

Technology Sector Study

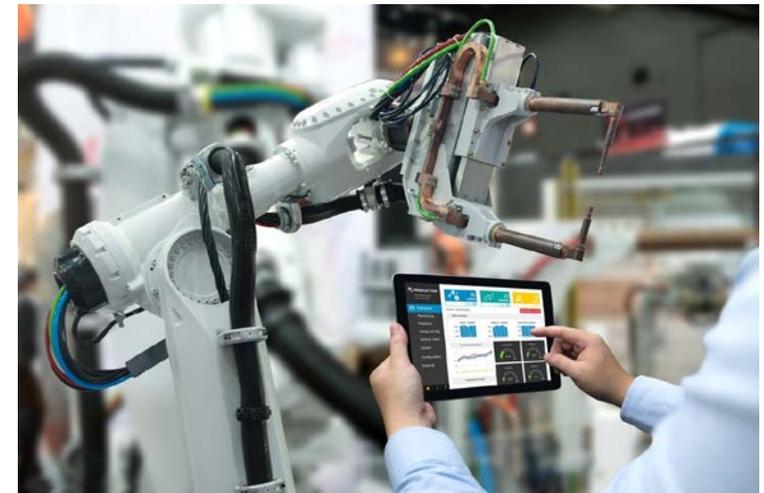


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- Technology is defined as the application of scientific knowledge for practical purposes. The world has progressed at a rapid pace in terms of technological advancements in various fields such as engineering, medicine, communication and manufacturing.
- The tech industry encompasses the category of businesses involved in research, development, or distribution of technologically based goods and services. Some examples are the manufacturing of electronics, development of software, computers, or other products and services related to information technology and industrial automation.
- The industry caters to the needs of both consumers centric and other businesses. Producers of consumer goods such as computers, mobile devices, home appliances and televisions etc. are continuously aiming to develop new and more technologically advanced features in order to attract customers.
- For businesses (mainly industrial manufacturing), advancements in technology enables them to achieve better quality and higher efficiency. This encompasses industrial and systems automation, software development and communication systems etc. A key aspect of this technology is that it often provides critical information and services that enable businesses to make key strategic decisions. It is also vital for businesses to maintain up to date technology in comparison to their competitors or they may find themselves at a disadvantage or even becoming non-competitive.
- This sector study will particularly focus on systems automation and software segments of the tech industry.

