**7B Incorporated**

**Business Plan and Report**

***Augmented Reality Education***

**1. Executive Summary**

**1.1. Company Background**

**1.1.1. Business description**

7B Incorporated *(7B Inc.)* is a self-learning service that sells AR-kit, a self-learning tool mostly targeted for STEM Education. The kit contains the hardware needed for building the robot, along with an mobile app compatible to iOS and Android smartphones. These kits come in handy for people who wants to learn robotics, as the instructions of constructing the objects will be given in audio-visual form, step by step, in detail.

**1.1.2. Business Model**

7B Inc. will prepare self-learning services for the clients. Nowadays, the STEM Education system (Science, Technology, Economics and Mathematics) is more encouraged, so students are getting more exposed to hands-on practice on prototyping and building models. The AR application we provide enables clients to visualize the instructions through their cameras in the mobile devices using computer vision technology. The augment of the visual instructions will allow users to scan the product by using printed items on the hardware and provide timely response and instructions to them. Besides, the audio system complements with the AR instructions, which further stimulates students’ learning. Therefore, this product allows learners to pick up the knowledge more efficiently. With the introduction of the application, this service will save the student by reducing the time to figure out the building process and identifying the scratches.

**1.1.3. Mission Statement**

This product provides an online, instant platform for clients to self-learn STEM Projects, and increases the mobility, efficiency and convenience of these education.

**1.2. Market Opportunity**

7B Inc. sees the potential market in STEM Education. The company targets to deliver the services to customers through the application and the AR-Kit. The company is currently focusing on Arduino Robotics hardware development in AR-Kit.

**2. Market Environment and Business Structure**

**2.1. Business Opportunity**

Online education has been a glooming industry all over the world. Around 16.72% of Hong Kong’s Population is children (in the age group of 0-18) and 93.5% of the population (over the age of 15) had attended school according to data collected in 2002. These well educated parents who are motivated to put their children into Hong Kong's rigorous curriculum want their kids to have an edge over others’. A poll conducted by the Hong Kong Federation of Youth Groups in 2017 showed that about 51 percent of respondents had symptoms of anxiety. The conventional ‘textbook’ approach to learning is slowly being frowned upon as children today are becoming less interested in what they’re learning. This is the perfect market to introduce technology that could change the style of teaching our kids STEM in the 21st century.

**2.2. Business Type**

7B Inc. is a Business-to-Consumer (B2C) retailing technology company that provides a new way of learning STEM prototyping using Augmented Reality.

**2.3. Corporate Social Responsibility**

7B Inc. understands that the education is not accessible to children with tight financial budgets. Therefore, the company will donate 1 free ARKit to a child in need every 10 kits sold.

**3. Market Research**

**3.1. Market Background**

Demand of STEM Kits  
More parents are looking for alternatives as traditional curricula lacks content preparing their kids for a career of innovation and problem-solving. Some families are advocating for better courses or enrolling their children in extracurricular STEM programs, while others have turned to the marketplace to find the answer they seek (Forbes, 2018).  
  
Market Growth  


*New Yorker Report (2013)*

According to data from a research firm on the toy industry, sales of building sets rose 22% from 2011 to 2012, from $1.63 billion to $1.99 billion, while that of scientific and educational toys grew by 17% and 25% respectively. Across the five years of testing, most popular toys had been basic set of wooden blocks as they promote problem solving skills and also mathematical thinking. Alice Brooks, who co-founded *Roominate*, the wired-dollhouse kit, said that the company’s design drew on its founders’ own engineering experience and their understanding of the importance of problem solving, spatial skills, and self-confidence to success. They also tested the game with girls (The New Yorker, 2013). The global educational toys market is anticipated to grow at a compound annual growth rate (CAGR) of close to 10 percent from the present to 2021 (The Journal, 2017).

*References and Sources:*

*1.* [*Forbes, 2018, The Rise of the Stem Toy*](https://www.forbes.com/sites/forbestechcouncil/2018/05/29/the-rise-of-the-stem-toy/#4330491a724a)

*2.* [*The New Yorker, 2013, Can Toys Create Future Engineers?*](https://www.newyorker.com/business/currency/can-toys-create-future-engineers)

*3.* [*The Journal, 2017, Educational Toys Market Expected to Grow 10 Percent through 2021*](https://thejournal.com/articles/2017/07/18/educational-toys-market-expected-to-grow-10-percent-through-2021.aspx)

*4.* [*United Nations, 2016, Demographic Yearbook*](https://unstats.un.org/unsd/demographic-social/products/dyb/index.cshtml)

*5.* [*SCMP, 2017, Half of 3,441 Hong Kong Students Polled Show Signs of Depression*](https://www.scmp.com/news/hong-kong/education-community/article/2113124/half-3441-hong-kong-students-polled-show-signs)

**3.2. Target Market**

**3.2.1. Primary Market**

Secondary School students (Particularly Robotics)

Instead of delivering information to listeners through plain videos, AR-Kit is a more interactive approach towards learning. As the money comes from the parents, we will specify the difficulty level and the educational element of the kits so the parents are relieved to buy them.

