

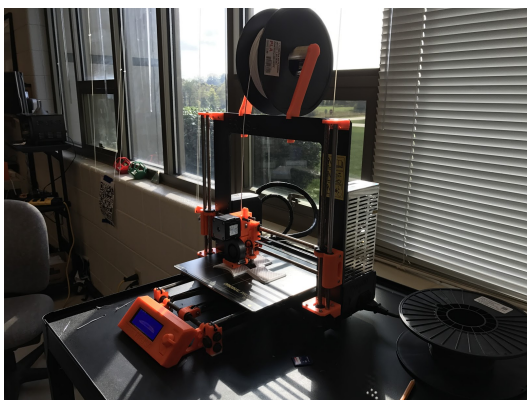
CASE STUDY 2: FULTON'S ESSENTIAL OILS PRODUCTS- ADDITIVE MANUFACTURING PRODUCTION

One of the biggest challenges to all entrepreneurs that are developing new physical products is the obtaining the capital necessary to facilitate the prototyping and production process. Costs associated with engineering, design, tooling, labor, and equipment are almost always daunting and can easily exceed over \$100,000 before the developer ever sells their first product. This typically means that a great deal of excellent products never hit the market because raising the funds can be nearly impossible for some inventors due to a lack of fundraising experience, demographic background, or even just a lack of the right networking connections.

This was the experience for Joshua Fulton. He and his wife had come up with an excellent concept for a product, and the concept was well received by their target market within the essential oils industry. However, they faced several problems. Although the market was primed for their product, their current estimated costs and time of manual production were far too high and too long, and they didn't have \$150,000 just lying around to throw at this project. An even bigger problem was the complexity of their product; the design was such that conventional plastic injection molding could not be used as a production method. So even if they had the money and 8 to 12 months to get the molds made, it would still be impossible to produce what their market research said the consumers wanted.

Fortunately, Somerset Community College's (SCC) Additive Manufacturing (AM) department in conjunction with the National Science Foundation's Advanced Technological Education grant program offered the Fultons an opportunity they could not have imagined. SCC AM Lab Technicians agreed to collaborate with the Fultons to do something many would have said was impossible; to help them bypass all of their problems regarding funding and conventional manufacturing, and show them how to produce their end product with low cost FDM 3D printers. What would have cost tens of thousands to even begin development, cost less than \$3,000 to

begin testing and final production. The design development time spanned a period of only forty-five days, and involved only five actual days worth of design work.



The current result is that the Fultons went from prototype concept to startup production in just one-hundred days with an equipment and parts budget of less than \$5,000. An expense that, given their income of nearly \$40 dollars per unit, will have an incredibly short return on investment period. Due to this eye opening experience, the Fultons are applying the training and expertise given to them by SCC AM Lab Technicians to purchase more desktop FDM units and set them up for a higher volume production of nearly 900 units a month. Additionally, with 24 to 28 hour print cycles, the Fultons only have to check on the equipment, unload, and reload them approximately once a day. This automation and minimum labor/overhead concept seemed virtually unimaginable before for such a low equipment cost.



Although the Fulton's business endeavors related to this product are less than four months old, their products are not only already available for purchase, but their opportunities are endless. Given the speed and flexibility of their Additive Manufacturing methods, they can continually iterate their primary product and block out competitors, introduce new features and artistic variations, and explore new markets with a minimum amount of research and development resources and time.



For more information visit: <https://www.facebook.com/cadd.lab>

Or SCC's 3D printing program webpage:

<https://somerset.kctcs.edu/education-training/program-finder/digital-printing-technology-3d-printing.aspx>

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