U.S. Self-Service Kiosks:

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Additional segmentations and data sets available upon request. Email custom@bccresearch.com.

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Introduction

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Chapter 1: Introduction

A self-service kiosk is an interactive device that enables a customer to conduct some sort of transaction or to facilitate a service at their convenience. For example, by using a self-service kiosk a consumer can buy a ticket for a train or bus trip by just going to the device, paying their fare and getting a ticket, all without waiting in line or asking for help. Self-service kiosks are being used more and more at quick-service restaurants, where they can help reduce ordering and waiting time. Kiosks are also very useful for checking in and out of hotels; offices use them to check in their inventories; and airports deploy them to enable consumers to check in to a flight to save the consumers and the airlines time. Prior to kiosk technology being widely adopted, cost-conscious businesses had to choose between slower service with fewer employees of more employees to provide quicker service. Now, kiosks make it possible to both provide quick service and limit the number of employees providing service. Self-service kiosks provide a convenient alternative for consumers to the full-service counter.

The intent of a self-service kiosk is to speed up customer interaction, ensuring a fast and convenient exchange on both sides. Four basic services are normally offered by self-service kiosks: payment options, check-in services, branding/promotion, and product management. Near-field communication (NFC) and other safe payment options are provided by some self-service kiosks, enabling users to purchase a vast range of digital services via an automated system. With self-service kiosks, check-in for hotels and flights can be done very quickly, saving a lot of time compared to other types of check-in. Without any extra effort from the company, branding and marketing are easily done because any ads can be shown on the kiosks for a large number of people to see. Finally, of a product needs to be delivered rapidly, kiosks can do this, handling heavy foot traffic while ensuring accurate service.

In this report, the U.S market for self-service kiosks is segmented based on the application and end-user industry. Based on applications, the self-service kiosks market has been categorized into Check-in Kiosks, Check-out Kiosks, Ticketing Kiosks, Self-ordering kiosks, Financial Services Kiosks, Bill Payment Kiosks, Digital Signage Kiosks, Bitcoin Kiosks, Temperature Screening Kiosks, and Others. Check-in Kiosks accounted for the largest share of the market in 2019.

Based on the end-user industry, the self-service kiosks market has been segmented into Hospitality & Entertainment, Financial Services, Medical/Healthcare, Retail, Food Service, Travel & Transportation, Government, Education Institutions, and Others.

In this report, ATMs and vending machines are excluded.

Study Goals and Objectives

The goals and objectives of this study are to:

- Define the U.S self-service kiosks market.
- Analyze the market by application and end-user industry.
- Estimate the market revenues for the self-service kiosks market, by application and end-user verticals

- Identify market drivers, restraints and other forces impacting the U.S. self-service kiosks market.
- Profile major players and discuss solutions and strategies
- Analyze the current regulations in the self-service kiosk market

Scope of Report

In this report, the market has been segmented based on the application and end-user industry. The report provides an overview of the U.S self-service kiosks market and analyzes market trends. Using 2019 as the base year, the report provides estimated market data for the forecast period, 2020-2025. Revenue forecasts for this period are segmented based on the application and end-user industry. Market values have been estimated based on the total revenue of self-service kiosks OEMs, software providers and service providers.

The report covers the market for self-service kiosks with regards to the user base, across different end-user industries. It also highlights major trends and challenges that affect the market and the vendor landscape. The report estimates the U.S market for self-service kiosks in 2019 and provides projections for the expected market size through 2025.

Note: Market projections for 2021 were estimated based on the assumption that the distribution of COVID-19 vaccines will be largely completed by the end of the second quarter of 2021.

Reasons for Doing the Study

The report provides important information on the current size and anticipated growth of the U.S self-service kiosks market and its related market segments. It also covers the characteristics of the market, leading solution providers, trends in consumer preferences, and various other market opportunities. The self-service kiosks industry has been growing at a significant rate in the U.S over the last decade. BCC Research is publishing this study because it has identified self-service technologies as a growing market that presents strong growth opportunities for all stakeholders. The market is dynamic and growing with new developments and adoption from new industries and sectors.

Intended Audiences

The report will interest the following audiences:

- Technology providers.
- Self-service kiosks solution developers.
- Display manufacturers.
- Tablet kiosk developers.
- Academic institutions.
- Advertising agencies.
- Cloud solution providers.
- Software developers.
- Research institutions.
- Private organizations.

- Government agencies.
- Independent consultants.
- Investors.

Information Sources

The following sources were used to obtain the information required for the study:

- Primary sources:
  - Selected experts from related industries.
  - Market leaders.
- Secondary sources:
  - Industry publications.
  - Company websites.
  - Directories.
  - Research papers.
  - White papers.
  - Databases such as OneSource, Factiva and Bloomberg.
  - SEC filings.

Methodology

To produce this report, BCC Research used both primary and secondary sources. Primary sources included industry experts from core and related industries, as wells as affiliates such as kiosk manufacturers, platform providers, software providers, private consultants, and other related segments of the value chain. All primary sources were interviewed to obtain and verify critical qualitative and quantitative information and to assess prospects. Secondary sources included various directories, white papers, technology blogs, and databases.

A mixture of top-down and bottom-up approaches were used to estimate and validate the size of the U.S. self-service kiosks market. Key players were identified through secondary research. Industry value chain and the market revenue of players were determined through primary and secondary research. This includes the analysis of annual business and financial reports from top market players, as well as extensive interviews with CEOs, directors, vice presidents, and marketing executives.

Market estimates were determined using secondary sources and verified through primary sources. These are based on various parameters: the presence of key players, sales partners and distribution networks. Research also included an analysis of R&D activity. The total market size was established and validated based on revenue and revenue shares of companies in the self-service kiosks market. Based on the overall market size, a top-down approach was used to determine the market size of each individual segment.

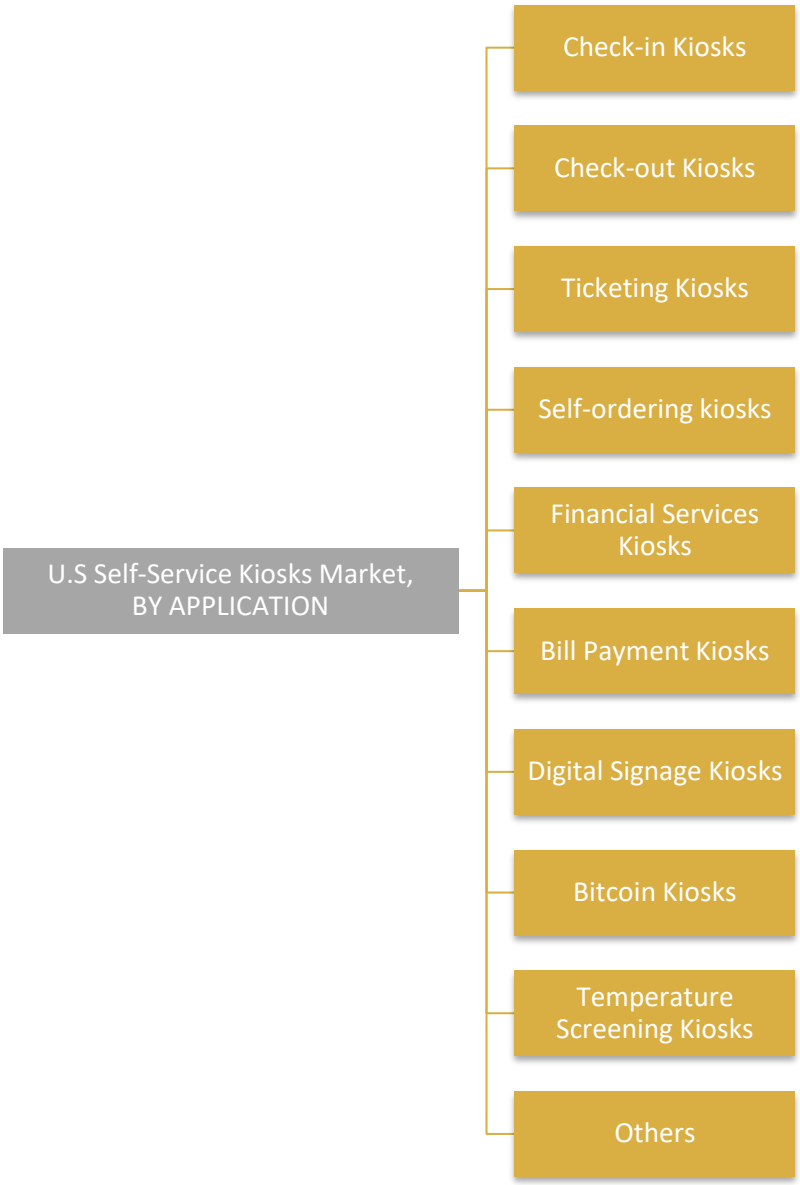
This report utilizes input from many sources and especially from the Kiosk Manufacturer Association. This report is not a typical “Kiosk Market Report,” that includes kiosk and non-kiosk segments and/or does not normalize kiosk revenues. We have attempted to distinguish between competitive and supplier markets that might result in including non-kiosk industry players and products. For instance, NCR has

revenues of almost $7 billion and while it does participate in the kiosk industry, it is technically not a player in the competitive kiosk industry, which is the case for many other similar market players.

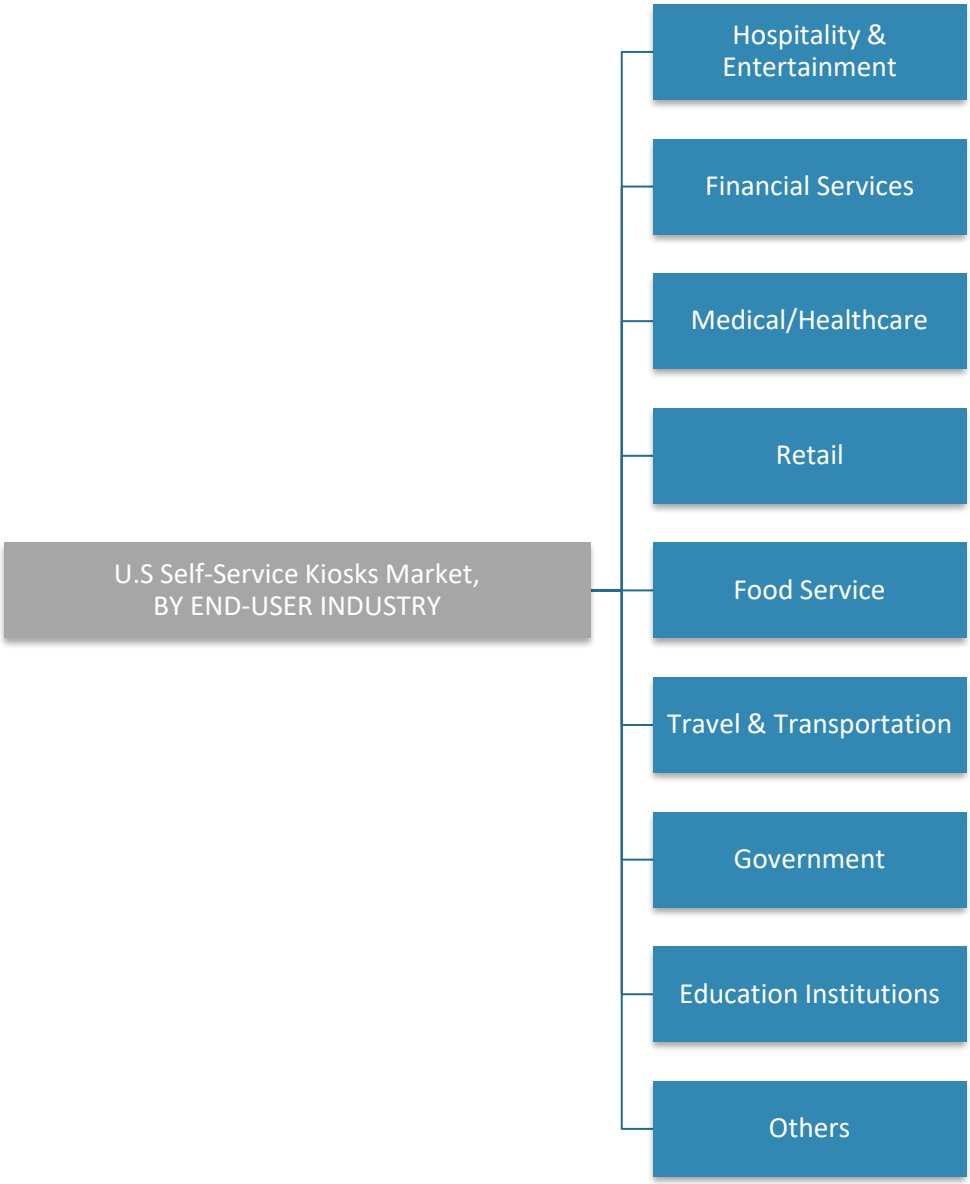
The scope of this report encompasses the unattended self-service kiosks market and to a certain extent interactive digital signage (which are conflicting terms). Digital signage (content display networks), ATMs and vending are related markets for the purpose of this report.

This report covers dedicated kiosk companies and some other manufacturing that have partitioned off a small segment of their business to explore opportunities in the kiosk industry.

U.S Self-Service Kiosks Market, by Application



U.S Self-Service Kiosks Market, by End-User Industry



Analyst's Credentials

Led by Research Head Anand Dubey, the BCC Research staff is composed of expert analysts skilled in conducting primary research, secondary research, and data analysis and who have decades of combined experience covering a wide range of industries, including healthcare, advanced materials and emerging technologies. Collectively, the team represents a diverse set of educational achievements with individual graduate work completed in microbiology, electrical engineering, business administration, surgery, and other subject areas.

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- IFT159A *Machine Learning: Global Markets to 2022.*
- IFT117A *Cognitive Computing: Applications and Global Markets.*
- IFT154A *Virtual Reality Technologies: Global Market to 2022.*

Chapter 2

Summary and Highlights

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Chapter 2: Summary and Highlights

Self-service kiosks are interactive and intuitive in nature, making them an important platform for customer self-service. Basically, self-service kiosks are application-specific electronic systems that can significantly increase operational efficiency, and are widely regarded as a business tool that can easily streamline the products and service delivery. As well, self-service kiosks are used in industrial applications as they can provide streamlined process control effectively. Kiosks are evolving as an important tool for organizations to evaluate consumer behavior and purchasing habits. Interactive and self-service kiosks are finding applications across domains including quick-service restaurants, healthcare, travel, tourism, entertainment, and retail. Some benefits to businesses from self-service kiosks include lower operational costs, and increased revenue and a consequent return on investment (ROI).

The U.S market for self-service kiosks was valued at $2.6 billion in 2019. It is projected the self-service kiosks market in the U.S. will grow at a CAGR of 16.1% to reach $4.4 billion by 2025. The U.S. market for self-service kiosks has been segmented based on the application and end-user industry. Based on applications, the self-service kiosks market has been categorized into Check-in Kiosks, Check-out Kiosks, Ticketing Kiosks, Self-ordering kiosks, Financial Services Kiosks, Bill Payment Kiosks, Digital Signage Kiosks, Bitcoin Kiosks, Temperature Screening Kiosks, and Others. The check-in kiosks segment had the largest share of the market in 2019 and was valued at $530.5 million. The U.S. market for check-in kiosks is expected to grow at a CAGR of 19.8% to reach $873.6 million in 2025. In recent years, check-in kiosks have become more popular in several environments. Airline check-in kiosks, healthcare check-in kiosks, and hotel and hospitality check-in kiosks are some of the most popular forms of check-in kiosks.

Based on end-user industry, the self-service kiosks market has been segmented into: Hospitality & Entertainment, Financial Services, Medical and Healthcare, Retail, Food Service, Travel & Transportation, Government, Education Institutions, and Others. The retail end-user segment accounts for the dominant share of the market and was valued at $452.6 million in 2019. In the retail segment, self-service kiosks are widely installed across department stores, grocery stores, convenience stores, and specialty retailers. One of the key reasons for the strong growth of self-service kiosks in the retail space is the need for a multi-channel environment, which is necessary to connect to customers, including prospective customers. In addition, the proliferation of contactless payments, such as those using near-field communication (NFC) and mobile payment, will also lead to a growing need for self-service kiosks in retail stores.

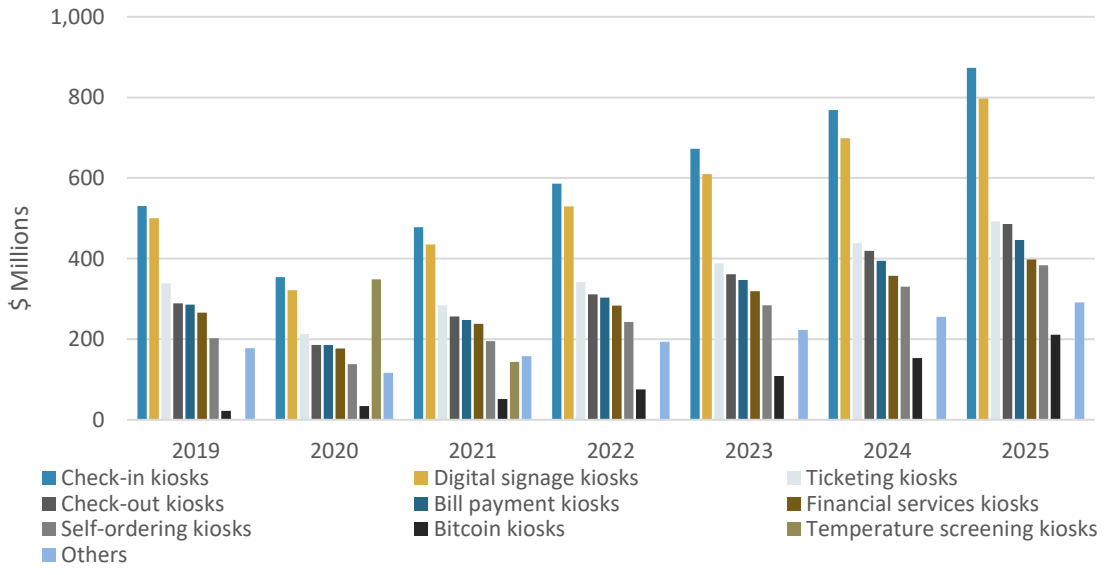
The fastest growing end-user segment in the U.S. self-service kiosk market is the medical and healthcare segment, which was valued at $312.3 million in 2019. The self-service kiosk market in the medical and healthcare segment is projected to grow at a CAGR of 19.1% to reach $715.2 million in 2025. In healthcare sector, self-service kiosks can be used for a variety of purposes such as appointment check-in, secure patient identification, real-time demographics verification, real-time eligibility checks, consent form viewing and e-signature, outstanding balance and co-pay collection, alert notifications, facility directions, and ordering prescription refills.

Summary Table:
U.S. Self-Service Kiosks Market, by Application, Through 2025
($ Millions)

Application	2019	2020	2021	2022	2023	2024	2025	CAGR% 2020–2025
Check-in kiosks	530.5	354.0	478.2	585.8	672.5	768.3	873.6	19.8
Digital signage kiosks	500.3	321.9	435.2	529.6	609.5	698.5	797.2	19.9
Ticketing kiosks	338.0	212.6	284.0	342.4	388.4	438.3	492.2	18.3
Check-out kiosks	289.0	185.5	256.8	310.9	361.6	419.6	485.9	21.2
Bill payment kiosks	285.8	185.5	247.9	303.0	346.9	394.6	446.2	19.2
Financial services kiosks	265.8	177.0	237.9	283.8	319.3	357.3	398.1	17.6
Self-ordering kiosks	202.6	138.2	195.3	242.8	283.9	330.6	383.4	22.6
Bitcoin kiosks	22.2	34.2	51.4	75.6	108.6	152.9	211.0	43.9
Temperature screening kiosks	-	348.6	143.3	-	-	-	-	
Others	177.5	116.8	158.3	193.7	222.9	255.4	291.3	20.1
Total	2,611.7	2,074.3	2,488.3	2,867.6	3,313.6	3,815.5	4,378.9	16.1

Source: BCC Research

Summary Figure:
U.S. Self-Service Kiosks Market, by Application, 2019–2025
($ Millions)



Source: BCC Research

Chapter 3

Self-Service Kiosks: Market Overview

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Chapter 3: U.S. Self-Service Kiosks: Market Overview

History of Self-Service Kiosks

The development of the interactive terminal (kiosk) can be traced back to 1977 at the University of Illinois at Urbana-Champaign. Murray Lappe, a pre-med student, developed this first terminal. The kiosk was named the Plato Hotline and provided students and visitors with a wide range of information such as to how to find movies, maps, directories, bus schedules, extracurricular activities, and courses. The interactive terminal was created on the PLATO computer system and the interface was a plasma touch screen interface.

However, the first commercial interactive terminal arrived in 1985 and was created through a project developed by the shoe retailer Florsheim Shoe Co., led by executive VP, Harry Bock. The interactive kiosk was created, manufactured, and customized by ByVideo Inc. of Sunnyvale, Calif. Florsheim Shoe Co. installed more than 600 interactive terminals (kiosks) providing images and video promotion for customers who wished to purchase shoes that were not available at the retail location. The interactive terminal enabled customization such as the selection of style, size and color. In addition, the interactive terminal allowed for payment through the terminal itself. The payment was sent to the company's mainframe through dial-up lines, for next-day home or store delivery via Federal Express. This kiosk network operated for more than six years in Florsheim retail locations.

The first commercial kiosk with an internet connection was displayed at Comdex in 1991, and it was set up for locating missing children. The 1990s also saw significant development in the interactive terminals market with big players such as IBM stepping into the market. In 1991, IBM entered a strategic partnership with MarCole to support the development of an electronic catalog prototype. Throughout the 1990s, the kiosk market saw the development and introduction of several new kiosks, software, and related solutions and services. The market also witnessed the entrance of new companies and significant adoption of kiosks in industries such as healthcare and retail.

Note: Technically the telejuke, which was developed in 1955, is considered to be the first commercially deployed self-service kiosk. Touchscreens were launched in 1971 with the founding of Elographics. In 1974, an NCR scanner was first used when some Juicy Fruit gum was scanned at checkout. 1977 saw the advent of the academic device, Plato. In 1981, Minitel in France can be said to have produced the first mass self-service kiosk device. Florsheim Shoe Co. unveiled the flagship U.S. "kiosk" innovation in 1985.

Adoption of Kiosks in Non-Traditional Industries

The 2000s saw further growth in interactive kiosks through their adoption in nontraditional industries such as music and printing. The first music distribution kiosk appeared in 2000 and by 2006 music distribution kiosks were common. In 2001, interactive (and self-service) photo printing kiosks were developed. The adoption and use of these kiosks grew with the popularity of digital cameras.

Further Popularity of Small-Sized Models

The 2000s further saw the growing adoption and popularity of small and slim kiosks. These kiosks offered several advantages such as ease of installation, operating efficiency, better look and feel, and low cost. This period also saw the release of several new, smaller models from companies such as Fujitsu and NCR, and which were in line with the slim and small design. King Plynth, a kiosk product from King Products + Solutions, served as the design model for many kiosk manufacturers.

Period of Acquisitions, Mergers and Partnerships

The 2000s also saw several mergers and acquisitions within the kiosk market. In 2004, Networld purchased Kiosk Magazine, the Kiosk.com site and the Fall Kiosk Show; Fujitsu acquired Optimal Robotics; and NCR purchased Kinetics and entered the airline check-in kiosk business. NCR further continued its acquisition spree and acquired Galvanon in 2005. In 2008, HP entered the kiosk and self-service market by teaming up with KIOSK Information Systems. Other acquisitions, mergers and partnerships that occurred during this period include Noritsu's acquisition of Lucidiom in the photo kiosk software market, Meridian Kiosks' acquisition of King Products, and the purchase of Kiosk Logix assets by Showcase Technology. Other transactions included NCR's acquisition of Netkey (started as Lexitech) and the Self-Service and Kiosk Association merger with the Digital Signage Association to form the Digital Screenmedia Association. The entry of new vendors and acquisitions and partnerships led to new products in the market and strong adoption of kiosks by companies in different industries. Further, the adoption of kiosks in nontraditional industries, such as music and aviation, also led to the strong growth of this market.

Future of Self-Service Kiosks

Self-service is increasingly becoming the standard and is being anticipated and accepted by customers in many different circumstances. Society has come to terms with self-service, and both customers and companies have generally acknowledged its advantages. With the help of self-service technologies, shoppers can save time, avoid human interaction, maintain control, and organizations can save money on human capital. Interactive digital kiosks are being used in more locations and have features that are broader than ever. Currently, self-service kiosks are used in a restaurant for food ordering and are being used across the transportation and entertainment segment for various applications. The current generation of self-service kiosks are more stable and resilient, which has resulted in them being used across different verticals. Hyper-efficient kiosks are being developed; they feature low energy requirements and instant sleep/wake-up modes. Some companies also are providing solar-powered solutions for off-grid service. Self-service kiosks come with a wide range of integrated features and functionality including touch screens, full-color displays, multimedia, speech recognition, and others. Some of the most used types of kiosks also accept payment by card, contactless and even mobile.

With the accelerated pace of technological evolution, greater investment is being made in self-service kiosks, which will enable them to provide even more functionality. Mobile integration with self-service kiosks is being enhanced and extended, and the availability and reliability of this equipment will also be increased by advancements in technology.

Development of Artificial Intelligence-Based Self-Service Kiosks

The development of AI-driven kiosks powered by human intelligence and self-learning skills has the potential to make the current self-service kiosk generation obsolete. Not only can AI-driven kiosks display human intelligence, but they also have capabilities for self-learning. With the help of machine learning, digital kiosks can learn with the help of various learning algorithms. They will continuously keep on learning from variations they come across in every interaction with users. This will enable them to extend their intellect and transcend their own constraints. Subset AI technologies such as natural language processing and computer vision enable touchless kiosks to understand and extract voice and gestures even from nuanced backgrounds. ML algorithms have the ability to minimize background noise, which can enable gesture control interfaces to accurately determine gestures and provide users with answers. These self-learning capabilities will contribute to the growth of AI-driven kiosks across multiple applications.

Tablet Kiosks and All in One Computers - the Future of Self-Service?

Tablet kiosks have recently come to the fore and are steadily replacing traditional self-service kiosks, as more and more businesses tend to use them. Traditional kiosks definitely serve the purposes for which they are built, but they are somewhat bulky, whereas tablet kiosks have proven to be a more compact alternative that come in in smaller sizes and varied shapes. A tablet kiosk can be built into an enclosure and can be used for various purposes. Tablet kiosks can also be connected to devices such as printers, scanners and cash acceptors. For POS systems and self-service/interactive kiosks, tablet kiosks deliver a new range of opportunities. Different variations and sizes of tablet kiosks are being developed to meet ever-growing consumer demands, whether they are self-service kiosks at supermarkets, check-out kiosks for cash payments at convenience stores or a customer-facing kiosk used for inventory queries. Tablet kiosks can be configured as handheld tablets, floor-mounted kiosks, tablet housings, ticket printers, and cash acceptors.

When kiosk software is loaded into a tablets, the software transforms the tablet operating system into kiosk mode to fulfil a particular business purpose or purposes. There is a wide range of factors that push businesses to adopt tablets as kiosks over conventional kiosks.

The first and the most prominent factor is the price differential. Conventional kiosk machines can be very costly and generally range between $5,000 and $10,000 or higher. Tablets cost one-fifth to one-tenth as much as a traditional kiosk, which essentially makes tablets a better choice for SMEs, start-ups and low-turnover businesses.

Another prominent factor is the fact that tablet kiosks require much less space than conventional kiosks, which is advantageous for businesses with a space crunch and small-size retail stores where floor space is minimal, and consumption needs to be measured. On top of that, tablets are the new-age devices that today's consumers are very familiar with and this gives them the requisite comfort level in using the devices.

The portability of tablet kiosks enables business owners and retailers to position them anywhere within the shops and stores where they are easily accessible by customers. As tablets are portable, it is easier to carry them from one place to another to address a business's requirements.

Although both tablet kiosks and all-in--ne computer kiosks are similar, tablet kiosks are comparatively low cost and can be used in light-duty applications where there are proper security and service considerations. Tablets for self-service can be purchased online through websites such as Amazon. Although the specification of these tablets' changes ever year, they are generally available in 7-inch, 10 inch and 12 inch sizes. Tablets generally used in self-service are not weatherproof or shockproof.

All-in-one (AIO) computer kiosks are typically not found on Amazon and generally costlier in comparison to tablet kiosks. The high cost of AIO computer kiosks is largely due to their robustness and their commercial uses. Currently, larger varieties of hybrid models are available which have large touchscreens and have built-in "pluggable" CPU slots (SDM). AIO computers are gaining popularity each year and display sizes between 5 inches and 55 inches are currently dominating the market. Many companies are using AIO computers for digital signage wherein larger screen sizes can be accommodated.

For any self-service project, delivering an unattended self-service solution to customers involves multiple steps and there are specific costs along the way. Formulation, design, manufacture, software development, shipping, and installation are some of the key processes involved in the deployment of a self-service kiosk. Generally, the greatest cost can be service and support over multiple years, which can easily exceed the other factors combined. This often surprises people. Training and service in kiosk deployment are often overlooked components. Also, usage of low-cost, lower-quality products may also increase maintenance costs. Thus, it is imperative for companies to go with the best device rather than a low quality device so total cost cn be controlled over the products life cycle.

Case Study for Poor Selection of Self-Service Kiosk
One major retailer with more than 5,000 bill payment kiosks opted to use a plastic cassette for the currency and did not properly train in-store personnel on removing and replacing the cassette. Six months after deployment, service and replacement costs for that one component grew to more than $400,00 per month, every month.

There are tangible considerations for using tablets as well. Tablets are inherently LESS secure and are almost always consumer grade. When considering digital signage, for example, it is better to get an industrial grade model design for use 24x7 rather than an inexpensive consumer product off Amazon. Replacement costs are high and the downtime factor increases. Consumer-grade tablets and computers often come preloaded with unnecessary software that can provide an attack vector. Tablets are most often used in a purely informational capacity since the lowest-cost models do not offer easy integration of transactional devices. As well, models such as iPads also have few ports and are not designed for device integration.

The lifecycle of a consumer-grade tablet means it is entirely possible that the same tablet model will not be available in a short time.

Tablet kiosks have seen some acceptance (e.g., at Panera with credit card readers) but generally the market has remained fairly consistent at perhaps 10% of the kiosk market.

There are now "tablet kiosks" that exceed a 32-inch display size. They are hybrids and not a typical iPad or Android consumer tablet, however.

While tablet kiosks are becoming a significant portion of the kiosk market, It is wise to remember that they will need a lot more attention.

Some recommended tablet resources include Kiosk Group.

Impact of COVID-19

Since the COVID-19 outbreak was first diagnosed, it has spread to over 200 countries. COVID-19 was first declared a global health emergency by the World Health Organization (WHO) in January 2020. Since then, the emergency has grown into a global public health and economic crisis that has affected the $90 trillion global economy beyond anything witnessed in nearly a century. According to estimates, the virus could reduce global economic growth by 3.0 percent to 6.0 percent in 2020; a partial recovery is possible in 2021 provided there is no second wave of infections.

As the COVID-19 pandemic shattered consumer and business spending, the U.S. economy experienced in the second quarter of 2020 its worst blow since the Great Depression.. Before the pandemic, the U.S. economy was doing well. Unemployment was at a 50-year low and inflation was also below the 2.0% target of the federal government. However, “actual” GDP growth dropped by around 31.4% during the second quarter due to the closure of large segments of the U.S. economy. In the second quarter, the country's unemployment level increased to 14.7%. Though the rate has dropped for five consecutive months, it is still well above the 3.5% reading seen in February. Sports and entertainment, food service, travel and tourism, retail, and hospitality are some of the major sectors in the U.S. economy that were most impacted by COVID-19.

The outbreak of COVID-19 caused the suspension of many major U.S. sports leagues. With major sporting events in the country canceled or suspended, the lockdown led to about 1.3 million sports-related jobs being affected. Sporting events gradually resumed during the months of May/June, but with stadiums remaining empty and matches being played behind closed doors. Across the country many movie theater and other entertainment venues have been closed and film releases have been moved to future dates or delayed indefinitely. Due to cinemas and movie theaters closing, box office receipts have dropped by billions of dollars; streaming has taken the place of movies in theaters. Many blockbusters originally scheduled to be released between March and November have been postponed or canceled around the world, with film production also halted. Similar scenarios were also witnessed across segments such as amusement parks, museums and other tourism sectors. All these factors have had a significant impact on the market for self-service kiosks in the media and entertainment sectors.

The hospitality segment is among the most severely affected in the U.S. due to COVID-19. According to a study conducted by the American Hotel & Lodging Association, nearly two-thirds (65%) of hotels in the country remain at or below 50 percent occupancy, which is way below the threshold at which most hotels break even and pay off debt. Urban hotels are struggling the most and are currently facing an occupancy rate of 38 percent, which is slightly below the national average. COVID-19 has left hotels struggling to remain in operation across major cities in the country and this has resulted in significant job losses and a dramatic decrease in state and local tax revenue. Thousands of hotels are unable to afford to pay their mortgages and face the risk of foreclosure and permanently shutting their doors. Owing to these massive revenue losses, many hotels in the nation are delaying their investment on infrastructure, which is expected to have a direct effect on the demand for self-service kiosks. It is

estimated that contact-less services such as self-check-in kiosks, online check-in and check-out, and digital key technology is expected to witness significant growth post the COVID-19 era.

