estimation Prototype

The prototype development costs are derived from industry-standard quotations for hardware prototyping, cloud-AI integration, and mobile app MVP development, combined with benchmark figures from comparable IoT and software projects (Azilen, n.d.). All values already include a built-in buffer to account for uncertainty, early-stage iteration, and potential increases in component or development costs.

Category	Description	Cost (€)
Hardware Prototype (Camera v1)	*Engineering of first hardware version: PCB design, camera module integration, enclosure, optical protection, mounting & battery setup*	30k
AI Testing & Cloud Integration	*Setup and testing of Vision API, Product Search catalogue, ingestion workflow, latency evaluation, dataset creation*	30K
Pilot Hardware Testing	*Environmental trials (humidity, condensation, cold), battery-life measurement, field testing in several fridges*	10K
App Development (Prototype MVP)	*Basic mobile app with device pairing, reference-image uploads, inventory UI, human-in-loop correction flow, notification basics*	30K
Total Cost	—	**100k**

2 Industry Attractiveness

Linking Food-Waste Behaviour to Smart-Appliance Potential

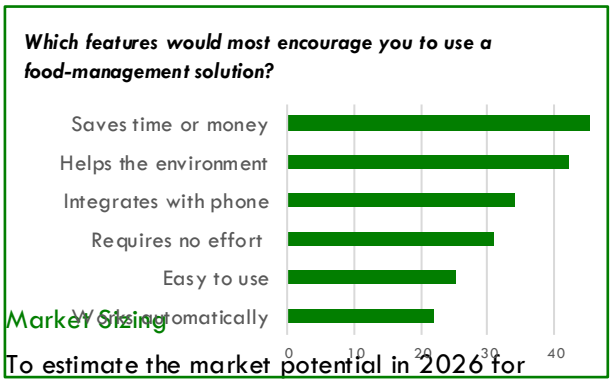
To justify entering the smart-appliance industry with a digital fridge-management solution, it is essential to validate whether improved visibility can meaningfully reduce household food waste. Evidence shows that waste often results from a lack of oversight of what is stored at home (van Herpen et al., 2019). At the same time, effective interventions must fit effortlessly into daily routines rather than require ongoing attention (Simões, Carvalho & De Matos, 2022). Together, this suggests that automated, low-effort smart-fridge technologies are well aligned with the behavioural drivers of food waste, strengthening the attractiveness of this industry for solutions like ours.

Smart Refrigerator Industry

Building on the concept paper, which already demonstrated strong growth in the smart-appliance market and a rising number of smart homes, this section deepens the focus on the specific segment relevant to our solution: refrigerators. While the overall refrigerator market in Europe is expected to grow at a relatively modest pace with a CAGR (2025-2030) of around 3.68%, industry reports expect the smart-fridge segment to expand significantly faster, with growth rates of roughly 10.7% in the same timeframe, reflecting increasing consumer demand for connected, convenience-enhancing features (Statista, 2025a; Mordor Intelligence, 2025). However, adoption in this category remains slow due to long replacement cycles. Refrigerators typically remain in use for around 15 years, meaning that even strong growth in smart-fridge sales translates only gradually into household penetration (Umweltbundesamt, 2025). This dynamic creates a structural delay between technological availability and mass adoption. For Fresh*TRACK*, this market configuration is highly attractive, because consumer interest in smart-fridge functionality is clearly rising, yet the slow turnover of physical appliances leaves a large installed base of conventional fridges underserved.

Customer Validation

To validate these market assumptions, we conducted a consumer survey. The respondents showed a positive attitude towards an automated fridge-management system; 88% were interested in learning more (Fresh*TRACK* Team, 2025). The strongest adoption drivers were saving time or money and requiring no effort, which are two core elements of our value proposition. Additionally, a majority indicated they would feel comfortable using a small device that tracks items inside the fridge, confirming that consumer openness towards retrofit smart-fridge functionality is high.

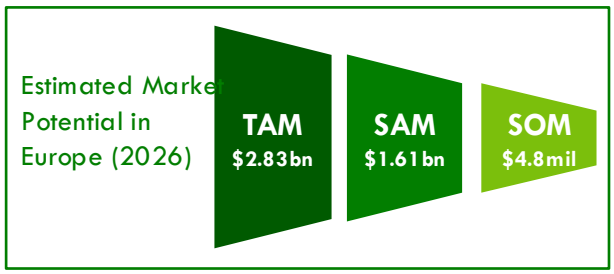


Market Sizing

To estimate the market potential in 2026 for Fresh*TRACK* in our target market Europe, we apply a top-down approach based on the structure of the household appliances market. Refrigerators account for around 16% of total household appliance revenue in Europe (18 billion USD of a 112 billion USD market) (Statista, 2025b). Applying this ratio to the estimated 17.7 billion USD European smart home appliances market leads to a Total Addressable Market (TAM) of 2.83 billion USD for fridge-related smart functionalities (Statista, 2025c).

The Serviceable Available Market (SAM) focuses on the share of the market that can realistically be captured. Given the long replacement cycle of refrigerators and low penetration of smart fridges in Europe, we exclude 5% to account for existing smart-fridge users. Combined with a 60% willingness-to-adopt rate derived from our consumer survey, the SAM for Fresh*TRACK* is estimated at 1.61 billion USD.

Considering early-stage adoption rates in consumer IoT and the competitive nature of the market, a conservative capture rate of 0.3% is realistic. Applied to the SAM this results in a Serviceable Obtainable Market (SOM) of approximately 4.8 million USD.



Competitor Analysis and Industry Implications

To evaluate the economic viability of our solution, we analyse Smarter's FridgeCam as the closest comparable retrofit competitor in the connected-kitchen space. Smarter's latest available financial data from 2023 indicates that the company experienced a challenging phase, with limited liquidity and accumulated losses, reflecting the difficulties of scaling hardware-centric consumer IoT products in their early years (Companies House, 2025). However, the company's continued operation and subsequent developments provide important additional context. Smarter has expanded its workforce from 7 to over 20 employees, broadened its product range and maintains distribution through more than 3,000 retail partners across the UK, Europe and North America (LinkedIn, n.d.; Smarter, n.d.).

Smarter's trajectory illustrates that even products with broad retail distribution and continued organisational development depend heavily on whether they solve a meaningful and consistently experienced consumer problem. The FridgeCam's mixed market performance shows that early interest does not automatically translate into long-term adoption if the everyday value is not strong enough.

From these observations, two dominant industry forces become evident. First, buyer power is high. Households face no urgency to upgrade their refrigerators and only purchase additional devices when they solve a meaningful problem. Smarter's experience shows that convenience alone is not enough to justify adoption. Second, the threat of substitutes is serious. For many consumers, simply checking the fridge manually or using free apps is sufficient. This means that only solutions offering genuine automation and reduced cognitive effort can achieve sustained usage.

Competitor Analysis and Industry Implications

Fresh*TRACK* positions itself in the mid-market gap identified in our Concept Paper between low-engagement manual apps and high-cost smart fridges. The Smarter case shows that retrofit solutions only succeed when their everyday value is clear and requires minimal effort. Our own research supports this, with consumers consistently prioritising convenience, automation and cost savings. Therefore, Fresh*TRACK*'s focus lies on delivering reliable, AI-supported automation that visibly reduces food waste and enhances convenience, forming the core of our market-facing value story. By offering a non-subscription solution that improves through learning and minimises manual input, Fresh*TRACK* directly addresses high buyer power and strong substitution pressures.

3 Organisational Feasibility

Organisational Setup

Fresh*TRACK* will be established as an Irish Private Limited Company (LTD), a legal structure that ensures limited liability for all founders and provides a stable foundation for operating a consumer-facing hardware–software product. The LTD is the most common and suitable form for early-stage ventures, offering no minimum capital requirements, a flexible share structure for future investment and a low administrative burden, which aligns well with the needs of a resource-constrained startup (PwC Ireland, 2024). Ireland's corporate environment also supports lean company setups and facilitates EU-wide operations, making it well suited for a product intended for the broader European market.

Required Organisational Capabilities

To determine the organisational feasibility of Fresh*TRACK*, it is essential to define the capabilities that a startup building a hybrid hardware-software consumer product must possess. Because value is delivered across digital and physical touchpoints, the relevant capabilities can be best understood along the value chain of the venture.

