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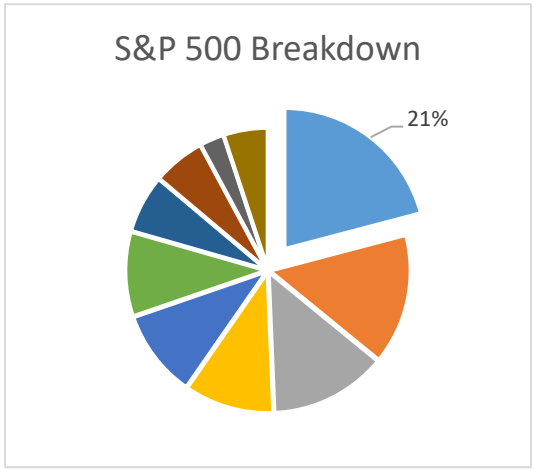
Sector Report: Information Technology A

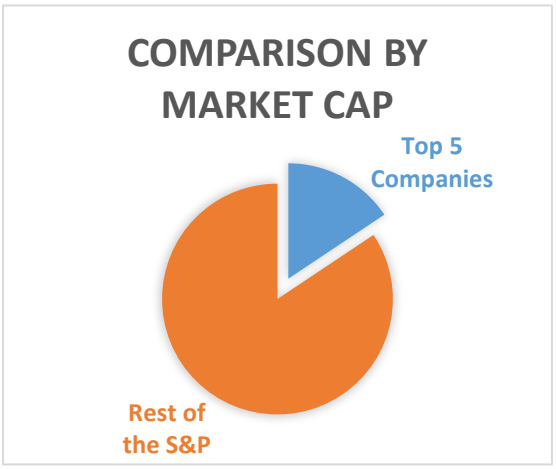
Sector Overview:



Currently, the information technology sector makes up the biggest portion of the United States' economy. This sector has seen major increases over the past few years and will continue to increase regardless of economic condition. This will be discussed in more detail, later in the report. This information technology boom can also be seen in the S&P 500, with the IT sector having the largest weighting. Overall, this sector comprises about 21% of the S&P 500 index (shown on left) which has a weight nearly as much as the second and third highest sectors combined. This weighting is expected to continue to rise as technology is becoming more apparent in everyday life, as discussed later in the report. Because of this, many articles have recently been written discussing how the S&P 500 could potentially become a technology index. Since this information technology sector is so large, it's important to analyze based on sub-sectors. These sub-sectors make up companies that produce software, hardware, and/or semiconductor equipment, as well as companies that provide internet software and services. With a surplus of sub-sectors, we decided to focus on internet software and services, IT services, and software sub-sectors. These areas are comprised of companies that provide services such as internet software, IT consulting, data processing, outsourced services, and other services. They also produce application software, system software, and home entertainment software.

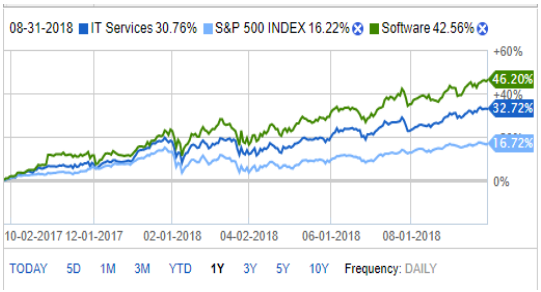
Top Companies:

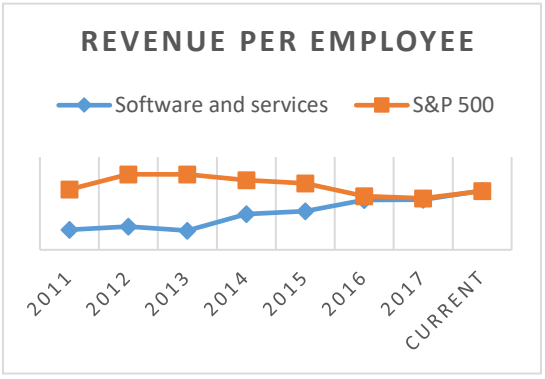
The information technology A sub-sector contains a lot of large market cap companies, with the top 5 listed below:



Company	Market Capitalization	Current Share Price
Amazon	$961.49 Billion	$1,971.31
Microsoft	$877.40 Billion	$115.61
Alphabet Inc.	$839.74 Billion	$1,195.31
Facebook	$473.85 Billion	$162.44
Alibaba Group	$423.60 Billion	$162.00

This top five list for the information technology A sub-sector contains four companies that are listed in the top five companies of the S&P 500. This fact helps support the reasoning that the S&P 500 is becoming a technology-based sector. In addition, these five companies account for roughly 15% of the S&P 500 index (shown on left) in terms of market capitalization. This explains how these companies are not only dominating in the development of the IT industry, but also are the cause of the major growth in the S&P 500.