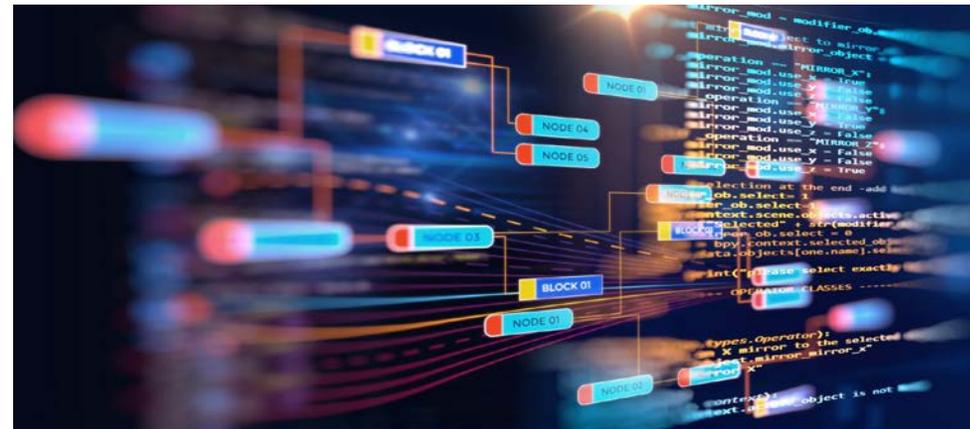


Automation & Process Control

- Automation and process control is used in industrial settings to control the conditions in which a product is made through technology.
- The use of automation and process control in industrial setting allows the advanced systems to make required adjustments within established parameters. It relies on specialized control systems that manage the flow, output and other aspects of an industrial process based on feedback obtained from sensors and data monitoring systems.
- The main advantage of implementing automation and process control is increased efficiency and better quality. Automation and process control minimizes human intervention beyond the monitoring of each system. As a result, steps that would otherwise be time-consuming can be carried out swiftly by the automated system while reducing chances of human error, thus reducing wastages or redundancies. In addition, it also enables repetitive tasks or operations to be carried out efficiently while ensuring compliance with required standards is strictly observed.
- Process control is typically implemented in industries where continuous production occurs. Some examples are:
 - **Pharmaceuticals**: Extreme precision is required when producing medicines as there is no room for even minor errors. Therefore, automation and process control is used to minimize human error and guarantee the safety of medicine produced.
 - **Petrochemicals**: Process control can be used to closely monitor the refining and production process to ensure consistent quality and uninterrupted production.
 - **Food & Beverage**: The food and beverage industry must comply with specific health standards and process control can be used to monitor and adjust the ingredients or required temperature to ensure a high quality output.
 - **Energy**: These systems are used to control power production ensuring adequate supply while monitoring fuel levels, temperature etc. In addition, they are also used to control pressure in oil and gas pipelines to ensure safety and continuous supply.

Software

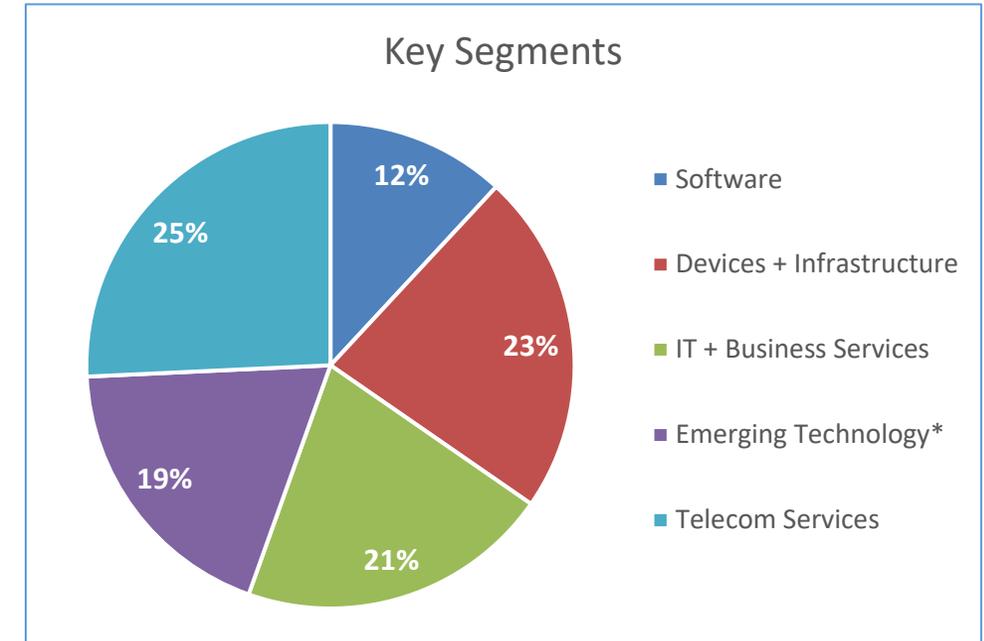
- Software can be defined as a set of instructions or programs that enable a computer to execute specific tasks. It is a generic term used to describe programs that run on PCs, mobile devices and other smart devices. It includes operating systems, diagnostic tools and a variety of applications.
- There are four basic categories of software:
 1. **Programming Software**: a set of tools to aid developers in writing programs. The various tools available are compilers, linkers, debuggers, interpreters and text editors.
 2. **System Software**: serves as a base for application software. System software includes device drivers, operating systems (OSs), compilers, disk formatters, text editors and utilities helping the computer to operate more efficiently.
 3. **Application Software**: is intended to perform certain tasks. Examples of application software include office suites, gaming applications, database systems and educational software.





Overview

- The market size of the global tech industry, which encompasses hardware, software, services and telecommunication, is estimated to stand at USD~4.8trn in CY20 as compared to USD~5.0trn in CY19.
- The COVID-19 pandemic accelerated the already growing trend of digitization as it forced a larger number of people to connect online. It also created opportunities for the tech industry to come up with creative business solutions as access to technology is less limited due to location or constrained to specific activities.
- While the tech industry performed better than many others in the aftermath of COVID-19, it was not immune to spending cuts and deferments in investments which resulted in the ~4% decline in revenue over the year.
- The United States is the largest tech market in the world and represents ~33% of the world total, equivalent to USD~1.6trn. Meanwhile, China is the fastest growing market and contributes ~14% to the total market. It has closed the gap in terms of IT infrastructure, software and services and is developing leading technology in 5G and robotics.
- The adjacent graph shows some of the key segments of the tech industry and their respective shares in the total market size. The largest segment is telecom services which contributes ~25% to the total market followed by devices and infrastructure which accounts for ~23% of the total.



