

IDEA REPORT

Digital Transformation

LOCKHEED MARTIN



Leadership Institute

College of Engineering and Computing



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I. What is Digital Transformation?

The topic of Digital Transformation focuses on the prediction of how society will change as a result of an increase in technology. Digital Transformation is an effect on how businesses operate worldwide. It refers to the integration and adoption of new technologies by businesses and the fundamental changes that go with it. Digital Transformation in today's society demands of departments within businesses, changing of visions, missions, and purposes of businesses, and a company-wide mindset change that must begin with executives and reach everyone throughout the company in order to be successful.

A company's direction and mission are crucial as they are what drives the business to operate. In order for businesses to have success in the digital age, they must incorporate digital ideas and governing principles into their mission. Since these changes are often company wide, a great deal of leadership and cross-departmental communication and coordination are needed to ensure all employees function toward the same goal.



Source 4

Digital Transformation is centered around market disruption, innovation, and integrating new technology into product development and management operating principles. These changes are implemented with the future in mind, and they directly affect it in the future. The end goal of all of this Transformation is for businesses to create products or services that are customer-focused, innovative, and provide benefits that ultimately make life easier.

II. Digital Transformation WILL Affect Everyone

This report discusses how Digital Transformation will affect the younger generation and the workforce as a whole. However, it should be emphasized that Digital Transformation affects almost everyone, and it should gain proportional awareness and attention. As businesses begin implementing new operating technologies into their companies and products, people will understand and adopt these new products quicker, and with less of an ambient learning period needed to adopt these technologies.



The Younger Generation

In regards to the younger generation, students and young professionals need to understand that Digital Transformation is and how it is going to impact various industries when they look for employment. This is true because they (we) are going to be doing the majority of our work in this very digital future, with constantly changing demands from consumer and from the market itself. Digital Transformation does not receive much coverage by mainstream media and is not a widely discussed topic, at



least at Miami University, excluding the Lockheed Martin Leadership Institute. In order for students to have better awareness of Digital Transformation and how it affects their careers, higher education institutions must give better visibility about Digital Transformation and how it might affect different majors and minors in the future.

The Workforce

As for people currently in the workforce, It is especially important for everyone in a company to gain background in Digital Transformation, especially managers. Executives of businesses will normally be the catalyst of internal digitization, however it is extremely important for everyone at all levels of a business to maintain the same ideas. They need to understand the trends in the technology industry and the ways that changes will be affecting their company.

III. The Dangers of Digital Transformation

Digital Transformation is a huge shift in how business is going to be done on a daily basis, and along with most change comes uncertainty. Since Digital Transformation deals with a vast amount of new and innovative technologies, there is not much data behind most of the them (artificial intelligence, autonomous cars, new types of additive

manufacturing) as not enough time has passed for either manufacturers testing to complete sufficient cycles and under different conditions, or for consumer feedback to reach the manufacturers about possible improvements. The figure below illustrates industry leader Waymo Autonomous Vehicles' testing data from the previous three years. This figure indicates the amount of miles driven during testing of Waymo's autonomous vehicles per year.

(Source 5)

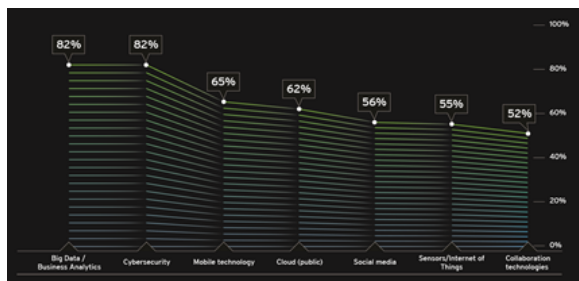
Aside from not having a sufficient amount of data to be able to predict safety or environmental concerns of new digital technologies, it is also unknown what the moral and social impacts could be upon integration of these new technologies.



When creating artificially intelligent machines (and at some point robots),



programming ethics and moral decision making into these machines or bots will have a *much* greater impact than simply the world of technology, as they will be interacting with humans all of the time, and their quality and programming will affect human lives. Extreme caution must be taken with respect to safety and analyzing enormous amounts of new data as we enter this digital age. Since all of this new data is being collected from new digital technologies, having an advanced data analytics team and system is going to be crucial for businesses, and keeping this data safe calls for much more focus of cybersecurity within companies, as illustrated in the following chart from Cognizant.

