To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University Community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set for this Honor Code: Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work. Extent of the Honor Code: The Honor Code at George Mason University shall be specifically concerned with cheating or attempted cheating, plagiarism, lying, and stealing in an academic setting. Examples of these include but are not limited the following: a. Use of unauthorized material b. Use of unauthorized assistance c. Duplicate use of student's prior work d. Violation of syllabus requirements regarding integrity e. Self-plagiarism f. Inadequate citation g. False citation h. Failure to adhere to citation forms set by the professor i. Failure to quote sources/material j. Submission of another individual's work k. Removing an exam from a classroom l. Posting or enabling of posting of homework assignments and/or exams or solutions on websites m. Taking photos of exams/academic work without authorization n. Taking someone else's work without knowledge o. Falsifying sources, data, or information p. Providing a false excuse for missing a test or class q. Providing false information, including identifying information r. Falsifying official correspondence

John Callahan

IT 104 001

Kamaljeet

3D Printing

3D Printing has the potential to completely turn what we believe is possible

upside down. From printing organs to printing parts for an automotive vehicle. 3D

printing can print objects that require precise measurements. When previously took

days to make can be printed in hours and sometimes minutes. 3D printing will have the

biggest impact on the medical field. Anything from printing new limbs for wounded

soldiers to manufacturing a new liver for someone who would not otherwise be able to

obtain one from the donor list. The donor list can be eliminated, people will not have to

give up their organs to save the ones they love. No more sacrifice, no more worry, no

more wondering if you a doctor will be able to find a compatible organ all because of a

printer. Just like the printer I will use to print this paper, a 3D printer receives the

instructions or blue prints to whatever is being printed and prints the object. This

technological break through will be responsible for increasing the quality of life for

millions of people around the world. Soon this technology will be accessible to

everyone around the world. With the right amount of funding this technology could print

food for the hungry or print clothes for the less fortunate. I will be taking you through the

background, potential benefits, ethical and security risks, and social problems of 3D

printing.

3D printing sounds like something out of a science fiction novel but the technology for printing objects from digital data was developed in 1984 by a man named Charles Hull. In 1988 Hull developed SLA-250 the first 3D modeler, the precursor to the 3D printer. From this point people began to improve and perfect the product. This technology has been developed for over 20 years and a true 3D printer is still not easily accessible to the public. In 2011 this first 3D printed aircraft was made. This to me in incomprehensible. Something this complex can be printed. Every single piece pf an air craft has to be perfect in order for it to fly safely Since Hull created the technology necessary to print objects using digital data 3D printing has shown up all over pop culture. From comedians bashing the seemingly unbelievable technology to popular T.V. shows working the technology into their plots. Greys Anatomy for example uses 3D printing to print an organ for a patient in need. In the show the printer is described as an experimental liability. 3D printing has been around for about 25 years and haven't even begun to scratch the surface of what this technology is capable of.

The Potential benefits of 3D printing are unmeasurable. In the medical field alone the benefits will completely change the way our hospitals run. The donor list will dissolve, organs will be printed for those who need new ones. Wounded warriors will have higher quality custom fit artificial limbs in half the time. Skin grafting for burn victims will be a thing of the past. Skin that is compatible with the victim will be printed without hesitation. Along with printing crucial body parts, the printers with be able to print medication with precise measurements.   The benefits will be life changing for all 7 billion people on the earth. The benefits stem past the medical field and also include the military, education, and manufacturing fields. The military can use this technology

to better equip itself to protect us as citizens. An aircraft has already been printed using a 3D printer, so who is to say a battle ship is unable to be printed? Fire arms will be produced faster than any mass-producing arms company could compete with. Our soldiers will be able to protect us better than they ever have before. The most common problem schools nowadays face is over population. Not enough desks, books, and space but these printers could solve all of these issues. 3D printers seem to have no limit to their potential so why could we not be able to print an addition to a school building? This options would be cost effective and the time frame for this renovations would much faster than having a construction company do it. Time is an important when dealing with renovations to a school because the longer a renovations cuts into the school year the longer kids are out of school. The manufacturing industry will witness a massive increase in efficiency and productivity. Mass printing will take the place of mass production and render the assembly line obsolete. This benefit will come at a cost however. People will lose their jobs strictly because a printer does a better job than they ever could.

The ethical dilemma that presents itself when dealing with 3D printing has do with invasions of privacy, copyright infringement, and theft. An example of an invasion of privacy that would be made possible with a 3D printer would be cloning. Someone could be cloned using a 3D printer. Although the clone would not be living, it would still look and feel like the person it is model after. All the printer would need is a picture of the person and their dimensions. The potential for copyright infringements is unmeasurable because the capability if the printer is unmeasurable. Anyone could print something identical to someone invention all they need it the digital data. This goes

hand in hand with theft facilitated by 3D printers. Say you walk into a store and you see a product on the shelf but you do not want to pay the full amount, once these printers are available to the public you will be able to print that produce from your home. This is a problem for companies moving forward. Why buy their product of you can print your own? Companies will sink due to lack of demand along with their customers having their own means of supply.

The security risks that go with being able to print any object are numerous. For example, what if someone were to get the measurements to your house key? Or perhaps a criminal needed a gun? If this product is to ever see the open market blockers will have to be set up to prevent these objects from being printed.

One of the biggest issues this technology will cause is the loss of jobs. This technology will result in decreased need for those working in factories even more than before. The 3D printer will render most of the technology seen in manufacturing useless, thus lowering the need for manual labor in this field.

To conclude, 3D printing will have an incredible impact on medicine, military, education, and the economy through job loss. Every effect of 3D printing has cannot be good, everything comes with a price. In this case, we thousands of jobs lost with millions of lives saved by this technology, we also trade the potential security risks with the increased protection from the military. Although everything that this technology brings is not perfect, the benefits largely outweigh the suffering.

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