Largest Tech Companies by Market Cap (28 May 2021)	
Name	Market Cap (USD bln)
Apple	2,091
Microsoft	1,878
Amazon	1,629
Alphabet (Google)	1,592
Facebook	943

* Emerging technology refers to new or developing technology that doesn't fit into the traditional categories such as Artificial Intelligence (AI) or Internet of Things (IoT).

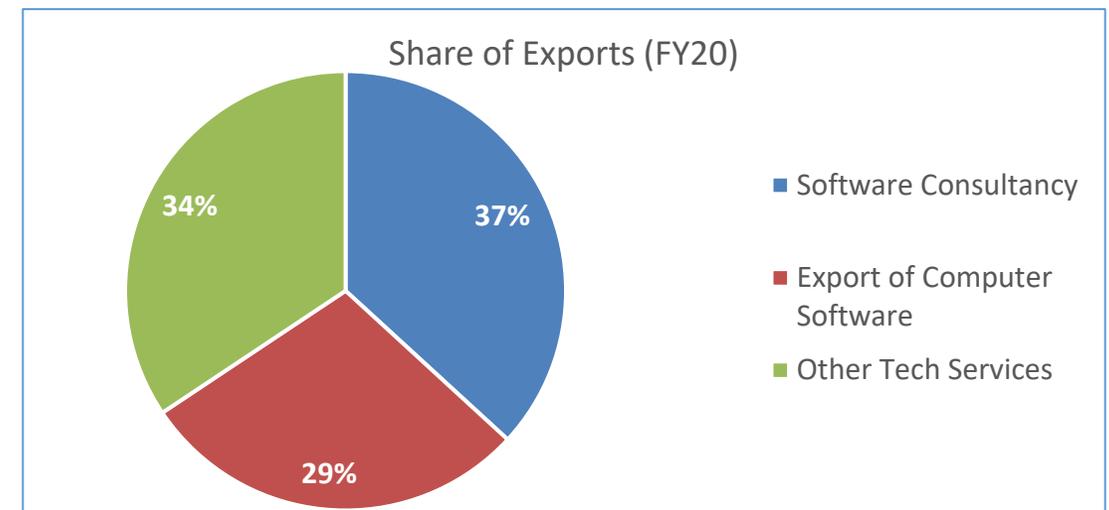
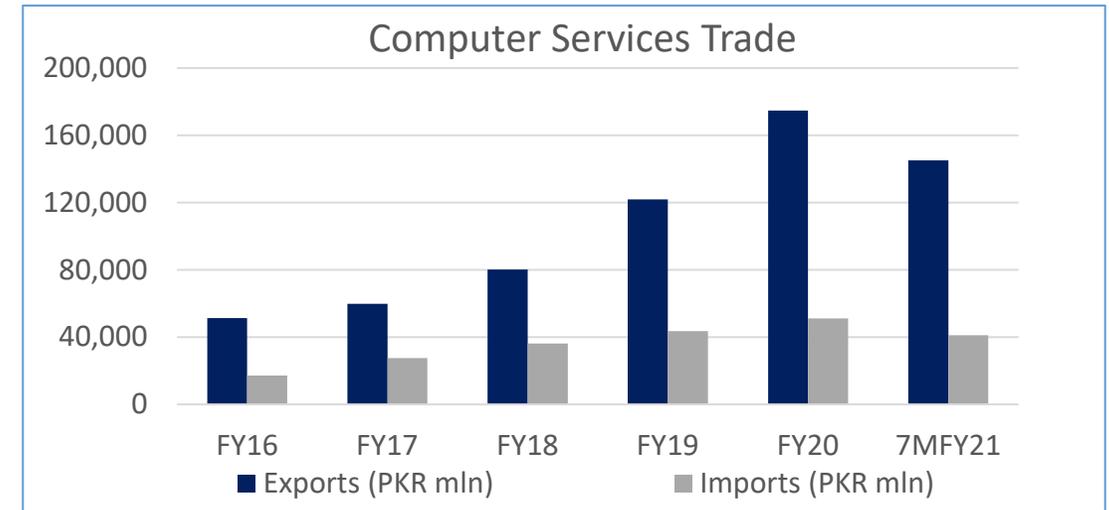
Source: Comptia, <https://companiesmarketcap.com/tech/largest-tech-companies-by-market-cap/>

