



An Empirical Study on the Rise of Startups during COVID-19 Pandemic

Talha Humayun ¹
Arham Ahmed²

Abstract : COVID-19 has affected the life of every individual and has changed the mode of working. According to the studies, the COVID-19 brought the toughest time for everyone around the world. It disturbed the regular lives of people, bringing in supply shortages in stores and hospitals, disturbing the business markets and lead to downsizing in companies. However, the COVID-19 has also resulted in the emergence of several startups. This paper analyzes the trends of startups during COVID-19 period. The paper first hypothesized that there is a growing interest towards startup during and post COVID-19 era. Then, a questionnaire was constructed to perform a quantitative study on startup trends. The study was comprised of 12 questions and participants were people from the Karachi, Pakistan. A total of 79 respondents' replies were analyzed. The Spearman correlation test and ANOVA test were performed for analysis. It has been found that there is a growing trend of startups specifically during the COVID-19 period. Finally, the possible reasons for the rise in startups, the people preferences and satisfaction were analyzed using various statistical tests.

Keywords: *startups, COVID-19, customer satisfaction, investors' preferences, scalable Vs small startups*

1. Introduction

The innovation and ideas always lead to the breakthroughs in the lives of the people. This helps in bringing them the convenience in their daily lives, but the acceptance to those ideas used to take decades as the information flow has been limited. Since the inception of information age, the new and undiscovered ideas can be known to the masses in lesser time. It is indeed not necessary that the idea has to be accepted instantly through the societies, but the vision is always that the impact would be massively significant. The startups in the 21st century are a new way of bringing the

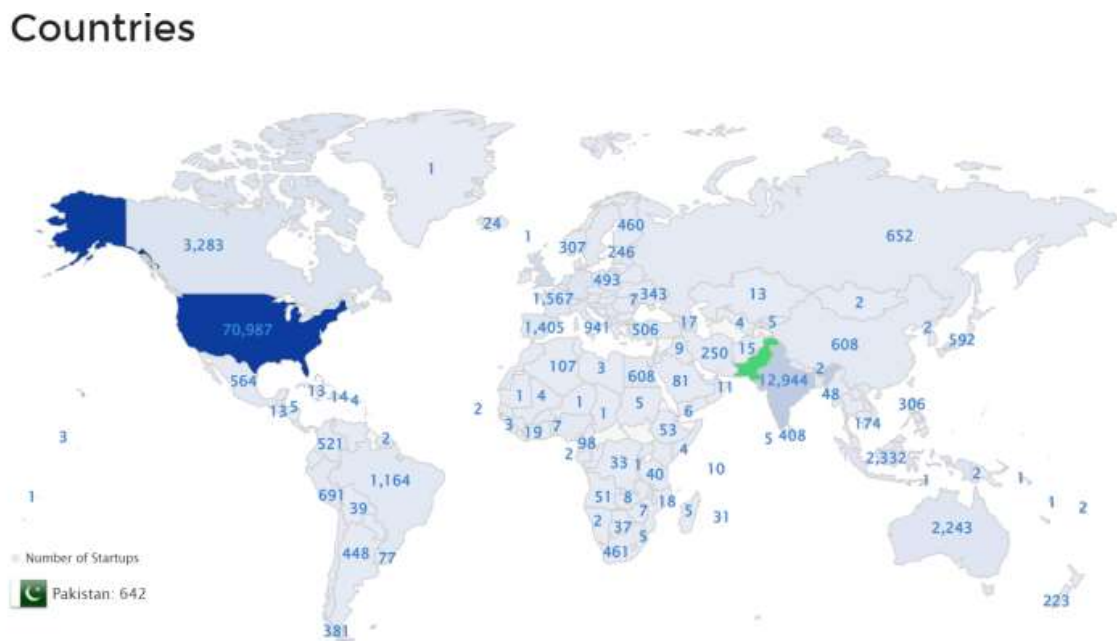
¹ NED University of Engineering and Technology, Karachi

² NED University of Engineering and Technology, Karachi

attention to the new ideas. The big companies that once had the humble beginnings as startups were founded by the well-known names today such as Bill Gates, Elon Musk, Mark Zuckerberg etc. [25].

The *startup* is a company that is said to be in the first stages of its operations. The startups search for profitable, repeatable and scalable business models [14]. They are usually founded or envisioned by one or more of the people with the same vision and mission to develop a product or service for which there seems to be a demand by the masses or huge group of people. These visionaries, also known to be the entrepreneurs, see an opportunity to provide a solution to a problem through which they can provide convenience to the people and the cash flow for themselves [26]. Although, lacking initial funding, the visionaries tend to fund or raise their startup through different venture capitalists (VC) or by turning to their family and friends.

Figure 1 shows the number of startups in various countries all around the world. Pakistan has 642 startups. As can be seen, the leading player in the number of startups has always been United States of America due to the fact that USA has greater number of opportunities and better resources compared to the world but this does not stop other countries to come in the list of the greatest number of startups, with USA having 70,987 number of startups followed by India to be 12,944 and UK 6,193[12].



The startups lead to the growth in the economies for the countries especially the developing ones. As seen by the COVID-19 pandemic, the restrictions on the physical interaction out of the premises of our own houses has been limited by the government, has caused a major impact and influence on our daily lives as well as on the businesses. The economies have been greatly impacted and can be considered more serious than earlier recessions [14]. Although the businesses that have solely relied on or that adopted the e-commerce model, even being one or two years from their inception, have evidently saw a huge growth in their business. However, according to various studies [13, 14], the startups have seen a time of crisis during the lock down era. In other studies, the COVID-19 era has led to the digital transformation [17]. A digital economy is one that is influenced by digital technologies such as internet, mobile computing, cloud computing, big data, artificial intelligence, block chain and internet-of-things (IoT). The consumer has now access to wide range of offerings and the economy has moved from local to global and international level.

This study analyzes the trends of startups in a developing country, both qualitatively and quantitatively. The objectives of this paper are as follows:

- To perform a qualitative study to highlight the need to promote the startups especially the ones adopting the ecommerce as the primary model during the COVID-19 period
- To perform a quantitative study and perform various statistical tests to establish the rise of startups during COVID-19 period.