At the strategic level, the organisation requires capabilities in business modelling, financial planning and market intelligence to guide early decision-making.

In product development, Fresh*TRACK* needs competencies in technical feasibility assessment, product/service design and legal compliance, including GDPR and product safety. As a physical consumer product, core operations and supply-chain competencies are required to manage manufacturing partners, logistics and quality assurance. For market traction, strong marketing, communication, branding and sales skills are necessary to position the product effectively and drive adoption.

Beyond these functional requirements, startups also depend on broader organisational skills. Research highlights that young ventures operate under uncertainty, limited resources and dynamic environments, making flexibility, cross-functional collaboration, creativity and iterative problem-solving essential (Paternoster et al., 2023).

Skill Gap Analysis

To ensure that the organisational capabilities identified in the previous section are reflected within our organisation, we conducted a structured skill gap analysis using a capability matrix. Each team member was assessed on a scale from 1 (very low skill) to 5 (high skill), allowing us to map the strengths and gaps across the functions

Overall, the matrix shows that the founding team demonstrates solid competencies among key dimensions.

FreshTrack Team	Financial Literacy	Market Intelligence	Product Development	Legal	Supply Chain & Operations	Marketing	Sales	Flexibility	Creativity & Innovation	Problem Solving
Anaïs Wunsch (CEO)	3	4	2	1	3	4	3	4	4	4
Katherine Moyer (CFO)	4	3	1	2	3	2	2	3	3	3
Christian Geiger (COO)	3	3	2	2	4	2	3	4	3	4
Tom Blume (CTO)	2	3	3	3	3	1	2	4	4	4
Dennis Chumakov (CMO)	2	4	2	1	2	4	4	4	4	3
Total Score	**14**	**17**	**10**	**9**	**15**	**13**	**14**	**19**	**18**	**18**

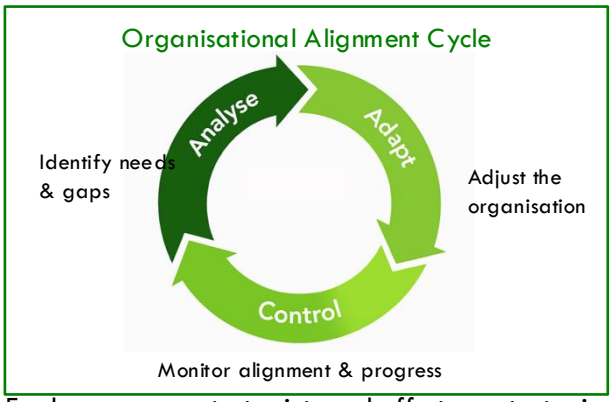
However, the analysis highlights two critical capability gaps that are essential for the successful development of the solution: Product Development and Legal.

The low score in Product Development (11), indicates that the team lacks strong technical expertise as this gap primarily concerns the technical dimension of product development, including app development, software architecture and the coordination of early technical decisions. Because these tasks are at the core of Fresh*TRACK*'s initial development phase and because tight alignment between engineering and the rest of the organisation is crucial, we plan to address this gap by bringing a technical co-founder into the team. This lowers long-term costs and ensures strong organisational alignment.

The second critical gap appears in Legal (9). While certain legal awareness is partially covered by the CTO's technical understanding, this area requires more specialised expertise to ensure compliant data practices, risk management and operational legitimacy. To close this gap, Fresh*TRACK* plans to engage an external legal advisor specialising in GDPR, consumer product regulation and certification. This ensures that the organisation can operate responsibly without placing unrealistic expectations on the technical team. While this represents an unpredictable cost factor, it is a conscious strategic decision that will be accounted for in the projected development expenses.

Minimal Viable Organisation (MVO)

To ensure organisational feasibility in the early stages, Fresh*TRACK* adopts an MVO approach, which applies lean-startup logic to organisational design. Instead of building a fully resourced organisation from the outset , the MVO represents the smallest organisational setup capable of delivering a functional first version of the product (Ries, 2017). This is operationalised using an Analyse – Adapt – Control cycle to ensure that our organisational setup fits the actual requirements.



Fresh*TRACK* concentrates internal efforts on strategic, financial, operational and market-facing functions, while relying on external partners for tasks requiring deep technical or regulatory expertise. Partial outsourcing of these competencies therefore enables the organisation to progress efficiently without committing early to costly, specialised in-house roles.

Beyond this lean resourcing logic, the MVO incorporates lightweight coordination mechanisms, such as weekly cross-functional check-ins, shared project boards and joint milestone reviews. These routines enable the team to synchronise strategic, technical and operational decisions without creating formal hierarchies or bureaucratic processes.

Additionally, Fresh*TRACK* applies an MVO framework for scalable organisational evolution. As the product and sales mature, internal roles will expand only when recurring needs emerge, such as onboarding in-house engineers once the technical direction stabilises or adding customer-support capacity once adoption grows. This stepwise scaling logic ensures that Fresh*TRACK* grows in response to validated needs rather than organisational assumptions.

4 Financial Feasibility

The Financial Feasibility Analysis concentrates on Fresh*TRACK*'s first fiscal year, which begins in 2027. This section is the result of considerable work to ensure our financial foundation is strong and strategically aligned with our goal of providing high-quality, hands-free food tracking. We have created three key financial reports: the Profit and Loss Statement, the Cash Flow Statement, and the Balance Sheet. These reports help us comprehend the economic dynamics of our business. We also developed a detailed Break-Even Analysis to determine the necessary sales volume to convert from a loss-making venture to profitability. This indicator not only demonstrates our financial viability but also sets a baseline for Fresh*TRACK*'s success. All relevant documents are shown within this section, and any extra details can be found in the appendix (see Appendix C, D, and E). Through rigorous planning and examination, our forecasts offer a strong base for informed decisions and will aid us in developing our pricing strategy. It will also reinforce the affordable yet high-quality orientation that our business model is centred around.

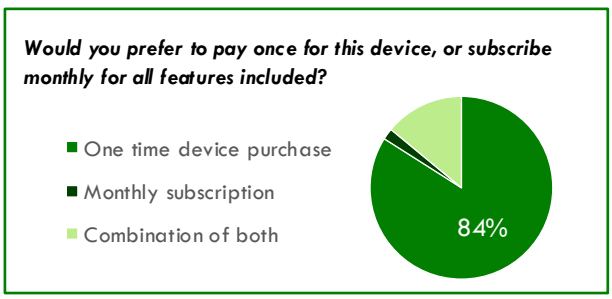
Funding

Our financial strategy for Fresh*TRACK* combines founder equity, bank debt, and potential investor funding. Each of the five founders will invest €30,000, giving up €150,000 in initial equity. We will also take out loans totalling €150,000 to finance set-up costs in 2026 and early operating expenses such as supply chain contracts, marketing, and tech infrastructure. In addition, we plan to pitch Fresh*TRACK* on Dragon's Den; if we secure an investment, we will rebalance the mix between debt and equity to reduce leverage and strengthen our capital base. This structured but flexible funding model is designed to support a successful launch and move the business toward positive cash flow within the first year of trading.

Pricing Strategy

We set the retail price of Fresh*TRACK* at €149.53 (incl. VAT). using a value-based, mid-range pricing strategy. Benchmarking against direct competitors in the smart-fridge and fridge-camera space (Chefling, 2024; Smarter, 2020; Leibherr, 2024) shows that this price positions Fresh*TRACK* toward the higher end of the cost spectrum, with lower-priced items offering basic cameras and higher-priced items being fully integrated smart fridge systems. This supports our intended positioning as an accessible but premium solution. Primary research indicates that participants viewed a higher cost as a fair price for the combined hardware and software functionality if it meant there would be no subscription (Fresh*TRACK* Team, 2025). In response, we removed the proposed monthly subscription fee and instead bundled core app features into the €149.53 purchase price (after tax). To offset recurring app costs without relying on subscription fees, Fresh*TRACK* will integrate relevant ads, such as grocery store promotions. This approach aligns with customer willingness to pay and strengthens Fresh*TRACK*'s differentiation as a one-time purchase. It maintains consistent value positioning while continuing to help households reduce food waste and grocery spending (see Appendix D).

