

Technological Unemployment

Introduction

For decades, rapidly evolving technology has continued to transform our global society, causing us to reevaluate traditional social and economic paradigms. While the innovations spurred by this technological revolution have resulted in many positive changes, the exponential rate of technological advancement is already producing unintended consequences that will greatly impact our global, national and state economies.

In considering these unintended consequences, the most important question facing North Carolina job creators is: how will technological advancement impact your companies and your continued ability to support new growth? This question can and should be analyzed from the perspectives of both employers and employees.

From the employer perspective (if, for example, you are the CEO of a company), the greatest challenge created by the technological revolution will be finding new ways to support a truly talented workforce that can adapt to changing roles in a quickly evolving economy. For example, as machines replace many lower-skilled positions and begin to fulfill the obligations of those positions as efficiently and effectively as human workers, job creators will need to have access to a substantial pool of human workers who can work with and maintain these machines and continue to provide value within a constantly changing business model.

From the perspective of the employee, technology will greatly impact the ability of lower-skilled workers to find good jobs that support adequately high quality of life standards when compared to more highly skilled employees. The employee of the future will need to be trained and educated continuously to fit the evolving needs of her employer. As such, lower-skilled workers will need access to the necessary resources to return to school, or their employer should be willing and able to retrain and invest in them as individuals who, with the right investment, can offer continued value over the full lifetime of their career.

In short, both employers and their employees will face many new challenges due to technological innovation that North Carolina's current education and workforce development systems are not adequately equipped to handle. As a state, North Carolina must create an aligned education and workforce development system that evolves at the rate of technological transformation and keeps pace with the needs of modern business. To that end, North Carolina needs, as Jim Clifton would describe in *The Coming Jobs War*, tribal leaders to take a larger responsibility in creating and embracing change in our education system. Clifton defines these leaders as "a self-organized group of talented people influencing and guiding," with the overall goal of making their local and state communities more successful (Clifton 2011:68).

North Carolina has an exceptional group of influential people who can work together to make our state the leading place to do business and pursue a high quality of life in the 21st century

economy; but these tribal leaders must take on the responsibility to address the coming complications and opportunities that will be created by the rapid advance of technology. In order to ensure the future needs of the business community are met, job creators must continue to think of ourselves as key tribal leaders who will need to play an active role in the solution.

Key Considerations for North Carolina

The unintended consequences and opportunities of rapid technological advancement will not only affect one group of people or one type of business. They will impact society in a number of fundamental ways. It is the business community's responsibility to ask ourselves: are we prepared for these transformative changes?

Currently, North Carolina's K-12 public school and community college systems are set up to teach students skills that prepare them to fill traditional employee roles – the types of roles that were widely found in yesterday's economy. Our students sit passively at desks, where they are asked to do what they are told and produce expected results. While this system was effective in preparing students for a 20th century workforce, today's students must be prepared to enter the 21st century workforce; and in order to thrive, they must have the skills needed to begin adapting to so-called “disruptive innovation” from day one.

Disruptive innovation is a term coined by Clayton Christensen, describing “a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly move up the market, eventually displacing established competitors.” Potential solutions to modernize and align North Carolina's education and talent development systems must fully embrace this concept in order to best prepare today's students for careers in tomorrow's workforce.

Fortunately, North Carolina is uniquely positioned – with exceptional educational resources, diverse economic sectors, a competitive business climate and a rapidly expanding population – to embrace technological innovation and continue expanding opportunities to grow our statewide economy in a positive direction. Our community colleges are well situated to accelerate their relationships with businesses in order to establish new understandings of what career requirements will be in the future, and to help create a roadmap that takes the steps we need to meet these future requirements. In addition, over the past several years, successful economic reforms championed by the state's business leaders have established North Carolina's job creators with the credibility and positioning they need to take a leading role in driving the implementation of proactive, forward-thinking solutions to modernize our education and workforce development systems.

The beneficial potential of technological innovation has already become apparent in our state. In the service sector, computer screens have taken the place of waitresses and register workers, creating more efficient systems. In the manufacturing and agricultural industries, companies are using technological advancements to boost yearly productivity and reduce the costs of a job (Miller 2015). As the costs of production continue to decrease, more manufacturers have been able to stay in the United States or return many jobs to the U.S. that had previously been sent overseas.