The closures due to the COVID-19 pandemic have significantly affected the United States restaurant industry, contributing to layoffs of employees and loss of revenue for restaurants and owners and threatening the existence of independent restaurants as a business segment. Within a week after the first closures, business associations representing independent restaurateurs asked local, state and federal governments for immediate relief measures, saying that as many as 75% of independent restaurants could not withstand more than a few weeks of closures. Nearly 16,000 restaurants were permanently closed by late July. By ramping up outdoor dining, curbside pickup and food delivery service, the restaurant industry has steadily adapted to the pandemic. While before the pandemic, digital transactions and delivery penetration were still gaining traction, the pandemic rapidly hastened this transition, accomplishing in months what was expected to take years. Thanks to increased mobile apps, the use of online platforms has soared. In many instances, as of late April and early May, casual dining-to-go sales volumes tripled or quadrupled, sometimes outgrowing a restaurant's own delivery efforts. COVID-19 has significantly increased the adoption of self-service kiosks across many restaurants in the country. The desire of consumers to avoid contagious diseases is accelerating the adoption of kiosks even more. Many restaurant owners around the nation claim that kiosks will become a staple of mainstream ordering and are experiencing an unparalleled number of consumer demands for instant installations of kiosks especially at quick-serve and fast-casual restaurants. A large portion of this demand is coming from big restaurant chains that need kiosks across multiple facilities.

The travel and tourism sector is among the hardest hit economic sectors in the U.S. due to COVID-19. The sector experienced a rapid and sharp drop in demand and a surge in job losses, and many small and medium size businesses are at risk. According to the U.S. Travel Association, the losses to the U.S. tourism industry due to the coronavirus are estimated to be $910 billion. According to Airports Council International-North America (ACI-NA), U.S. airports are projected to lose at least $13.9 billion in 2020 in response to the coronavirus (COVID-19) global health pandemic. The losses are largely attributed to the abrupt decline in passenger numbers. The precipitous decline in the consumer travel and tourism industry has caused a significant decline in the demand for self-service kiosks across the transport industry.

Consumer Perception Towards Touchscreen Kiosks and Growth of Contactless Payments

As consumers across the world continue to deal with the COVID-19 pandemic, there are few changes in habits that are more pronounced than how people view the risks in touching surfaces. This poses a key problem for touchscreen end users, since customers obviously have to touch a screen their finger; at times, gloved hands might not work as accurately on the screen. Kiosk operators have to ensure touchscreens are cleaned regularly. It is important to safely clean the touchscreen to remove oils, dirt, grime, and germs.

To overcome these problems, businesses had to place hand sanitizer and screen wipes at interactive kiosks with reminders for people to use them both before and after touching the screen. Many self-service kiosks were also embedded with UV-C disinfection technology and products. The usage of UV-C technology inactivates microorganisms at the genetic level by scrambling their cellular DNA; UV-C technology has been proven by independent testing to eliminate 99.9% of deadly pathogens on high-

touch surfaces. Surfaces such as IT equipment, workstations on wheels (WOWS), portable medical equipment (PME), and other high-touch surfaces, including those inside the hotel and restaurant industry, can be cleaned constantly by the no-touch, self-disinfecting system. Also, many businesses started moving towards the adoption of touchless kiosks allowing customers to simply speak to a display for whatever task they want to accomplish. Other companies, however, are finding ways to help keep touchscreens clean. The consumer apprehension toward touchscreens is seen to a great degree in hospitals and other healthcare facilities. On the other hand, touchscreen kiosks reduce the amount of face-to-face contact between staff and visitors asking for basic information. In certain cases, a stylus or some kind of special pen can be used to operate a kiosk.

Another big development concerning self-service kiosks is the growing use of contactless payment systems. With cash viewed as a vector for transmitting COVID-19, many businesses have taken steps to restrict the amount of cash transactions, which in turn is expected to positively affect the growth of contactless payment. Although self-service kiosks have seen declining use in terms of cash payments over the years, the COVID-19 pandemic has served to accelerate this decline, owing mainly to findings by scientists that the “infected” cash may cause human-to-human transmission of the disease.

In order to mitigate personal risk and avoid further spread of the virus, more customers than ever have used contactless cards during the pandemic. With that payment behavior solidly established in the past few months, customers are unlikely to return to paying with cash. In the U.K., authorities raised the contactless payment cap from £30 ($37.01) on April 1, 2020, to £45 ($55.52), enabling customers to make contactless payments for more purchases instead of handing over cash. In the U.K., the payments industry is actively working with retailers to raise the credit/debit card payment cap to aid consumers with their purchase at this crucial period. This would offer more people the option of using cards to pay for products rather than having to wait in line.

In a survey conducted in second quarter of 2020, Mastercard found that 82% of respondents worldwide now viewed contactless as the cleaner way to pay, and 74% said they will continue to use contactless payment post-pandemic. Many people have also avoided withdrawing or handling potentially "dirty" cash, so ATM use has fallen by more than 60%. Consumers are afraid that cash handling is dirty, and that the illness will transfer through handling money. The retail industry has adapted to the panic by mandating card-only payment, and even refusing to accept cash. This shift in consumer behavior and attitude towards cash, combined with concerted attempts by retailers and banks to push customers towards contactless payment, has significant consequences for self-service in that devices with cash-only payment will be increasingly unused by the vast majority of the population.

Contactless Payments Growth in U.S

With contactless payment already being on the rise, the coronavirus pandemic has heightened the use of contactless payments in the U.S. According to MasterCard's Contactless Customer Polling results, more than half the American population (more than 51 percent) are currently using some form of contactless payment. The survey also noticed a major change in consumer behavior towards greater use of contactless payment systems, owing to the prevalence of the pandemic. The increased use of mobile payments is partly due to concerns about the cleanliness of signing at the point of sale (POS), and the security of actually paying with a mobile device. The survey also found that half (50%) of Americans are worried about the cleanliness of their signature pads and that 72% of Americans would prefer to skip the signature altogether.

Many Americans are starting to use contactless cards without having thought of how they want to pay. About a third of Mastercard respondents have turned away from the card they once used for top-of-wallet transactions due to protection and convenience issues surrounding the coronavirus. This figure skyrockets to 43% for those under the age of 30 (in America, those under 35). In response to this point, rewards and incentives have significant impacts on what credit card a customer selects.

Growth in Demand for Touchless Kiosks

COVID-19 has dramatically changed consumers' perception of the hygiene risks of touchscreens in self-service kiosks. Although the concerns related to the hygiene levels of touchscreens in interactive kiosks were initially raised in 2018, the consumer focus on this has increased significantly during the COVID-19 pandemic. Across the world people are resorting to a multitude of low-fi hacks to avoid putting their hands in contact with public surfaces. To counter the increasing consumer apprehension towards self-service kiosks, leading kiosk providers across the world are developing solutions that provide contactless interfaces and interactions. Currently, the technology being used in touchless solutions include voice control, gesture controls powered by hand tracking and mid-air haptics, and contactless mobile systems. Many other companies are coming up with solutions that can change their current touchscreen solutions to touchless kiosks. For instance, Kiosk Innovations' foot-controlled (Foot-Nav) and gesture-controlled (Gesture-Nav) can be installed on any current or new kiosks with a USB connection. These devices use basic up, down, forward, backward, and enter/select keys for navigations. At the same time, they can be combined. The user can use either the foot pedal or the gesture-controlled module. For those who prefer to do it conventionally, the touch screen is still available.

Touchless kiosks can benefit both users and organizations that invest in them. Users can benefit from enhanced interaction and better hygiene. Organizations, on the other hand, can benefit from reduced maintenance costs and an opportunity to reach broader audiences. Consumer demand for touchless technology is being witnessed across all major end-user segments including supermarkets, big box retailers, airports, hospitals, and restaurants. Some of the major developments in touchless kiosk solutions are mentioned below.

22Miles developed a Voice Activation/Recognition & Control solution which makes user experience faster and more efficient. Voice response technology promises to add new interactivity for self-service devices, making it easier for the average person to use; it will also enhance the experience that business owners are looking for. Audio-enabled screens powered by RealSense enable users to speak their requests and commands to the screen when standing within speaker proximity.

Kiosk Information Systems has developed a touchless solution which combines conversational AI with digital kiosk technology so that customers and patients have the choice to use self-service solutions without the need to touch the screen. KIOSK has partnered with Valyant AI to develop a contactless solution. The solution enables touchless kiosk interactions with AI capable of driving the visual display and software to deliver intuitive user interfaces that require the least amount of button presses possible. Applications for this solution include self-ordering for hospitality, and in particular QSRs, as well as contactless self-service kiosks at hospitals to help with healthcare questions and triage to billing inquiries.

Increase in Usage of Mobile Phones for Self-Ordering

The COVID-19 pandemic has led to a significant increase in the use of mobile phones for self-ordering and other self-service applications. For mobile ordering, the effects of the pandemic were massive, pushing more customers to download restaurant and retail applications and sign up for loyalty programs. Over the last few months, numerous chains have reported skyrocketing mobile app use. The outcome has created an incentive for the industry to drive more business and brought new opportunities for operators that did not expect the growth before the pandemic. The pandemic has pushed buyers online, prompting more businesses to unleash mobile ordering functionality or improve their existing apps to retain these customers and generate more sales.

Major retailers and foodservice companies in the U.S. are enabling their consumers to download a kiosk application to minimize their interaction with physical self-service kiosks. A kiosk application generally is used to convert the normal mobile devices, handheld endpoints and digital signages into kiosks running only the applications and websites whitelisted by the company IT admin. A kiosk application locks the user's mobile devices or other endpoints such as tablets, laptops, PCs or smartphones, wherein they can conduct a limited task on the devices, such as searching only whitelisted websites and accessing only whitelisted apps. For encouraging the usage of contactless payment due to COVID-19, many self-service kiosks are being enabled with electronic payment technology which allows remote payment using mobile devices allowing contactless payment.

One such touchless interface solution that is used for self-service applications is KioTouch, developed by KioWare. KioTouch enables the end-user to use their own personal mobile device to operate a self-service kiosk. The user scans a QR code from the kiosk's screen, which then opens a mouse-style trackpad interface on their mobile device which they can be used to send commands to the kiosk. Scrolling, swiping and clicking gestures enable the user to interact as they usually would with the kiosk, but without touching it. KioTouch also enables users to enter sensitive information safely and securely into custom fields using the keyboard on their mobile device.

KIOSK Information Systems also launched a touchless kiosk solution which provides a QR code-based technology that enables users to operate the kiosk using their smart phone. The user simply scans the QR code presented on the kiosk screen and conducts the kiosk transaction without touching the kiosk screen by just using their smart phone. For business operators, the QR code technology avails several benefits including a low level of effort to deploy as it runs simultaneously with their application (no need to modify the software), increased efficiencies with capture of usage metrics and a more seamless customer experience.

Regulatory Impacts

Since kiosks are products that are accessible at public facilities, they are subject to different kinds of regulations and must comply with federal standards. Although not all of these regulations are mandatory it is certainly recommended that companies comply with these regulations to avoid additional problems in the deployment phase. Some of the regulations that companies should consider for compliance include ADA (Americans with Disabilities Act), PCI (Payment Card Industry Data Security Standard), HIPAA (Health Insurance Portability and Accountability Act) and FDA Standards. Businesses which fail to comply with these standards may face significant fines from regulatory bodies. For instance, for failing to comply with ADA standards, businesses have to pay a maximum civil penalty of around $75,000 to $150,000 for subsequent violations. Large retailers are also subject to class-action

lawsuits. Over the last few years, manufacturers and operators of kiosks have been subject to an increasing number of high-profile class-action lawsuits alleging non-ADA compliance.

ADA & Accessibility

The primary goal of the ADA guidelines for self-service kiosks is to ensure that these devices can be accessed and used by users with mobility limitations and hearing/vision impairments on the same level as users with no physical disabilities. ADA compliance is not only applied to kiosk units, but it also applies to its components such as the touchscreen, the peripherals and the area surrounding the kiosk.

ADA standards when it comes to physical kiosk accessibility include:

Forward Reach Limits

- If a kiosk can be accessed via a forward reach and is unobstructed, the maximum height of the touch screen is 48 inches and the minimum height of the touch screen is 15 inches.

- If there is an obstruction in front of a kiosk (such as a countertop) and the depth of the obstruction is 20 inches or less, the maximum height of the touch screen is 48 inches. The floor must be clear underneath the obstruction at an equal or greater depth.

- If the obstruction exceeds 20 inches, the maximum height of the touch screen is 44 inches, and the maximum depth of the obstruction is 25 inches. The floor must be clear underneath the obstruction at an equal or greater depth.

Side Reach Limits

- If a kiosk is only accessible via a parallel approach and the side reach is unobstructed, the maximum height of the touch screen is 48 inches and the minimum height is 15 inches.

- If there is an obstruction (such as a countertop) in front of a kiosk and the obstruction depth is 10 inches or less, the maximum height of the obstruction is 34 inches and the maximum height of the touch screen is 48 inches.

- If the obstruction depth exceeds 10 inches, the maximum depth of the obstruction is 24 inches, the maximum height of the obstruction is 34 inches and the maximum height of the touchscreen is 46 inches.

Protrusion Limits

If a kiosk is wall-mounted and has nothing below it to alert someone with visual impairments navigating with a cane to its presence, it can have a maximum depth of 4 inches from the wall, a minimum height of 27 inches and a maximum height of 80 inches.

Floor Space Requirements
It is the responsibility of the kiosk owner to provide adequate floor space around the kiosk to accommodate wheelchair users. Floor space requirements are outlined in their own section of the ADA website.

Recommendations by KMA for Accessible Kiosks Distribution

- It is recommended that only 'accessible' kiosks be installed until 25% of the total kiosk population in any given location, grouping, common purpose, or application meet Standards for Accessible Design.

- This minimum kiosk population density applies to owned, jointly owned, leased, shared use, controlled, franchised, or operated kiosks or other ICT terminals deployed in public spaces, public amenities and in places of public accommodation or service.

- To comply with the ACAA Standards for Accessible Design only 'accessible' kiosks should be installed until 25% of the kiosk population meets the requirements for Accessible Design.

- To comply with the ACAA, 25% of the kiosk population, located together for a common purpose(s), in a group, line or other configuration, must be compliant by December 12, 2022.

The Kiosk Manufacturer Association has a complete compendium of accessibility ramifications in unattended self-service. This includes current requirements as well as Proposed Code of Practice, which covers voice command and other emerging accessibility technologies.

Access Board Regulations

The Architectural and Transportation Barriers and Compliance Board, also known as the Access Board, is an independent federal agency devoted to accessibility for people with disabilities. In September 2017, as part of an effort to add clarity to the steps that kiosk deployers must take to accommodate disabled users, the Access Board released a final rule for electronic and information technologies used by federal agencies, as well as guidelines for customer premises equipment and telecommunications equipment, including kiosks.

Access Board rules for kiosk accessibility fall into two categories: Section 508 of the Rehabilitation Act of 1973, which is specific to federal agencies, and Section 255 of the Communications Act of 1934, which covers public deployment of telecommunications equipment and customer premises equipment such as kiosks by any manufacturer or service provider.

Some of the standards set out in the Access Board's 2017 guidelines:

- In general, devices with a display screen shall be speech-output enabled for full and independent use by individuals with vision impairments.

- Speech output shall be provided for all information displayed on-screen.

- Where transactional outputs are provided, the speech output shall audibly provide all information necessary to verify a transaction.

- Speech output shall be delivered through a mechanism that is readily available to all users, including, but not limited to, an industry-standard connector or a telephone handset. Speech shall be recorded or digitized human or synthesized. Speech output shall be coordinated with information displayed on the screen.

- Where speech output is required, braille instructions for initiating the speech mode of operation shall be provided.

- Devices that deliver sound, including required speech output, shall provide volume control and output amplification.

- At least one mode of characters displayed on the screen shall be in a sans serif font. Where ICT does not provide a screen enlargement feature, characters shall be 3/16 inch (4.8 mm) high minimum based on the uppercase letter "I." Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

- At least one mode of operation shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.

PCI Regulations

The PCI Security Standards Council is an open global forum responsible for the continuing development, progress, dissemination, and implementation of payment cardholder account data security standards. The mission of the PCI Security Standards Council is to improve the security of payment account data by driving education and understanding of the PCI Security Standards, including specifications for the Data Security Standard (DSS), Payment Application Data Security Standard (PA-DSS) and PIN-Entry System (PED).

Kiosks which accept card payments are required to comply with the data protection standards of the Payment Card Industry Security Standards Council. Protecting cardholder details from unauthorized access are the key aim of the PCI DSS specifications. While enforcement of PCI DSS standards is expensive and time-consuming and requires annual certification, the non-compliance with these standards, in the long run, would lead to higher costs. Penalties for non-PCI DSS compliance include substantial fines from the card schemes, as well as liability for fraud losses resulting from data breaches, not to mention the loss of customer confidence.

PCI DSS has 12 core requirements, which include encryption, network security, firewalls, and access controls. PCI DSS demands that kiosks and other payment terminals be physically protected and tamper-resistant so that no one can access the computer inside the kiosk through the kiosk enclosure. Kiosks must also use application software built in accordance with the PCI SSC Payment Application Data Protection Standard and should use encrypting PIN pads that comply with the PCI PIN Transaction Security Point of Contact standards in addition to complying with PCI DSS.

Network security is another key issue that is addressed by the PCI compliance standards. In order to be PCI compliant kiosks should never store payment card numbers locally and they need to provide a secure network connection, whether via Wi-Fi, a cellular connection or a hardwired connection. To avoid a hacker from taking control of a kiosk, best practice in the industry calls for the operating system of the kiosk to be locked down so that only licensed applications can run on the terminal. A key requirement of the PCI DSS is that payment terminals must be kept up to date with their operating system's new security patches. Running point-to-point encryption technology would make it easier to achieve PCI DSS compliance for kiosk operators. P2PE encrypts a card number as soon as the card is entered into the card reader of a POS terminal or kiosk. For decryption, the encrypted card number is then transmitted to the processor over the network. Since the merchant does not have access to the security key required to decrypt the number of the card, P2PE provides a high degree of security and thus decreases the overhead of the merchant's PCI DSS enforcement.

Another security technology which helps in protecting cardholders at kiosks and POS terminals is tokenization. In a tokenization system, the card number is automatically replaced by a unique numerical identifier called a token when a customer uses a card for a transaction. Tokenization and point-to-point encryption remove or render information from payment cards useless to cyber criminals and work to provide additional protection for payment card data in compliance with other PCI standards.

With regard to loading of private or secret keys, regulations specify that POI devices must support one or more of four specified techniques for the loading of private or secret keys. Methods a and b are for plaintext key loading and methods c and d are for encrypted key loading. The requirement specifies that EPPs and OEM PEDs intended for use in an unattended environment shall only support methods a, c and d. It further specifies that SCRPs shall only support the loading of encrypted keying material.

New Developments: In December 2020, the Kiosk Manufacturer Association (KMA) announced the launch of new initiatives in the PCI Compliance space for unattended self-service kiosks. Those initiatives include providing content for the PCI Perspectives Blog, creating a SIG or Special Interest Group on PCI SSC for unattended and semi-attended transaction, as well as new guidepost content from sponsors and members outlining best practices. The KMA has a standing PCI Compliance committee and a Slack-based working group. Members include OTI Global, Unattended Card Payments (UCP), Datacap Systems, Ingenico, KioWare, Olea Kiosks, Lilitab, and Self-Service Networks.

EMV Regulations

EMV is defined as “a payment method based upon a technical standard for smart payment cards and for payment terminals and automated teller machines that can accept them.” EMV “smart cards” store their data on integrated circuits in addition to the traditional magnetic stripes. According to financial services company FirstData, EMV chip cards transmit a variable algorithm that varies with each transaction, making the data more reliable than what is used on magnetic stripe cards. Companies had until Oct. 1, 2015, under EMV standards to make their payment processing equipment EMV-complaint. If a fraudulent transaction happened with a merchant who had not updated their equipment, the merchant would have to assume the expense of the transaction along with any penalties or fees that could be imposed. Although EMV requirements were reasonably straightforward for in-person transactions, such as those in a grocery store's attended checkout register, when it came to transactions on an unattended device, such as a self-service kiosk, they were a bit murkier.

EMV adoption is still in the early stages of adoption in the self-service industry. Although the deadline for merchants to bring payment devices into compliance with EMV standards was passed in 2016, there are still many non-compliant devices in the marketplace. To increase the adoption of this technology, several measures are being taken to improve the protection of the payment devices deployed in self-service from both a hardware and software perspective. One of these measures includes the usage of PCI-certified devices in a point-to-point-encrypted environment with secure read encrypted device capability, known as SRED. In this way to ensure confidentiality, all card data is encrypted at the time of the transaction.

The use of a PCI-certified EMV solution has many advantages. These solutions not only ensure end-to-end protection of payment transactions, but also ensure that rogue devices and skimmers cannot be inserted, or card readers be disabled without disconnecting anti-tamper switches. From a customer viewpoint, when making a purchase at an EMV-enabled self-service kiosk, it gives them confidence to use their payment cards, which offers a similar experience to the one they are used to at a brick-and-mortar store. From an operator perspective, it gives them the future security of being compliant with EMV, particularly as unattended solutions begin to offer higher-priced products.

HIPAA Regulations

For companies to maintain HIPAA compliance and prevent HIPAA violations, companies need to properly secure data. The HIPAA Security Rule PHI (protected health information) focuses on confidentiality, integrity, and availability. Confidentiality implies that for unauthorized individuals or procedures, data or information is not made accessible or disclosed. Integrity ensures the data or information in an improper way has not been changed or lost. Availability means that data or information is only available and usable by an authorized person upon request.

In response to a substantial rise in computer-related information violations in recent years, regulations of the Health Insurance Portability and Transparency Act (HIPAA) and the Health Information Technology for Economic and Clinical Health Act (HITECH) have become tighter and penalties have become more serious. With health information valued as worth twice as much as other information on the underground market, making privacy and security protection an integral part of the production of technology development, rather than an afterthought, not only mitigates risks, but also helps to ensure compliance with HIPAA and HITECH.

Self-service kiosks with privacy filters strike the balance between accessibility and security of information. HIPAA-compliant privacy touch screens provide the ease and service of an interactive self-service kiosk while shielding sensitive information from users. Many self-service kiosks which are currently being upgraded with privacy filters are suitable for open or high-traffic environments where it is important to retain sensitive on-screen data. These systems are particularly ideal for healthcare facilities and banking centers, registration, and government services as well as other self-service kiosks and interactive applications. These privacy filters block ambient light and narrow the viewing angle so that on-screen data can only be viewed by a person positioned directly in front of the display. Although other viewers see only a solid black screen from a side perspective, no blurring or image distortion is encountered by the current user. This revolutionary technology ensures vividly clear image quality and reduces the glare of the screen to help avoid eyestrain. Privacy filter integration does not affect the functionality or responsiveness of the touch screen and offers extra protection from dust and dirt for the display.

FDA Regulations

The United States Food and Drug Administration (FDA or U.S. FDA) is a federal agency of the Department of Health and Human Services. The FDA is responsible for protecting and promoting public health through the control and supervision of food safety, tobacco products, dietary supplements, prescription, and over-the-counter pharmaceutical drugs (medications), vaccines, biopharmaceuticals, blood transfusions, medical devices, electromagnetic radiation emitting devices (ERED), cosmetics, animal foods and feed, and veterinary products.

FDA regulations in the self-service kiosk market mostly apply to self-service kiosks used for temperature sensing. The usage of temperature sensing kiosks exploded across the country due to the COVID-19 pandemic. Temperature sensing kiosks generally do not need any contact from the users except to approach the terminal. A thermal imaging camera or thermopile temperature sensor is usually used to determine surface temperature (usually the forehead). Thermal imaging systems will drill down to the inner canthus, which provides a temperature that is more representative. Temperature kiosks were largely unregulated by the FDA until August 2020. In October, the FDA released new guidelines on the use of thermal imaging devices, temperature check and fever detection. The FDA issued the Enforcement Policy for Telethermographic Systems during the Coronavirus Disease 2019 (COVID-19) Public Health Emergency guidance to help expand the availability of thermal imaging systems and mitigate thermometer shortages during the public health emergency. The guidance sets forth an enforcement policy that is intended to apply to all thermal imaging systems that are intended for medical purposes for the duration of the public health emergency related to COVID-19 and provides recommendations regarding performance and labeling of such systems.

Market Drivers

The key market drivers for the self-service kiosks market include:

- Self-service kiosks enhance the consumer experience in the QSR and retail segments.
- Self-service kiosks increase revenue and reduce operating costs.
- Growth in use of kiosks by smart cities.
- Increasing demand for contactless payment.

Self-Service Kiosks Enhance Consumer Experience in the QSR and Retail Segments

In the fast service restaurant (QSR) and retail sectors, self-service kiosks are gaining popularity as a method to enhance customer service and enable better use of a pared-down workforce. By increasing the speed of ordering, self-service kiosks in quick service restaurants will significantly save time. With the help of self-ordering kiosks restaurants can take orders more easily. Self-ordering kiosks also increase the precision of the order and decrease the chance of human error. Self-service kiosks in QSRs can reduce the counter's overall friction and have become a fantastic tool to boost spending and encourage more consumer loyalty. Many large and small QSRs around the United States are expected to increase their spending on self-service technologies even after the COVID-19 vaccine roll-out is completed. Many QSRs in the country predict that self-service kiosks will boost the consumer experience by enabling consumers to search options at their own speed and freeing up more staff to deliver food and connect with customers.

In the retail sector, kiosks play a key role in transforming the way consumers interact with a brand. With the aid of self-service kiosks, retail stores can offer each customer a targeted selection of items and reduce the problems of stock overloads. Self-service kiosks play a crucial role in bridging the gap between physical and virtual stores in retail. Self-service kiosks play a key role in boosting the customer experience in the retail setting by handling customer queuing effectively. A supermarket self-check-out kiosk helps clients to search and pay for their items without the support of a cashier or sales associate. This successful approach enables sales associates to redirect their energy to customer service. Order-pickup kiosks can assist retailers to speed up the order pick-up process and simplify it. When it is loaded, clients can position their orders online or in-app and pick up their order from the locker. A strategically positioned interactive kiosk in retail offers the ability to search for more information, browse the new in-store catalogue, check stock at other locations, and more. Kiosks also provide customers with a great opportunity to track, use and sign up for loyalty programs, with exclusive offers available when they review their in-store accounts.

Self-Service Kiosks Increase Revenue and Reduce Operating Costs

Self-service kiosks greatly boost customer continuity and increase business performance in multiple end-user segments. A kiosk generates a high ROI by increasing sales and reducing operating costs. In addition to the major advantages provided to a company by satisfied customers, kiosks are becoming more and more affordable, and this drop in kiosk costs will help small to medium-sized companies to remain competitive. Studies conducted through restaurants and retail outlets have shown that customers who interact with self-service kiosks typically buy 10% to 30% more than customers who interact with business employees. Self-service kiosks often play a key role in up-selling, as add-ons and promotions visually displayed to consumers on the kiosk prompt customers to add more to their orders. Due to the increase in sales that using kiosks yields, businesses are expected to make a quick return on their investment.

Kiosks help businesses save costs in many ways, as well as make more money from increased ticket sales. By automating the ordering process and freeing up counter space, kiosks help make available square footage more efficient. Kiosks can be placed in strategic locations by restaurants to help direct traffic for dine-in customers and freeing up more space. In addition, kiosks can be used to free up employees from mundane tasks. Kiosks free up time for things of greater importance that are more important to the customer, such as preparing food and keeping the restaurant clean. Self-service kiosks often help companies learn useful information about their clients and their buying habits. This knowledge can be used by companies to tailor promotions, boost sales and deepen customer loyalty. Kiosks can also be used to optimize discounts and offer add-ons. This helps businesses both increase revenue and serve their customers more accurately.

Growth of Smart City Kiosks

Many city leaders across the United States are looking to technology as an instrument to better serve citizens while reducing the tax burden. Technology is being injected more deeply into the lives of residents. A key component of this technology involves the smartphone, which can be utilized to provide instant updates on transit schedules, traffic, health facilities, safety warnings, and community news. Smart cities are putting data and digital technology to work to make better decisions and improve the quality of life. More accurate, real-time data enables agencies the opportunity to track events as

they happen, understand how demand trends shift, and react with solutions that are quicker and less costly.

As a part of this transition towards smart cities, static signage is being replaced with interactive kiosks for greater public engagement and seamless updates of digital content. A major emphasis on these interactive kiosks is being placed on functionality and aesthetics and they are built to be modern, open, realistic, and to withstand the rigors of daily use. Without the need for cranes or forklifts, installation of these kiosks is also simple and provides quick access to the monitor for maintenance. Smart city kiosks are being used for wayfinding, contacting emergency services, sharing important city data such as restaurant information, local attractions and events, providing up-to-date public transport news, introducing interesting city stats, and even games.

For example, St. Louis, Mo., deployed its first group of interactive smart digital kiosks in the city in January 2020. City officials expect that up to 50 new kiosks will be located in communities throughout the city by the end of this year, with more expansion expected for 2021. These kiosks provide sidewalks with lighting, increase protection, and provide an emergency two-way call button for contact that initiates a 911 call to law enforcement and first responders.

Increasing Demand for Contactless Payment

Contactless payment refers to a safe way for customers to buy goods or services through the use of radio frequency identification (RFID) technology and near-field communication (NFC) technology using a debit, credit, smart card, or other payment device This payment method works by tapping a payment card or other device close to a point-of-sale terminal fitted with contactless payment technology. Contactless payment is often referred to by some banks and retailers as tap-and-go or tap.

Contactless payments took a while to arrive in the U.S., but this transaction process is experiencing a growth spurt in the retail world, a trend that seems most likely to continue through 2021. Retailers have registered a 69% rise in contactless transactions since January 2020. With 94% of retailers expecting further contactless payment growth over the next 18 months, the trend promises to continue into 2021 and beyond. Contactless payments still have sufficient space for expansion in U.S. retail. Touchless methods of payment are a vital part of ensuring the health of retail employees and customers, but they pose concerns about the security of payments and the fees paid to merchants to process transactions.

Self-service kiosks are generally equipped with contactless payment terminals. They enable customers to make payments through debit cards, credit cards, or devices such as smartwatches and smartphones that are NFC-enabled. These transaction modes are very safe, easy and fast, helping merchants reduce waiting time and enhance the experience of in-store payment. Thus, the growing acceptance of contactless payments during the forecast period is expected to help fuel the growth of the self-service kiosk industry.

Market Restrains

The key market restraints for the self-service kiosks market include:

- Increasing cyberattacks.

- High initial costs.

Increasing Cyberattacks

Although kiosks have a wide range of benefits, security is often a secondary concern for many kiosk software companies, which concentrate primarily on ease of use and ease of management. Self-service kiosks, since they are often installed on the same network as other company workstations, such as cash registers, are highly vulnerable to hacking. This makes it very simple for hackers to get into the networks they are linked to that are extremely accessible. Unmanned and stationary kiosks have become an enticing option for hackers. According to a 2018 Positive Industries survey, when hackers employ certain forms of attacks, most kiosks can be hacked in less than 20 minutes. Network attacks, deactivation of the kiosk mode, and card data theft are some of these attack types.

Kiosks are also susceptible to multiple threats, such as ATM jackpotting, PIN stealing, malware attacks, web application vulnerability exploitation, browsers, USB ports, etc. Standard security measures such as firewalls, antivirus and encryption do not always offer adequate threat protection. Some of the most common types of cybersecurity threats to self-service kiosks include:

Physical Attacks: Portable drives and portable media such as USBs, CDs and hard drives may make business data vulnerable. Large companies that hire contract employees to operate kiosks are at higher risk because these workers can easily obtain access to internal networks. When hackers have access to these devices, they can hijack them and load them with malware or viruses that can read the information on kiosks.

Attacks on Operating System: Many dedicated-use kiosks run on an outdated, unpatched version of Windows in locations where maintenance is difficult (such as in remote, high-traffic tourist areas). This saddles customers with a sluggish and obsolete interface and puts the kiosk at great risk of being compromised, but their owners do not feel the need to upgrade them because they are still technically running. Embedded devices often use hardware and software that is obsolete. In January 2020, when Microsoft ended support for Windows 7, devices running Windows 7 became an easy target for hackers.

Attacks on Kiosk Applications: The applications installed on the kiosk are also vulnerable to attacks of various kinds. Many businesses use visitor management systems to greet visitors to businesses and services. Companies buy software for visitor management and set it up on PCs or handheld devices such as tablets. These systems can leak information in different ways, such as during periods of inactivity or shutdown, or allow an attacker to plant malware or access data to run an application as a non-privileged user.

High Initial Costs

Many businesses are automating the sales process using smart kiosks, but which can require huge capital investment. These costs include purchase costs, process costs and maintenance costs. In addition, during the continuing pandemic, companies often face difficulties in responding to changing hourly needs. Businesses may already be suffering from a serious cash shortage, resulting in some of their employees being laid off. This may influence business behavior in the next few years, as companies look for ways to recover from the effects of the pandemic while incorporating new, pandemic-induced methods of operation.

Chapter 4

Self-Service Kiosks Market by Application

bccPublishing

Chapter 4: Self-Service Kiosk Market by Application

Introduction

A self-service kiosk is an interactive device that enables a customer to connect with a business directly, and conduct a transaction at the customer's convenience. An interactive device for buying tickets for a train or bus is a common example of a self-service kiosk. The user simply has to go to the self-service kiosk, pay, and get a ticket, all without standing in line or asking for help. Self-service kiosks are also commonly used in quick service restaurants where the intended purpose is to speed up the ordering and waiting process for food. Not only do these kiosks apply to commercial aspects, but they are also very useful for checking in and out of hotels, offices also use them to check in their suppliers and airports use self-service kiosks for self-check-in and other applications which save time for both consumers and airlines.

