

Capturing data: The industry landscape will keep moving toward large companies, boosting demand

IBISWorld Industry Report 51821 Data Processing & Hosting Services in the US

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2 About this Industry

2	Industry Definition
2	Main Activities
2	Similar Industries
3	Additional Resources	.....

4 Industry at a Glance

5 Industry Performance

5	Executive Summary	.....
5	Key External Drivers	.....
7	Current Performance	.....
9	Industry Outlook	.....
11	Industry Life Cycle	.....

13 Products and Markets

13	Supply Chain	.....
13	Products and Services	.....
15	Demand Determinants	.....
15	Major Markets	.....

16	International Trade	.....
17	Business Locations	.....

19 Competitive Landscape

19	Market Share Concentration	.....
19	Key Success Factors	.....
19	Cost Structure Benchmarks	.....
22	Basis of Competition	.....
23	Barriers to Entry	.....
24	Industry Globalization	.....

25 Major Companies

25	International Business Machines Corporation	.....
26	Amazon.com Inc.	.....
27	Salesforce.com Inc.	.....
29	Hewlett Packard Enterprise Company	.....

31 Operating Conditions

31	Capital Intensity
----	-------------------	-------

32	Technology and Systems	.....
32	Revenue Volatility	.....
33	Regulation and Policy	.....
33	Industry Assistance	.....

34 Key Statistics

34	Industry Data	.....
34	Annual Change	.....
34	Key Ratios	.....
35	Industry Financial Ratios	.....

36 Jargon & Glossary

About this Industry

Industry Definition

This industry provides data processing or hosting services. Data processing services provide specialized reports from information supplied by

clients. Hosting services can include web and application hosting. Services range from automated data entry to data processing.

Main Activities

The primary activities of this industry are

Application hosting

Application service provider services

Data entry services

Data processing computer services

Data processing

Database management

Web hosting

The major products and services in this industry are

Application service provisioning

Business process management

Data storage and management services

Website hosting services

Other services

Similar Industries

52232 Credit Card Processing & Money Transferring in the US

This industry provides financial transaction processing, reserve and liquidity services and check or other financial instrument clearinghouse services.

54121b Payroll & Bookkeeping Services in the US

This industry provides outsourced payroll services for clients' employees, including basic bookkeeping.

54121c Accounting Services in the US

This industry provides a range of financial services, such as auditing of accounting records, preparing financial statements and preparing tax returns.

54121d Tax Preparation Services in the US

This industry provides a range of financial services, such as auditing of accounting records, preparing financial statements and preparing tax returns.

54151 IT Consulting in the US

This industry provides expert advice and assistance in the fields of writing, modifying, testing and supporting software to meet the needs of particular customers.

About this Industry

Additional Resources

For additional information on this industry

www.aitp.org

Association of Information Technology Professionals

www.itwire.com

ITWire

www.census.gov

US Census Bureau

IBISWorld writes over 1 000 US industry reports, which are updated up to four times a year. To see all reports, go to www.ibisworld.com

Industry at a Glance

Data Processing & Hosting Services in 2019

Key Statistics Snapshot

Revenue	Annual Growth 14–19	Annual Growth 19–24
\$162.2bn	4.1%	2.2%
Profit	Wages	Businesses
\$14.3bn	\$51.2bn	57,593

Market Share

- International Business Machines Corporation
12.3%
- Amazon.com Inc.
6.8%
- Salesforce.com Inc.
6.8%
- Hewlett Packard Enterprise Company
4.9%

p. 25

Key External Drivers

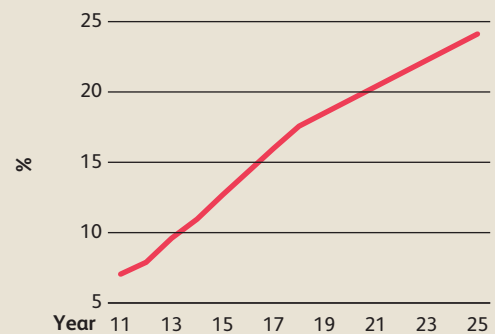
- Percentage of services conducted online
- Number of mobile internet connections
- Corporate profit
- Demand from internet publishing and broadcasting
- Price of computers and peripheral equipment

p. 5

Revenue vs. employment growth

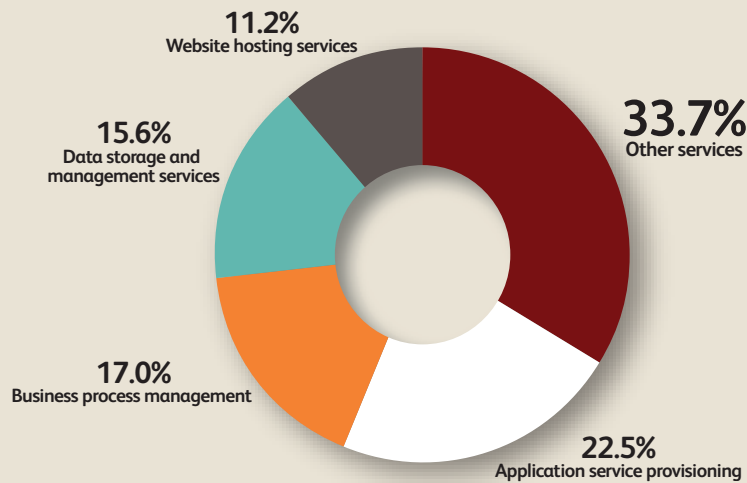


Percentage of services conducted online



SOURCE: WWW.IBISWORLD.COM

Products and services segmentation (2019)



SOURCE: WWW.IBISWORLD.COM

Industry Structure

Life Cycle Stage	Growth	Regulation Level	Medium
Revenue Volatility	Medium	Technology Change	High
Capital Intensity	Low	Barriers to Entry	Medium
Industry Assistance	Low	Industry Globalization	Medium
Concentration Level	Low	Competition Level	High

FOR ADDITIONAL STATISTICS AND TIME SERIES SEE THE APPENDIX ON PAGE 34

Industry Performance

Executive Summary | Key External Drivers | Current Performance
Industry Outlook | Life Cycle Stage

Executive Summary

The Data Processing and Hosting Services industry provides infrastructure used for a variety of information technology (IT)-related activities, ranging from web hosting to automated data entry services. Over the five years to 2019, businesses have increasingly outsourced their IT infrastructure needs, directly benefiting industry operators. The advent and popularization of cloud computing, one of the industry's fastest-growing product offerings, has similarly led to greater demand. As a result, the industry has fared well during the five-year period, with revenue expected

continued shift of media to online platforms, has additionally benefited industry growth. The continued movement of businesses toward online services has driven funding toward resellers and content providers that lease resources from industry data hosts. As downstream demand has increased, industry profit has grown in turn as operators have been able to raise their selling prices.

Over the five years to 2024, industry revenue is expected to grow at an annualized rate of 2.2% to \$181.2 billion. As the technology required to process and host data becomes more complex, the level of expertise needed to effectively manage large data centers will rise. Companies will increasingly capture more data, requiring the outside expertise of industry operators to manage their data needs. In addition, supply disruptions in the hardware market may push companies that manage their IT infrastructure needs in-house to opt for third-party providers. To meet these demands, the industry landscape will continue to move toward large companies and independent contractors. Consolidation among the industry's largest companies is likely to accelerate as operators merge to meet the data demands of the industry's largest clients. However, the number of nonemployers will also likely rise as companies with limited IT budgets outsource smaller projects to freelancers.

A primary driver of growth has been the outsourcing of application hosting to specialized companies

to grow at an annualized rate of 4.1% to \$162.2 billion, including an anticipated 4.9% increase in 2019.

A primary driver of growth has been the outsourcing of application hosting to specialized companies as an alternative to local hosting of enterprise software. Since data processing and hosting require the use of complicated equipment and sophisticated technical skills, many companies have moved away from internal IT management, opting to outsource work to reduce costs without limiting performance. Investment in internet companies, driven by the

Key External Drivers

Percentage of services conducted online

Industry operators enable online transactions and services by providing information technology infrastructure that processes the underlying data. An increase in the percentage of services conducted online necessitates greater data use, increasing demand for industry services. The percentage of services

conducted online is expected to increase in 2019.

Number of mobile internet connections

As the number of mobile internet connections increases, demand for services that use these connections rises. This includes many location-based services that have yet to build significant delivery

Industry Performance

Key External Drivers continued

systems that use industry services. The number of mobile internet connections is expected to increase in 2019.

Corporate profit

Demand for industry services depends on corporate profit levels, partly because businesses that perform well are more likely to update to the latest technology and software to maintain efficiency. Companies that perform well, for instance, need additional data storage to maintain customer lists and find customer purchase trends. Corporate profit is expected to increase in 2019.

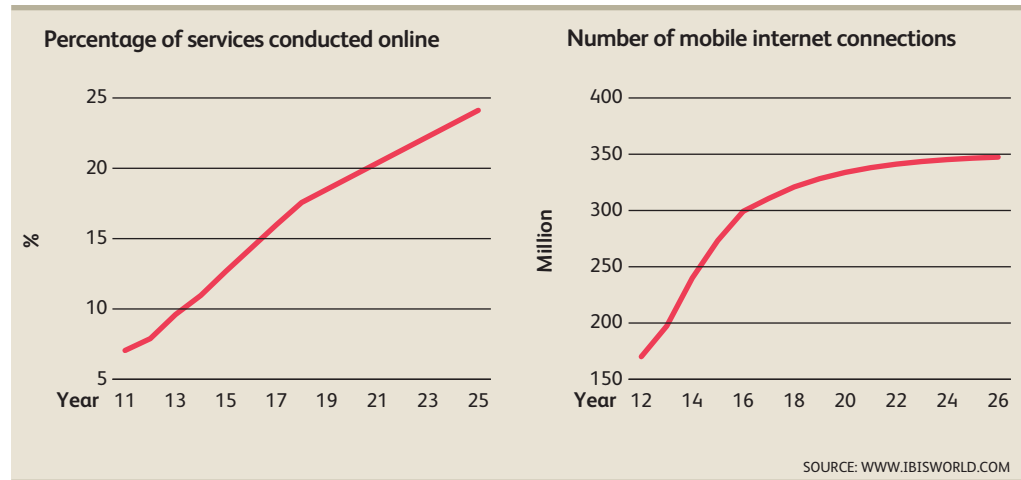
Demand from internet publishing and broadcasting

Web hosting is a significant driver of industry growth. As demand for hosting services increases, industry operators will

supply the data infrastructure to make websites operational. Demand for internet publishing and broadcasting is expected to increase strongly in 2019, representing a potential opportunity for the industry.

Price of computers and peripheral equipment

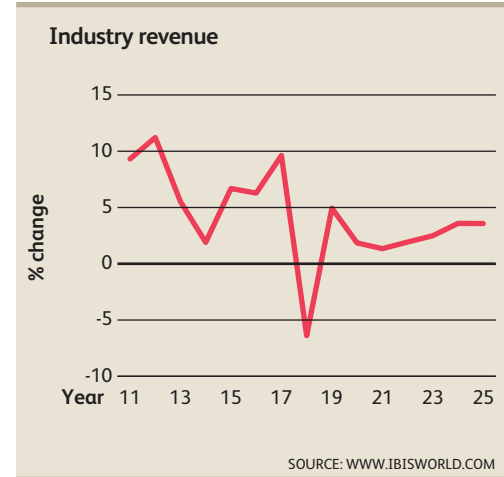
Falling computer prices make the purchase of costly equipment required for data processing and hosting more affordable, making the internal provision of industry services more feasible for nonindustry companies. As a result, a decline in prices adversely affects demand for industry services. The price of computers and peripheral equipment is expected to decrease in 2019, representing a potential threat to the industry.