To meet the first objective, a qualitative study has been performed. The motivation is that the economy of the developing countries can get better, more job opportunities which were snatched during the lockdown, can be created and that the young generation can get more opportunities in bringing their creative ideas, arising purely due to the excess of time during the lockdown, into reality. For the second objective, the data was acquired through the online questionnaire survey carried out in first quarter of 2022 from the small sample of general population. A total of 79 responses were gathered through a questionnaire. The data was analyzed through various statistical tests. The overall study regarding the opportunities arising during the COVID-19 pandemic due to the startups including the economical betterment of the society, with the inclusion of technology and the e-commerce has led us to the following hypothesis:

H1: The number of startups during the pandemic rose significantly with the goal of getting more customers' centric

H2: The number of startups during the pandemic did not rise with the goal of getting more customers' centric.

Rest of the sections of the paper has been organized as follows. The next section presents the literature review. This is followed with the qualitative study. Then, the methodology for the quantitative study is presented followed by results section. The paper concludes with providing a summary of research done and avenues for future research.

2. Literature Review

There has been a great deal of research interest in analyzing the trends of startup during COVID-19 time. For a detailed survey, readers can see [31]. In [13], the period has been termed as a time of crisis. According to their studies, the sudden pressure on startups during this period has been neglected by Govt. and policy makers. The authors in [13] interviewed various entrepreneurs and found out the ways to help the startups in the time of crisis such as taxation support, flexible hours of working, loan support and special programs by Govt. In various studies, the challenges faced by startups during the lock down period have been investigated [14]. There are six basic types of challenges faced by startups such as financial, human resources, support measures, marketing and crisis management.

In [15], the impact of COVID-19 on startups has been investigated and various factors were identified that impacts the stock returns. The negative effect of COVID-19 is alleviated if the size of startup is large with low debt, large board size and CEO duality. It is also alleviated in society where people are more collectivistic and cooperative. Also the people that are less sensitive to uncertainty and are oriented towards long term aspects have less impact of COVID-19. According to [16], the growth of fintech has been positive even during the COVID-19 time.

In another study [17], the COVID-19 period has lead to digital transformation and provides a range of opportunities to business to go from local level to global level. The period has accelerated the digital transformation among businesses such as retail, restaurants and education. During the COVID-19 period, 52% of startup portfolios have been positively impacted or unaffected, while others also performed reasonably well according to [18]. In [19], the authors identified that the COVID-19 can become an opportunity for air line startups. A framework comprising eight facets called STARTUPS have been proposed. The performance of Polish ICT startups at the time of COVID-19 has been studied in [20]. It has been found that 52% of the startups have experienced a positive impact due to the COVID-19. The crisis has been an opportunity for businesses to transform their operations enhancing customer satisfaction and increased competitiveness.

In [32], it has been observed that people shifted towards established startups during the instability period of COVID-19. In [33], it has been found that remote work attracts the job seekers mores. A thematic analysis on agri-startups attitude during the COVID-19 was studied in [34]. [36] identified that firm entry increases in UK and overall during the pandemic and there is a great deal of business creation in COVID-19 times. The study on the grow of Fintech during the pandemic time in MENA regions have been performed in [37]. The rise of startups during the time of pandemic has been analyzed in [39]. In [40], it has been identified that crowd funding played a major role for filling the gaps for startups that was created due to commercial banks and venture capitalist becoming cautious at the time of pandemic. The authors in [41] analyzed the resilience

of Peruvian startups during the pandemic time using Lengnick-Hall framework. The impact of COVID-19 on entrepreneurship in Morocco has been performed in [42].

A number of studies have been done for Pakistani startups. According to [21], there is a negative impact of fear of COVID-19, stress and anxiety amongst the startups. The policy makers should work to address these fears. In [22], COVID-19 has been identified as a detrimental factor for SMEs in Pakistan. The authors proposed theory of Business Model, Technology, and Innovation, along with Modern Portfolio Theory for these SMEs to endure the challenges of COVID-19. Customer adoption of online food delivery services during the COVID-19 period has been investigated in [23].

In a distinct direction, the rise of wearable devices during Covid19 period has been investigated through a systematic literature review in [19]. An analysis of sentiments of people during COVID-19 period has been performed in [28]. In miscellaneous studies, the resilience of startups during the crisis time of COVID-19 was studied in [35]. In another study, the challenges that entrepreneurs faced during the time of COVID-19 was analyzed in [38].

After having an extensive literature review, it has been concluded that there are literature from both perspectives i.e. evidences regarding positive and negative impacts of COVID-19 on startups. However, a critical study on the existing work shows that there is little work on the impact of pandemic on startups in Pakistani environment. So, the paper presents a study on the rise of startup due to COVID-19 in Pakistani environment. In the next section, we will perform a qualitative study on why COVID-19 can be considered as an opportunity for startups. Then, the quantitative study is presented.

