HIGHLIGHTS:

Today’s technology is a double-edged sword for the Coastal Bend economy. While technological advances have made many small businesses more competitive relative to large corporations, the requirement of digital skills in the workplace, particularly in occupations with high job growth and wage earnings, has created new challenges in regional workforce and economic development.

How has technology affected our regional workforce?

To understand the competitiveness of the regional workforce, we first look at how technology has changed the business landscape and workforce demand.

Today, the impact of technological advances on the economy is best described in the context of digitalization, which is the diffusion of digital technologies, such as electronic tools and software applications, into business models and operations.

Level Playing Field

The latest technological change has affected the way most companies conduct business. In general, technology has created a level playing field for small businesses to compete with large corporations.

According to a series of articles published by the Houston Chronicle, technology helps business owners reduce operational costs with information technology, which automates office functions with such tools as record keeping software, and facilitate communication with customers through such tools as the Internet and mobile apps. In other words, technology raises employee productivity and broadens a business’s customer base.

Technology has also promoted globalization. Advances in business communications have allowed companies to collaborate with others, and to outsource their functions to vendors around the world.

Winners and Losers

In reality, technology has created both winners and losers though. The retail trade sector is dominated by small businesses, the majority of which are locally owned.

A look at the performance of different retail businesses in Corpus Christi since 2001 reveals dramatic shifts within the sector. As a measure of industry size, the total number of people employed by online-based businesses (electronic shopping and mail-order houses) more than tripled between 2001 and 2018.
On the contrary, many local specialty stores, including florists, liquor stores, office supplies stores, furniture stores and book stores, have downsized or closed, resulting in job losses over that same period. This reflected in part the growing popularity of online shopping technologies on the mix of local businesses.

The conventional wisdom also holds that technology, especially automation and artificial intelligence, will take away many jobs available today. While this pessimistic prediction remains to be seen, the job market and the work environment have indeed changed dramatically as a result of technological change.

Digitalization

Compared to industry, the impact of technology on the workplace seems more broad-based. According to a recent report of the Brookings Institute (Mura et al., 2017), the digital content of the U.S. overall workplace has grown rapidly within the past decade. Researchers at the Institute group U.S. jobs into occupations that require different levels of digital skills.

Obviously, the occupations that require the highest levels of digital skills are software developers and computer programmers. On the low end of the digital skills continuum are such occupations as construction laborers, personal care aides, and restaurant cooks.

Digitalization has occurred even in low-tech industries, such as construction, in which basic technologies were introduced to their operations.

Although the extent of digitalization, or computerization, has increased across the U.S., the pace of development has varied widely across industries and occupations. By grouping jobs into three broad ranges of digital skills, the shares of jobs that require a high level and medium level of digital skills have increased since 2002.

Correspondingly, the share of low-digital jobs shrank from 56% of overall employment in 2002 to 29% in 2016. In other words, technology has caused shifts in the mix of occupations.

U-Shaped Job Creation

The Brookings report also shows that digitalization has led to higher wage earnings and job creation especially among certain jobs. While employees in occupations with medium- or high-digital skills tend to be paid more than those in low-digital occupations, there is a U-shaped job growth pattern across the digital skill spectrum.

This U-shaped pattern is also observed in the Coastal Bend labor market. Between 2001 and 2018, job growth for occupations with low (e.g., personal care) and high (e.g., architecture and engineering) digital skill levels were remarkably higher than job growth for occupations with medium (e.g., education, community service) levels of digital skills.

This pattern is attributable to the effect of technology that takes the form of automation, which has eliminated some jobs except those that still require physical labor.

Digitalization is also associated with higher earnings and regional prosperity. Researchers at the Brookings Institute have compiled a database of average digitalization scores for the workforce in U.S. metro areas.

While most metro areas experienced an increase in digitalization of their workers, the shares of employment in highly digital occupations vary widely.

A scatter plot of metros’ average annual wage earnings against their workforce’s average digital scores clearly highlights the impact of digital skills on economic prosperity.
Coastal Bend Job Change by Digital Skills, 2001-2018

Source: EMSI, 2018.3.

Metros’ Mean Annual Wages and Mean Digital Scores, 2016

Source: Brookings analysis of O*Net, OES, and Moody’s data.
San Jose, California, in Silicon Valley leads the nation in highly digital jobs; its average annual wage also exceeds $120,000.

Corpus Christi is on the low end of the digital workforce score, which might explain its per capita income level below the national average.

### Polarization

Digitalization is changing the skills certain demographic groups need to secure a high-paying job. In particular, women tend to be more concentrated in occupations with medium digital-skill ratings, such as healthcare professions and education.

As described above, in the Coastal Bend, job growth in many of these occupations tends to lag behind job growth in either high or low end of the digital skills spectrum.

Women are underrepresented in either such highly digital occupations as computer and mathematical, and architecture and engineering, or least digital occupations, such as construction and transportation.

Similarly, Hispanics are underrepresented in highly digital jobs. They make up more than 60% of the Corpus Christi population, but garner less than 40% of jobs in the top two tiers of occupations with digital skills.

All told, technology might have created new workforce training challenges for such cities as Corpus Christi, in which Hispanics and women are major demographic groups.