Essay

Ethical considerations for the use of artificial intelligence: lessons from the evolution of digital transformation strategies at the regional and national levels in the Caribbean

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Abstract

The modernisation and digitisation of government processes is being encouraged globally. The tools that will be used to achieve this will be artificial intelligence systems. In the anglophone Caribbean the main proponent has been the Caribbean Community (CARICOM) Caribbean Telecommunications Union (CTU) in a paper published in 2017. The sub-regional Organisation of East Caribbean States (OECS) has demonstrated a similar interest. Subsequently several initiatives, regional and national, have been launched with the purpose of producing a unique national identifier and a "digital ID card". This has raised concerns about the extent to which human-centric ethical considerations have a role in the implementation of such initiatives. The evidence from research results forced a change in the researcher's original hypothesis that there would be little evidence of ethical concerns. This paper provides definitions for the various terms to be used in the discussion. It describes the acceleration effect of the arrival of Covid19 in 2020. It then discusses information available so far about the progress of these regional and national initiatives. In conclusion the paper outlines the extent to which it is possible to see ethical considerations being included in the implementation of these initiatives.

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1. Introduction

The intention of this paper is to focus on the implementation of artificial intelligence (AI) systems as required for the provision of 21st century government and its pre-requisites a unique identifier for each citizen/a digital identity card. This provides an example of the implementation of artificial intelligence systems where the system is in close relationship with the citizen and provides a context in which to ask the following questions. Are ethical guidelines emerging for digital transformation processes in the Caribbean which establish a conceptual framework that serves as the basis for the responsible use of AI? Do lessons learned from developments around digital transformation in the Caribbean have anything to offer to discussions on ethics and AI?

Information to answer the questions proposed above was gathered from desk review of published work and of relevant news reporting in the anglophone Caribbean, and an interview and subsequent exchanges with Marlon Narcisse, Director Public Service Modernisation, Government of Saint Lucia, the officer in charge of the Saint Lucia digiGov initiative. Discussions were held with Dr Keith Nurse, currently Principal of Sir Arthur Lewis Community College, and with other actors as the opportunity arose.

The direction of this paper is to begin by establishing the context within which this research was conceived. Some background information about the anglophone Caribbean will then be provided. Following this, definitions of the aspects of AI and of ethics that will be used for the discussion will be offered. The arrival of the Covid 19 virus early in 2020 provided a shock and an impetus whose effects required inclusion. The various projects under consideration will be described and examined to expose the presence or absence of ethical considerations in their implementation. Finally, some conclusions will be drawn summarising the findings. The initial expectation of this researcher was that little evidence would be found of ethical considerations in implementing the projects being discussed; however, the research exposed evidence of pushback by citizens against citizen-related AI projects where insufficient attention appeared to be being given to ethical issues.

2. Definitions

Many of the terms used in the discourse on this topic have become blurred in their meaning over time. This section indicates how these terms have been used in this paper.

a | Artificial intelligence

is popularly defined as the initiatives to train machines to "think" in the same way that human beings think. The goal is "artificial general intelligence" (AGI) at which point the machine will be able to replicate human thought. AI is a precision instrument. It does not tolerate diversity. It requires a limited and very carefully defined vocabulary. The labels used by AI to identify data must be applied, with great precision and consistency, by human beings who by nature are neither precise nor consistent. For AI to truly function as it should, it must be given all of the data. As yet this requirement cannot be satisfied. This presents one of the greatest areas of vulnerability globally for the ethical application of AI systems, and is particularly to be observed in the Caribbean. Incomplete data will produce inaccurate results.

The UNESCO draft Recommendation on the Ethics of Artificial Intelligence recognises that the meaning of "artificial intelligence" has changed and will continue to change over time (O'Hagan, 2021). While the process of artificial intelligence has become more complex and sophisticated the most basic actions of that process remain the same. The changes have come about in the actors manipulating the data, and in the ways in which the data is collected. For purposes of this paper, and remembering the requirements for 21st century government, artificial intelligence is considered as an extension of "relational databases", the ability of machines to manipulate datasets and databases to create relationships, to recognise patterns and to point to presence or absence of individual pieces of data.