Overview

- Pakistan's tech industry contributes ~1% to the national GDP and stood at approximately PKR~362bln in FY20 (FY19: PKR~332bln) with the domestic market size for IT products and services estimated to be PKR~187bln in FY20 (FY19: PKR~210bln). Meanwhile, during FY20, exports of the total tech industry increased to PKR~175bln (FY19: PKR~122bln).
- The industry comprises of over 7,000 companies with this number expanding each year. These companies operate in a wide array of areas such as customized software development and Business Process Outsourcing (BPO) services.
- The industry employs over 500,000 professionals, many of whom have expertise in latest and emerging IT products and technologies. In addition, around 20,000 IT graduates and engineers are being produced in the country each year.
- In recent years, the government has increased its focus on the tech industry and recognized the potential for growth and investment that exists. The Ministry of Information Technology & Telecommunication (MoITT), through bodies such as the Pakistan Software Export Board (PSEB), has taken various steps such as the establishment of IT Parks and incubators to promote the industry and provide an enabling ecosystem for businesses and start ups.
- PSEB has established 15 IT Parks in various city centres of the country. They provide essential infrastructure to tech companies at lower costs. In addition, the government has also established a National Incubation Centre to develop and cultivate start ups in the country. In addition, there are several private incubators operating in the country as well with many having a focus on tech related products and services.
- This sector study particularly focuses on the computer software segment of the tech industry which also includes automation, computer programming and software consultancy services.

Trade of Computer Services

- The category of computer services encompasses hardware and software consultancy services, trade of computer software and other technological services.
- Since FY16, Pakistan's exports of computer services has grown with a CAGR of ~36% and stood at PKR~175bIn during FY20 (FY19: PKR~122bIn). Meanwhile, imports of computer services have also grown, albeit at a lower CAGR of 31% since FY16. During FY20, imports stood at PKR~51bIn (FY19: PKR~44bIn).
- During 7MFY20, exports stood at PKR~145bIn, exhibiting an increase of ~49% YoY. Meanwhile, imports during the period stood at PKR~41bIn a growth of ~45% from the comparative period.
- During FY20, the largest contributor to exports (at ~37%) was software consultancy followed by the export of computer software, which contributed ~34% to total computer service exports.

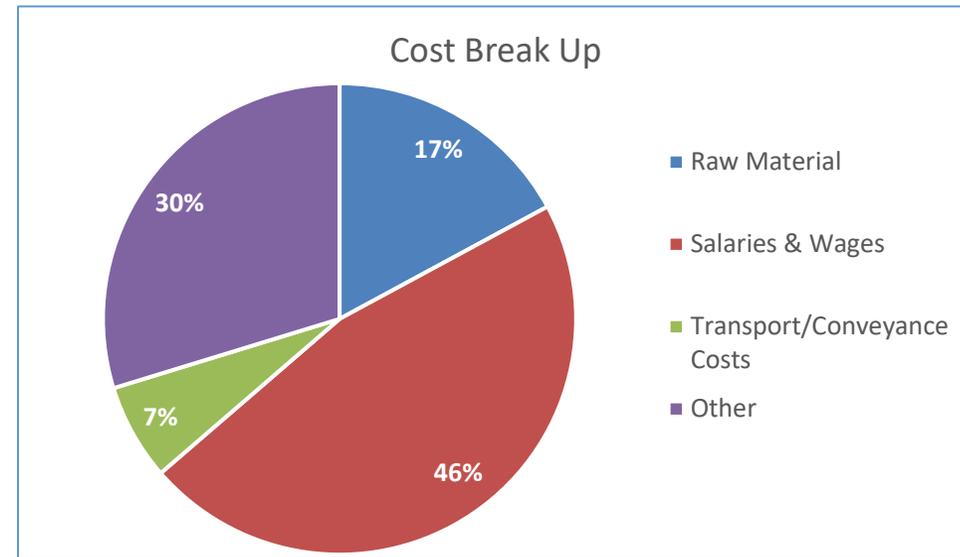
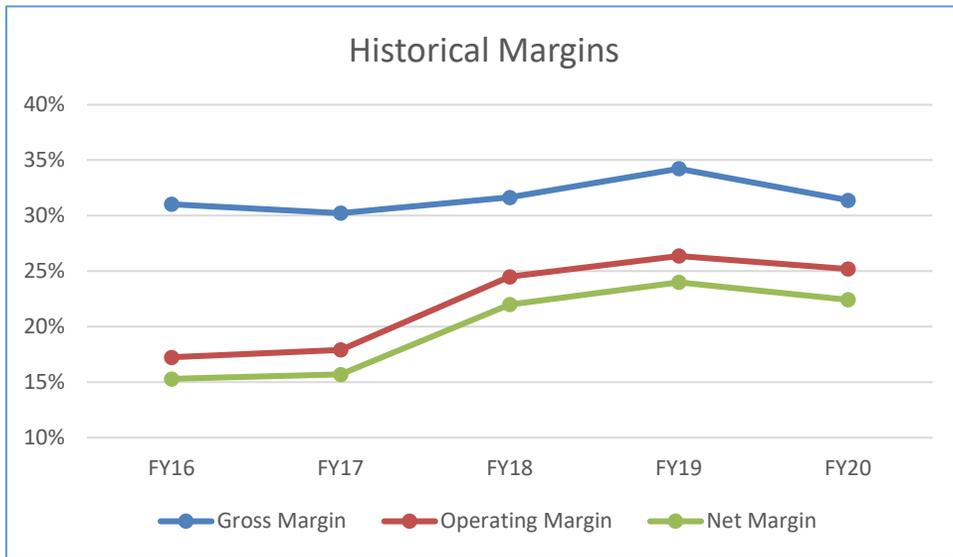