In addition, there have already been many examples of large and small companies alike utilizing technological innovation to disrupt current paradigms in ways that break down old barriers and continue to maximize their ability to grow.

For instance, self-driving cars are expected to have major impacts on future transportation networks, as societies transition to automated forms of transportation. Google has already produced a vehicle that is capable of driving on the highway without human input, and they are continuing to expand the technology to make it safer than if a human was behind the wheel. Toyota, a Japanese company, announced on November 5, 2015 that they are establishing a new research arm, Toyota Research Institute (TRI) in Silicon Valley, which will invest \$1 billion over the next five years in artificial intelligence and robotics. The overall goal of TRI will be to develop autonomous cars which can provide seniors with increasing levels of mobility (Toyota 2015). While these visionary endeavors understandably receive the bold headlines, smaller companies like Etsy are also helping to lead the global innovation revolution. Etsy operates a peer-to-peer e-commerce website that allows individuals to sell their products around the world, debunking the myth that globalization and innovation are phenomena that only massive companies can embrace effectively. These examples are all illustrative of how companies are beginning to truly invest in the future of technology to destroy traditional paradigms and create more productive and efficient networks and systems.

Moreover, technology gives companies the capability to have a workforce that performs uniformly; one that does not take vacations, cannot get sick, quit, get hurt or sue its employers. Additionally, machines are capable of evolving and learning new tasks much quicker than humans, and can be retrained through more systematic, streamlined and cost-efficient approaches than those that would be needed for a human workforce. Thus, technology allows for outputs and quality of goods and services to go up, while prices to go down. In fact, according to Robotics Industries Association, the average cost of operating a medium-sized robot is \$0.75/hour; a human performing the same duties could cost between \$15-20/hour (Anandan 2015) to compensate. These robots are able to work 24 hours a day, 7 days a week and 52 weeks a year, and they do not require health insurance coverage or a pension.

Challenges for North Carolina

While technology has many potentially positive attributes, there are a number of foreseeable – yet unintended – consequences related to its rapid advance. The most significant issue that will quickly become apparent to job creators will be the loss of traditional jobs. Machines are replacing people not only in manufacturing careers, but across all economic sectors, and positions that are more structured and routine are particularly vulnerable to the phenomenon of “technological unemployment.” Examples include sales clerks, secretaries, waitresses, truck drivers, paralegals and telemarketers. All of these occupations are similar because they involve a level of repetition that is simple – or at least possible – for machines to replicate.

Technological innovations will also replace positions that are not as easy to duplicate. There are now computer-generated programs to create written content, replacing the need for many reporters and content writers. An excellent example of this can be seen from the Durham, NC based company Automated Insights, which uses an automated-writing platform called Wordsmith. Robots are also now capable of analyzing a human’s medical symptoms and

diagnosing conditions. Some estimates predict that “just under half of the occupations (44%) and employees (48%) face a high probability (over 70%) of replacement by technology” (Walden 2015:6). This will greatly impact our society and will continue to expand the gap between low-skilled and high-skilled workers, with direct impacts on wages.

Even assuming there remain enough job opportunities available in the future to replace positions that are lost to technological advances, current models for education and talent development do not meet the specific career needs of a nimble, modernized workforce. While positive steps have been taken, North Carolina’s current education system has not evolved with changing technology and continues to educate students on how to fit into the 20th century model of a traditional workforce. As a result, the workforce skills gap continues to expand as workforce and education systems struggle to align. Companies are already challenged to find truly talented employees, particularly in fields related to STEM. If our education and workforce training systems do not evolve to become more nimble, these challenges will only continue to become more daunting for North Carolina.

Additionally, in order to mitigate the financial impacts of job losses, many employees are turning to part-time positions, such as UBER driver, in order to have an income or to supplement another part-time position. This new model of employment mean more workers will be working in fields that do not have access to the traditional safety nets that are often considered a significant part of employment. Healthcare, pensions and disability are becoming uncoupled from employment as multiple sources of income for an individual becomes the new norm. This could create a larger population of people who will need to be supported by social welfare programs. One possible unintended consequence for job creators could be an increase in taxes that diminish the profitability gains directly produced by technological advancements.