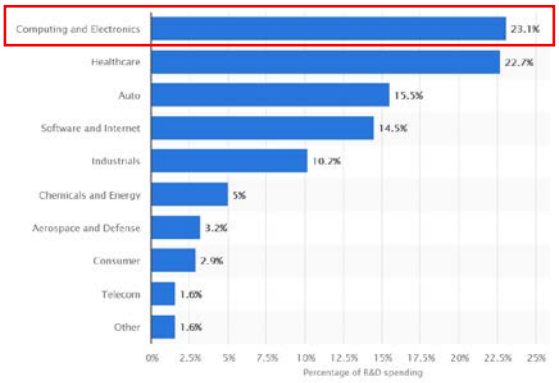
Financial Position:

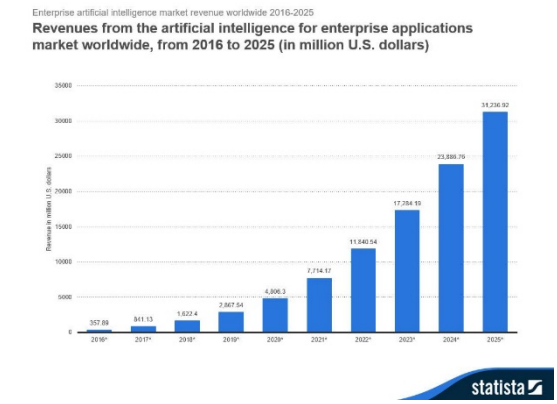
Overall performance: The IT sector has shown strong performance over the past 24 months. This can especially be seen with the software and services sub-sector over the past few years. (Graph shown on the left) When analyzing the 12 months, software experienced a 46.20% increase in price, compared to a 32.72% increase of the whole IT sector and a 16.72% increase of the S&P 500. We can see from the graph (shown on the left) that this growth rate has accelerated over the past few years. It has been growing significantly from 2016 to 2018 and has increased dramatically in July of 2018.

Industry revenue: Over the past ten years, the software & services sub-sector had revenue that almost quadrupled. According to FactSet, as of December of 2017, it shows year-over-year growth of 24.92% in revenue. (shown on the left). Revenue per employee is growing tremendously (shown on the left) which shows the growth of the industry in terms of productivity. We expect revenue growth to continue for the next 24 months, surrounded by the strong economic environment.

EBITDA Margin: Software and services industry has maintained a consistent EBITDA margin between 26%-30% since 2011, which is far beyond that of the S&P 500. This strong EBITDA margin indicates that companies in the industry are generally operating efficiently and are very profitable.

Key Drivers:



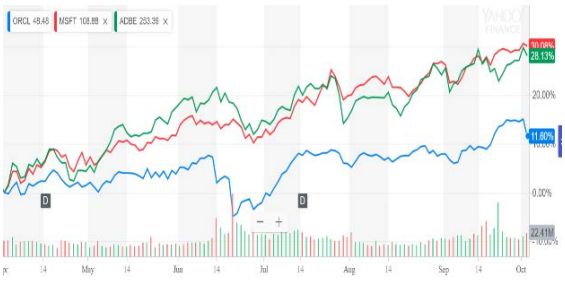


Research and Development: R&D is fundamental to a company's success within the Information Technology industry. As the industry continues to evolve and further develop, staying competitive and innovative is essential for a company to succeed in the future. The need to stay competitive is one of the top reasons why companies are putting a major focus on research and development. Technology companies typically spend a significant percentage of their revenue on research and development to stay relevant in the fast-evolving landscape. (shown on the left) Huge R&D expenditures also indicate ample financial resources. However, research and development spending does not necessarily mean a good investment. Companies should not only focus on how much they spend and R&D, but also keep an eye on how well they are utilizing R&D expenditures and producing competitive and innovative products and services.