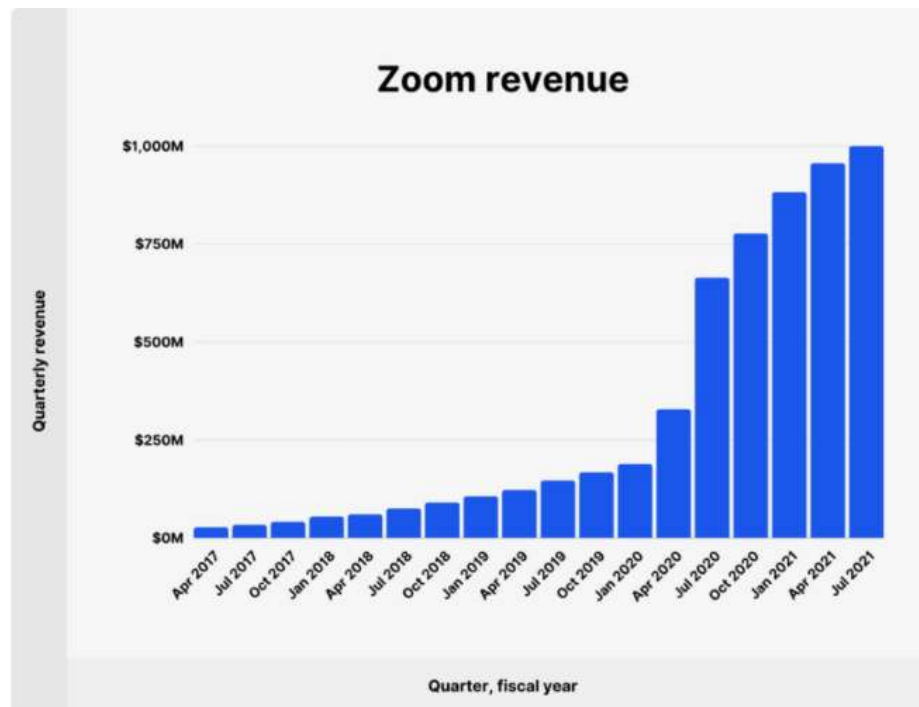
3. The rise of startups during COVID-19

The startups are a backbone to any economy that creates employment and income opportunities [1]. Especially in the developing or emerging countries, these startups are playing a vital role to improve the economy of the country. In both developed and emerging countries the startups accounts for around 40% to 60% of the total global GDP [2]. It is a fact that developing countries like India has improved its economy by exporting most of its technical skills as it becomes hub of information technology increasing its GDP to 7.5%. This has made the other underdeveloped countries to introduce schemes to promote the young generation to take part in economic growth as well as advancement and innovation within the field of technology. This can allow the export of the national or local products and services which are also few of the most important aspects in economic and employment growth as 40% of GDP accounts for industrial production and 35% for exports alone [3]. According to [5], “without startups, there would be no net job growth in the US economy. From 1977 to 2005, existing companies were net job destroyers, losing 1 million net

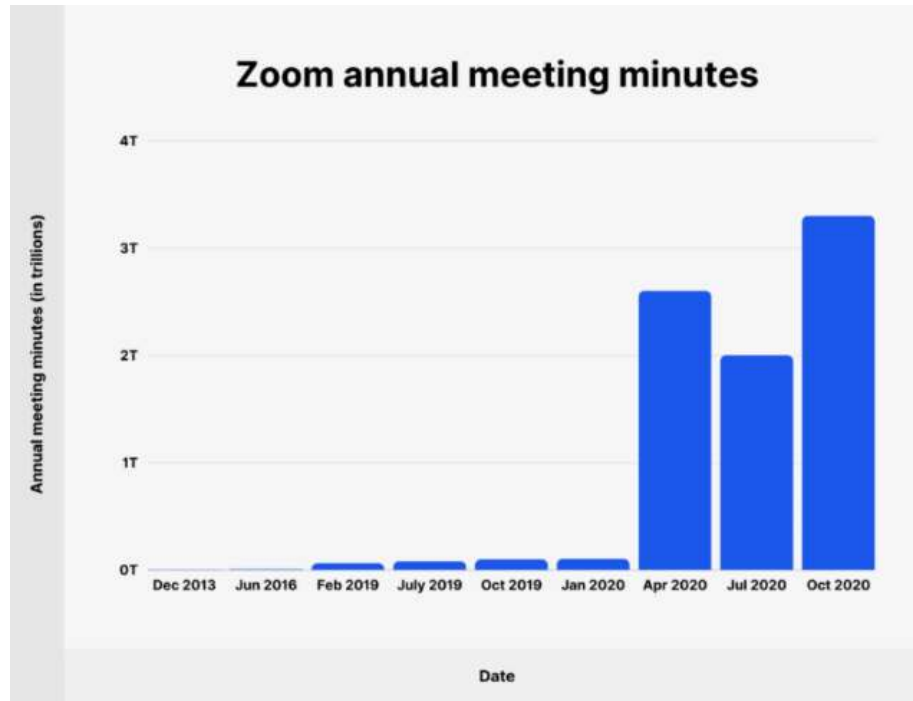
jobs per year. New businesses in their first year, added an average of 3 million jobs annually, according to [4].

The COVID-19 pandemic has disrupted many things including the daily routine of the people globally and the societies were under lockdown and were urged to maintain social distancing to halt the spread of the deadly virus. During this time many people realized their strengths and weaknesses and the time gave them an opportunity to self-reflect. The creative ideas were born and many people saw it as a time to sell their ideas to improve the lives of others. As mentioned by the [5], 69 percent of the US entrepreneurs start their businesses at home. The pandemic's uncertainty to the life has elevated the spirits of the people to take more risks as an entrepreneur where majority of the people supports to start a company. [6]

The fact that entrepreneurial qualities within the people has also been increasing can be shown below as more incubators and accelerators are increasing from two to twenty-four since 2012 only within developing countries, to support new visionaries with increase of number of investors. [7]. The startup can go a long way with a good mission and vision but can only be sustained if constant innovation and technology is integrated into the system which allows it to grow exponentially. For example, Zoom meetings before pandemic hit was not generating enough income but as soon as the pandemic had hit and all the lockdowns were implemented the users, usage and revenue has grown exponentially [8] as shown in Figure 2.



a. Zoom revenue



b. Meetings from zoom

Date	Number of daily meeting participants
December 31, 2019	10 million
March 31, 2020	200 million
April 21, 2020	300 million

c. Revenue from Zoom has increased considerably in four months

Figure 2: Zoom revenue and meeting statistics [23]

This shows the fact that with even such a surge Zoom had prepared itself to tackle such an enormous traffic that was coming its way during the pandemic as the vision of the company states “video communications empowering people to accomplish more” and the values to be “Community, Customers, Company, Teammates, Selves” [9]. This led to the following conclusion: *startups which are directly dependent on the internet are bound to grow when it meets the customer’s demands.*

In addition, the need for utilization of the financial services through internet significantly increased when the transactions of physical currency were banned in order to stop the dispersion of the deadly virus. Many institutions found the opportunity to extend their services by providing incentives to the consumers. From banking sectors to Foreign Exchange to Stock Exchange to Crypto Exchanges all the categories providing the optimal and best experience to the user with the convenience of operating it from the home rather than going to their physical office. This provision

of the financial services with the aid of technology through the internet is called fintech, financial-technology.

