

Mitigating Covid-19 Impact on Small Businesses and Startups Using Digital Technologies

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Abstract – The COVID-19 pandemic struck the world with fierceness unprecedented in more than a hundred years. Almost immediately after the outbreak, digital technologies were employed to directly fight the pandemic in manner of tracking the spread of the disease, monitoring the infected people, as well as managing the vaccination process. But, besides the primary global health concerns, there was a secondary impact, i.e. impact on the economy where small businesses and startups appeared to be the most vulnerable. Having this in mind, in this paper, we explore the possibilities of using digital technologies to mitigate the pandemic's devastating impact on the most fragile economic entities. We compiled largely available digital systems that are immediately usable, affordable and appear to be quite adequate to help small businesses and startups survive the pandemic and even boost their income.

I. INTRODUCTION

The sudden attack of SARS-CoV-2 virus at the end of 2019 took the world by surprise, and even the most advanced healthcare systems were unprepared for such highly infectious disease. It swiftly circled around the globe severely affecting public health. As a primary response, the medical institutions promptly reacted to establish medical procedures for treatment of COVID-19. But, knowing the reproduction number of the new infection, it was maybe of greater importance to fight the spread of the disease. For this purpose the main role was given to digital technologies since electronic devices, tools and systems can quickly generate, store and process data. In this manner, multitude of tools for monitoring, detection and prevention of COVID-19 were developed in order to remediate the outbreak. Some of the research that discusses such implementations is presented in the following lines.

Ting, Carin, Dzau and Wong [1] in early 2020 explored the potential application of four inter-related digital technologies, such as Internet of Things (IoT), Big-Data Analytics, Artificial Intelligence (AI) and Blockchain, to augment public-health strategies to prevent the spread of COVID-19 with better detection, monitoring and surveillance of existing and potential COVID-19 patients.

Kumar, Kumar Gupta and Srivastava [2] discuss the various aspects of modern technologies used to fight against COVID-19 crisis at different scales, including medical image processing, disease tracking, prediction outcomes, computational biology and medicines. Most

notably, they speak about using smartphones and Internet to aid in detection and mitigation of the disease impact, the recent advances in technology that can help in effective tracking and quarantine of COVID-19 cases and potential uses of AI in managing the pandemic.

Whitelaw, Mamas, Topol and Van Spall [3] share their viewpoint on the importance of the application of digital technologies in pandemic management and response, i.e. for early surveillance, testing, contact tracing, and strict quarantine. They also emphasize that countries that have adopted these technologies maintained low COVID-19 per-capita mortality rates.

He, Zhang and Li [4] examine the emerging technologies used to mitigate the threats of COVID-19 and provide insights and suggestions into how information systems and technology scholars can help fight the pandemic.

The aforementioned papers tackle the implementation of digital technologies to fight the direct health threats caused by the COVID-19 pandemic. But there was a secondary impact as well, i.e. impact on the economy, where the most vulnerable entities appeared to be small businesses and startups.

For example, Facebook's report from June 2020 [5] surveyed 86,000 owners, managers, and workers in companies across the US with fewer than 500 employees. They summarize that 31% of the small and medium businesses have shut down in the first 3 months of the outbreak in the country. Furthermore, the situation was particularly severe for personal business, among which even 52% reported shutting down.

Bartik et al. [6] in July 2020 published a similar research, reporting that 43% of the businesses in the US stopped working, while the most affected were food, art and sport industries, reducing about 50% of the employees.

In August 2020, the MIT Technology Review [7] published a research that explores the influence of the pandemic on the organizational plans and expectations of businesses during such outbreak. The research was based on a survey of 372 business leaders. Among the most notable conclusions were that 62% of the respondents expected 2020 company revenues to decrease, 25% of them expected decrease of more than 25%, but 90% of them expected accelerated implementation of new technologies in their businesses.

Another research on a similar subject was published in October 2020 by McKinsey & Company [8] that takes a rather different approach. They surveyed 899 executive directors and managers that work in different industries, regions and company sizes. Their research casts light on the acceleration of the planned implementation of digital technologies in their businesses in order to quickly respond to the market demand during such difficult times as the COVID-19 pandemic. The research revealed that digital technologies were implemented 43 times faster than planned, the organization of offerings of online products and services was accelerated 27 times with 20% immediate increase in actual online offers, and the implementation of digital data security increased 19 times faster than expected.