> *"I absolutely don't like another subscription to the others I already have, like my Netflix or Amazon, so I'd rather pay more at once.*



Assumptions

Our financial projections for Fresh*TRACK* are built on the assumptions (summarised in Appendix C) and use primary survey and focus-group data together with secondary market statistics. We are aiming for a market penetration of 5% of the SOM calculated in the Industry Attractiveness section. Our operational plan schedules the delivery of our first purchase order, 3,100 units (2 cameras per unit), by 1 January 2027. The selling price is set at €121.57 (before tax) per unit, and marketing expenditure fixed at 5% of monthly revenue. On the cost side, payroll assumes five employees earning €1,000 per month plus 11.15% PRSI. Financing costs use a 6% annual interest rate. Logistics assumptions include €0.09 per unit for shipping from China (Shapiro, 2025; SINO Shipping, 2021), €0.60 per unit for fulfilment (Shopify, 2025), and €0.01 per unit for warehousing in Ireland (Proligis, 2021). The costs of managing the Shopify website are included in the marketing costs (5% monthly). Together, these assumptions drive our financial statements and provide a transparent, research-based foundation for evaluating the financial viability of the Fresh*TRACK* venture.

Start-Up Costs

Fresh*TRACK*'s start-up costs (summarised in Appendix D) are split into capitalisable items and non-capitalisable expenses which flow into the P&L statement. This separation ensures that our financial statements reflect ongoing operating costs while fixed assets are depreciated over time. The largest start-up costs relate to the product development totalling to around €100,000. Import charges for the camera are embedded into our COGS through the €0.09 per-unit shipping and related landed-cost assumptions. This structure ensures that early-year financial performance reflects realistic operating costs and supports a clear path toward sustainable growth.

Profit and Loss Statement

For 2026, we aim for a market penetration of around 5% based on the SOM calculated, expecting to sell around 3,000 cameras, generating €364,710 in sales revenue with a gross profit margin of 30%. In addition to this, ad revenue is expected to be €9,960 in 2027, meaning €0.60 per user per month. One-time set-up costs (see Appendix E) make up the largest early expense, but are partially offset by capitalising assets such as technology and furniture. Our procurement approach remains

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Income in EUR													
Units Sold	140	160	180	200	220	240	260	270	300	320	340	370	3,000
Cumulative Users	140	300	480	680	900	1140	1400	1670	1970	2290	2630	3000	3,000
Stock on 31st of each month (beginning with 3100 units in Jan. 2027)	2,960	2,800	2,620	2,420	2,200	1,960	1,700	1,430	1,130	810	470	100	100
Unit Price	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	
Hardware Revenue	**17,020**	**19,451**	**21,883**	**24,314**	**26,745**	**29,177**	**31,608**	**32,824**	**36,471**	**38,902**	**41,334**	**44,981**	**364,710**
Ad revenue per unit per month	84	180	288	408	540	684	840	1,002	1,182	1,374	1,578	1,800	9,960
Total Revenue	**17,104**	**19,631**	**22,171**	**24,722**	**27,285**	**29,861**	**32,448**	**33,826**	**37,653**	**40,276**	**42,912**	**46,781**	**374,670**
Hardware Cost of Goods	263,786												263,786
Software Cost of Goods Sold	203	435	696	986	1,305	1,653	2,030	2,422	2,857	3,321	3,814	4,350	24,070
Total COGS	**263,989**	**435**	**696**	**986**	**1,305**	**1,653**	**2,030**	**2,422**	**2,857**	**3,321**	**3,814**	**4,350**	**287,856**
Gross Profit	**(246,885)**	**19,196**	**21,475**	**23,736**	**25,980**	**28,208**	**30,418**	**31,404**	**34,797**	**36,956**	**39,098**	**42,431**	**86,814**
Gross Profit Margin in %													
Operating Expenses in EUR													
Set-up Costs (to be Activated in P/L)	161,500												161,500
GDPR Costs	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	15,000
Depreciation & Amortization	275	275	275	275	275	275	275	275	275	275	275	275	3,300
Office Rent	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	12,000
Salaries	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
Payroll Taxes	558	558	558	558	558	558	558	558	558	558	558	558	6,690
Warehouse Rent/Inventory	563	563	563	563	563	563	563	563	563	563	563	563	6,751
Travel Costs	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Insurance	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Telecommunications	50	50	50	50	50	50	50	50	50	50	50	50	600
R&D (Hardware + Software)	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Marketing/Advertising/Website	851	973	1,094	1,216	1,337	1,459	1,580	1,641	1,824	1,945	2,067	2,249	18,236
Accounting and Tax Consultation Costs	25	25	25	25	25	25	25	25	25	25	25	25	300
Legal and Consulting Costs	150	150	150	150	150	150	150	150	150	150	150	150	1,800
Banking Fees	30	30	30	30	30	30	30	30	30	30	30	30	360
Total Operating Costs	**171,751.04**	**10,373**	**10,494**	**10,616**	**10,737**	**10,859**	**10,980**	**11,041**	**11,224**	**11,345**	**11,467**	**11,649**	**292,536**
EBIT in EUR	**(418,636)**	**8,824**	**10,980**	**13,120**	**15,243**	**17,349**	**19,438**	**20,363**	**23,573**	**25,611**	**27,632**	**30,782**	**(205,722)**
Interest Payments	750	750	750	750	750	750	750	750	750	750	750	750	9,000
Taxes													
Net Income in EUR	**(419,386)**	**8,074**	**10,230**	**12,370**	**14,493**	**16,599**	**18,688**	**19,613**	**22,823**	**24,861**	**26,882**	**30,032**	**(214,722)**
Retained Earnings	(419,386)	(411,313)	(401,082)	(388,712)	(374,219)	(357,620)	(338,932)	(319,319)	(296,496)	(271,635)	(244,754)	(214,722)	(214,722)

Profit and Loss Statement (per month) CY2027

efficient: we plan to purchase 3,100 units of Fresh*TRACK* in January 2027, helping to reduce shipping costs and limit supply-chain risks. By year-end, we project a negative EBIT of €205,722 and a net loss of €214,722, driven mainly by initial investment and ramp-up costs. With growth stabilising in the second year, we expect a substantial reduction in losses, supporting Fresh*TRACK*'s path toward sustainable long-term performance.

Route to Market

Fresh*TRACK*'s route to market aligns closely with the needs of our target customers, who prioritise convenience, low effort and fast access to problem-solving tools. To meet these expectations while maintaining strong margins and scalability, we will begin with a digital-first strategy, selling exclusively through our own Shopify store and Amazon. Simultaneously, we will invest in search engine optimization to boost product awareness and accelerate early market traction. Once initial market traction is established, we will expand through partnership channels, such as electronic retailers, enabling Fresh*TRACK* to reach consumers who prefer in-store validation.

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Statement of Cash Flows

The Cash Flow Statement shows whether Fresh*TRACK* generates enough liquidity to meet obligations, fund essential investments, and support ongoing operations. In our first fiscal year, we prioritise efficiency and careful resource allocation. A key component of this plan is consolidating procurement: we intend to place a single bulk order for 3,100 units intended for sale. Although this concentrated purchasing strategy temporarily affects cash flow during the procurement period, it reduces logistical complexity and lowers overall purchasing costs. Apart from essential initial investments, such as setting up our office, we do not expect major capital expenditures in the first year. This approach supports stable cash flows and strengthens financial resilience. As is typical for an early-stage venture, we project a negative operating cash flow in year one due to start-up costs and required upfront investments. However, with continued efficiency gains and rising sales volumes, we expect Fresh*TRACK* to achieve positive operating cash flow in the upcoming terms, a key milestone for building a strong financial foundation and scaling the business sustainably.