Depending on the industry in which they are used, self-service kiosks offer advantages for both customers and business. Some of the advantages of kiosks for self-service include:

- Fewer employees are needed to service customers/passengers, resulting in savings to the company.
- Workers are freed up for tailored/enhanced customer support.
- Less queuing and reduced customer/passenger waiting times, which also helps to alleviate the burden on customer service employees.
- More individuals can be served in a shorter period of time, increasing production and associated income.
- The customer's experience is improved, as they have power over searching or checking in/out details.
- An adaptable and changing solution, as the technology used can be updated without having to overhaul the entire kiosk in many cases
- Ability to offer different features and functions; the same kiosk can provide data as well as take payments, print tickets and generate more revenue through upsells and ads
- Smaller kiosks, such as tablet kiosks, can also be customizable, which is great for ergonomics, usability and means that they can be moved to suit the company's needs when needed

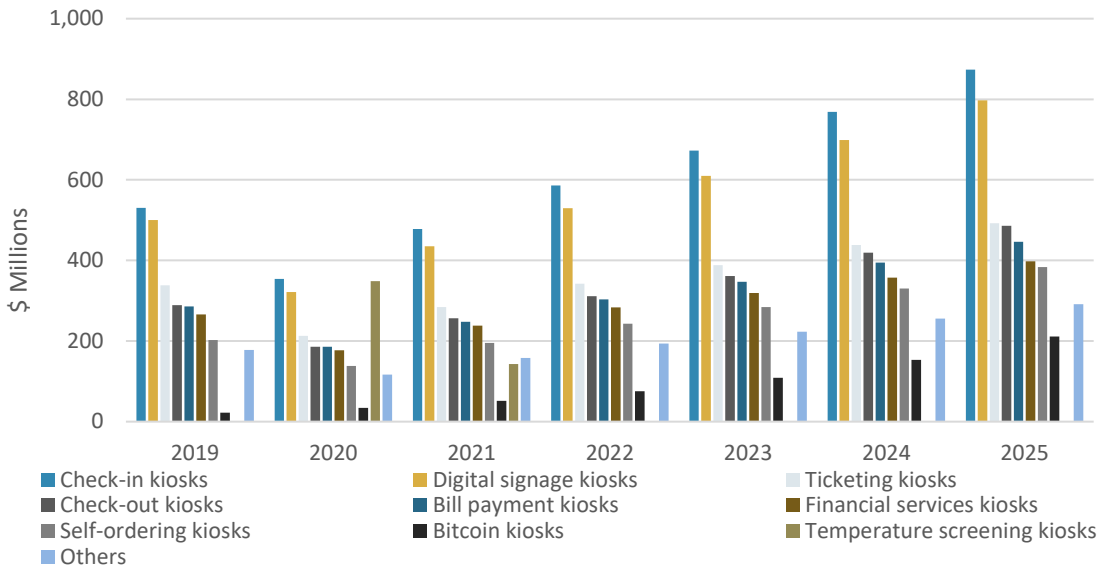
In this report, the U.S. market for self-service kiosks based on application has been segmented into Check-in Kiosks, Check-out Kiosks, Financial Services Kiosks, Ticketing Kiosks, Self-ordering Kiosks, Bill Payment Kiosks, Digital Signage Kiosks, Bitcoin Kiosks, Temperature Screening Kiosks, and Others.

Table 1
U.S. Self-Service Kiosks Market, by Application, Through 2025
($ Millions)

Application	2019	2020	2021	2022	2023	2024	2025	CAGR% 2020–2025
Check-in kiosks	530.5	354.0	478.2	585.8	672.5	768.3	873.6	19.8
Digital signage kiosks	500.3	321.9	435.2	529.6	609.5	698.5	797.2	19.9
Ticketing kiosks	338.0	212.6	284.0	342.4	388.4	438.3	492.2	18.3
Check-out kiosks	289.0	185.5	256.8	310.9	361.6	419.6	485.9	21.2
Bill payment kiosks	285.8	185.5	247.9	303.0	346.9	394.6	446.2	19.2
Financial services kiosks	265.8	177.0	237.9	283.8	319.3	357.3	398.1	17.6
Self-ordering kiosks	202.6	138.2	195.3	242.8	283.9	330.6	383.4	22.6
Bitcoin kiosks	22.2	34.2	51.4	75.6	108.6	152.9	211.0	43.9
Temperature screening kiosks	-	348.6	143.3	-	-	-	-	
Others	177.5	116.8	158.3	193.7	222.9	255.4	291.3	20.1
Total	2,611.7	2,074.3	2,488.3	2,867.6	3,313.6	3,815.5	4,378.9	16.1

Source: BCC Research

Figure 1
U.S. Self-Service Kiosks Market, by Application, 2019–2025
($ Millions)



Source: BCC Research

Check-in Kiosks

The self-service check-in kiosk shares the check-in counter workload, makes check-in more convenient and improves customer satisfaction. In recent years, check-in kiosks have become more and more popular in a number of environments. In general, the most common form of check-in kiosks can be seen at airports, where they are used to print boarding passes and to check-in baggage. The automated self-check-in kiosk feature lets airlines keep queues shorter and manage travel time flows more efficiently. Usually, checking in at the kiosk takes just a fraction of the time usually taken to check in with an attendant. Airline self-check-in kiosks are very sophisticated and fitted with multiple peripherals used for reading various state and country issued IDs, such as card readers, passport readers and barcode scanners. Due to the high volume of traffic that the kiosk will see over its lifespan, they are designed to be very durable.

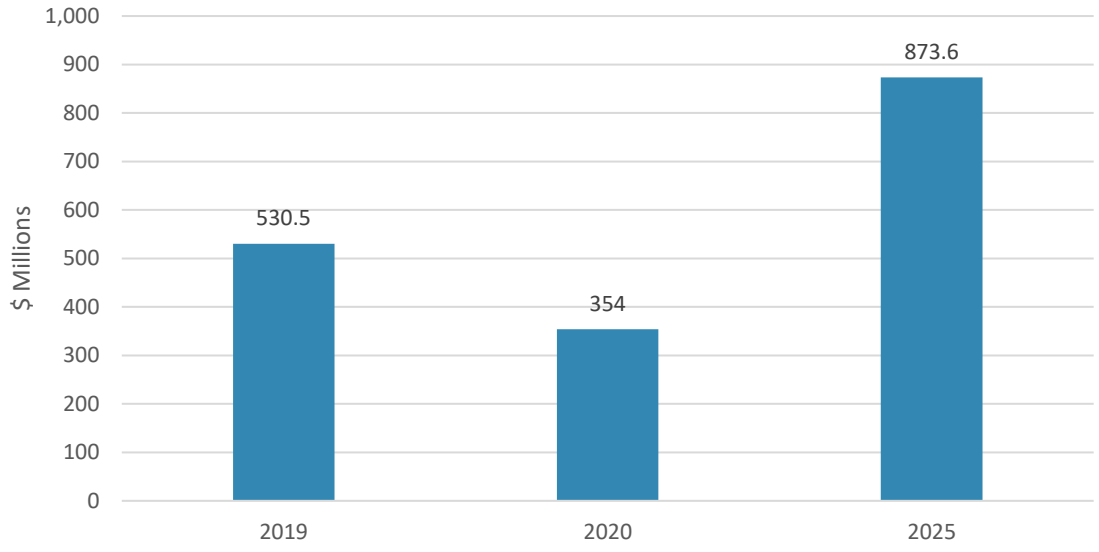
The need to build in safer systems during the COVID-19 pandemic is bringing about an upgrade in check-in kiosks in U.S airports. For example, in June 2020, United Airlines Inc. announced the addition of 219 touchless check-in kiosks throughout the United States. It is among one of many measures announced by the company for its CleanPlus strategy of addressing travel during the pandemic. Using these touchless kiosks, travelers can print luggage tags and boarding passes by scanning their phone or a boarding pass. In May 2020, the first systems were rolled out in Orlando, Boston, Dallas/Fort Worth, and Chicago, and there are plans for adding 20 kiosks. Also, in July 2020, American Airlines revealed its plans to incorporate touchless check-in solutions. The airline's planned touchless check-in kiosks will scan the boarding pass on the user's personal mobile device and print bag tags after the boarding pass is

checked, all without the customer needing to touch the kiosk. It is anticipated that this new technology will be made available at more than 230 airports.

Over the past few years, patient check-in kiosks have become very popular in the healthcare segment. Self-service kiosks provide quicker check-ins, greater patient control and accelerated collections. In most applications, the kiosk enables the user to process their insurance records, answer questions about their visit, digitally sign HIPAA disclosure documents, and also pay for their visit. Healthcare check-in kiosks minimize wait times and mistakes in data processing, improve employee productivity and increase patient satisfaction rates. Healthcare facilities can increase overall customer satisfaction by deploying check-in kiosks, while also recognizing higher returns. Self-check-in kiosks have played a growing role across many U.S. healthcare facilities since the outbreak of the COVID-19 pandemic. Employees no longer face exposure to germs from sick people when a patient checks in at a self-service kiosk. Plus, kiosks are easily disinfected. Guidelines for cleaning and disinfecting kiosks have been distributed by the Centers for Disease Control and Prevention.

Self-check-in and check-out kiosks in the hospitality sector maximize the productivity of staff and enhance guest experience. These kiosks reduce waiting times for visitors and remove front desk queues. Although the implementation of self-check-in systems in hotels was already increasing across the world, this trend has accelerated due to the COVID-19 crisis. Kiosks can be a good option, with proper safety precautions, to ease the check-in process. Most check-in kiosks come with simple instructions, a straightforward graphic presentation, and an intuitive style. The majority of check-in kiosks deployed in hotels can read credit/debit cards, and can even take cash payment. These kiosks deliver add-ons and upsells, and also can print room door access cards.

Figure 2
U.S. Check-in Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

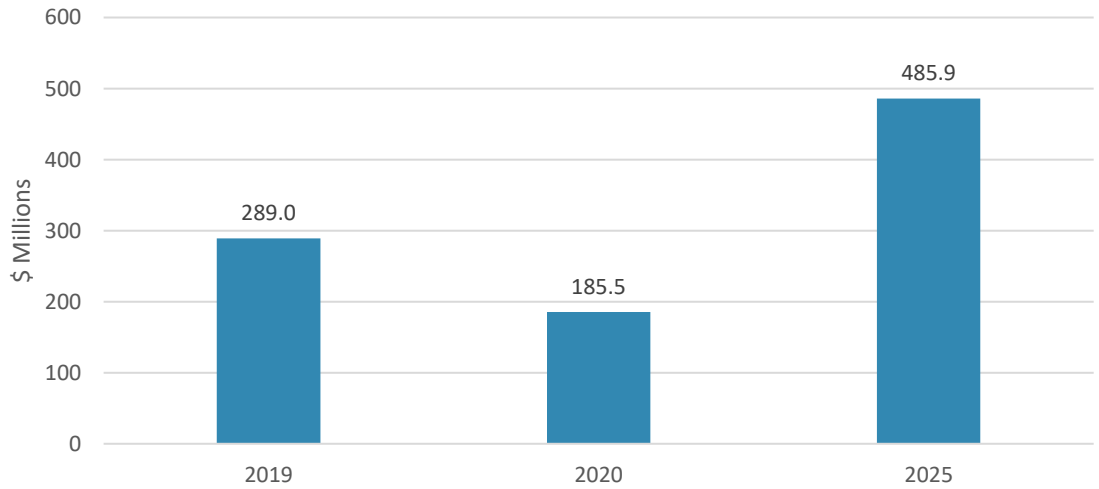
Self-Service Check-Out Kiosks

Self-check-out kiosks provide retail stores with a system for consumers to process their transactions. Self-service kiosks provide an alternative to conventional cashier-staffed checkouts in grocery and retail stores. With self-checkout kiosks, consumers conduct the cashier's job themselves by scanning the items and applying payment. With growing acceptance of automation and informal customer exchanges, the demand for self-checkout kiosks has been increasing across the U.S. As part of their consumer shopping experience, a rising number of retail companies have incorporated self-checkout stations over the last few years. Self-checkout kiosk deployment promises lower labor costs and improved productivity for retail businesses. The increasing depersonalization of retail shopping, however, could pose a challenge to the growth of these systems for both consumers and businesses alike.

Self-check-out kiosks have become more popular now as more retailers are looking to invest in automation technologies, primarily due to the economic benefits of freeing up resources and workers for more complex tasks and services, and the potential to speed up check-out and minimize waiting times. Many major retailers, however, claim that self-check-out kiosks pose new issues, including a higher rate of fraud, along with the friction caused when the system is not running too smoothly.

Self-service check-out kiosks played a crucial role in the successful functioning of grocery and retail stores around the country during the COVID-19 pandemic. Self-service check-out kiosks decrease the risk raised by close human interaction and contamination and also increase checkout performance at locations with a heavy customer flow, such as the supermarket. Many of these self-service check-out kiosks even support contactless payment methods such as face payment or QR code payment to prevent possible spread of viruses through cash transactions. These kiosks can also be customized by adding hand sanitizer, which can be used by shoppers after they touch the screen.

Figure 3
U.S. Self-Check-Out Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

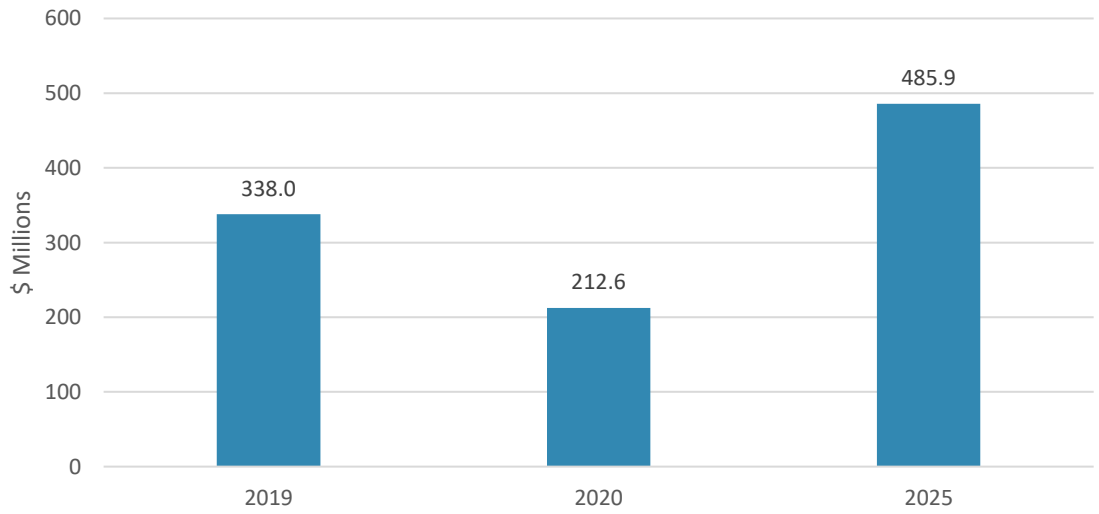
Ticketing Kiosks

Ticketing kiosks are among the most common self-service equipment in the public transport sector; they minimize long queues and waiting times at ticket counters. Ticketing kiosks played key role in enabling transit stations to serve more and more people while enhancing the overall experience of travelers. Ticketing kiosks are also found in venues such as cinemas, live performance centers, theme parks, sports and entertainment stadiums, universities and schools, and ski resorts. A self-service ticketing kiosk provides customers with convenience by providing fast and easy access to the tickets they need, while also reducing business operating costs by freeing up workers for other duties. By increasing venue traffic, reducing overhead and staff, expediting operation, and compiling customer data to monitor patterns and recognize loyal patrons, ticketing kiosks enhance both the customer experience and business ROI.

With the advent of the ticketing kiosk, amusement parks and theme parks can provide the option of self-service ticketing. Customers can now opt to either go to a staffed station or purchase from the kiosk, depending on variables such as comfort, availability and personal preference. In amusement parks and theme parks, ticketing kiosks can print and issue RFID wristbands or barcode wristbands on tickets. Kiosks can also be pre-loaded with blank wristbands that are printed when a ticket is bought by the customer. The ticket grants entrance into the park to the tourist and can also be used to make purchases inside the park, facilitating cashless transactions.

To buy their seats and pick their seat positions, movie- and concert-going guests can use ticketing kiosks. Ticketing kiosks are currently used in cinema, dance, performance, and concert theaters. The ease and simplicity of ticketing kiosks ensures that the ticket counter wait time goes down and customer satisfaction goes up.

Figure 4
U.S. Ticketing Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

Self-Ordering Kiosks

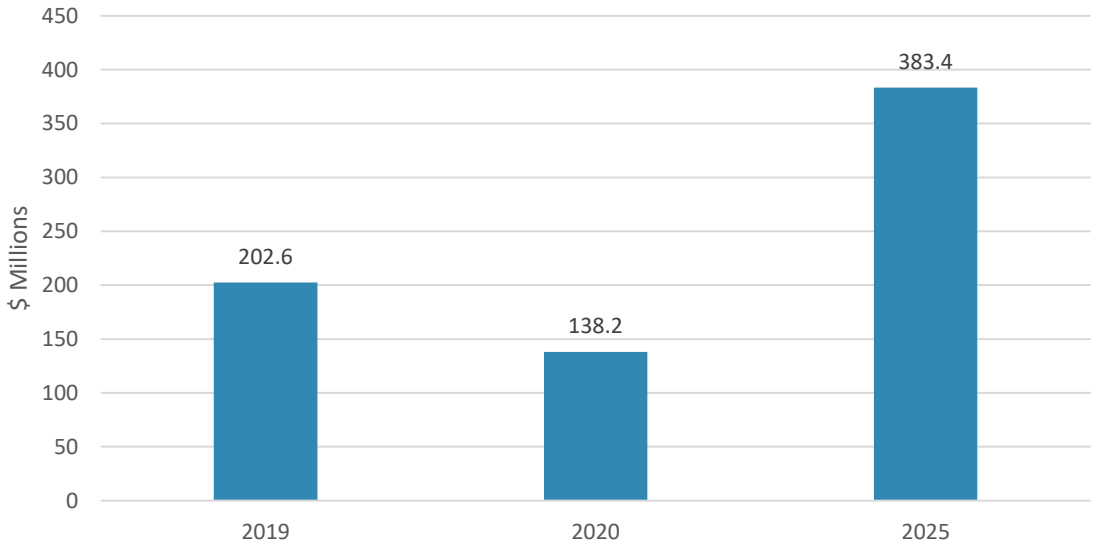
The demand for self-ordering kiosks in the U.S. has risen over the past three years, with demand driven in particular by limited service restaurants. Self-order kiosks boost service speed for restaurants and enhance the accuracy of ordering. The technology also helps increase the value of orders by upselling clients, and as well enables better use of labor. In U.S. restaurants, the demand for self-ordering kiosks has recently gained momentum, but these kiosks are very popular across many European countries.

In QSR and fast casual restaurants, self-service kiosks play a key role in the expediting the ordering process. According to a survey conducted by Tillster in 2019, more than 65% of consumers would be more likely to visit a restaurant if self-service kiosks were provided. Restaurants are becoming aware of these possibilities and increasing their investment in self-service technologies. The availability of kiosks in restaurants also improves the customer's experience. While many people perceive that kiosks would replace jobs, the fact is that beyond running the cash register, the addition of self-service technology provides more opportunities for employees to enhance customer service. Employees who typically operate the cash register can concentrate instead on delivering superior experiences. Cashiers can instead turn more attention to the guest experience, deliver orders, give refills, respond to customer requests, and altogether enhance the brand's customer experience. At present, McDonald's has self-service kiosks in around 14,000 of its U.S. restaurants. When it started rolling out these kiosks in 2017, the company said its aim was to boost the customer experience by speeding up ordering time, reducing human error and enabling easier customization of orders.

While self-service kiosks are delivering on consumer desire for ultimate convenience, they're altering behavior, too. As the use of technology increases, self-ordering has been shown to increase revenue by increasing the average order size per customer, while decreasing restaurant costs through improved productivity.

Self-order kiosks played a key role in improving the pace of service and supporting safe practices in restaurants during the COVID-19 pandemic. The first point of direct customer and staff contact is simplified by the availability of self-ordering kiosks. These kiosks helped encourage consumers to resume their patronage. Customers can self-order and can wait at a safe distance from other customers for their order to be delivered. There are no menus or table surfaces to contact and minimal physical interaction with workers.

Figure 5
U.S. Self-Ordering Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

Financial Services Kiosks

The financial services kiosks segment includes a variety of self-service banking kiosks that offer customers options and flexibility to carry out their transactions in a more convenient way. Types of financial services kiosks include check and cash deposit, multifunction, passbook printing, account opening, debit card printing, and checkbook printing kiosks, as well as others. By moving forward with digital transformation, financial institutions across the U.S are focusing on shifting their brick-and-mortar locations from transaction-centric cost centers to sales-centric facilities. As they automate various financial functions, self-service kiosks help in the transformation of banking and financial institutions to deliver creative products and services, ensure compliance with regulations, and enhance the accessibility of banks. A significant cross-section of financial industry players are using interactive digital kiosks to bridge the gap between online and branch financial services. Consumer contact with self-service digital kiosks started with the introduction of ATMs. The popularity and dependence on self-service kiosks grew as people became more dependent on technology. Financial kiosks play a key role in enhancing operating performance and reducing the cost of manpower. Examples include:

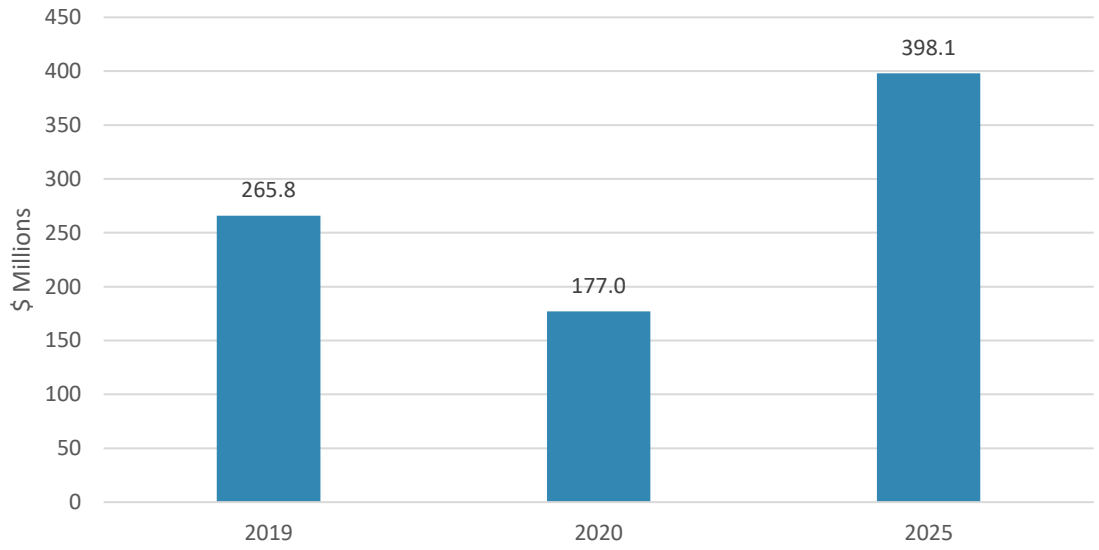
- A passbook printing kiosk is an innovative, automated kiosk that enables clients to print savings, recurring deposit and PPF account passbooks on their own. The kiosk retrieves the specifics of the account transaction and prints them on the passbook.

- Check deposit kiosks enable customers to securely deposit individual or multiple checks to their accounts. These kiosks reduce the cost and processing time spent on check transactions inside a

branch. They also encourage financial companies to take an environmentally friendly approach by eliminating printed slips and envelopes.

- Account opening kiosks enable the opening and issuance of non-personalized debit cards to clients instantly. The kiosk digitizes the account opening process while following the standard application format of the bank, with a self-service option for the customer to open an account at the kiosk and obtain a non-personalized debit card instantly.

Figure 6
U.S. Financial Services Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

Bill Payment Kiosks

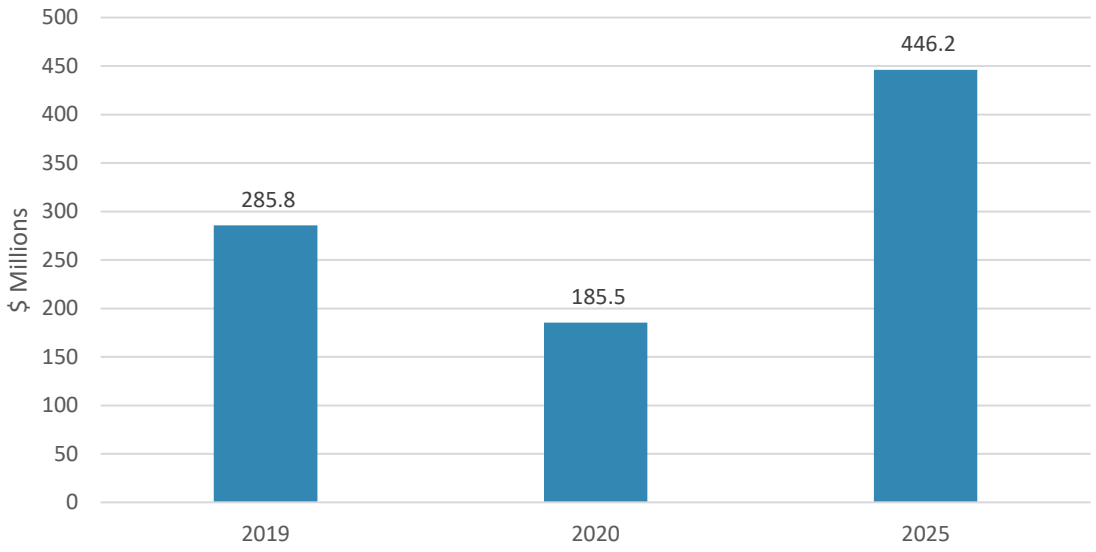
Self-service bill payment kiosks are a simple way to enhance customer service and improve the productivity of operations. These kiosks enable customers to securely conduct self-service transactions via credit/debit cards, checks, or cash. In cases where a business has to accept daily payments from their clients, bill payment kiosks may be used. Payments for electricity, cellphone bills and supermarket credit cards are only a few of the cases under which consumers make daily payments. Bill payment kiosks are also used for applications such as payment of alimony, mortgage fees, hospital fees, cell phone payments, cable TV bills, money transfers, tuition payments, and prison services. Self-service bill payment kiosks reduce congestion, decrease waiting times, increase customer satisfaction, cut operational cost, generate faster cash flow, and boost employee efficiency.

A bill payment kiosk enables customers to pay their bills from any place with ease. Bill-paying customers can make choices, such as paying a bill, entering details, or entering an account number, and use the

buttons on the bill pay interface to respond to pop-up messages. They can also switch to or cancel the transaction on a previous screen. Bill payment kiosks can accept different payment methods, Such as cash, card or check. The bill payment kiosk will print and dispense a receipt of the transaction after payment has been made. Details such as date, time, bill pay kiosk ID, transaction number, payment method, as well as card authorization number and amount paid, can be included on the receipt.

Bill pay kiosks are growing in popularity in the U.S. They target underbanked consumers or those who do not have the ability to pay bills online. The deployed applications primarily focus on utility payments. Currently, around 25% of the U.S. population is unbanked or underbanked, according to a 2017 survey by the Federal Deposit Insurance Corp., and this is the primary market for bill pay kiosks..

Figure 7
U.S. Bill Payment Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

Digital Signage Kiosks

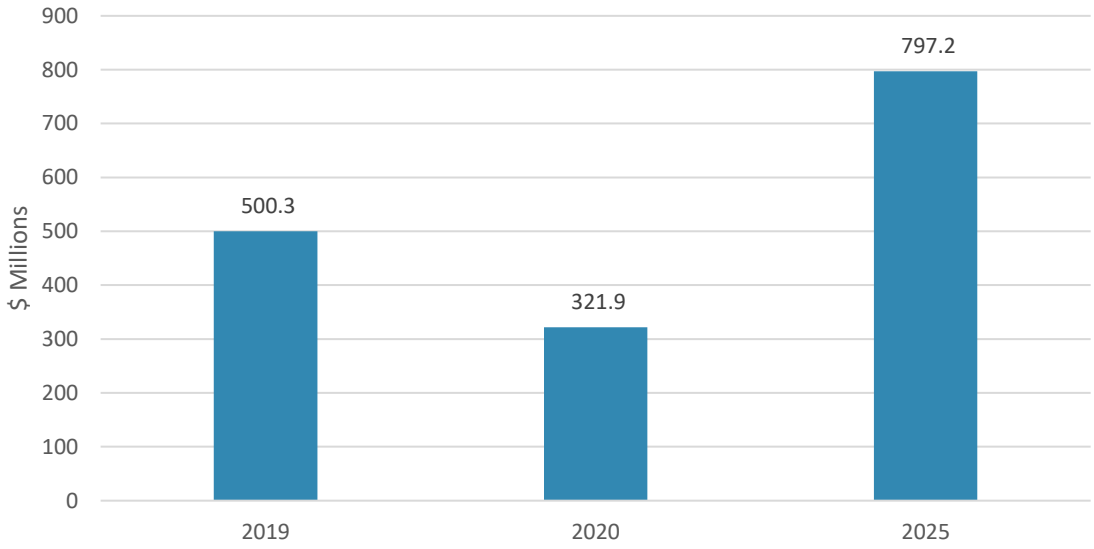
Today, consumers utilize and rely on technology more than ever before. As a result, corporations, organizations and institutions are also seeking ways to introduce technology-based tools and services to their core activities. A big part of this digital transformation is the self-service kiosk. Digital signage kiosks are extremely flexible and carry out a wide range of functions across multiple sectors such as retail, healthcare, and travel and tourism. Digital signage kiosks are devices which make information broadcasting easy by allowing passers-by to see the information they choose passively, which is ideal for displaying important notices, wayfinding or other general information that may be relevant to brand or company, making this a great technology for reception areas or waiting rooms.

Over the years, digital signage kiosks have gained considerable prominence and currently have applications across the country in classrooms, hospitals, office buildings, shops, and public spaces. For many organizations, distinguishing between a digital signage kiosk and simple digital displays is complicated. The structural makeup is one of the noticeable distinctions between digital signage kiosks and digital displays. While digital displays usually consist of only the display itself, digital signage kiosks feature a sturdy enclosure constructed from cold-rolled steel to house and protect the screen, device and any other related components of the unit. To complement the appearance of the location in which they will be installed, digital signage kiosks can be personalized. On the other hand, digital displays tend to have a simpler look, with few choices for color, design and branding and little space for customization. Digital signage kiosks are designed to incorporate components, facilitate interactivity, and provide an overall more comprehensive solution, whereas digital displays are usually designed solely for the display of digital content. In addition, digital signage systems can be configured to integrate the hardware and components needed for indoor and outdoor use, which further contributes to their industry-wide versatility.

In terms of digital signage kiosks, the ones we have considered include wayfinding and information kiosks. Wayfinding kiosks enhance the tourist, guest and customer experience by helping them to find information and directions without having to track down an employee for assistance. Many helpful integrations, such as turn-by-turn directions, interactive maps, and kiosk-to-phone mobile hands-off/SMS directional assistance, are found in wayfinding kiosks. Wayfinding kiosks can be personalized with a number of features that make it easier to navigate an unfamiliar area for tourists, visitors and customers. Wayfinding kiosks can help travelers navigate to and around venues such as shopping centers, office complexes, business parks, amusement parks, sports stadiums, department stores, shopping districts, tourist attractions, and restaurants.

Information kiosks are being used currently used in retail and commercial environments around the world. These types of information kiosks house a computer terminal with custom-made software. They enable the user to use the touch technology to navigate their way around the information that is provided, while preventing them from accessing the computer system. An information kiosk is a tool for providing data in an accessible and visually appealing manner. An information kiosk helps consumers in making educated choices, improves interaction and increases sales. As well, information kiosks enable quick access to important company details, directions and announcements for employees. Currently, the use of an information kiosk will help almost any sort of organization. There are already many markets and industries that rely on them. Office lobbies, banks, hospitals, cafeterias, visitor centers, zoos, and government agencies are only a few examples.

Figure 8
U.S. Digital Signage Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

Bitcoin Kiosks

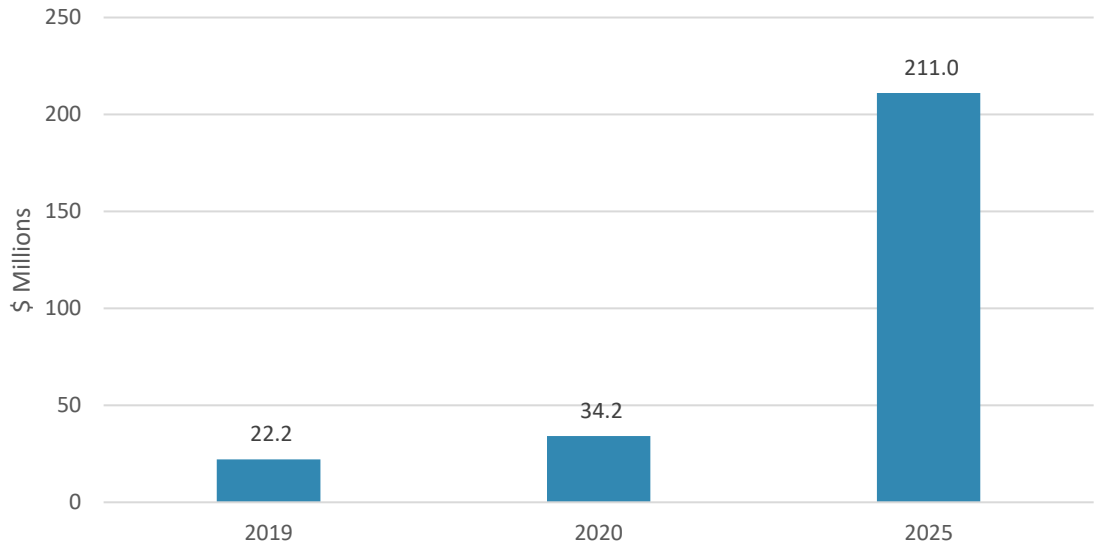
Bitcoin demand soared to a record high against the dollar in 2020, fueled by higher demand from both institutional and retail investors who saw the virtual currency as a safe haven and an inflation hedge. Overall, in 2020, Bitcoin has gained more than 170%, fueled by demand for riskier assets in the midst of unprecedented fiscal and monetary stimulus, an appetite for inflation-resistant assets, and hopes that cryptocurrencies would gain mainstream acceptance. The U.S. is a worldwide cryptocurrency regulation center which sets the pace for a lot of adoption. In the U.S., cryptocurrency regulations vary from state to state, and these instruments are often viewed and governed differently by federal authorities. Cryptocurrencies, for example, are not deemed legal tender by the Financial Crimes Enforcement Network, which analyzes transactions to flag financial crimes. However, since 2013, financial cryptocurrency exchanges have been regarded as operators of services and tokens as other property that replaces money.

