

Effects of Digital Divide on the low income & elder community

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## **Introduction**

The digital divide has crippled those who need to stay connected because of Covid-19 and it is an issue that is affecting the citizens at the City of Gonzales. We are communicating with city officials to solve this issue, and are figuring out how to help those who are less fortunate during these hard times. Our goal is to first understand how the pandemic has affected the city which will better help us tackle the digital divide issue. Second, brainstorm and design a solution that may help the city of Gonzales. Lastly, the app will continue to improve to keep people in the know and find ways to access city services easily. We aim to use our skills as computer scientists to create a long term solution to tackle the issue of digital divide in the City of Gonzales.

## **Literature Review**

When Covid took the world into lockdown, the need to be connected on the internet became a mainstream issue, since we have to continue one way or another during lockdown/Covid. In this era of rapid adaptation to new lifestyles, the life we had before Covid-19 is no longer adequate for years to come. For example, organizations, schools, and governing bodies are becoming increasingly involved in getting students and families the need to continue their schooling via virtual learning.

Looking at an article from the New York Times, a story is featured that touches on the hardships that some schools face in these times of the pandemic. The problem found commonly throughout the world: there are so many orders coming in for laptops, but not enough of them

being shipped out to equip those in need. Just focusing on Chromebooks and other low-cost laptops, the high demand found around the globe has “created months long shipment delays and pitted desperate schools against one another” (Browning, 2020). The article shows a total 41% increase from last year in laptop orders, which has strained many tech giants in the race to get schools equipped. It will take some time for orders to be able to ship out to the various countries around the world and solve the digital crisis, while those in waiting must hold on while struggling against the frustrations of the pandemic.

The article brought to light that many across the United States as well have had to suffer, as the case for people in communities such as Santa Fe Indian School in New Mexico depicts. Many of them actually live in tribal homes without any wi-fi access, so they are waiting on SIM-card equipped laptops which don’t need wi-fi to get on the internet (Browning, 2020). Up north of there, all the way up to Idaho, Scott Miller, a principal from the Bonneville Joint School District, shared their frustrations. “Those that are behind continue to get further behind, and it’s through no fault of the kids at all,” a common sentiment found throughout the article. Overall, the article does an excellent job at painting pictures of both personal strife, as well as broader strokes for the U.S. nation as a whole alongside other nations.

Furthermore, the lowest-income communities, and even more so communities of color, suffer more from this. The article does a good job of covering a wide range of different countries with varying degrees of success on getting students connected online. In addition to that article, during an interview from ABC News with the president of the National Education Association, or Becky Pringle, she was able to confirm a study for Pennsylvania had forty-three percent of

colored children in poverty do not have access to the internet (Galaskas, 2020). The source follows closely to patterns that we have observed in other accounts of school tech shortages while also mentioning Pennsylvania, so it does check out. The interview was handled with minimal bias as well.

So far, we generally have an understanding of how a pandemic can make some feel the strain of limited resources and options. There appears to be a lot that happens within the digital divide. Looking at a scientific journal article from “Computers in Human Behavior”, there is an in-depth research project that looked into how those who have computer and internet access fared better compared to those who do not. They found, through a use of quantitative and qualitative methods, that families who were given the chance to use a computer at home with internet access “...as a whole was being positively impacted by having a computer accessible in the home” (Araque, 2013). This included looking up how to learn new skills and better use computers.

In addition to those findings, the article included a broad selection of suggestions from the scientific community that tackled deeper reasons as to how people may not be able to benefit as easily from technology. After reading about how racial stereotyping feeds a self-fulfilling prophecy and how offering access to computers can help curb the effect, as well as reading on middle-aged groups and lower-education participants being tailored to benefit from classes and online meetings, it is safe to say that there is a lot to gain through the expansion of technology across the lower-income communities.

For the states across the country that have to limp by already in a state of internet obsolescence, for example Ohio, an opinion piece in *The Enquirer* laid down their observations and

addressed what needs to be done for such a rural state to leap forward. The author, who goes by the last name Kelly, went to lengths in order to convey that no lone, single project is able to get the state to their goal by itself. They claimed that “lasting solutions will require concerted efforts by state and local governments, educators and the business community” (Allen, 2020). This part does make us wonder: where do we go next after establishing a first step towards internet access for all? Are we truly equipped and well-acquainted with diplomats throughout California to make sure the small, rural City of Monterey is able to keep everyone connected in the current era of electronics? We may just have to keep an eye on our more distant Ohian neighbors to see where we should go from here.