	January	February	March	April	May	June	July	August	September	October	November	December
Cash Receipts in EUR												
Income from Sales												
Cash Sales from Camera	17,020	19,451	21,883	24,314	26,745	29,177	31,608	32,824	36,471	38,902	41,334	44,981
Cash Sales from Ads	84	180	288	408	540	684	840	1,002	1,182	1,374	1,578	1,800
Other Cash Receipts												
Total Cash from Sales	**17,104**	**19,631**	**22,171**	**24,722**	**27,285**	**29,861**	**32,448**	**33,826**	**37,653**	**40,276**	**42,912**	**46,781**
Income for Financing												
Interest Income												
Loan Process	150,000											
Equity Capital Investments	150,000											
Total Cash from Financing	**300,000**											
Other Cash Receipts												
Total Cash Receipts	**317,104**	**19,631**	**22,171**	**24,722**	**27,285**	**29,861**	**32,448**	**33,826**	**37,653**	**40,276**	**42,912**	**46,781**
Cash Disbursements in EUR												
Expenses												
Bulk Order for 3,100 units of cameras (January 2027)	263,786											
Operating Expenses	171,476	10,098	10,219	10,341	10,462	10,584	10,705	10,766	10,949	11,070	11,192	11,374
Set-up Costs (to be activated as assets in balance sheet)	16,500											
Returns & Allowances												
Loan Payments	750	750	750	750	750	750	750	750	750	750	750	750
Software Development	200	200	200	200	200	200	200	200	200	200	200	200
Income Tax Payments												
Owner's Draw	15	15	15	15	15	15	15	15	15	15	15	15
Total Cash Disbursements	**452,727**	**11,063**	**11,184**	**11,306**	**11,427**	**11,549**	**11,670**	**11,731**	**11,914**	**12,035**	**12,157**	**12,339**
Net Cash Flow in EUR												
Opening Cash Balance	0	(135,623)	(127,054)	(116,068)	(102,652)	(86,793)	(68,482)	(47,704)	(25,609)	130	28,372	59,127
+ Total Cash Receipts	317,104	19,631	22,171	24,722	27,285	29,861	32,448	33,826	37,653	40,276	42,912	46,781
- Total Cash Disbursements	452,727	11,063	11,184	11,306	11,427	11,549	11,670	11,731	11,914	12,035	12,157	12,339
Ending Cash Balance	**(135,623)**	**(127,054)**	**(116,068)**	**(102,652)**	**(86,793)**	**(68,482)**	**(47,704)**	**(25,609)**	**130**	**28,372**	**59,127**	**93,569**

Cashflow Statement (per month) CY2027

Balance Sheet

The Balance Sheet as of December 31, 2027, outlines Fresh*TRACK*'s assets and the sources which are financing them, providing a snapshot of our financial position at the close of our first fiscal year. Current assets include bank balances and inventory (100 Fresh*TRACK* units at cost). Fixed assets are comprised of deposits, office furniture, computers and software, and telecommunications equipment, net of accumulated depreciation of €3,300 (straight-line over 5 years). These form the core infrastructure required to operate and scale the business. On the liabilities side, Fresh*TRACK* holds €150,000 in short-term notes payable as part of its initial financing strategy. The company also records €30,000 in long-term liabilities, representing capital leases used to fund essential equipment, such as mainframe servers and powerful technology. Equity consists of €150,000 in paid-in capital from the founders, offset by retained losses of €214,722.01, resulting in a year-end net equity position of -€64,722.01. While negative equity is typical in early-stage ventures with large upfront investment costs, Fresh*TRACK*'s balance sheet reflects a stable foundation of sufficient liquidity, essential assets in place, and a manageable mix of short-term financing and long-term capital leases. This supports the company's path toward long-term operational and financial sustainability.

Assets	
Current Assets	**EUR**
Bank Balances	93,568.77
Accounts Receivables	
Inventory (100 units of camera)	8,509.22
Other Current Assets	
Total Current Assets	**102,077.99**
Fixed Assets	
Deposits	5,000.00
Furniture	3,000.00
Computers / Software	7,000.00
Telephones / Telecommunications	1,500.00
Patents / Licenses / Domain Name etc.	-
Website/Domain/Online Shop	-
D&A	(3,300.00)
Total Fixed Assets	**13,200.00**
Other Assets	
Total Assets	**115,277.99**
Liabilities	
Current Liabilites	
Short-term Notes Payable	150,000.00
Income Tax Due	
Other Current Liabilities	
Total Current Liabilities	**150,000.00**
Long-term Liabilities	
Long-term Notes Payable	-
Other Long-term Liabilities	30,000.00
Total Long-term Liabillities	**30,000.00**
Net Worth	
Paid-in Capital	150,000.00
Retained Earnings	(214,722.01)
Total Net Worth	(64,722.01)
Total Liabilities and Net Worth	**115,277.99**

Balance Sheet as of December 31, 2027

Break-Even Analysis

The Break-Even Analysis for CY2027 uses our pricing model and fixed-cost structure to assess Fresh*TRACK*'s path to profitability. We model three scenarios - Base, Worst, and Best Case - by adjusting total fixed expenses by ±15% to reflect operational uncertainty.

	Base Case	Worst Case	Best Case
Average Selling Price per Unit (before tax)	121.57	121.57	121.57
Average Cost of each Unit	85.1	85.1	85.1
Gross Profit Margin	30%	30%	30%
Total Fixed Expenses	292,536.13	336,416.55	248,655.71
Euro Sales to Break Even	974,939.23	1,121,180.11	828,698.34
Number of Unit Sales to Break Even	8,020	9,223	6,817

Projected Sales of 2027	364,710.00
Projected Number of Unit Sales 2027	3,000.00

Break-Even Analysis CY2027 (In EUR)

With a selling price of €121.57 before tax and an average unit cost of €85.09, each device generates a contribution margin of €36.48. Based on our calculations, we are not going to meet the Base or Best Case scenario break-even points, indicating that profitability will not be reached in the first fiscal year. This is something many start-ups face during their first year in business (Parsons, 2025). Despite this expected first-year loss, existing equity and controlled cost structures enable us to withstand the early deficit. Enhancing contribution margins, reducing fixed costs, and scaling sales progressively will be key to narrowing the break-School is slow but going well, wrapping up my big projects this week. even gap. Even with early losses, Fresh*TRACK* retains a viable pathway to long-term financial sustainability.

5 Value Proposition Design

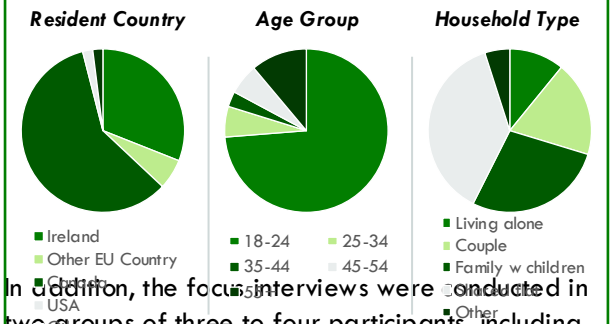
The following section will outline our data collection approach for applying the Value Proposition Canvas (VPC) to Fresh*TRACK*, based on the approach of Osterwalder et al. (2015). This aims to identify key customer segments along with their needs and challenges.

Methodology

To build a solid understanding of our customers, we employed a two-step primary data approach: a survey to capture general patterns and a series of focus interviews to gain deeper insights into our customer profiles.

The survey was shared within our network, which, owing to the diverse backgrounds of our team, reached a wide range of people. In total, 64 participants completed the survey, which comprised 19 questions covering demographic information, household routines, food waste practices, consumer behaviour and interest in potential new solutions (Appendix F).

Demographic Data of Survey Responses

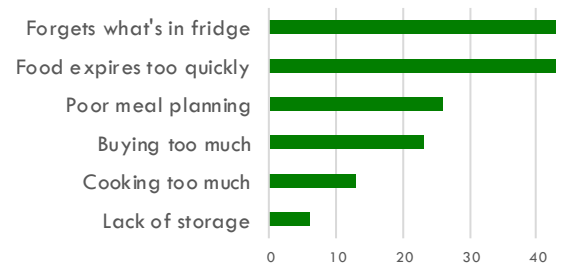


In addition, the focus interviews were conducted in two groups of three to four participants, including individuals living in Germany, Ireland, Canada and the USA. The goals of the focus groups were to determine priorities in household habits, desires, and struggles, as well as to gain further insights, such as price preferences. The questions for these focus groups are listed in Appendix G.