A Bitcoin ATM is a kiosk that enables customers to use an automated teller machine or a dedicated kiosk to purchase Bitcoin. Some Bitcoin ATMs offer both the purchase of Bitcoin as well as the sale of Bitcoin for cash. Consumers appreciate the convenience of buying and selling Bitcoin at physical locations, since Bitcoin transactions have become more and more prevalent. Bitcoin ATMs work similarly to bank ATMs where the user can feed in currency, hold the QR code of the Bitcoin wallet up to the display, and the account is credited with the corresponding amount of Bitcoin. In retail locations, such as convenience shops, gas stations, malls, and grocery stores, Bitcoin kiosks are appearing. These kiosks are also capable of dispensing cash; the sum is converted from Bitcoin, subtracted from the user's wallet through a safe

gateway, and the cash is dispensed. Thanks to the increased popularity of cryptocurrencies, Bitcoin kiosks are one of the fastest-growing segments in the U.S.

Over the forecast period, the increase in cryptocurrency popularity in the U.S. is expected to fuel demand for Bitcoin kiosks.

Figure 9
U.S. Bitcoin Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

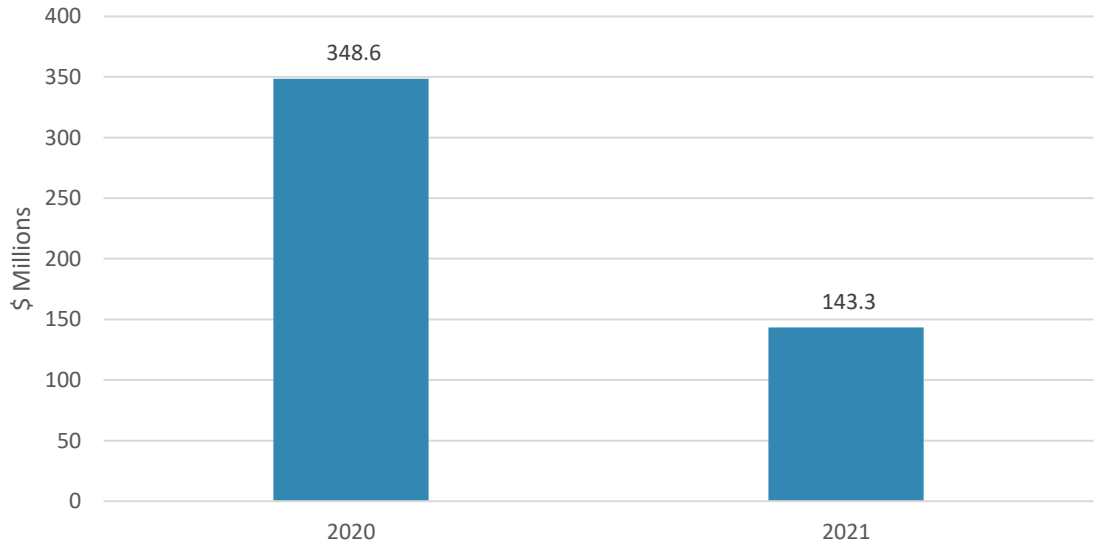
Temperature Screening Kiosks

Temperature screening kiosks were largely developed by kiosk companies in response to the COVID-19 pandemic. COVID-19 fostered the demand for temperature detection in combination with biometric identity verification as companies scrambled for ways to protect visitors and workers from airborne pathogens and bacteria. Hardware and software manufacturers of kiosks partnered with providers of biometric technology on solutions that enable individuals to take their temperature to gain access to a facility or area. Many of the current systems for temperature screening include infrared sensors combined with thermal cameras for facial recognition. A facial recognition-based temperature screening solution enables visitors and workers to walk up to a kiosk and be scanned for an elevated temperature without attendant intervention and without touching the screen. To read and report the individual's temperature to an operator, the person is then scanned by a contactless thermal camera. A temperature scan with an accuracy of ± .5 °C is given by the thermographic camera and associated device software. The machine software provides the calculated actual temperature data and the “not elevated” or “elevated” status (elevated status threshold is 100.4° F, according to CDC guidelines). The

operator then has the necessary details to either implement secondary screening measures or grant entry based on facility procedures and policies.

For employees and customers, non-contact temperature screening kiosks have become an additional layer of security. These devices provide instant alerts with a highly accurate thermal technology to identify those with high temperatures to help the organization minimize the risk of entry of potentially contaminated people into a facility. The temperature screening kiosk is a touchless, hands-free system. Temperature screening kiosks check guests and workers for elevated body temperature. The system notifies the user and sends a warning to management staff via email or to the remote management application if someone's body temperature is high. Temperature warnings from the system are sent in real time to a monitoring console for appropriate action by security personnel. A temperature screening kiosk is useful in any business or public setting, but is particularly suitable for entry points, access gates to buildings, school campuses, health clinics or hospitals, community gatherings or public venues, hotels, retail stores, and transportation hubs. Multiple industry verticals, such as financial institutions, manufacturing plants, schools and colleges, restaurants and retail shops, offices and lobby areas, hospitals, clinics, assisted living facilities, and hotels, are currently using temperature screening kiosks.

Figure 10
U.S. Temperature Screening Kiosks Market, 2020–2021
($ Millions)



Source: BCC Research

Others

Self-service kiosks, such as internet kiosks, picture kiosks, betting kiosks, HR kiosks, and others are considered under the Others segment. Photo kiosks are among the some of the most popular of self-service photo printing devices. Self-service digital photo kiosks enable consumers to order photo prints,

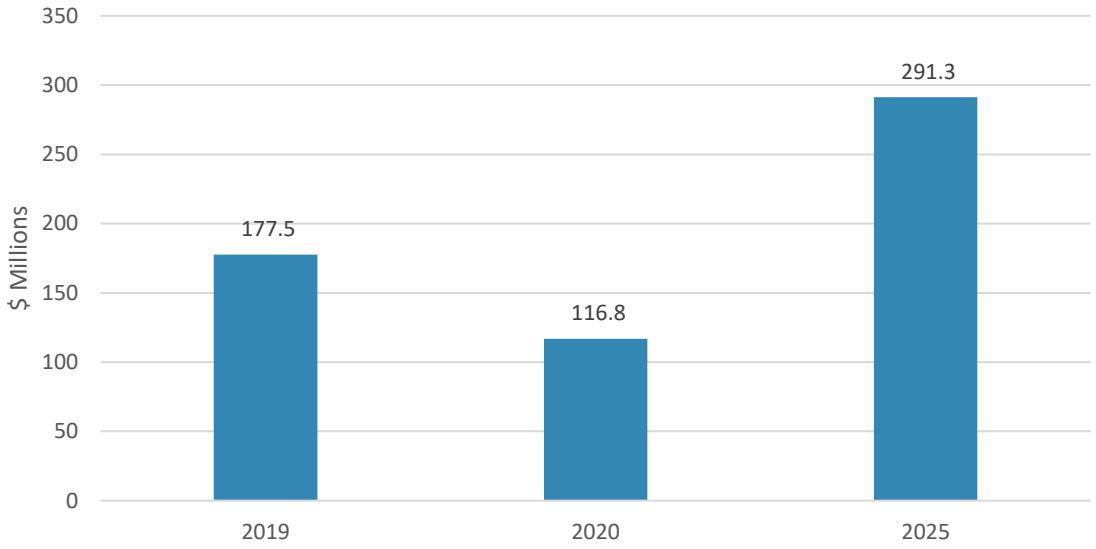
enlargements and creative photo products such as books or greeting cards. Consumers can order using images from their camera media card or USB, a Facebook albums or a smartphone. Photo kiosks generate exceptionally good ROI (return on investment).

Sports betting kiosks enable users to place legal bets, access handicap facilities, sports information, and locally advertised promotions. These sports betting kiosks provide betting access virtually 24/7, removing many frustrations faced by customers when placing bets through sports books. Self-service betting kiosks remove typical consumer frustrations, including long peak queues, strategic hours, conventional restricted operating hours, sports books, inconvenient locations, and occasional errors in transactions.

HR self-service kiosks play a key role in cost-effective recruiting procedures, contact with staff and administration of benefits. Self-service kiosks help staff and job seekers access the same data and facilities for human resources that employees in the workplace have. With lower transaction processing costs, quicker turnaround times, and reduced data entry, printing, distribution, and paper costs, these facilities offer substantial savings and return on investment.

Smart city kiosks are systems that are being integrated in one physical framework with a focus on digital interaction and potential scope for the amalgamation of multiple services. In addition to the various advantages that this unified unit offer, a new business model is also being deployed. They are usually deployed at no cost to a local government and funded by ads running on the kiosks. Smart city kiosks are increasingly becoming an integral component of smart cities, speeding the transition of interaction between residents and public/private services. Smart city kiosks provide a myriad of digital services, such as wayfinding, free Wi-Fi, charging capabilities for smartphones, emergency warnings, emergency reporting facilities, monitoring of air quality, surveillance, connectivity with local businesses, and access to public services.

Figure 11
U.S. Other Types of Kiosks Market, 2019–2025
($ Millions)



Source: BCC Research

Chapter 5

Market Breakdown by End-user Industry

BCC Publishing

Chapter 5: U.S Self-Service Kiosks Market, by End-Users

Introduction

Over the last few years, different types of self-service kiosks have been emerging across different industries, ranging from hospitality to transport. Although some companies are still apprehensive about deploying this equipment, many businesses are leveraging this technology to establish effective digital communication with their customers. Some of the most common types of self-service kiosks used across different industry segments include self-check-in kiosks, ticketing kiosks, bill payment kiosks, wayfinding kiosks, and others.

Self-service kiosks have numerous benefits, and these benefits may differ based on the sector in which they are utilized. Some of the benefits of self-service kiosks include fewer staff needed to serve customers/passengers, less queuing or reduction of customer/passenger waiting times, more people served in a shorter period of time, and improved customer experience by giving consumers the control over seeking information or checking in/out.

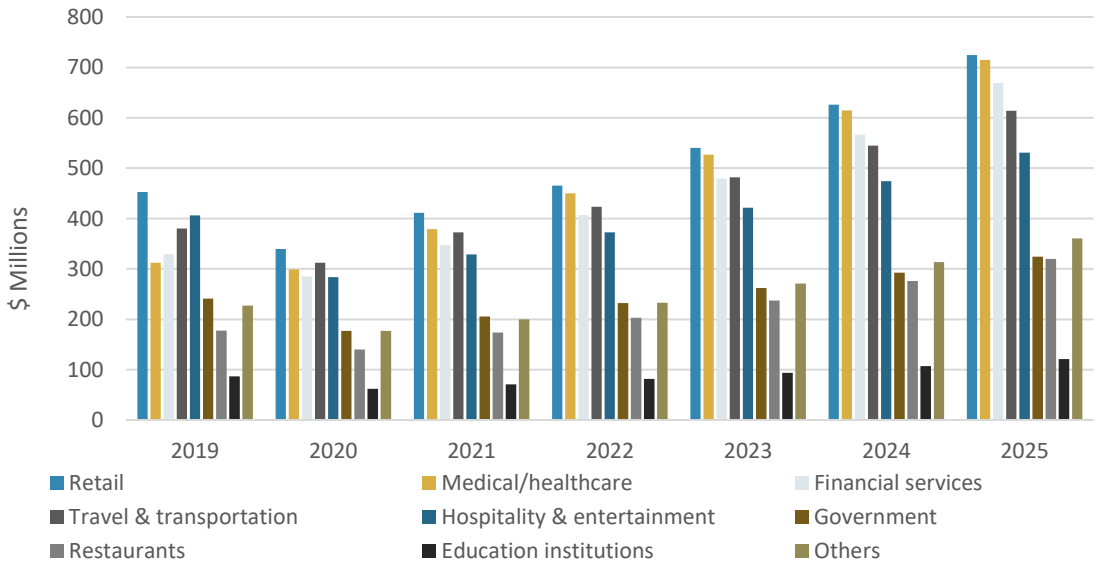
In this report, the U.S. market for self-service kiosks based on end-users has been segmented into Hospitality/Entertainment, Financial Services, Medical/Healthcare, Retail, Restaurants, Travel and Transportation, Government, Education Institutions, and Others. The retail segment currently has the largest share of the market, accounting for about 20 percent of the total U.S. self-service kiosks market. The fastest growing end-user market for self-service kiosk is projected to be the medical/healthcare segment, which is expected to grow largely due to the growth of telemedicine. Telemedicine kiosks enable users to communicate with a healthcare provider and get almost instantaneous feedback regarding everything from coughs and colds to pink-eye and follow-up after surgery.

Table 2
U.S. Self-Service Kiosks Market, by End-user Industry, Through 2025
($ Millions)

End-User Industry	2019	2020	2021	2022	2023	2024	2025	CAGR% 2020–2025
Retail	452.6	339.5	411.4	465.1	540.2	626.1	724.3	16.4
Medical/healthcare	312.3	298.6	378.8	450.0	526.9	614.8	715.2	19.1
Financial services	329.1	284.6	347.0	406.6	479.5	566.3	669.3	18.7
Travel & transportation	380.1	312.5	372.6	423.6	481.6	545.0	614.1	14.5
Hospitality & entertainment	406.0	283.4	329.0	372.6	421.6	474.3	530.5	13.4
Government	240.8	177.0	205.5	232.4	261.8	292.6	324.5	12.9
Restaurants	177.4	139.8	173.4	202.8	237.2	276.1	319.9	18.0
Education institutions	86.6	62.2	70.9	81.6	93.7	106.8	120.9	14.2
Others	226.8	176.7	199.7	232.9	271.1	313.5	360.2	15.3
Total	2,611.7	2,074.3	2,488.3	2,867.6	3,313.6	3,815.5	4,378.9	16.1

Source: BCC Research

Figure 12
U.S. Self-Service Kiosks Market, by End-user Industry, 2019–2025
($ Millions)



Source: BCC Research

Hospitality & Entertainment

The end-user sectors considered under the hospitality & entertainment segment include hotels, tourist attractions, museums, casinos, sporting events, and exhibitions. Before the COVID-19 pandemic, the hospitality segment was among one of the fastest growing end-user segments for self-service kiosks. In the hospitality sector, self-service kiosks are deployed for a wide range of functions such as check-in/check-out, bill payment, loyalty program enrollment, and wayfinding. Self-service kiosks present a range of advantages to hotels and other users such as more consistent upsell opportunities, savings on labor and the alignment of the hotel experience with guests' increasing preference for convenience. The hotel industry is among one of the most highly affected economic sectors due to the COVID-19 pandemic. Decisions to shut down hotels have forced companies to stop their investment in capital expenditure and focus more on trying to mitigate their cash and working capital issues. Due to the pandemic many businesses have made their venue available for hospital beds and hospital employees.

The slow reopening of hotels has brought in significant new opportunities for self-service kiosk providers. Across the country, the hotel industry is investing in solutions that will not only enable them to meet new standards, but also improve the safety of their guests and staff. Some of the self-service technologies which are witnessing an increase in demand include self-check-in kiosks and apps which allow guests to book, check in, check out, and request services without the need to visit the front desk. Applications also include contactless temperature checking kiosks, which read an individual's temperature and sound an alarm when an irregularity is found in that person's temperature. With the expected distribution of COVID-19 vaccines expected to be in full swing by the second quarter of 2021, self-service technologies are expected to witness significant growth in this segment.

Travel and tourism kiosks enable companies to expand their reach without adding staff or facilities. Self-service kiosks streamline the check-in process, wayfinding kiosks help customers navigate their destination and promote interactive information to explore their surroundings, and visitor survey kiosks offer a forum for visitors to respond to surveys and leave feedback on their experience. This segment of the market has also witnessed a significant decline during 2020, but the market is expected to grow significantly from the second quarter of 2021.

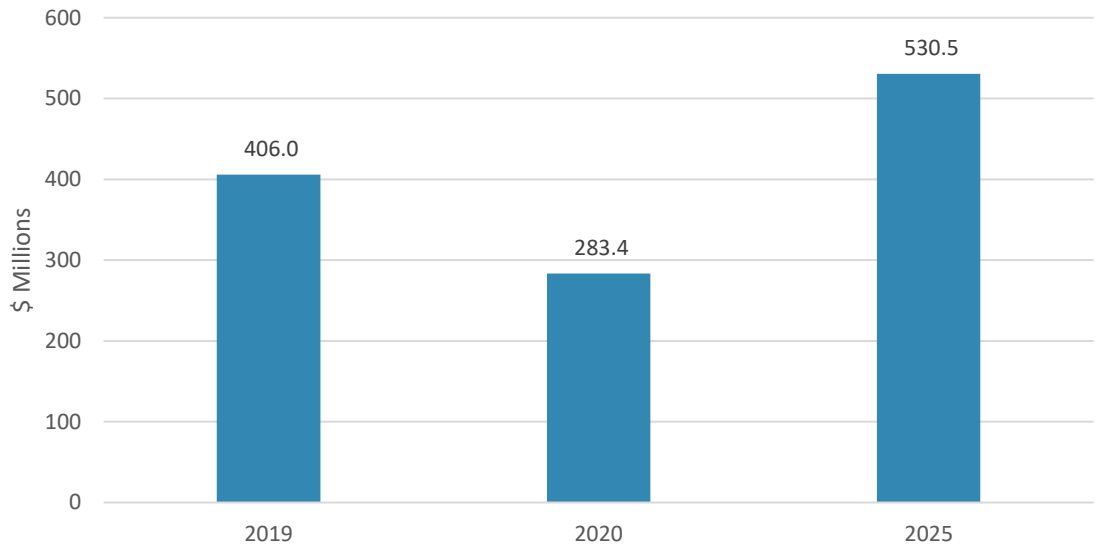
Over the last few years, the casino and gaming industry increasingly moved towards the adoption of self-service technologies. Usage of interactive self-service kiosks enhances the guest's casino experience and will produce deeper customer loyalty and engagement, thereby increasing revenue. Some of the most common types of self-service kiosks used in the casino and gaming industry include interactive loyalty kiosks, information and wayfinding kiosks, reservations and queuing kiosks, and ticketing and registration kiosks.

The outbreak of the COVID-19 pandemic has affected sporting events across the world. Many sporting events were either canceled or postponed. Across the world, many major sporting events were played behind closed doors with no fans. The Major League Soccer (MLS) top-tier football league in the U.S. was postponed to June and was played with no fans. The Boston Marathon, which was originally scheduled for April 20 and later postponed for five months, has been canceled for the first time in its 124-year history. The National Basketball Association (NBA) restarted its season in July and finished the season with fans allowed in the stadium. The postponement and cancellation of events caused a major dent in capital spending by companies, which caused a significant decline in the self-service kiosks market. Some of the most common types of interactive kiosks that are used across sporting stadiums include

digital signage kiosks, ticketing kiosks, kiosks for visitor registration, parking kiosks, and wayfinding kiosks, among others.

For months. movie theatres across the U.S. were empty, shuttered by the coronavirus pandemic. The three publicly traded movie theater chains reported more than $1 billion in losses in the third quarter of 2020 and most movie theaters are still unsure about their reopening. With progress on the distribution of COVID-19 vaccines, theaters are expecting to get back to normal by the third quarter of 2021. Self-service kiosks in movie theatres can be used to buy tickets, retrieve tickets purchased online and give customers extra time to browse through the menu and discover new products.

Figure 13
U.S. Self-Service Kiosks Market for Hospitality & Entertainment, 2019–2025
($ Millions)



Source: BCC Research

Financial Services

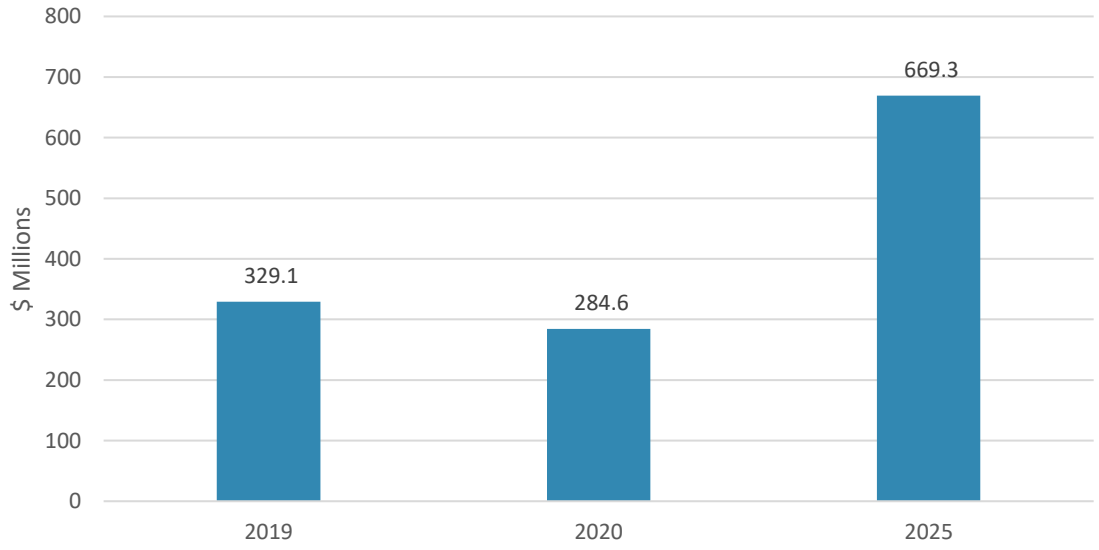
Increased consumer demands and rising competition are driving digital transformations in the financial services sector. The financial services sector has been seeking new and creative ways to steer the industry towards IT consumerism, along with the appropriate use of smart devices. By implementing digital transformation, financial institutions can concentrate on developing their brick-and-mortar locations from transaction-centered cost centers to sales-centered properties. If these banking and financial institutions struggle to automate processes, deliver creative products and services, ensure compliance with regulations, and enhance the accessibility of banks, then they will become more of a back-office utility.

Financial kiosks offer customers the convenience of performing their transactions when and where they want. In banks or off-site locations, financial kiosks function as a complementary banking outlet. Financial self-service kiosks provide customers with the convenience of bypassing teller lines and completing traditional branch transactions easily, such as account opening, account management, appointment scheduling, and check-in and research and purchase of financial items. By migrating routine transactions to the self-service banking kiosk channel, tellers can dedicate more time to customer service, facilitating high-value product purchases and cross-sales. Some of the most common types of self-service kiosks that are used by the banking sector include check and cash deposit, multifunction, passbook printing, account opening, debit card printing, and checkbook printing kiosks.

After the outbreak of the COVID-19 pandemic, many banks and other financial service institutions installed temperature sensing kiosks for initial body temperature assessment. These kiosks can detect initial body temperature in in seconds, without physical contact.

Under the financial services segment, this report also considers the Bitcoin marketplace. Bitcoin is a cryptocurrency created in 2009. Bitcoin exchanges allow people to buy or sell bitcoins using different currencies. As Bitcoin transactions are becoming more and more prevalent, consumers are appreciating the convenience of buying and selling bitcoin at physical locations. Bitcoin ATMs work similarly to bank ATMs. That is, users can feed in currency, point the QR code of their wallet up to the display, and the account is credited with the corresponding amount of Bitcoin. Bitcoin kiosks are currently being placed across retail locations, such as convenience shops, gas stations, malls, and grocery stores.

Figure 14
U.S. Self-Service Kiosks Market for Financial Services, 2019–2025
($ Millions)



Source: BCC Research

Medical/Healthcare

The medical/healthcare segment is expected to be the fastest growing end-user segment for the adoption of self-service technologies. In the healthcare sector, self-service kiosks can be used for a variety of purposes such as appointment check-in, secure patient identification, real-time demographics verification, real-time eligibility checks, consent form viewing and e-signature, outstanding balance and co-pay collection, alert notifications, facility directions, and ordering prescription refills.

Self-service kiosks help to reduce waiting time for patients. It is common for healthcare staff to complete paperwork and manually collect all patient information and related data. By using interactive kiosks to complete this task, the process can be completed more efficiently and quite likely more accurately. Self-service kiosks help minimize errors in records, since patients fill in needed information on their own.

Self-service kiosks in healthcare facilities help minimize costs, as they can reduce the use of paper and staff time. In addition, nurses and employees spend less time on the paperwork and on administrative tasks, allowing them focus more on providing patients with adequate care and treatment. In hospitals, bill payment kiosks typically have all the updated and related information about physicians and patients, which helps them to settle all bills and payments through electronic systems such as credit and debit cards. These kiosks also reflect the remaining balances upon payment.

Benefits of Kiosk-Enabled Healthcare System

- Efficient and fast processes.
- Excellent control of time and money.
- Improved operational management and monitoring.
- Superior patient treatment and improved healthcare facilities.
- Enhanced profitability.
- Single medical record for life.
- Automatic workflow.
- Wayfinding.
- Bill payment.
- Telemedicine.
- Patients during their treatment receive warnings and reminders.

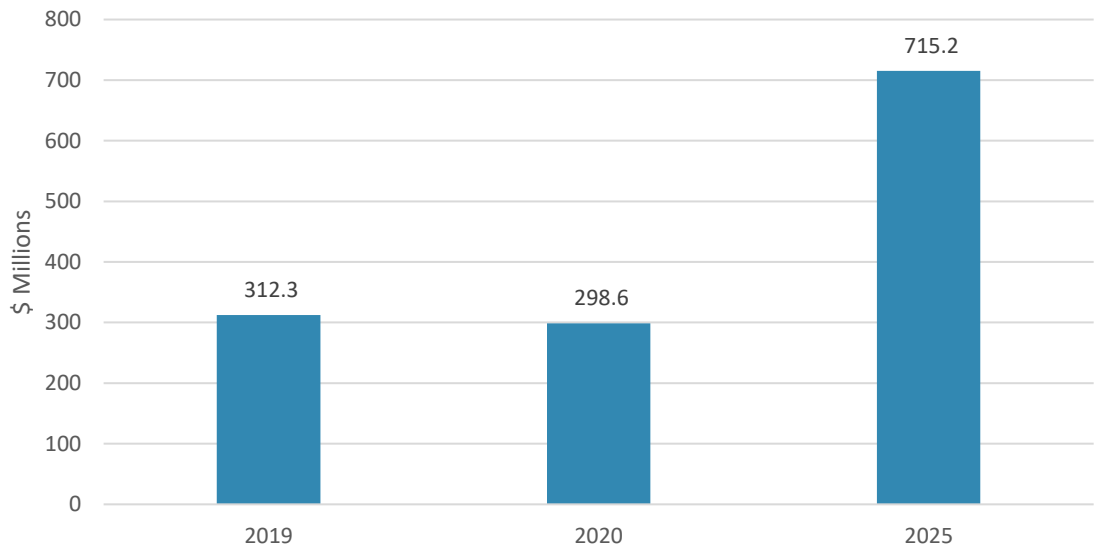
Applications of Self-Service Kiosks for Telemedicine

Healthcare providers are adopting information and communication technologies (ICTs) to increase access to healthcare services worldwide. This is beneficial mostly to underserved rural communities and in developing countries, which usually suffer from lack of access to quality healthcare. Pandemics such as COVID-19, epidemics and natural disasters provide tremendous challenges in the delivery of healthcare service. In such scenarios, telemedicine can help medical practitioners to manage and evaluate patients remotely. Telemedicine can help limit spread of communicable diseases, thus decreasing the danger to both patients and healthcare workers. Avoidable and unnecessary exposure of care givers and doctors is possible with telemedicine as patients can be screened remotely, diagnosed

and treated. Telemedicine can also offer fast remote access to medical consultants who might not be directly accessible in person. It makes accessible extra professional help for care in healthcare facilities in remote areas.

Telemedicine kiosks enable patients to communicate with a healthcare provider and get instantaneous feedback rather than scheduling an appointment at a doctor's office or making their way to the local urgent care center. By equipping the kiosks with digital otoscopes, digital stethoscopes, and an array of other sensors, primary care physicians can collect all of the information they need to decide about the next steps in a patient's workup. When the patient diagnosis is completed, a physician can email a PDF copy of the patient's visit and send prescriptions to the local pharmacy.

Figure 15
U.S. Self-Service Kiosks Market for Medical/Healthcare, 2019–2025
($ Millions)



Source: BCC Research

Retail

Establishments considered under the retail segment include retail stores, grocery stores, restaurants, and other food service establishment. Despite being the largest contributor to the self-service kiosk market, retail applications of kiosks are expected to continue to grow during the forecast period. The retail sector will see the adoption of kiosks not only among large retailer players, but among small retailers as well. However, the adoption of kiosks in the retailer sector will largely be in the mature technology-intensive regions rather than in developing and emerging regions.

One of the key reasons for the strong growth of self-service kiosks in the retail space is the need for a multi-channel environment, which is necessary to connect to customers, including prospective

customers. In addition, the proliferation of contactless payments, such as those using near-field communication (NFC) and mobile payment, will also complement self-service kiosks in retail stores. Some of the key drivers of strong growth and acceptance of kiosks in the retail space include:

- Improvements in the customer's buying experience: One of the key reasons for strong acceptance of kiosks in the retail space is the ability of kiosks to improve the customer's buying experience. Kiosks are available on an as-needed basis and are available 24/7, which improves the buying experience. These kiosks help save time and show consumers that the company is utilizing the latest technologies to improve the customer experience. These factors promote loyalty among consumers, as they can enjoy a more enhanced buying experience using these kiosks.

- Increased customer base: By placing kiosks at strategic locations, a retailer has the ability to reach more customers without a costly investment in additional brick-and-mortar space. This approach increases revenue opportunities by expanding the customer base, which increases the potential for the retailer to sell more products. Retail kiosks can play a vital role in retail expansion as they can provide a cost-effective method to expand the company's reach and generate more sales.

- Reduces the cost of business: A company offering kiosks and having kiosks at strategic locations can offer more services at a lower cost. A single kiosk can replace multiple human attendants, thus reduces costs considerably in the long term. In addition, by streamlining the total number of employees needed to service their customers, a retailer can also cut back on costly managerial resources, as fewer total employees require less total management.

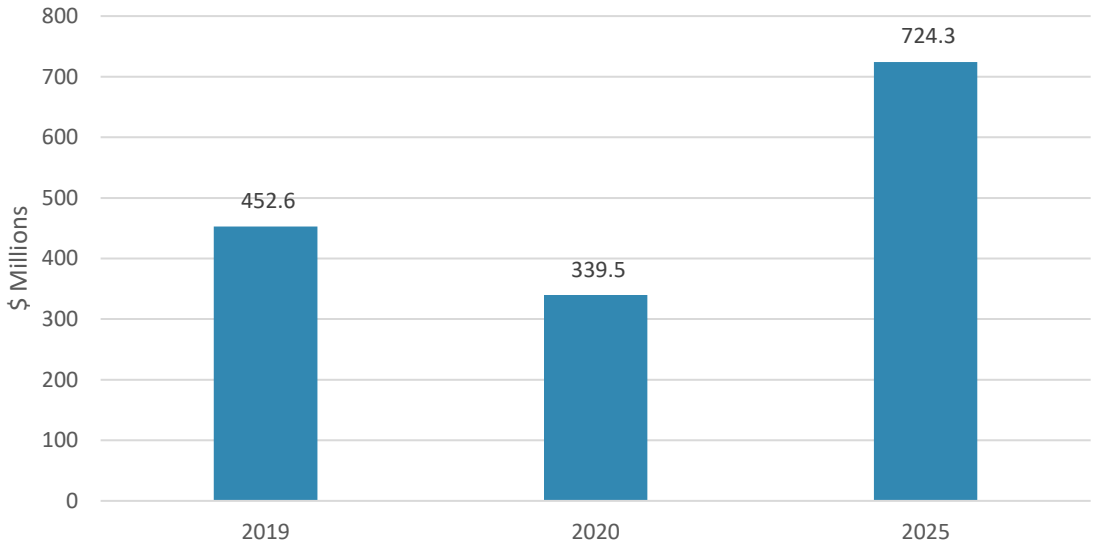
- Gaining efficiency through diverse applications: In addition to streamlining the general consumer experience, interactive kiosks are very expandable and offer the ability to streamline many of the other aspects of the retail business that typically require human interaction. These applications include, for example, accepting job applications, processing credit applications, managing gift registries, and purchasing gift cards.

- Improving operational efficiency: Because kiosks can handle a large number of applications and jobs, employees will have increased free time to focus on other important tasks, thus improving a company's operational efficiency significantly. In addition, retailers can utilize kiosks for their internal human resource needs, which provide a very efficient user experience for employees as they manage their benefit packages and stay current on the latest HR policies.

The COVID-19 pandemic has had a major influence on the retail sector in the United States. The pandemic has forced the closure of many retail outlets, signaling an unparalleled business disruption. In terms of health and safety, supply chain, labor force, cash flow, customer demand, and promotion, retailers and brands face a daunting range of short-term challenges. With lockdowns easing across many states, retailers are reopening their businesses and are taking significant steps to improve the safety and security of their employees as well as customers. One such step includes daily health checks through temperature screenings, self-assessment surveys or questionnaires. Workplace temperature kiosks can assist employers in providing a safe and secure environment for employees. Using infrared technology, temperature screening kiosks allow for unobtrusive temperature readings. The fast and reliable results mean that these kiosks are a great solution for organizations that need an effective process to track

temperatures and symptoms of employees. Retailers and restaurants are also using touchless beverage dispensing systems that provide retailers real-time visibility of their dispensers and beverages.

