Algorithms in the distribution of COVID-19 relief funds in Zimbabwe: A discourse or actual practice?

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This document represents part of the author's study programme while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

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List of Acronyms

AI	Artificial Intelligence
CCP	Chinese Communist Party
CCZ	Consumer Council of Zimbabwe
CTP	Cash Transfer Programme
GPS	Global Positioning System
ICT	information Communication technology
IFRC	International Federation of Red Cross and Red Crescent Societies.
IT	Information Technology
MDC	Movement for Democratic Change
NGO	Non-Governmental Association
OxCGRT	Oxford COVID-19 Government Response Tracker
POTRAZ	Postal and Telecommunications Regulatory Authority of Zimbabwe
SAPST	The Southern African Parliamentary Support Trust
UAV	Unmanned Aerial Vehicles
UK	United Kingdom
UPR	Universal Periodic Review
USD	United States of America Dollar
Viset	Vendors Initiative for Social and Economic Transformation
WHO	World Health Organisation
Zanu PF	Zimbabwe African National Union Patriotic Front
ZWL	Zimbabwe Dollar

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To the great land of Alkebulan the land of the Ngara WaMambo.

Abstract

In this research paper, I used a qualitative research approach to explore the decision by the government of Zimbabwe to use an algorithm based response to distribute cash relief. I wanted to get an understanding on the discourses at play, politics of decision making, benefits as well as negative effects of using algorithm based responses to disasters. To collect the required data the I used a remote research design to conduct interviews with key informants drawn from various fields such as Information Technology (IT), government, technology experts and civil society organisation. In the analysis of the data, I developed a theoretical framework to set as a basis for analysis and this data was triangulated with secondary data that was collected from documents generated by agencies such as the Auditor General of Zimbabwe. The findings show that the use of the algorithm by government points to alleged abuse of the funds through fraud and corruption, politics of patronage at play, creating exclusions, abuse of power and use of the algorithm to deflect any wrong doing or blame on government. However, the use of the algorithm to make the cash-based transfers has positive impact as it resulted in faster, cheaper and simpler distribution of the funds and also allowed for monitoring and tracking of the funds. The main limitations to the study were the COVID-19 restrictions which hindered in-person interviews and lack of access to some key informants as permission was not granted. To overcome these challenges, I used remote research design and interviewed experts in the field I was researching.

Relevance to development studies

The use of new technologies such as algorithms in humanitarian situations is gaining a lot of traction and prominence, as it allows for cheaper, faster and efficient ways in the delivery of aid. Accordingly, it is important academics to study further the potential strengths, weaknesses, opportunities and threats, that come with the deployment of algorithms in the delivery of immediate relief. The use of technology is also affected by other factors such as politics, power dynamics, community attributes as well as social factors. Therefore, for better decision making governments need to holistically look at the various factors to proffer workable solutions to issues which affect our societies.

Key words

Humanitarian, algorithm, technology, cash relief, disaster, decision, artificial intelligence, humanitarianism, politics, government.

Chapter 1: Introduction

The use of technology and new innovation in disaster response is gaining a lot of traction around the world. Without being left out countries in the global south are also taking a leading role in the adoption of these technologies. The use of technologies such as algorithms or computer programmes to deliver immediate relief in disaster situations brings in efficiency and cheaper ways to deliver relief aid. However, the COVID-19 situation created a new frontier that hindered the smooth targeting of recipients as well as delivery of aid using the traditional innovations. In trying to overcome these challenges the government of Zimbabwe adopted the use of an algorithm in the disbursement of cash relief and this came in with its own opportunities and challenges which the study pursues to uncover. To decode the issue at hand the research was conducted through holding interviews with key informants and experts to gather data that would be triangulated with secondary data from other commissioned researches as well as documents from government agencies. Through the analysis of the data collected a number of negative consequences, challenges as well as the role of politics in the development of algorithms emerged. The discussions in the analysis of the data show that it is important to interrogate policy actions before they are implemented and to also try to find ways to successfully deploy the use of new technologies without major implications on the recipients and creating unwanted results.

1.2 Decrypting the problem

COVID-19 posed as a major challenge to societies as it affected the affluent, businesses whether large or small as well as vulnerable groups such as the poor. Schellekens and Sourrouille (2020) allude that “COVID-19 can be described as a heat-seeking missile speeding toward the most vulnerable in society. That metaphor applies not just to the vulnerable in the rich world; the vulnerable in the rest of the world are not more immune.” With the rapid spread of the virus, countries across the globe scrambled to put in appropriate responses to curb the spread of the virus that the world was unprepared for. Moore M *et al*. (2017) through the application of the Infectious Disease Vulnerability Index found out the world was not prepared for a large scale disaster and their results pointed out that 22 of the 25 most-vulnerable countries are in the African region. However, for the case of COVID-19 Schellekens and Sourrouille (2020) noted that the vast fatalities to the disease were in the high income countries.

Cash and Patel (2020) put forward that history has been changed since the world wars as disease out breaks have affected more so those countries which seemed to be less vulnerable than those nations that were assumed to be vulnerable to disease. The nature and unpredictability of the COVID-19 pandemic resulted in unexpected results that it affected the high-income countries more than the poor in terms of fatalities and infections.

In response to the rapid spread and in trying to contain the virus governments across the world put in various policy measures. Through the Oxford COVID-19 Government Response Tracker (OxCGRT) Hale *et al.* (2020) noted that governments instituted a wide range of responses that included contact tracing, closing of schools, restrictions to travel, bans on public gatherings, investment in healthcare facilities, social welfare provisions among other measures. Lewis and Kelman (2012) posit that, responses to disasters are meant to reduce the risk, however these responses can lead to disaster creation. Hilhorst (2020) argues that COVID-19 is a hazard that turned into a disaster due to the shortfalls of the top to down emergency management responses by policy makers.

For the case of Zimbabwe, the government adopted the use of an algorithm based cash transfer system that posed new opportunities and challenges worth investigating. The International Federation of Red Cross and Red Crescent Societies (2013) states that as new applications of technologies are widely implemented and used during relief efforts by aid agencies the risks and failures of technology become more apparent. Belliveau (2016:300) reassesses that “some technologies may generate new forms of risk, and an over-reliance on technology may foster a widening gap between humanitarians and people in need.” Silcock (2001) reveals that the use of technology has gained ground in its usage thereby changing the way people interact, work, conducting of business by private companies as well as ways in which governments deliver services to the people.

A major challenge to the new system was the targeting of the recipients on how they would be selected since traditionally means testing and assessments were conducted by government personnel on the ground to physically perform the tasks. With the COVID-19 restrictions in place, this meant government personnel from the various agencies could not perform their assessments that were now going to be performed by the algorithm by making assessment on three main variables to identify those

eligible for funding. The three variables analysed were bank account balances, mobile wallet balances and geographical location of the person based on mobile network data (Chipenda and Tom 2021:8). Belliveau (2016) acknowledges this assertion by alluding that that over-dependence on technology might possibly result in the erosion of the practical comprehension and compassion that should direct and inspire the humanitarian response as there will be a wide divergence between the aid workers and those in need. For example, Scott-Smith (2016) posed that bunkerisation prevents aid workers from interacting with aid recipients thus they may lose good awareness of the societies with which they are dealing.

The use of the three variables creates challenges with regards to access to the funds by some venerable communities as it was assumed everyone has a mobile phone or bank account. Some of the most vulnerable people do not have access to a mobile phone or bank accounts, which meant that they would be left out from the selection population by the algorithm. Aiken *et al*. (2021:23) puts froward that "many individuals in LMICs do not own mobile phones. Thus, any targeting system based on mobile phone data may exclude those without phones from receiving program benefits." This challenge is buttressed by Mudzingwa (2020) suggesting that the use of the algorithm creates exclusions as some potential vulnerable groups and families may not be able to access the funds due to lack of access to a mobile phone. This then goes against the findings by Read, Taithe and MacGinty (2016) who reveals that digital technologies in disaster response technology are more accurate, faster and more egalitarian. The International Federation of Red Cross and Red Crescent Societies (2013) and Belliveau (2016) highlight on some of the key challenges that result from the use of technology for example through digital exclusion, cost, biases, compromised impartiality and neutrality, privacy issues among other challenges. Read, Taithe and MacGinty (2016) in their study reference on the challenge on digital exclusions that come up as a result of use of technology. In their study they state that technologies may replicate existing power asymmetries in which those without access to technology tend to be marginalised thus raising questions about technology empowering the vulnerable.

The automation of the process also meant that no human interaction was going to take place that would result in the decrease of the level of understanding of the victim's situation (Scott-Smith (2016). Lack of understanding of the victim's situation would lead

to inadequate solutions to their problem or issue. For example, the government offered ZWL$300 (USD3) as the monthly pay out against a poverty datum line of ZWL$7171 that meant the allowance was grossly inadequate to meet the needs of the recipients (Chipenda and Tom 2021). Innes and Beacon (2021) posit that algorithms can be used in the wrong context for example implementing standardised AI alternatives in complicated situations without sufficient human input to make assessments can result in increased risk of prejudiced decisions as everyone might not fit the mould or the algorithm specifications. This risk associated with use of algorithms was realised in the UK in which an algorithm was used to determine grades of A level students after they failed to sit for their exams due to the COVID-19 pandemic. The use of the algorithm resulted in students from poorer backgrounds to have dramatically downgraded results compared to their richer counterparts in private schools who were awarded considerably higher scores by the algorithms. This resulted in a huge outcry and controversy for the Scottish and UK governments who later performed U-turns, saying exam results would be based on teacher-assessed grades Mahdawi (2020).

Chipenda and Tom (2021) also point to the vague selection process of the recipients as a major challenge to the cash transfer program by the government. They allege that the lack of clarity on the process fuels speculation that the ZANU PF government is at it again to play politics of patronage by only selecting recipients who are associated with the party. This falls in line with claims by the International Federation of Red Cross and Red Crescent Societies (2016) who assert that digital technologies tend to increase the dominance of elite groups voice and accountability. Furthermore, Jiang (2016) notes that algorithms were developed by the Chinese Communist Party (CCP) to link lower-level officials with their political superiors which saw those with political links receiving promotions. This thereby points to the ability of decision makers or those in power to have the ability to influence and manipulate the outcomes when an algorithm is used to pursue their own interests and those who patronise with them. This has also been echoed by Jiang and Zhang's (2020) stance that many researches have shown that in multi-party democracies election competition amplifies political players need to give more resources to co-party members or those who side with them.

With the advancement in technologies especially the growth in use of algorithms and AI, this has further heightened the risks that come with technology and it is important to acknowledge that algorithms can be susceptible to some very significant failings

(Innes and Beacon 2021). Evidence from a study carried out by Obermeyer *et al.* (2019) shows that algorithms do not only produce flawed outcomes but can be biased. Racial biases were noted as a result of an algorithm in which they found out that the algorithm consistently lowered risk scores of black patients compared to white counterparts resulting in lower care costs for black patients than for white patients. To put it into perspective the algorithm resulted in black people receiving on average US$1 800 less per year than the care given to a white person Kendi (2019). Therefore, to test the claims and investigate the allegations around the deployment of the algorithm the study employed the use of a qualitative approach to the research.

