3D Printing: An Analysis of a Growing Technology

An Honors Thesis (HONRS 499)

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Abstract:

We have created a website highlighting 3D printing and the effects of the growing technology. The website provides the user a history and description of the technology. We addressed the effects on different industries as well as the financial, legal, and environmental effects. A cost analysis of one of the printers at Ball State was also performed to show the university’s role in this emerging technology.
The inspiration for the 3D printing project came from my love of technology and emerging media. I hadn’t heard much about the technology and especially didn’t know how it worked. I was intrigued by an article in *Fortune* that my thesis partner, Ashley Chambers, sent me.

A website was created because it is more technology-based and innovative compared to a traditional paper. The website created a 3D medium that allowed the different pages to connect and interact in a way that a 2D piece of paper couldn’t. Much of my business career will be spent on a computer presenting data in a logical and efficient manner, similar to my thesis website. The website is an efficient way to present the information and the hyperlinks create links similar to a filing system that accounting firms use to cross reference work papers. A paper also didn’t seem to fit my major, talents, and interests. I didn’t have much experience creating a website, but the creation served as a good learning experience in addition to the research on the printers.

The “About” page serves as the background for the entire website and explains the different printing processes. Research on the brief history, uses, methods, and general processes steps was conducted. The different 3D printing methods differentiate the printers and materials that the printers can produce. It was important to understand the fundamental process of the printers in order to apply it to other sections. The research in this section was the most extensive.

“Printing at Ball State University” was important to me because I was glad my university valued the technology and saw it as an investment. The architecture building’s printer became the subject of the cost analysis because it was the largest and most expensive on campus. The printer is used frequently and has a regimented cost formula for students. The FAB Lab gave me many insights and information on 3D printing and the different projects my fellow students can produce. There was an intense mood in the air when a student would excavate their project and hope that it would not break. The other two printer locations emphasized that three different colleges can derive value from the technology and use the printers for different purposes. The raw data of the prices serves as the base for the formula students are charged in order for the university to break even.

The “Sustainability” page turned into an argument for both sides. Originally I had proposed that the research would conclude that the technology was harming the environment. Many argue that 3D printing helps the environment due to the savings in fuel costs and other material savings. Presenting both on the site helps readers see both sides and understand that it could change over time with the improvement of the 3D printing process.

The “Financial Impact” page was an area that I was practically excited about since I am an accounting major in addition to an information systems major. The new industry brings up tax issues with the increase popularity of the machines. Printed objects won’t be able to be taxed, just the materials that make up the process. Although this is similar to manufacturing, on-demand
prototyping that used to be typically outsourced will hurt tax collection. The government has also promoted 3D printing with tax incentives that encourage spending.

Another financial section was a general section on the impact of 3D printing on spending and how the projected increase in demand will affect prices. The trend of 3D printing stock shows that consumers value the product and have faith in the technology.

The thesis website was a great way to learn about an emerging media and combine the skills from my two majors.
Resources

21. Kuruvilla, Carol. "Doctors Replace 75 Percent of Patient's Skull with 3-D-printed Polymer Impl
Website:
http://3dprintingthesis.wix.com/3d-printing