Regarding the startups specifically, Calvino, Criscuolo and Verlhac [9] from the Organization for Economic Co-operation and Development (OECD) in May 2020 published a report tackling the employment growth for startups, concluding that the employments are doubled for startups that implement digital technologies compared to ones that don't. They also report that business formation during COVID-19 declined significantly and has been as severe as 70% in April 2020 in Portugal compared to the same month of prior year, and 46%, 54%, and 58% in Hungary, France, and Turkey, respectively.

De Cuyper, Kucukkeles and Reuben [10] also published a research in June 2020, at the World Economic Forum, tackling pandemic induced problems of startups where they conclude that even more than 70% of startups have had to terminate full-time employee contracts since the start of the COVID-19 pandemic.

This secondary impact of the pandemic, i.e. the devastating consequences to the economy, appeared to be as important to mitigate as the threat to the public health, thus the world needed to react quickly and intensively to alleviate the economy shock. As we mentioned previously, the most affected entities by the COVID-19 outbreak are small businesses and startups. We have also disclosed that digital technologies were immediately applied to fight the spread of the COVID-19 disease. Hence, in this paper we are taking an approach to explore the possibilities to mitigate the devastating impact on small businesses and startups using digital technologies. We compile variety of digital systems and solutions that are available to the public, and seem to be especially useful to these vulnerable entities in such difficult times for economic prosperity.

The rest of this paper is organized as follows. In section 2 we present the digital technologies that are readily available for use, and third section concludes the paper with a brief summary of contribution.

II. DIGITAL TECHNOLOGY TRENDS IN BUSINESS

Everyday more and more businesses implement digital technologies. As elaborated in [9], employment growth is twice as high in business entities that use digital technologies compared to the ones that decided to be non-digital. The COVID-19 pandemic further accelerated the digitization process, which turned out to be quite beneficial to businesses, especially the small entities and

startups. In this chapter we compile several digital technology trends that can help small businesses and startups survive the pandemic and even increase their revenues. The following suggestions do not target a specific industry branch. They are a compilation of available and affordable techniques, trends, applications and systems of digital (Internet) technology that can be easily implemented by vast number of business entities. We organize the implementation of digital technologies in four categories, i.e. (i) teaching courses online, (ii) building e-commerce strategy, (iii) strengthening online presence and (iv) building an online marketing strategy.

A. Teaching courses online

For educational businesses or startups this is a vital step. As people mainly restrain to attend social or other gatherings in Covid-19 pandemic, offering the services online is the crucial step to realize. Even though the teaching as a service mostly implies in person, online teaching is an opportunity to offer educational services to interested parties in their homes and offered to much greater audiences. The possibilities to create online teaching courses include three distinct ways for delivery:

- Online course delivery through web platforms that offer online learning environment;
- Online course delivery through web platforms that offer course delivery by download;
- Online course delivery on own course platform.

Regarding the web platforms for delivery of online courses, some of the most popular ones, as well as most affordable solutions, are presented in the Table I.

TABLE I. COURSE DELIVERY PLATFORMS THAT OFFER ONLINE LEARNING ENVIRONMENT

Platform	Basic/Starter plan
Udemy.com	- No monthly subscriptions; - Undisclosed details before account creation, but usually in the range of 50-75% of the course sales.
Stillshare.com	- 8.25\$/month; - Undisclosed details before account creation.
Teachable.com	- 29\$/month + 5% per transaction; - Unlimited students, videos, courses and hosting.
LearnWorlds.com	- 24\$/month + 5\$ per transaction; - Unlimited courses.
Teachery.co	- 49\$/month; - Unlimited students and courses.
Kartra.com	- 99\$/month; - 50 videos, 20 products.
Podia.com	- 39\$/month.
Systeme.io	- 27\$/month.
Kajabi.com	- 119\$/month.
Pathwright.com	- 99\$/month; - Unlimited courses, 1000 members
Xperificify.com	- 49\$/month; - unlimited courses, unlimited students
Thinkific.com	- Free plan with limited courses; - Unlimited students, Quizzes & surveys, Content hosting, Instant access to your funds.

Among the many platforms for selling online courses, thinkific.com appears as most suitable to begin with. Not only that it is the only platform that offers free option that does not expire, the options included appear even better than many paid plans of other platforms. Some of the more interesting additional features of the free plan include: instant access to funds, full e-commerce solution, courses with any content type, unlimited number of students and detailed reporting & analytics.