Industry Performance

Current Performance

The Data Processing and Hosting Services industry provides infrastructure for data hosting and processing services. As a result of an immense marketing push by some of its largest companies to popularize cloud computing, the industry has experienced steady growth over the past five years. In addition, the continued movement of media to online platforms has led to greater demand for industry services from internet-based companies that require industry operators to manage their information technology (IT) infrastructure needs. As a result of these trends, industry revenue is expected to grow at an annualized rate of 4.1% to \$162.2 billion over the five years to 2019,



including an expected 4.9% jump in 2019 alone.

The cloud spurs growth

Industry growth has been most significantly spurred by the advent and popularization of cloud computing, one of the industry's fastest-growing product offerings. Cloud computing is similar to time-sharing mainframe-computing resources; however, instead of using a single mainframe, a cluster of computers is virtualized into a single computing entity. The entity's resources can then be divided and distributed on an as-needed basis to clients, which pay based on their usage needs. Leading industry players International Business Machines Corp. (IBM) and Hewlett Packard Enterprise Co. (HPE) have both heavily integrated cloud computing into the data processing and hosting services they offer. As a result, this segment has experienced tremendous revenue growth over the past five years.

Small companies have driven demand for cloud-computing services due to

their limited budgets for IT spending. Since these companies often have business plans that depend on their ability to access and manipulate their own data, they may opt for cloud-computing services to handle their IT needs. At the consumer level, cloud-computing services have been offered free of charge from several platforms, including Dropbox, Google Drive and Apple iCloud. These services enable users to store any type of file on the cloud and access it on any computer or mobile phone. While the base subscription is free, paid premium subscriptions that increase the maximum storage capacity are available. As new cloud technology continued to develop over the past five years, more businesses and consumers demanded additional cloud-related services, increasing industry revenue and profit.

Outsourcing by large companies

Large companies with tremendous volumes of data and little internal IT expertise have also been primary drivers

of industry revenue growth. Since most companies lack the internal capability to handle their IT needs efficiently, they

Industry Performance

Outsourcing by large companies continued

have increasingly outsourced services to industry operators to concentrate on their core strengths and decrease overhead. This trend has benefited data-processing operators, which have replaced or supplemented large companies' in-house IT operations.

In particular, financial service companies have contributed to industry growth due to their willingness to pay for faster access to growing stores of data. Currently, financial service companies account for an estimated

17.3% of industry demand. Content providers, including resellers that sell web-hosting services directly to content providers, have also driven industry growth. Rich media, such as videos, music and applications, have grown increasingly popular, and the consumer bandwidth available to access this data has increased. As a result, demand for remote storage and web-hosting capacity has risen. Content providers constitute an estimated 46.0% of industry demand.

Offshoring threat

While increased outsourcing by large companies has helped fuel demand for industry services, growth in global connectivity has facilitated greater offshoring, whereby contracts for data processing and hosting are sent to foreign contractors. Due to lower overseas labor costs, international companies are able to offer data processing and hosting services at a lower price, increasing competition for industry contracts. Although offshoring has negatively affected industry revenue growth, continuing

Growth in global connectivity has facilitated greater offshoring

concerns related to the risks of international offshoring, especially for financial service companies, have limited the effect of this trend. The threat of intellectual property theft has prevented offshoring from significantly affecting industry revenue.

Industry landscape

Data processing and hosting services appeal to two distinct types of companies: new and large. New companies demand data hosting to avoid the cost plateaus associated with internal investment in new hardware and software. Large companies demand industry services because the cost of in-house management is greater than the cost of outsourcing. As a result, the industry depends on several factors, including the continued complexity of large-scale operations and the emergence of new companies that operate via the internet. The prevalence of internet companies, driven by the continued shift of media to online platforms, has spurred industry growth.

This increased investment has driven funding toward resellers and content purveyors that lease resources from data hosts, driving industry growth.

In recent years, larger companies have found that more resources are required to manage data as the amount of data that needs to be analyzed grows. This stems from the fact that data requires increasing amounts of metadata (i.e. data that describes and gives information about other data), which requires its own metadata, thereby resulting in exponential data growth. As a result, only companies with significant scale are able to handle the infrastructure and engineering required to manage huge

Industry Performance

Industry landscape continued

data loads, leading to increasing consolidation by the industry's larger players. Over the five years to 2019, large web hosting companies and IT service providers have increasingly acquired smaller companies to expand their hosting infrastructure.

Furthermore, industry profit, defined as earnings before interest and taxes, is expected to reach 8.8% of revenue in 2019. Combined with strong growth in

revenue this trend has spurred new industry entrants. Over the five years to 2019, the number of industry enterprises is expected to grow at an annualized rate of 1.3% to 57,593 companies. However, employment is expected to decline at an annualized rate of 0.9% during this period to 546,918 workers, as companies have increased the efficiency of their operations to cut down on labor costs.

Industry Outlook

Over the five years to 2024, the Data Processing and Hosting Services industry is expected to experience growth as client companies continue the trend of outsourcing information technology (IT) services to third parties. Efforts to improve operational efficiencies, coupled with the rising costs of handling IT

internally, will drive outsourcing by large companies. Moreover, the continued to shift to online services will drive additional demand for industry services. As a result, IBISWorld expects industry revenue to grow at an annualized rate of 2.2% to \$181.2 billion over the five years to 2024.

Outsourcing drives growth

Over the next five years, companies outside of this industry will likely focus investment on products designed to improve and streamline operations by adopting software that saves time and improves efficiency. The difficulty of maintaining data infrastructure capable of monitoring, collecting and collating the data needed to feed such software will likely push businesses to outsource their IT needs. Since distributed networks of servers are complex to install and maintain, most companies lack the expertise necessary to handle their data processing and hosting needs internally. In addition, outsourcing to industry operators enables companies to take advantage of the lowered costs offered by specialized operators in a time of rapid technological transformation, without compromising service. For small- and medium-sized businesses with limited IT budgets, outsourcing data and processing needs to industry operators eliminates

Nonindustry companies will focus investment on products designed to improve operations

the costly investments in equipment associated with industry services. As a result, IBISWorld expects IT outsourcing to continue over the next five years, with more businesses depending on industry operators to handle their data processing and hosting needs.

Continued growth in the financial services sector, which is among the largest sources of demand for industry services, is expected to drive revenue growth. As growth expectations have declined among asset managers, many institutional funds, such as endowments and pensions, have moved their money to hedge funds to achieve returns beyond

Industry Performance

Outsourcing drives growth continued

what standard market instruments, such as equities and bonds, can offer. Since the performance of those funds largely depends on the speed of computing resources, financial firms will increasingly require larger computer

infrastructures to achieve growth. As financial firms outsource their data and processing needs to industry operators, continued growth in financial markets is expected to drive industry revenue over the next five years.

Shift to online services

The increasing provision of services online will also lead to an increase in industry revenue, as companies rely on industry operators to handle the IT infrastructure behind online platforms. Over the five years to 2024, IBISWorld expects the percentage of services conducted online to increase at an annualized rate of 4.6%, continuing a process that accelerated during the current period. Industry services, such as cloud computing, have made starting an online business easier than ever before, giving clients the ability to access resources on an as-needed basis. Businesses are able to avoid the steep upfront costs of purchasing hardware and software previously required to operate online, instead purchasing computing resources in smaller and smoother increments they are able to expand and shrink to meet changes in demand. This model will likely continue to encourage investment in internet-based businesses, resulting in higher demand for

The increasing provision of services online will also lead to an increase in industry revenue

industry services. Industry operators are likely to gain from the shift to online services as profit margins are expected to increase over the five years to 2024.

In addition, in light of unexpected supply disruptions that can significantly increase the cost of hard drives, businesses that previously planned on handling their IT infrastructure needs internally may decide to outsource to industry operators. These supply disruptions encourage consumers to use the industry's data processing and hosting services to mitigate any fluctuations in the price of computer and peripheral equipment.

Growth and consolidation

Anticipated strong revenue growth in the Data Processing and Hosting Services industry will likely propel enterprise and employment growth over the five years to 2024. During this period, the number of industry enterprises is expected to increase at an annualized rate of 1.6% to 62,450 companies. Nonetheless, consolidation is expected to be the dominant trend among the industry's larger companies, as operators with multiple establishments complete mergers and acquisitions to meet the needs of the industry's largest clients.

Conversely, many industry clients will choose to outsource industry work to online freelancers to reduce costs and increase flexibility. This is especially the case for smaller companies that need industry services but cannot afford more-comprehensive data infrastructure solutions. As a result, the number of nonemployer establishments is expected to fuel both enterprise and employment growth. Over the five years to 2024, overall industry employment is expected to increase at an annualized rate of 1.9% to 600,111 employees.

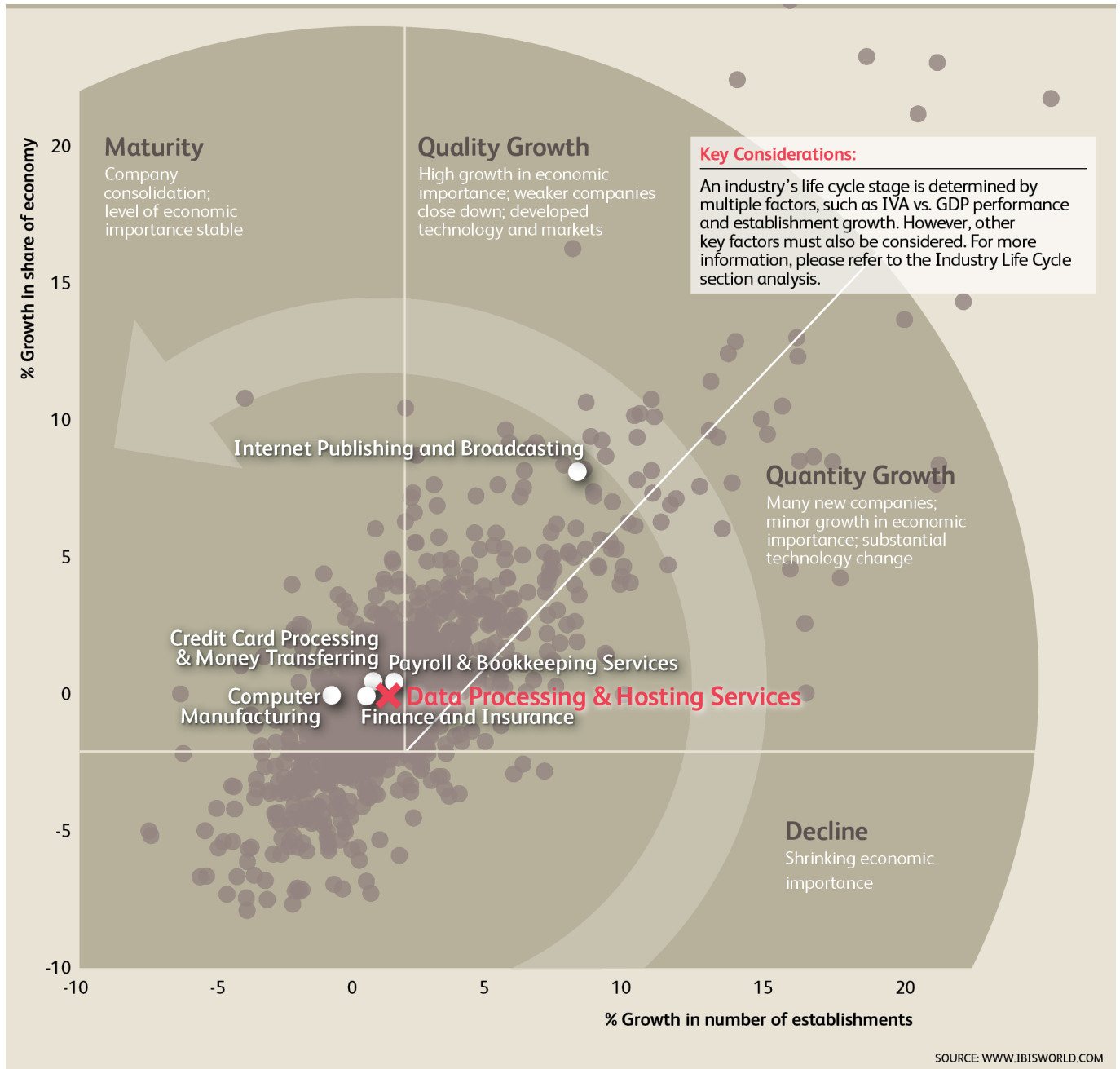
Industry Performance

Life Cycle Stage

Industry value-added (IVA) is forecast to grow in line with GDP over the 10 years to 2024

Technology has progressed and businesses need to store an increasing amount of data

New products such as cloud computing continue to benefit industry operators



Industry Performance

Industry Life Cycle

This industry is **Growing**

The Data Processing and Hosting Services industry is in the growth stage of its life cycle. Over the 10 years to 2024, IBISWorld forecasts industry value-added (the industry's overall contribution to the economy) to increase at an annualized rate of 2.0%. During the same period, GDP is projected to grow at an annualized rate of 2.0%, indicating that the industry is growing in line with the overall economy. While this is more in line with a mature industry, the rapid rate of technological change, more indicative of a growing industry, will continue to provide industry operators with new markets as businesses outsource their information technology (IT) needs. In addition, technological

change for key buying industries has spurred demand, as new internet startups and the movement toward internet services require the large hosting capabilities that the industry provides.