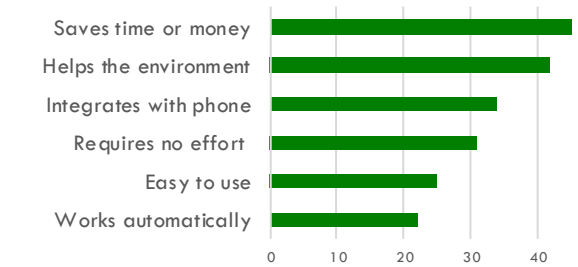
Each interview lasted approximately 30 minutes, covered around eight to twelve open questions and provided valuable and diverse perspectives. The questions were intentionally phrased openly to allow participants to express their thoughts freely.

Key Insights from the Survey

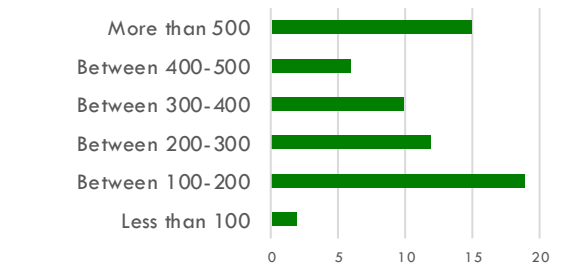
What are the main reasons food gets wasted in your household?



Which features would most encourage you to use a food-management solution?



How much money do you approximate spend on groceries per month (in €)



To support our primary data collection, secondary data was also incorporated. The insights gained from these sources helped us to refine Fresh*TRACK*'s value proposition.

Customer Understanding

At Fresh*TRACK*, we understand that prioritising customers awareness is crucial. As part of the concept paper, we initially developed a preliminary customer awareness profile.

By incorporating insights from our primary data collection, we were able to define our target customers more precisely, therefore gaining a better understanding of them.

Live busy lives where convenience and efficiency are crucial

Frustrated about dis-organisation and stress in household management

Willing to invest in smart tools that simplify their routines

Fresh*TRACK*'s customers form a diverse but clearly aligned group across age brackets, household types and countries. Despite varied backgrounds, they share common behavioural patterns shaped by busy routines, irregular shopping habits and a limited overview of their fridge inventory. Their daily lives are characterised by time pressure, fluctuating motivation for cooking and emotional responses to inefficiency and waste.

Where they live

Survey respondents as well as focus group members are distributed internationally and include participants from small cities, suburban and urban areas.

Their living situations range from shared flats and couples to families with children, reflecting a broad early adopter base.

Lifestyle and Household Routines

Customers show a tendency towards unstructured food management with only one or two larger shops per week but needing to supplement these with spontaneous purchases.

Meals are often planned without creativity or not at all, especially for people with irregular working hours.

Customers hold stable professional positions and enjoy good incomes, enabling them to invest in tools that improve their daily life.

Values and Motivations

Customers strongly care about convenience and managing their time and money efficiently. Their purchasing decisions are strongly influenced by automation processes and the desire to reduce stress and simplify mental load. Moreover, they value structure in their routines and the ease of integrating new habits into existing daily patterns. Environmental considerations appear as an additional yet secondary motivation, mainly as part of a broader desire to live responsibly.

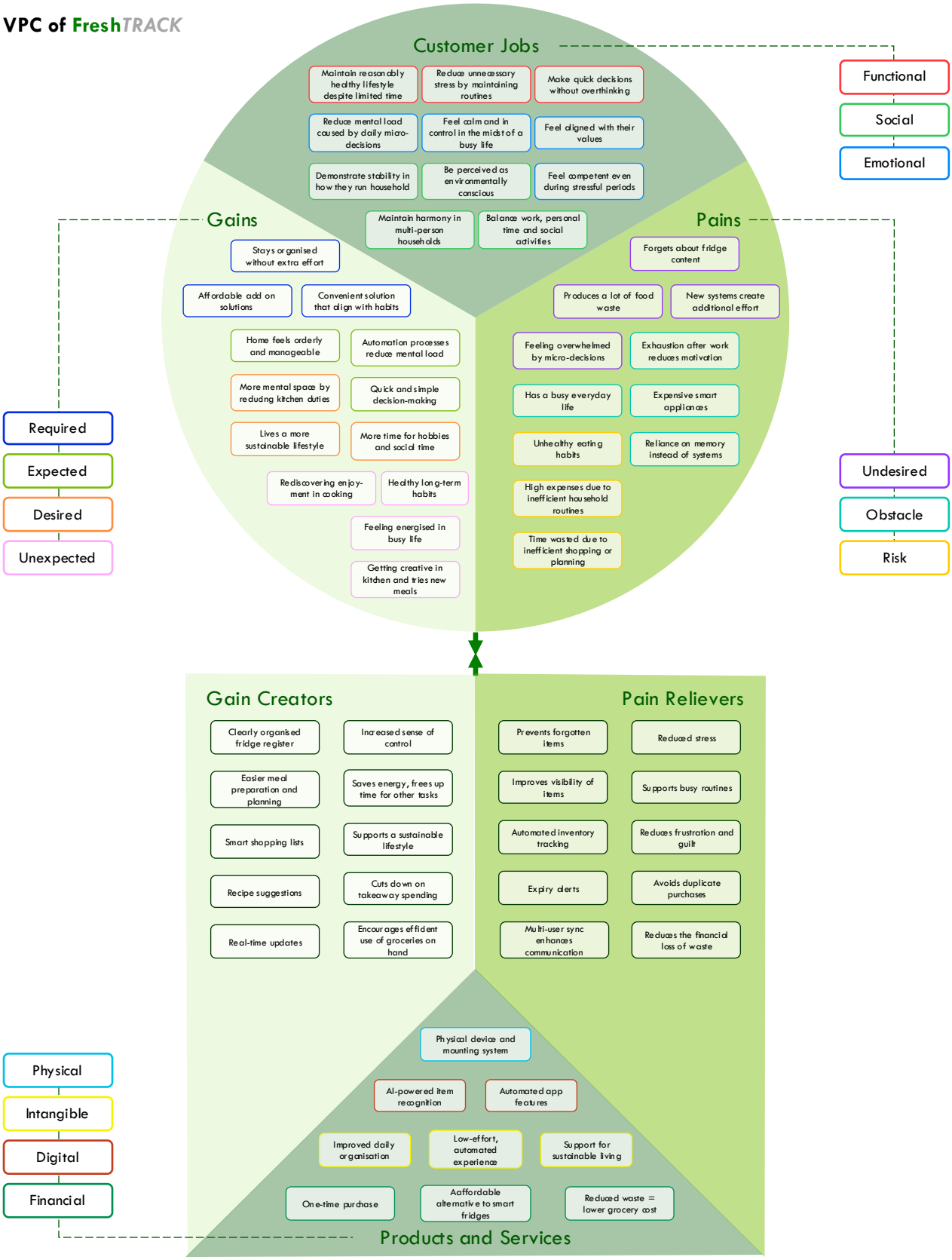
Emotional Responses

Interviews reveal a mix of stress, guilt and annoyance associated with food waste or inefficient household management. Many feel overwhelmed when shopping without clarity, and others feel guilty when throwing away expired food or realising they bought duplicates. These emotions shape their attitudes: they want smooth, low-effort routines that help them feel more in control.

Reasons for Hesitancy

Hesitancy stems primarily from concerns around additional effort and the risk of inconsistency. Some worry that new systems or routines quickly become another chore that they may forget to maintain.

VPC of FreshTRACK



Value Proposition: Customer Profile

Customer Jobs

Fresh*TRACK*'s target customers lead fast-paced lives with limited time to structure daily routines. Categorising customer jobs into functional, social and emotional needs reflects a detailed understanding of our customers (Osterwalder et al., 2015).

Functionally, these individuals seek to reduce unnecessary stress by maintaining routines and making quick decisions without overthinking. Focus group participants repeatedly described juggling work, childcare, or shared households and managing irregular weekly rhythms. Further, survey respondents reported inconsistent meal planning and frequent ad-hoc shopping, with 51% stating they sometimes throw away food, indicating difficulty in sustaining healthy habits under time pressure.

Socially, customers also want to be perceived as environmentally conscious and responsible, which aligns with the 42% survey respondents who rated reducing food waste as an important factor, expressing frustration when items spoil unnecessarily (Fresh*TRACK* Team, 2025). Furthermore, many aim to balance demanding work schedules with rest and social activities, demonstrating stability in how they manage their households and maintaining harmony where responsibilities are shared.