### **Research Question**

How does the digital divide affect the low income and elder community in lesser developed cities of the United States?

### **Research Design**

#### **City Staff Questions**

1. What are some of the most crucial things that people who are not as well off, or set up for the digital age, missing out on?
2. What are some solutions that can close the digital divide?
3. Do you think technology is a necessity or a luxury? Please explain your thoughts.

#### **Community Member Questions**

1. How do you think the governing bodies can help you with all sorts of digital needs during the pandemic?
2. After giving everyone the means to be connected to the internet, do you think that the digital divide will be slim to none or will it widen?
3. What challenges could someone face if they do not have the appropriate means to access the internet?
4. When covid is over do you think the government will continue to provide technology?
5. Do you think technology is a necessity or a luxury? Please explain your thoughts.

The main format of interviewing the volunteers will be virtually done. We are using Zoom's video conferencing software. We have already interviewed two volunteers from the city management - Mr. Rene Mendez, the City Manager of Gonzales and Carmel Gil, the Community Engagement & Strategic Partnerships Director. We are planning to interview two more volunteers who are probably going to be the community members so that we are able to get an idea of what the community thinks about this issue as well.

### **Service Organizations**

The City of Gonzales is perceived as one of the leading cities of South Monterey County and an innovator of comfortable living conditions and ethical development stances. Gonzales mission statement provides us a better understanding of the city's plan - "The City Council and the Staff of the City of Gonzales will realize our Vision by providing the leadership, commitment

and resources necessary to provide excellent services that enhance the quality of life of our diverse community.”

The global pandemic was responsible for many dire changes in the City of Gonzales and the world. City officials were quick to help their citizens but still struggled to efficiently communicate with its citizens. We as a team decided to focus our research into developing a technology that will close the digital divide and facilitate the communication between the city and the citizens.

### **Findings (Mustafa)**

The most common theme was that no one was really ready for this pandemic, and even after we are seven to eight months into the pandemic, most people find it difficult to be comfortable with all these different technologies that are necessary for almost everything. Professionals working from home need to have the skills required to communicate with their colleagues online and work their way through their computers without tech support, whereas students need to know how to attend their classes, submit their assignments online and get familiar with all the necessary softwares. With all these issues being very problematic for the citizens of the City of Gonzales, the management did their utmost to provide the citizens with the required means - one example being them partnering with T-Mobile to provide free hotspots to the citizens who needed them the most. However, many residents still had to buy resources with their own money in order to make it easier for them to do their work from home.

These interviews had been conducted in October and November. The interviewees agreed that people have now understood the importance of how to use all these technologies to work, study and teach from home. It turns out that the city management has a huge role in changing their mentality as by providing all these means for connecting online. They are also helping citizens become familiar with the technologies, so it has really helped everyone across the city.

Another sentiment was that everyone was satisfied with how the governing bodies have helped them through this pandemic and they are confident that they will keep helping them even after the pandemic is over - as one of the community members that we interviewed said, “When COVID is over, I do believe the government will continue to provide technology. With COVID, I believe that people are now realizing the disparity in technological needs within their communities, and I believe they wouldn't simply let these families suffer.” It is very encouraging for everyone to see the management doing everything they can to help the people out during this pandemic.

### **Conclusions (Ethan)**

Our findings in the report reinforce that the global pandemic widened the digital divide. As a result, the need for electronic tools and devices to keep up with the current demands is creating a serious problem that no one saw coming. Our world before is not going to be our world after this pandemic. Governments like Gonzales will need to continue to help its citizens in more ways than just providing basic necessities. Our world has reached a point where connecting through technology is expected, as it is crucial to have important discussions or



meetings when a face to face conversation is not available. It shows in our findings that kids and families who do not have digital tools will fall short in their academics, jobs, livelihood, etc.

Covid-19 is continually putting the status quo to the test as well as providing common struggles to all aspects of human life. The data that we found in our topic can be useful for other areas that are researching other topics as well. The digital divide exacerbates issues when combined with the global pandemic, as it applies to fields who are overtime being switched from analog to digital.

Throughout our interviews with city officials, it can be concluded that the pandemic has caused a new strain where most were not prepared for. Even before this pandemic, the City of Gonzales was providing a means of equity to support families digitally, however the demand now is beyond their normal upkeep. With this information, it really highlights that having internet access and a computer is a necessity to survive in this world and you will be left behind if you don't have it at all.