The traditional financial institutions are engaging with fintech startups either as investors or strategic partnerships in particular niches either to build economic models just like of banks, or to improve technology for the financial institutions, or to monetize current user data with higher level of customer engagement. According to Mckinsey Panorama almost 80% of financial institutions have entered into financial partnerships meanwhile, global venture capital fintech investment in 2018 has already reached \$30.8 billion, from \$1.8billion in 2011 and ever increasing from the common public too since the control from central entities has been shifting to decentralized model for financial transactions where people have more autonomy to their finances [10]. Figure 3 shows the fintech investments.

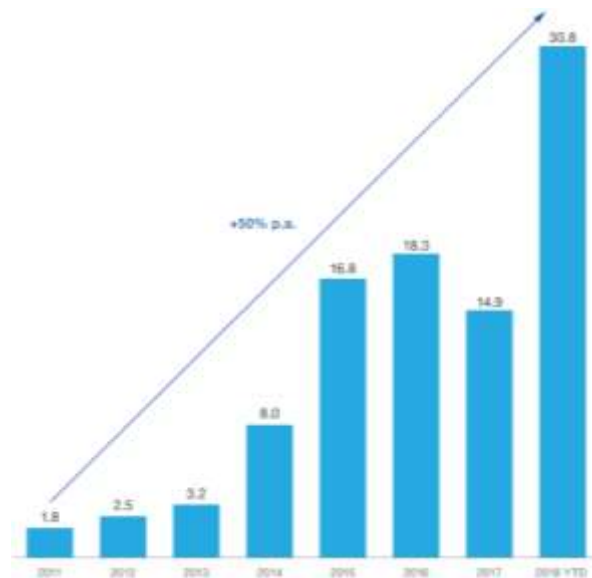


Figure 3: Fintech investments [29]

According to the [11], majority of the modern startups gravitate towards the internet and modern technologies. The breakdown can be as follows from among the majority of the startups 7.1% for Fintech, 6.8% for Life Sciences and Healthcare, 5.0% for Artificial Intelligence, 4.7% for Gaming, 3.3% for AdTech ad 2.8% for EdTech. This has been highlighted in Figure 4.

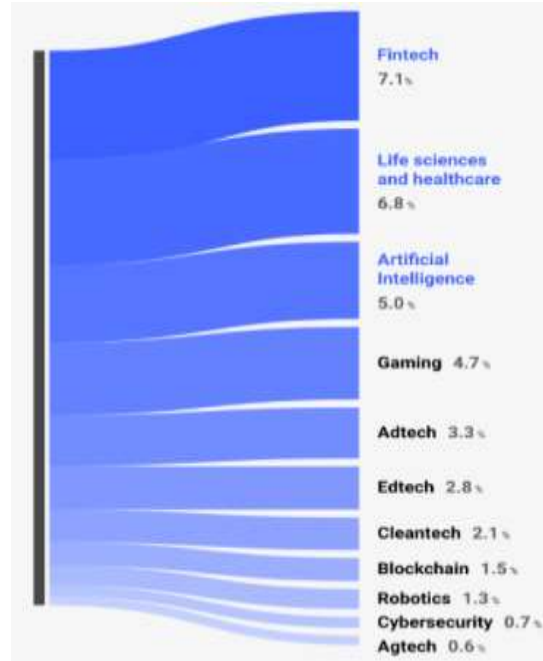


Figure 4: Interest of startups towards modern technology [30]

4. Methodology for Quantitative study

In order to analyze the trend related to rise of startup, a questionnaire was developed and responses were collected from people in Karachi. The following section highlights the data and questionnaire along with the survey details. The analysis has been performed in next section.

a. Dataset description

In order to obtain the relevant data, ordinary people were surveyed to get a sense of whether or not there was an increase in startups or if people were thinking of quitting their jobs and starting a business permanently due to the COVID-19 uncertainties. The research approach that was chosen is basically a quantitative approach where the individuals were asked to answer a series of questions and the answers were based on a Likert scale also known as a rating scale where the individuals can give their responses on a scale of 1-5 where 1 is the category where people strongly disagreed and 5 is the category where people strongly agreed with the given statement. Table 1 provides the summary of research methodology adopted. It can be seen that convenience sampling has been done for this study. The questionnaires were distributed through online forms as well as through physical channels. For this survey, Karachi has been chosen because it is the economic hub of Pakistan. It has a vibrant economy and has a good talent pool. Additionally, the city provides a great deal of strategic advantages for the startups. In addition, there is an influx of foreign investors in Karachi as compared to other cities of the country.

Table 1: Summary of research methodology

Parameter	Value
Research type	Quantitative
Response type	Likert scale
Response data type	Ordinal
Number of responses	79
Tool for analysis	Python
Sampling type	Convenience sampling

The survey asked the individuals a diverse set of questions to get a sense of the startups that might have sprung up due to COVID-19 and might just still after the world has now learnt to live with this virus. A total of 79 responses were collected and since the answers were based on a Likert scale, the data types of all the questions are ordinal. After the dataset has been collected, the next step is the cleaning and transformation process where certain analysis is going to be made.

b. Questionnaire and preprocessing

Python has been used as the language for analysis. After importing the dataset in the Jupyter Notebook, the first step was to access what shape the dataset was in. Taking a first look at the dataset, there is a column that was generated when downloading the dataset from the Google Forms which is the 'Timestamp' column. This column wasn't needed and was removed from the final dataset. The next step is to perform the different statistical tests to determine the hypothesis of whether or not there was an increase in startups during the COVID-19 pandemic or if people are thinking of quitting their jobs and starting their own business. A total of 12 questions were asked and in order to do the statistical tests the questions were divided on the basis of certain categories in order to do the analysis and come up with a verdict. Figure 5 shows the questionnaire and Figure 6 shows the snapshot of the responses gathered.

1. During the COVID-19 pandemic lockdowns, people are getting more creative ideas for starting a startup?
2. Availability of time during lockdown introduced people to the idea of having their own startup?
3. Do you agree with the following statement: One of the reasons of the rise in startups is the increase in entrepreneurial qualities within people (That is taking more risk for a better life).
4. Digital startups are more successful compared to the traditional ones (involving a proper setup)?