Presently, major players in this industry invest heavily in research and development to create new products that will improve the efficiency of data processing and hosting services. Cloud computing has quickly become one of the fastest-growing products the industry offers. Over the next five years, industry operators are expected to continue to move toward cloud-related services to meet the growing IT needs of their clients. Moreover, the industry landscape is expanding.

Products & Markets

Supply Chain | Products and Services | Demand Determinants
 Major Markets | International Trade | Business Locations

Supply Chain

KEY BUYING INDUSTRIES

- 51913b **Internet Publishing and Broadcasting in the US**
 Internet publishers and broadcasters use data hosts to store and transmit content to users.

- 52 **Finance and Insurance in the US**
 The finance sector is the single largest enterprise-level industry that demands data processing and hosting services, primarily in the form of market and transaction data.

- 92 **Public Administration in the US**
 Government agencies demand industry services as part of outsourced contracts.

KEY SELLING INDUSTRIES

- 33411a **Computer Manufacturing in the US**
 Computer manufacturers supply the industry with computers.

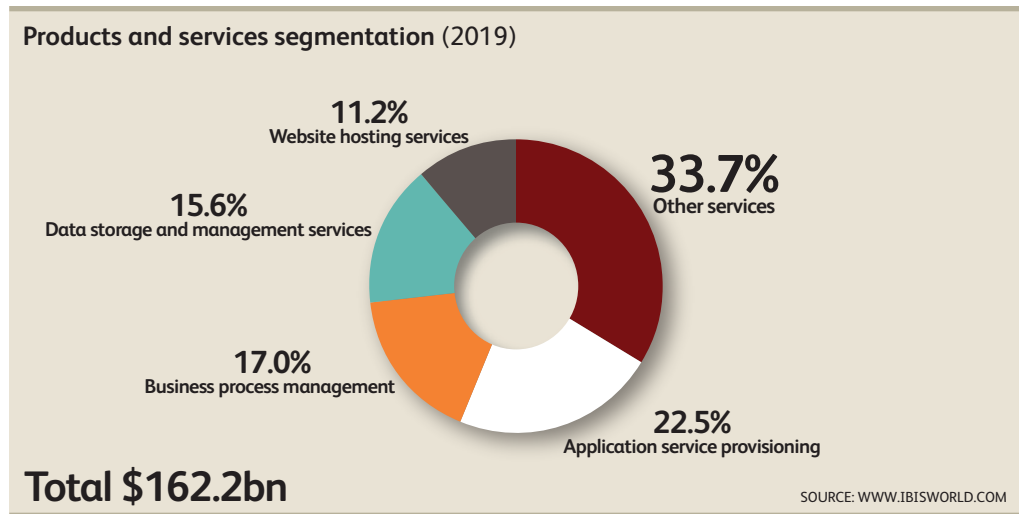
- 33411b **Computer Peripheral Manufacturing in the US**
 Computer peripheral manufacturers supply the industry with computer equipment.

- 51121 **Software Publishing in the US**
 Software publishers supply the industry with packaged software solutions.

- 51711c **Wired Telecommunications Carriers in the US**
 Wired telecommunications carriers supply the industry with telecommunications services.

- 54151 **IT Consulting in the US**
 IT consultants help the industry implement computer systems design solutions.

Products and Services



Data processing involves capturing, digitizing and processing data from various sources. Traditional data processing services include taking data from manually filled forms, images or publications, and preparing and integrating databases. However, with the advent of multimedia and the

internet, sources have widened to include manually printed documents, images, sounds and video. New output media is equally diverse, including databases on servers and management of records derived from internet-based queries. Data processing has numerous subcategories.

Products & Markets

Products and Services continued

The majority of total industry revenue is derived from three services. The first is business process management and data processing, which uses technology to improve business efficiency. The second is data storage and management services, which involves storing and accessing data. The third is application service provisioning, also called software as a service (SaaS). The industry also offers many other value-added services, including links to customer invoicing services and data warehousing and mining to assist in market and customer analysis. Website hosting services have also increased as an area of revenue, as companies require websites to operate and promote their businesses in an increasingly competitive environment.

Application service provisioning

Application service provisioning is becoming more important within this industry, accounting for an estimated 22.5% of industry revenue. To operate efficiently, many companies use SaaS, which enables single users to access computer software across a server. This strategy improves overall company efficiency because it avoids manually installing software onto each computer. However, SaaS increases companies' risk of losing their data because all of their information is processed and stored on a single server instead of on separate computers. This segment has grown as a share of revenue over the past five years.

Business process management services

Business process management services comprise an estimated 17.0% of industry revenue. Business process management services are diverse in nature and used in a variety of different applications, including financial, human resources,

supply-chain management, customer relations management and vertical markets management. This segment has fallen over the past five years.

Data storage and management services

Data management and data storage is also becoming increasingly popular. As companies collect more information from customers, they require additional capacity to store and use that information. Smaller companies have dedicated information technology departments to (at least partly) oversee these operations, while other companies opt to outsource this function to third-party companies. However, some of this outsourcing will go to data storage companies abroad. As a result, this segment has declined slightly as a share of revenue over the past five years and is expected to account for an estimated 15.6% of revenue.

Website hosting services

Website hosting services enable businesses and individuals to make their websites accessible on the World Wide Web. Web hosting services also provide Internet connectivity on a server. This segment is expected to make up an estimated 11.2% of revenue. As more businesses conduct services online, demand for web hosting services will increase.

Other services

Other services offered by the industry, which comprise 33.7% of revenue, vary greatly from document transformation to software publishing. These activities are not the main sources of revenue for this industry, but when they are combined, they provide a material part of data processing and hosting companies' revenue.

Products & Markets

Demand Determinants

While numerous factors create demand for data processing and hosting services, the primary drivers are business sentiment, the price of services and the cost of technology. The price of a company's services is a strong determinant of whether a customer will use them. Additionally, if the client's business is booming, there is a larger possibility that it will require data processing or hosting services.

Business sentiment

Demand for industry services depends on business sentiment and corporate profit, partly because businesses that perform well are more likely to update to the latest technology and software to maintain efficiency. For instance, well-performing companies need additional data storage to maintain customer lists and find customer purchase trends. This factor will increase the use of software as a service (SaaS).

Cost of technology

Demand for industry services is sensitive to developments in the global IT market. More affordable hardware and software means that data processing and hosting companies are able to deliver services to their customers at less costly rates.

Increasingly, data processing operations are being offshored to countries such as China and India, with highly skilled yet low-cost labor. The lowered cost through offshoring will be passed on to clients in the form of lower prices. In turn, lower prices will increase demand.

Conversely, as hardware and software become faster and more affordable, companies will likely undertake data processing and hosting services in-house. This trend would decrease demand for this industry's services from major corporate clients. However, the specialization of the industry's major players ensures that outsourcing sporadic or major projects is more cost-effective than performing the task in-house.

Price of existing services

Providing application services is an important new technology for businesses. The ability to access software remotely from a company's server enables employees to work from any computer, regardless of whether the software is installed on that computer. This factor significantly increases efficiency. Additionally, SaaS eliminates the need to purchase and install licensed software on every single computer, saving companies time and money.

Major Markets

The industry's primary markets are enterprises with large amounts of data to which they need fast, secure and reliable access.

Resellers

Resellers include companies that buy hosting services to resell them, usually to smaller customers such as individuals or small businesses in need of web hosting services. These resellers constitute an estimated 15.8% of the industry's revenue. This segment grew as a percentage of total industry revenue over the past five years,

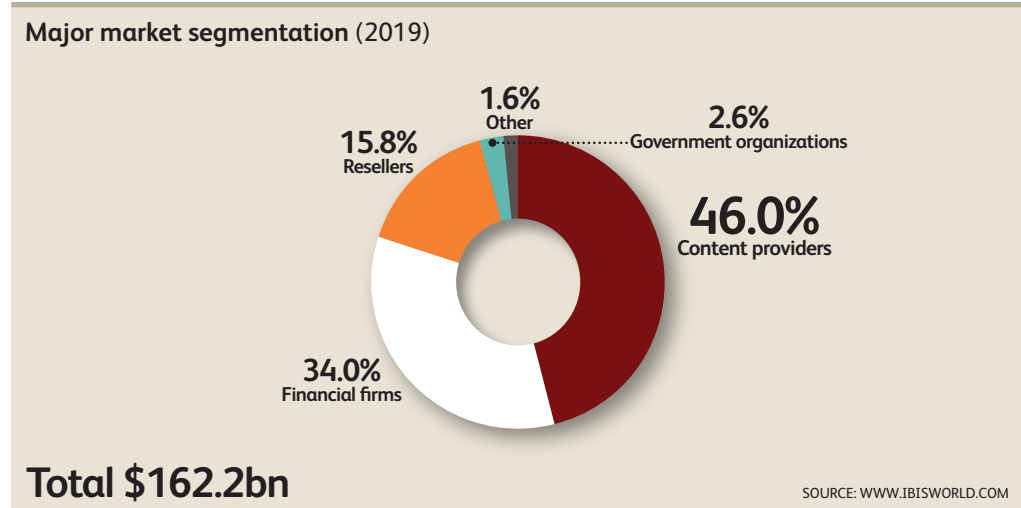
as demand for web hosting services from smaller customers has increased.

Financial firms

The finance industry is the second-largest individual business sector, expected to account for 34.0% of industry revenue in 2019, as it has significant need for industry services. In particular, real-time market data is a major source of revenue for this industry, as companies in this industry require access to large amounts of rapidly changing data on market information and trends.

Products & Markets

Major Markets continued



Content providers

Content providers pay hosting fees to web hosts for hosting websites and related data. Content providers are the largest single market segment for this industry, expected to account for 46.0% of industry revenue in 2019. In particular, entertainment websites that use external hosting or content delivery networks are significant members of this group. This segment has grown as a percentage of total industry revenue over the past five years, as streaming services such as Netflix and Hulu have become increasingly popular, creating increased

demand for data hosting from this market segment.

Government organizations

Government organizations make similar usage of data processing and hosting as private companies, accounting for an estimated 1.6% of industry revenue. Government organizations typically remain relatively small as a percentage of industry revenue, as their budgets tend to be more restricted than private organizations, which makes these organizations slow to purchase additional services from industry operators.