Business Risk

- **Fast Paced Growth:** The tech industry is among the fastest growing industries and new developments and technologies are continuously being introduced. Players must keep pace with new and relevant upgradations in technology or they may lose competitive advantage or even risk becoming obsolete in the long run.
- **B2B Model:** Since many players within the tech industry are involved in providing services to other businesses, their demand depends on conditions in these client industries. If the overall economy, or any client industry or sector is not doing well, it would hamper the creation of new demand for tech players providing services.
- **Digital Literacy:** Mobile phone usage in Pakistan has increased exponentially in recent years and has resulted in increased digital literacy among the population. However, while there may be addition of approximately 20,000 IT graduates each year, this is still a small proportion of Pakistan's total population of over 200 million.
- The majority of population, particularly those residing in rural areas or belonging the low income groups, remain lacking in digital literacy particularly regarding advanced technologies. As a result, this limits or restricts the potential of the domestic tech market.

Margins & Cost Structure

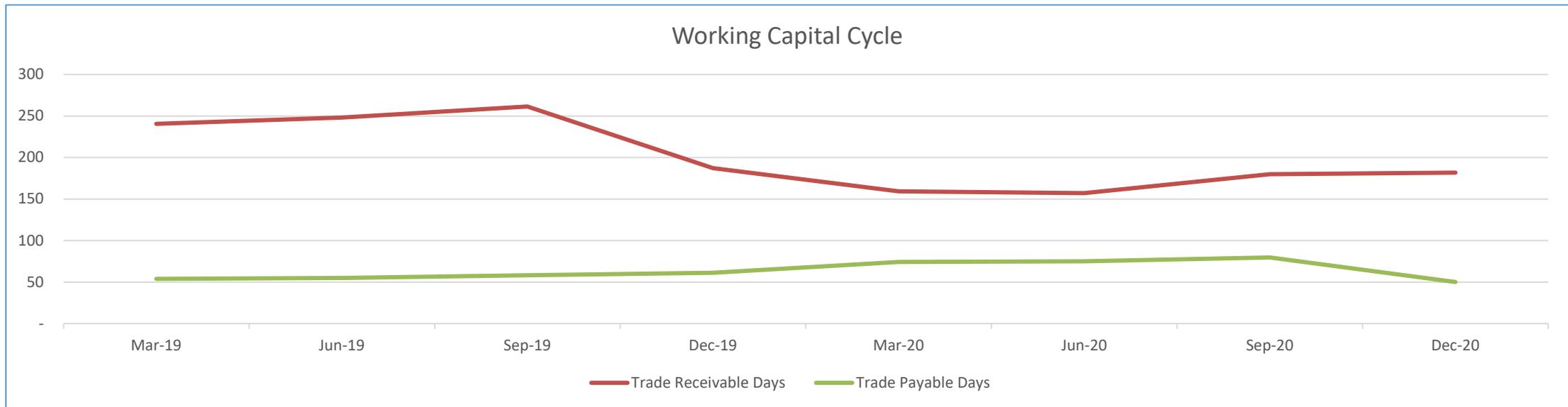
- In recent years, the industry has maintained a high level of gross margin in the range of 30-35% as most players are providing high quality services where they can compete internationally. Meanwhile, operating and net margins have observed an increasing trend since FY16, and particularly in FY18 when additional incentives for the industry were introduced by the government that reduced operating costs and improved bottom-line. The export oriented players also benefited from rupee depreciation during FY20 which resulted in increase in the value of exports.
- During FY20, there was a slight decline in overall margins, with gross margin falling from ~34% to ~31%. This was due to the spread of COVID-19 pandemic which resulted in delays in projects and thus revenue recognition for some players.
- The largest component of direct costs for the industry is Salaries & Wages which contributes ~46% to total direct costs as the industry has a requirement for technically proficient and skilled labor force.