5. Do you think people are more inclined towards traditional startup models (involving a physical setup)?
6. You have a better experience shopping digitally rather than shopping through brick-and-mortar stores.
7. Do you think that once the pandemic ends, people will still prefer to have their own startups rather than carrying on with their traditional jobs?
8. You are satisfied by the quality of products delivered to your home when you shop online (includes food delivered)
9. How much it is likely that investors would want to invest in a startup that is not a traditional one?
10. Investors look for the teams' experience and profile before investing in a startup.
11. Investors look for vision and mission of the startup before investing in a startup.
12. In your opinion, what kind of startup would be more successful during the COVID-19 pandemic?

Figure 5: The questionnaire to identify the rise of startup during COVID-19

During the Availability of Digital products Do you think you have? Do you think you are satisfied? How much do investors look for? In your opinion, what kind of startup would be more successful during the Covid-19 pandemic?									
4	2	5	5	5	3	5	4	3	5 Small business startups (Description: Hairdressers, Bakers)
4	5	5	4	4	5	5	5	4	5 Scalable startups (Description: Started small and scaled, e.g. Google, Facebook, Twitter)
4	5	4	3	4	2	4	3	3	4 Scalable startups (Description: Started small and scaled, e.g. Google, Facebook, Twitter)
4	4	4	3	3	4	4	4	4	5 Buyable startups (Description: Sold to a larger company for a huge sum)
5	5	4	4	4	4	4	4	3	5 Scalable startups (Description: Started small and scaled, e.g. Google, Facebook, Twitter)
3	4	3	4	5	2	4	4	3	5 Lifestyle startups (Description: People with hobbies working on their passion)
4	4	3	5	3	3	4	3	1	4 Social startups (Description: NGO's, Charities, etc.)
4	3	2	5	4	4	4	4	4	5 Buyable startups (Description: Sold to a larger company for a huge sum)
5	1	5	5	4	1	5	3	1	5 Lifestyle startups (Description: People with hobbies working on their passion)
5	4	3	4	4	4	4	4	4	4 Buyable startups (Description: Sold to a larger company for a huge sum)
3	4	2	5	1	4	3	4	4	4 Lifestyle startups (Description: People with hobbies working on their passion)
2	1	2	3	3	5	3	2	3	2 Scalable startups (Description: Started small and scaled, e.g. Google, Facebook, Twitter)
3	5	5	5	3	1	2	1	5	5 Lifestyle startups (Description: People with hobbies working on their passion)
5	5	2	4	4	5	4	4	4	3 Scalable startups (Description: Started small and scaled, e.g. Google, Facebook, Twitter)
4	5	5	3	2	2	3	2	4	5 Scalable startups (Description: Started small and scaled, e.g. Google, Facebook, Twitter)
3	3	3	3	3	3	3	3	2	3 Big business startups (Description: Large companies creating new innovative products)

Figure 6: Snapshot of the response

5. Results & analysis

In order to analyze the trends, a series of statistical tests are performed. We will analyze the results based on the null hypothesis and alternate hypothesis against the different categories of questions.

a. Analyzing Question 1 & 2

The first category of the question is asking some individuals of starting a startup. The null hypothesis is whether people want to have their own startup during the pandemic and the alternate hypothesis is that people don't want it. Non-parametric tests are used for the analysis which includes Spearman's correlation and the Anova test. Asking the question of having creative ideas

of a starting a startup and the other question of having their own startup during lockdown results in the Spearman correlation value of - 0.5407.

Note that the Spearman correlation can take values between +1 and -1, and the value of 0.5407 indicates that there is a strong correlation between starting a startup and having their own startup. Looking at the Anova test, the value that needs to be looked at is the p-value which if it is less than 0.05 than it indicates that the result of the correlation between the two questions is not statistically significant which indicates that the null hypothesis should be accepted. Figure 7 shows the results.

Spearman Correlation		0.541	Anova: Single Factor								
Question #01				SUMMARY							
				Groups	Count	Sum	Average	Variance			
Strongly Disagree	1	Strongly Disagree (%)	1%	1. During the Covid-19 pandemic lockdowns, people are getting more creative ideas for starting a startup?	79	328	4.1519	0.74586			
Disagree	1	Disagree (%)	1%	2. Availability of time during lockdown introduced people to the idea of having their own startup?	79	319	4.03798	1.06264			
Neutral	15	Neutral (%)	19%								
Agree	30	Agree (%)	38%								
Strongly Agree	32	Strongly Agree (%)	41%	ANOVA							
				Source of Variation	SS	df	MS	F	P-value	F crit	
Question #02				Between Groups	0.51266	1	0.51266	0.56694	0.45261	3.90176	
				Within Groups	141.063	156	0.90425				
Strongly Disagree	3	Strongly Disagree (%)	4%								
Disagree	2	Disagree (%)	3%	Total	141.576	157					
Neutral	16	Neutral (%)	20%								
Agree	26	Agree (%)	33%								

Strongly Agree	32	Strongly Agree (%)	41%
Total Responses	79		

Figure 7: Results for Q1 & Q2 i.e. starting a startup

b. Analyzing Question 3,4 & 5

The next category of questions is if people prefer to start a digital startup or a traditional one. The null hypothesis is that the digital startup is better than a traditional one and the alternate is the opposite is true. There is not a strong correlation between the questions which indicates that they are not influencing each other. The p-value is also smaller on two occasions where it indicates that people prefer the digital startup over the traditional and that it will be more successful and also investors would invest in it as well. On the other occasion if it is a traditional startup then people would also prefer it and investors will also invest in it too. Figure 8 shows the results.