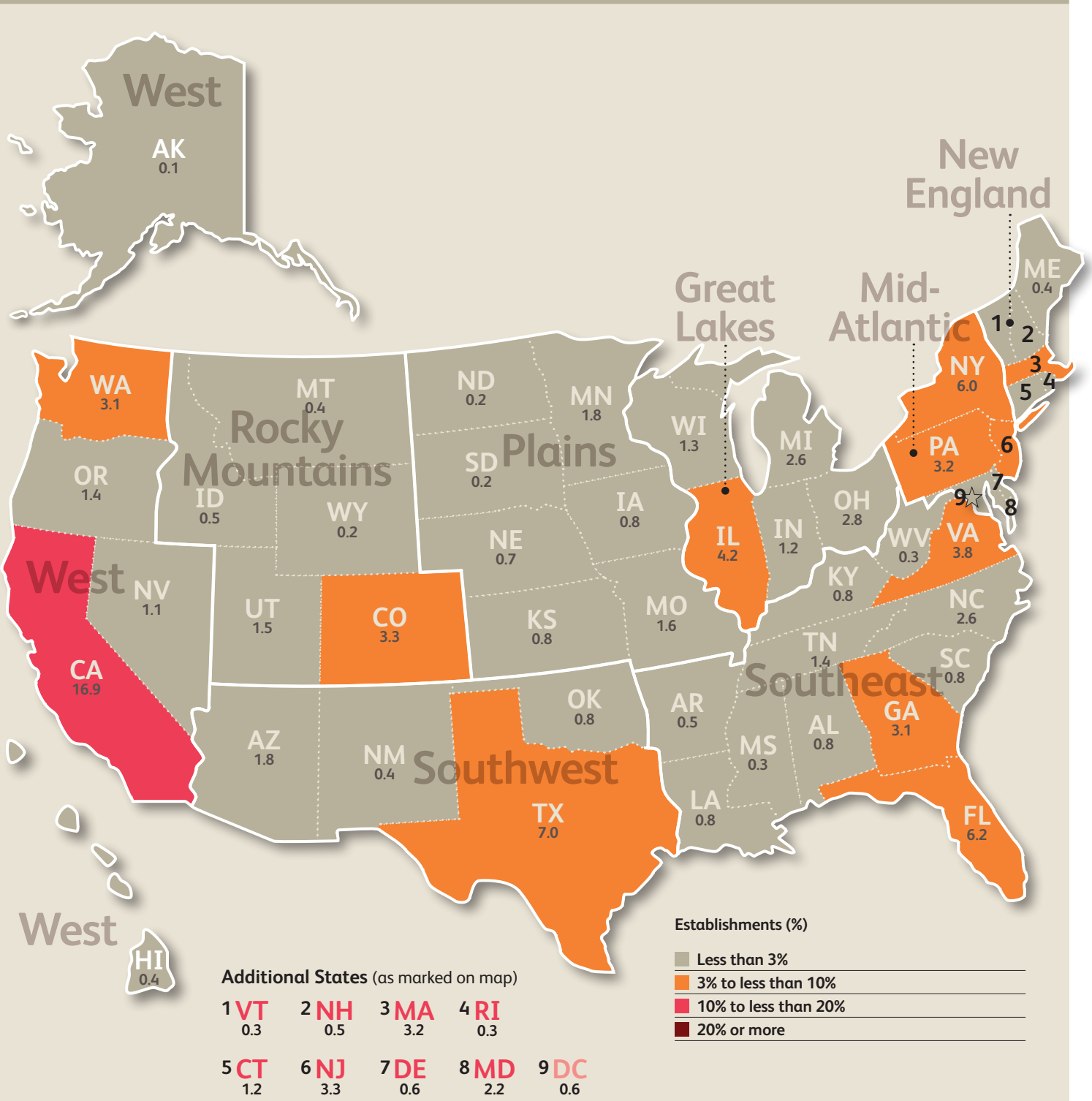
International Trade

Trade does not occur in this industry due to the service-based nature of activities data processing and hosting companies provide. However, globalization has made maintaining an international presence more common among large hosting companies that service

multinational corporations. Just as some US businesses have set up shop abroad, some companies operating in the United States are foreign-based. While outsourcing of domestic data processing and storage jobs is common, there is no physical trade of goods.

Products & Markets

Business Locations 2019



Products & Markets

Business Locations

The Southeast (21.2%), Mid-Atlantic (15.9%) and West (23.0%) regions have a combined share of more than half of industry establishments. These regions make up the largest portion of establishments because they have the highest number of people in the United States. Other reasons include the geographic client locations in these regions. For example, California, which holds 16.9% of establishments, has a large number of industry establishments because of the number of technology companies based in Silicon Valley. Additionally, most major international clients of this industry have headquarters in California. The Mid-Atlantic region also has a large number of establishments because many of the nation's financial institutions are headquartered in New York. Even businesses that work remotely want to stay close to their customers so they can provide quick assistance with any technical difficulties. Consequently, New York is home to 6.0% of industry establishments.

Outsourcing

The shift of employees to other countries is having a marked effect on the industry's geographic spread. As skills become more oriented toward sales and client services roles, US employees will spend more time contacting current and prospective clients. IBISWorld expects that as computer technology becomes more mobile, there will be a minor shift of establishments away from large



commercial centers, as industry companies attempt to minimize rent and other associated costs with maintaining establishments in major cities. Many employees that work in this industry will be able to work remotely from home.

IBISWorld research indicates that the main operations of many companies are located abroad. Many operators in this industry require large servers and database systems to operate. Over the next five years, data processors and hosting service providers will shift their operations to other countries because the price to rent real estate and hire workers in foreign countries such as India is often more affordable than labor in the United States.

Competitive Landscape

Market Share Concentration | Key Success Factors | Cost Structure Benchmarks
 Basis of Competition | Barriers to Entry | Industry Globalization

Market Share Concentration

Level
 Concentration in this industry is **Low**

The level of concentration in the Data Processing and Hosting Services industry is low, primarily due to the range of services that data processing and hosting service companies can provide. In 2019, IBISWorld estimates that the 4 largest operators in the Data Processing and Hosting Services industry will account for an estimated 30.9% of revenue.

The industry’s concentration has remained relatively steady, with small fluctuations in recent years. Customers have more recently abandoned the traditional bundling model in favor a diffuse network of providers for their various IT needs. As a result, smaller, innovative companies like Salesforce, have taken market share away from the

industry’s largest companies. Substantial acquisition activity by IBM and HPE, however, has helped them preserve their leading positions in the industry. Additionally, large operators have innovated data solutions and expanded their industry-relevant services over the past five years. For example, HPE launched HPE Pointnext in 2017 as an innovative approach to IT services. The industry’s smaller operators experience increasingly difficult competitive conditions, as large companies with falling costs look to control broader segments of the market. These smaller companies are likely to target niche providers for acquisition over the five years to 2024 to increase their market share.

Key Success Factors

IBISWorld identifies 250 Key Success Factors for a business. The most important for this industry are:

Having a cost-effective distribution system

Having a cost-effective delivery system enables companies to better compete on price. This is becoming progressively important as more companies provide similar services at affordable prices abroad.

Ability to quickly adopt new technology

Due to the rapid pace of technological change in the information technology industry, many industry companies must quickly adopt new techniques to remain competitive.

Ability to manage external (outsourcing) contracts

Most industry operators outsource several operating functions. To continue

to deliver quality services, managing external contracts properly is essential.

Access to multiskilled and flexible workforce

It is necessary to have access to a large pool of labor with varying levels of skills, from data processing to programming. This helps companies stay competitive and adopt new technologies more quickly.

Ensuring pricing policy is appropriate

With price-based competition occurring on some outsourced contracts, it is important to ensure that the organization’s pricing policy is reasonable.

Effective quality control

Many of the industry’s services require strict quality control because clients rely on companies to keep data secure.

Cost Structure Benchmarks

The largest cost segment in this industry is wages, as this industry requires a highly skilled labor force. As a result, operators have sought to increase the

efficiency of their operators to decrease their labor costs during the period. Profit margins have grown during the period as downstream demand has

Competitive Landscape

Cost Structure Benchmarks continued

increased, enabling operators to raise their selling prices.

Wages

Employee compensation, including payroll and benefits, makes up the largest industry expense, representing an estimated 31.6% of revenue in 2019.

Industry operators employ several highly skilled workers, particularly in computer and mathematical occupations because of the technical nature of industry work. These workers include computer support specialists, computer systems analysts and software developers. Since the nature of computer and mathematical work typically requires advanced education and significant work experience, the average industry wage is high at an estimated \$93,577 in 2019.

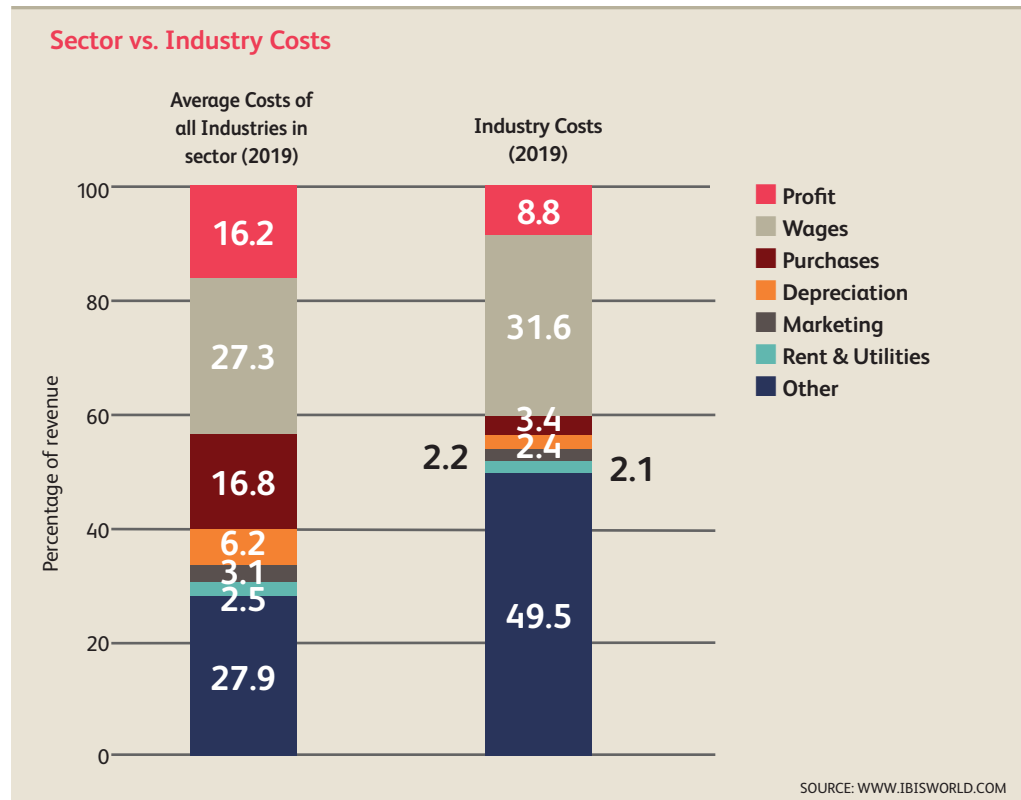
Wages have decreased marginally during the current five-year period as the supply of skilled employees remained

strong. Spending on wages is expected to remain the largest component of industry revenue moving forward, as the nature of industry services require costly technical work. However, revenue has grown far more quickly than wages, resulting in declines in wages' share of revenue.

Purchases

Purchases account for an estimated 3.4% of industry revenue in 2019, representing a decline from 3.7% of revenue in 2014.

Industry purchases are primarily composed of internet connectivity charges, the fees that operators must pay telecom companies for bandwidth (the amount of data that can be carried from one point to another in a given time period) and data infrastructure hardware. Competition and government regulation have ensured that connectivity costs have remained reasonable to avoid overwhelming data hosts and processors.



Competitive Landscape

Cost Structure Benchmarks continued

Nonetheless, the cost of bandwidth has begun to rise, potentially increasing industry spending on this segment over the next five years.