Figure 16
U.S. Self-Service Kiosks Market for Retail, 2019–2025
($ Millions)



Source: BCC Research

Restaurants & Quick Service Restaurants

Self-service kiosks can significantly improve the customer experience in the food service industry. Self-service kiosks play a key role in improving the ordering process, reducing the waiting times. Digital signage kiosks in restaurants provide interactive information which reduces counter congestion thereby allowing customers to move around freely. Digital menus enable consumers to order exactly what they want, and as well enhance consumer buying behavior by encouraging them to purchase items that they had not considered before. Self-service kiosks decrease the probability of orders being inaccurate as the consumer conducts that part of the operation, thereby helping to boost the overall efficiency of restaurant service.

The other major factor that is driving the adoption of self-service technologies in the food service industry is the increasing usage of self-service payment kiosks. Both the consumer and the service provider benefit from these kiosks as they provide flexibility in payment and control and also reduce payment time. Moreover, they also reduce human interaction, thereby making the operation smoother and more user-friendly.

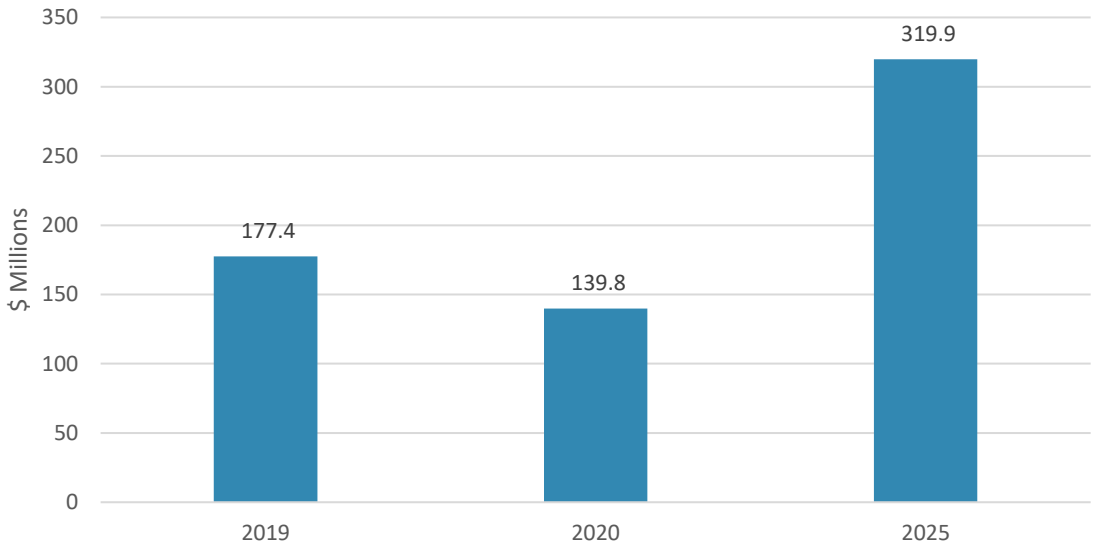
The COVID-19 pandemic impacted the United States restaurant industry via mandated closures, resulting in layoffs of workers and loss of income for restaurants and owners and threatening the

survival of independent restaurants as a category. The closure of restaurants also had a significant impact on the self-service kiosk industry. Post COVID-19, self-service kiosks are expected to play a bigger role in the food service industry. As many restaurants reopen their business, they are introducing temperature detection in conjunction with biometric identity verification to help restaurants protect visitor and employee health. Mobile phone orders are also increasingly making it easier and safer for customers to place orders. Restaurants and retail outlets are also planning to upgrade their self-service kiosks with 3D cameras that make it possible to order and pay without touch. 3D facial recognition is inexpensive, easy to install and incredibly reliable. It accurately identifies customers even with changes in facial hair, makeup, hair styles and colors, or headwear.

Quick serve restaurants are fast-food outlets that serve food quickly to customers. Self-service kiosks are increasingly being used in QSRs to automate the complete process of food delivery. Self-service kiosks can accelerate the ordering and checkout process. Over the last few years, the adoption of self-service kiosk has significantly increased in QSRs. This growth of self-service kiosks in QSRs is largely being driven by the growing number of digitally savvy consumers who are increasingly expecting control, choice and personalization when ordering. Also, consumer familiarity with kiosks due to widespread use in other business environments is aiding the adoption. Quick service restaurants across the country are realizing the operational and financial benefits of kiosks, which is further driving the growth.

Over the last few years, there has also been an increasing deployment of self-service kiosks in virtual or ghost kitchens. Virtual kitchens are commercial cooking spaces with no dine-in option. These kitchens largely function as hubs for online delivery and catering orders; they circumvent the need for costly buildouts in premium locations. Virtual kitchens reduce the burden on restaurants. Virtual kitchens are being used by restaurant chains to test and launch new products. In virtual kitchens, self-ordering kiosks are being used by consumers to place orders on site and pick them up. These self-ordering kiosks are largely outdoor kiosks.

Figure 17
U.S. Self-Service Kiosks Market for Restaurants & Quick Service Restaurants, 2019–2025
($ Millions)



Source: BCC Research

Travel & Transportation

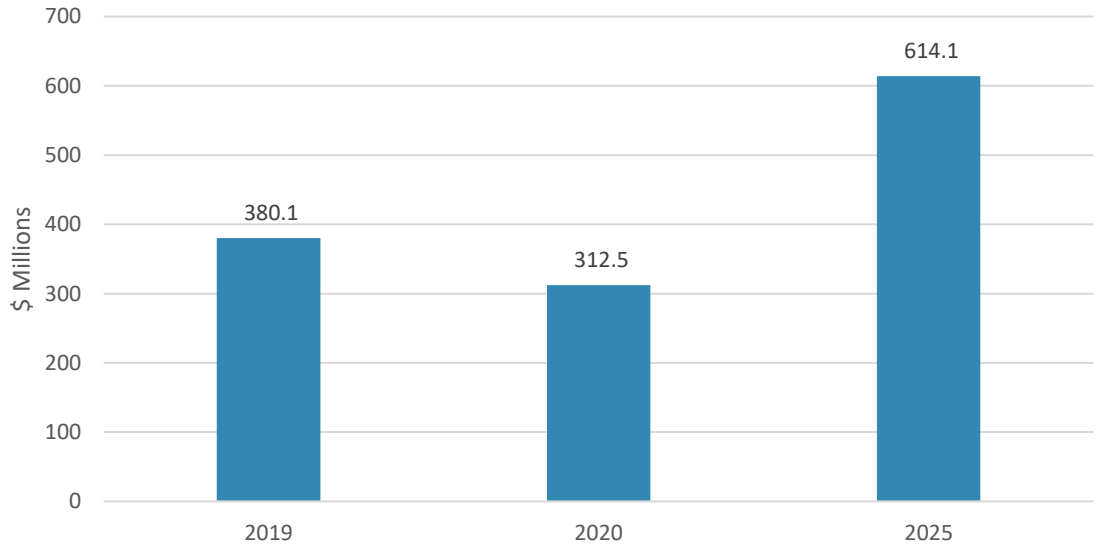
The travel and transportation sector is projected to be among one of the fastest growing segments of the self-service kiosk market. The main growth in the travel and transportation sector is expected to come from increasing use of self-service kiosks in airports and as check-in/check-out terminals in places such as railway stations. The growing adoption of self-service solutions by airlines, such as ticketing, self-boarding, check-in, and bag label printing, is presently the most prominent factor increasing the demand for airport kiosks. Passengers around the country are increasingly embracing these solutions to avoid long lines and delays at airports. Moreover, increasing passenger traffic is making self-service a convenient way to control and expedite passenger clearance, baggage clearance and check-in processes. Further, the growing trend of privatization of airports is encouraging airline companies to increase their IT spending on airports, which in turn is paving the way for market growth in self-service kiosks. To control the spread of COVID-19, airports across the country are implementing automated temperature check kiosks to check each passenger's temperature before they board a flight. Although temperature check kiosks cannot detect COVID-19, they will detect abnormal temperature readings, and can relay a notification to the airline.

Before the pandemic, the National Railroad Passenger Corp. (Amtrak) had been making a significant investment in self-service technologies. The outbreak of the COVID-19 pandemic has brought significant losses to the company. Amtrak is projecting losses of about $700 million this year, following a 95 percent drop in ridership amid the coronavirus crisis. With services opening in a few states, Amtrak has been trying to provide customers with new, innovative measures that promote physical distancing and

contactless travel and which make the consumer travel experience simple and safe. Amtrak is providing users with an app that helps to prevent crowding in stations and provides an extra level of confidence for passengers to make travel safe and secure. Amtrak has also been installing new ticketing kiosks at stations, making it easier for riders to obtain tickets.

Many cities in the United States are installing smart city kiosks that provide users with information such as travel updates, inclement weather details, wayfinding, and traffic or transit closure updates.

Figure 18
U.S. Self-Service Kiosks Market for Travel & Transportation, 2019–2025
($ Millions)



Source: BCC Research

Government

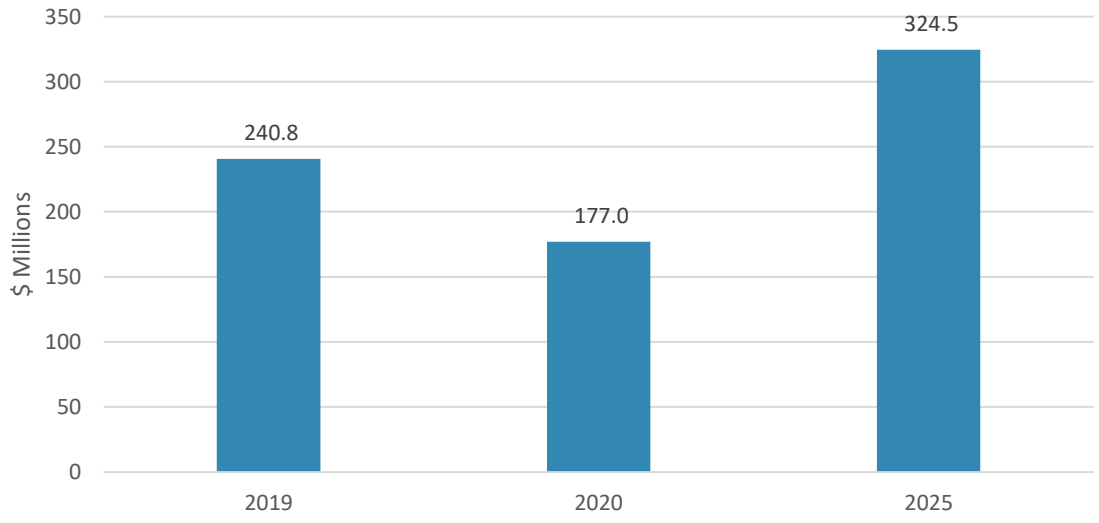
Since the early 1990s, kiosks have become an effective tool for federal and state agencies in disseminating information and government services to the public. Currently, interactive kiosks with enhanced features such as retina scanners, built-in cameras and signature pads are being used by government agencies for security purposes. The enhanced technology and an increased range of capabilities in self-service kiosk have made them critical in serving government agencies' tech-based offerings. Self-service kiosks have been used across many government agencies to streamline activities. These interactive kiosks are capable of handling a number of transactions and can also function as information kiosks and relieve front-line employees from mundane tasks. Self-service kiosks are being used by the government for efficient crowd management. For example, these interactive devices act as information kiosks, enabling people at large events to click on what they want to see and then get desired information.

Another area of government in which self-service kiosks are being used more is the court system. Although court kiosks have been available in the market since the early 2000s, with the rise in usage of kiosks in other sectors, there has been an increasing usage of these kiosks in courts as well. The earlier version of court kiosks was largely used to check in litigants, attorneys and visitors. Currently, court kiosks are embedded with enhanced functionalities and can perform various operations such as fee and fine collections, docket details, wayfinding, and others. The current range of interactive kiosks can also connect judges with counsel and can be used to file a variety of legal papers. These kiosks may be found on off-courthouse premises, such as in another government facility, making it simpler for the public to pay fees and penalties or process paperwork. Not only can this allow the public to have greater access to public facilities, but it can also help minimize foot traffic at the courthouse.

The U.S. Department of Veterans Affairs has also been adopting self-service kiosks to provide its services more effectively. Self-service kiosks enable veterans to have convenient control and access to their health information, thereby enhancing their experience with the department. Other functions of self-service kiosks for Veterans Affairs include:

- Check-in for scheduled appointments.
- View future appointments.
- Manage, review and update personal and insurance information.
- Apply for reimbursement of travel to appointments.
- More discreetly provide information they may view as sensitive, such as age or race/ethnicity.
- Apply for beneficiary travel mileage reimbursement.
- Request medical records.
- Manage their account balance.

Figure 19
U.S. Self-Service Kiosks Market for Government, 2019–2025
($ Millions)



Source: BCC Research

Educational Institutions

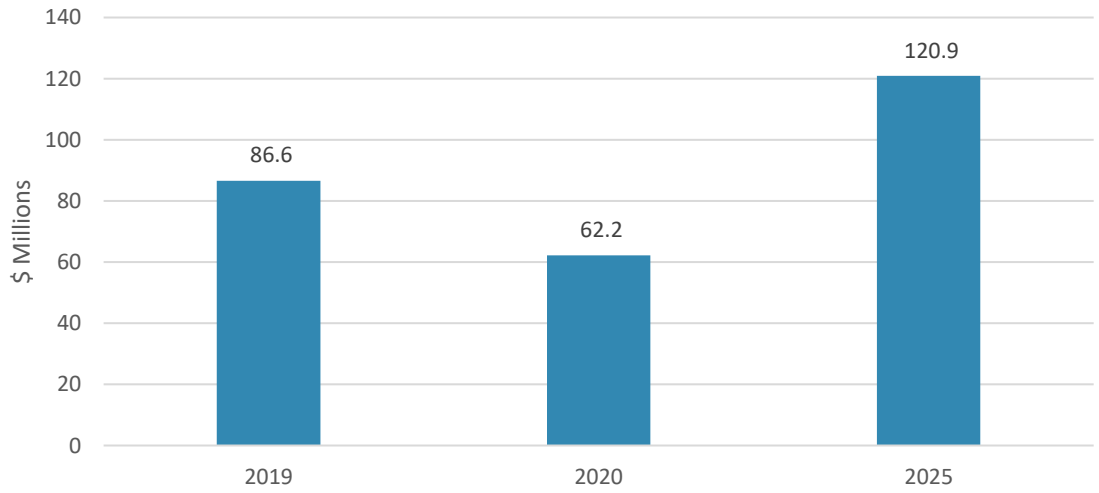
The education industry is continually under pressure to reduce costs while providing more student services. Self-service technology providers offer a wide range of scalable and integrated self-service solutions that help colleges and universities meet these needs. Interactive kiosks in schools and universities are used for class/program registration, event promotion, wayfinding, and as printing stations.

Across many U.S. universities, administrators are strategizing about where and how to use this technology. Educational kiosks can deliver solutions for many campus-related needs. By automating many tasks, educational kiosks help colleges and universities improve their staff productivity. This is primarily accomplished by offering self-service capabilities for students and other users for items such as registering for classes, ordering books online, filling out applications for financial assistance, and checking catalogues of courses.

One of the major benefits of education kiosks in colleges and universities is to reduce queuing time and decrease congestion. Education kiosks can facilitate service at high-traffic times and locations and alleviate the congestion that can occur in more populated universities and colleges. They reduce the wait times associated with many of the applications that students attempt to process on a regular basis. High-traffic periods such as orientation, sporting activities and weekends with parents can be handled better because transactions are accelerated.

Educational kiosks also help reduce or contain staff overhead costs, enabling universities to reorient their staff towards more productive works. Kiosks in universities also provide opportunities for continuous branding.

Figure 20
U.S. Self-Service Kiosks Market for Educational Institutions, 2019–2025
($ Millions)



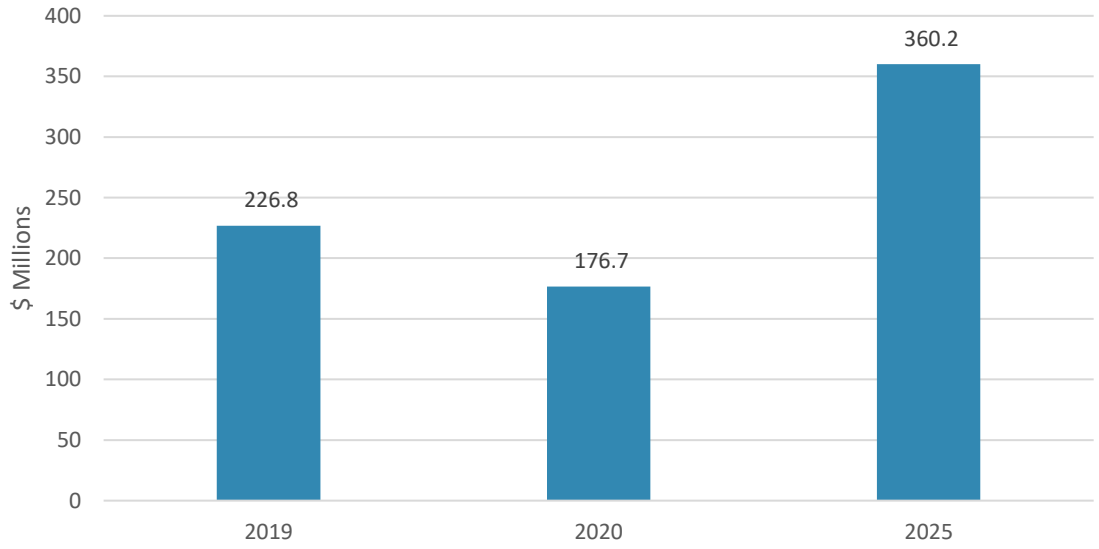
Source: BCC Research

Others

The Others segment includes facilities such as libraries, IT companies, manufacturing, and other corporate offices. Over the last few years, there has been increasing use of self-service kiosks in libraries across the U.S. Library kiosks save time for users and staff and help in smooth and efficient functioning. Applications of self-service kiosks in libraries include book checkout, book check-in, book renewal, cataloguing services, bibliographic services, and others.

Over the last few years, self-service kiosks are becoming an integral component of a digital workplace. Business are deploying kiosks in their offices to provide everyday services such as event lookups, wayfinding with floor maps and booking a workspace. Also, many corporate offices are deploying temperature sensing kiosks to conduct temperature checks on employees and visitors so as to maintain a safe and secure working environment.

Figure 21
U.S. Self-Service Kiosks Market for Others, 2019–2025
($ Millions)



Source: BCC Research

Chapter 6

Competitive Landscape

BCC Publishing

Chapter 6: Competitive Landscape

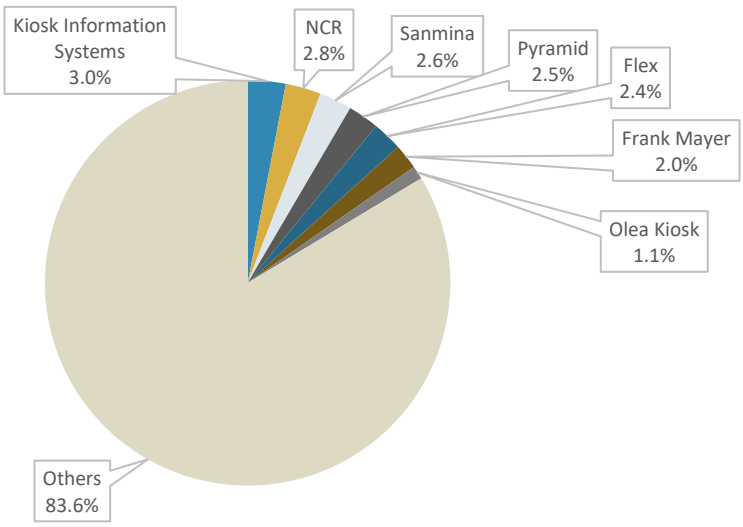
Market Share Analysis

The U.S market for self-service kiosks is highly fragmented due to the presence of numerous local and regional players. Over the next few years, the competition in the market is expected to intensify further as companies launch new products and engage in pricing competition. Kiosk Information Systems, NCR Corporation Sanmina Corporation, Pyramid Computer GmbH, Frank Mayer, Olea Kiosk. These companies provide self-service solutions to customers of varying sizes in the financial, retail, hospitality, and other industries, including the tourism and media and entertainment segments. Companies in the self-service kiosk market provide service and support for their products and solutions through services contracts with their customers. These companies have also established managed services contracts with key customers and continue to pursue additional managed services relationships. Longer term managed services arrangements can help improve the efficiency and performance of a customer's business and increase the strategic and financial importance of its relationship. The primary sales channel for kiosk companies involves direct sales teams.

To remain competitive in the market, self-service kiosk providers are primarily focused on designing and developing solutions that anticipate customers' changing technological needs as well as consumer preferences. A significant share of a company's expenses may be spent on research and development in order to provide a continuing flow of innovative, high-quality products and services and to help maintain and enhance competitive position.

BCC Research estimates that Kiosk Information Systems is the leading self-service kiosk provider in the U.S., accounting for around 3.0% of the market in 2019. Kiosk Information Systems offers custom, remote, bill payment, locker, vending, rental, and ticketing hardware, along with software. Since 1993, the company has been a leader in the design and manufacture of self-service solutions. NCR Corporation is estimated to be the second largest company in the U.S., accounting for 2.8% of the total market. Kiosk Information Systems is a leading provider of standard as well as custom kiosks and software solutions.

Figure 22
U.S. Self-Service Kiosks Market Share Analysis, 2019
(%)



Source: BCC Research

Strategic Analysis

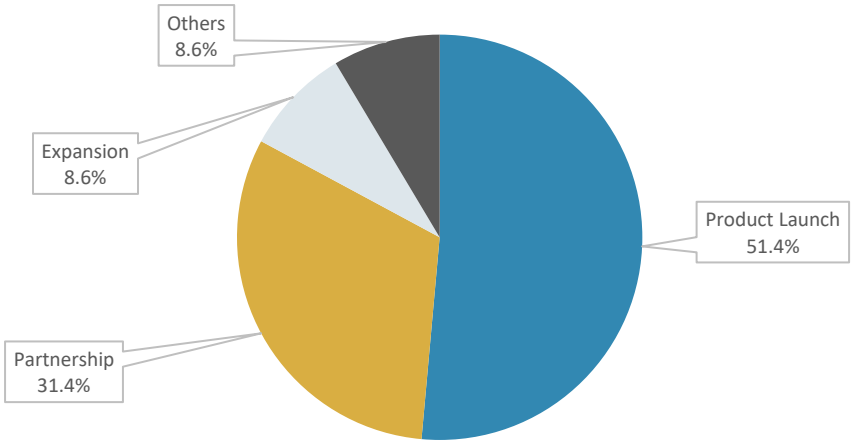
The strategic analysis presented here is a result of analysis performed on company profiles of key players in the U.S self-service kiosks market. The strategies of the key market players were gathered and analyzed, particularly their recent developments. The data obtained through press releases is limited in scope to their publicly available information. The key strategies adopted by important players in the self-service kiosks market include:

- Product Launch: Some of the companies operating in the self-service kiosks market focus on product launches to enhance their product portfolio and to bring competitive product offerings into the market. Product launch is the end objective of new product development and is the process to bring new products into the market. In-depth understanding of the market needs, market competition and promotional efforts are the key factors that determine the success of a new product in the market.

- Agreements and Partnerships: Key players in the market sign supply and R&D agreements to capture major market share and compete with other players.

- Expansions: In expansion, business entities enlarge their product portfolio and enter a completely new business or expand their global presence. Suppliers in the self-service kiosks market adopt this strategy to capture market share, to respond to customer demand and to increase net revenue.

Figure 23
U.S. Self-Service Kiosks Market Strategic Analysis Share , 2019-2020*



Source: BCC Research

From the illustration above, it can be seen that the product launch strategy was the most preferred strategy in the self-service kiosks market. Partnerships and expansions were the other primary strategies adopted by key players to gain competitive advantage and expand their market share. About 51.4% of the top strategies adopted by the key players were product launches. Partnerships and expansions accounted for 31.4% and 8.6% of the overall strategies, respectively.

Key Developments

Table 3
U.S. Self-Service Kiosks Market, Key Developments, 2019-2020*

Date	Development Type	Description
May 2020	De-merger	AU Optronics Corp. announced the demerger of AUO's General Display and Public Information Display businesses to Da Qing Corp., an entity wholly owned by AUO. This enables the two business units to have more agility for future development, and to enter strategic partnerships with higher flexibility, accelerating the building of ecosystems with partners across diverse domains, extending the value chain for smart display applications, integrating AIoT and novel technologies to seize new market opportunities from digital transformation of all verticals, with an aim to enhance overall operating performance.
April 2019	Partnership	AU Optronics Corp. partnered with PlayNitride to develop high-resolution, flexible micro-LED display technology. AUO and PlayNitride each contributed their expertise in display and LED to jointly develop a 9.4-inch high-resolution, flexible micro-LED display with the world's highest 228 PPI pixel density, achieving yet another industry milestone with pioneering technological breakthroughs.
August 2019	Expansion	AU Optronics Corp. launched several new display technologies at Touch Taiwan 2019. The new displays launched by the company include a 17.3-inch OLED display with UHD 4K image quality and 120Hz refresh rate, and a 17.3-inch OLED display with UHD 4K image quality and 120Hz refresh rate
October 2020	Product Launch	Frank Mayer and Associates Inc. launched a temperature and health-screening kiosk which helps employees safely return to work during the coronavirus pandemic. With the health screening and temperature kiosk, the company plans to provide its customers with an easy way to protect employees while saving costs.
August 2020	Partnership	Frank Mayer and Associates Inc. announced a partnership with Data Display Systems LLC to develop a kiosk solution for employers looking to enact health screening and temperature checks at their worksites.

Date	Development Type	Description
May 2020	Partnership	Frank Mayer and Associates Inc. announced a partnership with Agile Force to provide custom hardware solutions to employers looking to enact remote temperature scanning at their worksites. With the COVID-19 pandemic creating a greater demand for this practice, both companies have worked to integrate a complete solution into the existing Agile Force platform that meets ISO 13154 standards and limits close human interaction.
May 2019	Product Launch	Frank Mayer and Associates Inc. launched freestanding, floor tablet and counter self-order kiosks at the 2019 Interactive Customer Experience (ICX) Summit in Dallas.
May 2020	Product Launch	Honeywell announced the launch of new temperature monitoring solution that incorporates advanced, infrared imaging technology and artificial intelligence algorithms to conduct non-invasive, preliminary screening of personnel entering a facility.
November 2019	Product Launch	Kiosk Group announced the launch of Roo Printer Tablet Kiosk. The Roo Printer Kiosk is used for check-in, information or transaction applications.
May 2020	Product Launch	KIOSK Information Systems launched KNECT IoT, an enhanced remote monitoring application for real-time visibility of an unattended kiosk deployment. The new features within KNECT IoT raise the standards on what customers can expect from their remote management system (RMS) when they deploy digital kiosks throughout their business network and service delivery channels.
May 2020	Partnership	KIOSK Information Systems announced a partnership with Valyant AI, a Colorado-based artificial intelligence (AI) company, to create contactless experiences driven by conversational AI across environments in which kiosks are deployed.
January 2020	Expansion	Posiflex Group announced the formation of KIOSK Information Systems Europe GmbH to provide comprehensive sales and support services to European buyers of its standard and custom self-service kiosk solutions. KIOSK Information Systems through this expansion is actively expanding its footprint to serve European customers as well as further develop its global capabilities.
March 2019	Partnership	KIOSK Information Systems announced a partnership with Bitcoin ATM pioneer Bitstop to bring their next generation Bitcoin ATM to market, enabling customers to easily buy and sell bitcoin and other digital currencies.

Date	Development Type	Description
February 2019	Partnership	KIOSK Information Systems announced a partnership with Zenig, an innovator of healthcare solutions, to provide an easy to use, turn-key self-service offering for hospitals, outpatient centers and physician practices. Zenig provides easy-to-use, effective patient-centered healthcare solutions. Their self-service kiosk is simple to implement, and enables patients to self-check-in, verify demographic information, sign contracts, and collect payments.
November 2019	Product Launch	KioWare announced the launch of KioWare OS for Android. KioWare OS was created to avoid the problems that occur when organizations use less-than-ideal consumer tablets to meet their self-service kiosk needs.
January 2019	Product Launch	KioWare announced the launch of KioWare for Chrome OS(TM) which is a kiosk application used with Chrome OS Kiosk Mode to secure the Chrome Operating System and activate additional interactive kiosk features.
May 2020	Product Launch	Nanonation launched a pandemic suite of products, with components focused on future reuse. The hardware and software used in these products can easily be adapted to serve a variety of post-pandemic business functions, ensuring maximum return on companies' investments.
May 2020	Product Launch	Nanonation announced the launch of a temperature screening kiosk to aid businesses during the COVID-19 pandemic. The kiosk is a no-contact solution to test employee or visitor temperatures, and is available as either a free-standing kiosk or a tabletop tablet.
October 2019	Product Launch	Olea Kiosks announced the launch of the Franklin Bill Pay kiosk as the newest addition to its self-service line-up. The Franklin Bill Pay kiosk has the ability to accept and dispense dollar bills, dispense coins, read checks, and take credit card payments.
September 2020	Partnership	Pyramid Computer has announced a strategic partnership with FreeStylus, a Philadelphia-based company. The objective of this cooperation is to offer users an alternative and better experience with safer interactions while keeping the environment in mind. The effort is aimed at restoring consumer confidence regarding touch interaction displays while providing a solution that aims to slow down the spread of the corona virus.
January 2020	Expansion	Pyramid Computer announced its expansion into the North America region at The NRF Big Show in New York City, January 2020. This move will enable the company to become a real local partner for their clients in the United States.
September 2019	Product Launch	Pyramid Computer announced the launch of new Polytouch® 32 PE4000. The Polytouch 32 PE4000 is the world's first system to combine four self-service kiosks on a single pedestal.

Date	Development Type	Description
May 2019	Product Launch	Zebra Technologies Corp. launched its CC6000 and CC600 Customer Concierge kiosks, providing customers with an optimal online and in-store shopping experience with self-service capabilities. The 10-inch CC6000 and 5-inch CC600 kiosks combine the familiarity of a consumer tablet with an enterprise-class Android™ platform that enables retailers to deliver a truly unique shopping experience featuring quick access to product information, pricing and availability and personalized service.
October 2019	Partnership	Evoke Creative announced a partnership with Radius Networks, a leading provider for location services. This partnership will help businesses across Europe adopt innovative technology solutions in-store, curbside and drive-thru. With the simple integration of Radius Networks and Evoke technologies, businesses can simplify and complete their customer journeys.
August 2019	Product Launch	Evoke Creative announced the launch of a new generation of self-service kiosks for McDonald's. These kiosks were developed to support the latest McDonalds store format in the U.K.
October 2020	Product Launch	Acquire Digital announced the launch of five new features to improve self-service solutions and the flow of visitor traffic in public spaces. Acquire's improved signage functionality is designed to tackle COVID-19 concerns with new self-service software features. The five new features launched by the company include Acquire Mobile Control, Acquire Voice Control, Acquire Wave, Contactless Temperature Kiosk, and Traffic Control solutions
February 2020	Product Development	Acquire Digital announced the launch of Wayfinder V4.4 in the form of its SmartHub technology. SmartHub is a central point of data gathering and delivery through multiple technologies.
June 2020	Product Launch	Burroughs Inc. announced the launch of TransacTec™ Device as a Service (DaaS). This turnkey solution provides financial institutions and retailers with an easy way to adopt cash automation technology cost-effectively.
February 2020	Partnership	Burroughs announced a partnership with KAL, a world-leading ATM software provider to provide customers with hardware-agnostic software solutions as an alternative to existing OEM-centric options and compliance-driven upgrades.
April 2020	Product Launch	Qwick Media announced the launch of Hydrosanz©™ Large Capacity Hand Sanitizer for high-traffic locations. Hydrosanz©™ is an effective solution for COVID-19 prevention. These kiosks are ideal for public transport hubs and at entrances to all major building types (commercial, residential and institutional).

Date	Development Type	Description
March 2019	Acquisition	Qwick Media Inc. announced a share purchase agreement with SFE Global Inc. SFE Global is an environmental services provider to city and county water and sewer systems, providing services in underground water, storm and sanitary lines throughout the western United States.
July 2019	Partnership	TEAMSable POS announced a partnership with North American Bancard (NAB), an innovative payment technology company. NAB/EPX is expected to become an integrated payment processor platform for TEAMSable's new line of smart payment terminals
August 2020	Product Launch	Storm Interface launched new hardware for speech-commanded self-service applications. Self-service terminals with voice recording, voice recognition or speech command features are deployed in public locations.
December 2019	Partnership	Storm Interface and Vispero announced a partnership to combine the JAWS screen reader with Storm's Assistive Technology Products to create the most accessible kiosk experience for users who are blind, have low vision or limited dexterity.
May 2020	Product Launch	Mimo Monitors announced the launch of Touch-Free, Temperature-Taking Platform. This enterprise-grade platform is reliable, flexible, and customizable, to ensure it can optimize for what every business needs. It contains the premium Mimo Monitors hardware display, as well as Revel Digital's CMS analytics and accurate temperature sensing software, along with a one-year license.

Source: Company Websites and Press Releases

Chapter 7

Company Profiles

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Chapter 7: Company Profiles

22MILES INC.

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Milpitas, CA 95035
Tel: 408/933-3000
Website: www.22miles.com

Company Overview

22Miles is a leading digital signage software and solutions provider in the U.S. The company was established in 2007 and is based in Silicon Valley, California. Since its inception, the company has successfully deployed thousands of digital signage installations for leading brands and organizations. Some of the major consumers of 22Miles products and solutions include Westfield, Stanford Children's, Okada Casino, Astra Zeneca, Eli Lilly, OCCC, Nashville Music City Center, Etech Shows (ITEXPO Gartner and AWS), Colgate University, USC, GA Tech, JLL, Cushman & Wakefield, Four Seasons Resort Worldwide, Hilton Worldwide, IHG, Toyota HQ, and the U.S. Department of Commerce, and many others

22Miles Inc. has received several awards for its software and solutions. Some of the major awards received by the company include: 2015 DIGI Award for Best Interactive Retail Digital Signage and 2014 Digital Screen Media Association Best Healthcare Self-Service Interactive Kiosk Award. The company delivers technology solutions that assist its clients/partners in building, expanding and optimizing their communication and user-engagement channels.