**3.2.2. Secondary Market**

Parents and Science Teachers

Parents and teachers can work together or provide education to their children, while also giving them a chance to learn. We also encourage family packs, which allows users in the group to share courses and progress with each other.

Adult self-learners

With STEM being the the mainstream of development in coming years, some industries will be replaced by machines. Apart from this, robotics is also a common interest between adults, but they lack good and reliable sources to assist their learning. Our platform allows them to attain the essential skills and technical knowledge, which may come in handy for their work.

School subscriptions

It is an alternative way to increase the brand exposure to our primary market - the secondary school students. Due to its large student base, our products can be sold through bundling, which secures a certain number of customers. If the students are interested in our product, they can do further subscriptions personally, so we are open to a potentially larger customer base. Apart from this, we will design different courses with different content and difficulties to cater for individual schools’ needs.

**3.3. The Competitors**

Our competitors consists of companies or other startups that develop STEM education kits or toys primarily for students. Listed below are some of the identified competitors in our research.

Amazon STEM Toy Club

Amazon STEM Toy Club, a direct competitor in the long-term, is a subscription plan which delivers STEM education toys at a price of $19.99/toy, marketed to parents with children of the age range 3-13. While Amazon STEM Toy Club has brand reputation to act as promotion, customers have claimed to have received the same toy previously sent to them. Moreover, information regarding the service mostly comes from the customers’ questions and answers, thus there is no official FAQ for potential customers to research upon. The lack of reliability from these aspects may turn away potential consumers.

MyStemKits

MyStemKits, a long-term, direct competitor, offers an online catalogue of STEM kits that can be printed out via 3D printing. Their lesson plans are available with the kits for usage in the classroom, alongside a classroom plan for $1500/year with unlimited printing access. Starter kits also offered for cheaper for individual use. MyStemKits engages in a lot of promotional activity, including holding workshops for teachers and its products listed in Amazon and Staples. Ultimately, a 3D printer is required in order to use their kits after payment, which means extra time and costs are needed for printing of the kits and purchasing of plastic filaments.

Antbo

Antbo (at $69) is a buildable and programmable insect [robot](https://www.thetoyinsider.com/category/toys/tech-toys-2/) that teaches kids about STEM education. It is designed for kids ages 6 and above. Antbo uses nearly sensors, simulation artificial neuron network through the movement system and optimized gait algorithm to simulate the movement of insects. The complexity of this product meant that there are complicated and potentially unclear instructions, which result in hours or even days for kids to build this robot. Besides, it has short battery life which only last for 2-3 hours and is not waterproof. AntBo also uses a couple different promotional methods, such as marketing campaigns and volume discounts, but they fail to utilize modern methods of reaching larger market.

Creative Technologies in the Classroom (CTC 101)

CTC 101 is a modular STEAM program consisting of a toolbox with more than 25 projects and easy-to-assemble experiments. It includes boards and components for up to 30 students. The students are taught by educators usually from their own school, which means that the students cannot learn it individually. The price of the kit is 2100 dollars, so unless the school pays for the kit, interested students will find it difficult to buy the product.

Spirobot  
Spirobot is an indirect competitor to AR-Kit, with its primary focus being on programming to create a 2D or 3D drawing. This not only has narrow and limited real world application, it also requires users to purchase Spirobot’s expensive printing machine, which means users have to pay a lot to use their services. With Spirobot, users only have exposure to the software side of robotics, which is only half of the true experience. As for the promotional strategies, even though they provide free delivery service, it is not enough to cancel out the unattractiveness of the product.

**3.4. Our Competitive Edge**

7B Inc. will have these major competitive advantages:

1. It will focus on the convenience of quick assembly of STEM kits whenever the client wishes.
2. It will focus on clear instructions depicted to the customer in favor of written instructions on paper.
3. It will focus on a more eco-friendly building way which means less written instructions paper have to be printed.