Profit

Profit, defined as earnings before interest and taxes, in the Data Processing and Hosting Services industry has been consistently strong. Although profit margins declined somewhat as the period began, they have since grown to total 8.8% of revenue in 2019.

Profit margins vary significantly depending on company size. Although the majority of small- to medium- sized businesses are profitable, some smaller companies fail to generate a profit. Small- and medium- sized businesses make up the majority of industry operators, with the average company employing less than 10 employees in 2019. By contrast, companies with more than 500 employees, which make up less than 1.0% of the industry, are typically able to generate much higher profit margins. However, some major companies are the exception to this trend as the expansion of data processing and hosting services requires capital investments and highly-skilled employees, which increases both purchasing and wage costs. Many companies must temporarily sacrifice profitability in this industry to remain competitive and to earn steady profit margins in the future.

Depreciation

At 2.4% of revenue, depreciation represents a sizable cost to industry operators. Over the five years to 2019, depreciation costs

have remained steady, a trend that is expected to hold over the next five years. The industry requires significant capital investment in equipment and computer hardware. Due to the rapid pace of technological change in the industry, technical hardware has a short useful lifespan and depreciates rapidly. As a result, industry operators are forced to continuously invest in new hardware and software to remain competitive.

Marketing

The highly competitive nature of services in this fragmented industry has caused operators to increase spending on marketing to increase market share. In 2019, marketing expenses are estimated to account for 2.2% of industry revenue.

Rent

Industry operators rent buildings to host data centers, which can require a large physical footprint. In 2019, rent costs are expected to account for 1.7% of industry revenue.

Utilities

Industry facilities often consume a significant amount of electricity, which accounts for the vast majority of a typical operators' utilities costs. In 2019, these costs are expected to account for 0.4% of industry revenue.

Other

Other spending, which includes research and development, administrative services and professional business and financial fees, represents an estimated 49.5% of industry revenue in 2019.

Competitive Landscape

Basis of Competition

Level & Trend
Competition in
this industry is
High and the trend
is **Increasing**

As more US companies outsource their operations to low-cost nations abroad, the level of competition increases. Since data processing and hosting companies are able to hire workers at a less expensive rate overseas than they can in the United States, they are able to pass on their cost saving to their customers. Bigger companies are better able to outsource than smaller companies. As a result, larger data processing and hosting companies are able to be more competitive, charging less for their services and buying out smaller companies.

Internal competition

The industry is highly competitive, with a large number of smaller operators and significant competition for data processing and storage projects. Many data hosting companies are undifferentiated. Therefore, many companies compete on price. To cut costs and lower the price to their customers, some major operators are exporting domestic operations to highly skilled and low-wage countries such as India and China. Growing price pressure will force companies to close establishments and continue exporting low-level jobs to less expensive nations. However, companies that offer application hosting, streaming services or other interactive services compete on the basis of user-friendliness. In addition, the customizability and ease-of-use of industry services has grown more important as clients seek out IT solutions that are compatible with their existing business needs and can be implemented with minimal friction.

Competition based on product reliability is also important. When the price difference is small, clients will choose the products and services of

reliable companies as opposed to unreliable ones. For application service providers (ASP), this is even more significant, as server security is necessary to store clients' software and applications. Additionally, for web hosting companies, it is important that servers are not "down" a majority of the time; clients that use web hosting companies require their websites to be available and online.

External competition

External competition in this industry is in the form of former clients withdrawing from their outsourced contracts and establishing in-house IT operations to manage their data. Some operators, particularly technology companies, do this because it ensures absolute confidentiality of information. Having in-house IT departments for data hosting reduces the risk of information being leaked. Additionally, some clients discontinue their contracts after being dissatisfied with the price and service. Unsatisfied clients are likely to leave their service providers.

However, international competitors represent a far greater threat to domestic operators. As the vast majority of work in the industry can now be conducted remotely, without any physical presence, international operators are increasingly able to take business from domestic companies. While this benefits the clients of data processing and hosting companies, small companies in this industry are increasingly in danger of being priced out of the market. In recent years, the threat of a security breach from outsourcing to international competitors has slightly decreased competition from offshoring.

Competitive Landscape

Barriers to Entry

Level & Trend
Barriers to Entry
in this industry are
Medium and Steady

The industry's largest players have considerable capital investment, including server farms with incredible processing power. However, thousands of smaller companies perform some form of data processing outsourcing for smaller clients. For those wishing to enter the industry at its bottom end, the barriers do not pose a significant challenge.

The cost of establishing an operation in this industry is high due to the cost of computing and other equipment. For data hosting companies, the leasing of space on other companies' servers may offer a lower short-term initial cost solution to establishing a company in this industry. Nevertheless, data processing and application service providers have a lower need for capital. They mostly rely on labor to develop software and process information through computers.

Basic equipment costs are declining while providing faster processing power. However, the industry will likely expand its reliance on such technology, possibly increasing future capital costs for start-up companies. The use of appropriate equipment on a leased basis can lower the initial establishment costs.

Larger players have an advantage, benefiting from economies of scale. Larger data storage companies are able to use their data servers to host information for many clients rather than just one. Larger application service providers and data processing companies are also able to benefit through outsourcing. By taking

Barriers to Entry checklist

Competition	High
Concentration	Low
Life Cycle Stage	Growth
Capital Intensity	Low
Technology Change	High
Regulation and Policy	Medium
Industry Assistance	Low

SOURCE: WWW.IBISWORLD.COM

the operations portion of its business abroad, industry operators are able to save on labor and material costs.

Aside from the start-up capital costs to obtain computers and servers, new entrants to this industry must also obtain business contracts. New entrants are more likely to target smaller companies in the region because they lack the means and reputation to service larger clients. Start-up companies must spend a relatively large amount of money advertising their business to clients.

New entrants also need to manage their labor costs effectively. Therefore, companies are taking some aspects of their businesses to low labor-cost companies in India or China. Low wage costs in these regions enable companies to have larger servers and data storage areas. Smaller companies that first enter the industry often do not have the luxury of outsourcing their entire operation. Therefore, they will either rent servers from abroad or buy servers domestically to serve their clients.

Competitive Landscape

Industry Globalization

Level & Trend
Globalization in this industry is **Medium** and the trend is **Increasing**

Historically, US-based companies have dominated the industry, with companies in lower labor-cost countries abroad offering some competition. However, the technology revolution that India has been experiencing over the past decade has caused a seismic shift within the industry, and there is now a burgeoning data processing sector in India. Neighboring countries are attempting to recreate its success.

While there are still data processing and hosting companies on US soil, the rise of Indian companies such as Infosys and the propensity for US businesses to outsource their work abroad is creating a

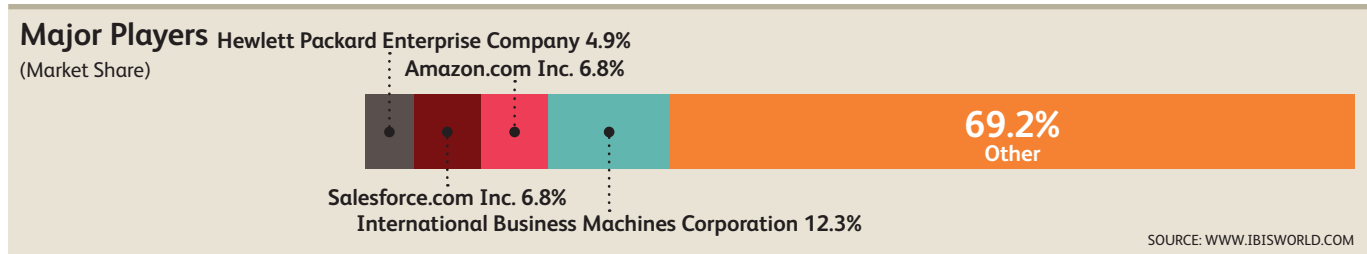
more globalized industry. Data processing and hosting companies will have their sales and client relationship in the United States, while outsourcing the main operation abroad at a lower cost. This trend is also apparent for data storage and hosting companies.

In the future, more technology companies based in foreign countries will likely gain industry prominence with a larger share of revenue. However, a fundamental physical restriction, particularly the speed at which electrons or light can traverse the globe, will mandate that companies maintain operations somewhere near their customers.

Major Companies

International Business Machines Corporation | Amazon.com Inc.

Salesforce.com Inc. | Hewlett Packard Enterprise Company | Other Companies



Player Performance

International Business Machines Corporation

Market Share: 12.3 %

Industry Brand Names

First Data Corporation
HP Enterprise Services
Electronic Data Systems

Founded in 1911, International Business Machines Corp. (IBM) is a US-based multinational technology consulting and software development company headquartered in Armonk, NY. IBM manufactures and sells high-end computer hardware and software and also offers consulting, information technology (IT) and hosting services. IBM has operations in most major cities worldwide and employs 380,300 workers. The company's diverse client base includes several prominent financial institutions. According to the company's most-recent financial information, encompassing a full year of operations, IBM's worldwide revenue totaled \$79.6 billion in 2018.

IBM's operations are divided into five business segments: Cognitive Solutions, Technology Services and Cloud Platforms; Global Business Services;

Software, Systems; and Global Financing. The Cognitive Solutions division provides IT infrastructure services and business process services. This segment provides strategic outsourcing services using cloud computing, analytics and virtualization to help businesses meet their IT needs. The technology services and cloud platforms segment provides clients with innovative infrastructure technologies to help meet the new requirements of data, cloud and engagement, from deploying advanced analytics to moving to digital service delivery with the cloud and securing mobile transaction processing.

The fastest-growing portion of this division is cloud computing. The Cloud Platforms segment revenue grew 12.0% in 2018. The IBM SmartCloud delivers business and IT services over the network, changing the way that businesses use and store data. Over the past five years, IBM

International Business Machines Corp. (US industry-specific segment) - financial performance*

Year	Revenue		Operating Income	
	(\$ million)	(% change)	(\$ million)	(% change)
2014	22,350.8	N/C	3,793.9	N/C
2015	21,459.8	-4.0	3,508.5	-7.5
2016	21,435.0	-0.1	3,186.6	-9.2
2017	21,170.7	-1.2	1,540.3	-51.7
2018	20,709.1	-2.2	2,269.7	47.4
2019	20,030.5	-3.3	2,865.3	26.2

*Estimates

SOURCE: ANNUAL REPORT AND IBISWORLD

Major Companies

Player Performance continued

has helped clients integrate cloud computing into their business by making IT resources highly automated and virtualized. Hybrid cloud services, in particular, have become more popular. Amid increasing demand for cloud computing, IBM has made itself a leader in the industry by heavily investing in this technology. The company holds more patents than any other US-based company, and invested \$5.4 billion in research and development in 2018 (latest data available).

IBM has actively acquired smaller companies to increase its industry-specific product and service offerings. In 2014, IBM acquired Cloudant Inc., extending the company's mobile and cloud platform by enabling developers to easily and quickly create next-generation mobile and web-based applications. More recently, IBM has expanded their presence within the industry through the acquisition of Verizon Cloud Services and Cloudigo, both of which are expected to boost the company's industry relevant performance over the next five years. The most recent industry-specific acquisition was IBM's acquisition of Red Hat in 2018, which is expected to improve its

hybrid cloud services and open source cloud software offerings.

Financial performance

IBM's industry-relevant revenue decreased over the five years to 2019. Its profit margins have decreased as well. Although demand for cloud-based services has increased as clients outsourced their IT infrastructure needs, falling sales from new and existing accounts combined with poor growth in lower-margin technologies have resulted in overall revenue declines. Rather than outsourcing all of their IT needs to one company, customers have recently abandoned the traditional bundling model in favor of a diffuse network of providers for their various IT needs.

