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Back in the early to mid-eighteenth century, England started to see a population boom. With that, more clothing was needed to clothe the growing population. Cottage Industries, in which people spun their clothes in their homes, were not able to keep up with the rapidly growing population. In response, a series of innovations started to shift the production of textiles from these cottage industries to the factory system. Workers in these factories used an invention, the flying shuttle, that had been developed by James Kay. This greatly improved the productivity of the textile industry and England entered the hundred year period known as the Industrial Revolution. Later innovations such as the steam engine, railroads, and iron industry would continue to industrialise England and eventually continue to the United States.

In 2016, many people live much better lives than 200 years ago, but still over 11% of the world's populations does not have enough food to eat. There still remains almost fifty countries that are on the United Nations list of Least Developed Countries (LDCs). Based on several factors such as Human Development Index and indicators of socioeconomic development, these are the countries that have not been able to enter the 'Industrial Revolution' that countries like the United Kingdom have entered. Some people say it is corruption in the government that is stopping these countries from developing. Other people say it is cultural boundaries that need to be overcome. By overcoming these factors, LDCs with the use of modern technology will be able to start 'industrialising'.

Fifty countries still are labeled as developing, but with the increasing access to technology this soon may change. Many of the advancements that came out of the Industrial Revolution were geared towards the mass production of products or to people that had money to make their businesses run more profitably and efficiently. For example, the cotton gin was an invention made to increase the amount of cotton that could be harvested while decreasing the amount of people that were needed to pick the cotton. Yet, many plantation owners increased the number of slaves working in the fields to increase yields. The men and women who worked the fields were just seen as another part of the machine. At that period in time not everyone had a cotton gin, only the wealthy planation owners owned this new innovation. This is in contrast to today where not only is the technology changing at an increasing rate, but also the availability of these innovations is becoming more accessible to the world's poor.

One reason for this is due to remittance. Remittance, is "the funds an expatriate sends to their country of origin via wire, mail, or online transfer. (Investopedia)" According to the World Bank, it is an important source of resources for many developing countries ("World Bank", 14). The report also states in 2014, remittance accounted for $404 billion in 2013 and is projected, by 2016, to account for over half a trillion dollars. Countries rely on it because remittance is more consistently available compared to other economic contributors. For instance, developmental assistance does not even come close to matching the amount brought in by remittance. Remittance is more stable than private debt, and for some countries, like Nepal, it doubles the amount the country could produce by itself. Also, unlike many forms of developmental aid which are usually earmarked, individuals are able to assess where their family have the greatest need and allocate their income based on this need. What is interesting is that LDCs are not alone in

taking advantage of this income. China and India, who both are not labeled as an LDC, brought in a combined $140 billion in 2013 through remittance. If countries as powerful and wealthy as India and China take advantage of remittance, this shows how important the resources LDCs gain through remittance is to LDCs. It is important to reiterate what is key to remember it is not just the money brought back by these labour workers that is important, but the technology they also bring back. Take an item as common in the United States such as an iPhone. Officially, Apple did not sell their products in a handful of countries, yet if you traveled to many of these LDCs there were still people with Apple products. The diffusion of technology through remittance allowed for people in these countries to acquire these devices even though they were not sold there.

Now while not everyone is able to afford an iPhone or a fancy smartphone, much of the world does have a phone. In 2006, over 80% of the world's population was covered by some sort of cell service, a number that has surely grown. In 2012 three-quarters of people on Earth have access to some sort of mobile phone (mobile). The number of people who were on some sort of cell service, post-paid or pre-paid, exponentially increased from just shy of 1 billion in 2000 to over 6 billion in 2012 with nearly 80% of these phones being in developing countries. What we see here is access to technology that was not seen in the Industrial Revolution. This expansion of communication is a defining factor that will enable individuals to access information and use technology to help better their lives.

Among many factors that inhibits countries from developing is corruption. One country that has dealt with corruption from its conception is Nepal. Corruption runs rampant through all veins of the government from party leaders to office administrators. As mentioned in Dr.

Khanal's research, most of the time corruption is a deep rooted problem that is hard to remove (Khanal). Today it is prevalent, especially at lower level jobs, because of the lack of repercussions for being corrupt and because how easy it is to make extra money. Personally, I have seen it many times when I go back home to Nepal. Especially when performing simple, but, timely tasks such as applying for a permit that could take three days to 'process', but by giving the secretary 200 rupees suddenly the you are told to come back tomorrow for the permit.