Emotionally, customers seek to reduce the mental load caused by daily micro-decisions. Several individuals of the focus groups described losing track of what they have at home or feeling overwhelmed when shopping without clarity.

How confident are you that you currently know what you have in your fridge right now?

49%
"Low"

They also want to feel competent even under stress and to ensure their routines align with personal values such as sustainability and mindful living.

> *"I find it frustrating when things hide at the back of the fridge and I only realise they've expired when it's too late.*

Customer Pains

Fresh*TRACK*'s customers face a range of practical and structural pains that complicate their everyday routines. One significant risk they experience is increased household expenses resulting from inefficient routines. Inefficient planning also leads to wasted time. Many focus group participants noted requiring multiple shopping trips per week or improvising meals due to missing items, which disrupts their schedules and adds extra hassle. In addition, irregular planning and rushed decisions contribute to unhealthy eating habits, with several individuals explaining that they resort to quick options or ready-made meals when feeling disorganised.

Customers also face significant obstacles that make it difficult to maintain smooth routines. Their everyday lives are characterised by demanding work schedules, leaving little time or energy for consistent organisation. Participants explicitly mentioned exhaustion after work and low motivation for planning or organising meals. Expensive smart appliances were also cited as inaccessible or unrealistic options for improving household routines, making it harder for individuals to adopt tools that could offer support. The reliance on memory frequently leads to mistakes like forgotten items or miscommunication within households.

These obstacles contribute directly to several undesired outcomes that shape customers' daily frustrations. For instance, forgetting

what is stored in the fridge is widespread. This lack of overview results in large amounts of avoidable food waste.

> *"I find it frustrating when things hide at the back of our fridge and we only realise they've expired when it's too late.*

Many also reported feeling overwhelmed by the number of micro-decisions required in daily life, from planning meals to coordinating shopping, which adds mental strain on top of already busy schedules. Finally, when new tools require extra effort, they quickly become unsustainable, as customers noted that added steps often create more work instead of simplifying routines.

Customer Gains

At a fundamental level, customers require conditions that help them keep their daily routines manageable and simple. They value affordable solutions to their household that fit within their existing household instead of buying new appliances. Additionally, customers need ways of staying organised without adding extra effort. A convenient approach that aligns naturally with their habits is therefore essential.

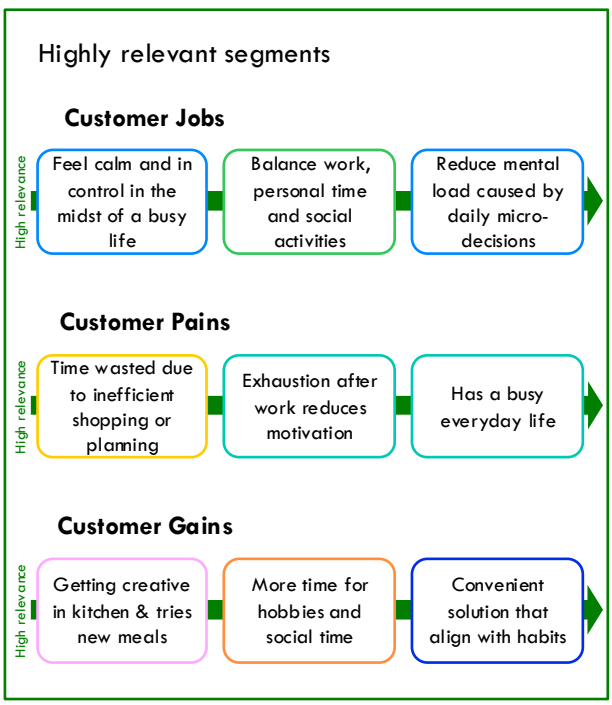
Beyond these requirements, customers expect their daily tasks to run smoothly with minimal friction. Automation and streamlined processes are seen as helpful because they reduce the mental load created by frequent small decisions. They also expect to be able to make quick and simple decisions about everyday matters. Having an orderly and manageable home environment is another essential factor, as disorder often leads to inefficiencies which they wish to avoid.

On a deeper level, customers desire lifestyle improvements that extend beyond comfort. Many aspire to live in a more intentional way, reflected by 65% of survey respondents who value environmentally friendly practices as a motivator for improving routines (Fresh*TRACK* Team, 2025). Moreover, they also want more mental space and free time, aiming to reduce kitchen-related duties that compete with work and personal life. This way, they can enjoy greater balance, hobbies and social engagement.

> *"I am a picky eater. Not having to think about what to cook next would be really nice*

Customers may also experience positive outcomes beyond what they initially anticipate. Some may find themselves getting creative in the kitchen or trying new meals once routine pressures decrease. Others may rediscover enjoyment in cooking when daily stress is reduced or experience an increase in energy due to smoother routines. Improved organisation can also support healthier long-term habits, allowing customers to feel more grounded and consistent despite their demanding lives.

> *"I would love to enjoy cooking again but right now I just see it as a burden.*

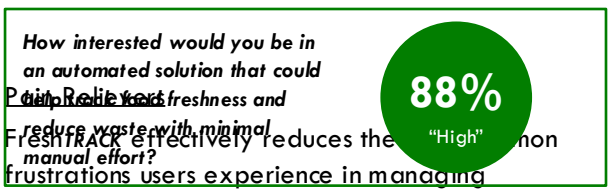


Value Proposition: Value Map

Products and Services

Fresh***TRACK*** delivers a hybrid physical-digital solution that combines compact hardware with software that seamlessly integrates Google Cloud products into its AI/IT architecture, creating an automated, low-effort fridge management experience. The camera device mounts non-invasively inside the fridge, ensuring compatibility without affecting appliance warranties. It is engineered to operate reliably despite condensation, reflective surfaces, and varying temperatures, capturing clear images only when the fridge door opens to preserve battery life and reduce data usage.

On the software side, Fresh***TRACK*** integrates image recognition and a household-specific product catalogue to update inventory automatically. Users access an intuitive dashboard that provides expiry alerts, smart shopping lists, and recipe suggestions based on their actual ingredients. Multi-user accounts ensure that all household members share the same up-to-date fridge view, reducing confusion and improving coordination. The system is intentionally designed to minimise interaction while still providing support when needed, aligning with user preferences for simplicity and low cognitive load. Fresh***TRACK*** is offered as a one-time purchase with no subscription fees, addressing widespread subscription fatigue and making it a cost-effective and accessible long-term solution for households.



Pain Reliever

Fresh***TRACK*** effectively reduces the [illegible] common frustrations users experience in managing household food. It eliminates the guesswork around what is inside the fridge by updating inventory automatically, reducing the likelihood of forgotten items, expired food, and wasted groceries. The system removes the need to remember dates or keep mental lists, issuing timely expiry reminders and generating smart shopping lists that help prevent duplicated purchases or unnecessary trips. This is especially valuable in households with shared cooking and shopping responsibilities, where communication gaps often lead to inefficiencies or confusion.

Fresh***TRACK*** also reduces the mental load associated with daily food decisions. Many users expressed stress, frustration, or guilt when food was wasted or when they lacked clarity about what ingredients were available. By offering structure and visibility, the system alleviates this emotional burden and helps create a more organised and predictable routine. The financial impact is equally important: by reducing spoilage and last-minute spending, Fresh***TRACK*** supports more stable and intentional household budgeting. Together, these pain relievers demonstrate how the system measurably improves everyday life by addressing both practical problems and the emotional pressures surrounding household management.

Human-in-the-Loop

While Fresh***TRACK*** automates the majority of fridge management tasks, full automation is neither feasible nor desirable in real households. Factors such as occlusion, similar packaging, or low-confidence recognition events mean that users must occasionally be involved in the identification process. For this reason, the system incorporates a structured human-in-the-loop workflow, prompting the user to confirm or correct items only when the AI is uncertain. This ensures consistently high accuracy while allowing the system to learn over time. This approach aligns with ease-of- use principles by maintaining automation

where possible but keeping the user in control at key decision points.