Customer expectations and customer loyalty: In this digital-driven world, the function and effectiveness of a software/service are essential factors of customer satisfaction. As more advanced technologies are emerging, the industry becomes even more competitive, and customer expectations continue to rise. An excellent example of this is that some of the top companies in the industry such as Alphabet, Amazon, and Facebook, are dominating the whole industry and generate a large portion of the industry's total revenue. This is mainly since they have a large number of loyal customers and it's challenging for a competitor to replace their position. Therefore, customer loyalty becomes vital, and satisfying customer expectations should be one of the most important goals for technology companies.

Artificial intelligence: By developing AI, companies can cut labor cost, save time, and make decisions that are more reliable. It is the new trend in not only the information technology sector but can be seen throughout the market. Many companies are currently focusing on artificial intelligence, as this development will bring endless opportunities. We will discuss AI in more detail, later in this report.

Companies:

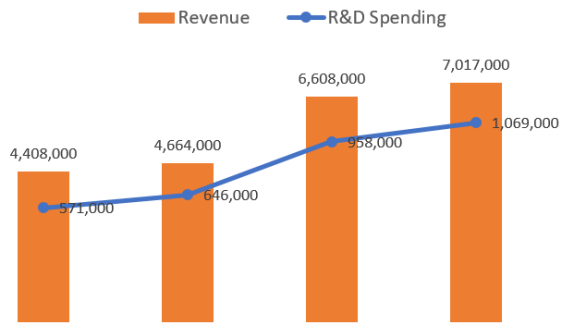


Oracle Corporation: We recommend a **Sell** on Oracle stock for the following reasons:

- Oracle is currently trading at $50.23. During the past 6 months, it shows an increase of 11.6%. When comparing this to the growth of its competitors, such as Microsoft and Adobe, this growth is relatively small. (shown on the left)

Adobe System Inc.: We recommend a **hold** of Adobe stock for the following reasons:

- Adobe is currently trading at $272, which is up by 13.26% since last 6 months
- However, Adobe has year-over-year revenue growth of 24.72% and has a P/E ratio of 53.9, compared with their competitor's averages of 40.43.
- In September 2018, Adobe, Microsoft, and SAP announced a trifecta cloud initiative that merges the companies' cloud services and makes it easier for customers to have control over data. This will allow data to be manipulated across all three platforms and we believe this will be revolutionary for the industry and shows very positive growth for the future.



Activision Blizzard Inc.: We recommend a **hold** for Activision Blizzard shares for the following reasons:

- Activision is currently trading at $83.39, which is up by 13.31% over the last 6 months.
- According to Yahoo finance, Activision has a year-to-date revenue growth of 25.22%, along with the increasing spending on R&D. (shown on the left)
- Activision recently launched "Call of Duty: Black Ops 4", Battle Royale mode. Clients' initial response to the game mode was very positive. According to CNBC, the game's BR mode has a possibility to generate more than $500 million of annual incremental sales. They have "Call of Duty: Black Ops 4" slated for a release of October 12th.

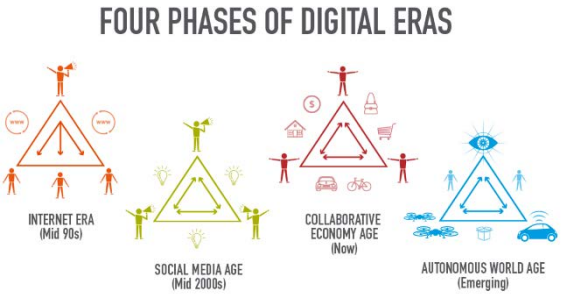
Amdocs Limited: We recommend a **Sell** for Amdocs' shares for the following reasons:

- Amdocs is currently trading at $65.08, which shows a decrease of 1.05% over the last six months. This when compared to their competitors shows that Amdocs should be performing better in terms on stock price. (shown on the left)
- In addition, their biggest client, AT&T, accounts for a sizable amount of their total revenue. However, management forecasts decreasing revenue from AT&T in fiscal 2018. We believe this will have a negative impact on their company.