Spearman Correlation	SUMMARY			
01	0.1001			
Spearman Correlation		Groups		
02	0.06587	Count	Sum	Average
			Variance	

Spearman Correlation				4. Digital startups are more successful compared to the traditional ones (involving a proper setup)?						
0.19995				79 328 4.1519 0.848426						
				6. Do you think people are more inclined towards traditional startup models (involving a physical setup)?						
				79 264 3.34177 0.920156						
Question #03										
				ANOVA						
Strongly Disagree	1	Strongly Disagree (%)	1%							
Disagree	2	Disagree (%)	3%	<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Neutral	16	Neutral (%)	20%	Between Groups	25.9241	1	25.9241	29.3162	2.28E-07	3.901761
Agree	25	Agree (%)	32%	Within Groups	137.949	156	0.88429			
Strongly Agree	35	Strongly Agree (%)	44%							
				Total	163.873	157				
Question #04										
Strongly Disagree	8	Strongly Disagree (%)	10%	Anova: Single Factor						
Disagree	7	Disagree (%)	9%							
Neutral	34	Neutral (%)	43%	SUMMARY						
Agree	26	Agree (%)	33%	<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		

Strongly Agree	8	Strongly Agree (%)	10%	6. Do you think people are more inclined towards traditional startup models (involving a physical setup)?	79	264	3.34177	0.920156	
				10. How much it is likely that investors would want to invest in a startup that is not a traditional one?	79	272	3.44304	1.044791	
Question #05									
Strongly Disagree	4	Strongly Disagree (%)	5%	ANOVA					
Disagree	8	Disagree (%)	10%	Source of Variation	SS	df	MS	F	P-value
Neutral	27	Neutral (%)	34%	Between Groups	0.40506	1	0.40506	0.412289	0.52175
Agree	29	Agree (%)	37%	Within Groups	153.266	156	0.98247		3.901761
Strongly Agree	11	Strongly Agree (%)	14%						
				Total	153.671	157			
Total Responses	79								

Figure 8: Results for Q 3,4 & 5 i.e. people's preference about startup

Spearman Correlation	0.517 477		Anova: Single Factor							
Question #06				SUMMARY						
					Groups	Coun- t	Su- m	Aver- age	Varia- nce	
Strongly Disagree	7	Strongly Disagree (%)	9%	8. You have a better experience shopping digitally rather than shopping through brick-and-mortar stores.		79	24 6	3.113 924	1.230 445	
Disagree	14	Disagree (%)	18%	9. You are satisfied by the quality of products delivered to your home when you shop online (includes food delivered)		79	25 7	3.253 165	1.088 932	
Neutral	30	Neutral (%)	38%							
Agree	19	Agree (%)	24%							
Strongly Agree	9	Strongly Agree (%)	11%	ANOVA						
					Source of Variation	SS	df	MS	F	P-value
Question #07				Between Groups		0.765 823		0.765 823	0.660 369	0.417 668
				Within Groups		180.9 114	15 6	1.159 688		
Strongly Disagree	6	Strongly Disagree (%)	8%							
Disagree	10	Disagree (%)	13%	Total		181.6 772	15 7			
Neutral	28	Neutral (%)	35%							
Agree	28	Agree (%)	35%							

Strongly Agree	7	Strongly Agree (%)	9%
Total Responses	79		

Figure 9: Results for Q. 6 & 7 i.e. satisfaction over online shopping

d. Analyzing Question 8 & 9

The next category of question is that if people would want to return to their jobs or continue their startup. The null hypothesis is people want to continue their startups and not their jobs. There is a small correlation between the questions and the p-value is very large. The null hypothesis should be accepted and the alternate should be rejected that people would want to continue their jobs over their own startups. Figure 10 shows the results.

Spearman Correlation	0.37	Anova: Single Factor							
Question #08	SUMMARY								
				<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>	
Strongly Disagree	2	Strongly Disagree (%)	3%	5. Do you agree with the following statement: One of the reasons of the rise in startups is the increase in entrepreneurial qualities within people (That is taking more risk for a better life).	79	305	3.86076	1.09575	

Disagree	6	Disagree (%)	8%	13. Do you think that once the pandemic ends, people will still prefer to have their own startups rather than carrying on with their traditional jobs?	79	310	3.92405	1.148
Neutral	19	Neutral (%)	24%					
Agree	26	Agree (%)	33%					
Strongly Agree	26	Strongly Agree (%)	33%	ANOVA				
					<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>
Question #09					Between Groups	0.15823	1	0.15823
					Within Groups	175.013	156	1.12188
					Total	175.171	157	
								<i>F</i>
								<i>P-value</i>
								<i>F crit</i>
Strongly Disagree	2	Strongly Disagree (%)	3%					
Disagree	7	Disagree (%)	9%					
Neutral	15	Neutral (%)	19%					
Agree	26	Agree (%)	33%					
Strongly Agree	29	Strongly Agree (%)	37%					

Total Responses 79

Figure 10: Results for 8 & 9 i.e. preferences for job over startup

e. Analyzing Question 10 & 11

The next category of question is to determine whether or not investors look for some experience and vision before investing in a startup. The null hypothesis is that they do not and the alternate is that they do. There is not a strong correlation and the p-value is small as well i.e., less than 0.05. The null hypothesis is rejected which means investors look for experience and the vision and mission in a team before investing in a startup. Figure 11 shows the results.

Spearman Correlation		0.29	Anova: Single Factor							
Question #10			SUMMARY							
					Count	Sum	Average	Varian		
				Groups						
Strongly Disagree	3	Strongly Disagree (%)	4%	11. Investors look for the teams' experience and profile before investing in a startup.	79	31	3.9240	0.8659		
				12. Investors look for vision and mission of the startup before investing in a startup.		0	51	53		
Disagree	2	Disagree (%)	3%		79	33	4.2531	0.9094		
						6	65	45		
Neutral	13	Neutral (%)	16%							
Agree	41	Agree (%)	52%							
Strongly Agree	20	Strongly Agree (%)	25%	ANOVA						
									P-	
				Source of Variation	SS	df	MS	F	value	F crit
					4.2784		4.2784	4.8197	0.0296	3.9017
Question #11				Between Groups	81	1	81	44	13	61
					138.48	15	0.8876			
				Within Groups	1	6	99			

Strongly Disagree	2	Strongly Disagree (%)	3%			
					142.75	15
Disagree	1	Disagree (%)	1%	Total	95	7
Neutral	13	Neutral (%)	16%			
Agree	22	Agree (%)	28%			
Strongly Agree	41	Strongly Agree (%)	52%			
Total Responses	79					

Figure 11: Results for Q. 10 & 11 i.e. looking for experience fort start

f. Analyzing Question 12

There is also one question asked in the survey which was purely a qualitative one which asks the individual of which type of startup would succeed the most in the pandemic. This question could not be used in the analysis since it was purely observational and therefore was used in a different type of analysis. A pie chart showing the different responses of the question is shown below in Figure 12. Most people prefer to start small but scalable and then grow. Also people prefer life style and hobby type startups.