Overall, IBM's industry-specific revenue is expected to decrease at an annualized rate of 2.2% to \$20.0 billion over the five years to 2019. Nonetheless, the company remains in a strong position moving forward. IBM's cloud-computing offerings have shown robust growth over the past five years, and its recent acquisitions have served to bolster its expertise in cloud-based offerings.

Player Performance

Amazon.com Inc.
Market Share: 6.8 %

Amazon.com Inc. (Amazon) is an US-based e-commerce and cloud computing company that was founded in July of 1994. The company originated as an online bookstore, but later diversified into selling just about everything, ranging from jewelry to food to furniture. The company is the largest internet-based retailer in the world by total sales and market capitalization. The company is headquartered in Seattle, WA, and provides services globally. The company employs an estimated 566,000 people globally. In 2018, Amazon recorded global revenue of \$232.9 billion (latest data available).

Amazon's operations are organized into three business segments: North

America, international and Amazon Web Services (AWS). The company operates in this industry through its AWS segments, which provides on-demand cloud computing platforms to individuals, companies and governments. The segment also provides computing, networking, database and application services. In 2016, Amazon announced an alliance with VMware, a subsidiary of Dell Technologies that provides cloud computing and platform virtualization software and services. For the last year, the two companies have been developing a cloud version of VMware's software for Amazon's AWS users. More recently, the pair announced that they were working

Major Companies

Player Performance continued

on a different product; one that would run inside private data centers. It is speculated that the final product may be a bridge between private data centers and Amazon's AWS cloud service. The company has engaged in heavy acquisition activity, although not all acquisitions have been industry relevant. In 2019, Amazon acquired CloudEndure, an Israeli cloud computing company.

Financial performance

Over the five years to 2019, Amazon's industry-relevant revenue is expected to increase at an annualized rate of 50.9%

to \$11.0 billion. Amazon's industry-relevant revenue has increased by more than 40.0% every year of the period due to sustained investment and acquisition activity. Industry relevant profit has increased as well during the period. The behemoth of a company, which is weaving itself into more industries through its acquisitions such as Whole Foods, has not yet taken over the industry. However, with such strong growth figures and the ability to continuously mutate to secure future market share, Amazon is expected to be a growing figure within the industry.

Amazon.com Inc. (US industry-specific segment)-financial performance*

Year	Revenue (\$ million)	(% change)	Operating Income (\$ million)	(% change)
2014	1,407.3	N/C	138.8	N/C
2015	2,387.9	69.7	456.7	229.0
2016	3,702.7	55.1	941.8	106.2
2017	5,290.6	42.9	1,312.4	39.4
2018	7,774.2	46.9	2,210.9	68.5
2019	10,994.2	41.4	3,510.6	58.8

*Estimates

SOURCE: ANNUAL REPORT AND IBISWORLD

Player Performance

Salesforce.com Inc.
Market Share: 6.8 %

Salesforce.com Inc. (Salesforce) was founded in 1999 and is currently headquartered in San Francisco, California and employs over 35,000 workers as of 2019 (latest data available). The company provides on-demand software as a service (SaaS) to corporations, mainly through customer relationship management (CRM). The company has experienced tremendous growth over the past decade, with its total revenue reaching \$13.3 billion in fiscal 2019 (year-end January).

Salesforce's flagship CRM application helps companies record, track and

manage customer information, including sales and customer service. It is considered a form of data processing because the customer enters data into the software and the system delivers vital customer information back to the client. Within the CRM segment, Salesforce focuses on four particular services: automation, partner relationship management, customer service and support and marketing.

Besides traditional cloud computing (where the end user does not require knowledge of the configuration or location of the system that delivers its

Major Companies

Player Performance continued

data processing services), the company also generates money from consulting and professional training work, accounting for a small percentage of its SaaS revenue. The company has experienced tremendous revenue growth over the past five years as a result of increases in subscription and support revenue from new customers, as well as upgrades and additional subscriptions from existing customers and improved renewal rates. However, the company has struggled to become highly profitable throughout the current five-year period, starting off negative early during the period then becoming larger toward the end.

Like other major industry operators, Salesforce has fueled its growth through strategic acquisitions. In 2018, Salesforce acquired MuleSoft Inc for \$6.5 billion, as well as a back-end development software company, Attic Labs, and an e-commerce product CloudCraze. Each acquisition

was meant to fill a gap in the company's services. The acquisition of MuleSoft will enable customers to better integrate information across clouds and data sources. This will leverage one of the major strengths of Salesforce: being able to manage multiple aspects of business operations and information technology (IT) in one convenient application.

Financial performance

Salesforce's industry-specific revenue has increased rapidly over the five years to 2019 at an annualized rate of 25.0% to reach \$11.1 billion. During the beginning of the period, Salesforce operated at a loss but has been profitable since 2015. Due to the high level of integration offered through its products and increasing number of businesses adopting cloud-based technologies, Salesforce revenue is expected to continue growing, and its market share is expected to increase in tandem.

Salesforce.com Inc. (US industry-specific segment) - financial performance*

Year**	Revenue (\$ million)	(% change)	Operating Income (\$ million)	(% change)
2014-15	3,637.1	N/C	-98.8	N/C
2015-16	4,686.9	28.9	80.8	N/C
2016-17	5,993.6	27.9	154.9	91.7
2017-18	7,285.2	21.5	313.8	102.6
2018-19	9,053.0	24.3	364.7	16.2
2019-20	11,084.9	22.4	400.9	9.9

*Estimates **Year end January

SOURCE: ANNUAL REPORT AND IBISWORLD

Major Companies

Player Performance

Hewlett Packard Enterprise Company
Market Share: 4.9 %
Industry Brand Names
Global Technology Services

Hewlett Packard Enterprise Co. (HPE) is a global technology corporation that specializes in software and a variety of technology-related services. While Hewlett-Packard Company (HP) was founded in a one-car garage in 1939 by two Stanford electrical engineering graduates, William Redington Hewlett and David Packard, the company split into two separate companies in November 2015. As a result of the separation, HP's former technology infrastructure, software, services and financing businesses migrated to HPE. The company remains headquartered in Palo Alto, CA, providing services across more than 160 countries and employing an estimated 60,000 people. In fiscal 2018, the company recorded global revenue of \$30.9 billion.

HPE's operations are organized into four business segments: Hybrid IT, Intelligent Edge, Financial Services and Corporate Investments. The company operates in this industry through its Hybrid IT segment, which provides services-led and software-enabled infrastructure solutions spanning secure servers, storage, data center networking and hardware.

Over the past five years, the company has undertaken significant acquisition

activity. In 2017, the company acquired SimpliVity, a provider of services for simplifying and scaling data through various platforms and hyperconvergence. The company also acquired Nimble Storage, which provides high performance, high capacity memory recovery and backup services. Another highly industry-specific acquisition was that of Cloud Cruiser, which provides financial-management solutions via the cloud to facilitate cost optimization and profit maximization. Its latest industry-relevant acquisition was in December 2018 when HPE acquired QuattroLabs, a cloud-based data center management company that offers "management as-a-service" software.

Financial performance

HPE's financial performance reflects its results as under HP through November 2015, and under HPE afterward. Over the five years to 2019, HPE's industry-specific revenue is expected to decrease at an annualized rate of 4.0% to \$8.0 billion. Profit margins have also declined, partially due to acquisition activity, at an annualized rate of 3.5% to reach \$741.7 million.

HPE's performance during the five-year period has been impeded by several factors. The company has been

Hewlett Packard Enterprise Company (US industry-specific segment) - financial performance*

Year**	Revenue (\$ million)	(% change)	Operating Income (\$ million)	(% change)
2013-14	9,788.6	N/C	887.9	N/C
2014-15	10,002.7	2.2	626.4	-29.5
2015-16	9,791.0	-2.1	1,262.0	101.5
2016-17	8,033.2	-18.0	173.9	-86.2
2017-18	8,283.7	3.1	498.9	186.9
2018-19	7,977.8	-3.7	741.4	48.6

*Estimates **Year-end October 31

SOURCE: ANNUAL REPORT AND IBISWORLD

Major Companies

Player Performance continued

under significant pressure due to the emergence of industry trends such as the growth of mobility, the increasing demand for hyperscale computing infrastructure, the shift to software-as-a-service, the transition toward cloud computing and aggressive pricing. The company has also come under pressure from the emergence of fast-growing competitors that have expanded their product and service offerings with integrated products and solutions. Rather than outsourcing all of their IT needs to one company, customers have more recently abandoned the traditional bundling model in favor of a diffuse network of providers for their various IT needs. These developments have increasingly undermined HPE's competitiveness in the industry. As result, HPE experienced declining revenue for the majority of the period.

HPE has undertaken significant restructuring efforts to reverse its decline from the beginning of the period. Just prior to the five-year period, the company began implementing a restructuring plan to consolidate data centers, systems and tools to better position the company competitively. While this restructuring incurred significant costs initially, undermining operating profit, the company has since recovered somewhat. The separation of HPE into a separate entity was also an attempt by HP to reinvigorate the performance of its varied business segments. Additionally, HPE's recent acquisition activity will likely provide strong leverage for growth within the industry as these new subsidiaries become further integrated. Although HPE's market share has declined over the past five years, it may rebound over the next five years as its investments in hybrid IT technology pay off.

Other Companies

Other relevant companies, including Google, Apple and Dropbox, are beginning to offer more consumer-level data hosting services through cloud computing. Google Drive, Apple iCloud and Dropbox's flagship service

all offer consumers a free, basic account that permits them to store files on the cloud, which is accessible from any computer or mobile phone; they also offer paid, higher-capacity subscription options.

Operating Conditions

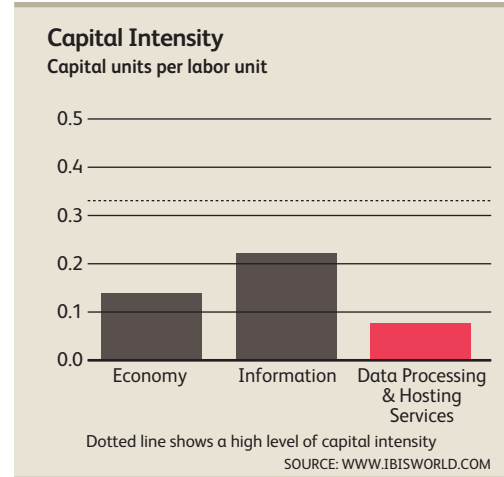
Capital Intensity | Technology & Systems | Revenue Volatility
 Regulation & Policy | Industry Assistance