Economic Indicators:

Overview: The economic status of the sector looks very strong. Although in the past, the IT sector has been controlled by the economy, we believe that this will change in the future. We believe this is due to our key drivers. Since the information technology A sub-sector is so dominated by R&D and AI, companies are going to have continue to use technology to stay competitive going forward. Since this is the

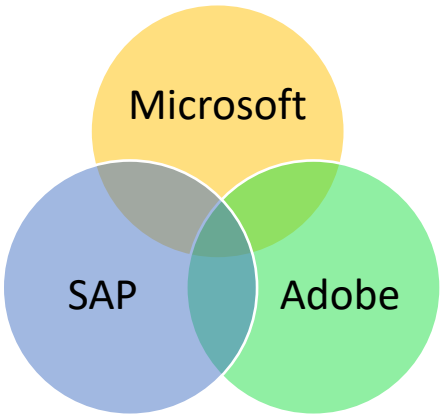
case, we believe that the IT sector will continue to see increases despite how the market is performing.



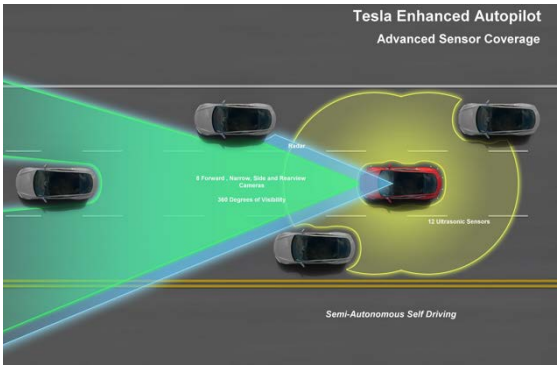
Future:

Overview: The future of technology looks very bright but will also be centered around change. One very important aspect of this change will be centered around data. In the new digital age, data is the new currency and determines the future of a company. This data is especially used with artificial intelligence and multi-platform systems. (figure on the left) When talking about the future of technology, these aspects of data must steer the discussion.

Multi-Platform Systems: Multi-platform systems are becoming the way for technology companies to strive ahead of their competitors. An excellent example of this was through the Microsoft, Adobe, and SAP alliance in September of 2018. (figure on the left) These three companies are launching the "Open Data Initiative" which will offer their customers to better leverage their data. This initiative will allow a data exchange between the three platforms. This will greatly improve their data systems and will be a huge advantage to their customers. A huge part of this initiative allows customers to easily convert PDFs to any Microsoft product. Previously, this was a very tedious process and required a special type of Adobe product. In addition, this alliance will allow a massive data pool between these three companies and will allow a lot more transparency between their products. This alliance is a massive stride in the data space and will allow the companies to grow stronger and a lot more competitive.

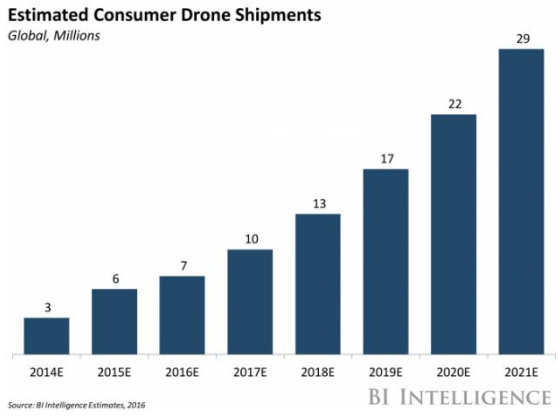


Artificial Intelligence: While the multi-platform systems will become crucial to be competitive in the technology sector, the future for technology is mainly geared toward thinks for itself, much like a human. This technology has numerous applications but can especially be seen in self driving cars, pilotless airplanes, and drones.



The technology for self-driving cars has made tremendous improvements over the past decade. The technology behind autonomous cars includes sensors, connectivity, and software algorithms. (shown on the left) The sensors on these cars has replaced the cameras, on the old models, and is used for blind spot monitoring, forward collision warnings, and distance to the car in front. The connectivity piece uses the internet, along with GPS, to access changing conditions such as the latest weather and road conditions. With this technology in place, it brings the artificial intelligence piece. The artificial intelligence uses software algorithms combines the sensors with the connectivity information to make informed decisions. This software acts as the brains of the car and uses the information gathered to avoid collisions, adjust routes based on traffic delays, and adjust speed based on weather such as snow and rain.