Artificial intelligence requires human intervention to make the original collection of the data and then to organise it systematically with some type of labelling, although this requirement is changing. Only when this has been done can the tool carry out its tasks. The definition supplied by Russell and Norvig (2020) "the designing of intelligent agents that receive precepts from the environment and take actions that affect environments" suggests a further evolution than what is currently utilised in the Caribbean. At least initially the precepts will be provided by government or some other human agency rather than being extrapolated by the system. The same is true about the data that will be used.

There is increasing concern among international organisations to establish ethical guidelines around the use of AI, a tool with potential for good and for evil. The need

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to establish these guidelines is becoming urgent as AI systems creep more deeply into the global fabric of life and reach parts of the world that are hungry for technology solutions but lack awareness of possible dangers. So seriously is this issue taken that the Member States of UNESCO in November 2019 mandated the creation of a non-binding recommendation on the ethics of AI for possible adoption at UNESCO's general conference in 2021. This initiative led to global consultations. The Caribbean sub-region was consulted separately, and its findings integrated with those from the Group of Latin American and Caribbean (GRULAC) countries to be a part of the presentation of global thinking on the issue (UNESDOC, 2020).

Meanwhile in the wider, developed world, in generally accessible and popular articles, the movement has been towards increasing criticism of AI and of the claims made on its behalf (Matwin, 2021). The call for "human centred" AI has become louder (Johnson, 2021). In developed countries there are more resources available to allow citizens to broaden their knowledge of AI and understand its advantages and disadvantages. In the developing world in contrast the messaging is still largely positive, and there is little awareness of the degree to which AI has infiltrated people's lives. The invariable response of persons consulted during initial research for this paper confirmed the author's original expectation that little or no evidence would be found of attention to ethical considerations in the implementation of AI based projects.

The AI systems that are considered in this paper are those designed to provide government services by digital means facilitated by the creation of unique digital identity cards. These will necessarily have an impact upon all citizens and so call for the most rigorous oversight. This research was predicated on the hypothesis that little progress has been made in integrating ethical and human rights considerations into the development and use of artificial intelligence applications in the Caribbean region. The findings of the research suggest that this hypothesis is incorrect. However, technology solutions are still presented as overwhelmingly desirable, and the citizenry have learned that convenience is the most important priority. The price of convenience is ignored or hidden.

b | Ethical and human rights considerations depend on the ethos or context within which the artificial intelligence applications are functioning. For purposes of this paper the ethos or context being considered is one that is "citizen-centric", terminology used frequently by the CTU in its exposition of 21st century government. The citizen, and therefore the human consideration, is to be given priority.

AI must be provided with data to be able to function. Data collection seeks "hard facts" which allow for objective and reasonably accurate forecasting, for example of weather. This creates a gap of missing subjective experience (MacEacheran, 2021).

The AI system provides detailed information about measurable aspects of the situation. Human perception goes beyond this to include other subtle variables that have not or cannot be measured. Flaws in AI systems frequently occur because of what was not included in their original setting up.

The human perspective, the subjective experience, is critical but frequently omitted. The United Nations and others have called for awareness raising and capacity building particularly in the developing world, but these types of conversations are rarely found among ordinary people in the Caribbean. Only 1% of the Caribbean people has any real sense of what AI is and where it is to be found (K. Nurse, personal communication, May 30, 2021). Information and communication technologies (ICT) together with AI is the system that it is perceived will solve the problems of the Caribbean economies, all benefits, no dangers (Smets & Deyal, 2018; Valencia, 2020; Ram, 2018; ECLAC, 2021). The coming of Covid 19 in 2020 has taught about all the various inadequacies that exist in the system but had been previously unobserved or insufficiently addressed – broadband provision, access, devices, knowledge.