22Miles has a wide portfolio of products and solutions which includes digital signage, touch, wayfinding, video walls, mobile, AR, virtual receptionist, room booking, desktop suite, temp screening with access control, touchless touch solutions, full CMS, and services and integration. The company's customer solutions portfolio includes UI/UX design and custom API integrations for any display or mobile applications and triggering. 22 Miles also provides custom development on certain projects that may be more out-of-the-box requests.

Due to the outbreak of the COVID-19 pandemic, 22Miles have made several additions to its product portfolio. The company introduced TempDefend along with other Touchless Touch-voice, gesture, and Secure Mobile Control solutions. 22Miles also developed a video call server to support virtual receptionist, and also introduced facial recognition tech, rapid tracking and multi-user tracking technology for temp scanning and a CDC survey/questionnaire and check-in app.

Continuous innovation is one of the primary strategies adopted by the company to stay ahead of the competition. 22Miles gathers regular feedback from its global partners and clients and gathers information on the various developments underway in Europe and Asia to forecast future developments in the U.S. Over the last four years, 22Miles has made over 550 version releases of its software.

Product Portfolio

Table 4
22Miles Inc.: Software and Solutions

Software and Solutions	Description
Waytouch Premier™	Waytouch Premier™ is an Interactive wayfinding solution developed by the company. Using the company's wayfinding software & solutions, a customer can ease the stress of visitors, by helping them navigate throughout property seamlessly. The wayfinding solutions can also be used to keep visitors informed with the latest news, promote local businesses and amenities, and provide visitors with traffic & weather updates.
Mobile Wayfinding App	22Miles Mobile Wayfinding system enables users to find an indoor route and information on any mobile device, such as a smartphone, tablet or and hand-held game console.
Interactive Digital Signage Software	22Miles interactive Digital Signage Software solution empowers users of any level with a solution engineered for user simplicity paired with robust options. This solution empowers organizations with a CMS that inspires limitless creativity to leverage organizational goals in the agile workspace environment.
Digital Reader Boards	22Miles digital reader board solutions help companies to communicate to visitors, customers, patients, and employees. They can also be used to easily schedule a digital read board to display information for events.
Publisher Pro	Publisher Pro is the company's digital signage software. The software provides an intuitively simple drag-and-drop toolbox of widgets and filters.
Digital Menu Boards	Major applications in which these solutions are used include upscale sit-down restaurants, alcoholic beverage-focused nightclubs, wine bars and brew pubs, fast-service oriented delis, coffee shops, and much more.
Carry2Mobile	Carry2Mobile™ empowers the digital audience to experience content on a mobile phone with no App download. Carry2Mobile™ benefits both the display owners as it leads to higher usability and the end user as it is now much more seamless to consume content on the go. Carry2Mobile™ uses HTML5 technology to seamlessly transition the user experience from a digital sign to a mobile device's web browser.
Room Booking Solution	22MILES Room Booking Solution combines wayfinding and room booking applications. The company's all-in-one platform enables companies to bring their meeting status right to the conference room door, highlight vacant rooms on a 3D wayfinding map, and even drive content to the mobile devices of your attendees.
Mobile Wayfinding App with 22Miles AR Plug-in Capabilities	The company's mobile AR app helps users navigate, with a clearer direction to start.
Virtual Receptionist	22Miles Touchplus capabilities provide a unique virtual lobby experience for any organization. These solutions integrate the company's existing communication systems with any type of content design. It also provides a secure check-in process with live web-cam feed that shows who is waiting at the lobby.

Software and Solutions	Description
TempDefend	TempDefend is 22Miles Protection-as-a-Service solution. TempDefend thermo-sensing technology leverages a combination of camera technology, facial, and body temperature detection software, integrated sensors, and dynamic machine learning algorithms to aid in the prevention of viral spread.

Source: Company Website and Press Releases

ACQUIRE DIGITAL INC.

One Boston Place, Ste. 2600
Boston MA, 02108
Tel: 844/291-3501
Website: www.acquiredigital.com

Company Overview

Acquire Digital is a global leader in the development of innovative digital signage software and interactive experiences. The company was established in 1997 and since its inception has played a key role in developing many industry firsts and has been making exceptional strides in the digital signage segment. The company has installed tens of thousands of hardware and software products for consumers across the world.

Acquire Digital continuously develops new solutions and makes enhancements to its existing solutions. The company over the last year has started working on integrating with a new DOOH partner. Based upon the company's earlier work in Las Vegas, it is adding functionality to LED control software for controlling super-sized displays. The company has also recently completed a large airport wayfinding project in the U.S. and plans to integrate technology from this project into its standard wayfinding offering. Acquire Digital is also building a new digital signage CMS to incorporate elements of DOOH and standard digital signage offerings into one that encompasses the company's entire interactive digital suite.

Acquire Digital's primary end-user markets include retail (shopping malls, retail stores), travel (railway, airports), leisure (entertainment, events), and sports (venue perimeter signage and interaction). The company's secondary markets include partner companies (kiosk companies) and network operators (clients in various industries who will put together a solution from multiple vendors and supply this hybrid solution).

Some of the most prominent clients for the company include Saint-Gobain, Disney, Walmart, The British Museum, GE, Sony, Atos, Accenture, BBC Radio, MSN, and others.

Table 5
Acquire Digital Inc.: Products and Services

Product	Description
Acquire Editor	Acquire Editor is company's digital signage tool that is ideal for use within retail, airports, leisure & tourism, education, banking, and healthcare. These solutions are used by management and power users to create, manage and deploy content to their screens.
Acquire2Go	Acquire2Go is the company's web-based digital signage solution that enables users to create, edit and upload content on the go. Acquire2Go gives users complete control of their network using any web-enabled device. This is the perfect solution for those that control multiple screens but need to update content away from the office.
Wayfinder	Wayfinder solution from the company is an enterprise grade digital directory solution, with best-in-class experience for users and owners.
Touchless kiosk solutions	The company during the COVID-19 pandemic added touchless kiosk solution (scan QR code to remotely control the kiosk on mobile for any Windows based kiosk), enhanced the mobile>website handoff on wayfinder solutions, added speech recognition control to wayfinder, and added gesture control. It also created a traffic counter/smart entry kiosk application for retail store entrances.
Custom solutions	CMS for digital signage, interactive gamification for digital signage, interactive kiosk solutions for small screen and large format displays, and consulting services.
Other solutions	Digital shelf edge solutions, anonymous audience measurement, remote kiosk management support tools, entry counter, kiosk contactless tools.

Source: Company Website and Press Releases

Recent Developments

Table 6
Acquire Digital Inc.: Recent Developments, 2020

Date	Development Type	Description
October 2020	Product launch	Acquire Digital announced the launch of five new features to improve self-service solutions and the flow of visitor traffic in public spaces. Acquire's improved signage functionality is designed to tackle COVID-19 concerns with new self-service software features. The five new features launched by the company include Acquire Mobile Control, Acquire Voice Control, Acquire Wave, Contactless Temperature Kiosk, and Traffic Control solutions
February 2020	Product development	Acquire Digital announced the launch of Wayfinder V4.4 in the form of its SmartHub technology. SmartHub is a central point of data gathering and delivery through multiple technologies.

Source: Company Website and Press Releases

ALVENI LLC (USA)

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Austin, TX 78730
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Website: www.alveni.com

Company Overview

Alveni was founded by Jorge Eurán Graham in 1996 in Monterrey, Mexico, with a focus on full project management for interactive self-service kiosks. In 2010, to enter the global marketplace, Alveni opened an office in Austin, Texas. Alveni is a turnkey solution provider specialized in the complete project management of a kiosk project. Alveni is involved in the complete cycle of kiosk project, that is, integration to the final deployment and remote monitoring.

Alveni LLC is the U.S. subsidiary of Alveni S.A. de C.V., a Mexican company leader in interactive kiosk solutions since 2003.

Table 7
Alveni LLC.: Products and Services

Products and Services	Description
CHAC	These kiosks are ideal for access information, human resources, electronic surveys, internet access, customer service, tickets, receipts or coupon printing, and virtual remote assistance.
MENTA	These kiosks are ideal for vehicle check-in / check-out, specialized parking access, outdoor customer service, videoconferencing, RFID tag check-in / check-out, and other outdoor applications.
MAYA PAYMENTS	These kiosks are ideal for schools and universities, directory location, virtual maps, multiuser interactive games, product information, tourist information, and client services.
MAYA	These kiosks are ideal for access information, wayfinding, human resources, building directory, electronic surveys, customer services, and ticket, receipt or coupon printing.
KUALI	These kiosks are ideal for point of sale, wayfinding, human resources, building directory, electronic surveys, customer services, and ticket, receipt, or coupon printing.
KANAL XL	These kiosks are ideal for mall and building directories, wayfinding, virtual maps, digital signage or advertising, product information, tourist information, customer services, multimedia presentations and video, and virtual remote assistance.
CUSTOM KIOSKS	Alveni provides its customers with customized solutions. For their custom kiosk solutions, Alveni selects only the highest quality peripherals and unique components to provide reliability to manage the complete user experience.
YUUM	These kiosks are ideal for access information, wayfinding, human resources, building directory, electronic surveys, customer services, and ticket, receipt, or coupon printing.

Products and Services	Description
KANAL	These kiosks are ideal for mall and building directories, wayfinding, virtual maps, digital signage or advertising, product information, tourist information, customer services, multimedia presentations and video, and virtual remote assistance.
AXIOT	These kiosks are ideal for services payments, online banking, taxes payments, music and other products purchases, official documents processing and payment, and large-format printing.
IKAL	These kiosks are ideal for mall and building directories, wayfinding, virtual maps, digital signage or advertising, product information, tourist information, customer services, multimedia presentations and video, and virtual remote assistance
CHAC-i	These kiosks are ideal for restaurant self-service ordering, social media applications, wayfinding, customer service, events check-in, building directories, electronic surveys, electronic payments with printed receipts, coupon printing, and any other self-service application.
Services	Services provided by the company include project management, content development and design, manufacturing, remote management, and installation and maintenance.

Source: Company Website and Press Releases

ANALYTICAL DESIGN SOLUTIONS INC., DBA KIOWARE

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York, PA 17401
Tel: 717/843-4790
Website: www.kioware.com

Company Overview
KioWare initially started as ADSI in 1991 as an engineering and IT consulting firm in the electronics industry. KioWare primarily focuses on providing self-service system software; its self-service applications are viable in all vertical markets. The company's largest markets are retail, healthcare, financial services, and government. KioWare provides the self-service framework upon which applications reside, so that customers are not forced to re-invent the sell-service wheel and can concentrate on the value-add of the application software.

The company's main product is Kiosk System Software, which is a lockdown software that secures a desktop and allows users to turn their PC or mobile device into a self-service kiosk. Users can configure KioWare to restrict access to the application(s) or websites. KioWare kiosk software is available for Windows, Android, and Chrome OS devices. KioWare Server product provides centralized kiosk management and monitoring capability.

Product Portfolio

Table 8
KioWare: Products and Services

Product	Description
KioWare for Windows	Chromium Based Lockdown Software
KioWare for Android	Single App Mode & Android Browser Lockdown.
KioWare Classic for Windows	Internet Explorer Based Browser Lockdown
KioWare OS	KioWare OS enables KioWare for Android functionality to be installed as the firmware of Android SBCs
KioWare Lite	KioWare Lite provides vital lockdown security for browser-based applications, restricting users from accessing the operating system (OS) and desktop, and limiting internet access to only allowed websites & applications. Providing security from malicious activity and restricting users from saving sensitive data to the desktop or external devices, KioWare Lite protects both individual, dual user data and organization-wide data from unauthorized access, creating the restricted environment for kiosk or purposed device usage.
KioWare Basic	KioWare Basic provides the functionality of KioWare Lite with the addition of managing external devices such as additional displays, printers, scanners, cash/coin acceptors/dispensers, EMV credit card terminals, etc.
KioWare Full	KioWare Full provides the functionality of KioWare Basic with the addition of communicating with KioWare Server
KioWare Server	KioWare Server provides centralized remote monitoring and management of kiosks running KioWare Full and is installed in deployer's infrastructure.
KioCloud	KioCloud is our hosting of KioWare Server in the cloud eliminating the need for deployers to install and manage their own KioWare Server
KioCall	KioCall enables video conferencing to easily be added to a kiosk application running KioWare.

Product	Description
KioTouch	KioTouch is a web service that enables any kiosk application (i.e., KioWare is not required) to display a QR code to a kiosk user that when scanned by the user's mobile device enables mouse and keyboard control to be handled by the mobile device. The kiosk user never needs to touch the kiosk. KioTouch is ideal for existing deployed kiosks because it enables touchless capability to be added without requiring any hardware modification.

Source: Company Website and Press Releases

Recent Developments

Table 9
KioWare: Recent Developments, 2019

Date	Development Type	Description
June-2020	Product Launch	KioWare launches KioTouch - a web service based touchless kiosk solution that uses QR codes and the kiosk user's mobile device.
November 2019	Product launch	KioWare announced the launch of KioWare OS for Android. KioWare OS was created to avoid the problems that occur when organizations use less-than-ideal consumer tablets to meet their self-service kiosk needs.
January 2019	Product launch	KioWare announced the launch of KioWare for Chrome OS(TM) which is a kiosk application used with Chrome OS Kiosk Mode to secure the Chrome Operating System and activate additional interactive kiosk features.

Source: Company Website and Press Releases

AU OPTRONICS CORP.

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Website: www.auo.com

Company Overview

AU Optronics Corp. (AUO) was formed in September 2001 by the merger of Acer Display Technology, Inc. (the former parent of AUO, established in 1996) and Unipac Optoelectronics Corp. In October 2006, AUO acquired Quanta Display Inc. The company is headquartered in Hsinchu Science Park, Republic of China. AUO's main activities are research, development, production, and sale of thin film transistor liquid crystal displays (TFT-LCDC) and other flat panel displays used in a wide variety of applications. AUO also engages in the production and sale of solar modules and systems. The company's common shares have been publicly listed on the Taiwan Stock Exchange since September 2003 and its American Depositary Shares (ADSs) have been listed on the New York Stock Exchange (NYSE) since May 2002.

AUO over the last decade has established itself as a specialized PID solutions provider. The company developed several value-added products that are used across various end-user segments such as restaurants, hospitality, transportation, education, retail, and entertainment.

The company's diverse portfolio of PID products include ultra-high resolution, ultra-high brightness, extreme narrow bezel, dual-sided, and stretched displays. These high-quality PID products are complemented by a broader solution set that includes display system, media player software and after-sales service.

AUO is a global leader in optoelectronic solutions and now houses a staff of more than 38,000 throughout its global operations spreading across Taiwan, Mainland China, Japan, Singapore, South Korea, the United States, and Europe. AUO generated $9.4 billion in sales revenue in 2019.

Product Portfolio

Table 10
AU Optronics Corp.: Products and Services

Product	Description
AUO Touchscreen Displays and Digital Signs	AUO has a complete generation of G3.5 to G8.5 TFT-LCD fabs, with over two decades of technological know-how and product expertise. AUO's product portfolio ranges from 1.1 to 85-inch displays for all types of applications.
Display Technologies	AUO's complete line-up of Gen 3.5 to 8.5 production lines provides a full range of panel sizes and all types of display applications.

Source: Company Website and Press Releases

Recent Developments

Table 11
AU Optronics Corp.: Recent Developments, 2019 and 2020

Date	Development Type	Description
May 2020	De-merger	AU Optronics Corp. announced the demerger of AUO's General Display and Public Information Display businesses to Da Qing Corp., an entity wholly owned by AUO. This provides the two business more agility for future development, with the ability to enter strategic partnerships with greater flexibility, accelerate the building of ecosystems with partners across diverse domains, extend the value chain for smart display applications, integrate AIoT and novel technologies to seize new market opportunities from digital

Date	Development Type	Description
		transformation of all verticals, with an aim to enhance overall operating performance.
April 2019	Partnership	AU Optronics Corp. partnered with PlayNitride to develop high-resolution, flexible micro-LED display technology. AUO and PlayNitride each contributed their expertise in display and LED to jointly develop a 9.4-inch high-resolution, flexible micro-LED display with the world's highest 228 PPI pixel density, achieving yet another industry milestone with pioneering technological breakthroughs.
August 2019	Expansion	AU Optronics Corp. launched several new display technologies at Touch Taiwan 2019. The new displays launched by the company include a 17.3-inch OLED display with UHD 4K image quality and 120Hz refresh rate, and a 17.3-inch OLED display with UHD 4K image quality and 120Hz refresh rate

Source: Company Website and Press Releases

BURROUGHS INC

38505 Country Club Dr., Ste. 210
Farmington Hills, MI 48331
Tel: 734/737-4000
Website: www.burroughs.com

Company Overview

Burroughs Inc. is a Michigan-based company that provides payment products and services. The company offers check and document scanners and cash automation services such as dual delivery and compact currency recyclers, dispensers, networked vaults, intelligent safes, networking, ATMs, and software solutions.

Burroughs Inc. was established in 2009 and has over the years driven numerous evolutions in payment and transaction technology. The company's aims to position itself as a leading integration partner for full life-cycle management of payment and transaction technology ecosystems delivered through innovation, collaboration, agility, service excellence, and investment

Table 12
Burroughs Inc.: Products and Services

Products and Services	Description
Maintenance services	The company provides technology-driven remote and onsite support for first- and second-line maintenance issues. Users can monitor call status in real time via our eAccess customer portal.
Remote managed services (RMS)	The company provides around-the-clock monitoring services that help them to resolve problems fast, reducing vulnerability and operational failures and maximizing uptime and availability.

Products and Services	Description
Project management	Project management services guide companies through key hardware and software decisions, such as site surveys, rigging, installation, staging, bring-live, OS and software upgrades, and network conversions.
TransacTec device-as-a-service (DaaS)	TransacTec™ is a turnkey solution for enabling an evolving ecosystem of products, best-in-class service, project management, analytics, predictive logistics, and next-gen remote managed services combined under one simple monthly payment.
Software solutions	Burroughs delivers middleware, analytical software and device software for a full ecosystem of products and services through its existing and growing partnerships with leading industry providers.

Source: Company Website and Press Releases

Recent Developments

Table 13
Burroughs Inc.: Recent Developments, 2020

Date	Development Type	Description
June 2020	Product launch	Burroughs Inc. announced the launch of its TransacTec™ Device-as-a-Service (DaaS). This turnkey solution provides financial institutions and retailers with an easy way to adopt cash automation technology cost-effectively.
February 2020	Partnership	Burroughs announced a partnership with KAL, a world-leading ATM software provider to provide customers with hardware-agnostic software solutions as an alternative to existing OEM-centric options and compliance-driven upgrades.

Source: Company Website and Press Releases

DYNATOUCH

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San Antonio, TX 78217
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Website: www.dynatouch.com

Company Overview

DynaTouch is an IT solutions company specializing in self-service solutions using kiosks, public access workstations, digital displays, mobile devices, and other interactive technologies. The company was established in 1988 and over the last few years has been one of the leading manufacturers, developers and integrators of customized self-service solutions. The company to date has installed kiosks and interactive display systems in all 50 states of the United States and in 27 countries around the world.

DynaTouch over the years has developed an unmatched reputation for not only developing top quality products, but for being responsive, easy to work with and for standing behind all aspects of their work.

DynaTouch's core product is TIPS Kiosk Management Software, which is an industry leading solution for creating, deploying, managing, and maintaining self-service device networks enterprise-wide.

Table 14
DynaTouch: Products and Services

Products and Services	Description
Floor-standing kiosks	The company's products under this segment include standard floor-standing kiosks, slim floor-standing kiosks, floor-standing kiosks with large displays, and floor-standing kiosks with overhead monitors.
Sit-down kiosk models	Sit-down models are ideal when an audience will need a little more time at the kiosk, such as to fill out long forms or applications, or to watch educational materials and tutorials. They are also an excellent option if the audience includes wheelchair users.
Countertop kiosk models	Countertop kiosk models are designed for operation on an existing counter or desk. These models are ideal when there is an existing counter or desk space, limited floor space or other seated options.
Wall-mount kiosk models	Wall-mount kiosk models include both wall-mounted kiosks and wall-mounted digital displays. They are available as stand-alone monitors, or all-in-one style units with integrated monitor, PC and/or touchscreen. Wall-mount units are ideal where floor space is limited and can be used for most applications.
Outdoor kiosk models	Outdoor kiosk models provide information to end users outside of business hours with no supervision. They easily streamline processes in locations where customer service isn't readily available. These kiosk self-service stations are perfect in areas of large crowds to help reduce long wait times.
Tablet & mobile models	Tablet kiosk models can include floor standing units, wall-mounted units and countertop units. Tablet kiosks offer a highly affordable solution relative to full-sized standard kiosks and can be used for a wide range of applications. The company also offers mobile and cart kiosks.
Lobby Sentinel™ thermal imaging kiosk	The DynaTouch Lobby Sentinel is an advanced thermal imaging kiosk which allows for fast and accurate screening of visitors and employees for elevated skin surface temperature.
TIPS™ kiosk management software	TIPS™ kiosk management software is an ideal software solution for presenting and managing web-enabled content and applications on unattended, public access kiosks, displays, tablets, and workstations.
Professional kiosk services	The company offers services from design to integration to deployment, and worldwide support.

Source: Company Website and Press Releases

EVOKE-CREATIVE

Power Station, Thermal Road Units 6 & 7 Wirral
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United Kingdom
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Website: www.evoke-creative.com

Company Overview

Evoke Creative is a U.K.-based company involved in the design and manufacturing of interactive digital solutions such as self-service kiosks, digital signage, ticket machines, interactive touchscreens, self-check-out machines, and large format video walls. The company serves consumers globally. The company has installed mor than 30,000 self-service kiosks to businesses worldwide and is the only company providing a complete end-to-end service on a suite of innovative products.

The U.S. division of the company is headquartered in Greenville, S.C. Some of the major clients for Evoke-Creative products include McDonald's, Nike, Tesco, Adidas, and others.

Table 15
Evoke-Creative: Products and Services

Product	Description
EV/Serve10	EV/Serve 10 is a compact self-service kiosk which packs plenty of function into a small form. Major functions of these kiosks include ordering, collection and queue busting. The EV Serve 10 modular design incorporates a range of peripherals for a full self-service solution.
EV/Serve22	The EV Serve22 range of modular, adaptable kiosks are designed for even the most demanding environments. This kiosk has a 22-inch touch screen to create impact and a clear call-to-action. These kiosks are highly customizable with variable chassis and color options. This versatile self-service kiosk can be used for ordering, checkout, browsing, or ticketing and integrates a wide range of peripherals into a compact footprint.
EV/Serve27	These kiosks have a 27-inch touch screen to create impact and a clear call-to-action. These kiosks are highly customizable with variable chassis and color options to truly represent your brand. This versatile self-service kiosk can be used for ordering, checkout, collection, or browsing and integrates a wide range of peripherals into a compact footprint.
EV|Duo	The EV Duo range of kiosks combines two displays to enable customers to complete transactions and view targeted advertising. The modular design incorporates a wide range of peripherals. Functions include express checkout, loyalty, feedback, and customer service.
EV|Duo Slim	The EV Duo Slim range of kiosks combine two displays to allow customers to complete transactions and view targeted advertising. Functions include express checkout, loyalty, feedback, and customer service.
EV|Self Check	The EV Self-Check Kiosks are a compact and versatile self-service kiosk which are ideal for convenience stores and retailers who want their own self-service solution. Streamlined and affordable, the modular, versatile body has multiple mounting

Product	Description
	options and integrates with a variety of payment and peripheral devices. Functions include express checkout, basket to bag and self-service.
EV|SSBT	The EV SSBT Kiosk is the company's premium sports betting terminal. It features ergonomically positioned dual touch screens for an engaging and rewarding experience. When idle the integrated digital signage display attracts players and encourages interaction via live odds and gameplay. The robust modular body is designed for the most demanding environments and can integrate a wide variety of peripherals including card payment, bill payment and RFID. Functions include self-service betting, odds checking, and digital signage.
EV|Showcase	The EV Showcase Kiosks are mainly used for customer engagement and communication. These kiosks feature a large 27-inch interactive tabletop display and RFID antenna. This interactive display lets the customer view and interact with product data and related content – simply by placing an item on the interactive surface. The device is perfect as a staff-assisted sales tool for upselling and recommendations. Combining a payment device and printer the Showcase becomes a fully transactional point-of-sale tool. Functions include express product comparison, sales tool, and staff education.
Digital hand sanitizing kiosk	The digital hand sanitizing kiosk combines an elegant design with an automated hands-free alcohol dispenser and a large media-friendly 15" display, providing users with a unique on-site antibacterial protection and communication solution.
Temperature check & screening station	The temperature check & screening station takes the key features of the hand sanitizing kiosk and introduces a built-in infrared camera. This allows the temperature of the person in front of the kiosk to be checked and the results displayed on screen.

Source: Company Website and Press Releases

Recent Developments

Table 16
Evoke-Creative: Recent Developments, 2019

Date	Development Type	Description
October 2019	Partnership	Evoke-Creative announced a partnership with Radius Networks, a leading provider for location services. This partnership will help businesses across Europe adopt innovative technology solutions in-store, curbside and drive-through. With the simple integration of Radius Networks and Evoke technologies, businesses can simplify and complete their customer journeys.
August 2019	Product launch	Evoke-Creative announced the launch of a new generation of self-service kiosks for McDonald's. These kiosks were developed to support the latest McDonald's store format in the U.K.

Source: Company Website and Press Releases

FRANK MAYER AND ASSOCIATES INC.

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Grafton, WI 53024
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Website: www.frankmayer.com/

Company Overview

Frank Mayer and Associates Inc. is a U.S.-based, third-generation family-owned company based in Grafton, Wis. The company over the years has positioned itself as an industry leader in the creative design and manufacturing of interactive kiosks, offering cost-savings, efficiency, and customer experience solutions for markets such as healthcare, retail, restaurants, cannabis, and more. As an end-to-end solution provider, the company's onsite services include design and industrial engineering, prototyping, production, integration and fulfillment, and distribution. Consumers use the company's kiosks as powerful marketing tools that connect consumers with the brands.

Product Portfolio

Table 17
Frank Mayer and Associates Inc.: Products and Services

Product	Description
Standard Kiosks	Frank Mayer and Associates develops standard kiosks designed for any environment. Some of the company's kiosks include Advantage, Countertop, Advantage Floor, Advantage, Advantage Plus, Approach 22, Approach 32, Approach Wall, Connect, Elevate, Pathway, Streamline, and Transcend
Temperature Screening Kiosk	Screen for symptoms of COVID-19 or other infectious diseases using temperature kiosks that utilize sophisticated fever-detection technology and customizable health screening questions. The company's health screening and temperature kiosk monitors employees and visitors with a temperature sensor as well as customizable compliance questions. The Wi-Fi enabled system allows for easy access to employee data at a centralized or remote location and provides a secure record of compliance traceability to screening questions and temperature readings using nondescript user identification. Kiosk can be used for temperature screening from the forehead or wrist. Kiosk has contactless hand sanitizer
Contactless Temperature Kiosk	The contactless temperature screening kiosk of the company is among one of the best solutions for touch-free monitoring. The company's Contactless Temperature Kiosk quickly checks body temperatures using an infrared sensor on the wrist. Customized with a contactless ID reader and wrist scan, the temperature kiosk is an efficient way to screen groups of people quickly and in a safe manner.
Advantage Floor Kiosk	The Advantage freestanding kiosk houses a powerful self-service experience in a simple, sleek design. With its streamlined shape, customizable graphic panels, optional ADA scanner and payment hardware, the Advantage is an ideal solution for multiple industries and complementary to every environment.

Product	Description
Connect Floor Kiosk	Boasting the smallest footprint available in the standard kiosk line, this pedestal self-service kiosk allows interaction and convenience for companies looking to expand program capabilities. Personalize it to your brand with a wide variety of customization options. An entry level kiosk solution with convenient delivery times.
Streamline Large Screen Kiosk	The Streamline freestanding kiosk's large screen and clean, minimal appearance command attention in any environment. Whether it's providing wayfinding instructions, offering endless aisle options, or everything in between, customers will be drawn to its simple design and powerful self-service abilities.
Transcend Floor Kiosk	The sleek, curved design of the Transcend freestanding kiosk offers a modern look to any environment. Along with customizing options including graphic panels, PC options, and ADA hardware, the Transcend is an optimal choice no matter the self-service need.
Pathway Kiosk	Featuring a commercial-grade touchscreen, optional assistive technology, and more, the Pathway freestanding kiosk delivers an interactive experience with a small footprint for establishments with less available traffic area. Like all Frank Mayer and Associates, Inc. kiosks, it can be customized to fit to user's needs with magnetic graphic panels, PC options, and payment hardware.
Elevate Freestanding Kiosk	Elevate freestanding kiosk's back panel which allows for customizable graphics at eye level helps users take advantage of branding opportunities. In addition, businesses can tailor the kiosk to meet their needs with different PC options, ADA components, as well as payment and scanner hardware.
Approach 32" Floor Kiosk	This self-service floor kiosk is designed to meet the specific needs of your industry by delivering an interactive experience that offers convenience and order process efficiency to both customers and employees. Whether you are offering self-checkout, an endless aisle, or another one of its many applications, a self-service floor kiosk program offers many benefits. The enclosure marries smart design with a small footprint, offering an array of customization and brand personalization options.
Custom Kiosk Solutions	The company's custom interactive kiosks are used to connect the consumer's brand to their customers. The company develops user-friendly solutions that are unique and help its customers to reach their goals.
In-Store Merchandising Displays	Frank Mayer and Associates develops in-store merchandising displays for many leading brands across United States and worldwide.

Source: Company Website and Press Releases

Recent Developments

Table 18
Frank Mayer and Associates Inc.: Recent Developments, 2019 and 2020

Date	Development Type	Description
October 2020	Product Launch	The company launched a temperature and health-screening kiosk which helps employees safely return to work during the coronavirus pandemic. With the health screening and temperature kiosk, the company plans to provide consumers with an easy way to protect employees while saving costs
August 2020	Partnership	The company announced a partnership with Data Display Systems LLC to develop a kiosk solution for employers looking to enact health screening and temperature checks at their worksites.
May 2020	Partnership	The company announced a partnership with Agile Force to provide custom hardware solutions to employers looking to enact remote temperature scanning at their worksites. With the COVID-19 pandemic creating a greater demand for this practice, both companies have worked to integrate a complete solution into the existing Agile Force platform that meets ISO 13154 standards and limits close human interaction.
May 2019	Product Launch	The company launched free-standing, floor tablet, and counter self-order kiosks at the 2019 Interactive Customer Experience (ICX) Summit in Dallas

Source: Company Website and Press Releases

HONEYWELL INTERNATIONAL INC.

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Website: www.honeywell.com

Company Overview

Founded in 1985, Honeywell International is a diversified technology and manufacturing company that operates four business segments: Aerospace; Home and Building Technologies; Performance Materials and Technologies; and Safety and Productivity Solutions. As of December 31, 2019, the company employed around 113,000 employees of whom approximately 44,000 are located in the United States.

The Aerospace segment of the company is among one of the leading global suppliers of products, software and services for aircrafts that sells to original equipment manufacturers (OEM) and other customers in a variety of end markets including: air transport, regional, business and general aviation aircraft, airlines, aircraft operators, and defense and space contractors.

The Home and Building Technologies segment is a leading global provider of products, software, solutions, and technologies that enable building owners and occupants to ensure their facilities are safe,

energy efficient, sustainable, and productive. Honeywell Building Technologies products and services include advanced software applications for building control and optimization; sensors, switches, control systems and instruments for energy management; access control; video surveillance; fire products; remote patient monitoring systems; and installation, maintenance, and upgrades of systems.

The Performance Materials and Technologies segment is among one of the leading companies in developing and manufacturing high-quality performance chemicals and materials, process technologies and automation solutions, including Honeywell Forge connected solutions. The segment comprises Process Solutions, UOP and Advanced Materials. Process Solutions provides automation control, instrumentation, advanced software and related services for the oil and gas, refining, pulp and paper, industrial power generation, chemicals and petrochemicals, biofuels, life sciences, and metals, minerals, and mining industries.

The Safety and Productivity Solutions segment is a leading global provider of products and software that improve productivity, workplace safety and asset performance to customers around the globe. Safety products include personal protection equipment, apparel, gear, and footwear designed for work, play and outdoor activities; gas detection technology; and cloud-based notification and emergency messaging. Productivity Solutions products and services include mobile devices and software for computing, data collection and thermal printing; supply chain and warehouse automation equipment, software and solutions; custom-engineered sensors, switches and controls for sensing and productivity solutions; and software-based data and asset management productivity solutions.