Note: Margins and cost figures are reflective of 4 listed players

Working Capital Management

- The industry's working capital cycle is largely a function of trade receivables and trade payables. Since the industry is a service provider, most players have little or no inventory. Meanwhile, revenues are mostly contract based and greater length of contract can lead to increase in trade receivable days.
- The average net working capital cycle of the industry is ~140-145 days. Net working capital days in December 2020 stood at 136 days a significant increase from 87 days in June 2020.
- There have been some fluctuations in the working capital cycle in recent months as the COVID-19 pandemic caused delays in completion of contracts and projects thus impacting revenue recognition of some players.

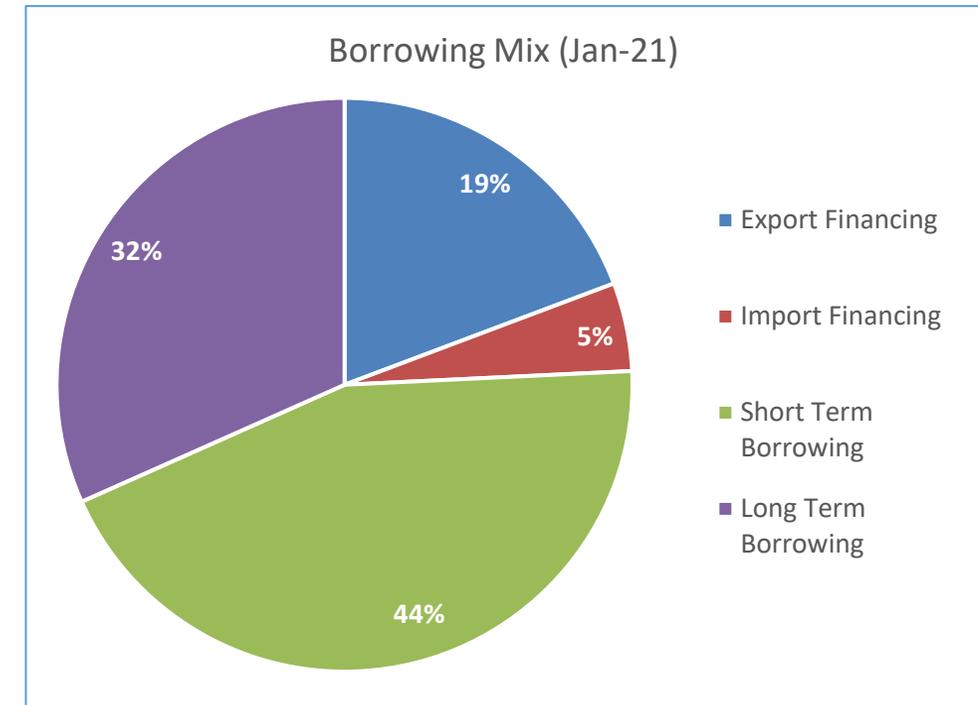


Note: Working capital figures are reflective of 4 listed players



Financial Risk

- The industry's total borrowing stood at PKR~10,690mIn at end January 2021 as compared to PKR~8,598mIn at end January 2020.
- The largest component of the industry's borrowing is short term borrowing, which constitutes ~44% of total borrowing and stands at PKR~4,689mIn (Jan-20: PKR~3,342mIn) mainly for working capital management.
- Meanwhile, long term borrowing contributes ~32% to total borrowing and stands at PKR~3,370mIn (Jan-20: PKR~2,504mIn).
- In addition, the industry has access to discounted borrowing in the form of Export Finance Schemes which amounts to ~19% of total borrowing and stands at PKR~2,048mIn (Jan-20: PKR~1,200mIn).
- The industry has an average leverage ratio of ~16% indicating a low level of financial risk.



