INDUSTRY 4.0

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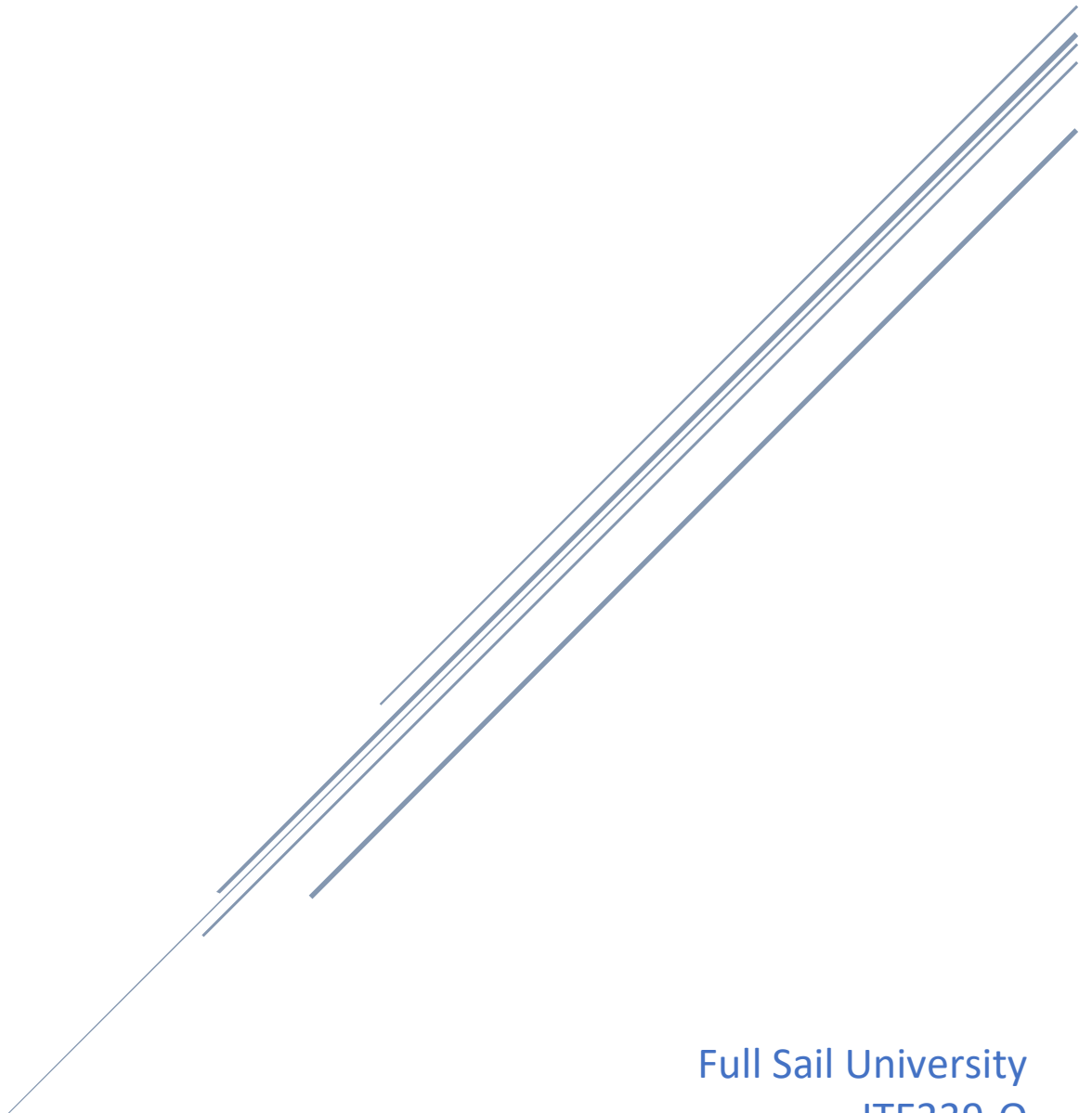
Full Sail University
ITE239-O
March 28th 2021

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When we first hear about Industry 4.0, we must think about what came before it. As we take a look back at the history of technology, we will notice that all things old are new as well. Learning the history of technology or anything of that matter gives us the upper hand on how the future of technology or this world could be. Starting with Industry 1.0 in 1784 it was all about mechanization, stream power and weaving loom. With Industry 2.0 starting in 1870 it was about mass production, assembly line, and electrical energy. Industry 3.0 starting in 1969 and is where automation, computers and electronics started to come in to play. Now, today Industry 4.0 takes on Cyber-Physical systems, IoT and networks. The fourth industrial revolution is the ongoing automation of traditional manufacturing and industrial practices, using modern smart technology.