Business Performance

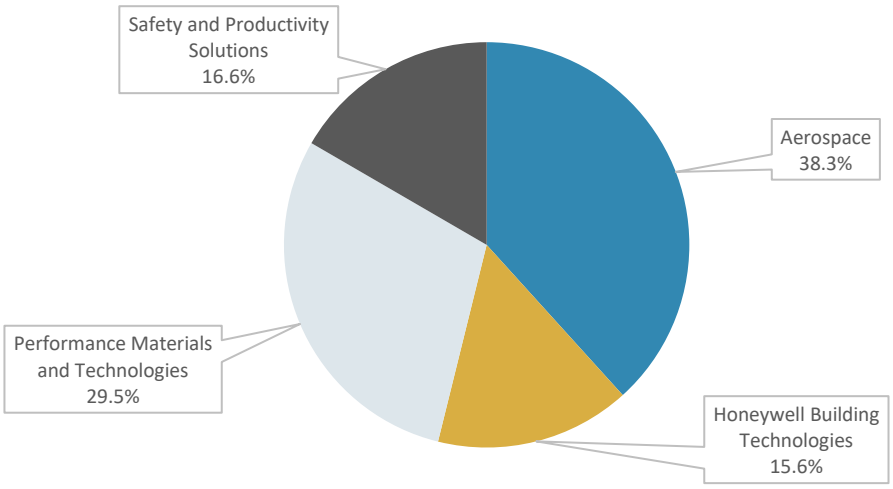
Honeywell International net revenue for the financial year 2019 amounted to $36.7 billion, which is about 12.2% lower compared to the previous year's revenue of $41.8 billion. The company's revenue decrease in 2019 is largely attributed to spin-offs. In the absence of the revenue of sales related to the Transportation Systems and Homes and Global Distribution businesses, sales grew 4% from $35.3 billion in 2018 to $36.7 billion in 2019.

Table 19
Honeywell International: Net Revenue, 2017–2019
($ Millions)

	2017	2018	2019
Revenue	40,534	41,802	36,709

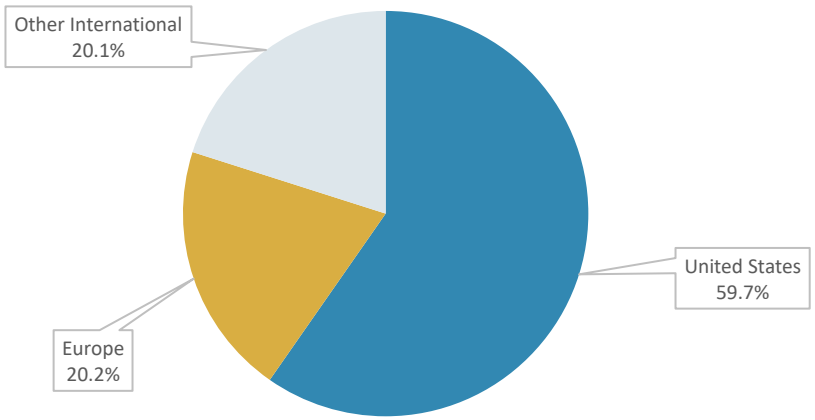
Source: Company Website and Annual Report

Figure 24
Honeywell International: Revenue Share, by Segment, 2019
(%)



Source: Company Website and Annual Report

Figure 25
Honeywell International: Sales Share, by Region, 2019
(%)



Source: Company Website and Annual Report

Product Portfolio

Table 20
Honeywell International: Products and Services

Product	Description
Self-registration kiosks	Honeywell is moving from a resale approach to a joint go-to-market relationship with manufacturer friendlyway® for the sale of the LobbyWorks® floor standing kiosk. friendlyway offers a complete family of kiosk designs to meet specific site and application needs.
Honeywell AI-Driven Thermal Imager	Honeywell's new temperature monitoring solution incorporates advanced, infrared imaging technology and artificial intelligence algorithms to conduct non-invasive, preliminary screening of personnel entering a facility.

Source: Company Website and Press Releases

Recent Developments

Table 21
Honeywell International: Recent Developments, 2020

Date	Development Type	Description
May 2020	Product Launch	Honeywell announced the launch of new temperature monitoring solution that incorporates advanced, infrared imaging technology and artificial intelligence algorithms to conduct non-invasive, preliminary screening of personnel entering a facility.

Source: Company Website and Press Releases

KIOSK GROUP

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Website: www.kioskgroup.com

Company Overview
Kiosk Group Inc. is a Maryland-based, privately held company that provides interactive kiosks to many leading companies, organizations, and government agencies. With over 30 years of experience, the company has developed interactive kiosk hardware and software solutions for hundreds of interpretive exhibits, transactional kiosks, sales exhibits, and training programs.

Kiosk Group was among the pioneers in identifying the potential of the iPad for kiosk use and introduced the first commercially available iPad kiosk enclosures in 2010.

At the same time, they also created and launched Kiosk Pro, which remains one of the best-selling kiosk software packages available for iOS and iPadOS. Acting as a secure web browser, the app allows users to present their own content to visitors and manage their devices remotely in the field.

While Kiosk Group offers a standard 'ready-to-ship' line of kiosks, they also specialize in customization, working closely with customers to create the perfect kiosk for their project. With an in-house engineering team and a complete print shop, the company can integrate any peripheral or signage request on-demand with quick turnaround and high-quality results.

Product Portfolio

Table 22
Kiosk Group Inc.: Products and Services

Product	Description
CheckPoint Non-Thermal Health Screening Kiosk	Easily screen employees and visitors with a simple set of health screening questions. After screening, a date-stamped badge is printed for easy identification within the facility.
Standard 'Ready-to-Ship' Tablet Kiosks	Available in standalone, countertop, wall-mounted, and handheld options. Kiosks can be based on a variety on iPad, Windows, or Android tablets.
Roo Printer Tablet Kiosk	Featuring a locking, fold-down front access door to the printer for easy paper roll replacement, the Roo can be used with several standard thermal kiosk printers, including models from Brother, Epson, Bixolon, and Star Micronics.
Liberty Scanning Kiosk	Designed for full-page scanning using the iPad's rear camera, the Liberty features a tray for document placement and motion-sensor LED light. Perfect for government and healthcare locations to enable affordable self-service scanning by visitors.
Other Accessory & Peripheral Integrations	Existing integrations are available for an array of popular kiosk peripherals including card readers, barcode scanners, and hand sanitizer mounts, among others. Custom engineering is also available for new integrations.
Graphics & Signage Options	A wide variety of graphic and signage options are printed in printed in-house on professional, large-format UV and vinyl printers. Variable-size printing droplet technology delivers fine details, smooth gradients, and crisp colors. Quick turn-around with top-notch quality control.
Caretaker ATD Thermal Screening Kiosk	Automated, touchless kiosk with a professional-grade, high-resolution thermal camera. Caretaker uses artificial intelligence to analyze facial landmarks and identify the inner canthus of the eye for fast, accurate temperature screening.
Kiosk Pro Software	A secure kiosk browser app for iPad and iPhone. Manage and display interactive content including webpages, PDF and video while preventing unrestricted internet access and protecting visitors' personal information.

Source: Company Website and Press Releases

Recent Developments

Table 23
Kiosk Group Inc.: Recent Developments, 2019

Date	Development Type	Description
December 2020	Partnership	Kiosk Group announced a partnership with LOKO AI, a California-based company specializing in artificial intelligence and thermal imaging, in the form of Caretaker ATD, a fully automated, touchless kiosk with a professional-grade thermal camera designed for fast, accurate temperature screening.
August 2020	Product launch	Kiosk Group launched the CheckPoint non-thermal health screening kiosk. CheckPoint allows facilities to easily screen employees and visitors with a simple set of health screening questions. After screening, a date-stamped badge is printed for easy verification of screening.
November 2019	Product launch	Kiosk Group announced the launch of Roo Printer Tablet Kiosk. The Roo Printer Kiosk is compatible with specific printers from Brother, Epson, Bixolon, and Star Micronics and is used for check-in, information, or transaction applications.

Source: Company Website and Press Releases

KIOSK INFORMATION SYSTEMS

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Website: www.kiosk.com

Company Overview

Kiosk Information Systems Inc. (KIOSK) is a Colorado-based company that designs and manufactures self-service solutions. The company offers custom, remote, bill payment, locker, vending, rental, and ticketing hardware, along with software. Since 1993, the company has been a leader in the design and manufacture of self-service solutions. The company provides highly specialized experts to surround every aspect of the project, executing personalized customer deliverables in parallel.

KIOSK Information Systems to date has deployed more than 200,000 kiosk units successfully. The company over the years has developed deep experience in a full complement of vertical markets, providing niche expertise in both platform creation and volume deployment support. OEM and end-customer projects range from traditional applications in retail, bill payment and HR to highly custom multi-function banking, vending, smart locker, and border security solutions.

In 2016, KIOSK was acquired by Posiflex Technology Inc., a global leader in POS solution design and manufacturing. In 2017, Posiflex also acquired Portwell, a global industry leader in state-of-the-art computing solutions. This parent/sister company relationship enables KIOSK to self-source many of the key components in self-service solutions (e.g., all-in-one PCs, PCAP LCDs, scanners, printers, etc.).

Product Portfolio

Table 24
Kiosk Information Systems Inc.: Products and Services

Product	Description
Standard kiosks	Expanse, Apex, Entry, Benchmark, Paragon, Portal, Windfall, Avant, Landmark, Stellar, Thinman, Stealth, Outdoor Kiosks, and POS Terminals/Tablets.
Custom solutions	KIOSK over the years has developed itself into one of the world's leaders in custom design. Custom kiosks provided by company include Materna, BCycle and nrg.
Kiosk remote management	KNECT IoT is a remote management software platform that provides the essential foundation for an easily managed and successful kiosk deployment. The platform leverages the Internet of Things, enabling real-time system and component-level alerts, as well as automated IoT campaigns on what actions to take based on the nature of the alert (i.e., remote re-boot, email/text path, escalations, etc.). Leveraging these automation features enables users to optimize uptime and maximize efficiency.
Bill payment software	KIOSK's bill pPayment software is used widely in retail locations for electronic payment and money transfer services.
Vending	The Automated Retail Vending platform includes a sophisticated software set used to provide an enhanced customer experience and to optimize back-end efficiency.
Ticketing Software	KIOSK provides licensable code modules to support a complete base of ticket delivery, retrieval and transaction management requirements. It facilitates a simple user flow with fast processing, ensuring a positive self-service customer experience.

Source: Company Website and Press Releases

Recent Developments

Table 25
Kiosk Information Systems Inc.: Recent Developments, 2019 and 2020

Date	Development Type	Description
May 2020	Product launch	KIOSK launched KNECT IoT, an enhanced remote monitoring application for real-time visibility of an unattended kiosk deployment. The new features within KNECT IoT raise the standards on what customers can expect from their remote management system (RMS) when they deploy digital kiosks throughout their business network and service delivery channels.
May 2020	Partnership	KIOSK announced a partnership with Valyant AI, a Colorado-based artificial intelligence (AI) company to create contactless experiences driven by conversational AI across environments in which kiosks are deployed.
January 2020	Expansion	Posiflex Group announced the formation of Kiosk Information Systems Europe GmbH to provide comprehensive sales and support

Date	Development Type	Description
		services to European buyers of its standard and custom self-service kiosk solutions. Through this expansion, the company is actively expanding its footprint to serve European customers as well as further develop its global capabilities.
March 2019	Partnership	Kiosk Information Systems announced a partnership with Bitcoin ATM pioneer Bitstop to bring their next generation Bitcoin ATM to market, enabling customers to easily buy and sell bitcoin and other digital currencies.
February 2019	Partnership	Kiosk Information Systems announced a partnership with Zenig, an innovator of healthcare solutions to provide an easy to use, turn-key self-service offering for hospitals, outpatient centers and physician practices. Zenig provides easy-to-use, effective patient-centered healthcare solutions. Their self-service kiosk is simple to implement, and enables patients to self-check-in, verify demographic information, sign contracts, and collect payments.

Source: Company Website and Press Releases

KIOSK INNOVATIONS

460 E 76th Ave., Unit 4C
Denver, CO 80229
Tel: 303/287-7004
Website: www. kioskinnovations.com

Company Overview

Kiosk Innovations is a self-service interactive kiosk manufacturer based in Colorado. The company designs and fabricates bill pay, financial, retail, check-in, ticketing, HR, information, healthcare, vending, and other kiosks. To keep its prices competitive, the company designs and manufactures everything in-house. Kiosk Innovations manufactures unique and original designs that not only stand out from their surroundings but incorporate ever-changing technological innovations as they are introduced to the industry.

Table 26
Kiosk Innovations: Products and Services

Products and Services	Description
Standard kiosks	The standard kiosk portfolio of the company includes the following models: Apex, Atlantis, Aurora, Challenger, Comet, Discovery, Eclipse L, Eclipse P, Enterprise, Falcon, Galaxy 19, Galaxy 32, Horizon, Infinity, Infinity TS, Ion, Nova, Saros, Saturn, and Spectrum.
Custom kiosks	Custom kiosks manufactured by the company can either be a simple touch screen kiosk or a high-tech, automated retail kiosk. The company places a large focus on industrial design to ensure that the customers have full visibility into their design and know exactly what they will be receiving in the end.

Products and Services	Description
Services	Services provided by the company include manufacturing and integration, graphics, field support – onsite service options, and others
Software	Software products from Kiosk Innovations include browser lockdown- security software, hardware/ software watchdog, remote user management, remote monitoring, reporting, digital signage, and other custom software.

Source: Company Website and Press Releases

LG-MRI

6415 Shiloh Rd. East,
Alpharetta, GA 30005,
Tel: 770/255-7138
Website: www.lg-mri.com

Company Overview

Formed in 2014, LG-MRI is a 50-50 joint venture between outdoor LCD technology pioneer Manufacturing Resources International and consumer electronics powerhouse LG Electronics. Under the joint venture, the companies have developed a unique and powerful combination of expertise in display technology and design, with the scale, experience and resources to catalyze the digitization of out-of-home media on a global scale. Products developed by the company include touchscreen LCDs deployed in bus shelters; and smart and connected kiosks deployed across cities, stadiums and mixed-use properties around the world. LG-MRI is among one of the leading providers of outdoor display technology.

Product Portfolio

Table 27
LG-MRI Products and Services

Product	Description
BoldVu	BoldVu displays deliver unparalleled visual performance in outdoor environments. With luminance ratings up to 5000 nits, their high-efficiency LED backlight and obsessively engineered optical stack achieve incredibly bright imagery in the face of intense sunlight.
CoolVu	CoolVu is BoldVu's multipatented thermal management technology that extracts and expels heat from inside the BoldVu®, without exposing display electronics to ambient air or environmental contaminants such as dust, dirt and moisture and without the use of air filters
ToughVu	ToughVu cover glass shields delicate electronic components from the effects of adverse weather and vandalism. And with its low diffuse reflection, low haze, and anisotropy and bi-refringence qualities, ToughVu glass ensures that digital imagery shines with brilliance and delivers maximum contrast, color accuracy, color saturation, and viewing angles.

Product	Description
BestVu	BestVu's meticulously engineered optical stack achieves ultra-bright whites and super deep blacks so that every color in-between appears vibrant
InfiniteTouch	InfiniteTouch is a next-gen PCAP touch sensor exclusively available on BoldVu displays. Comprised of multiple layers of glass with index-matched sputter ITO conductors, and containing no plastic films, InfiniteTouch delivers high transmission, low reflection and true tablet-like responsiveness, making it an incredible platform for delivering engaging interactive experiences.
BoldVu LT Semi-Outdoor	BoldVu LT Semi-Outdoor displays are designed for placement in areas protected from direct sun exposure, such as in shopping malls and subway stations where its 850-nit operating luminance is bright but not overbearing.
BoldVu Outdoor	BoldVu outdoor displays are intended for deployment in areas out in the open and exposed to the elements. With a daytime operating luminance of 3500 nits, BoldVu is an excellent fit for a wide array of outdoor venues.
BoldVu XT Extreme Outdoor	BoldVu XT displays are for outdoor venues with big skies and ultra-bright sunlight, such as stadiums and raceways. When the sunglasses come out, the 5000 nit daytime luminance of BoldVu XT still shines bright.
SmartVu Service	SmartVu Service facilitates resolution of critical display issues through advanced display monitoring, expert technical assistance and flexible hardware coverage.

Source: Company Website

LILITAB LLC

39 Larkspur St., Ste. B
San Rafael, CA 94901
Tel: 888/705-0190
Website: www.lilitab.com

Company Overview
Lilitab LLC is a California-based company that designs innovative tablet solutions that help businesses to connect with their customers. The company provides fully customizable, end-to-end solutions that transform business operations by increasing efficiency and improving customer interactions.

Lilitab employs a select group of highly experienced designers, engineers and business leaders who are passionate about advancing the use of tablet computers in public-use environments. As an industry leader, the company is always evolving to meet the ever-changing business and technology landscapes across various industries. Solutions provided by the company help businesses to enrich their in-store experience, forge stronger customer relationships, and save time and money while deploying the most original, fun and effective uses for tablets in the marketplace.

With over 25 years in the kiosk industry, Lilitab CEO Adam Aronson designed the first-generation tablet kiosk system in 2011. Two years later, the company released its 2.0 product line, which laid the foundation for the company's rapid success. Lilitab over the years has emerged as an industry leader in the tablet kiosk market and continues to steadily increase revenue, employee head count, customer count, and number of units deployed.

Lilitab currently operates throughout North America and around the world. The company's kiosk product line is on version 3.0 and its products have applications across every industry including healthcare, restaurants, tradeshow and events, retail, government, and more. Lilitab's tablet kiosks are currently being used by leading companies in the U.S. such as Panera Bread, Quest Labs, Macy's, Whole Foods, Sephora, Land Rover, and more.

Table 28
Lilitab LLC.: Products and Services

Products and Services	Description
Lilitab tablet kiosks	Lilitab offers a wide range of tablet kiosk solutions. These tablet kiosks include free-standing, counter/surface and wall-mounted kiosks. The product portfolio of the company under this segment includes models for floor, counter, surface, flip, picture, wall, and telemedicine tablet cart.
Branding and graphics	The Lilitab Tablet Kiosk System offers the largest range of graphic options, giving users flexibility to tailor their message with the brand. The product portfolio of the company under this segment includes: Lilitab Faceplate Graphic, Lilitab Front Mount Graphic Panel, Lilitab Backdrop Graphic, Lilitab Counter Backdrop Graphic, Lilitab Floor Graphic Merchandizer, Lilitab Backdrop Graphic Case, Lilitab Counter Backdrop Graphic Case, and Lilitab Graphic Panel Clips.
Replacement and spare parts	The product portfolio of the company under this segment includes: Head Unit with Faceplate, Faceplate Only, Replacement MagDOCK Keys, Key Extender, Hardware Kit, Pro Head Unit Cable, Right-Angle Lightning Cable, Right-Angled USB C Cable, Right-Angle Micro USB Cable, Base Housing, MagKEY, Lilitab Graphic Panel Clips, Cleaning Kit, and Apple Power Extension Cord.
Lilitab kiosk management system	The Lilitab KMS provides features that help end-users deploy a full-service, enterprise-grade kiosk network without the need for custom iOS app development.

Source: Company Website and Press Releases

MARATHON DEPLOYMENT INC.

164 Westford Rd., Ste. 21
Tyngsboro, MA 01879
Tel: 978/226-1171
Website: www.marathondeployment.com

Company Overview
Marathon Deployment is a Massachusetts-based company that provides a full range of services in information technology focusing in the areas of deployment and field service. The company serves

clients mainly in the retail, hospitality and business services verticals globally. Marathon Deployment is highly valued by kiosk OEMs largely due to its high-quality installations and customer service practices.

The company's hardware solutions are largely directed towards the following markets: kiosk, point of sale, QSR, retail, digital signage, and healthcare. The company to date has performed more than 1,000 kiosk and digital menu board installations.

Table 29
Marathon Deployment Inc.: Products and Services

Products and Services	Description
Break-fix	Break-fix is designed to service clients that want on-going support. Benefits of a break-fix program include flexible and cost-efficient service to keep IT business equipment up and running.
National rollouts	The company has developed an ability to deliver simultaneous multisite installations, allowing nationwide rollouts to be completed in the shortest time possible. This means companywide upgrades can be completed in days not weeks, providing a real competitive advantage.
Project management	Marathon Deployment offers a project management team that is the key to their success with all clients. The company's experienced staff is committed to providing superior service, quality and value in the management and execution of every project.
Site survey/maintenance	Marathon Deployment provides site survey services in order to accurately review and evaluate a physical location where proposed equipment will be installed. The company also provides a customized maintenance program for new or current systems, which will allow consumers to focus on growing their business.

Source: Company Website and Press Releases

MIMO MONITORS

743 Alexander Rd., Ste. 15
Princeton, NJ 08540
Tel: 855/937-6466
Website: www.mimomonitors.com

Company Overview
Mimo Monitors, established in 2008, is an industry leader in small touch screen monitors, displays and tablets. The company believes in creating small footprint and high-value displays that drive innovation and provide a seamless experience for digital signage, conference rooms, kiosks, point of purchase, point of sale, hospitality, retail, and more. The company also offers personalized, direct communication and detail-oriented service to ensure client satisfaction. Mimo Monitors focuses on providing flexible and customizable solutions that are designed to fit the need. The touch screens provided by the company are intuitive to use, easy to deploy and sleek in design. They also enhance productivity and user experience.

Mimo Monitors has installed solutions in locations throughout the world for Fortune 500 and leading brands such as Google, Logitech, Verifone, Hertz, John Deere, Four Winds Interactive, and more.

Table 30
Mimo Monitors: Products and Services

Products and Services	Description
Temperature sensing digital signage tablet platform	The company's temperature sensing digital signage platform is reliable, customizable and seamless to use. Designed specifically to be flexible, it contains an award-winning Mimo Monitors hardware display, Revel Digital's CMS analytics and accurate temperature sensing software, along with a one-year license.
LA Photo Party	Mimo Monitors provides durable 15.6-inch touchscreens to LA Photo Party as part of their photo booths as well as a smaller 10-inch touchscreen for the rear of the kiosk. The touchscreen is utilized to navigate and interact with their software as well as provide a large user preview of the photo.
Optic Wash	The Magic Touch 10-inch USB monitor is a turnkey solution for Optic Wash's mall and eyewear kiosks for automated eyewear and jewelry cleaning. With the compact size and responsive touchscreen, kiosk manufacturers can focus on the functionality of their system and not worry about interactivity with the customer.
Snapz Photo Booths	Snapz brings unique experiential skills and services to promotions, launches and exclusive parties. Snapz depends on multiple models of touchscreen including the company's UM-1080C-OF as the touch interface to the customer. The durable display is seamlessly integrated into the exterior of photo booth as a touch-based control panel and advertising.
MCS Technologies	MCS utilizes a small capacitive 7-inch touch screen in their facility access kiosk. The small touchscreen along with fingerprint reader is used to identify authorized personnel and allow access to buildings.
Harpeth Industries	A rugged 17-inch open frame touchscreen is used by Harpeth Industries in their automated telephone kiosk. Installed where durability is the greatest importance, the company is able to custom design a vandal-proof touch screen for their high-reliability requirements.

Source: Company Website and Press Releases

Recent Developments

Table 31
Mimo Monitors: Recent Developments, 2020

Date	Development Type	Description
May 2020	Product launch	Mimo Monitors announced the launch of a touch-free, temperature-taking platform. This enterprise-grade platform is reliable, flexible and customizable to ensure it can optimize for what every business needs. It contains the premium Mimo Monitors hardware display, as well as Revel Digital's CMS analytics and accurate temperature sensing software, along with a one-year license.

Source: Company Website and Press Releases

NANONATION INC.

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Lincoln, NE 68508
Tel: 402/323-6266
Website: www.nanonation.net

Company Overview

Nanonation is a U.S.-based company that develops customer interaction software. The company offers a wide range of digital products such as digital signage, interactive product finder, digital photo booth, interactive signage, directories, donor recognition signage, digital trophy cases, and an interactive timeline. Nanonation over the years has worked with numerous Fortune 500 corporations as well as government, educational and non-profit organizations. The company over the years has deployed hundreds of thousands of digital signs and kiosks with these organizations. Nanonation's clients include Rogers Wireless, Nike, Harley Davidson, Bed Bath & Beyond, American Eagle Outfitters, Twitter, DSW, Room & Board, Celebrity Cruises, Methodist Healthcare, Spokane Transit, and others.

In addition to pre-built and semi-custom products, Nanonation offers a series of solutions targeted at those building and deploying kiosks. These kiosk industry solutions allow kiosk deployers the ability to rapidly add key components to their deployment, such as attract loop management, device monitoring, automated alerting or even a CMS for interface components, without having to build such components from scratch. These components work alongside, or are integrated as part of, a deployer's existing application. This means lower development effort and costs.

Nanonation focuses significantly on innovation as a component of its growth strategy. The company regularly releases new interactive products based on client demand and technology opportunities. The company has recently launched a full template library for digital signage customers with 50 initial templates that can be used for a variety of purposes and it plans to update the library regularly. Nanonation also launched the latest version of Commandpoint, its award-winning Content Management System. and is migrating all existing customers to this platform.

The company's full range of SOC players and Brightsign integration is expected to be launched in Q1 of 2021.

Product Portfolio

Table 32
Nanonation Inc.: Products and Services

Product	Description
COVID-19 Solutions	The company offers a capacity control solution and temperature screening kiosk.
Custom Interactive Solutions	The company develops intuitive interactive solutions that solve logistical headaches, simplify complex ideas, and delight visitors.
Semi-Custom Solutions	Semi-custom solutions include mobile applications, locked browsers, quiz games, and bill pay kiosks. These solutions are a great way to incorporate digital solutions into any environment and Nanonation's team provides end-to-end services to ensure that users get the most out of the experience. Custom software development provides clients with unique experiences specific to their goals and the end-user. Transactional kiosks, virtual reality games, and interactives to educate and entertain are a few of the custom deployments Nanonation has created.
Digital Signage Solutions	Nanonation's digital signage platform has full-enterprise capabilities, making it a preferred solution for clients that have multi-location deployments but is just as intuitive for smaller deployments. The company's cloud-based management tool enables multiple users to manage the digital signage network, schedule content and view activity reports. The system gives unparalleled control with item-level day-parting, rules-based playback, as well as regional and local content management using metadata tags.
Interactive Signage	Nanonation's interactive signage enables a variety of industries to attract and engage customers and visitors. Corporate communications, wayfinders, directories, product finders, donor recognition boards, temperature screening kiosks, digital trophy cases, and digital timelines are some of the ways interactive signage can be utilized in retail stores, schools, non-profits, and museums.
Digital Directories Solutions	The company's digital directories solutions help guests in wayfinding applications. This solution is made available to the users as both static or touchscreen displays and makes any simple to complex multi-building environment easy to navigate. As the environment changes, the system can be updated at any time or place via the company's management tool. With Nanonation's digital wayfinding solution, maps can be updated within seconds.
Interactive Donor Solution	Nanonation's Interactive Donor Solution is an engaging way to educate visitors about donors and why they chose to give a gift. Users can touch the scrolling tiles to learn more about each story. The search functionality allows visitors to find specific donors by first or last name.

Product	Description
Wayfinding Solutions	The company's wayfinding engine helps make navigating space simple. The company's wayfinding solution is used across stores, campuses, rooms, offices, and buildings. With a digital wayfinding solution, maps can be updated within seconds.
Digital Trophy Case	Digital Trophy Case allows schools to highlight athletic and academic accomplishments while engaging students, alumni, parents, and staff. Within the touchscreen experience, users can navigate through history, yearbooks, records, and more.
Digital Timeline Solution	With a digital timeline solution, monumental moments or artifacts can be showcased with ease. Users can select photos, text or videos that enable them to learn more about the items they find interesting. Not only are users able to display important artifacts, but they can also now tell their full story, leaving visitors with a more comprehensive understanding.
Kiosk Deployment Tools	The Kiosk Deployment Tools are a product set for developers, used to streamline management of kiosk deployments and optimize UI and UX. With this toolkit users can monitor kiosks in real-time, from printer paper statuses to connectivity, control alerts, notifications, and deploy new configurations or UI files.
Customer Experience Software	The company's Customer Experience Software has applications in digital signage, kiosks, mobile, smart shelves, and other communication mediums. Some of the major end-user segments for the company include retail, travel, hospitality, and entertainment. Nanonation’s software helps companies create powerful ways to interact with customers. The company develops flexible online tools that can help companies in scheduling, managing and measuring multimedia-marketing initiatives.
Temperature Screening Kiosk	Nanonation’s Temperature Screening Kiosk is contactless, allowing visitors and employees to check their temperature prior to entering a facility. The kiosk has an optional survey feature, which can be customized or selected from CDC recommended questions. An optional printer can distribute badges to individuals who have passed the screening.

Source: Company Website and Press Releases

Recent Developments

Table 33
Nanonation Inc.: Recent Developments, 2020

Date	Development Type	Description
May 2020	Product launch	Nanonation announced the launch of a temperature screening kiosk to aid businesses during the COVID-19 pandemic. The kiosk is a no-contact solution to test employee or visitor temperatures that comes in two different options, including a free-standing kiosk or a tabletop tablet. The hardware and software used in these products can easily be adapted to serve a variety of post-pandemic business functions, ensuring maximum return on companies' investments. Temperature screening kiosks help streamline the process of screening and thus lower an organization’s labor costs. Multiple

Date	Development Type	Description
		screen sizes, stands, printers, and features are available to tailor the kiosk to anyone's needs, from hospitals to corporate offices.
November-2020	Product launch	Nanonation's new Template Library allows users of all design levels to create relevant and fresh content for their signage network. The template library is included with each digital signage purchase and is accessible through our Content Management System, Commandpoint. Templates for announcements, birthdays, employee highlights, events, menu boards, are some of the few designs you can find within the library.

Source: Company Website and Press Releases

OLEA KIOSKS INC.

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Cerritos, CA 90703
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Website: www.olea.com

Company Overview

Olea Kiosks Inc. is a leading kiosk designer and manufacturer. The company was established in 1975 and currently produces a wide variety of kiosks including standard kiosks, custom kiosks, specialty kiosks, and more. Olea Kiosks serves customers in the U.S. and throughout Europe. Olea's self-service kiosks are currently being used in airports, shopping malls, hotels, and hospitals wherein they help companies to create seamless experiences for customer interactions, while improving cost efficiency.

Olea offers more than 20 universal designs. Many of these designs are modular in nature so they can be adjusted slightly to meet the needs of many verticals. The modularity of these designs allows for solution lifecycle management where components can be upgraded if needed and because of the broad applications, Olea can scale its operations for products and field deployment.

The company has several smaller footprints, modern designs that are frequently deployed for the following applications:

- Quick serve restaurants and food ordering.
- Check-in for healthcare, hotel, corporate, appointments.
- Ticketing.
- Wayfinding.
- Loyalty programs.

Olea also provide a wide range of custom self-service kiosks. The advantage of a custom kiosk is that it enables Olea to incorporate all the requirements into the solution as opposed to seeing how it can take the requirements and select the best fit from a universal solution. When customers propose to go for standard solutions, it is not always possible to get the best solution. Customers will likely get something that is adequate, but it will have some shortcomings. Going with a custom solution will ensure it is the best solution in terms of functionality and aesthetics.

Since the COVID-19 break, Olea has been focusing attention on contactless solutions that reduce human-to-human interaction and instead encourage human-to-machine interaction. As a means of addressing COVID-19, the company added three contactless temperature screening kiosk solutions. These solutions address a variety of end-users as they range from passive solutions to highly secure solutions with facial recognition capabilities.

Innovation is one of the key strategies adopted by the company to maintain its competitive advantage in the market. Some of the company's latest innovations include additional products to address the healthcare market with telehealth and telemedicine as well as additional some enhancements in the finance and hospitality solutions.

The healthcare, hospitality and corporate segments are some of the key end-user segments for the company's products. Each year tens of millions of transactions are performed on Olea Kiosks. The company largely operates from its 80,000-square-foot campus in Southern California. Some of the company's major consumers include Nextep Systems, SCA Promotions, JCDecaux, Apple, DFW, IBM Corp., Nike, Dell, Zebra Technologies, and others.

Product Portfolio

Table 34
Olea Kiosks Inc.: Products and Services

Product	Description
California Cyber Security	The California Cyber Security kiosk helps companies safeguard their infrastructure from malware threats on USB drives, Blu-ray/CDs/DVDs, and other portable media devices brought in by employees, contractors, vendors, and others.
Metrolite	Metrolite features a compact footprint with a huge branding area, which is ideal for companies seeking to improve ROI and user interaction in small spaces or high-traffic areas.
Milan Landscape	Milan Landscape is a modular interactive digital signage kiosk which is used in any facility that needs to inform, direct or influence visitors.
Milan Portrait	Milan Portrait is a modular interactive digital signage kiosk with LCDs ranging from 32 inches to 55 inches. This pedestal-style kiosk was developed for interactive digital signage applications and can accommodate virtually any single or multi-touch LCD monitor, with the option to split the screen for multiple applications, such as retail and wayfinding.
Food service kiosks	The food service segment of Olea Kiosks includes various self-service kiosks models such as Austin-Desktop, Austin–Freestanding, Austin–Wall-Mounted, Franklin Bill Pay, Irvine Desktop, Irvine Freestanding, Irvine Wall Mount, Metrolite, and Seattle.
Healthcare	The healthcare portfolio of Olea self-service kiosks includes Austin–Desktop, Austin–Freestanding, Austin–Wall-Mounted, Boston Healthcare, and Verona.
Human Resources	The human resources portfolio of Olea self-service kiosks includes Boston, Boston Healthcare and Metropolis.