Note: Leveraging ratio figure is reflective of 4 listed players

Regulatory Framework

- The tech industry is overseen by the Ministry of Information Technology and Telecommunications (MoITT). In 2018, the ministry introduced a Digital Pakistan Policy with a vision to accelerate digitization and expand the knowledge based economy.
- Some of the key objectives highlighted in the policy are promotion of innovation and entrepreneurship through start up incubators, increase in software exports and IT remittances alongside the domestic market, improve digital inclusion by bridging the urban-rural gap and the gender disparity and attract foreign and domestic investment in the industry.
- The regulations implemented in line with these objectives include:
 - Zero income tax on IT exports till 2025
 - Three year tax holiday for tech start ups with no minimum and withholding tax
 - Tax holiday for venture capital funds till 2024
 - 100% equity ownership allowed to foreign investors
 - 100% repatriation of capital and dividends allowed
- In addition, the establishment of IT Parks, Tech Special Economic Zones and National Incubation Centers has vastly improved the ecosystem available for tech companies as these locations are specifically equipped with latest ICT infrastructure and facilities which enable a conducive environment.
- The industry is represented by the Pakistan Software Houses Association for IT and ITES (PASHA). The association lobbies with the government and provides its input on policies and legislation related to the industry.
- Moreover, the government has facilitated freelancers by increasing the monthly limit of receiving payments to \$25,000 through the home remittance channel.



SWOT Analysis

- Regulatory structure supports local industry and encourages exports.
- Conducive environment due to the presence of IT Parks, Tech SEZs and Start Up Incubators.
- Availability of skilled labor as 20,000 IT qualified individuals enter the workforce each year.
- Relatively lower costs compared to international players



- Service related players are dependent on conditions in client industries and sectors.
- Low level of digital literacy amongst majority of the country's population.

- Ever changing technological platforms and evolving technologies.

- Significant investment incentives have been provided for local and foreign investors.
- Growing urbanization and digital literacy to create demand in the long term.
- Focus on automation in local industry

Outlook: Stable

- Pakistan's economy is on the path of recovery after the decline witnessed due to the COVID-19 pandemic which caused various industries to suspend operations and restricted demand. Likewise, it also resulted in delays in projects and contracts for the tech industry. The players who cater to the export market also faced difficulties as international markets remained under lockdowns even after the domestic restrictions had been eased.
- However, the lockdown restrictions forced a large number of people towards remote working while also increasing the usage of online transaction and payment systems. This situation created opportunities for the tech industry to provide services to enable businesses to continue their operations.
- During 7MFY21, the exports of tech products and services has continued unabated, standing at PKR~145bln, exhibiting an increase of ~49% YoY. Meanwhile, import during the period stood at PKR~41bln a growth of ~45% from the comparative period. A positive indicator for the industry is that the growth in exports in recent years has outpaced the growth in imports.
- Moreover, the industry continues to benefit from favourable government policies which are intended to grow the industry and attract investments in the industry from both domestic and foreign investors.
- In addition, the MoITT has recently drafted a 'National Freelancing Facilitation Policy 2021' which, if implemented, would aim to increase the number of freelancers and as well as export remittance inflows by improving ease of doing business, carrying out skills development and capacity building.
- The decision taken by the State Bank of Pakistan (SBP) to lower the policy rate by 625bps to 7% in the last quarter of FY20 has lowered the finance costs. The tech industry should save PKR~540mln in finance costs and further improve margins.
- The inflation level in the country has also declined. The average inflation rate during the 1HFY21 stood at ~8.7% as compared to an average inflation rate of ~10.7% during FY20. Moreover, the exchange rate is also expected to remain stable in the near future.

- Pakistan Bureau of Statistics (PBS)
- Pakistan Stock Exchange (PSX)
- State Bank of Pakistan (SBP)
- Federal Board of Revenue (FBR)
- PACRA Database
- Business Recorder
- Comptia (<https://www.comptia.org/content/research/it-industry-trends-analysis>)
- <https://www.processindustryinformer.com/process-control-everything-you-need-to-know>
- <https://www.techopedia.com/definition/4356/software>
- <https://companiesmarketcap.com/tech/largest-tech-companies-by-market-cap/>

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