There are different technologies that are transforming the industrial production scene. We have Plastics and Polymer Engineering Technology where polymer technology is the manufacture processing, analysis and application of long chain molecules. Also, we have chemical engineering technology. Chemical engineering technologist work in process design, plan engineering, environmental control, engineering sales and plant operations. They produce, transform and transport materials. Another technology that I believe that is transforming the industrial production scene is Welding Engineering Technology. Most people know what a welder is, but just in case a welder studies different welding methods and processes, metals, material science, computer-aided design and more. I think even to this day a welder is a very important career and technology that we still need and will always need. Even though we have machines that may can do it for us, there are also designs that not even a computer can do, surprising isn't it?

Let's talk more about Cyber-Physical systems (CPS), IoT and networks. CPS are systems of collaborating computational entities which are in intensive connection with the surrounding physical world and its on-going processes, providing and using, at the same time, data-accessing and data-processing services available on the internet. I want to speak on a very important figure in technology and that is Elon Musk the CEO of Tesla. Elon Musk is also the CEO of the Neuralink company. This company specializes in neurotechnology to develop implantable brain-machine interfaces. You can just imagine the technology that is being created so that we can know more about the brain and also learn more about diseases that we don't know much about today. This is where Industry 4.0 really speaks volume in how much the industry practices and technology has grown.

There are talks that IoT and Cyber-Physical systems are going to shape the future of technology. Internet of Things or IoT are devices that are embedded with sensors, software and other technologies which are connected to a network in order to exchange data with other devices. Think of the Ring doorbell camera security system or if someone could control their lights by using an app on their smartphone, these are some of the examples of what we call IoT. Explaining the differences between IoT and CPS are just that. Even though both systems are complex and at times very hard to understand they both have a goal of making technology easier to read and manage. In my own words I can say IoT can also be a subsystem of CPS or even vice versa. I say that, because CPS can bring more efficiency and connectivity of devices and so forth.

I want to shift the focus a little and talk about Cloud Computing. Cloud computing is where we can manage data, store data, control our systems and etc. from a remote location. If I were to explain cloud computing to someone who knows nothing about it. I would start off by saying cloud computing is a vast subject. I would also provide an example and say if you want to save something to a computer, but you don't want it to be locally or on your own device then you can store your info on someone else's computer and by someone else I mean a company that specializes in that technology, so when you want to retrieve your data, you will need to sign

in to the platform to do so. You can think of google docs or the popular file sharing service Dropbox as a cloud service.

We have cloud computing and we have industry 4.0. How do both of these complement each other? As I stated before cloud technology gives us the flexible freedom to manage and control our stored data. Well with that think about all the data that we have to keep and manage when we think of industry 4.0. When we have a smart refrigerator in our home and use are app to make sure the refrigerator is close how exactly does the app retrieve that data to then communicate it with you. If I wanted to look at the history of when every time somebody pressed my Ring doorbell system I would have to sign in to their platform and retrieve the data. Well, that data is stored on a server that is probably miles and miles away from you. If we were to talk about storage then when we add cloud computing and IoT together we know that IoT devices are going to store a lot of information. Cloud computing provides us that resource to expand our storage compacity without slowing down our own personal computers. Cloud technology is an enabler of Industry 4.0 because it provides an easier way to manage these technologies. Take a minute and think about the medical field and how I talked about Neuralink. Imagine how quickly they could break their local systems if cloud computing was not a thing. You can bet that they use cloud platform services like AWS or Microsoft Azure to keep their data secure and accessible.

In of world that we live it is hard to believe that nobody is using Industry 4.0 today. Honestly, I am pretty sure there are a good amount of people who are not keen to this digital world that we are in and heading deeper into. With that being said besides them everyone is apart of and is using Industry 4.0. From big companies to individuals, we all play are part. If you have any type of smart device, if you use programming languages or scripting languages to automate task in the workplace or at your home to turn your bedroom light on at a certain time or change colors then you are using Industry 4.0. If you use cloud platforms to manage virtual networks, create virtual machines, vpns or simply resource groups you are using Industry 4.0.

In conclusion the world is forever evolving and it will never stop evolving. We have people who continually want to change the world and some are for the good and some are for the worse. As a technologist I feel like it is my responsibility to keep up with the technologies and expand my knowledge. Industry 4.0 is today, but what about the future? We need to prepare ourselves for Industry 5.0 which is labeled as personalization. 5.0 is focused on co-operation between man and machine. Working besides robots and bringing back industrial production. Sounds familiar, doesn't it? What is old is always new. Remember Industry 1.0 mechanization.

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