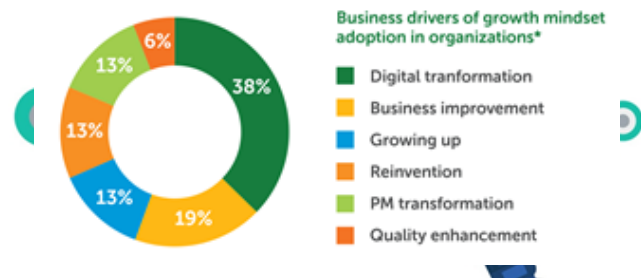


(Source 6)

Ensuring this new data is used appropriately and that it is secured is vital to the betterment of businesses, the entire market, and society in general, as this data comes with extreme power and information. Thus, keeping it from falling in the wrong hands must be a top priority.

In addition, these new digital technologies create shifts in the

workforce demand by decreasing the need for unskilled labor. New artificial intelligence and machine learning technology will be very advanced and will be able to do a large amount of jobs that require humans because of this. This is something that society will need to worry about and potentially come up with a solution to, because the workers displaced by artificially intelligent technology are going to need some type of employment.



(Source 7)

IV. Mindsets and Skills Needed in Digital Era

This massive shift in business strategies results in a copious amount of reorganization within a company and within entire markets. This means that everyone including executives, managers, employees of all departments, and even consumers must be able to adapt to not only new conditions and technologies, but also new mindsets and operating principles.

In order to be able to possess these new mindsets and adaptable culture is by having a growth mindset.

A growth mindset consists of being able to maintain an open mind and having the ability to be ready for change in any area of life, welcoming new and foreign things, and being ready for new challenges. Being able to welcome to the massive amount of changes and challenges that are a byproduct of Digital Transformation while continually improving on oneself as more technology is integrated is a necessity.

Something that is similar to a growth mindset in the sense of leadership and professionalism is emotional intelligence. Having a high emotional intelligence is an incredibly undervalued trait in modern society. Possessing the ability to have self-regulation skills, self awareness, empathy, social skills, and high motivation is an extremely sought after as an employee of any company, and in the digital age with more and more artificial intelligence and machine interaction, these skills will prove to be even more valuable as meaningful human interaction is trending downward.



With Digital Transformation threatening jobs across multiple different industries researchers predict that people who are “right brained” will tend to be more successful. A person who is right brained tends to be intuitive, a holistic thinker, creative, and idealistic. Whereas, a person who is left brained is logical, practical, analytical, and likes math [4]. When looking at the differences between left and right brained people, many of the traits of people who are right brained can be replicated. Many jobs that are replicated, like mentioned earlier will be replaced by robots. However, creativity and intuition are very hard to replicate, and thus concludes that people who have right-brained traits will be more marketable in the digital age. Developing the right side of the brain can be hard with many people believing that it is a natural ability. However, schools investing in a liberal education have a better chance of increasing a person’s “right brain” [5]. This type of education allows students to become well-rounded and diversify what they know. Diversification, as mentioned is crucial in the digital era. Students also learn creativity and they get to gain perspective from many different angles. Another effect of Digital Transformation that comes with an increase.

V. Importance and Impact of Digital Transformation on one's Career

Since Digital Transformation will impact almost every industry, It is important for everyone to be able to acknowledge that change is happening, and then act accordingly. Sometimes, diagnosing change is difficult, and in order to have the best results within all businesses, identifying what needs to be done early on in the timeline of Digital Transformation and being efficient when changing things about the business will yield the best results for everyone involved. This demands active leadership and digital mindsets from everyone involved, especially executives.

It will streamline daily responsibilities as a mechanical engineer because of all of the new technologies and new strategies being incorporated into engineering. With all of these new changes however, it is necessary going to need to possess the dedication and drive to continually learn as industries are transforming. Having the ability to reinvent yourself and continually learn and acquire skills that add value to a company while also differentiating yourself from the rest of the people in an industry. However, with new technologies constantly being developed along with a forever

increasing demand for innovative products being brought to market, it is definitely going to present a challenge as it will demand extreme creativity, collaboration, and coordination throughout someone's career.