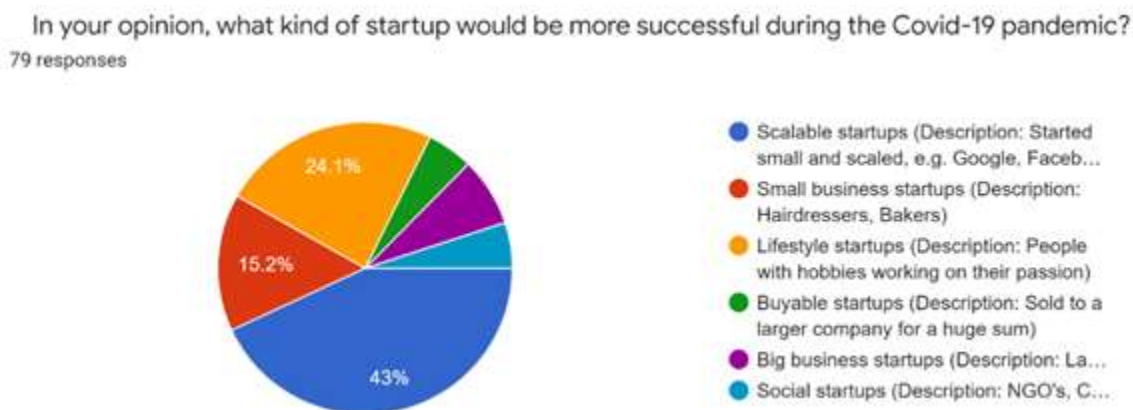


Figure 12: Results for Q. 12 i.e. kind of startup

6. Discussions on Results

A spearman correlation value of 0.5407 indicates that people are more inclined towards startup during COVID-19 because of the availability of the time. In addition, investors are likely to invest more in startups. Also, online shopping is getting popularity. There is a great deal of opportunity for young entrepreneurs to start a company especially in information and communication technology (ICT) sector. People want their own startup and would prefer a traditional one. In addition, people tends to continue their startups over their jobs if it was possible. The investors look for some experience and also look for individuals and startups that have a path and vision and mission before investing in a startup. People believe that those startups will succeed that are scalable and also those as well that are considered lifestyle startups.

It is also concluded that there was an increase in startups during the pandemic, but there wasn't a dramatic increase in it because there was uncertainty during the pandemic and if the startup became successful people will continue with their startup. People like stability and a startup is very unstable when it is in its initial stages therefore, there wasn't a drastic increase in startups but there was some sort of increment in the startups.

7. Conclusion

In this study, a qualitative and quantitative study was performed on startups in the COVID-19 period for a developing country. A questionnaire based survey was performed to determine if there is a rise in startups during COVID-19 and the possible reasons for this rise. The questionnaire asked several questions on a Likert scale. The results were subjected to several statistical tests such as Spearman correlation and ANOVA test. It has been found that people are getting more attractive ideas during startup. People prefer digital startup over traditional ones. Also, people are not happy with online shopping experience. But most importantly, people want to continue as startup instead of traditional jobs. The investors also look for experience for startup. One subject question was asked and it was found that people prefer to start small and then scale it.

There are some limitations of this research. The study was performed for a small population and for one city. In future, this research can be extended to cover people from other countries and cities. Secondly, advanced statistical tests can be employed further such as PLS/SEM and other types of hypothesis testing.

Contribution: NI – writing, TH – writing and implementation, AA – conceptualization and data collection

Funding: There is no funding associated with this research

Data availability: The data pertaining to this research will be made available after publication

References

- [1] Chatterjee, R., Shiwaku, K., Gupta, R.D., Nakano, G., & Shaw, R. (2015). Bangkok to Sendai and beyond: Impact of disaster risk reduction in Asia. *International Journal of Disaster Risk Science*, 6 (2), 177-188. <https://doi.org/10.1007/s13753-015-0055-4>
- [2] Dirga Lestari, Saida Zainurossalamia ZA, Siti Maria, WirasmiWardhani and RizkyYudaruddin (2021). The impact of the COVID-19 epidemic on the performance of small and medium-sized e-commerce users. *Problems and Opinions in Management*, 19 (3), 467-477. doi: 10.21511 / ppm.19 (3) .2021.38
- [3] Igwe, P. A., Amaugo, A. N., Ogundana, O. M., Egere, O. M., &Anigbo, J. M. (2018). Factors affecting the state of investment, SME production and businesses in Nigeria. *European Journal of Sustainable Development*, 7 (1), 182-200. <https://doi.org/10.14207/ejsd.2018.v7n1p182>
- Mbuyisa, B., & Leonard, A. (2017). The role of the use of ICT in SMEs in poverty reduction: A systematic review of literature. *International Development Journal*, 29 (2), 159-197. <https://doi.org/10.1002/jid.3258>