1.3 Justification

A number of researchers have studied on algorithms and their various applications in different fields. The stance by Duffield (2018) on the computational turn highlights that, humans have moved from a world that valued reason and agency to a world where society celebrates the transference and ability to think for ourselves to machines thereby resulting in the loss of value of the human being in the decision-making process. In a related study Hoffmann (2019) found out that bias and fairness are central themes in the field of data justice as they directly speak to the hazards that 'big data' and algorithmic decision-making brings when applied to respond to particular situations with the likelihood of worsening unfair distributions of liberal goods such as rights, opportunities and wealth. Chipenda and Tom (2021) in their research on Zimbabwe's Social Policy Response to COVID-19 pointed to potential biases and lack of fairness due to the vague selection of recipients and possible abuse of the fund through politics of patronage by the ruling party ZANU–PF considering its tainted past. The concerns raised by Chipenda and Tom (2021) can be corroborated by the findings of the Zimbabwe Human Rights Commission (2016) report in which village residents in the Mazowe, Dewure Resettlement Scheme, Muzarabani and Buhera North were prejudiced and subjected to bias in the giving out of food rations and farming implements due to their association with a rival party that is the Movement for Democratic Change (MDC).

Obermeyer *et al.* (2019) states that "empirical investigations of algorithmic bias, have been hindered by a key constraint that algorithms deployed on large scales are typically proprietary, making it difficult for independent researchers to dissect them." Devereux and Vincent (2010) in their study researched on the use of alternative

technology such as smart cards, mobile phones, or bank accounts to provide electronic cash transfers to vulnerable groups as a social protection measure by governments and humanitarian organisations. In their study they concluded that technology provides an avenue and holds huge capacity in the delivery of societal protection service particularly if utilised at a nationwide level seizing the positive aspects of its usage towards cost optimality (Devereux and Vincent 2010). With the different debates about the use of AI in disaster response and the emerging negative and positive consequences more imperial evidence is needed to test these approaches. Hence, this research will explore the problem on the use of AI by the government of Zimbabwe to distribute COVID-19 cash relief funds. The case of Zimbabwe gives an opportunity to gather more imperial evidence as it is a first for the country that creates a good learning opportunity not only for Zimbabwe but other countries who seek to use algorithms in the distribution of immediate cash relief.

1.5 The case of Zimbabwe

It all started with a media statement by the Wuhan Municipal Health Commission with news of a viral and lethal pneumonia spreading in Wuhan, Hebei province in China and with the emergence of social media the news spread like a veld fire across the globe. This got the attention of the World Health Organisation (WHO) as the virus was now being detected across the world at an alarming rate. This was a cause for concern and WHO classified COVID-19 as a pandemic on the 11th of March 2020 (WHO 2021). Upon receiving this information and after internal deliberations the government of Zimbabwe on 27 March 2020 declared the COVID-19 pandemic as a national disaster.

This paved way for the allocation of state resources to fight the pandemic (Chipenda and Tom 2021). The Minister of Finance immediately allocated ZWL$600 (approximate value USD$8million) for vulnerable households and small businesses under a cash transfer programme to mitigate the impact of COVID-19 lockdown (Moyo 2020). Chipenda and Tom (2021) state that the aid package included food aid, cash pay-offs, enhancement of healthcare services, monetary incentives for businesses, review of retirement funds among other modalities. The food provisions as well as cash pay-outs were implemented by using the existing modalities in the selection of aid recipients conducted via vulnerability or stress testing.

A challenge then arose when new information came up on the disbursement modalities of the cash pay-outs. Mudzingwa (2020) reveals that the Minister of Finance and

Economic Development indicated that the government was going to be using a "sophisticated algorithm" to determine those eligible to receive funding. The computations by the algorithm assessed the amount of funds in a possible beneficiary's bank account, mobile money wallet and then computes GPS location through the persons phone number and finally calculating and deciding if one is qualified to be a recipient of the cash pay-out (Mudzingwa 2020). Mhlanga (2020) as cited in Nhapi and Dhemba (2020:843) asserts that "it is disconcerting, however, that the government of Zimbabwe will not increase its cushion pay-outs of $200 per family due to inadequate resources, to provide more cover for workers, traders and distressed families owing to disruptions caused by COVID-19."

The statement by the Minister of Finance on the use of technology in disaster response opens up key questions that the research seeks to understand this decision by government. This was done by looking at the decision making rationale whether the risks created by the responses increase or lead to the reduction of the disaster risk while also meeting the needs of those affected by the disaster. Mudzingwa (2020) highlights one key shortfall in the use of the algorithms in which he pointed out that, by disbursing the funds through mobile phone wallets, this created restricted access to relief aid by poorest or those who do not have the luxury to own a cell phone. With the emerging concerns of the citizens with regards to the COVID-19 responses there is need to evaluate and investigate whether the policy responses formulated using an algorithm are achieving their intended goals or exacerbating the disaster risk.

The Southern African Parliamentary Support Trust (Sapst) as quoted by Nyuke (2021) put forward that a number of residents highlighted that they had not taken delivery of food aid and neither did they receive cash pay-outs from the Ministry of Finance. In the evidence received by the parliamentary committee the community members disclosed that their names were recorded on lists with the Ministry of Public Service for the relief aid. However, none had received the cash pay-outs. Furthermore, Mudzingwa (2020) suggests that the laxity shown by people in allowing their data to be accessed and used on the backdrop of the COVID-19 pandemic is a cause for concern as it is unknown how the electronic list will be stored and protected from abuse. Subsequently, it will not be startling if the data harvested is utilised unlawfully at a later point in time when COVID-19 has been subdued. With these negative consequences that are

coming up with regards to the use of the algorithm, this further poses some questions which the research sought to unravel.

1.8 Research questions

The purpose of this qualitative study was to explore why governments are designing and adopting algorithms for cash-based transfers.

Main research question

1. Why did the Zimbabwe government decide to choose AI based system to distribute financial relief in response to the COVID-19 generated disaster?

Sub questions

1. What are the positive benefits of the Zimbabwe's government's decision in using an algorithm in the distribution of immediate relief?
2. What are the negative effects of using an algorithm in disaster response situations to recipients of immediate relief?
3. How does the politics of decision making affect the development of algorithms in selecting recipients of financial aid?

This study seeks benefit the academia, policy makers and humanitarian organisations. This research seeks to contribute to the academic field by enriching and building on knowledge already known, as technology is an ever-evolving field, thus current knowledge will need to be updated continually. Humanitarian organisations and policy makers may benefit from the results of this study if the results point to a need of a review in the way they deploy algorithms in disaster response situations. The study may also benefit vulnerable sections of society or those affected by disasters as responses initiated by policy makers or humanitarian organisations would be improved.

Chapter 2: Exploration of Zimbabwe government's decision.

2.3 Conceptualisation and theoretical framework.

Jabareen (2009:51) defines a conceptual framework "as a network, or "a plane," of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena. The concepts that constitute a conceptual framework support one another, articulate their respective phenomena, and establish a framework-specific philosophy." From the discussion above six main concepts emerge that are the political model of decision making; removal of shame; patronage; corruption; power and post humanitarianism.

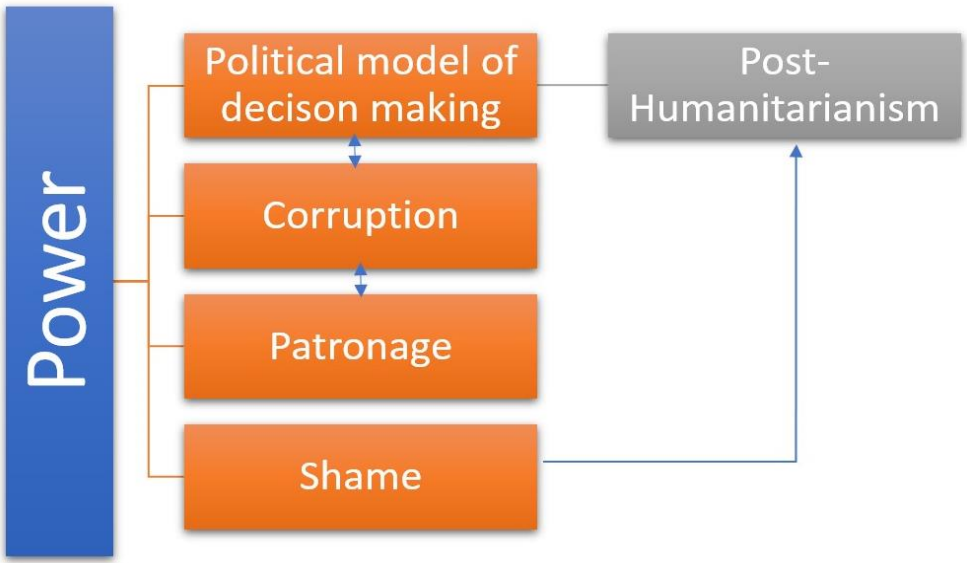


Figure 1: Author (2021) Conceptual framework

Each of the 6 concepts identified above collectively constitute the theoretical framework of why the Zimbabwe government decided to choose AI based system to distribute financial relief in response to the COVID-19 generated disaster. Figure 2 illustrates the conceptual framework and the interwoven relationships between the 6 concepts. Three concepts of decision making, corruption and patronage are directly interlinked to the concept of power by Lukes (1974). The relationship between power and patronage is established when politicians want to sustain their power, they use patronage that is an exchange of service between a client and patron to ensure they remain in power. This relationship is also evident between the concept of power and corruption that is also linked to patronage as politicians or those in power use their influence for personal gain. This is the case for the algorithm as the minister used his

power to influence who receives the aid corruptly and awarding of the tender to a distribution partner Netone which has a small market share in the mobile industry.

The concept of power is also interlinked with the concept of the political decision making in that those in power use their decision making roles to show that they are in control. For example, the minister decided to use is discretion and decided the use of the algorithm to show that he was in control of the COVID-19 induced disaster. This was also a strategic decision as the decision environment created by the COVID-19 pandemic requires robust and fast response to assist those affected by the lockdown measures.

The concept of post humanitarianism is related to 2 concepts which are removal of shame and political model of decision making. This concept of post humanitarianism theorises that capitalism is taking over in disaster response initiatives as solutions are being borrowed from the private sector with the intention to make profits out of a desperate situation that relates to the decision makers decision to use an algorithm in the distribution of the relief funds using a government linked private mobile telecoms company Netone. The concept on removal of shame proposed by Keen (2020) is intertwined by the concept of power and post humanitarianism in that the concept posits that those in power use technology to remove blame on themselves and placing it on machines that cannot be blamed. This was clearly at play when the government of Zimbabwe chose to use the algorithm to deflect blame away from themselves if the algorithm idea could have been a flop and also hide behind the algorithm as the disbursements made through the algorithm where paltry payments. Keen (2020:1154) terms this “to be reinforcing a sense of shamelessness, impunity and complacency to that many policymakers are already highly susceptible.”

2.4. Decision making, politics of patronage, power and corruption.

The government of Zimbabwe used its decision-making role to decide the use of an algorithm to select recipients for the COVID-19 relief funds. Dean and Sharfman (1993) assert that in political model of organisations decisions are spaces in which people or individuals strive to please their own interests. The basis for these preferences is individual objectives against organisational objectives. Therefore, conflict of interest is unavoidable. Harris (1998) defines decision making as the identification and selection of different alternatives basing on the ideals and principles of the one making the decision. To make the choice means there are competing choices and the selection of

the ideal one is based on the intended goals, objective, requirements, standards and so forth.