To summarize, thinkific.com free option offers complete website builder with content creation tools and included e-commerce solution than can integrate 3rd party payment processors. The online entity will receive a free subdomain and with a paid option it can be replaced with custom domain. The only, partly-undisclosed, feature of the free account is the “limited courses” feature that does not explain what exactly the limitation applies to.

On the other hand, there is always the possibility to offer courses as digital downloads, even though it is not the most appropriate way for courses delivery. Regarding teaching courses, these platforms lack some of the essential features that dedicated course platforms offer, such as video preview of the course, student discussions and student surveys, to name a few.

However, for the sake of completeness, in the the following Table II we present the most popular platforms that offer sales of digital items by download.

TABLE II. COURSE DELIVERY PLATFORMS THAT OFFER COURSE DELIVERY BY DOWNLOAD

Platform	Basic/Starter plan
Shopify.com	- 29\$/month; - Additional 2.9% + 0.3\$ per transaction.
Etsy.com	- 0.2\$/item listing fee for 4 months; - 5% per transaction;
Sellfy.com	- 19\$/month; - 0\$ per transaction; - Unlimited products.
Sellwire.net	- 9\$/month; - Manage up to 10 files; - Unlimited file versions; - Unlimited orders.
Simplegoods.co	- 0\$/month; - 3% per transaction; - Up to 3 products; - 4BG per file; - Works only with Stripe accounts!
Podia.com	- 39\$/month; - Includes custom website
Getdpd.com	- 10\$/month; - 1GB storage space; - 20 products; - Unlimited bandwidth; - Unlimited sales.
Fetchapp.com	- 10\$/month; - 2GB storage space; - Unmetered bandwidth.
Sendowl.com	- 15\$/month; - 30 items; - 3GB storage space.
Payloadz.com	- 29\$/month; - 2.9% + 0.29\$ per transaction

Platform	Basic/Starter plan
Selz.com	- 26\$/month; - 2.9% + 0.3\$ per transaction; - Unlimited products; - Custom online store.

It appears that the best options of this type are Etsy and Simplegoods, but since Simplegoods works with Stripe only (which is not yet supported in many countries), it is not quite suitable at this moment. The next best options are Sellwire and Fetchapp. In comparison to the previous dedicated course delivery platforms, Thinkific appears to be a better solution for delivering online courses.

In essence, delivering any services, including online courses, via own custom platform is always the better solution regarding functionalities and customization. But, these solutions are expensive. From building to hosting, to processing payments etc. As such, these solutions are not recommended as starter solutions and should be employed only after a startup or small business has already built a sustainable community of users and has achieved a steady monthly income.

B. Building e-commerce strategy

E-commerce is the new business norm. It is the form of activity that many businesses cannot survive without. Building an e-commerce strategy is extremely valuable to any entity, and e-commerce solutions are readily available for any business today, regardless of its size or type. There are three different ways to incorporate e-commerce solution and we present them in ascending order of their investment requirements:

- Using well established online marketplaces;
- Using e-commerce platforms to build online store;
- Building a custom online store.

The easiest way to offer products online is by utilizing online marketplaces. According to UK Tech News [11] marketplaces in 2019 contributed 1.7 trillion USD to the world economy and they forecast that this financial impact will grow significantly in the next five years and it is expected to exceed 7 trillion USD in the next five years. This rise is driven by more and more companies embracing marketplaces as their choice to facilitate online sales, which emerged as a perfectly viable solution to expand sales quite substantially, in comparison to the traditional local sales.

Choosing the right online marketplace to sell own products is a challenging task. To be as profitable as possible on these platforms, first we need to identify the best online marketplaces for the brand and products. On the other hand, each online marketplace has its own unique requirements such as product categories, listing fees, subscription fees, commission rates etc. Furthermore, we need to analyze and understand the different strategies for selling on e-commerce marketplaces, to ensure which ones hold the most promise for our products and what are the first steps to undertake to a stable beginning.

In Table III we have compiled a list of nine online marketplaces that hold promise as being among the best solutions for small businesses and startups, among which Bonanza's offer appears as the most appealing.