There are also other factors that play into corruption. Another factor that Dr. Khanal mentions is that higher rates of corruption tend to come with a higher income inequality ratio (Khanal). This seems to perpetuate the income disparity as those with little income and resources continue to fall under the failing social safety net that corruption tears away at. What is also key to remember is that the corruption that occurs in Nepal and many other developing countries is not hidden from the general public. Going off of what Dr. Khanal says in his report, it becomes understood that in order to get any kind of bureaucratic work done one has to contribute to this cycle. This cycle ends up keeping the elite wealthy and does not give others the opportunity to move up the socio-economic ladder due to the rich being able to spend their way to get laws to work for their best interests. At the same time, it prohibits the poor from getting a fair playing field to compete in markets with these elites that control the political system. A report by Transparency International places Nepal 130 out 167 on their Corruption Perception Index for 2015 (Corruption Perception Index, 2015). That's the same position as Iran and below Egypt and Pakistan. This position does not surprise me as I can vividly remember at many parties, my dad talked with his friends about all the different ways ministers in Nepal would take advantage of being in power. One example in particular is that they all request a new Toyota Land Cruiser as

their vehicle, a vehicle that costs over $140,000 in Nepal thanks to a almost 300% import tax, and then when their term is up, they merely take the car with them when they leave office.

A lot of times money is also the root of the problem. In order to be classified as an LDC, the average income per person per year comes out to $2 a day (IMF, 2014). When living pay-check to pay-check and barely getting enough food to eat, it is easy to see the economic reasoning for corruption for lower-level labourers. The same logic can also explains why middle and upper officials accept bribes as well. For many, they grow up in poverty and once they gain power and access to the money that comes along it, it is hard to go back to life as a private citizen where they have no power. This can also explain why officials would take the car as when they leave office. Once they leave, they usually do not have the same connection to money. This cuts off a major source of their income, once again relating to money being the primary reason for corruption. A recent report by the NORAD also found this to be the case. Increasing economic factors and producing a stronger labour market, one that is able to get their basic needs met, will help lessen the reason for government officials to be corrupt and accept these bribes (Dix). It is scary to realise that the sort of corruption that occurs in Nepal is not the worst. It should make everyone cringe that there are almost 40 countries that are even more corrupt. What is even more worrisome for everyone, not just people living in LDCs, is that Transparency International's report labels over 68% of countries have a 'serious corruption' problem and nearly half of the G-20 falls into this category. This means that rooting out corruption is not just a barrier for LDCs in being able to effectively use technology to develop, but also people in the developed world to be aware of and to help combat. Technology is only a small part of the bigger function in helping these countries to develop. Part of the solution for getting rid of corruption is

to allow individuals to have the access to their basic necessities. This relates back to the point of the paper which is that technology, when implemented correctly, can help with the development process of these countries by reducing corruption on an individual level by helping provide for these basic necessities. Through the innovations that are possible with the increasing access to technologies like the Internet and mobiles, innovations that turn into a way of making money. By helping create jobs and lifting individuals out of poverty, technology helps fight corruption in future generations. If people have the basic needs and maybe a little more while growing up then they will be able to attend school rather than working in a factory and receive an eduction. That will enable them to get higher paying jobs that allow them to be less reliant on bribes that they would be inclined to take if they did not have the proper income to support themselves.

Now while the availability of technology has increased, that does not necessarily mean that people in these regions have taken advantage of using them to help make their lives easier. Susan Davis, CEO of BRAC, one of the largest NGOs in the world, talks about in her Harvard Business Review article that merely having access to the Internet or any sort of technology geared to making lives of locals easier does not directly result in them having better lives. One of BRAC's largest projects has been establishing one of the largest mobile banking providers in Bangladesh through their own bank, BRAC Bank. Now to us in the United States, mobile banking is a no-brainer solution and a huge time-saver. Instead of having to make a trip to the local brach, one can now scan a check with their cellphone and through the magic of science, the deposit the money into their account, check their balance, or even transfer funds to another person's account. This was the idea BRAC had when they launched the programme in 2012. Davis states in her article that the goal of introducing mobile banking to Bangladesh was to "help

the hard-working families save time." What ended up happening though was that the farmers would receive an SMS confirmation of their money being deposited and then go to the local branch to confirm with a clerk that their money was actually there. A redundant process, right? Why would one feel the need to go to the branch when he/she already received a confirmation? This is where the lack of cultural understanding prevented a great idea from spreading.

As Davis points out in her article, "most product innovations are geared toward the rich[developed nations]." BRAC's idea process in implementing mobile banking was the same as JP Morgan Chase's here in the United States. What they had not done was take into account the local culture and laws. As explained by Shaman Abed, who runs BRAC's micro finance programme:

> In a country where most people think that the only thing that is irrefutable is hard copy documentation with someone's signature affixed to it, we were asking our borrowers to take a major leap of faith. Some of them said to us: 'If ever there is a dispute and we end up in court, no magistrate or judge will want to see an SMS confirmation. They'll want to see proof' - meaning a hard-copy passbook.

BRAC had failed to see the banking culture that was so dependent on physical hardcopies of payment sheets. With farmers barely making ends meet, there was just too much risk to make the switch to a new style of banking. Especially when it was not supported in the court of law.