Human language as it is being used to describe AI is biased. The language used about artificial intelligence seems designed to inculcate a respectful deference to this greater than human cognitive power. The verbs used when discussing AI describe human activities - it can "learn" it can "think". This bias itself is an ethical failure. What artificial intelligence is capable of is scanning long lists (databases), picking out matched items, and reporting patterns created by the hits and the misses, all done at superhuman speed. This objective explanation is not offered. It is not true (and therefore not ethical) to suggest that AI "thinks" in the way that human beings think. It compares lists of data. It does this very quickly, and the results are very useful. Looked at objectively the system becomes much less intimidating. The "learning" functions like Pavlov's conditioning. A connection is created between stimulus and response, but not necessarily by following human perceptions of cause and effect. Could this be why human speech, at least in English, has become so cliché-ridden that hope is always the light at the end of the tunnel, and that the possibility of the oncoming train has been erased? (Ratcliffe, 2018). The human factor needs to be included in any consideration of AI. And the basic contribution of the human factor with all its biases, all its capacity for good and for evil, must be included in our understanding of what artificial intelligence is, for artificial intelligence relies initially on human comprehension and is therefore vulnerable to human bias and human error.

c Digital transformation is the process that must be undertaken before artificial intelligence can be applied to the task. In 2020 Covid19 arrived and with it the removal of choice about whether or not things should, or could, be carried out online. The requirement of "distancing" meant that substitutes must be found

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at short notice for face-to-face interactions. The situation with digital transformation moved from being an academic discussion of possibilities to take place at some time in the future to being an immediate need for governments to supply a solution.

Digital transformation demands a holistic change. The switch to digital technology must be complete to be fully effective. How things are done and, to an extent, why things are done are altered. The former logic no longer exists, experimentation provides the "roadmap", and failure is a constant obstacle to be navigated around (The Enterprisers Project, 2020

Digital transformation demands attention to a wide range of issues. It is necessary to ensure access to the technology. This must be access in terms of the electronic devices that are used, access to a reliable source of power, and access to a reliable and sufficiently powerful internet connection. Human expertise is also required to effect the transformation. This need is repeated here because to the eyes of the citizen the crucial human role is frequently hidden. The human beneficiaries of the system must also be ensured connection access and access to devices, and they need knowledge to use the system. If the ethos of the context is citizen-centric then the transformation must consider issues such as literacy, both regular and digital, language, physical ability, culture, and social circumstances. Digital transformation requires cultural change and may disrupt and alter existing systems. In regions like the Caribbean digital transformation may exacerbate old vulnerabilities and create new ones. Digital transformation is itself both a preliminary activity to, and an integral part of, the implementation of artificial intelligence. Among the requirements for ethical digital transformation are appropriate planning and comprehensive inclusion. This needs to be considered together with the abrupt change of circumstances that accompanied the arrival of Covid19.

d The enticement of **21st Century Goverment** in the Caribbean is a very powerful one. The original CTU concept describes the existing situation this way. The inherited knowledge system from European colonialism is paper-based and functions in silos. Citizens are required to produce information on paper to each government agency although the required information is already held somewhere in the system, possibly in several different places. This process is very time-consuming and repetitive, leading to frustration and delay for the citizen, and ever more paper records that require filing and storage. It is also insecure and lacks transparency (Caribbean Telecommunications Union, 2017. 21st century government requires digitisation of existing records to allow them to be interconnected. To achieve the convenience of 21st century government a first requirement is to create an information profile for each citizen linked to a unique digital ID to facilitate interaction with the government (Caribbean Telecommunications Union, 2021, p. 4).

Some of the hardships of the "colonial system" have already been mitigated. In the Caribbean, government records have been siloed in individual ministries and carefully guarded. The old model dictates that information is precious and made more precious by scarcity. Power derives from control of information. The new model that arrives with digital transformation proposes a contradiction to this. Sequestered information is worthless. To be valuable, information, and particularly data, must become a freely accessible resource. The situation in which records of births and marriages are held in the Registry of Civil Status, but a change of name is effected by a deed which is registered with the Office of Deeds and Mortgages, as is currently the case in Saint Lucia, is untenable under this new model.

Twenty-first century government at its most basic level is the facilitation of transactions between government and individual citizens by digital means. To make this possible at all, it is essential that each citizen have a unique identifier of some type. The foundation for this identifier is often the birth certificate. At least in the case of Saint Lucia the old paper-based records are frequently inaccurate. Human beings are capable of many types of inaccuracies and errors from spelling errors to illegible handwriting and misinterpreted pronunciation. Registration will unavoidably involve human intervention. The old errors that affect the old paper records are equally capable of distorting the new digital records with potentially serious outcomes for the citizen. A necessary ethical consideration is that while computing devices are invariably precisely accurate in reporting the information that they have been given, the human beings who must enter the data have considerable potential for error.