**3.5. Challenges**

Reliance on big companies and brands

The company is using Arduino boards to make profits, which may infringe their intellectual property if agreements between the company and Arduino cannot be reached. Copyrights are a concern and if not handled properly, it will severely limit the company’s development.

Abundance of rivals

The prevalence of the internet has made online education increasingly popular. Meanwhile, other companies have a larger customer base and assistant staff, other companies will be able to deliver a better experience to customers.

Ease of replication

As much as Augmented Reality is involved, many companies, ranging from big ones like Google and Apple, to small startups in similar scale would be able to replicate our technology based on our business idea. To avoid elimination, the company has to steadily improve and reach out to more of the educational market.

**4. Promotion and Sales**

**4.1. Marketing Aims**

This marketing plan will highlight the following customer benefits:

1. Less time spent planning and reading the instructions
2. The convenience of learning whenever and wherever the client wishes
3. Less money spent to seek for professional advice

**4.2 Marketing Strategy and Costs**

**4.2.1. Online promotions**

Website

The company will create a website, initially using Wix, to create a platform for subscribers and customers to keep track of our product updates and company news, including details of our subscription pack, the pricing and the course curriculum. In the long run, the website will create a forum for all customers exchange their ideas and help others. We also allow users to subscribe to our email newsletter here, where we can send our promotional offers.

Social Media exposure

The company will create official fanpage on Facebook, Instagram and Twitter to keep our customers updated. Setting up a fanpage is free, while advertising on the platforms will be charged. We believe the cookies provided by these websites can help us narrow down our advertisements to customers who are enthusiastic about our products.

YouTube advertising  
We will create both short and long advertisements on YouTube, which helps in familiarising our target audience with the product. To increase the efficiency of the advertisements, the company will also sponsor YouTube channels, particularly educational channels related to robotics, as they can keep the target audience engaged, and the audience is more likely to conform to them.

Set up listing in search engine local directories

Google and Bing both offer a free listing for local businesses. Yahoo charges for local listings, but the listing is more frequent on Yahoo. The service, Yahoo Localworks, lists in 50 directories including Yahoo Local, Yelp and Bing.

**4.2.2. Promotions off the Internet**

School Workshops and Talks

It is a way to promote our product at institutions. If they are impressed by our services, we can collaborate school subscription plans to them. To increase the attractiveness, the average price of the product will be cheaper than that of individual subscriptions. The sales of our product will be boosted by the bundling strategy of this target market.

Company-held Contests

The company will host competitions based on the AR-Kits we provide. It is not only a way to make profits, these contests can also help promote the brand of the company.

Subscription booths at bookstores and book exhibitions

We can sell our products through booths at bookstores and book exhibitions. This could come along with discounts with other products in the store.

Loyalty Programs

The company will introduce loyalty bonuses to customers to keep them. The yearly subscription fee could be discounted after they have paid for our service for a year.

**4.3. Sales Methods**

Customers first order our products through online on our webpage and make online payments. They will then schedule the available time slot for delivery services. They can contact us for enquiries or further information of our products. Afterwards, the company will also ask customers to evaluate our products and services. Their recommendation and preferences will be taken into account for future marketing strategies.

**4.4. Sales Estimates**

|  |  |
| --- | --- |
| Factor | Influence on Sales |
| Market Analysis | Around 16.72% of Hong Kong’s Population is children. With the increasing trend of STEM Education, the products from the company match the market needs. |
| Maximum Capacity | Initially 400 units/month. |
| Breakeven Units | 20 units monthly for net profit, which is highly feasible. |
| Seasonality | Unlikely to be affected by seasonality.  Individual subscriptions at summer holiday may be higher as school students are shifted to individuals. |

|  |  |  |
| --- | --- | --- |
| Month | Estimated Sales (Units) \* | Income (US$) |
| January | 50 | 5,000 |
| February | 50 | 5,000 |
| March | 50 | 5,000 |
| April | 80 | 8,000 |
| May | 96 | 9,600 |
| June | 120 | 12,000 |
| July | 157 | 15,700 |
| August | 198 | 19,800 |
| September | 253 | 25,300 |
| October | 324 | 32,400 |
| November | 413 | 41,300 |
| December | 528 | 52,800 |
| **Total** | **2,319** | **231,900** |

\*Estimated Sales = 1.6 \* average monthly sales of preceding three months (1.6 derived from market trends)

**5. Finances**

**5.1. Definition of a Unit**

One unit is defined as one assembled *AR STEM kit*.

