

BIG Idea Finalists and Mentor Contact Information

Finalist Information

Presentation Time:

BIG Idea Business Name: School:

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Free Bird RC

Concept Overview:

Free Bird RC (FBRC) is a business that utilizes 3D printing technology to provide printing and rapid prototyping services to remote control (RC) vehicle hobbyists and businesses alike. Traditional accessories are expensive and often only fit select RC vehicles. There is also minimal differentiation of parts/accessories, with limited product lines available. Free Bird RC will remedy this problem by using 3D printing to make durable, low-cost accessories that fit a wide range of RC vehicles.

Product or Service:

FBRC is located in Madison, South Dakota. I am designing and producing customizable RC parts such as bumpers, fender plates, and wheels. For accessories, FBRC is making items such as sand ladders, roof racks, and scale equipment (shovels, coolers, etc). For prototyping services, FBRC will correspond with customers and print items and prototypes to their specifications. To produce its products and meet customer needs, FBRC will utilize fused deposition modeling, also known as 3D printing. FBRC has multiple 3D printers that it uses for different purposes. For example, it uses separate printers for producing parts and accessories versus custom prints, as the latter requires more versatility. FBRC's primary materials are PLA, PETG, and TPU filaments. One thing that makes FBRC unique is its affordability and customizability of part/accessories. Filament materials are more affordable than traditional materials and 3D printing allows for much more customizability. Rather than pay excessive sums to commission an architectural model, a business could send the file to FBRC and have the completed product within hours. A potential drawback of 3D printing for producing parts/accessories is individual scalability. As sales climb for a specific item, it may no longer be easiest to print items and an injection molding investment may be necessary to scale a product. FBRC is also unique in its technological integrations for production. Prepping a printer for production and managing prints can be time consuming. With artificial intelligence, FBRC is able to manage multiple printers at once and start/manage prints from a different location.

Marketing Opportunity:

The total RC hobby market has an estimated \$1.725 billion in annual revenue. 3D printing and prototyping services in the United States made up 27.2% of the US

3D printing market, or an estimated \$4.35 billion in 2021. Additionally, the North American 3-D printing market is expected to grow over 200% in the next seven years. To determine FBRC's customer base, I interviewed RC hobbyists both online and in-person. I found that FBRC's target customer would meet the demographics of what I found to be an "average" RC hobbyist: a middle-aged, suburban male with an annual income of \$30-\$80,000 per year. I've also narrowed down FBRC's average customers to three specific archetypes based on age and corresponding incomes, preferences, and budgets for accessories. I have been using Van Westendorp's Price Sensitivity Model to determine product price points by asking four questions, then graphing and factoring in price sentiments. These questions help FBRC determine an effective price range. This data, along with sales, will help FBRC make price adjustments to stay sustainable in a demanding market. FBRC plans to maintain a 70% gross profit margin on most products to enable strong profitability and stay well in excess of its production costs. The main promotion and marketing for FBRC would be through Google AdSense and by promoting listings on the ecommerce stores FBRC is selling through. I am in the process of developing a website to sell products through, which would lead to a greater focus on search engine optimization and marketing.

Competition:

I've identified one primary competitor for RC parts/accessories. They have a selection of items sold through an ecommerce platform. These products are made from traditional materials in small quantities and are therefore more expensive. FBRC has a competitive edge in key ways. Most of FBRC's products are customized and have received positive reviews. FBRC also has a cost advantage, as material inputs are much smaller than its competitors. Most importantly, 3D printing gives FBRC a major advantage in versatility. FBRC can print one product and immediately switch to producing a different one as needed. Consequently, FBRC can produce items as they're demanded and avoid the task of selling existing inventory. For its cost advantage, material and printer depreciation costs come to less than \$0.40 for an RC bumper, with print time depending on the customized order. When completed, FBRC's website will enable customers to receive an automatic quote for prints, as parameters for time and volume would determine costs and markups accordingly. A weakness of FBRC is large volume prints (>0.5 kilograms), as they require considerably more print time and are feasible only for custom print jobs due to their cost. To protect against competition, FBRC will seek intellectual property protection for designs. FBRC has an advantage in product differentiation and my design skills, since it's expensive for competitors to design new products and acquire properly skilled labor. Also,

by using artificial intelligence to manage production, FBRC can better manage manual inputs and focus on maintaining its technological advantage.

Management and Operations:

For implementing my idea, design, management, and online sales skills are crucial. I have over two years of experience in 3D printer maintenance and STL file design, with over 4,000 hours of print-time. I also have several years of experience in computer aided design and running an ecommerce store. For accounting, FBRC would enlist the skills of someone to do bookkeeping part time. Eventually, as sales scale, I would also delegate tasks such as packing and shipping to hourly laborers so I could divert more time to production management, file design, and higher business needs. FBRC considers many costs (startup, fixed, variable) in its financial projections. For startup costs, things such as legal fees, web hosting, equipment, materials, insurance, etc, are considered. Future variable costs are estimated based on cost per unit sold (such as shipping, commissions, materials, depreciation, etc). Custom prints are billed at \$3/hr for print time in addition to design fees (if applicable). 3D printers are the largest equipment necessity for FBRC as a business. Aside from that, CAD software is also vital. FBRC is currently using an AnyCubic Vyper and upgraded Creality printers for production, with programs such as Blender and Fusion360 for CAD. FBRC's largest ongoing expense after establishing operations is going to be labor. As FBRC scales, based on current projections, the largest accompanying factor to increased sales is labor. Once fully operating, labor is expected to be approximately 40% of FBRC's total expenses, assuming the use of part time labor at current rates.