Notification Strategy

To avoid overwhelming users, especially during cooking when several items may be removed at once, Fresh*TRACK* consolidates all low-confidence detections into a single, grouped push notification. Rather than sending multiple alerts, users receive one concise message summarising all confirmation requests. This reduces notification fatigue, streamlines the correction process, and supports a positive user experience. By notifying only when necessary and in an efficient format, Fresh*TRACK* reinforces its value as a low-effort and unobtrusive system.

Gain Creators

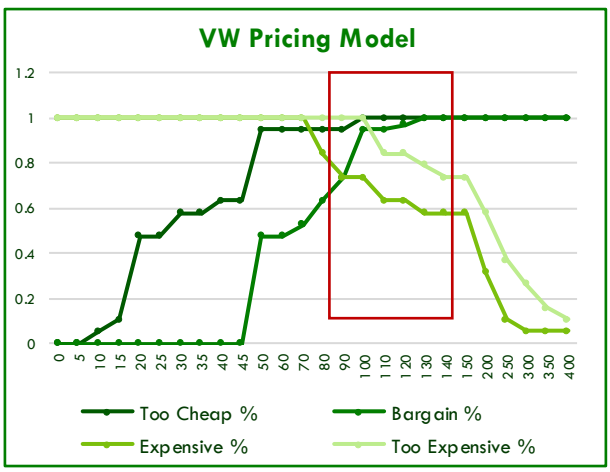
Beyond relieving pain points, Fresh*TRACK* creates positive gains that enhance daily life. By providing clear visibility of fridge contents, users can make faster, more intentional meal decisions and maintain more consistent eating habits. The system can be personalised through dietary preferences or restrictions, allowing recipe suggestions and shopping recommendations to align with individual lifestyles.

Fresh*TRACK* also improves household coordination. With a shared real-time inventory view, all members can see what is available and what needs replacing, reducing miscommunication and enabling smoother planning for meals and grocery shopping. Smart shopping lists and predictive prompts help households stay ahead of upcoming needs and make better use of items nearing expiry. Users gain a stronger sense of control, reduced uncertainty, and greater confidence in their routines. Financial gains also emerge as households use ingredients more efficiently and avoid unnecessary purchases. These gains demonstrate how Fresh*TRACK* enhances organisation, decision-making and the overall cooking and shopping experience.

Pricing Justification & Value

A key component of Fresh*TRACK*'s value proposition is its data-driven pricing model, which was developed using the Van Westendorp Pricing Model (Shaddix, 2023), applied specifically to respondents aged 24 and above who spend €300 or more on groceries per month. This filtering ensures alignment of the analysis to the segment with both purchasing power and a clear financial incentive to reduce food waste. The resulting acceptable price range strongly supported a one-time purchase model, with respondents consistently indicating low willingness to pay for recurring subscriptions.

This insight differentiates Fresh*TRACK* from many existing smart-home or meal-planning solutions that rely on monthly fees, reinforcing our commitment to affordability, transparency and long-term value. Moreover, future planned partnerships with retailers will enhance the value proposition further by integrating weekly savings, promotions and personalised offers directly into recipe suggestions and smart shopping lists. This both reduces household grocery costs and strengthens Fresh*TRACK*'s position as a financially beneficial and convenience-driven solution that continues to grow in value over time.



Value Proposition: Summary

Fresh*TRACK* delivers a clear and compelling value proposition by directly aligning its offering with specific needs, pains, and aspirations identified within the target customer segment. The product provides an accessible, automated fridge-management solution that removes cognitive burden, reduces waste, and streamlines daily household routines, while simultaneously creating new benefits such as coordinated shopping, informed meal preparation, and improved household organisation. The system's design integrates a simple physical device with advanced AI recognition, real-time inventory, and proactive planning tools, bridging the market gap between low-engagement manual apps and high-cost smart appliances. In addition, Fresh*TRACK* embeds light gamification elements such as badges for reduced waste, weekly savings summaries, and optional friend or household leaderboards to reinforce positive habits and celebrate progress. These features enhance emotional engagement and provide motivational feedback, helping users build long-term sustainable behaviours.

Fresh*TRACK*'s one-time pricing model further strengthens its value proposition by offering ongoing benefits without recurring subscription fees – a preference strongly expressed in the pricing research. Planned partnerships with retailers will introduce personalised discounts and weekly flyer integrations, improving both the utility and financial value of the system over time. Together, these elements position Fresh*TRACK* as a comprehensive, future-oriented solution that not only addresses the problems households face today but actively supports healthier, more efficient, and more intentional living in the long term.

Customer Retention

Customer retention is strengthened by Fresh*TRACK*'s ability to deliver increasing value over time. As the system learns household patterns, it provides more accurate reminders, tailored recipe suggestions, and increasingly relevant insights. Gamification elements such as progress indicators or badges for waste reduction offer gentle motivation and help reinforce positive habits without overwhelming users. Retention is further supported by the expansion of Fresh*TRACK*'s ecosystem, including optional fridge organisers designed for optimal camera visibility and potential sensor add-ons once the MVP is validated. This ongoing evolution ensures that Fresh*TRACK* remains a dynamic and improving tool, encouraging long-term engagement.

Customer Se

Fresh*TRACK*'s customer service model is designed to be clear, accessible, and supportive. Users benefit from intuitive onboarding tools, an in-app help centre, and responsive assistance for troubleshooting issues such as pairing or recognition difficulties. Automated diagnostic guidance helps users resolve common problems quickly, while more complex queries receive human support. Customer feedback will continue to shape future improvements and influence the development of add-on products such as organisers and sensor modules. By prioritising reliability and responsiveness, Fresh*TRACK*'s builds trust and reinforces its value as a seamless, user-centred system.

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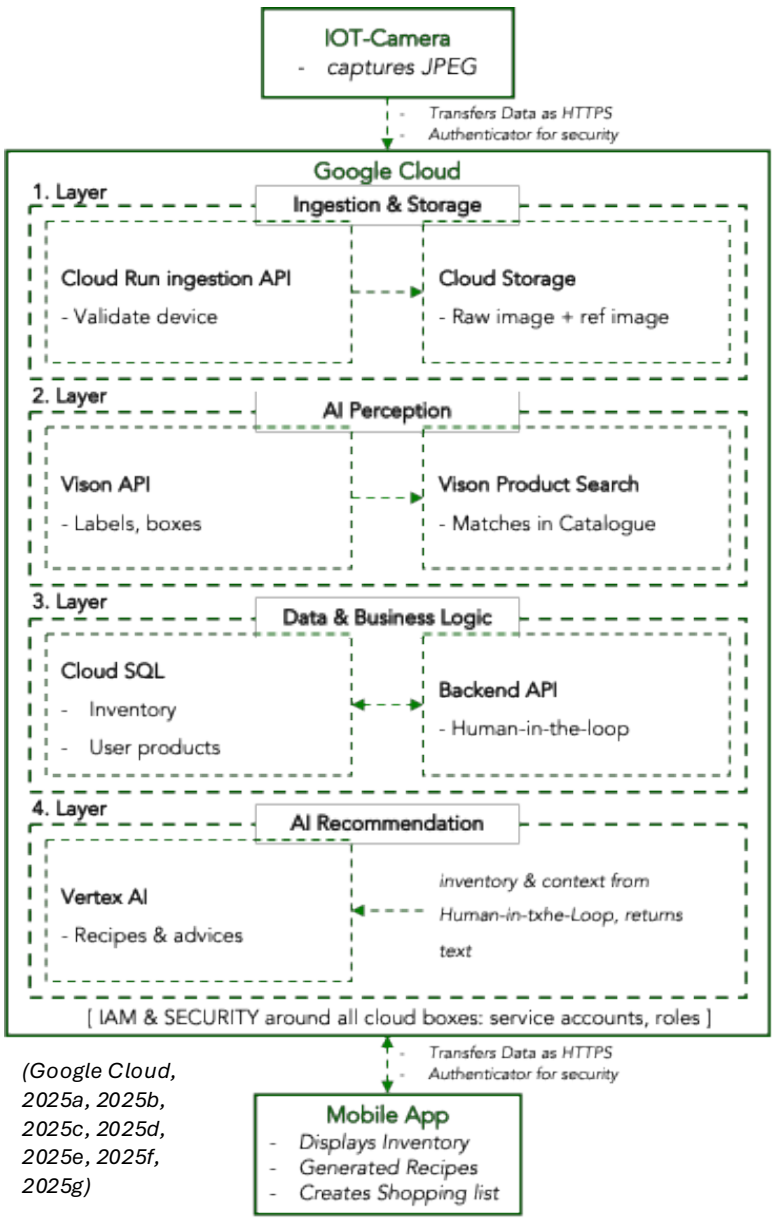
Appendix