TABLE III. ONLINE MARKETPLACES

Marketplace	Commission
Etsy.com	5% per sale and 4% + 0.30 EUR per transaction (EU)
Happeno.com	10% per sale and 3.4% + 0.35 EUR per transaction
Bonanza.com	Zero fees for direct sales made through the free referral link. OR 3.5% per sale (min. 0.50 USD)
Ebid.net	5% per sale
Ecrater.com	Zero fees for buyers you bring to the store, OR 2.9% per sale
Asos.com	20% per sale
Poshmark.com	20% per sale
Depop.com	10% per sale

On the other hand, e-commerce platforms offer tools to build online stores. More specifically these platforms offer Software as a Service (SaaS) for quick building of online shops. The majority of such platforms will host the newly built store on their servers as well. In Table IV we present the most popular ones, accompanied with some relevant information.

TABLE IV. E-COMMERCE PLATFORMS

Platform	Basic features	Base pricing
Shopify.com	Online store with included e-commerce website and blog Unlimited products	29 USD / Month
Bigcommerce.com	Online store Unlimited products, storage and bandwidth	29,99 USD / Month
Ecwid.com	Online store 10 products (free) 100 products (\$15/m)	Free 15 USD / Month
Wix.com	Online store Unlimited products and bandwidth	17 USD / Month
Volusion.com	Online store 100 products Unlimited bandwidth	29 USD / Month
Weebly.com	Online store Free domain Unlimited storage	12 USD / month

E-commerce platforms compared to the previous online marketplaces offer e-commerce services that are somewhat more expensive, but using these platforms has some advantages, such as building a standalone store.

Custom e-commerce solutions are the most expensive options and are best suitable for larger companies.

To summarize, online marketplaces presented in Table III are chosen among many other primarily because of

their commission rates. The majority of them charge less than 10% commission, which is an acceptable rate since no other costs, such as for e-commerce website development and hosting, are required to launch and online store. Since different online marketplaces usually have different customers, a good practice is to be present in more than one online marketplace, to ensure higher visitor rates and sales conversions. Using e-commerce platforms is mostly recommended for businesses that are not new and already have some steady revenues. They are a good option for boosting sales or expanding the store in general. Custom e-commerce solution should be employed when the business has grown enough to support the expenses that come along with it, but it is certainly recommended when the time to build such solution is right.

C. Strengthening online presence

Projecting an image of a prosperous business is crucial for its success. Thus, one of the main features that a business should possess is a corporate website. A website is not a means that would attract internet traffic by itself, but it is a vital part of the corporate image that describes the business quality. Having a website and online presence strategy allows marketing the business online. A website is also important because it helps to establish credibility as a business. Another important aspect is that the business can be adequately represented to the customers, and to build trust. A good website gives credibility to the business, but it also helps to give a positive impression that the company is bigger and highly successful. One of the great things about the Internet is that the size of the company does not really matter. Therefore, maybe the website is more important for small businesses than to the big ones. Websites are always available and accessible 24 hours a day. As a result, the existing and potential customers can visit the website and acquire information about the new and upcoming products or services whenever it is convenient for them.

The secondary benefit that should come along with building a business website is the possibility to build a database of email contacts for the users who wish to subscribe to newsletters or other periodicals. An email list enables the business to engage with current and potential customers on a daily, weekly or monthly basis. Some of the tactics to gather new users is to create a gated content that would be visible only to registered users. Additionally Call-To-Action (CTA) can be used on the website and social media pages to promote the email newsletter.

Another good practice is to register the business with web search engines such as Google, Yahoo and Bing. The registration can be easily performed, while registering the business with search engines allows it to be found more easily on searches and it shows up on Google Maps. All that needs to be done is to fill out the registration form and verify the business through their confirmation process, which can be done either with a phone call or by standard mail.

Finally, maybe the most important option to raise online presence are social media. Social media started as a tool for getting exposed, but over a short time it has grown

to become a necessary investment in time for every business to make. Today it is easy to achieve placing ads and offers on a Facebook page or have a direct channel with the customers on Twitter. Similarly, networking on LinkedIn, both at personal and company level, can be another way to help startup businesses promote. Besides standard social networking, a good practice is to employ a media channel of short videos (on YouTube or similar platforms) about the services offered that will act as a teaser advertisement. Depending on the business, other social media can be employed as well.

D. Building an online marketing strategy

There are multiple online tools for marketing support. Depending on their functions, online marketing tools can be classified into several groups, such as:

- E-mail marketing
- Social media marketing
- Search engine marketing
- Online marketplaces marketing

E-mail marketing tools are tools used by marketers to create, send, test, optimize, and report on their email campaigns. Many of these tools are offered in free option, while other, more feature full options are not much expensive. Some of the best e-mail marketing tools are presented in Table V.