Harris (1998) goes on to state that decisions are made in the decision environment which is defined as “the collection of information, alternatives, values, and preferences available at the time of the decision.” This could point to the decision by the Minister of Finance in Zimbabwe to select the use of an algorithm to other options available, such as physical distribution of cash by the department of social welfare (Chipenda and Tom 2021). Child, Elbanna and Rodrigues (2010) make the claims that strategic choice is a process in which power holders within organisations make decisions of strategic action based on initiatives within a network of internal and external organizational relationships.

Ennser-Jedenastik (2014) conceptualises patronage as an exchange relationship of goods and services between a client and patron. For example, a party politician allows access to public goods or employment in government in exchange for electoral support, campaign support or party membership to the client. For the case of the algorithm, it cannot be disregarded as allegations pointed to selective access to the COVID-19 relief funds based on political affiliation. Evidence from research carried out by Maringira and Gukurume (2020) shows that in order to appease the youths in Zanu PF its former leader Robert Mugabe would dangle residential stands, and allow extortion by Zanu PF youths on taxi drivers in return for them to mate political violence on rivals. This is a clear example of political patronage and political clientelism where there is an exchange of resources for political support. Chipenda and Tom (2021) also raised concern with regards to the use of the algorithm posing that “it was not clear how recipients to the COVID-19 relief funds would be identified, with fears that the funds would be used for ZANU–PF’s patronage politics, given its chequered past in this regard.” Therefore, the Minister could have also been driven by politics of patronage in solving the local problem by the use of the algorithm.

Panizza *et al* (2021:1) elucidates that patronage “is a tool that politicians use to build, sustain, and project power. That power may be used for personal political gain, or it may be used to control government and public policy.” These goes to show that the minister took the decision to adopt the use of the algorithm to project power and show that he is in control in the midst of the COVID-19 pandemic. Furthermore, the minister showed his control over public policy by clearly stating that the government was going

to be using the algorithm and the selected distribution partner would be the government controlled Netone without any consultations being conducted (Mudzingwa 2020). This shows top down decision making at play normally associated with autocratic leaders. Van Vugt (2004:2) reveals that “autocratic style leaders will do whatever they feel is necessary to provide the common good. They decide that group members should contribute how much without asking anyone for input.” By looking at this stance by the minister brings to the fore the theory of power by Lukes (1974) in which power is understood to in its three dimensions that include decision-making power, non-decision-making power, and ideological power.

This thereby feeds into the concept of corruption in which “patron-client relations often involve extra-legal exchange of favours, and the need to maintain an effective and loyalty following often compels patrons to turn a blind eye on clients’ illicit activities, such as corruption” (Jiang 2016: VI). Corruption is defined as “the unlawful use of official power or influence by an official of the government either to enrich himself or further his course and/or any other person at the expense of the public” (Iyanda 2012:38) For the case of the COVID-19 relief funds the media was awash with publications of alleged corruption that were unearthed by investigative journalists in Zimbabwe and resulted also in the sacking of the minister of health due to corruption allegations (Ndhlovu 2021).

Turpin and Marais (2004) put forward that there are various views and theories of decision making that can be found in literature. Below is a summary of some of the theories to decision making as summarised by Tartar and Hoy (1998:221) as they assessed the question of matching decision strategies or models to 4 situations.

	Classical	Administrative	Mixed scanning	Incremental	Garbage can	Political
Setting goals	Organizational objectives are set prior to alternatives	Objectives usually are set prior to alternatives	Policy guidelines are set prior to alternatives	Objectives and alternatives are interwined	Objectives emerge spontaneously	Objectives emerge spontaneously but are personal
Means-end analysis	Always begins with a means-ends analysis	Frequently begins with a means-ends analysis, but occasionally ends change	Broad ends and tentative means focus the analysis	No means-ends analysis. Means and ends are not separable	Means and ends are independent; chance connects them	Personal ends determine organizational means
Test of a good decision	The best means to an organizational end	A satisfactory organizational outcome	A satisfactory organizational outcome	Decision makers agree that the decisions are in the right direction	Participants agree that the solution and problem match	Personal objectives are accomplished
Guiding principles	Theory	Theory and experience	Theory, experience, and comparison	Experience and comparison	Chance	Power

Table 1: Source Tartar and Hoy (1998:221)

The political model or personal rationality model is relevant to this study as it attempts to explain the rational for the decision making processes by the Minister of Finance in Zimbabwe. Tartar and Hoy (1998) put forward that the political model of decision making characterised by politics as the main factor in coming up with decisions, personal goals drive decision making, personal ends are achieved through organisational goals and the model is a descriptive framework that relies on power to explain decisions. Turpin and Marais (2004:145) view the political decision-making model as “a personalised bargaining process, driven by the agendas of participants rather than rational processes.” This theory could point to the decision making process by the Minister of Finance as Chipenda and Tom (2021) in their research on Zimbabwe's Social Policy Response to COVID-19 pointed out on the possible abuse of COVID-19 relief funds by the Minister of Finance who is a member of the Zanu PF political party. Furthermore, the choice of the use of the algorithm as it allows for discretionary application. Van der Voort *etal* (2019:37) Their paper reveal that “decision makers had discretionary freedom to include, exclude, use or ignore information derived from big data projects. As such, big data does not seem to have had a big impact on the way decision makers legitimized their decisions.”

2.5 Humanitarian technology

The International Federation of Red Cross and Red Crescent Societies (2013:20) states that “humanitarian technology refers to the use and new applications of technology to support efforts at improving access to and quality of prevention,

mitigation, preparedness, response, recovery and rebuilding efforts." The use of these new technologies or new applications creates new frontiers which can either be positive or negative when they are implemented. Therefore, for the case if Zimbabwe the policy makers ought to know if the positives and negatives of deploying the algorithm in the disbursement of the cash relief. However, the COVID-19 situation proved to be a curve ball at the same time as the government had to move swiftly to cushion the vulnerable groups. This meant the government overlooked the negatives and focused on the positives of using the algorithm and had to accept the consequences which come with such a decision.

Jacobsen (2015) points to how other academics theorise technology as constituted and constitutive agency. Under constitutive agency Jacobsen (2015:146) puts forward that "technology does not just influence the making of social order vis-à-vis its use as a means through which to achieve a set of predefined political interests." From this approach we can gather that the use of technology does not only influence social order it is a way to achieve political interests. On the other hand, technology as constituted focuses on science and technology studies to be legitimate and authoritative Jacobsen (2015).

Stephenson and Anderson (1997) noted some of these positives by alluding that new technology and increased connectedness through computer systems have greatly influenced the design of hazard forecasting and relief efforts. The use of technology has resulted in new ways to disaster response such as post humanitarianism posited by Duffield (2016) in that human beings are removed physically from the disaster sites and computer programs or algorithms are used to make assessment of disaster situations and the formulation of disaster response mechanisms. Governments and various institutions are now hoping onto the use of technology in disaster response with policy formulations, manuals, development of algorithms and data analysis as the Zimbabwean government did.

Furthermore, Belliveau (2016) suggests more advantages that come with the use of technology by stating that, new technological advances that have emerged and become widely available in the humanitarian sector offer greater effectiveness of humanitarian actions by improving access and support to persons in need of relief goods and services. Yoo (2018) also put forward that, new gadgets and digital solutions have come into play for example the use of unmanned aerial vehicles (UAV)

‘drones’ for delivering aid and assessing damage in real time and the development of algorithms ‘software’ for example Ushahidi an open-source crisis mapping software. In support of Belliveau’s (2016) views International Federation of Red Cross and Red Crescent Societies (2013) asserts that new ICT tools for humanitarian action have potential in disaster response and assistance delivery as ICT tools can better predict and detect disasters with speed, efficiency and at a greater scale thereby their use results in enhanced matching of risks and responses. Innes and Beacon (2021) preposition that algorithms subsume a genuine function to buttress a wide variety of choices by authorities in improving productivity, reliability and precision of the decision making processes.

With such advantages in the use of technology and the COVID-19 restrictions the use of the algorithm made a lot of sense as speed and efficiency were essential in the distribution of the funds to the recipients as they were in dire need. However, Chipenda and Tom (2021) put forward that cash transfers are not a new phenomenon in Zimbabwe and Africa as a whole. For instance, Zimbabwe’s neighbours Zambia in response to the COVID-19 induced disaster also provided emergency cash transfers (ECT) backed by support from the international donor community to assist poor households to cope with the negative effects of the pandemic (Chipenda and Tom 2021)

Scott-Smith (2016:2230) views humanitarian technology as “the vague call to manage emergency relief in ‘new and better ways’ makes it hard to pin down, but calls to innovate all involve an underlying commitment to novelty, embracing new technologies and shifting focus to ‘new actors’ in the private sector.” The government of Zimbabwe took a leap of faith by embracing new technology to solve a challenge that was on its hand. As Scott-smith (2016) alludes to a shifting of focus to new actors the government is out sourcing knowledge and innovation from the private sector which normally takes a leading role in making new innovations. Government in the global south are perceived as backward and characterised by lack of innovation but for the response to the COVID-19 induced disaster the government of Zimbabwe took a cue to find new and better ways to try and target and distribute aid to those in desperate need of assistance. The New Humanitarian (2020) states that “the rapidly evolving outbreak is pushing aid groups to plan for new responses in communities already facing long-

running crises – and forcing a re-think of how the sector operates when resources are stretched."

From the definitions above we can gather that humanitarian technology refers to the use of new innovations such as algorithms. As such the government of Zimbabwe adopted the use of an algorithm as part of the cocktail of measures to counter the COVID-19 induced disaster. The definition by Scott-Smith (2016) focuses on the incorporation of other players in the private sector as new players to also take part in the formulation of disaster response systems and the use of technology from the private sector.

Duffield (2018) theorises the use of technology in relief efforts as post humanitarianism in which he focuses on three major aspects on how technology is being put to use in humanitarian situations. Firstly, he focuses on the removal of aid workers from the field to work offsite or away from disaster sites. Secondly, he points to the marketisation of disaster relief efforts in which the capitalism is taking a leading role in the automation of disaster relief efforts by use of new technology. Lastly, the theory by Duffield focuses on the devaluation of human thought process in which human agency and thinking capacity is outsourced to computer programmes and the removal of human face to face interaction of aid workers and those in need or the victims (Keen 2020). For example, the theory by Duffield (2018) brings out that technology is taking over human reasoning and agency in which computers are taking over decision making processes as well for example through the use of artificial intelligence.

World Bank's (2015:19) report titled 'Mind, Society and Behaviour' supports the need for post-humanitarianism as a way to overcome the natural limitations on human judgment. For the case of Zimbabwe an algorithm deployed by the Minister of Finance took over human reasoning and judgement as it was used to select potential recipients through making assessments of people's bank accounts balances, mobile phone balances and using GPS location of potential recipients without any human involvement (Mudzingwa 2020). However, the use of the algorithm is limited as it works within the confines of the set parameters to maintain fairness, meaning no deviations can be taken which is quite difficult considering human nature that there are always special circumstances or special cases that can come up (Bijkerk 2018). When special exceptions come up the algorithm would naturally reject a potential beneficiary that might not be the case if a human being could have been in charge of the process as

the human mind is creative and can try to find a solution to the special cases or circumstances of some potential recipients. On the other hand, if technology is used for the case of the algorithm, it creates safeguards which can sometimes counter human flaws for example the automation of the process cuts out the potential threats such as nepotism, fraud and favouritism that are common in human beings (Innes and Beacon 2021). Therefore, taking the human being out of the thought process and automating disaster response efforts has its positive and negative implications. Thus, deployment of this algorithm confirms Duffield's (2018) theory as human agency and reasoning in being taken over by the use of computer programs.