### **Recommendations (Jonathan)**

A recommendation for the City of Gonzales on how to address the issue of the digital divide is difficult to give because city officials have already been actively working on plans to modernize their city to tackle this issue. As Gonzales officials move forward with the modernization, they should develop a plan to upgrade their technological vocabulary, understanding, and technological infrastructure. It is important to be able to have these pipelines

of communication through tech related services in this age of information. As technology moves forward at an exponential rate it is important to be thinking about what is next and how to utilize these new services that technology has to offer, otherwise they may fall behind as the leading city in south Monterey County. Moving forward it is important to recognize that contingency planning should at least be a consideration.

Being prepared for these natural disasters and updating key parts of the city to build a stronger, and better system should be one of the top priorities. As new tech comes out, these plans should be re-evaluated and continuously integrated and upgraded over time.

Overall, our main recommendation is for officials to get familiar with technological hardware and services. There are many services that tech has to offer that could help their city such as a server center to analyze data that they collect which could improve the efficiency of the city in the future. Most of these services are easily accessible if the city officials work hard to understand the tech and the positive impact it could have on their city.

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## **Appendix A (Mustafa)**

### **Interview with City Manager of the City of Gonzales: Rene Mendez**

This interview was conducted over zoom and the interviewee was chosen based on their position in the city's management. He has had a lot of experience with helping the needs of the people of Gonzales city and knows what challenges the citizens of Gonzales face, especially after the

COVID-19 pandemic has forced everyone to stay in their homes and become comfortable with technological means as in-person meetings have shifted to virtual.

**What are some of the most crucial things that people who are not as well off, or set up for the digital age, missing out on?**

During the time of COVID, it is very important to be set up for the digital age because if not, people will not be able to access any information. The main source of sending and receiving information is the internet these days - Even though some people think using all the different technologies are very simple to use and affordable, there are a lot of people who think otherwise.

**What are some solutions that can close the digital divide?**

What the management of the Gonzalez city has done, is consider technology a priority and a utility. They think that if everyone becomes comfortable with the necessary technological items, it will be very beneficial for everyone to continue working or attending school during COVID-19. The city has already partnered with T-Mobile to provide many hotspots for free to the citizens of Gonzales. One idea they mentioned was that fiber connections can be used in small communities and let the service providers figure out how to give everyone access to the internet. Multiple strategies can be made to overcome these issues and save money while doing it.

**Do you think technology is a necessity or a luxury? Please explain your thoughts.**

There is no doubt that technology is a necessity. Especially during the pandemic, everyone needs to be able to use relevant technologies to continue with their lives.

**Appendix B (Jonathan)**

**Interview with Carmen Gil (Director of Community Engagement)**

This interview was conducted over zoom. When I met with Carmen I thought it would be important to hear her thoughts on the digital divide and how the pandemic was affecting the communities of Gonzales. Carmen is the director of the Community Engagement department at the City of Gonzales offices. Her input and feedback is very beneficial to the development of these communities.

**What are some of the most crucial things that people who are not as well off, or set up for the digital age, missing out on?**

Information, the pandemic has affected the community in many ways. One such effect is the access to resources and information. Normally such information gets posted outside of city buildings or word of mouth on the streets in public. Because of the shelter in place caused by the pandemic, citizens are having difficulty going outside and connecting with people who may know this information. Now most information is posted online and communication is done through social media. Community members who don't have access to a smart phone are missing

out on potentially very important information that can range from safety to city plans to what is happening in the city. Those without these smart phones potentially may fall behind compared to those with smart phones and access to social media sites.

### **What are some solutions that can close the digital divide?**

The City of Gonzales has already been hard at work trying to find ways to close the digital divide. One idea was to set up wifi hotspots throughout the city to help those who don't have access to proper and sufficient internet access. The city is also working on setting up hot spots at all the county libraries for families who are needing wifi access. These are great ideas because it shows that the city cares about its communities, is actively trying to help the citizens, and gives less fortunate people a chance at getting back on track.

### **Do you think technology is a necessity or a luxury? Please explain your thoughts.**

Hearing the answer to this question from an appointed leader in the community gives us a valuable perspective and insight into how the city may respond to the needs of its communities. Our interviewee answered with "Necessity". Communities need to know about information, whether it be opportunities, medical information, as well as school and education. The City of Gonzales took on broadband as their mission because they believe their citizens need technology and access to the internet in the current era.