TABLE V. E-MAIL MARKETING TOOLS

Tool	Basic features	Base pricing
Mailchimp.com	2000 contacts	Free
Mailerlite.com	1000 subscribers 12000 emails / month	Free
Sendinblue.com	Unlimited contacts 300 emails / day	Free
Convertkit.com	1000 subscribers	Free

Even though these tools offer adequate features in their free plans, they are not necessary and with a little bit of effort e-mail marketing can be easily built when the business has a website and offers subscription possibilities to the users.

Social media marketing is the use of social media platforms to connect with the audience or potential users to increase webstore traffic and increase sales. Advertising on social media comes with a certain costs. In Table VI we present the advertisement prices for the most popular social media platforms.

TABLE VI. SOCIAL MEDIA MARKETING TOOLS

Social media	Base pricing
Facebook.com	About 0.2 – 2.0 USD per click (depending on the industry)
Twitter.com	About 0.2 – 2.0 USD per click
LinkedIn.com	Min 2 USD per click
Instagram.com	About 0.5 – 1 USD per click

Search engine marketing is the use of web search engines to advertise products or services over Internet. In Table VII we present the advertisement prices for the most popular web search engines.

TABLE VII. SEARCH ENGINE MARKETING TOOLS

Search engine	Base pricing
Google.com	Average of 1 to 2 USD per click
Bing.com	
Yahoo.com	

However, we need to bear in mind the conversion rate, i.e. the percentage of clicks that have resulted in purchases. For example, the average conversion rate of Google Ads is about 3,75%, and for social networks is about 2,5%.

Similarly to search engine and social media marketing, online marketing and advertising can be performed directly in the marketplaces presented in Table III. Here we present in detail the marketing and advertising possibilities and expenses for two marketplaces (Etsy and Bonanza), as their conditions and charges appear to be the most suitable for a startup or small business.

Etsy Ads are based on an auction for ad space on Etsy's properties. Etsy enters "bids" for an ad space on behalf of the business based on a daily budget set by the administrator of the business. Thus, the actual costs incurred will vary depending on the number of participants in the auction and their bid amounts. A bid is the maximum amount of money the business will be charged if a buyer clicks on the Etsy Ad. Etsy's calculation of bids is based on information the business administrator provides, such as the daily budget or the listings the business wishes to include for Etsy Ads. Etsy sets the minimum daily budget and each business can set its daily maximum budget for Etsy Ads. To summarize, Etsy Ads prices are variable and therefore are undisclosed in general information. To see the current Ads prices the administrator must go to the Advertising Dashboard in the Shop Manager section of the business user account. The average conversion rate using Etsy Ads appears to be between 1% and 5%, but is varies largely among different industries. Therefore, to calculate whether Etsy Ads will yield more profit, a conversion rate of 2,5% should be considered.

Bonanza's advertising program functions quite differently compared to Etsy's, and appears to offer a program that is the most suitable to small businesses, especially for startup businesses. The main reason for this suitability is because Bonanza advertising is payable only after a sale is made, so there are no prior expenses for advertisements. Bonanza offers their marketing plans in four advertising levels, which consist of a range of fees and benefits:

- Basic level - 9% maximum fee per sale
- Standard level - 13% maximum fee per sale
- Superior level - 19% maximum fee per sale
- Elite level - 30% maximum fee per sale

Higher advertising levels unlock access to additional shopping channels and include a higher ad spend to drive more buyer traffic to the listings. When we combine the “Zero fees for direct sales made through the free referral link” then Bonanza emerges as the primary choice to open an online store.

III. CONCLUSION

Besides the public health issues caused by the COVID-19 pandemic there was a devastating impact to the world economy as well, where the most vulnerable entities were small businesses and startups. To fight the pandemic, digital technologies were immediately deployed, not only to prevent the spread of the disease, but to help vulnerable businesses survive and even boost their revenues. We have compiled four groups of digital technologies, quite appropriate for supporting businesses, i.e. teaching courses online, building e-commerce strategy, strengthening online presence and building an online marketing strategy. We reviewed the most popular systems from each group and we presented the most adequate options for mitigating the impact of the COVID-19 pandemic on the small businesses and startups.

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