In short, technological unemployment is a challenge North Carolina’s tribal leaders simply cannot afford to ignore. If our state’s job creators are able to step up to the challenge and play an active role to find solutions to these issues while continuing to embrace expanding technology, our state will be capable of accelerating and cultivating new industries and support North Carolina’s continued economic competitiveness in the coming decades.

Turning Challenges into Opportunities

Even with the challenges technological advancements create, exciting opportunities are promising to keep North Carolina moving forward. Technology has provided innovations that are now free and instant; a unique quality that was unavailable before the technological age. The capability to fundamentally transform education, health care, and agricultural systems, and support economic growth at an unprecedented rate has never been more apparent. However, as tribal leaders, we must make an active decision to embrace the opportunities that lie in front of us.

North Carolina is uniquely positioned, with a robust agricultural sector, competitive energy supplies, leading health care sector and a highly diversified economy, to become an innovative growth leader in the coming decades. Both the agriculture and energy sectors are key components of our competitive business climate, allowing North Carolina to offer economic growth and high quality of life opportunities for North Carolinians throughout all regions of the

state and endure fluctuations in the economy. If technological advancements are strategically deployed for the advancement of these sectors, it will count as a major step toward a tremendous sustained competitive advantage for our leaders to pursue a comprehensive economic development plan that stretches to all corners of North Carolina.

North Carolina Vision 2030: A Plan for Accelerating Job Growth and Securing North Carolina's Future places a high priority on anytime/anywhere access to learning for educators, students and existing workers by enabling digital devices to replace textbooks. The success of this priority will broaden access to digital learning opportunities for students across the state, fostering a statewide education system that can continue to evolve with changes in technology. Classrooms in rural areas could use video technology to give students access to courses or teachers that would have otherwise not been available. The potential for technology to transform the educational system in North Carolina is boundless and should be fully embraced to maximize the state's talent development potential and prepare students for the careers of tomorrow.

Healthcare is another area ripe for increased efficiency and broader access. For example, recently a hospital in Belhaven, located in Beaufort County, was closed due to an unsustainable structure where there were not enough people to pay for the services available. One solution that could be enabled by technological innovation is the utilization of telemedicine technologies that could monitor a patient between doctors' visits so they will not need to drive long distances for doctor's appointments and can be tracked for any changes in their health to notify them sooner if they need to go to a hospital (*News and Observer*, Quillin, 2015). There are many other examples where technology can be deployed to accelerate transformation of the healthcare sector to make it more efficient and enable access for people who struggle to find to adequate healthcare where they live.

North Carolina job creators are at the forefront of understanding how rapidly changing technologies will impact our state. A focus on increasing investments to support entrepreneurship through an "innovation-focused" strategic plan will be essential in guiding both job creators and education policy makers toward effective solutions to the challenge of technological unemployment. Moreover, an increased focus on supporting business-driven activities that foster STEM-related issues should be utilized to encourage students to be engaged with technology in early stages of development.

Technology will continue to impact every industry and individual in North Carolina as it advances ever further with each passing year. Public officials and business leaders alike have the responsibility to understand the challenges and consequences technological advances will bring for North Carolina and spearhead a plan that drives innovations in key sectors, like education and workforce development, health care, energy, life sciences and agriculture, turning these challenges into opportunities for our state. If not us, then who? If not now, then when?

Questions to Consider:

What if the education system does not innovate at the speed of business and there are not workers prepared for the careers of the future?

What if the gap between low-skilled and high-skilled workers continues to grow?

What if there is mass unemployment due to technology without an innovative nimble worker retraining system?

As globalization continues to expand and tax dollars for online sales continue to be lost, what happens to our economy?

What if you do not prepare yourself and your organization for the changes that are bound to happen due to disruptive technology innovations?

Timeline/Progression to Preparation

- Clear understanding of projected job loss based on new technology and an effective way to track it
- Public-private partnerships with the education system starting in late elementary and middle school to teach kids about career options and different industries
- Incorporating technology more readily in all classrooms
- Business to take the lead in addressing issues in their industries around technological unemployment through developing an effective plan and on-going support for small businesses and entrepreneurs
- Re-training and on-going education systems readily available and fine-tuned based on workforce skills gap and new technology
- Create a system prepared to support entrepreneurs, the self-employed, and small businesses to incorporate more independence
- North Carolina is prepared by being an innovative state with citizens who are educated, nimble, and prepared to work the jobs of the future, create new positions and re-train when necessary

Resources

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