Capital Intensity

Level
 The level of capital intensity is **Low**

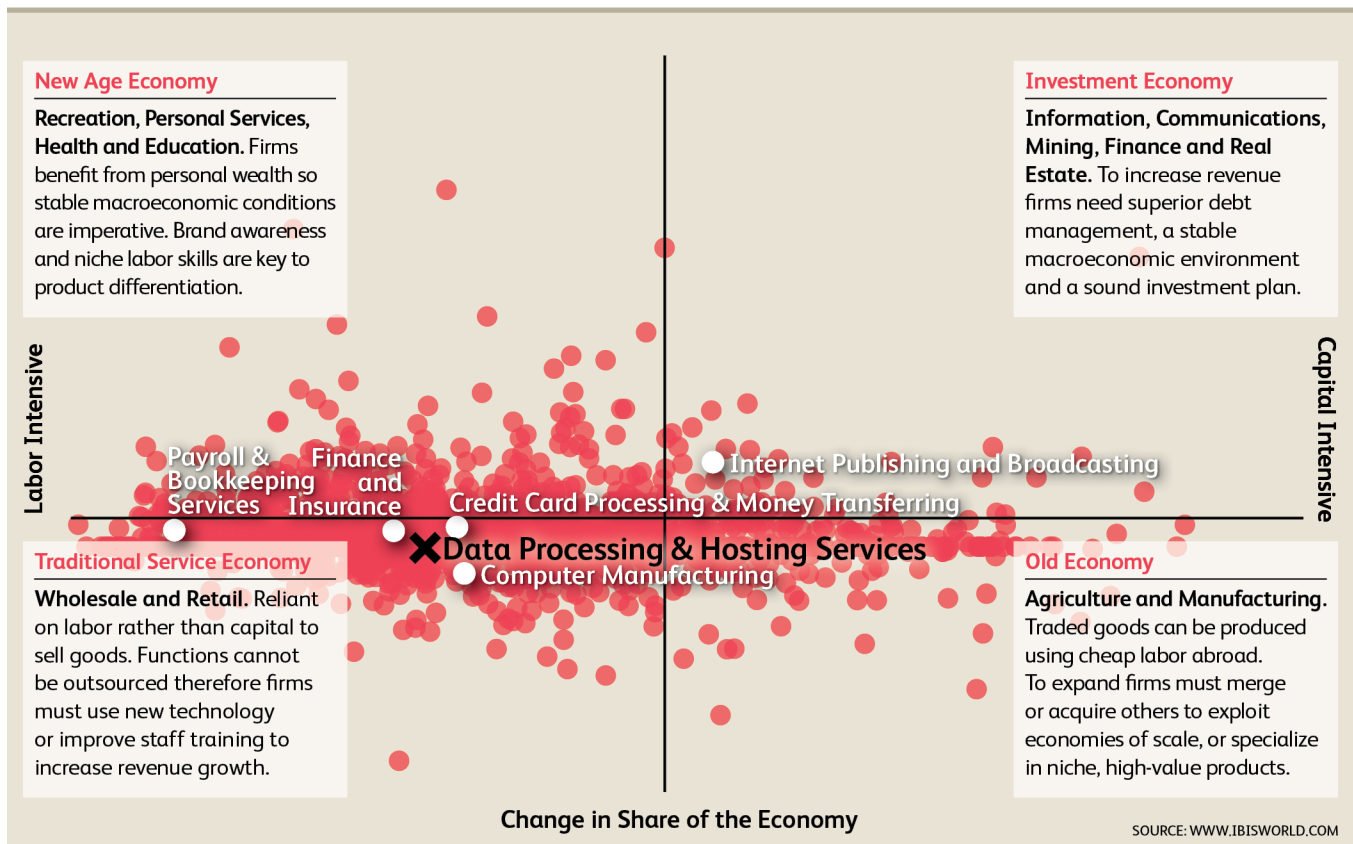
The Data Processing and Hosting Services industry has a low level of capital intensity. For every \$1.00 spent on wages, an estimated \$0.08 is allocated toward capital expenditure in 2019, up from \$0.06 in 2014.

The industry is labor, skill and knowledge-intensive, but with significant need for computing and software-related equipment. Labor costs are the largest expense for industry operators, representing an estimated 31.6% of revenue in 2019. As a result, typical industry operators employ a variety of costly technical specialists, including computer support specialists, computer systems analysts and software developers. However, the industry requires significant capital expenditure



on computing equipment. Rapid technological advances have forced operators to make significant investments

Tools of the Trade: Growth Strategies for Success



Operating Conditions

Capital Intensity continued

in new computing equipment over the past five years to remain competitive. Since this trend is expected to continue over the next five years, some companies may look to offset new capital spending

by leasing equipment. By leasing equipment, operators are able to avoid the high depreciation expenses associated with the short life cycles of technological products.

Technology and Systems

Level

The level of technology change is **High**

This industry uses computer hardware and software and telecommunications; therefore, it is exposed to the technological advancements of all of those industries. For example, most industry operators have adopted cloud technology. The cloud refers to the virtualization of many computing resources into a single logical computing entity whose resources can then be re-virtualized into any number of logical computing entities. Advances in software rather than hardware largely drive the push toward cloud computing. Virtualization software is a major component, but so are new file systems and database management systems designed to take advantage of this style of server architecture by distributing data and the examination of data across multiple computers. Software of this type includes Hadoop and NoSQL, as well as commercial offerings by companies like Oracle and EMC. More

information on these programs can be found in the Database, Storage and Backup Software Publishing industry (IBISWorld report 51121b).

In addition, new trends in technology include edge computing, which involves computation largely performed on nodes known as “smart devices” or “edge devices” as opposed to cloud computing which takes place in a centralized cloud environment. Edge computing is used in the Internet of Things (IoT) trend and significantly reduces the volume of data that must be moved, thus reducing traffic and transmission costs. Additionally, water cooling has expanded, which is important in ensuring data processing hardware does not overheat, a problem that has worsened as computing power increased. Lastly, artificial intelligence affects this industry as well, and can be implemented in data centers to coordinate the various components involved in operating a data center.

Revenue Volatility

Level

The level of volatility is **Medium**

The Data Processing and Hosting Services industry has a moderate level of revenue volatility, largely due to volatility in the magnitude of revenue growth, with the exception of a decline in 2018, due to oversupply from companies rapidly expanding their operations, fueling a brief contraction. Industry customers typically subscribe to hosting services, meaning that revenue streams remain steady. Since

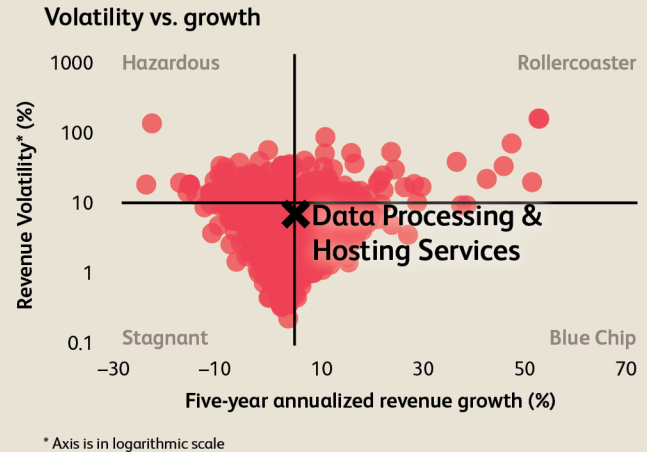
the quantity of data required continues to grow, industry price declines are typically met with increased demand from customers. In addition, new services such as the cloud and broader software as a service have stimulated demand for industry services, causing revenue to rise. With industry revenue projected to grow steadily over the next five years, volatility will likely decline.

Operating Conditions

Revenue Volatility continued

A higher level of revenue volatility implies greater industry risk. Volatility can negatively affect long-term strategic decisions, such as the time frame for capital investment.

When a firm makes poor investment decisions it may face underutilized capacity if demand suddenly falls, or capacity constraints if it rises quickly.



Regulation and Policy

Level & Trend
The level of Regulation is **Medium** and the trend is **Increasing**

The overall level of regulation surrounding activity by the industry is regarded as moderate but is gradually increasing primarily as a result of greater access and usage of personal information. Standard intellectual property regulations exist to ensure a company’s proprietary software is not lost to competitors. There is also considerable pressure to create a legislative framework to oversee online operations, particularly in regard to protecting intellectual property. However, the breadth of information and freedom with which the industry moves makes enforcing any legislation highly challenging. In addition to federal law, individual states have a variety of laws concerning children’s online privacy,

e-reader privacy, various privacy policies for websites and online services, as well as privacy of personal information held by internet service providers, among others.

As mentioned, the industry regulation influence is increasing, a result of the increase in industry globalization. As domestic operators move into international markets, they must be aware that individual countries have specific privacy laws. The rapid technological advances that are enabling global operation have outpaced many regulatory changes. There may be a global economy, but there still exists individual regulations and legislation. This will pose still some compliance, regulatory and legislative issues in some parts of the world.

Industry Assistance

Level & Trend
The level of Industry Assistance is **Low** and the trend is **Steady**

The industry does not receive any direct assistance in the form of subsidies or government protection. Nonetheless, demand from government accounts for a substantial share of industry revenue. The

industry also receives assistance from various industry associations. For example, the Association of IT Professionals provides assistance in the form of education to individuals in a variety of IT industries.

Key Statistics

Industry Data

	Revenue (\$m)	Industry Value Added (\$m)	Establishments	Enterprises	Employment	Exports	Imports	Wages (\$m)	Domestic Demand	Percentage of services conducted online (%)
2010	101,627.5	42,761.5	55,374	51,503	427,507	--	--	32,293.9	N/A	6.4
2011	111,095.0	47,177.5	55,739	51,639	444,524	--	--	35,512.5	N/A	7.0
2012	123,559.7	57,495.9	58,322	53,952	480,625	--	--	44,769.2	N/A	7.9
2013	130,367.3	62,020.1	58,181	53,415	532,784	--	--	48,331.5	N/A	9.6
2014	132,846.5	64,295.9	58,405	54,022	570,804	--	--	53,136.8	N/A	11.0
2015	141,731.0	68,857.0	58,033	53,999	583,605	--	--	55,534.3	N/A	12.7
2016	150,631.5	61,811.6	58,809	54,691	507,634	--	--	47,501.6	N/A	14.3
2017	165,132.0	70,307.6	61,418	56,929	544,185	--	--	51,152.3	N/A	16.0
2018	154,579.4	66,060.4	60,405	56,167	525,645	--	--	49,104.5	N/A	17.6
2019	162,213.3	69,469.7	62,026	57,593	546,918	--	--	51,179.0	N/A	18.5
2020	165,214.1	71,005.7	62,821	58,312	556,742	--	--	52,103.8	N/A	19.4
2021	167,432.0	71,983.7	63,580	59,021	563,526	--	--	52,751.6	N/A	20.4
2022	170,664.4	73,564.2	64,543	59,901	571,774	--	--	53,573.0	N/A	21.3
2023	174,915.9	75,358.1	65,785	61,028	582,405	--	--	54,636.8	N/A	22.2
2024	181,191.1	78,226.9	67,371	62,450	600,111	--	--	56,357.6	N/A	23.2
Sector Rank	3/37	3/37	3/37	3/37	2/37	N/A	N/A	2/37	N/A	N/A
Economy Rank	70/694	45/694	116/694	110/694	68/694	N/A	N/A	31/694	N/A	N/A

Annual Change

	Revenue (%)	Industry Value Added (%)	Establishments (%)	Enterprises (%)	Employment (%)	Exports (%)	Imports (%)	Wages (%)	Domestic Demand (%)	Percentage of services conducted online (%)
2011	9.3	10.3	0.7	0.3	4.0	N/A	N/A	10.0	N/A	9.8
2012	11.2	21.9	4.6	4.5	8.1	N/A	N/A	26.1	N/A	11.9
2013	5.5	7.9	-0.2	-1.0	10.9	N/A	N/A	8.0	N/A	21.7
2014	1.9	3.7	0.4	1.1	7.1	N/A	N/A	9.9	N/A	14.1
2015	6.7	7.1	-0.6	0.0	2.2	N/A	N/A	4.5	N/A	15.7
2016	6.3	-10.2	1.3	1.3	-13.0	N/A	N/A	-14.5	N/A	13.0
2017	9.6	13.7	4.4	4.1	7.2	N/A	N/A	7.7	N/A	11.6
2018	-6.4	-6.0	-1.6	-1.3	-3.4	N/A	N/A	-4.0	N/A	9.9
2019	4.9	5.2	2.7	2.5	4.0	N/A	N/A	4.2	N/A	5.3
2020	1.8	2.2	1.3	1.2	1.8	N/A	N/A	1.8	N/A	5.1
2021	1.3	1.4	1.2	1.2	1.2	N/A	N/A	1.2	N/A	4.8
2022	1.9	2.2	1.5	1.5	1.5	N/A	N/A	1.6	N/A	4.6
2023	2.5	2.4	1.9	1.9	1.9	N/A	N/A	2.0	N/A	4.4
2024	3.6	3.8	2.4	2.3	3.0	N/A	N/A	3.1	N/A	4.2
Sector Rank	8/37	7/37	15/37	14/37	11/37	N/A	N/A	11/37	N/A	N/A
Economy Rank	41/694	54/694	119/694	133/694	45/694	N/A	N/A	45/694	N/A	N/A