- Sharma, M.K., & Bhagwat, R. (2006). Information system performance: Evidence from selected Indian SMEs. *Journal of Production Technology Management*, 17 (2), 199-223. <https://doi.org/10.1108/17410380610642278>
- [4] Wadhwa, V. (2010, August 14). Startups or Behemoths: Which Will We Bet On? Retrieved from <https://techcrunch.com/2010/08/14/startups-or-behemoths-which-are-we-going-to-bet-on/>
- [5] <https://smallbiztrends.com/2019/03/startup-statistics-small-business.html>
- [6] <https://smallbiztrends.com/2015/06/learning-by-doing-entrepreneurship.html>
- [7] i2i Pakistan Startup Ecosystem Report 2019
- [8] <https://backlinko.com/zoom-users>
- [9] <https://explore.zoom.us/en/about/>
- [10] Jeff Galvin, Feng Han, Sarah Hynes, John Qu, KausikRajgopal, and Arthur Shek. "Synergy and Disruption: Ten Styles That Build Fintech". December 17, 2018. <https://www.mckinsey.com/industries/financial-services/our-insights/synergy-and-disruption-ten-trends-shaping-fintech>
- [11] Artem Minaev. "Getting Started Statistics (2022): 35 Facts and Styles to Know". February 24, 2022. <https://firstsiteguide.com/startup-stats/>
- [12] <http://www.startupranking.com/countries>, last accessed on January 2023
- [13] Kuckertz, A., Brändle, L., Gaudig, A., Hinderer, S., Reyes, C.A.M., Prochotta, A., Steinbrink, K.M. and Berger, E.S., 2020. Startups in times of crisis—A rapid response to the COVID-19 pandemic. *Journal of Business Venturing Insights*, 13, p.e00169.
- [14] Salamzadeh, A. and Dana, L.P., 2021. The coronavirus (COVID-19) pandemic: challenges among Iranian startups. *Journal of Small Business & Entrepreneurship*, 33(5), pp.489-512.
- [15] Hoang, H.V., Nguyen, C. and Nguyen, D.K., 2022. Corporate immunity, national culture and stock returns: Startups amid the COVID-19 pandemic. *International Review of Financial Analysis*, 79, p.101975.
- [16] Naz, F., Karim, S., Houcine, A. and Naeem, M.A., 2022. Fintech growth during COVID-19 in MENA region: current challenges and future prospects. *Electronic Commerce Research*, pp.1-22.
- [17] Soto-Acosta, P., 2020. COVID-19 pandemic: Shifting digital transformation to a high-speed gear. *Information Systems Management*, 37(4), pp.260-266.
- [18] Akehira, S.P., Alcantara, E. and Laforga Jr, A., 2022. Competition and Innovation: The Rise of Startups and Its Effects Towards the Philippines Economy. *Journal of Economics, Finance and Accounting Studies*, 4(1), pp.383-411.

- [19] Channa, A., Popescu, N., Skibinska, J. and Burget, R., 2021. The rise of wearable devices during the COVID-19 pandemic: A systematic review. *Sensors*, 21(17), p.5787.
- [20] Sun, X., Wandelt, S. and Zhang, A., 2022. STARTUPS: Founding airlines during COVID-19-A hopeless endeavor or an ample opportunity for a better aviation system?. *Transport Policy*, 118, pp.10-19.
- [21] Korpysa, J., 2021. ICT startups in Times of COVID-19. In 27th Annual Americas Conference on Information Systems, AMCIS 2021.
- [22] Soomro, B.A., Lakhan, G.R. and Shah, N., 2021. COVID-19 impediments and business start-ups in Pakistan: Evidence from the second wave of the pandemic. *Managerial and Decision Economics*, 42(7), pp.1909-1918.
- [23] Inam, G., Ullah, I., Singh, J. and Arumungam, T., 2020. Diversification, Innovation, and Digitalisation: An Effective Vaccine for Survival of Pakistan's SMEs Amidst COVID'19. *Electronic Journal of Business & Management*, 2, pp.35-45.
- [24] Ali, S., Khalid, N., Javed, H.M.U. and Islam, D.M.Z., 2020. Consumer adoption of online food delivery ordering (OFDO) services in Pakistan: The impact of the COVID-19 pandemic situation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), p.10.
- [25] <https://www.businessinsider.com/ages-of-tech-founders-when-they-started-their-first-companies-2019-4>, last accessed on January, 2023
- [26] Liu, J., Zhu, Y., Serapio, M.G. and Cavusgil, S.T., 2019. The new generation of millennial entrepreneurs: A review and call for research. *International Business Review*, 28(5), p.101581.
- [27] <http://zoom.com>, last accessed on January, 2023
- [28] Baig, S.M.H., Karim, S.D., Islam, N., Baig, M.M.H. and Karim, M.D., Twitter'in tweet'lerine göre COVID-19 hakkındaki genel duyguların analizi.
- [29] <https://www.mckinsey.com/industries/financial-services/our-insights/synergy-and-disruption-ten-trends-shaping-fintech>, last accessed on January, 2023
- [30] <https://www.statista.com/>, last accessed on January, 2023
- [31] Damayanti, S., Sumaedi, S. and Astrini, N., 2024. Studies on start-ups during COVID-19 pandemic: a bibliometric study. *Competitiveness Review: An International Business Journal*, 34(2), pp.305-326.
- [32] Bernstein, S., Townsend, R.R. and Xu, T., 2024. Flight to safety: How economic downturns affect talent flows to startups. *The Review of Financial Studies*, 37(3), pp.837-881.
- [33] Hsu, D.H. and Tambe, P.B., 2024. Remote Work and Job Applicant Diversity: Evidence from Technology Startups. *Management Science*.

- [34] Surisetty, S., Mansingh, P., Nisha, A. and Ihou, A.F., 2024. How do Agri-Startups Perceive the COVID-19 Pandemic: A Thematic Analysis. *International Journal of Religion*, 5(1), pp.391-401.
- [35] Korpysa, J. and Judit, O., 2024. Startups' organizational resilience in post-COVID times. *International Journal of Management and Economics*.
- [36] Bahaj, S., Piton, S. and Savagar, A., 2024. Business creation during COVID-19. *Economic Policy*, p.eiae008.
- [37] Naz, F., Karim, S., Houcine, A. and Naeem, M.A., 2024. Fintech growth during COVID-19 in MENA region: current challenges and future prospects. *Electronic Commerce Research*, 24(1), pp.371-392.
- [38] Sharma, G.D., Kraus, S., Liguori, E., Bamel, U.K. and Chopra, R., 2024. Entrepreneurial challenges of COVID-19: Re-thinking entrepreneurship after the crisis. *Journal of Small Business Management*, 62(2), pp.824-846.
- [39] Zhang, L. and Chen, A., 2024. A Deep Dive into an AI Startup Company in the Pandemic. *Issues in Accounting Education*, 39(2), pp.183-197.
- [40] Reardon, R.S., 2024. COVID-19 and Crowdfunding.
- [41] Alvarez-Salazar, J. and Bazán, M., 2024. Startup growth in pandemic: organizational resilience in an extreme crisis situation. *Management Research: Journal of the Iberoamerican Academy of Management*, (ahead-of-print).
- [42] Benchrif, H. and Karima, L., 2024. Navigating crisis: COVID 19's impact on Entrepreneurship in Morocco. *Journal of Entrepreneurship, Business and Economics*, 11(2), pp.245-274.