Innes and Beacon (2021) reveal evidence that through machine-learning and algorithms computers are able to do a better job than human experts more efficiently, quickly and cheaply, and on a bigger scale. This could be one of the key reasons why the government deployed the algorithm as the COVID-19 induced disaster required the use of a targeting, selection and disbursement solution which is quick, efficient and cheap to deliver relief to those in need. For example, the New Humanitarian (2020) in its report stated that COVID-19 has resulted in cutting of working hours at ports warehouses, slowing down the movement of relief food. With the slowing down of traditional aid such as food aid the use of cash disbursement was a viable option as it eliminated the obstacles facing traditional delivery of relief aid (New Humanitarian 2020). The harnessing of advance technologies such as AI and algorithms results in greater efficiencies for instance in aiding decision making processes, improved and personalised citizen experience, monitoring services in real time, understanding trends and future behaviours as well as the ability of algorithms to test run policies before they are implemented (Innes and Beacon 2021). To support this claim International Federation of Red Cross and Red Crescent Societies (2013) puts forward that, efficiencies and effectiveness of AI were highlighted through results of an experimental prototype, called Artificial Intelligence for Disaster Response or AIDR which had an accuracy range from 70% to 90%. This algorithm is a free and open-source platform that uses micro-tasking and real-time machine learning to automatically identify informative content on Twitter during disasters (International Federation of Red Cross and Red Crescent Societies 2013).

Duffield (2018) as quoted by Keen (2020:1) presents "post-humanitarianism as an attempt to use technology to understand people's conditions and behaviour often

remotely and without talking with them." The use of the algorithm confirms Duffield's theory as the use of the algorithm resulted in this computer program to carry out assessments remotely without any field officers on the ground. The contagious nature of COVID-19 and lockdowns which were put in place gives credence to the use of the algorithm. As officials were curtailed from travelling thus reducing potential exposure to the rapidly spreading virus. Belliveau (2016) highlights that, humanitarians are leveraging on technology especially in conflict areas where they could face extreme insecurity and threats to their life and safety by turning to 'remote management' to bridge the gap in physical proximity of staff and the conflict area. This assertion is supported by Scott-Smith (2016) positing that most of the technologies that are used in humanitarian action are aimed at increasing the physical scope of aid workers to plot and grasp topographies while located far off from disaster sites.

On the other hand, Keen (2020:1154) defines "post-humanitarianism as the process of removing shame from people who have power and placing it either onto the shoulders of people who don't or onto machines which so far cannot be shamed." This shame being referred to by Keen (2020) could explain why the government of Zimbabwe decided to use the algorithm to make shameless and paltry payments of ZWL$200 equivalent to USD$2,40 per month at the then current bank rate. The use of the algorithm meant that the government had an opportunity to run away from responsibility and accountability to the people as it could blame the use of the algorithm in the disbursement of the meagre allowances stating that its all the work of the algorithm. This goes also with the theory by Keen (2020) on the removal of shame as the government could lay all the blame on the algorithm thereby running away from its responsibilities.

The use of the algorithm by the government of Zimbabwe comes with its risks for example, on the right to privacy in the harvested data used to identify the recipients. Mudzingwa (2020) raises concerns that due to the COVID-19 crisis people relax in the way their user data was handled not knowing what will happen to the database of recipients after funds have been distributed. Sandvik *et al*. (2014:222) posit that "most technologies enable the collection and analysis of data, it needs to be pointed out that algorithms have politics; they are neither neutral nor natural, and there is a need to bring political contestation to the fore." The abuse of data by the ruling party Zanu PF has been raised in the 2018 elections as the ruling party drew the ire of the public and

civil rights activists when it sent personalised SMS messages that were super targeted thereby raising questions where the party got such specific user data violating people's right to privacy (Chiparadza 2018).

The core of accessing the people's user data is for power retention purposes as the Zanu PF party wants to get undue advantage over political foes. As Chiparadza (2018) put it "political parties have initially resorted to traditional means of inviting people to rallies and issuing manifestos. But now Zanu PF is being accused of going a step further by sending targeted campaign messages to people's phones asking to vote for them." The use of the algorithm has specific data on vulnerable people therefore with such data the ruling party has an opportunity to take advantage of these people for its own benefit and it would be easy to manipulate the people as their data is readily available specifying their financial positions and other private information that can be used to easily manipulate the vulnerable communities across the country (Mudzingwa 2020). International Federation of Red Cross and Red Crescent Societies (2013:184) posit that "the next phase in humanitarian technology is harnessing machine learning, artificial intelligence, to find meaning in big data." Therefore, if those in power fully understand and are able to decode this data, they would be able to use it for power retention.

Chapter 3: Searching and downloading the data

3.1 Research approach

For this research I decided to employ the use of a qualitative approach to the study. I used this method as it focuses on individual and group experiences and it allowed me to describe and interpret issues from the view of the study population (Creswell and Creswell 2018). The nature of the problem required that engagements be made with those with specialist knowledge in the area for example programmers of algorithms. The adoption of this approach was influenced by a constructivist philosophical worldview. Creswell and Creswell (2018:5) define a worldview as "a basic set of beliefs that guide action." Through the constructivist epistemology I was able to study what drove the government of Zimbabwe to decide the use of the algorithm, how various stakeholders define AI in disaster response and the opportunity to assess the theory by Keen (2020) on the removal of shame on decision makers.

3.2 Data collection methods and analysis.

I conducted a total of six qualitative interviews with an average length of an hour to an hour and a half. To select and identify the participants to the interviews I used the purposeful sampling technique. Furthermore, to select the participants I used convenience sampling as it allowed me to collect information from participants who were easily accessible to participate in the research project. Etikan, Musa and Alkassim (2016) state that "the purposive sampling technique, also called judgment sampling, is the deliberate choice of a participant due to the qualities the participant possesses." This has been necessitated by the limited time by which the research should be completed.

For the process of gathering the data, I developed a semi structured interview guide, consent form and research information sheet in advance. The purpose of the research was communicated openly to all key informants and stakeholders through the research information sheet. Before the interviews were conducted consent was requested to record the interviews through provision of a consent form, as they were conducted online.

Below is a table of the distribution of informants by position and sector.

Informant	**Position**	**Sector**
Informant 1	Information and Publicity Officer	Non-governmental organisation

Informant 2	Senior Journalist	Technology media house/ expert on technology issues
Informant 3	Gender and Inclusion Manager	Gender/woman affairs expert / development practitioner
Informant 4	District Development Officer	Ministry of Women Affairs, Community, Small and Medium Enterprises Development
Informant 5	ICT manager UNICEF Zimbabwe	International organisation/ expert in development of computer programs
Informant 6	IT-manager Den Haag Netherlands	Private sector/ insurance/ Expert on Algorithms

Table 2: Distribution of informants by position and sector

Two of the informants were from government who are responsible for policy making and took a leading role in the distribution of the relief funds thus, they have insider information. One informant was from a technology and media company that reported on the use and deployment of the algorithm. They can provide further details on how the decision to use an algorithm came about from the information they have. Two software developers or programmers of algorithms were interviewed, one based in Zimbabwe working for an international NGO and the other based in the Netherlands. They were identified and interviewed as they provided the technical working of algorithms and the decision making process. I selected the informants based on epistemological approach to the study.

It was not possible to interview the selected recipients of the immediate relief aid as the lists were not open to the public. However, I interviewed an official from a non-governmental organisation that had submitted names to the government lists. Furthermore, I updated the research question to cater for this limitation. The interviews I carried out involved the use of open ended questions that were intended to elicit views and opinions of the participants mainly on variables drawn from the theoretical framework.

However, I expected to interview more people including those in the Ministry of Finance as well as Ministry of Public Service Labour and Social Welfare as they were responsible for the selection and distribution of the relief funds. The intended

informants were not able to be part of the interviews as they did not get the required authorisation to be part of the research project. The research used existing datasets that have already been collected, from sources such as the Auditor general of Zimbabwe reports and Afrobarometer reports.

To support the data from the interviews in the data gathering process I also used secondary data. The secondary data was collected online using a set criterion that evaluated the data according relevance to study, up to date, peer reviewed and grey sources such as newspapers. In the analysis of the data a theoretical framework was developed to set as a basis for analysis and this data was triangulated with secondary data which was collected from documents generated by agencies such as the Auditor General of Zimbabwe. Searching of the data was done on Google Scholar, Erasmus University of Rotterdam Repository, and a general google search. When the searches generated a lot of results, I conducted an abstract screening and dates screening. I did this especially for data from government sources which had to be within 2020 and 2021.

To analyse the data, I first transcribed the recorded interviews. After transcribing the data, I used Atlas.ti in the coding and analysis of the data in which 17 codes were identified. Some of the codes included discourses, benefits of algorithms, accountability, politics of decision making, challenges of algorithms, removal of shame, post humanitarianism among other codes. With these codes I merged them according to themes which I later used in the analysis of the data. Some of the themes included benefits, negative effects, challenges, removal of shame and politics in decision making.

3.5 Positionality

The use of computer applications has always fascinated me and I have been generally following up with technological trends that has resulted in me subscribing to blogs and news cites about technology. By following up with current trends I have built my own opinions with regards to technology on how and as a small business owner I was immensely affected by the COVID-19 disaster in Zimbabwe and I thought I would benefit from the COVID-19 relief funds. As a person who did not benefit from the relief funds I felt let down by my government. Hence this might affect my impartiality on the decision by government in the use of an algorithm. Therefore, through this research I

was open to learn and get further insights on algorithms and their application in delivery of relief aid objectively.

3.6 The scope and limitations and possible practical problems

The lack of public information around the deployment and inner workings of the algorithm in Zimbabwe. Compounded by the impossibility to get access to informants in the government of Zimbabwe, who had direct knowledge of the system resulted as a limitation to the study. Henceforth, to overcome this challenge I interviewed other programmers to get an insight in the workings of algorithms. The programmers I interviewed one was based in Zimbabwe and responsible for development of technology solutions for an international development organisation. The other programmer is based in the Netherlands and he is responsible for development of algorithms and modelling solutions for insurance companies. The emergence of the COVID-19 restrictions on travel hindered my possibility to travel to Zimbabwe to conduct face to face interviews. However, I mitigated this by designing a remote research design.

Chapter 4: Algorithms in distribution of Covid-19 relief funds a discourse or a real practice.

4.1. Benefits

Five of the informants interviewed concurred that there are a number of rewards or benefits that could be accrued by the use of algorithms taking into consideration of the COVID-19 situation in Zimbabwe. Informant number 4 and 1 stated that the use of the algorithm was a welcome initiative taking into consideration the COVID-19 lockdown regulations by which travel was restricted. The use of the algorithm meant that people won't have to travel to government offices to physically access the cash thereby limiting interaction and the exchange of cash that was viewed as a super spreader of the virus (Mugoto 2021a). This also meant that officials from government did not have to interact with the recipients of aid that confirms Duffield's theory that post humanitarianism is a process of removing humanitarian officials from the field and they work in isolated sites far away from harm's way (Duffield 2018). Therefore, we can draw out that the use of the algorithm assisted in the reduction of transmission of the contagious COVID-19 virus as all computations and the delivery of the aid was automated.