According to the former CEO of Tesla, Elon Musk, Tesla is as much of a software company as it is a hardware company.



As previously mentioned, this technology has seen rapid advancements over the past few years and is specifically shown in the company manufacturer, Tesla. Tesla has recently introduced an autopilot on most of their cars which includes technology to go on or off ramps, park itself, and auto steer which includes making lane changes, adjusting in speed, and other features that enable it to drive itself. This technology required a lot of research and development which really shows why this is becoming the biggest driver in the industry. According to the former CEO of Tesla, Elon Musk, Tesla is as much of a software company as it is a hardware company. (shown on the left) This remark really shows how the automotive industry is really making strides toward the technology industry, especially with the advancements of the software in the cars. Tesla's rapid advancements to their cars has really motivated other major players in the automotive space to grow in R&D as well. The companies listed to be making these changes include some of the biggest players in the industry such as General Motors, Ford, Volvo, as well as many others.

This rapid change in the automotive space has promoted major changes in the software space. This has been especially apparent in the country, Israel. Israel is now home to numerous technology startups and will put it alongside Silicon Valley in the high technology space for the next decade. This industry has really been booming, with technology startups increasing by over 500% from 2013 to 2017. In addition, many American companies are coming very active in this space. In March of 2017, Intel purchased an Israeli company, Mobileye, a $15 billion acquisition. Mobileye develops software algorithms that processes information using the sensors and connectivity and currently has products on just about every automaker's autonomous test fleet. Mobileye has been very successful in the pace and has seen a major boom over the past few years. (shown on the left) This combination with Intel adds hardware, more software expertise, and data centers that many companies say will cause further deployment of the autonomous technology. With this recent acquisition, many companies are looking for the next Mobileye but the competition is very fierce. Israel is the hub for the autonomous technology, with companies in both the automotive sector, such as Ford and Toyota, and the technology sector, such as Apple and Microsoft, all extremely active in R&D.

While artificial intelligence has made massive progress in the automotive industry, it also has heavily impacted the airline industry with major advances in autopilot. In fact, many of the current airplanes can pretty much fly themselves now. Autonomous airplanes are definitely coming and the technology is only a few years away. We got a chance to speak with Billy Schnettgoecke, a former vice president at Boeing, who stated that the drones have really helped develop AI. These drones are mainly used by the military but they have the capability to communicate with one another to determine which targets to take down. (drone shipments are shown on the left) With this technology and AI at such a high level, he stated that it is only a matter of time before this becomes implemented into the commercial space. In addition, Billy and Boeing just received an award for being the first company to develop the technology to operate unmanned aircraft onto an aircraft carrier. We really think this helps to show the level at which this technology is at and shows how the future for commercial airlines looks to contain a large amount of change. Finally, Billy stated that software is the biggest part to make all of these changes possible. Boeing foresees a software heavy future and has been hiring a large of amount of software graduates and has purchased a ton of Silicon Valley-like companies that will aid in this transition. Overall, this also supports our key drives that AI and R&D are very important for the future of technology as well as large amount of data. This helps to

show the importance of multi-platform systems and shows how the Microsoft, Adobe, and SAP alliance will be the way of the future.

The military has clearly been increasing their use of drones and we think that the applications of drones can be endless. Some examples of these applications include the following:

- These drones could assist with natural disasters such as helping with the recent wildfires.
- It could be used to help to save lives such as detecting whether people are in a burning home or helping with various life-threating police calls. In addition, this AI technology could have endless possibilities in the medical field such as a variety of ICU applications or assisting in dangerous surgeries.
- Drone technology could be applied to everyday life such as in vacuums or in lawnmowers.

While there are a variety of applications of this technology, there is a major roadblock which includes protection from hackers and other forms of terrorists attacks that could result from these implementations. These regulatory pieces will most likely prevent changes in the near future but as technology develops, so will these prevention systems.

Overall, the future for artificial technology looks to be very bright but will face some problems along the way. However, it is safe to say that technology will definitely be the way of the future and will only a matter of time before the general public sees its applications in their everyday life.