Product	Description
Retail	The retail portfolio of Olea self-service kiosks includes Austin–Desktop, Austin–Freestanding, Austin–Wall-Mounted, Franklin Bill Pay, Irvine Desktop, Irvine Freestanding, Irvine Wall Mount, Metrolite, Milan Landscape, and Milan Portrait.
Virtual receptionist	The virtual receptionist portfolio of Olea self-service kiosks includes Irvine Desktop, Irvine Freestanding, Irvine Wall Mount, Milan Landscape, and Milan Portrait.
E-Government	The e-government portfolio of Olea self-service kiosks includes Boston, Boston Healthcare, Metrolite, Metropolis, Milan Landscape, and Milan Portrait.
Financial services	The financial services portfolio of Olea self-service kiosks includes Austin–Desktop, Austin–Freestanding, Austin–Wall-Mounted, Boston, Boston Healthcare, California, California Cyber Security, Detroit, Franklin Bill Pay, Geneva Indoor and Outdoor, Irvine Desktop, Irvine Freestanding, Irvine Wall Mount, Metrolite, Metropolis, Milan Landscape, Milan Portrait, Monaco Gaming, Monte Carlo Gaming, Seattle, and Verona
Gaming	The gaming portfolio of Olea self-service kiosks includes Austin–Desktop, Austin–Freestanding, Austin–Wall-Mounted, Milan Landscape, Milan Portrait, Monaco Gaming, and Monte Carlo Gaming.
Hospitality	The hospitality portfolio of Olea self-service kiosks includes Austin–Desktop, Austin–Freestanding, Austin–Wall-Mounted, and Franklin Bill Pay.
Outdoor	The outdoor portfolio of Olea self-service kiosks includes Detroit and Seattle.
Ticketing	The ticketing portfolio of Olea self-service kiosks includes Austin–Desktop, Austin–Freestanding, Austin–Wall-Mounted, Franklin Bill Pay, Milan Landscape, Milan Portrait, and Seattle
Wayfinding	The wayfinding portfolio of Olea self-service kiosks Includes Irvine Desktop, Irvine Freestanding, Irvine Wall Mount, Milan Landscape, and Milan Portrait.

Source: Company Website and Press Releases

Recent Developments

Table 35
Olea Kiosks Inc.: Recent Developments, 2019

Date	Development Type	Description
October 2019	Product Launch	Olea Kiosks announced the launch of the Franklin Bill Pay kiosk as the newest addition to its self-service line-up. The Franklin Bill Pay kiosk has the ability to accept and dispense dollar bills, dispense coins, read checks, and take credit card payments.

Source: Company Website and Press Releases

PARABIT SYSTEMS

2677 Grand Ave.
Bellmore, NY 11710
Tel: 516/400-3910
Website: www.parabit.com

Company Overview

Parabit Systems is a U.S.-based company that designs, fabricates and integrates enclosures and software. Products provided by the company allow users to authenticate physical identities and manage facilities efficiently and effectively. The custom kiosk solutions developed by the company provide comprehensive, enterprise level visitor registration, notifications, tracking, reporting, as well as other features including automated interaction with dynamic data sources and integration with building access control systems.

Parabit Systems delivers its products and solutions across the U.S, with offices in Miami, Los Angeles, San Francisco, and Chicago.

Table 36
Parabit Systems: Products and Services

Product	Description
Visitor check-in kiosks	Parabit Visitor Management Kiosks capture detailed information for a more accurate screening of visitors. Based on specific requirements custom to each installation, efficiently manage visitor, vendor, contractor, and employee access to facilities.
CUSS kiosks	Common-use self-service (CUSS) kiosks speed up the check-in process, reducing long lines and wait times. These kiosks enable multiple airlines and their passengers to utilize the same kiosk so existing space can be used more efficiently, increasing airport capacity.
Badging kiosks	Badging Kiosks offer a solution integrated with access control to verify employee and vendor credentials specific to the needs of airports. Kiosks make the badging process self-serviceable, whether it be the initial application to the renewal process.
Interactive digital signage	The company's interactive digital signage software can be displayed within kiosk enclosures for maximum impact for visitors. The company offers a total interactive digital signage solution for unique business and budget.
Telephone kiosks	Parabit's telephone kiosks provide highly visible customer assistance. A convenient reliable self-service solution, they can administer internal or external services or be used in conjunction with advertising to generate revenue.

Source: Company Website and Press Releases

PEERLESS INDUSTRIES INC.

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Website: www.peerless-av.com

Company Overview

Peerless Industries Inc. is an industry-leading designer & manufacturer of AV solutions. The company was established in 1965 and was one of the pioneers in the design and development of CRT TV wall mounts. Over the years, the company has positioned itself among the leading providers of mounting products, accessories and digital content delivery solutions for audiovisual (AV) industry. The company offers flat panels, projector and tablet mounts, cables, and AV carts, stands, racks, and furniture. Peerless Industries provides its products for residential and commercial markets worldwide.

The company regularly adds new products and solutions into the market to keep pace with the constant changes in AV technology. Products delivered by the company generally are easier to install, highly durable and have better aesthetics.

Table 37
Peerless Industries Inc.: Products and Services

Kiosk Enclosures	Description
KILH5	KILH5 is the company's new indoor, landscape kiosk mount that is designed to support the latest digital signage displays. With a flat base that can be free standing or bolted to the ground, the kiosk allows for quick access to electric and data cables, making it easy to install and maintain.
KILH540-S-EUK	KILH540-S-EUK is the company's new indoor, landscape kiosk mount that is designed to support the latest digital signage displays. With a flat base that can be free standing or bolted to the ground, the kiosk allows for quick access to electric and data cables, making it easy to install and maintain.
KIL640-EUK	The KIL640-EUK wall kiosk enclosure provides a sleek digital showcase for advertising, entertaining, interactive wayfinding, and much more. These innovative kiosk enclosures accommodate a wide variety of ultra-thin displays in either landscape (KIL models) or portrait (KIP models) orientation.
KIL740-EUK	The KIL740-EUK is the company's in-wall kiosk enclosure (landscape). With a profile less than 1-inch thin, this in-wall kiosk creates a minimalistic look to a large format digital wall signage.
KIPC25	KIPC25 is the company’s new indoor portrait kiosk, designed to support the latest LED displays and touchscreen panels up to 4 inches deep. With a flat base that can be free standing or bolted to the ground, the kiosk allows for electric and data cable access, making it easy to install and maintain.
KIPC2540-S-EUK	KIPC2540-S-EUK is the company's new indoor portrait kiosk, designed to support the latest LED displays and touchscreen panels up to 4 inches deep. With a flat base that can be free standing or bolted to the ground, the kiosk allows for electric and data cable access, making it easy to install and maintain.

Kiosk Enclosures	Description
KIPC2540B-3-EUK	KIPC2540B-3-EUK is the company's digital signage kiosk. Designed to support two ultra-thin or thicker commercial displays, this kiosk accentuates the sleek look of the flat panel displays, while providing ample space to integrate a media player, interactive touch system, camera, etc., to create a complete interactive kiosk experience.
KIPC2540B-S-EUK	KIPC2540B-S-EUK is the company's digital signage kiosk. Designed to support two ultra-thin or thicker commercial displays, this kiosk accentuates the sleek look of the flat panel displays, while providing ample space to integrate a media player, interactive touch system, camera, etc., to create a complete interactive kiosk experience.
KOP2549-XHB-EUK	KOP2549-XHB-EUK is the company's smart city kiosk for greater public engagement and seamless updates of digital content whenever, wherever. With a focus on functionality and aesthetics, the smart city kiosk is designed to be modern, approachable, practical, and endure the rigors of everyday use. Installation is easy without the need for cranes or forklifts, and the locking rear door offers quick access to the display for maintenance.
KIP740-EUK	The KIP740-EUK is the company's in-wall kiosk. With a profile less than 1-imch thin this in-wall kiosk creates a minimalistic look to a large format digital wall signage. Complete with extending arms for ease of installation and powerful fan to pull in fresh air for thermal management, this solution can be integrated into new construction or retrofit walls alike.
KIP640-S-EUK	KIP640-S-EUK is the company's wall kiosk which creates engaging digital solutions for portrait- or landscape-oriented applications. Even with a slim ADA-compliant 3.9-inch profile, these wall kiosks accommodate most ultra-thin displays while providing room for media players, fans and other electronic equipment to create an impressive interactive solution.
KOP2546-S-OHF-EUK	KOP2546-S-OHF-EUK is the company's smart city kiosk for greater public engagement and seamless updates of digital content whenever, wherever. With a focus on functionality and aesthetics, the smart city kiosk is designed to be modern, approachable, practical, and endure the rigors of everyday use.
KIPC2540-WHL-S-EUK	KIPC2540-WHL-S-EUK is the company's indoor portrait kiosk, designed to support the latest LED displays and touchscreen panels up to 4-inches deep. With a wheeled base for ease of movement, the kiosk allows for electric and data cable access, making it easy to install and maintain.
KIP586-1LG-EUK	KIP586-1LG-EUK is the company's portrait kiosk designed exclusively for LG Ultra Stretch Digital Signage (86BH5C and 88BH7D). Available in one, two, three, or four-sided models, this kiosk accentuates the sleek look of the one-of-a-kind Ultra Stretch display with its slim profile and curved design. Ideal for a wide array of applications, including transportation terminals, retail stores, banks, or museums, the Ultra Stretch Portrait Kiosk is the ultimate digital signage solution.

Source: Company Website and Press Releases

PROVISIO LLC

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Website: www.provisio.com

Company Overview

PROVISIO is a leading software development company providing turnkey digital signage, kiosk, and remote management software solutions for display computers and kiosks in public locations. The company's software products are sold across more than 50 countries through offices in the U.S. and Europe. Some of the leading clients of the company include Fortune 500 companies such as Verizon Wireless, OfficeMax, Hilton Hotels, BMW, T-Mobile, SEARS/Kmart, and Citibank, among others. PROVISIO was founded in 1996 and has offices in Miami, Fla., and Muenster, Germany.

Table 38
Provisio LLC.: Products and Services

Products and Services	Description
SiteKiosk Windows	Lockdown browser & kiosk software for safeguarding public access Internet-PCs, displays and tablets. Protects the browser and operating system against manipulations.
SiteKiosk Android	SiteKiosk Android is the software solution to secure tablets in a public location in kiosk mode and define how the device can be used and how the access can be restricted.
SiteCaster Kiosk-CMS	Kiosk CMS (content management system) enables users for applications such as automatically running product presentations and information displays, Interactive applications with page-based navigation, pop-ups and embedded web pages, Screensaver and attract loops and scheduled or event-triggered advertising campaigns to create and arrange content.
SiteRemote Cloud	Remote administration and maintenance software for kiosk systems and digital signage displays. These solutions monitor, manage and configure terminals, displays and tablets remotely. It also maintains the overview with statistics and reports or controls entire groups of terminals with self-created jobs.

Source: Company Website and Press Releases

PYRAMID COMPUTER GMBH (NORTH AMERICA)

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Company Overview

Pyramid Computer GmbH is one of the leading developers and manufacturers of IT solutions for the retail and hospitality segments. From its inception in 1985, the company has established itself as one of the leading manufacturers of self-ordering kiosks. Pyramid Computer to data has shipped more than 33,000 kiosks globally. Closer consumer proximity, flexibility and modularity along with innovation has enabled the company to become established in the fast-growing digital marketplace. Pyramid Computers currently employs more than 130 employees who are largely based at their global headquarters in Freiburg and production and logistics facility in Erfurt.

Pyramid Computer GmbH recently announced the opening of its North American operations in Boca Raton, Fla. This move will enable the company to become a local partner for their clients in the United States.

Table 39
Pyramid Computer GmbH: Products and Services

Product	Description
Polytouch® Classic	Polytouch Classic brings multichannel selling into the store and guides costumers precisely even through the largest mall.
Polytouch ® Curve	Polytouch Curve pushes the limits in retail and services on-site with a kiosk adaptable/adaptive like a chameleon.
Polytouch ® Flex	Polytouch Flex is the most compact and flexible kiosk design for self-service at checkout, access- and health-control.
Polytouch ® Mirror	Polytouch Mirror is used for interaction for changing rooms. This solution supports a user's search for alternatives by color, size and style.
Polytouch ® Passport	Polytouch Passport makes buying and ordering products and services on site convenient and fast.
Polytouch ® PE Series	Polytouch PE Series is largely used for self-checkout. These kiosks have up to two displays, two scales and 24 hand scanners per terminal unit. They are useful in shortening even the longest queues.
Polytouch ® Portal	Polytouch Portal is an all-in-one solution for self-checkout in most retail sectors. In addition to grocery stores, the Portal is also digitizing checkout processes in DYIs, drugstores and discounters by enabling customers to do it easily by themselves and thus get into the fast lane – without queuing, even at peak times.
Polytouch ® Rock	Polytouch Rock is an outdoor terminal for seamless ticketing and access control in extreme conditions of freezing cold and desert heat. These kiosks are ultra-durable and ultra-resistant.

Source: Company Website and Press Releases

Recent Developments

Table 40
Pyramid Computer GmbH: Recent Developments, 2019 and 2020

Date	Development Type	Description
September 2020	Partnership	Pyramid Computer announced a strategic partnership with FreeStylus, a Philadelphia-based company. The objective of this cooperation is to offer users an alternative and better experience with safer interactions while keeping the environment in mind. The companies combined their efforts to help restore consumer confidence in touch interaction displays while providing a solution that aims to slow down the spread of the coronavirus.
January 2020	Expansion	Pyramid Computer announced its expansion into the North America region at The NRF Big Show in New York City, January 2020. This move will enable the company to become a real local partner for its clients in the United States.
September 2019	Product launch	Pyramid Computer announced the launch of new Polytouch® 32 PE4000. The Polytouch 32 PE4000 is the world's first system to combine four self-service kiosks on a single pedestal.

Source: Company Website and Press Releases

QWICK MEDIA INC.

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Canada
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Website: www.qwickmedia.com

Company Overview
Qwick Media Inc. is a Canada-based interactive IoT company. The company offers touch screen kiosks, digital signage and mobile apps which enable consumers to self-service their needs through interactive directories, wayfinding, coupons, and other on-demand media applications.

The company provides the software platform QwickManager, which controls private-to-public self-serve solutions. Through its QwickWay platform, the company also provides wayfinding mapping and directories. Due to the spread of COVID-19 pandemic in 2020, the company has invested heavily in new solutions that include a thermal camera for temperature screening and touchless smart hand sanitizers. The company's self-serve systems provide for contactless payments, and thus reduced person-to-person contact.

Table 41
Qwick Media Inc.: Products and Services

Products and Services	Description
Touchless hand sanitizer dispensers	Hydrosanz©™ large-capacity hand sanitizer stations help protect public health, prevent the spread of disease and ensure adequate capacity for high-volume traffic. These kiosks are perfect for public transport hubs and at entrances to all major building types (commercial, residential, and institutional).
Digital signage	Qwick Media interactive digital signage is visual, expressive, easily managed and supported, flexible, and customized to drive customer success metrics. Large, attractive screens with touch screen capability and intuitive user interface are an excellent way to promote products and services.
Touchscreen kiosks	Qwick Media-manufactured touch screen kiosks are an excellent way to engage customers. These kiosks have large, attractive displays with touch screen capabilities, flexible hardware configurations, such as thermal printers, bar code scanners, ticket printing, and contactless payments.
Water refill station	Qwick Media Water refill stations not only supply customers with free cold, fresh, clean water, but also eliminate plastic bottles and save the environment. Equipped with digital signage and touchscreen capabilities this self-service device becomes a powerful communication and promotional tool.
Software	Qwick Media designs visually attractive self-service kiosk interfaces that engage users and successfully guide them to fulfill their self-service needs. This interactive software could be for information search, sharing or printing, checking in, making reservations, coupon scanning or printing, making purchases, or placing an order. The company's touch screen kiosk and digital signage software is built according to the highest standards of self-service.
Services	Qwick Media offers a full range of self-service solutions from concept to deployment, including software development and kiosk manufacturing, as well as lifelong support. The company guides users through each step of the process and deliver touchscreen kiosk and digital signage solutions that meet specific business needs.

Source: Company Website and Press Releases

Recent Developments

Table 42
Qwick Media Inc.: Recent Developments, 2019 and 2020

Date	Development Type	Description
April 2020	Product launch	Qwick Media announced the launch of Hydrosanz©™ Large Capacity Hand Sanitizer for high-traffic locations. Hydrosanz©™ is an effective solution for COVID-19 prevention. These kiosks are ideal for public transport hubs and at entrances to all major building types (commercial, residential, and institutional).

Date	Development Type	Description
March 2019	Acquisition	Qwick Media Inc. announced a share purchase agreement with SFE Global Inc. SFE Global is an environmental services provider to city and county water and sewer systems, providing services in underground water, storm and sanitary lines throughout the western United States.

Source: Company Website and Press Releases

SELF-SERVICE NETWORKS

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Company Overview

Founded in 1996 by Thomas Smith, Self-Service Networks emerged as an early pioneer in the interactive kiosk and self-service industry. Self-Service Networks has helped businesses empower their customers with secure, unattended transaction solutions. Self-Service Networks largely serves retailers, financial institutions, governmental agencies, and healthcare providers and empowers them to grow their product distribution when a staffed location is not possible or economical.

Over the years, Self-Service Networks has successfully implemented self-service solutions for a variety of customers serving various industries. Some of the key clients for the company include: International Bank of Commerce, U.S. Air Force, U.S. Army Corps of Engineers, Cadillac Fairview (Calif.), Comdata, PepsiCo, Sealed Air Corp., Macys, Decathlon, and others.

Table 43
Self-Service Networks: Products and Services

Product	Description
GiftWise™	Self-service gift card vending kiosk solution for shopping malls with existing gift card programs.
GiftWise+ Bundled Solution	Self-service kiosk solution including a fully managed gift card program.
GiftWise Print on Demand	Fully automated gift card printing and activation system.
Cash-2-Card Gift Reverse ATM Kiosks	Cash-2-Card Reverse ATM self-service kiosks not only empower cash-paying customers, but also improve the visibility of gift card programs. The company's Cash-2-Card Reverse ATM solution also serves as remote marketing touch point that can enroll customers in a loyalty program and collect valuable consumer information, dispense coupons and promotional cards, display digital advertising, and fulfill shopper rewards.
YooDoo Cashless Restaurant	YooDoo solutions empowers customers to place orders, pay when ready and streamline their experience within a restaurant.

Source: Company Website and Press Releases

STORM INTERFACE

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Company Overview

Storm Interface is a trading name of Keymat Technology Ltd. Keymat Technology Ltd. was formed in March 1986 as a private U.K.-registered company. In Oct. 2004, Keymat Technology changed its trading name to Storm Interface.

Storm Interface designs and manufactures keypads, keyboards and custom computer interface devices. The company's global head office is based in Langley, Berkshire, U.K.; it currently exports its products and solutions to over 60 countries worldwide.

Storm's primary activities are development and manufacture of responsive human interface devices for use in a wide range of public and industrial applications. The company's manufacturing division is based in Maldon, on the east coast of England.

Table 44
Storm Interface: Products and Services

Products and Services	Description
Assistive technology products	Storm assistive technology products are audio enabled, tactile, information-navigation devices designed for use as part of a 'text-to-speech' or 'audible content navigation' system. They are designed to provide an accessible hardware interface for touchscreen applications and are compliant with global accessibility mandates. Assistive technology products of the company include: AudioNav, AudioComm, NavPad, NavBar, Array Microphone, and the 1600 Series.
Access control products	Storm AXS range access control products offer reliable, easy to install solutions for both stand-alone and centralized access control applications. Storm's AXS products are manufactured using only high-quality materials and built to withstand hard use and abuse in demanding public and outdoor applications. Access control products include StrikeMaster, Exit Switches, Keypads with Readers, Locks, Power Supplies, and CodeMaster.
Displays	Displays provided by the company include: 5000 Series - 16 Key Vandal Resistant Keypad; 5000 Series - 16 Key Vandal Resistant Keypad 4 Line Display; 5000 Series - 16 Key Robust Keypad; 5000 Series - 16 Key Robust Keypad 4 Line Display; 5000 Series - 16 Key General Service Keypad; 5000 Series - 16 Key General Service Keypad 4 Line Display; 5000 Series - Display Bezel 3 Keys; 5000 Series - Display Module 4 Lines; and Under Panel Fixing Kit - 5000 Series.

Products and Services	Description
Keyboards	Keyboards provided by the company include: 1200 Series Miniature USB Keyboard U.K. Layout; 1200 Series Miniature USB Keyboard U.S. Layout; 2205 Series - Compact Keyboard U.K. Format; 2205 Series - Compact Keyboard U.S. Format; 2210 Series - Water Resistant T-ball U.K. Format; 2210 Series - Water Resistant T-ball U.S. Format; 2210 Series - Water Resistant T-ball French Format; 2210 Series - Water Resistant T-ball German Format; 2210 Series - Water Resistant T-ball Spanish Format; 2210 Series – U.K. Format; 2210 Series – U.S. Format; 2210 Series - French Format; 2210 Series - T-Ball U.K. Format; 2210 Series - T-Ball U.S. Format; 2210 Series - T-Ball French Format; 2220 Series Keyboard U.K. Layout; White Polymer Keys, 2220 Series Keyboard U.S. Layout; White Polymer Keys, 2220 Series Keyboard U.K. Layout; Metal Keys, 2220 Series Keyboard U.S. Layout; Metal Keys, 2230 Series – U.K. Format; 2230 Series – U.S. Format; 2230 Series - French Format; 2230 Series - German Format; 2230 Series - Spanish Format; Under-Panel Fixing Kit - 2200 Series; Foot Kit - 2200 Series; and Fixing frame for Storm 1200 Series Keyboard.
Keypads	Keypads provided by the company include: Storm 720TFX Series - 4 Button; Storm 720TFX Series - 12 Button; Storm 720TFX Series - 16 Button; Storm 720 TFX-I Illuminated 4 Button; Storm 720 TFX-I Illuminated 12 Button; Storm 720 TFX-I Illuminated 16 Button; Storm 720GFX Series - 4 Button; Storm 720GFX Series - 12 Button; and others.
Keypad encoders	Keypad encoders by company include: 450i USB Keypad Encoder; 450 USB Keypad Encoder; 420 RS232 Keypad Encoder; Link Cable for Storm 4 Button Keypads to 450 Series Encoder; Link Cable for Storm 12 & 16 Button Keypads to 450 Series Encoder; and Interconnect Cable
Pointing devices	Pointing devices by company include: Trackball - Robust Phenolic; Trackball - Stainless Steel; 1600 Series USB Navigation Keypad, USB Cable; PS2 Trackball Cable, 2.5m; and USB Trackball Cable, 2.5m

Source: Company Website and Press Releases

Recent Developments

Table 45
Storm Interface: Recent Developments, 2019 and 2020

Date	Development Type	Description
August 2020	Product launch	Storm Interface launched new hardware for speech commanded self-service applications. Self-service terminals with voice recording, voice recognition or speech command features are deployed in public locations.
December 2019	Partnership	Storm Interface and Vispero announced a partnership to combine the JAWS screen reader with Storm's Assistive Technology Products to create the most accessible kiosk experience for users who are blind, have low vision or limited dexterity.

Source: Company Website and Press Releases

TEAMSABLE POS

1911 Hartog Dr.
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Website: www.teamsable.com

Company Overview

Founded in 2006, TEAMSable POS started as a division of Team Research Inc., a public company in Taiwan and doing business based in San Jose, Calif., for over 25 years. The company offers a complete line of POS hardware and mPOS solutions including all-in-one touch systems, mobile devices, peripherals, and payment terminals. The company has proven itself to be a leading provider of quality products and first-class customer service, always ensuring that products are delivered in a timely fashion and within budget.

Over the years TEAMSable POS has evolved and played a leadership role in the point-of-sale industry, and on January 1, 2019, TEAMSable INC., became an independent company.

Table 46
TEAMSable POS: Products and Services

Products and Services	Description
Unattended retail / self-service kiosks	The company's products under this segment include 12N-RM-TOWER, 15N-RM-TOWER, 15N-RMK1-FLOOR, 22P-RMK1-FLOOR, 27P-RMK1-WALL, and 32P-RMK1-WALL.
Digital signs	The company's products under this segment include 10N-RM-DS, 12N-RM-DS, 13N-RM-DS, 15N-RM-DS, 22P-RM-DS, 24P-RM-DS, 27P-RM-DS, 32P-RM-DS, and 43P-RM-DS.
Android POS systems	The company's products under this segment include 15N-RM, 12N-RM-BL, 12N-RM-WH, and 7N-RK.
Payment terminals	The company's products under this segment include APT-40-MINI, APT-50, APT-120, and SKY 15-Si (15-inch Windows POS Terminal).

Source: Company Website and Press Releases

Recent Developments

Table 47
TEAMSable POS: Recent Developments, 2019

Date	Development Type	Description
July 2019	Partnership	TEAMSable POS announced a partnership with North American Bancard (NAB), an innovative payment technology company. NAB/EPX is expected to become an integrated payment processor platform for TEAMSable's new line of smart payment terminals

Source: Company Website and Press Releases

TECH FOR ALL INC.

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Tel: 781/934-7432
Website: www.tfaconsulting.com

Company Overview

Tech For All Inc. is an international accessibility and universal design consulting firm and over the years has served small companies, Fortune 500 corporations, educational institutions, government agencies, and nonprofit organizations representing people with disabilities. The company's sole mission is to help its clients successfully address the challenges of making their products, services, websites, kiosks, and mobile apps accessible for all, including people with disabilities.

The Tech for All team has received numerous awards and recognition for its contributions to technologies for people with disabilities, including:

- Access Award, American Foundation for the Blind.
- Technology of the Year Award, Industry Week Magazine.
- Computerworld Smithsonian Medal, Smithsonian Institute.
- Nominated for Stevie Wonder/SAP Product Vision Award, in top 10 finalists from 200 products from 27 Countries.

Table 48
Tech For All Inc.: Products and Services

Products and Services	Description
Self-Service Services	Tech for All's team provides design direction for kiosks, stand-alone products, point-of-sale, and transaction terminals that ensure an exceptional user experience for all users, including people with disabilities.

Source: Company Website and Press Releases

VISPERO

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Company Overview
Vispero is one of the world's largest assistive technology providers for the visually impaired. Although the company officially formed in 2016, its brands such as Freedom Scientific, Enhanced Vision, Optelec, and The Paciello Group have a long, rich history as industry leaders dating back to 1975.

Vispero develops and delivers innovative solutions that enable blind and low vision individuals to gain an education, obtain employment, succeed in professional careers, and live independently throughout their lives. Vispero currently operates in around 90 countries worldwide, with products localized in over 24 languages. With age-related eye diseases like macular degeneration steadily on the rise, assistive technology plays an increasingly vital role, resulting in a growing demand for low-vision devices and services. Vispero is uniquely positioned to address these challenges by providing the tools necessary to meet the needs of the low-vision population through their far-reaching distribution network.

Vispero has a wide range of brands that deliver a superior line of optical and video magnifiers; wearables; scanning and reading devices; and easy-to-use software. Vispero's partnership with key organizations and advocacy groups keeps it at the forefront of the low-vision industry.

Vispero has headquarters in both the U.S. and Europe. U.S. headquarters is in Clearwater, Fla., and European headquarters is in Barendrecht, the Netherlands. The company has a manufacturing hub in Huntington Beach, Calif., and subsidiary offices worldwide.

Table 49
Vispero: Products and Services

Brands	Description
The Paciello Group	The Paciello Group (TPG) is an accessibility solutions provider with a reputation for excellence. The business helps clients to achieve end-to-end accessibility in their digital assets (websites, software applications, mobile applications, documents, etc.), as well as assist in embedding accessibility into their processes and procedures.
Optelec	Optelec provides solutions that help anyone with a visual impairment, whether it is blindness, or any degree of low vision, with a wide range of products including hand-held and electronic video magnification hardware, speech enabled devices and daily living aids.
Freedom Scientific	Freedom Scientific products include screen reading software, optical character recognition (OCR) software and hardware in the form of a Braille display.
Enhanced Vision	Enhanced Vision is a leading developer of assistive technology for the visually impaired. Popular products under this brand include Pebble, Jordy, Merlin, DaVinci, and Acrobat. The brand also provides hand-held, wearable and desktop video magnifiers designed to help low-vision individuals living with macular degeneration, glaucoma, cataracts, retinitis pigmentosa, and diabetic retinopathy to read, write and fully participate in life.
JAWS Kiosk	JAWS Kiosk is a leading assistive technology solution for the visually impaired. The product was jointly developed by Paciello Group (TPG) and the Freedom Scientific brand.

Source: Company Website and Press Releases

ZEBRA TECHNOLOGIES CORP.

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Company Overview
Zebra Technologies Corp. and its subsidiaries are global leaders in providing innovative Enterprise Asset Intelligence (EAI) solutions in the automatic identification and data capture solutions industry. The company is largely involved in the design, manufacture and sales of a broad range of products that capture and move data. Zebra Technologies also provides a full range of services, including maintenance, technical support, repair, and managed services, including cloud-based subscriptions. Major end-users of company's products and services include retail and e-commerce, transportation and logistics, manufacturing, healthcare, hospitality, warehouse and distribution, energy and utilities, and education industries around the world.

Zebra Technologies operates in two segments: Asset Intelligence & Tracking (AIT) and Enterprise Visibility & Mobility (EVM). The AIT segment provides barcode printing and asset tracking technologies. The Asset Intelligence & Tracking segment product lines include barcode and card printers, supplies,

services, location solutions, and retail solutions. Industries served include retail and ecommerce, transportation and logistics, manufacturing, healthcare, and other end markets.

The EVM segment is among one of the leading providers of automatic information and data capture solutions. The segment's major product lines include mobile computing, data capture, RFID, and services. Industries served include retail and e-commerce, transportation and logistics, manufacturing, healthcare, and other end markets.

Business Performance

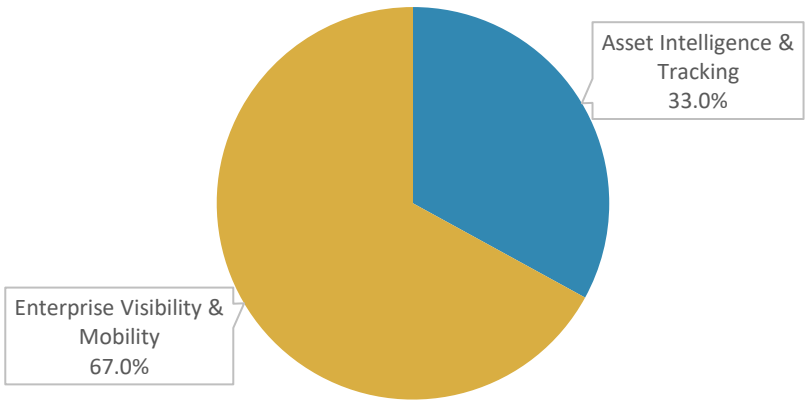
For the year ended December 31st, 2019, the company generated revenue of $4.5 billion, which is 6.3% more than previous year revenue of $4.2 billion. The revenue growth of the company in 2019 is largely attributed to the increasing sales of company's products in the North America and EMEA regions. Net sales increase in these regions was primarily in mobile computing products and support services.

Table 50
Zebra Technologies Corp.: Net Revenue, 2017–2019
($ Millions)

	2017	2018	2019
Revenue	3,722	4,218	4,485

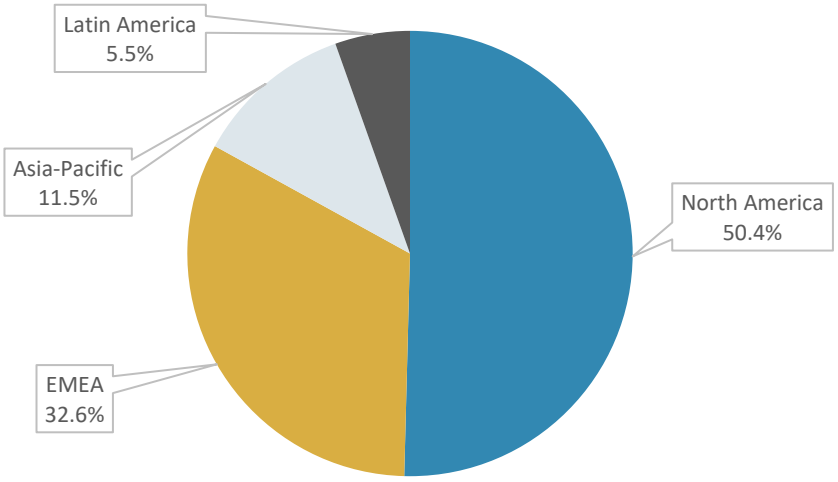
Source: Company Website and Annual Report

Figure 26
Zebra Technologies Corp.: Revenue Share, by Business Segment, 2019
(%)



Source: Company Website and Annual Report

Figure 27
Zebra Technologies Corp.: Revenue Share, by Business Segment, 2019
(%)



Source: Company Website and Annual Report

Table 51
Zebra Technologies Corp.: Products and Services

Product	Description
CC600 and CC6000 Customer Concierge (tablet-style kiosk)	Zebra's CC600 and CC6000 Customer Concierge Kiosks are interactive kiosks designed on the latest Android platform. These tablet-styled kiosks give customers a seamless retail experience, while providing guaranteed security and a long life-cycle
CC5000-10" Customer Concierge (business-class tablet kiosk)	The CC5000-10 tablet-style kiosk can be used easily by customers due to its comfortable and familiar consumer touch screen.
MK500 Micro Kiosk	The MK500 Micro Kiosk is ideal for basic customer self-service options, such as price check and basic digital advertising.
MK3100 Micro Kiosk	The MK3100 Micro Kiosk provides rich and intuitive interactive options.

Source: Company Website and Press Releases

Recent Developments

Table 52
Zebra Technologies Corp.: Recent Developments, 2019

Date	Development Type	Description
May 2019	Product Launch	Zebra Technologies Corp. launched its CC6000 and CC600 Customer Concierge Kiosks to provide customers with an optimal online and in-store shopping experience with the self-service capabilities. The 10-inch CC6000 and 5-inch CC600 kiosks combine the familiarity of a consumer tablet with an enterprise-class Android™ platform that enables retailers to deliver a truly unique shopping experience featuring quick access to product information, pricing and availability, and personalized service.

Source: Company Website and Press Releases

About BCC Research

BCC Publishing

About BCC Research

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Thanks and Acknowledgments

The Kiosk Association would like to thank BCC for allowing the Association to review this report along the way and ensure a more accurate and representative report is provided. We would like to recognize the contribution that individuals such as Francie Mendelsohn at Summit Research as well as Rufus Connell with Frost & Sullivan made in the early years of reporting and measuring the self-service kiosk market. This report actually mirrors some of the same mechanisms used in those early reports because they are still effective indicators.

DISCLAIMER

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