However, the lack of interaction between the government officials and the recipients raises a question on satisfying the needs of the people. This is because the government officials did not engage the recipients of aid to understand the real needs of the people. As the algorithm made the computations of using a set criterion that understand no morals or feelings of the people as a human would do and take into consideration. This situation was also highlighted by Duffield as cited by Keen (2020) to make the claims that technology innovation in aid operations results in the loss of potential prospects of face to face interactions that would allow aid workers to have an appreciation and considerate understanding of the community they are operating in. This needed to be taken into consideration because communities in Zimbabwe are not homogenous, people have different needs and wants tied to their external environment (Mugoto 2021a). For example, the needs of a person in a rural area are different from the needs of a person in an urban setting. This was also unearthed in Togo's algorithm based COVID-19 cash disbursement programme in which the analysis of this programme pointed out that phone-based targeting works best when the population is the same (Aiken *et al.* 2021). Smith and Mohiddin (2015) also state that "the scale and complexity of needs in urban areas in terms of numbers affected by a crisis,

heterogeneity of the population and diversity in the types of needs create difficulties for targeting CTP, especially in the context of scarce resources."

Informant 3 and 5 stated that the use of the algorithm provided for a cheaper, simpler, faster and accurate way in the disbursement of the COVID-19 relief funds to the recipients (Mugoto 2021a). For example, the use of the algorithm resulted in people from remote or rural areas saving travel costs and time as the money was sent directly into their mobile wallets (Mugoto 2021a). This points to effectiveness as cited by Innes and Beacon (2021) supporting this notion that machine-learning and algorithms are capable of doing a much better job than human experts in a more efficient, quick and cheap way, and on a larger scale. Evidence from a study carried out by Margolies and Hoddinott (2014) as cited by Bijkerk (2018) highlights that cash transfer programmes have a lower cost compared to food transfers i.e., costs per cash transfer ranged from $2.89 and $3.24 compared to costs per food transfer ranging between $6.41 and $11.46. Therefore, with the helpless situation caused by the COVID-19 pandemic it made pure sense for the government of Zimbabwe to use technology in response to the COVID-19 pandemic, as it provided value for money. Furthermore, the savings from the use of the algorithm could be directed to other pressing needs the government was facing.

Not only did Zimbabwe use algorithms to distributed cash relief but the Togolese government did as well, showing that counties in the global south are catching up on world trends and the developed countries in the use of technology to benefit their local populations that should be applauded for countries in the global south to taking such moves (Aiken *et al.* 2021). The use of the algorithm sets a good precedence for governments to adopt new and innovative ways to deliver services to the people. This brings benefits to the people as well as to the other governments. Other governments can learn from the experiences of Zimbabwe in addition to other countries that have embraced the use of algorithms in the distribution of cash relief.

Informant number 6, 2 and 3 pointed out a key benefit in the use of the algorithm which is the elimination of corruption and its associated vices such as nepotism or favouritism and fraud in the distribution of the relief funds (Mugoto 2021a). The use of the algorithm in Zimbabwe was a master stroke by the Minister of Finance taking into consideration the high corruption index of Zimbabwe. Transparency International (2021) ranks Zimbabwe at number corruption 157 out of 180 making it a highly corrupt territory. With

a high corruption rate, it was a noble idea to use the algorithm as it removed the human being from the decision making process. The informants stated that the role of the middle man or human would be cut out of the process thereby resulting in a corrupt free process in the selection and distribution of the relief funds (Mugoto 2021a). Informant number 6 went on to state that humans are subjective while algorithms are objective as they work within the parameters they are set. This was also collaborated by informant 5 asserting that algorithms make it easy to detect fraud (Mugoto 2021a). Evidence from a study carried out by Smith and Mohiddin, L. (2015) highlights that the use of mobile money transfers offers a high level of security to recipients and agencies as well as lower corruption risk as such technologies allow for real-time tracking and monitoring of the cash disbursements. Consequently, we draw a conclusion that the use of the algorithm provided for a secure and safe platform for the distribution of the public funds that need to be accounted for at the end of the day. With the high corruption index for Zimbabwe the use of the algorithm prevented those with official power in government to unlawfully benefit at the expense of the tax payer. This is because any tempering can be identified and tracked by the system. Thus, the algorithm was a solution to cure the possible incidence of any corrupt activities in the distribution of the aid.

4.2 Challenges

The informants to the study highlighted a number of challenges that surfaced due to the use of and algorithm and disbursement of the funds into mobile wallets. Informant 1 stated that in Zimbabwe there are three mobile communication companies and Econet has the highest percentage of over 80% of the market share. However, the government chose Netone which is a government owned entity for the distribution of the relief funds thereby leaving out a lot of vulnerable members of the community who are on the Econet platform. This anomaly was further buttressed by informant number 4 elucidating that some people in the rural areas share mobile phones and this means that those who do not own a mobile line were left out of the programme as the algorithm targeted those with a mobile line registered to their name (Mugoto 2021a). Mudzingwa (2020) as cited by Mugoto (2021b) brings out that the use of technology creates exclusions as vulnerable groups will not access the COVID-19 relief funds because they do not have access to a mobile phone. This is also compounded by poor network coverage in the rural areas that makes it difficult for some rural communities to access

the funds. This created a hurdle to cash relief recipients who traditionally received aid in physical cash.

However, the government tried to address this situation by allocating recipients of aid NetOne numbers to those without NetOne lines but this did not yield intended results as one still need a handset to insert the NetOne sim card. For instance, the Auditor General (2021) noted that a total of 89 recipients listed in the Buhera district social welfare database who were allocated NetOne numbers did not receive the NetOne lines/sim cards that were supposed to be availed by NetOne thereby prejudicing the government over ZWL$26 700 as it could not be accounted for. The political decision model states that decision makers can have spontaneous objectives which are personal that could explain why they ordered NetOne to allocate numbers to those without lines (Tartar and Hoy 1998). Also, one of the informants highlighted that these lines were distributed on a partisan basis thus confirming the political model of decision making that the Minister of Finance used to come up with the decision where personal ends determine organisational goals (Tartar and Hoy 1998).

In addition to the above, it is unclear why the government chose to distribute the funds via NetOne that holds only 12% of the market share and accounts for 2.5% of the number of transactions carried out. This could point out to why the general populace did not receive the relief aid. This was shown in the findings from Afrobarometer report of (2021) that highlighted that the aid was distributed unfairly. The choice to use NetOne could be traced to the fact that NetOne is a wholly owned government entity and the minister used his power to pick NetOne which is in line with the political model of decision making guiding principles that decision makers want to show their power through the decision they make (Tartar and Hoy 1998).

Figure 10: Market Share of Active Mobile Money Subscriptions

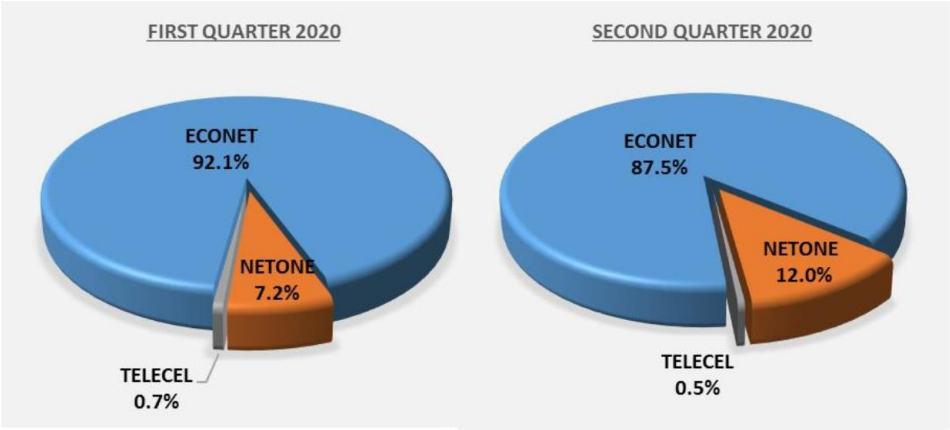
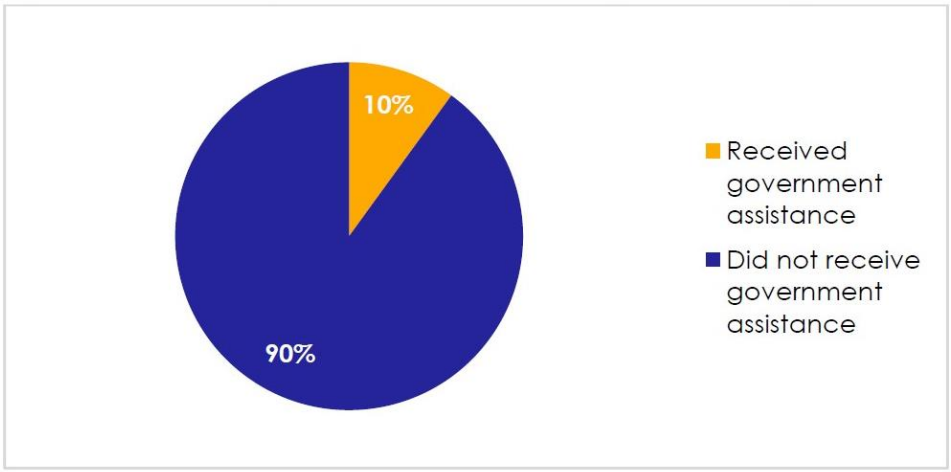


Figure 2: Source Potraz (2020:13)

To further analyse the rationale for the government's choice of a distribution agency the figure above depicts the market share of the mobile phone subscriptions in Zimbabwe in that Econet has the largest market share of 92% followed by NetOne with 7.2% and Telecel with 0.7%. It is surprising that the government choose NetOne as the main distribution partner for the COVID-19 funds despite them having only 7% of the market share that could point to the fact that the government is creating a narrative that they are doing something when in fact they are implementing nothing for the general populace. The disbursement of the funds into mobile wallets was an ideal initiative as a report by Postal and Telecommunications Regulatory Authority of Zimbabwe stated that Zimbabwe had a mobile penetration rate of 90% in 2020 (Media Institute of Southern Africa 2021). Thus, giving all mobile phone holders an opportunity to access the funds if selected by the algorithm.

However, despite all this the government chose NetOne with a minority which thereby confirms the findings of Afrobarometer why 90% of the people did not receive government assistance as shown below in figure 4: this was also highlighted by during public hearings conducted virtually by the Parliamentary Portfolio Committee on Public Service " as some citizens indicated that they had not received any food assistance or COVID-19 cushioning allowance from government. Submissions also revealed that some citizens were registered with the Ministry of Public Service for COVID-19 cushioning allowances, but had not received any assistance to date" Nyuke (2021).

Figure 9: Received government assistance | Zimbabwe | 2021



Respondents were asked: *Since the start of the COVID-19 pandemic, have you or your household received any assistance from government, like food, cash payments, relief from bill payments, or other assistance that you were not normally receiving before the pandemic?*

Figure 3: Source Afrobarometer (2021:7)

Informant number 5 and 3 stated that the government would be reluctant to employ the use of an algorithm as this would result in the loss of jobs in the future (Mugoto 2021a). Duffield's (2018) as quoted in Keen (2020) states that technological advancement has resulted in the replacing of human labour and agency as we have transferred our thinking capacity to machines. Jaspars (2018) as cited by Keen (2020) supports this notion by stating that post-humanitarianism creates few if any jobs on the ground. The loss of jobs in the future is a no for those who now hold power as it creates a narrative that they as a government are not creating jobs, but taking away the jobs that would be political suicide and unpopular decision.