Appendix A – Our Experts

No.	Expert	Affiliation	Expertise	Interview Date
1	Prof. Noel O'Connor	Dublin City University	Computer vision, video analytics, IoT imaging	20.11.2025
2	Axle Täubert	Google - *Head of Start-up*	Cloud platforms, AI product architecture, start-up development	21.11.2025
3	Prof. Michael Möhring	Hochschule Reutlingen	Data science, data-driven services, digital business models	03.12.2025

Transcript upon request

Appendix B - IT/AI infrastructure Blueprint



(Google Cloud, 2025a, 2025b, 2025c, 2025d, 2025e, 2025f, 2025g)

Appendix C – Assumptions for Financials

	January	February	March	April	May	June	July	August	September	October	November	December
Customers												
European Smart Home Appliance Market (in bEUR)	15.24											
% of Market Fridge Appliances	16%											
Total Addressable Market for Fridge-Related Smart Functionalities (in bEUR)	2.44											
Existing Smart Fridge Users (%)	5%											
Willingness-to-adopt Rate (%)	60%											
Service Available Market (bEUR)	1.39											
Targeted Market Share	0.5%											
Serviceable Obtainable Market (in mEUR)	6.95											
Price												
Sell Price Fridge Camera System (before tax)	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57	121.57
Marketing												
Advertising (as % of sales revenue)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Payroll Taxes												
PRSI	11.15%	11.15%	11.15%	11.15%	11.15%	11.15%	11.15%	11.15%	11.15%	11.15%	11.15%	11.15%
Number of Employees	5	5	5	5	5	5	5	5	5	5	5	5
Avg Salary per Employee (in EUR)	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Interest												
Yearly Loan Interest Rate	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shipment Costs												
Average Shipping Costs DDU China per unit	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Average Fulfillment Costs (from Warehouse to Customer in Ireland per unit (in EUR)	5	5	5	5	5	5	5	5	5	5	5	5
Warehousing												
Warehouse Rent per Unit in EUR (Fulfillment by Amount)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Exchange Rate USD to EUR (as of 2 Dec, 2025)												
0.86 USD = 1 EUR												

Appendix D – Price Calculation Fresh*TRACK*

Camera Set	
Cost Item	**Value (in EUR)**
Purchase Price per Unit	80
Shipment Costs per Unit to Warehouse in Ireland	0.09
Manufacturing Costs	80.1
Fulfillment Price (from Warehouse to Customer)	5
Prime Costs of One Unit	85.1
Gross Profit Margin	30%
Selling Price Before Tax	121.57
Tax (23%)	27.96
Sell Price of One Unit	149.53

Cost Item	**Value (in EUR)**
Units of Camera Sets Ordered	3100
Units of Camera Sets per m^3	720
Units of Camera Sets per Pallet	1245
Number of Pallets Require	3
LCL Shipment Costs per Pallet	99.84
Safety (15% Shipment Costs)	14.98
Ireland	344.45
Shipment Costs per unit of Camera Sets to Warehouse in Ireland	0.09

App Recurring Costs	
Cost Item	**Value (in EUR)**
App Hosting Costs per User per Month (cloud, storage, API)	0.5
App Maintenance & Updates	0.3
per Month	0.15
Google Gemini API Usage per User per Month	0.5
Total Operating Cost per User per Month	1.45

*There are two cameras included per unit

Appendix E – Fresh*TRACK* Set–Up Costs

Cost Item	**Value in EUR**
Facilities	
Deposits	5,000
Equipment	
Furniture	3,000
Computer/Software	7,000
Telephones/Telecommunications	1,500
Set-up Costs (to be activated directly in Balance Sheet)	16,500
Materials/Supplies	
Office Supplies	1,000
Company Apparel	500
Manufacturer Selection	
Contract manufacturer Due Diligence	3,000
Fees and Other Costs	
Licences/Permits (incl. Patents, Trademarks)	18,000
GDPR Implementation	5,000
Hardware Development	30,000
Software Development	60,000
Testing	10,000
Solicitors	2,000
Accountants	2,000
Insurance	5,000
Marketing	7,000
Training Costs	2,000
Online Marketplace Set-up Costs	
Domain Name Registration	2,000
Website Development	2,000
Online Shop Integration	2,000
Starting Operations	
Pre-launch Advertising	10,000
Set-up Costs (to be activated in P&L Statement)	161,500
Total Set-up Costs	178,000

Appendix F – Survey Questions

Consent

1. Please confirm that you agree to participate in this anonymous survey and are over the age of 18.

Food Waste Habits

2. How often do you throw away food that has gone bad or expired?

3. What are the main reasons food gets wasted in your household? *(Select all that apply)*

4. How big a problem do you think household food waste is?

5. How important is it for you to personally reduce food waste?

6. How confident are you that you currently know what you have in your fridge right now?

Smart Solutions

7. If there were an automated solution that could help track food freshness and reduce waste with minimal effort, how interested would you be in learning more?

8. Which of the following would make you most likely to use such a solution?

9. Would you be comfortable using technology that monitors your food (e.g., a small device that tracks items inside your fridge)?

Pricing

10. (For the following questions, please enter a price) At what one-time purchase price would you consider this device... : **Too Cheap** (so you doubt its quality)?

11. **A bargain** (great value)?

12. **Getting expensive** (you'd think twice)?

13. **Too expensive** (you wouldn't buy it)?

14. If there were an optional app subscription for advanced features, how much would you be willing to pay monthly?

15. Would you prefer to pay once for this device, or subscribe monthly for all features included?

Region

16. Where do you currently live?

About You

17. Age Group

18. Household Type

19. Approximate monthly grocery spending (*Please write currency type in the other field if not in €)*

Appendix G – Focus Group Questions

Understanding current behaviour and context (Jobs to be done)

1. Can you walk us through how you usually plan meals or grocery shopping?

2. How do you currently keep track of what food you have at home?

3. How confident are you that you know what's in your fridge without checking? Why

Identifying pains

4. What frustrations or challenges do you experience when trying to avoid food waste?

5. Which moments in your grocery or cooking routine feel the most inefficient or annoying?

6. How do you feel about not knowing what food is in your fridge, or realising you forgot about something, and it's now gone off?

Exploring gains

7. What would make managing your groceries and meals feel easier or more enjoyable?

8. What outcomes would make you feel that a food-tracking/ meal-planning tool is truly valuable?

9. What improvements would genuinely simplify your everyday life rather than add extra work?

10. What features of a food tracking system would make a solution genuinely useful or exciting for you?

Testing Fresh*TRACK*'s potential value (fit with proposed experience)

11. What concerns would you have about using a digital tool like Fresh*TRACK* regularly?

12. What price would you be willing to pay for a food tracking/ managing system?

13. Would you prefer a subscription model or a one-time, higher price model?

Declaration of Authorship

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Programme: Bachelor of Arts in Global Business (Germany & Canada)
Project Title: FreshTrack Feasibility Report
Module Code: BAA1003 New Enterprise Development
Lecturer: Dr. Eric Clinton
Project Due Date: 05/12/2025

Declaration

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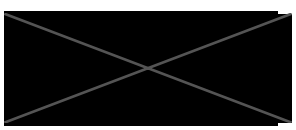
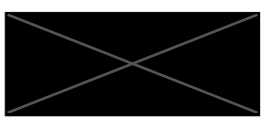
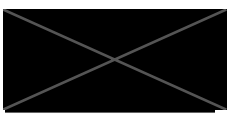
This assignment, or any part of it, has not been previously submitted by me or any other person for assessment on this or any other course of study. I have read and understood the referencing guidelines found at https://www.dcu.ie/library/citing-referencing and/or recommended in the assignment guidelines.

I understand that I may be required to discuss with the module lecturer/s the contents of this submission.


Anaïs Wunsch


Katherine Moyer


Christian Geiger


Tom Blume


Dennis Chumakov