Once implemented correctly though, technology can not only make people's lives easier, but also spawn innovation that transforms the society for the better. An example of technology working and helping the people is with Nairobi's semi-formal bus system which formed since the collapse of the national bus system in the 90s. MIT's Department of Urban Studies and Planning

teamed up with University of Nairobi to help map out these bus routes. Though Kenya's capital city has more than three million inhabitants, it lacks a true centralised transportation system like many of its counterparts in other parts of the world. Instead, over 9,000 of privately owned micro-buses take to the overcrowded streets to transport nearly 70% of the lower income and middle class residents everyday (Transportation Licensing Board, 2012). For people unfamiliar with the system, tourists and new residents, waiting in the wrong line can add several hours to a trip. Not only does this help with individuals' travel time, but also with the government's ability to plan future road projects. In one recent road project, the government did not take into account building bus stops on a major highway that is part of several buses routes, a major safety hazard, since they did not have access to a map of all the routes (Williams). With the help of mobiles, the team set out to map the routes used by the various buses and create a visual map. They then converted the data into what is called The General Transit Feed Specification (GTFS), developed by Google as a way of standardising trip information so that mapping software like Google's own Maps could use the information. It is a series of CSV files that shows the transit system's scheduled arrival and departure times for the benefit of the rider (General Transit Feed Specification). While this case study pertains particularly to Nairobi, the paper also highlights other organisations, like the World Bank and developmental organisation from developed countries, like USAID and AusAID, that are trying to do similar things in other cities in the same situation. Through the use of mobiles, the team was able to gather data on the routes that these various buses traveled to create map that is now available to the public. They then transcoded the information into the GTFS standard and now anyone in the world can go to Google Maps to plan

their route in advance. Thanks to the technology of mobiles, Nairobi is now that much closer to having a an easily accessible transit system like many other cities.

What allows this project to succeed, as compared to the initial role out of mobile banking in Bangladesh is Safaricom's ability to know the culture of the people they were marketing the product to. Nairobi is a hotspot for technological innovations in Africa. The mobile penetration rate in Kenya is 80%, above average for the Sub-Saharan Africa region and the number of mobile subscriptions has increased by 1.6% from 2013-2014 (Communication Authority of Kenya, 2014). This is double the rate of Bangladesh, who in the same period had a penetration rate of about 40% (GSMA Country Analysis: Bangladesh). The difference between the two countries is seen with mobile banking. In 2007, M-Pesa, a mobile money solution by Safaricom, a subsidiary of Vodafone, was introduced to the country. It was very similar to that of BRAC's mobile banking, but instead of being a flop, in just two years M-Pesa had 8.5 million subscribers and had transferred roughly $3.7 billion (3% of Kenya's GDP) (Williams, 2015). It was a huge success and this was largely due to Safaricom's ability to gain the trust and understand the users, mainly the poor and middle-class who felt that the banks were not safe place to keep their money due to ethic and political reasons. Through this trust and a more technologically savvy culture, M-Pesa was able to become a huge success in a matter of a few years. The same result is possible with BRAC's mobile banking solution as well. BRAC was not able to identify with the culture of the people like M-Pesa was able to. Now that BRAC has more of an understanding of the culture and the people of Bangladesh, they are able to make their product work for the people of Bengal, which relates back to my point that technology will never be an effective tool for the development of LDCs if it is implemented as a one solution fits all. As the two cases show, the

technology has to be adapted to fit the culture and society of the people in the region. Technology is very personal and there is no reason for it if it does not work into the lifestyle of the end user. This is evident with the Bengali farmers. Even though they had access to everything necessary to implement mobile banking, because it was such a far deviation from their comfort zone they did not want to trust it. Once it is properly implemented though, it allows people to have more time through time saving measures like mobile banking or increase their income through innovations and inventions.

To this point the paper has explained the positives that arise when technology is properly used to help countries develop and the people have an easier and better life. Even though this is promising to many, there are those who believe that this technology carries more risk than reward. Pew Research Centre did a study back in 2015 where they asked users form 32 developing countries what they thought about technology (Pew, 2015). While 64% thought it has a positive effect in education and the economy, over 40% said that it has a bad influence on morals. What does this mean then and why should we care? Well, this can create another barrier for introducing technology to these parts of the world. If people think the Internet, a form of technology, harms morality, they may be inclined to not use it.

While this paper points out there are many reason that have prevented LDCs from developing, it believes that through the proper implementation of technology some of these factors can be overcome. Still, there are many factors up to the individual country to fix before it can enter the developing stage. Some of these include solving internal political problems and securing the basic needs such as water and electricity for its citizens. Faults like these can be solved through improvements to their failing or non-existent infrastructure. Then there are other

countries, like Somalia and South Sudan, which are basically failed states with no working government. What it comes down to is tackling these problems head on to help people get out of poverty and be able to live meaningful lives and contribute to society. The goal of this paper was to highlight how technology, when properly implemented, can help spur innovation and make the lives of people in these countries better. This will result in individuals having more income to put into the economy as well as in their pockets. With individuals having more income the hope is that future generations do not have economic reasons to commit corruption and bribery. That they will eventually fade, resulting in more money coming to help the country. However we help these countries to develop, the end goal is the same: to make poverty be a distant memory that people only experience through their school textbooks.

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