Nonetheless, for the case of Zimbabwe the algorithm resulted in the surrendering of human agency as well as creating duplications. As posited by Duffield (2018) post humanitarianism results in people surrendering their agency to computers to think on their behalf, which was the same situation which occurred in Zimbabwe when the algorithm was deployed. The algorithm absorbed the role of social welfare officers to make assessments using computing power thereby rendering human redundant in the process. The World Bank (2015) report Mind, Society and Behaviour supports and

acknowledges this process of post humanitarianism as a way to overcome human beings' natural limitations on judgement. Where human agency is surrendered and machines take control leads to trust issues. Can potential recipients understand or acknowledge that their fate is on a computer programme rather than a human being making the decision? Keen (2021:1147) suggests that the surrendering of human agency under post humanitarianism creates "a nightmare vision of people being replaced by robots who then find that their distress is also being managed by robots."

On the issue of creating duplications of tasks, it was noted by informant number 4 and 1 who were tasked by treasury to draft lists of potential recipients of aid as well as to conduct the assessments of the aid (Mugoto 2021a). This created a duplication of the work as the algorithm and staff of the three agencies above were doing the same assessments. This had an implication in the allocation and distribution of the funds as discrepancies were noted in the Auditor general's report. The report alludes to the lack of proper assessment and coordination among stakeholders in the identification of the recipients. For example, Findings from the Auditor Generals (2021) report highlights those 58 recipients in Mutare who received COVID-19 allowances amounting to ZWL$45 240 had same identity numbers, different dates of birth and different gender while over 375 recipients had uncontactable addresses, suspicious names and identity numbers and received COVID-19 allowances amounting to ZWL$292 500. These anomalies then point to a situation whether the algorithm was ever used or this was a sophisticated way to cover up misuse of funds. This is because a simple computer programme could pick up these anomalies. With the high number of duplications noted by the Auditor General (2021), this brings out that potential recipients could have lost out from the funds, while other recipients received double allocations thus creating exclusions.

The lack of accountability of the funds shows that this programme carried out by the government needs to be investigated further as allowances could have been paid out to underserving members due to inadequate assessments and coordination. Informant 4 stated that the algorithm in terms of her knowledge was not used as they only drafted lists, submitted them to treasury then treasury sent back Netone lines that would be distributed to the recipients for the receipt of the cash relief (Mugoto 2021a). This view was supported by informant 2 by reviewing that there was no explanation on the workings of the algorithm. There was no feedback provided on the success and failures

of the system and this points to the fact that this was just a statement uttered by the Minister of Finance (Mugoto 2021a). However, informant 2 pointed out that through their investigations they uncovered that the funds were being distributed via Netone lines but unaware which part of the process the algorithm was used. Due to the haphazard nature in the drafting of the list. This points to a coordinated mess by officials in the responsible ministries to loot the COVID-19 relief funds for their own benefit. Lack of accountability results in lack of trust in the government and its initiatives as funds are open to abuse.

Furthermore, the informants allege the use of the algorithm for political gain. Informant 3 highlighted that the use of the algorithm would have huge political ramifications for the government as this would result in loss of jobs increasing the unemployment rate that is already astronomically high (Mugoto 2021a). The summary of political model of decision making by Tartar and Hoy (1998:221) posits that the test of a good decision for them is determined by personal objectives being accomplished. During the political campaigns of ZANU PF promised jobs for the people therefore if a policy would result in the loss of jobs, it cannot be taken onboard as it exposes their failure which politicians do not want to be associated with (Mugoto 2021a).

4.3 Negative effects

The research uncovered a number of negative effects that came up when the government of Zimbabwe decided to use an algorithm to disburse the COVID-19 funds. Informant 4 and 5 stated that algorithms are made using some assumptions or tailor made variables for example developers can develop algorithms tailored according to what they need or according to their perceptions or the input form the decision makers so it is not always the case that we get the exact results that we want when we use algorithms in the distribution of cash relief (Mugoto 2021a). Informant number 4 further stated that the interaction between the developer and the decision maker is what we refer to as the politics of algorithms. The informant gave an example that in the development of an algorithm politicians can pursue their interests by giving certain type of information to the developers of the algorithm (Mugoto 2021a). This was the case of Zimbabwe as the decision makers developed a set criterion for the algorithm thereby advancing their political objectives to be met as posited in the political decision making model. However, developers can also have their own intentions and develop an

algorithm based on their own perceptions to the information they would have been given in the development of the algorithm.

The informants stated that there is politics of patronage in the development and deployment of the algorithm as the political elites are the ones benefiting from the funds. She stated that from the lines they distributed out none of the recipients has reported back stating that they have received the funds which is worrisome because in other areas outside her jurisdiction people have received the funds thus pointing to politics of patronage. The issue of patronage was also raised by informant 2 proposing that the distribution of the funds was very contentious as it was claimed that people belonging to a certain party benefited more in the receipt of the funds than those in other political parties. The findings by the Afrobarometer report of (2021:7) state that "only about one in 10 respondents (9%) say that government assistance was distributed fairly, while almost half (48%) say benefits were distributed "somewhat unfairly" or "very unfairly". These figures show that the amounts claimed to have been disbursed by government departments to recipients are a fallacy as evidence from the Auditor general (2021) report shows misappropriation, fraud and looting by those in power for their own benefit.

Informant 3 stated that a critical negative effect of the use of algorithms is that these programs don't possess emotions or moral values and the human actor that is needed in humanitarian situations as people in precarious positions need the human element to empathise and sympathize with. Duffield (2018) puts forward that when aid workers operate remotely, they may lose opportunities to physically interact thereby limiting their understanding of the community.

This is the same with the deployment of the algorithm by the government of Zimbabwe as it could not fully appreciate the peculiar situations of each person's story as they deployed a one size fits all algorithm. This can have implications on the appropriateness of the aid and hinder understanding of people's situations taking into consideration their feelings, emotions and the ability for the government social workers to provide empathy by just visiting the potential recipients. This was also noted by Mudzingwa (2020) who makes the claim that the selection of the recipients was a hurried process as social welfare elements were bunched together with the informal sector. This shows that the process of coming up with the algorithm and its variable was a hurried process as different sections of the society were bunched together

despite having different needs and characteristics. However, considering the COVID-19 situation that limited interaction the use of the algorithm was a noble idea but more time needed to be put up in the development of the initiative. This then confirms the Scott-Smith (2016) argument that these technological innovations serve mainly the aid workers rather than the recipients thereby limiting the quality of face to face relationships that occur when people meet. One of the informants defined this process as command development as solutions to solve people's problems are imposed on the people without engagement with the people. The government could have come up with innovative means to try to engage the communities using online tools or other means to try and get input from the people on how to roll out the programme.

Despite the use of the algorithm the findings from the Afrobarometer report show that the general populace did not receive the COVID-19 relief aid. The findings by the Afrobarometer report (2021) point to incompatible use of distribution methods of the COVID-19 relief funds that includes the algorithm as well. One of the findings pointed out that "an overwhelming majority (90%) of Zimbabweans say they did not receive any assistance from the government, such as food, cash payments, or relief from bill payments, during the pandemic. Only one in 10 (10%) say their household received such assistance." (*ibid.: 2021*) This then poses a huge question of where did the COVID-19 funds go or who is the recipient of this aid if only 1 in 10 people state that they received the aid. From the informants it is alleged that the COVID-19 relief funds benefited the political elites rather than the general population. Evidence from the Auditor General (2021) special report highlights that the Ministry of Public Service Labour and Social Welfare Head Office could not account for ZWL$89 022 103 (USD$ 1 million approximate value as at 17 November 2021) meant for distribution to vulnerable communities across the country through NetOne.

> Furthermore, "the Ministry could not confirm whether the allowances had reached all the intended beneficiaries as reconciliations and confirmation reports were not prepared. This was contrary to section 63 (3) & (4) of the Public Finance Management (Treasury Instructions), 2019 which requires the Accounting Officer to institute internal controls for payments made." (*ibid.: 2021:6*)

The lack of accountability of the funds brings out a number of issues that despite the use of the algorithm alleged corruption and fraud still occurred and poses the same

question on who the recipients of the funds are. The Afrobarometer report (2021) states that 54% of the population believe that the bulk of the resources meant for COVID-19 response were lost to government corruption. The Auditor general further exposes huge irregularities in the distribution of these funds in Buhera district in which ZWL$260 400 (USD$ 2900) is unaccounted for and is alleged to not have reached recipients due to recipients database errors and irregularities.

Table 2: Allowances which may not have reached Buhera District beneficiaries due to database errors and other irregularities

Description	Beneficiaries affected	Total value $
Uncollected allowances	673	201 900
Beneficiaries who were allocated Net One numbers but did not receive the Net One lines	89	26 700
Beneficiaries whose COVID19 allowances were collected by third parties	88	26 400
Net One lines which were not allocated to individuals	18	5 400
Total	**868**	**$260 400**

Table 3: Source Auditor General (2021:10)

Table above shows shocking irregularities within the department of social welfare as over ZWL260 400 cannot be accounted for and this could point to the inefficiency of the algorithm to curb corruption and fraud. These irregularities are occurring in the department of social welfare pointing to the fact that the officials in these offices might be fraudulently pocketing the relief funds for themselves as over 88 lines were collected by third parties and these third parties did not sign for these lines thereby prejudicing the government of over ZWL$26 400. Furthermore, over ZWL$201 900 in 673 lines has been uncollected allowances and 89 recipients allocated NetOne numbers did not receive the NetOne lines that validates the data from the Afrobarometer report that COVID-19 resources have been lost to corruption in Government (Afrobarometer 2021:1).

Informants 6 also put forward that explainability of the algorithm is important as it clears the way an algorithm functions and if this explainability is not put out it creates a host of negative effects either ethical, moral, and legal. This issue was also raised by the by informant 2 posing that without disclosure of how the algorithm works a host of challenges appear including discriminatory distribution of the cash relief. This was collaborated by Media Institute of Southern Africa and Collaboration on International ICT Policy for East and Southern Africa's (2021:9) realisation that "the use of the algorithm highlights the extent of privacy threats in Zimbabwe as the data subjects were neither advised nor required to give their consent to the sharing of personal data for the relief programme." The deployment of the algorithm created a privacy concern which could have resulted in the government facing legal challenges as personal details of people were going to be collected from the mobile providers was going to be without consent of the general populace and in violation of section 57 of Constitution of Zimbabwe that guarantees the right to privacy.

4.1.4 Government of Zimbabwe decision to choose the use of an algorithm

The use and non-usage of the algorithm from the findings has created various debates and discussions from the informants. From the explanation of the Minister of Finance the use of the algorithm was in three major steps: input from lists from mobile phone companies; then the algorithm processes the data and lastly funds are distributed to the selected recipients as illustrated in figure 5. However, from the findings as illustrated in figure 6 there are 6 steps that took place in the distribution of the cash relief to recipients. This was also highlighted by informant 6 behind this notion that the use of algorithms in a controlled environment is different than when the algorithm is applied in the real world situation (Mugoto 2021a). The findings show that the use of technology has to be complimented by the human participation in the process and technology on its own cannot solve the problem which can result in negative consequences in the use of algorithms such as lack on emotions and human element that might be needed by the recipients.