VI. Changes Needed in Universities to Prepare Students for the Digital Era

In engineering and computer science undergraduate curriculums, need much more to be put on emotional intelligence and business. we believe that, in order to maximize your utility as an engineer that impacts a business and/or society in a positive way, you must have background on how to better understand unspoken dynamics in a workplace and how to better understand yourself. Within the same breath, knowledge of the business around you and about the market in general yields greater understanding of the purpose, mission, and vision of a company, which will show in the quality and timeliness of engineering work. For these reasons, we believe more business oriented material should be added to the curriculum. Additional subject matter focused on digital and future-oriented concepts (Artificial intelligence, robotics, data analytics, cybersecurity, newly introduced types of additive manufacturing and 3D printing) should be developed and integrated into undergraduate and graduate curriculums

as well as more visibility is gained into these technologies.

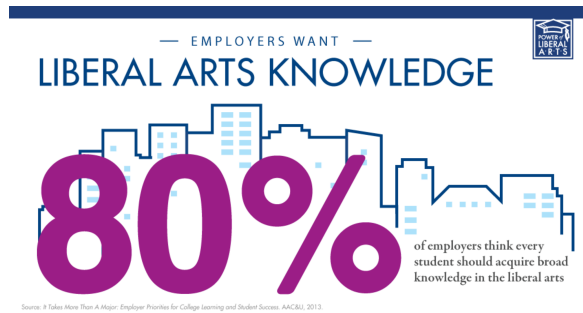
Communication is an important skill that will be even more important as companies continue to globalize. As a result group activities and projects in school requiring interactions in teams will force students to work on how they work in teams. As noted previously, with digital era, there is a continued push for change among companies. In the workplace, people may be working on a project and then abruptly stopped and forced to change. If projects were to be set up so that the task was abruptly shifted, it would simulate a project that an engineer may face in the workplace and even more as technology changes.

VII. What College Students can do to Prepare for Digital Era

College students need to have the initiative to want to learn about the future of things, as it ultimately will impact them the most. In addition to gaining initiative and responsibility regarding the future and how it will affect them, students need to also gain the ability to adapt to change by enhancing emotional intelligence and growth mindsets through exposure to leadership classes and/or getting involved with professional leadership institutes and societies. Getting in professional societies and leadership programs will ultimately give them

experiences that will be similar to being in a company as a professional. These societies and programs will also give them exposure to extremely valuable skills for throughout their careers, including emotional intelligence, agile project experience, and professional communication and public speaking. Also, research into the future of industries that you are interested in for exposure and awareness before finishing higher education will increase awareness that much more and should be encouraged.

In addition, gaining exposure to projects with deadlines and teamwork that is more indicative of professional work than a group lab report or a design project. The senior design projects give student good experience with professional work and deadlines, however students do not experience it until their senior years. If college students are able to gain this type of experience, it will better prepare them for the digital future and for their career in general, as they will have the ability to reinvent themselves based on market direction and trends. Using the RISC model that is based on resilience, inner strength, strategic thinking skills, and collaborative work spirit will immensely benefit students transitioning into their professional careers in the digital age because Digital Transformation brings change that hasn't been experienced



before by most markets, and possessing those qualities will yield the best results.

One other key skill that will be important in the digital age that college students should learn is being able to constantly learn throughout a career. In order to give the maximum utility to a company or business in Digital Transformation, being able to learn new things about the industry or about a certain technology regardless of how experienced or intelligent someone is will prove to be vital in the future. In order to gain these skills, aspects of liberal arts education will need focus from students, as they are what will differentiate them from artificial intelligence and new technology of the future.

VIII. Current Research of Digital Transformation in the Lockheed Martin Leadership Institute

In the future, the Lockheed Martin Leadership Institute will maintain its focus on personal development and

gaining awareness of oneself, as well as gaining useful knowledge and experience about emotional intelligence, management tactics, professional communication and leadership.

In addition to these valuable topics, adding digital leadership principles and applications of previously mentioned topics to a digital environment could be implemented. By adding these topics of Digital Transformation to the Lockheed Martin Leadership Institute's curriculum will not only increase enablement of success for institute members, but it will also promote the importance of Digital Transformation and future focuses innovation across the college of engineering and computing, and Miami University as a whole.



Sources

1.
<https://www.slideshare.net/niallmckeown/digital-transformation-45738266>
2.
<https://www.forbes.com/sites/davidsilver/2018/07/26/waymo-has-the-most-autonomous-miles-by-a-lot/#13d97497ee53>
3. /the-work-ahead-40-months-of-hyper-digital-transformation-codex2342.pdf
4.
<https://hub.neuroleadership.com/neuroleadership-growth-mindset-report>