### **Appendix C (Ethan)**

Interview with Isabel Mendoza (City and Community Staff)

**How do you think the governing bodies can help you with all sorts of digital needs during the pandemic?**

Governing bodies can help with digital needs during the pandemic by collaborating with the school to have different locations where students may use computers should they need them. Each school site has school at various times--LGES from 8am-10:30am, Fairview Middle School just before noon, and Gonzales High School from 1pm-3:15pm--so if they have windows for people to work on schoolwork as well as take their zoom calls a few days out of the week, I think that'd help a lot.

**After giving everyone the means to be connected to the internet, do you think that the digital divide will be slim to none or will it widen?**

After giving everyone the means to be connected to the internet, I think that the digital divide will be slim to none, as the City has advertised this opportunity widely. The City posted on social media and even partnered with the School District to ensure that youth had a means to complete their homework, and this was an idea that came about before the pandemic. Once the pandemic struck, I feel like the City has been trying to help so many people beyond our little town.

**What challenges could someone face if they do not have the appropriate means to access the internet?**

Some of the challenges someone could face if they do not have the appropriate means to access the internet include: failing class, not being able to provide for their families (if their work only allows them to work from home), and their children would have to go to someone else's house for internet, resulting in exposure to potentially getting COVID.

**When covid is over do you think the government will continue to provide technology?**

When COVID is over, I do believe the government will continue to provide technology. With COVID, I believe that people are now realizing the disparity in technological needs within their communities, and I believe they wouldn't simply let these families suffer.

**Do you think technology is a necessity or a luxury? Please explain your thoughts.**

Technology is a necessity, not a luxury. Technology is what we all rely on now--emails, coursework via Google Classroom, Zoom calls for meetings, electronic documents as opposed to physical paper ones, etc.--and it is erroneous for people to say that it is only for the wealthy or a luxury when it is evident that everyone is using it now, and it's become an integral part of everyday life.



### **Literature Review (by Sam)**

#### **How do you think the governing bodies can help you with all sorts of digital needs during the pandemic?**

On an international scale, the various countries have been mostly quick to take emergency action against COVID-19. The general policy is to keep people in their homes and to socially distance with masks on. However, besides financial troubles plaguing people of lower class more than the rest, there has been a distinct difficulty for people to continue their work with school as well as their jobs. Digitally adapting to keep people working and connected is largely a personal matter, when it should be assisted by government taxes to help those who struggle with the pandemic. Largely, it has to do with lacking the needed bandwidth that so many people are stranded in their homes. As made note of in a study from the University of Regina, “the United Nations has declared ... policy makers have a moral responsibility to address internet inequity” (Katapally, 2020).

With that in mind, basic broadband access brought to neighborhoods and cities that have people going without internet access might be one of the best solutions that the U.S. government could get behind. At a national level, whether it’s state legislatures or national mandates we should use to implement this, is up for debate.

**After giving everyone the means to be connected to the internet, do you think that the digital divide will be slim to none or will it widen?**

Theoretically, it should be narrow. How much it will be, and how long it will take to get there, is yet to be seen. But the fact is that going and having more broadband access for all of these different groups, such as the lower class, the elderly, and immigrants, will bridge the gap by a significant portion. In Russia for example, in a study posted in *Telecommunications Policy*, from 2008 to 2018, it was found that the mainstream availability of smart-devices is steadily increasing, while revealing that over time the “defining features of the digital divide become more diverse, and the income factor is still dominant” (Grishchenko, 2020). In other words, the known factors will continue to expand as researchers look over the data in time, and there will still be some work to be done. But in the end, it seems like the trend is pointing towards an equal opportunity for everyone to access digital information, and that divide is narrowing every day.

**What challenges could someone face if they do not have the appropriate means to access the internet?**

There are many things that improve just from having access to the internet, including a student's GPA, skill training, and much more. Looking at a study from the *Journal of Information and Knowledge Management* that tackled Nigeria's developing internet access across the nation, it

was shown in a collection of data that internet users “(46%) use the internet to retrieve relevant academic materials” (Ivwighreghweta, 2014). It even goes on to say that ninety percent of the 4500 respondents noticed that their GPA has improved, so it goes to show that there is a wealth of opportunity one can glean from the internet. But for those that do not have appropriate internet access, things including online meetings and academics will be unavailable to them. The source talked more about the positives of access, but we can deduce that, without those benefits, people would be less successful with school work since they wouldn’t have access to the internet.

**When covid is over do you think the government will continue to provide technology?**

6. Do you think technology is a necessity or a luxury? Please explain your thoughts.