From the minister's explanation the sequence of events in the disbursement of the funds would be as illustrated below:

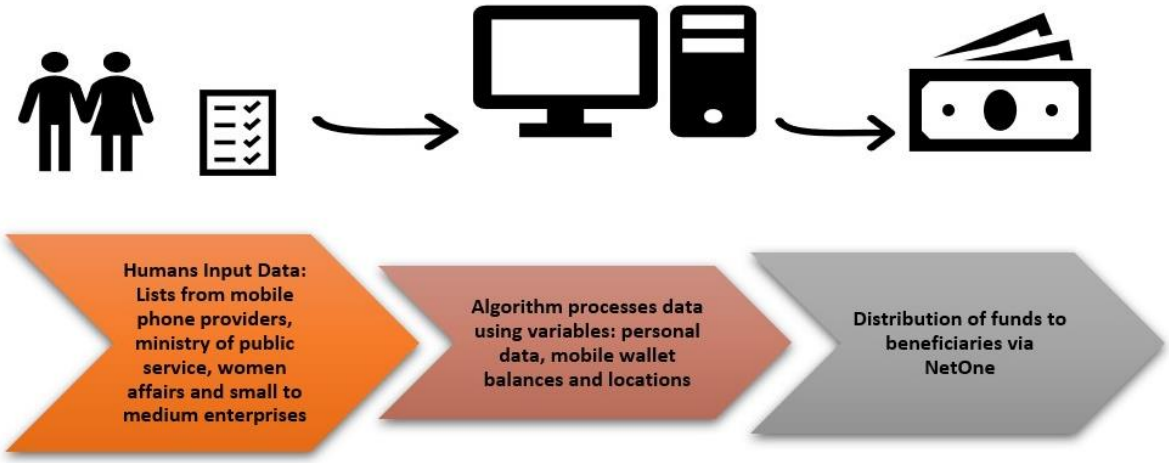


Figure 4: Algorithm process

From the illustration above it shows that there were three major steps in the distribution of the relief funds. The first step is the most critical step as it involves feeding in the data and this data has to be the right data of genuine people who deserve the COVID-19 relief funds. The diagram above is contrary to the findings from the informants hypothesizing a 6 stage process as shown below.

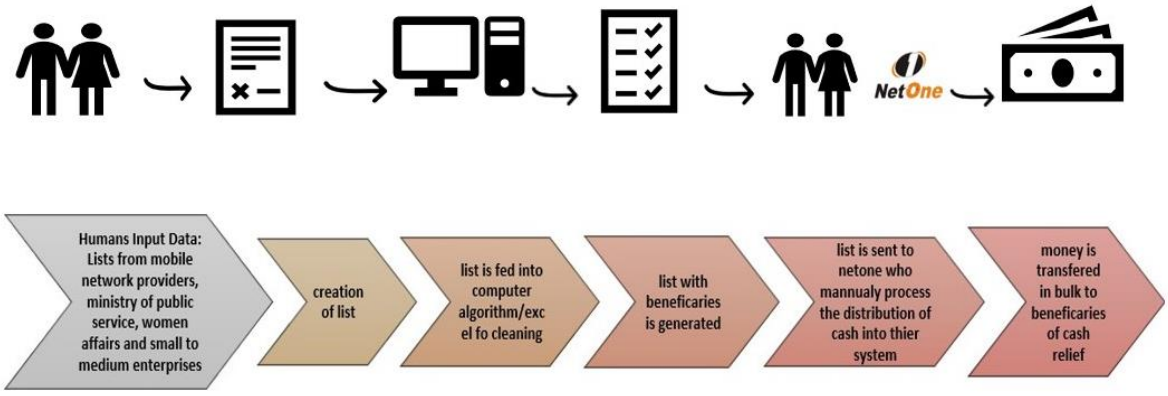


Figure 5 Distribution of financial aid

Findings from secondary data reveal that the development of the lists as shown on figure 6 raises a lot of concerns. For example, the Auditor General's report (2021) highlights that in Mutare district the database needs to be corrected through reassessments as it is littered with incorrect details of recipients. This goes to show that the selection of recipients was not done in an objective manner thus might open doors for abuse by the officials generating the lists as they can choose their friends and relatives to be recipients of the funds at the detriment of deserving people. In addition, the report shows the weakness in financial management in the government

agencies that needs to be dealt with as the government is losing money and there are no systems in place to block the leakages. This further has risks to government as allowances can be paid to non-existent people and the uncollected funds can be converted into personal use by the government officials. This claim can be supported by the findings from the Afrobarometer (2021) that put forward that 91% of the respondents who were classified as poor where likely to have gone without assistance compared to weather counterparts at 87%. This goes to show that possibilities in flawed recipient lists.

Informant 1 stated that the use of an algorithm could have been a noble idea as there were COVID-19 regulations in place. However, the mention of the fancy high sounding word ‘sophisticated algorithm’ was meant to cover up something the government was going to do or the money was just going to be on paper when in actual fact it doesn’t exist as the situation in the government coffers is dire (Mugoto 2021a). The informant further on went to state “that they as an organisation were asked to draw up a list from their members and submit it to the ministry of finance in which the recipients would receive ZWL$200 which was a shameful figure” (Mugoto 2021a). Keen (2020) posits that post-humanitarianism is the process of removing shame from people who have power and placing it on people or machines that cannot be shamed. The allocation of ZWL$200 equivalent of USD$2,40 showed the government was hiding behind the finger by trying to shift the shame on the algorithm. The actions of government conform to the assessments by Keen (2020) that the government was running away from its responsibilities and the use of this algorithm then points to the lack of accountability of government to the people as they can use technology to run away from their obligations as government. One of the informants alluded to this stating that the governance culture in Zimbabwe by government makes it difficult for politicians to be accountable to the people.

However, from the findings it came out that it was not particularly shame but the removal of blame on those who have power. The informants cited that the government did not want to be blamed for distributing money in which recipients could not end up using as it was quickly eroded by inflation. Therefore, they opted for the use on an algorithm in that they could lay blame onto the algorithm and the general populace could not question. For example, one of the informants provided evidence that the ZWL$200 that was distributed could not sustain a family for a whole month and the

processing was done by an algorithm consequently the blame is on the system (Mugoto 2021a). Moreover, the decision of this system could neither be blamed or rejected. The views by informant 1 were backed up by the informant 3 reinforcing that the statement by the minister to use an algorithm was just political rhetoric but in terms of action on the ground there are various steps that should be followed in the application of a policy statement which were not initiated that's why its rhetoric that is not translated into action (Mugoto 2021a).

Informant 5 highlighted that this was not mainly removal of shame on the government as it used the algorithm in the distribution of the relief funds but it was more of deceiving people, laying the blame on the algorithm and trying to put the blame on the system as no one could object the decision made by the algorithm (Mugoto 2021a). Chipenda and Tom (2021:8) in their research shared the same sentiments as they highlighted that there "were concerns on the RTGS 180 that was initially provided and later revised to ZWL$300 (approx. USD 3) which was considered by many as inadequate. This was against a backdrop where the Consumer Council of Zimbabwe (CCZ) had indicated that the cost of a monthly family basket for six in April 2020 was ZWL 7,171." The paltry amount meant that during the lockdown those families who had no savings possibly faced starvation and government should have provided better safety nets when it instituted the lockdown.

On the other hand, informant 2 pointed to lack of accountability by the government because the issue of the algorithm is a grey area as no one knows when the algorithm was used or even if it even existed. "This shows the lack of accountability of government to the people as they can use technology to run away from their obligations as the government did" (Mugoto 2021a). Furthermore, Informant 6 stated that "you should not use algorithms and AI as an excuse not to take ownership of your decisions, you can say, oh, computers have said no, so I said no. You can't use that."

Chapter 5: Conclusion

The research paper sort to gain an understating on why the government of Zimbabwe decided to use an algorithm to respond to a disaster situation. This research was done focusing on the case of the government Zimbabwe when it embraced technology for the disbursement of cash relief. The research focused in to try and find out the decision making process that led to the adoption of an algorithm by government and the

resultant implications. This algorithm was used to select and disburse cash relief to recipients or those affected by the COVID-19 induced disaster. The COVID-19 disaster resulted in loss of jobs, restrictions on movement, slowing down on economic activities that resulted in government instituting measures to try and cushion the general populace through aid packages. In which the government of Zimbabwe availed a ZWL$600 million package to cushion various sectors including those vulnerable groups who were in need of cash support.

The use of the algorithm comes with several benefits to both the government of Zimbabwe and the recipients of the cash relief. One of the key benefits was that assessments were done offsite meaning that the staff and recipients were safe from potential infection of COVID-19. This concurred with the post humanitarianism theory by Duffield. Secondly another benefit of the use of the algorithm was that the algorithm provided for a cheaper, simpler, faster and accurate way in the disbursement of the COVID-19 relief funds to recipients. With the benefits that came with the use of the algorithm are negative consequences and challenges that came up as a result of deployment of this technology.

As the algorithm was built using assumptions this resulted in a conflict of interest as those who hold political power use their influence to develop the algorithm to meet their needs forgetting the needs of the general populace as alluded to in the theoretical framework. The other negative consequence in the use of the algorithm is the lack of empathy, morals and emotions. These values and characteristics are found in human beings which thereby means the algorithm cannot appreciate and make considerations that come out of face to face interactions that are key in any humanitarian action. Considering the minister algorithm was using only three main variables to come up with a decision.

The demographic make-up of society posed as a major challenge in the success in the implementation of the algorithm as some vulnerable members of society do not own key technologies or have knowledge on the use of these technologies such as mobile phones. This meant that those without these devices did not benefit from the COVID-19 relief funds as the initiative required one to be an owner of these devices for possible selection as a beneficiary to the COVID-19 relief funds. However, the government tried to cater for these populations by providing them with lines however this might have not been adequate as one still needed a mobile phone handset to use the lines.

Another challenge that hindered the success of the initiative by government was the choice of distribution partner chosen by the government of Zimbabwe. The use of NetOne as the distribution partner created exclusion to potential recipients as the company has a market share of only 12%. The government tried to mitigate this by requesting for access to the database of the bigger mobile telephone company Econet. This had serious privacy concerns as data of the people was shared without consent of the recipients using the Econet sim cards or lines. The selection of the distribution partner pointed to the use of the political model of decision making in with those in power using this model to achieve personal goals and show their power.

The findings for the research showed that politics of patronage was evident in the distribution of the COVID-19 funds as the political connected accessed the funds. This was also confirmed by the Afrobarometer report in which community members stated that the government assistance through the COVID-19 funds were distributed in an unfair manner.

Interestingly one of the findings point to the allegation that no algorithm was used in the distribution of the COVID-19 allowances as the government used the high sounding words as the Minister said “we used a sophisticated algorithm’ to create a veil of sophistication that they did not have. Through the use of these rhetorical words created an opportunity for those who are in positions of influence and office holders in government agencies responsible for the distribution of these funds to possibly commit fraudulent activities which regards to the COVID-19 funds. A report from Zimbabwe’s Auditor General showed that funds in different districts were paid to non-existing recipients, which might point to fraudulent actions or problems in the distribution of the funds. Some reason for this in the report showed that funds in different districts were paid to non-existing recipients, funds paid out to undeserving members of the public due to poor assessments and coordination between government agencies, collection of sim cards with funds by unknown third parties among other anomalies.