**5.2. Variable Expenses**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Materials | | | | |
| Material Description | Bulk Price | Bulk Quantity | Quantity per Unit | Cost per Unit |
| Raw hardware materials | $755 | 1 kit | 1 kit | $7.55 |
| Total Material Costs per Unit: | | | | $7.55 |

|  |  |  |
| --- | --- | --- |
| Promotion | | |
| Method | Cost per unit | Description |
| YouTube Advertising | $0.2/view | $200 for 1,000 views |
| Sponsoring YouTube channels | $0.55/view | $550 for a channel with 10,000 subscribers (approximately 1,500 views per video) |
| Facebook advertising | $0.27/click | $270 for 100 clicks |
| Listings in Search Engines | $0 | Free listings offered by Google and Bing |
| Competitions | $150 | Entry fee needed such that it covers the cost of the winner’s prize |
| Domain Name | Initially $15/year | Costs to be self-covered by Site Ads |

**5.3. Economics of One Unit**

|  |  |  |  |
| --- | --- | --- | --- |
| Economics of One Unit | | | |
| Selling price per Unit |  |  | $100 |
| Variable Expenses per Unit |  |  |  |
| Cost of Goods Sold |  |  |  |
| Materials | $7.5 |  |  |
| Total Cost of Goods Sold |  | $7.5 |  |
| Other Variable Expenses |  |  |  |
| Commission | $0 |  |  |
| Packaging | $3 |  |  |
| Total Other Variable Expenses |  | $3 |  |
| Total Variable Expenses |  |  | $10.5 |
| Contribution Margin per Unit |  |  | $89.5 |

**5.4. Delivery of the Service**

The company will use third party logistics companies to ship the kits. Customers will be responsible for their shipping costs.

**5.5. Fixed Expenses for One Month**

|  |  |  |
| --- | --- | --- |
| Expense Type | Monthly Cost | Explanation |
| Insurance | $15 | The company has to be insured for protection against liability, ransomware on the server, or failure to deliver the products. |
| Salary | $0 | The company is a self-managed business and will not have any hired employees. |
| Advertising | $0 | Costs accounted under Variable Expenses. |
| Interest | $0 | The company is not planning to use bank loans. |
| Depreciation | $45 | Computers used for designing the product will depreciate over time ($2700 over five years). |
| Utilities | $20 | Since the entrepreneurs will not require any additional utilities, these costs will cover expenses such as service for their mobile phones. |
| Rent | $0 | Since the products will be stored at the entrepreneurs’ residence, no rents will be paid. |
| Other Fixed Expenses | $12 | Associated with travel expenses for promotional events. |
| Total Fixed Expenses: $92 | | |

**5.6. Startup Investment**

In order to assemble 100 units of our kits at startup, the following is required:

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Why needed | Vendor | Cost |
| Arduino UNO + USB Cable | Hardware assembly | Shenzhen iSmart Electronic Co., Ltd. | $380 |
| Carbon Film Resistors (220 Ohm) | Hardware assembly | Shenzhen YXS Technology Co., Ltd. | $50 |
| TCRT5000 Infrared Reflective Switch | Hardware assembly | Shenzhen Oky Newstar Import & Export Co., Ltd. | $80 |
| Carbon Film Potentiometer (220K Ohm) | Hardware assembly | Shenzhen Jiexing Weiye Electronic Co., Ltd. | $22 |
| Wire Connectors | Hardware assembly | Suzhou Huihua Electronic Technology Co., Ltd. | $4 |
| 700 tie in points Breadboard | Hardware assembly | Cixi Zhongyi Electronics Factory | $100 |
| Plastic DC Motor | Hardware assembly | Shenzhen Qianhai TT Motor High Technology Co., Ltd. | $86 |
| L293 Motor Driver IC | Hardware assembly | Shenzhen Xin Yuan Electronic Technology Co., Ltd. | $17 |
| LED Diodes | Hardware assembly | Shenzhen Liang Jia Liang Technology Co., Ltd | $16 |
| Total Startup Expenditures: | | | $755 |
| Emergency Fund (1/4 of startup expenditures) | | | $189 |
| Total Startup Expenditure: | | | $944 |

**5.7. Financial Ratios**

*Breakeven Units (Monthly):*

Fixed Monthly Expenses = $92.00 = 1.03 ≈ 1 unit

Contribution Margin $89.5