Key Ratios

	IVA/Revenue (%)	Imports/Demand (%)	Exports/Revenue (%)	Revenue per Employee (\$'000)	Wages/Revenue (%)	Employees per Est.	Average Wage (\$)	Share of the Economy (%)
2010	42.08	N/A	N/A	237.72	31.78	7.72	75,540.05	0.27
2011	42.47	N/A	N/A	249.92	31.97	7.98	79,888.82	0.30
2012	46.53	N/A	N/A	257.08	36.23	8.24	93,147.88	0.35
2013	47.57	N/A	N/A	244.69	37.07	9.16	90,715.00	0.38
2014	48.40	N/A	N/A	232.74	40.00	9.77	93,091.15	0.38
2015	48.58	N/A	N/A	242.85	39.18	10.06	95,157.34	0.40
2016	41.03	N/A	N/A	296.73	31.53	8.63	93,574.50	0.35
2017	42.58	N/A	N/A	303.45	30.98	8.86	93,998.00	0.39
2018	42.74	N/A	N/A	294.08	31.77	8.70	93,417.61	0.36
2019	42.83	N/A	N/A	296.60	31.55	8.82	93,577.10	0.37
2020	42.98	N/A	N/A	296.75	31.54	8.86	93,586.98	0.37
2021	42.99	N/A	N/A	297.11	31.51	8.86	93,609.88	0.36
2022	43.10	N/A	N/A	298.48	31.39	8.86	93,696.11	0.37
2023	43.08	N/A	N/A	300.33	31.24	8.85	93,812.38	0.37
2024	43.17	N/A	N/A	301.93	31.10	8.91	93,911.96	0.38
Sector Rank	12/37	N/A	N/A	28/37	10/37	26/37	17/37	3/37
Economy Rank	193/694	N/A	N/A	349/694	146/694	380/694	69/694	45/694

Figures are in inflation-adjusted 2019 dollars. Rank refers to 2019 data.

SOURCE: WWW.IBISWORLD.COM

Industry Financial Ratios

	Apr 2014 - Mar 2015	Apr 2015 - Mar 2016	Apr 2016 - Mar 2017	Apr 2017 - Mar 2018	Apr 2017 - Mar 2018 by company revenue		
					Small (<\$10m)	Medium (\$10-50m)	Large (>\$50m)
Liquidity Ratios							
Current Ratio	1.3	1.3	1.4	1.3	1.3	1.3	1.4
Quick Ratio	1.2	1.1	1.3	1.2	1.1	1.2	1.3
Sales / Receivables (Trade Receivables Turnover)	9.4	9.2	8.3	8.4	9.7	7.2	8.5
<i>Days' Receivables</i>	38.8	39.7	44.0	43.5	37.6	50.7	42.9
Cost of Sales / Inventory (Inventory Turnover)	n/c	n/c	n/c	n/c	n/c	n/c	n/c
<i>Days' Inventory</i>	n/a	n/a	0.4	0.4	0.4	0.4	0.4
Cost of Sales / Payables (Payables Turnover)	12.2	9.7	10.9	10.8	10.6	9.0	13.0
<i>Days' Payables</i>	29.9	37.6	33.5	33.8	34.4	40.6	28.1
Sales / Working Capital	20.3	25.0	16.4	15.1	17.5	16.2	13.6
Coverage Ratios							
Earnings Before Interest & Taxes (EBIT) / Interest	5.0	4.1	6.2	3.2	2.4	3.8	1.9
Net Profit + Dep., Depletion, Amort. / Current Maturities LT Debt	3.5	2.9	5.2	3.9	n/a	3.3	n/a
Leverage Ratios							
Fixed Assets / Net Worth	1.0	0.9	0.9	1.1	1.0	1.2	3.0
Debt / Net Worth	3.1	3.1	3.2	3.6	13.5	2.3	4.5
Tangible Net Worth	15.4	14.2	13.3	1.2	-6.3	5.3	7.9
Operating Ratios							
Profit before Taxes / Net Worth, %	33.0	31.4	39.5	29.8	32.5	27.0	28.1
Profit before Taxes / Total Assets, %	8.3	6.6	7.8	6.9	5.5	7.5	2.7
Sales / Net Fixed Assets	17.6	15.0	17.7	18.5	29.3	17.2	11.1
Sales / Total Assets (Asset Turnover)	2.3	2.1	2.1	1.9	2.5	1.5	1.5
Cash Flow & Debt Service Ratios (% of sales)							
Cash from Trading	44.7	53.5	46.7	52.4	55.7	57.5	41.6
Cash after Operations	7.3	8.6	8.4	7.9	5.5	12.1	10.2
Net Cash after Operations	7.4	8.1	8.7	8.5	5.0	11.5	9.4
Cash after Debt Amortization	2.2	3.4	3.0	2.1	0.3	3.0	3.5
Debt Service P&I Coverage	2.9	3.5	3.9	2.5	3.0	1.6	4.8
Interest Coverage (Operating Cash)	7.8	9.9	9.3	6.1	5.1	6.1	15.7
Assets, %							
Cash & Equivalents	19.2	17.7	19.8	17.7	16.6	17.7	19.8
Trade Receivables (net)	29.3	26.7	29.5	27.4	29.2	25.7	27.2
Inventory	2.9	3.1	2.5	2.7	2.0	3.4	2.7
All Other Current Assets	4.9	4.0	4.8	5.6	7.2	5.9	2.2
Total Current Assets	56.3	51.5	56.6	53.5	55.1	52.8	51.9
Fixed Assets (net)	21.1	24.0	20.1	21.4	25.3	18.9	18.9
Intangibles (net)	14.3	14.5	14.9	16.7	9.8	20.8	22.2
All Other Non-Current Assets	8.4	10.1	8.4	8.3	9.7	7.6	7.0
Total Assets	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total Assets (\$m)	7,068.0	6,943.3	6,600.3	6,436.9	229.8	2,268.4	3,938.7
Liabilities, %							
Notes Payable-Short Term	11.2	9.9	6.5	7.9	13.3	4.9	3.3
Current Maturities L/T/D	2.9	4.0	4.0	5.1	4.9	6.9	2.0
Trade Payables	13.4	12.7	12.8	12.7	15.5	11.0	10.5
Income Taxes Payable	0.2	0.3	0.4	0.1	0.1	0.2	0.2
All Other Current Liabilities	16.8	16.9	18.5	20.9	25.1	17.0	20.1
Total Current Liabilities	44.5	43.8	42.1	46.8	59.0	40.0	36.2
Long Term Debt	15.3	16.8	18.8	23.9	24.4	22.6	25.7
Deferred Taxes	0.6	0.5	0.4	0.4	0.2	0.3	0.8
All Other Non-Current Liabilities	9.9	10.1	10.5	11.1	13.1	11.1	7.2
Net Worth	29.7	28.7	28.2	17.9	3.5	26.1	30.1
Total Liabilities & Net Worth (\$m)	7,068.0	6,943.3	6,600.3	6,436.9	229.8	2,268.4	3,938.7
Maximum Number of Statements Used	237	233	200	200	80	78	42

Source: RMA Annual Statement Studies, rmahq.org. RMA data for all industries is derived directly from more than 260,000 statements of member financial institutions' borrowers and prospects.

Note: For a full description of the ratios refer to the Key Statistics chapter online.

Jargon & Glossary

Industry Jargon

APPLICATION SERVICE PROVIDER (ASP) A business that provides computer-based services to customers over a network.

CLOUD COMPUTING Computing model in which companies' computer applications are hosted in outside servers accessible via the internet and managed by third-party operators.

DATA WAREHOUSING The collection of data and the establishment of a common format for different data sets to enable them to work together and be stored in one place.

INFORMATION TECHNOLOGY (IT) The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by microelectronics-based computing and telecommunications.

OUTSOURCING To procure goods or services under contract with an outside supplier.

SOFTWARE AS A SERVICE (SAAS) Software that is deployed over the internet and runs behind a firewall in a person's local area network or personal computer.

IBISWorld Glossary

BARRIERS TO ENTRY High barriers to entry mean that new companies struggle to enter an industry, while low barriers mean it is easy for new companies to enter an industry.

CAPITAL INTENSITY Compares the amount of money spent on capital (plant, machinery and equipment) with that spent on labor. IBISWorld uses the ratio of depreciation to wages as a proxy for capital intensity. High capital intensity is more than \$0.333 of capital to \$1 of labor; medium is \$0.125 to \$0.333 of capital to \$1 of labor; low is less than \$0.125 of capital for every \$1 of labor.

CONSTANT PRICES The dollar figures in the Key Statistics table, including forecasts, are adjusted for inflation using the current year (i.e. year published) as the base year. This removes the impact of changes in the purchasing power of the dollar, leaving only the "real" growth or decline in industry metrics. The inflation adjustments in IBISWorld's reports are made using the US Bureau of Economic Analysis' implicit GDP price deflator.

DOMESTIC DEMAND Spending on industry goods and services within the United States, regardless of their country of origin. It is derived by adding imports to industry revenue, and then subtracting exports.

EMPLOYMENT The number of permanent, part-time, temporary and seasonal employees, working proprietors, partners, managers and executives within the industry.

ENTERPRISE A division that is separately managed and keeps management accounts. Each enterprise consists of one or more establishments that are under common ownership or control.

ESTABLISHMENT The smallest type of accounting unit within an enterprise, an establishment is a single physical location where business is conducted or where services or industrial operations are performed. Multiple establishments under common control make up an enterprise.

EXPORTS Total value of industry goods and services sold by US companies to customers abroad.

IMPORTS Total value of industry goods and services brought in from foreign countries to be sold in the United States.

INDUSTRY CONCENTRATION An indicator of the dominance of the top four players in an industry. Concentration is considered high if the top players account for more than 70% of industry revenue. Medium is 40% to 70% of industry revenue. Low is less than 40%.

INDUSTRY REVENUE The total sales of industry goods and services (exclusive of excise and sales tax); subsidies on production; all other operating income from outside the firm (such as commission income, repair and service income, and rent, leasing and hiring income); and capital work done by rental or lease. Receipts from interest royalties, dividends and the sale of fixed tangible assets are excluded.

INDUSTRY VALUE ADDED (IVA) The market value of goods and services produced by the industry minus the cost of goods and services used in production. IVA is also described as the industry's contribution to GDP, or profit plus wages and depreciation.

INTERNATIONAL TRADE The level of international trade is determined by ratios of exports to revenue and imports to domestic demand. For exports/revenue: low is less than 5%, medium is 5% to 20%, and high is more than 20%. Imports/domestic demand: low is less than 5%, medium is 5% to 35%, and high is more than 35%.

LIFE CYCLE All industries go through periods of growth, maturity and decline. IBISWorld determines an industry's life cycle by considering its growth rate (measured by IVA) compared with GDP; the growth rate of the number of establishments; the amount of change the industry's products are undergoing; the rate of technological change; and the level of customer acceptance of industry products and services.

Jargon & Glossary

IBISWorld Glossary continued

NONEMPLOYING ESTABLISHMENT Businesses with no paid employment or payroll, also known as nonemployers. These are mostly set up by self-employed individuals.

PROFIT IBISWorld uses earnings before interest and tax (EBIT) as an indicator of a company's profitability. It is calculated as revenue minus expenses, excluding interest and tax.

VOLATILITY The level of volatility is determined by averaging the absolute change in revenue in each of the past five years. Volatility levels: very high is more than $\pm 20\%$; high volatility is $\pm 10\%$ to $\pm 20\%$; moderate volatility is $\pm 3\%$ to $\pm 10\%$; and low volatility is less than $\pm 3\%$.

WAGES The gross total wages and salaries of all employees in the industry. The cost of benefits is also included in this figure.

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