The findings also pointed to the allegation that the government created a facade that they were going to be using an algorithm to disburse the funds. This was to find a way out and to direct attention away from their responsibility as government to provide adequate resources to the recipients of aid, considering that they were hit hard by the effects of the impact of the lockdowns that were put in place by the same government. Evidence from the Auditor General’s report showed that the government had paid out

paltry payments of less that USD$2 to recipients thus used the algorithm as a shield to divert shame away from them and direct the same shame to the algorithm. The informants put forward that this was not only removal of shame put removal of blame as the government didn't want to be held accountable for its actions.

The positive benefits which came out of the government's decision to use an algorithm is that I assisted in shielding government officials and recipients from the risk of infection by COVID-19 as assessments and disbursements were done remotely. Secondly the use of the algorithm resulted in faster and cheaper way to distribute the relief funds. Lastly the algorithm provided for an opportunity for a transparent distribution of the funds as the algorithm eliminated the chances or incidence oof possible corruption in the distribution of the relief aid. However, as it was the first time for the government to distribute the COVID-19 funds through an algorithm created some unintended effects and challenges. These unintended effects include politicians taking advantage of the system for their own benefit, politics of patronage, exclusions, lack of accountability and irregularities in the distribution of the funds as shown by the auditor generals report. The politics of decision making also came up as the findings show that personal goals are driving decision making as those in power try to use their decision making role to maintain power and control.

In conducting the study, the researcher encountered a number of limitations that affected the data collection as well as data analysis. Some of these limitations faced included the lack access to some of the intended informants who could not participate in the study due to bureaucratic processes. However, to counter these challenges in the data collection a remote research technique was employed.

This research allows for further research on this topic. For example, research on how the unintended implications of the use of algorithms affect access to financial aid in humanitarian situations.

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Annexes

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INFORMED CONSENT FORM

Thank you for reading the information sheet about the research to be conducted by Clifford Kudakwashe Mugoto titled Technology, Artificial Intelligence (AI) in disaster response situations: the case of Zimbabwe. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide to participate. If you are happy to participate then please complete and sign the form below. Once this has been signed by all parties the participant should receive a copy of the signed and dated participant consent form.

Please initial/tick the boxes below to confirm the elements of the study you are consenting to.

STATEMENT OF CONSENT	TICK BOX
I confirm that I have read and understood the information sheet and have had the opportunity to ask questions.	☐
I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences. In addition, should I not wish to answer any question or questions, I am free to decline.	☐
I understand that if I decide to withdraw, any data I have provided up to that point will be deleted immediately provided results have not already been published by 10 November 2021.	☐
I understand that my responses will be kept strictly confidential. I understand that my name will not be linked with the research materials and will not be identified or identifiable in the report or reports that result from the research.	☐
I agree for this interview to be audio tape-recorded. I understand that the audio recording made of this interview will be used only for analysis and that extracts from the interview, from which I would not be personally identified, may be used in any conference presentation, report or journal article developed as a result of the research.	☐
I agree for the researcher to take notes if I decline for the audio to be recorded	☐
I understand that no personal information or sensitive data will be collected in this research.	☐

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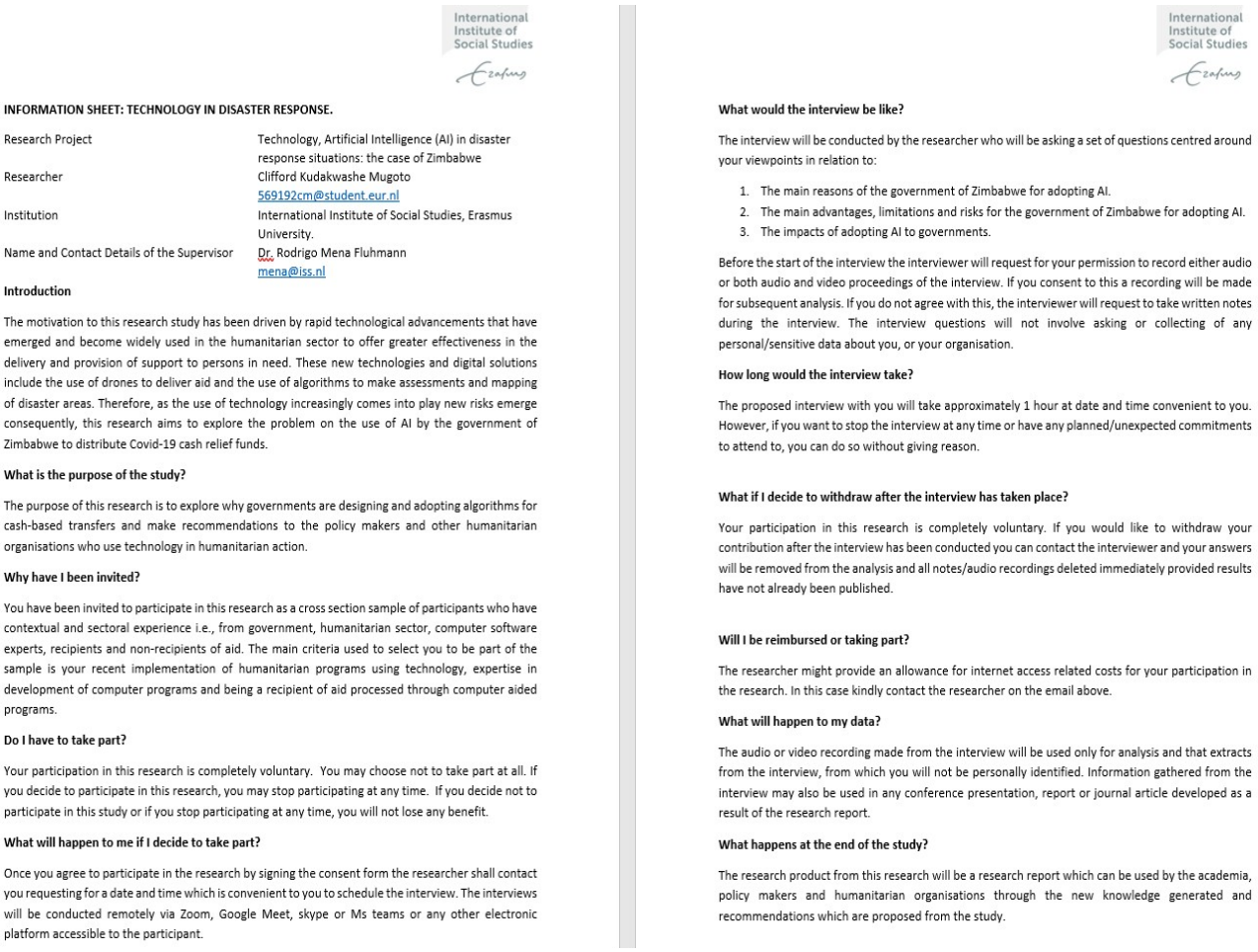
I understand that no other use will be made of the recording without my written permission, and that no one outside the research team will be allowed access to the original recording.	☐
I understand that I will not benefit financially from this study or from any possible outcome it may result in the future.	☐
I agree that the information I have submitted may be published as a report and I wish to receive a copy of it. Yes☐ | No☐	☐
I voluntarily agree to take part in this study.	☐

Name of participant	Date	Signature
Researcher	Date	Signature

annexes 1: Informed Consent form



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INFORMATION SHEET: TECHNOLOGY IN DISASTER RESPONSE.

Research Project	Technology, Artificial Intelligence (AI) in disaster response situations: the case of Zimbabwe
Researcher	Clifford Kudakwashe Mugoto 569192cm@student.eur.nl
Institution	International Institute of Social Studies, Erasmus University.
Name and Contact Details of the Supervisor	Dr. Rodrigo Mena Fluhmann mena@iss.nl

Introduction

The motivation to this research study has been driven by rapid technological advancements that have emerged and become widely used in the humanitarian sector to offer greater effectiveness in the delivery and provision of support to persons in need. These new technologies and digital solutions include the use of drones to deliver aid and the use of algorithms to make assessments and mapping of disaster areas. Therefore, as the use of technology increasingly comes into play new risks emerge consequently, this research aims to explore the problem on the use of AI by the government of Zimbabwe to distribute Covid-19 cash relief funds.

What is the purpose of the study?

The purpose of this research is to explore why governments are designing and adopting algorithms for cash-based transfers and make recommendations to the policy makers and other humanitarian organisations who use technology in humanitarian action.

Why have I been invited?

You have been invited to participate in this research as a cross section sample of participants who have contextual and sectoral experience i.e., from government, humanitarian sector, computer software experts, recipients and non-recipients of aid. The main criteria used to select you to be part of the sample is your recent implementation of humanitarian programs using technology, expertise in development of computer programs and being a recipient of aid processed through computer aided programs.

Do I have to take part?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not lose any benefit.

What will happen to me if I decide to take part?

Once you agree to participate in the research by signing the consent form the researcher shall contact you requesting for a date and time which is convenient to you to schedule the interview. The interviews will be conducted remotely via Zoom, Google Meet, skype or Ms teams or any other electronic platform accessible to the participant.

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What would the interview be like?

The interview will be conducted by the researcher who will be asking a set of questions centred around your viewpoints in relation to:

1. The main reasons of the government of Zimbabwe for adopting AI.
2. The main advantages, limitations and risks for the government of Zimbabwe for adopting AI.
3. The impacts of adopting AI to governments.

Before the start of the interview the interviewer will request for your permission to record either audio or both audio and video proceedings of the interview. If you consent to this a recording will be made for subsequent analysis. If you do not agree with this, the interviewer will request to take written notes during the interview. The interview questions will not involve asking or collecting of any personal/sensitive data about you, or your organisation.

How long would the interview take?

The proposed interview with you will take approximately 1 hour at date and time convenient to you. However, if you want to stop the interview at any time or have any planned/unexpected commitments to attend to, you can do so without giving reason.

What if I decide to withdraw after the interview has taken place?

Your participation in this research is completely voluntary. If you would like to withdraw your contribution after the interview has been conducted you can contact the interviewer and your answers will be removed from the analysis and all notes/audio recordings deleted immediately provided results have not already been published.

Will I be reimbursed or taking part?

The researcher might provide an allowance for internet access related costs for your participation in the research. In this case kindly contact the researcher on the email above.

What will happen to my data?

The audio or video recording made from the interview will be used only for analysis and that extracts from the interview, from which you will not be personally identified. Information gathered from the interview may also be used in any conference presentation, report or journal article developed as a result of the research report.

What happens at the end of the study?

The research product from this research will be a research report which can be used by the academia, policy makers and humanitarian organisations through the new knowledge generated and recommendations which are proposed from the study.

annexes 2: Information sheet

Mugoto C.K (2021a) Zoom Interview with informant 1	20 August
Mugoto C.K (2021a) Zoom Interview with informant 2	19 August
Mugoto C.K (2021a) Zoom Interview with informant 3	18 August
Mugoto C.K (2021a) Zoom Interview with informant 4	18 August
Mugoto C.K (2021a) Zoom Interview with informant 5	17 August
Mugoto C.K (2021a) Zoom Interview with informant 6	20 August

Table 4: Schedule of Interviews

Map 1 Map of Zimbabwe Worldometter (2021)