



@ShrimpingIt

Arduino-compatible inventions and educational kits

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Executive Summary

@ShrimpingIt originated as a summer-project by Cefn Hoile to offer **freely-licensed documentation** to high-school educators, **a distinctive brand of open-source programmable electronics**, supported by build walkthroughs, teaching resources, and procurement guides.

Over subsequent months, with minimal seed funding, and driven by popular demand, a sustainable business has emerged, offering **services to support the adoption of @ShrimpingIt project designs** by educators, operating as a part time enterprise to supplement Cefn's PhD bursary. The business has now reached a level of maturity to **launch as an online retailer**, marketing and supporting the adoption of its own electronics projects to UK educators, supplemented by **workshop facilitation at commercial rates**. This launch will provide full time employment for its lead designer and workshop facilitator, enabling @ShrimpingIt to reach many thousands more learners. As the operation scales, it is expected to create employment for a network of both kit-bagging workers and workshop facilitators.

The @ShrimpingIt approach addresses shortcomings in the cost, comprehensibility and flexibility of its proprietary competitors. Their **high cost** makes it unaffordable for individual learners to each have their own kit in the classroom, or for schools to gift them for home experimentation. Pre-designed multi-layer printed circuit boards have **limited comprehensibility** of their wiring compared to breadboard - very important in an educational setting. Finally, their **inflexibility** can make it technically infeasible to modify for other purposes, for self-directed learning or for personal inventions.

By contrast, **@ShrimpingIt projects** are **low cost**, can be **easily understood**, and are **ready to be reconfigured and repurposed** at a moment's notice. Projects and their supporting resources are specifically **designed to support educators** in the adoption of the @ShrimpingIt approach within UK schools and higher education. In this way, we enable teachers to use the richness of 'Maker' culture in the classroom as a gateway to Science Technology Engineering and Maths (STEM) subjects.

Target Audience and Market Research

As a part time business, based on just three project builds, without a professionally-designed website, paid advertising, video presentations or even an ecommerce system, @ShrimpingIt has already shipped retail kits to 1700 learners at an approximate cost of £10 per learner, and completed nearly than 30 days of workshopping with a revenue of up to £750 a day. This hands-on experience gives us an insiders' view on the issues facing teachers who are trying to incorporate programming and electronics in their classrooms and has directly informed the choice of projects and materials in the @ShrimpingIt portfolio. With our project designs, we target the 7.7 million learners in the UK between 11 to 20 years old, and our success in reaching this broad range of learners is demonstrated by our order book, serving repeat business to high-school early-years purchasers right through to undergraduate computer science courses.

In September 2015, a new national curriculum for computing becomes mandatory, requiring high-school teachers across the UK to incorporate programming tasks into their lessons for the first time. Because 'computing' education in the UK has focused on office products, text, graphics and spreadsheets, many teachers already in-post have no experience in programming, yet will be under pressure to deliver compelling lesson plans and term projects incorporating it. This date coincides with the launch of a BBC initiative to provide 1million free programmable Micro Bit devices for year-7 learners to experiment with

physical computing, a launch with the potential to create a huge demand for physical computing kits and resources like @ShrimpingIt, especially given the scarcity of hardware for other year groups.

Pricing, Sales and Risks

@ShrimpingIt is by nature and by design a low-capital, just-in-time supply business. For this reason our risk exposure is relatively low. @ShrimpingIt projects are like 'Lego kits' using components widely available through electronics wholesalers. Our retail arm can therefore be thought of as a 'service wrap' which draws on our experience to eliminate the complexities and subtleties of component sourcing for our customers, guaranteeing component bags to be ready for classroom use. We therefore employ a cost-plus pricing model for our service, charging 200% of the wholesale price, plus £20 per hour for labour costs, plus VAT. The intent is to keep costs as low as possible, whilst aggressively growing volume, targeting wildfire adoption through word-of-mouth among the teaching community.

Workshop facilitation is offered at £350 per day, plus the retail price of any kits used, plus expenses. This leads to a projected revenue of between £650 and £750 per commissioned day, depending on the format, delivering a price per learner of less than £20. Workshops take place direct with learners in term time, but our sessions can also be used towards teachers' mandatory Continual Professional Development (CPD) quota, offering a lucrative business in school holidays.

Financial Information

This business plan relies upon a modest £8000 loan as second-round funding to supplement the £1500 seed funding already in the business. This will be a five-year loan, but we expect to be able to pay it early within three years and will choose our lender accordingly. The cash injection will enable us to commission work by graphic designers, photographers and videographers to improve the presentation of our online resources, and promote them through online advertising. Printed promotional material for mailings, magazine inserts and face-to-face events will also be prepared and distributed. We will be in a position to increase the component stock we hold, (to anticipate projected growth of our order book by a factor of four when we begin working full time on @ShrimpingIt development and promotion). The running costs of the home office, a touring sales stall and mobile demonstration workshop for North-of-England events and a minimal salary to support the lead designer are also included in the forecast.

Once the lead designer is committed to working full-time on the business from September 2015, we expect very rapid growth with the target market - 11-20 year-olds in UK schools and universities - as it will remain well below saturation. Our most conservative estimate (based on a doubling growth factor) suggests the business should scale from an initial first-year turnover of roughly £30,000, (equivalent to kit supply for 3000 learners) doubling year on year to roughly £400,000 in its fifth year, or 40,000 learners - equivalent to a 0.5% share of the UK target adoption market, reached through their educators and schools' purchasing departments. A bolder estimate, (based on a tripling growth factor each year) suggests a fifth-year turnover of £1,800,000 - equivalent to 180,000 learners per year, more than a 2% share of the UK target market.

Company Structure and Team

At this stage the business is incredibly dependent on the lead designer to deliver many parts of the business. Kit-bagging and dispatch is currently completed by hand at home, and facilitation is also delivered at customer sites by the same person. Our £20 per hour costings for the bagging of components deliberately anticipates outsourcing piecework for a "living wage" rate per hour within the local community here in Morecambe, UK as demand for the kits scales. For dispatch, we will be moving to the "fulfilment by Amazon" service for warehousing and end-to-end e-commerce. This means pre-bagged kits can be shipped without any direct engagement with the Morecambe team. Finally, given the network of facilitators already using our free material throughout the UK, we are well-placed to outsource facilitation to trusted others on a day rate, whilst still absorbing retail profits from any kits used in the workshop.

As sales grow, all business functions except for project design will therefore be increasingly performed by others. The role of designing and maintaining @ShrimpingIt project resources will also become less and less critical to day-to-day business function as our existing portfolio of designs and supporting resources become finalised in response to customer feedback. Once the success of our initial marketing strategy is established, it is hoped the lead designer can return to a focus on the invention and sharing of new project designs, broadening our portfolio and guaranteeing our relevance to changing needs in the classroom.