For this reason, existing paper records will need to be checked and corrected as far as possible before the digital transformation takes place. In Saint Lucia, for example, this need for rectification of records has been recognised for several years. One of the earlier rectifications of data, existing in the physical, rather than the virtual world began in Saint Lucia as early as 1980 under the auspices of the Organization of American States (OAS) (DRDE, 1991).

The land registration and titling project (LRTP) was begun by the Government of Saint Lucia in 1983, long before there was any idea of digital transformation. A tool was required to create understanding of landholding in Saint Lucia. The LRTP created an accurate paper record of land ownership in Saint Lucia. The true purpose of the record remains as establishing the connection between a piece of land and its owner; the medium in which it is curated does not change this fact. Efforts have also been ongoing for some time to rectify entries in the Registry of Civil Status; these are woven into the digital transformation in Saint Lucia - the digiGov project.

The Saint Lucia digiGov project seeks initially to digitise the issue of driving licenses. In the existing system the renewal of driving licenses now depends on the date of original issue, rather than all licenses becoming due for renewal on 1st January of a new year. Now also there is more than one location where the renewal can be done. But this process, like other government processes, is still generally cumbersome and time-consuming, and involves a great deal of duplicated paper and duplicated effort. The move to automate it has proved to be popular. For its promised convenience, 21st century government is a very powerful attraction.

3.

Conceptual Analysis: Context

Latin America and the Caribbean (LAC) spans a large geographical area and contains a huge diversity of sovereign states from enormous Brazil, 3.288 million square miles and 212.6 million population 1,445 trillion US dollars GDP, to tiny St. Kitts and Nevis, 100.8 square miles, 53,192 population, 927.5 million US dollars GDP.

Size matters. Size affects what you can do, and how you can do it. Size often, though not always, decides what you can afford. Size suggests how you should look at things. The small anglophone Caribbean states that are the focus of this paper are late adopters of artificial intelligence systems. While there has been recognition of the challenges that artificial intelligence systems might solve there is also a lack of resources and expertise, and a lack of political will to work on implementation.

Artificial intelligence itself is an evolving phenomenon. Larger countries with more resources and larger populations have evolved with it, but smaller poorer countries have been left behind. The types of artificial intelligence related projects being implemented at a national and regional level in the anglophone Caribbean fall near the beginning of what might be described as an artificial intelligence continuum. As the definition of "artificial intelligence" evolves with the manifestations of the process, it seems to be forgotten that some countries are at a different place on the continuum from those at the cutting edge.

While there is much good practice to learn from that has been developed earlier and elsewhere, it is incumbent upon Caribbean citizens and their governments to tailor their ethical considerations to their own circumstances. This relates to the research questions: is the Caribbean creating its own guidelines for digital transformation processes and the ethically responsible use of AI?

The largest incursion of artificial intelligence systems in Latin America and the Caribbean (LAC) has been from those employed by very large multi-national companies like Facebook, Google, and Amazon. These systems present a serious challenge to the concept of ethical use. The effect is felt in large states as well as in small states. This is a global issue that needs a global solution.

Within the anglophone Caribbean the most obvious examples of the local implementation of artificial intelligence based systems are those projects which seek to improve and simplify the processes of government. The individual states create policy in this area. There are also several regional groupings, the most influential being the Caribbean Community (CARICOM) and the Organisation of Eastern Caribbean States (OECS) where policy is also created. Both groupings work towards regional integration.

CARICOM, created in 1973 by the Treaty of Chaguaramas, is the older and larger of the two. It has fifteen member states: Antigua and Barbuda, The Bahamas, Barbados, Belize, Commonwealth of Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago, and five associated

states: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, and Turks and Caicos Islands. It has established an agency, the Caribbean Telecommunications Union (CTU), to manage issues of telecommunications regulation and policy.

The OECS was established by the Treaty of Basseterre in 1981. The seven founding members are: Antigua and Barbuda, Commonwealth of Dominica, Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and The Grenadines. Anguilla, The British Virgin Islands, Martinique, and Guadeloupe have joined the OECS as associate members. It has a smaller and less diverse membership base than CARICOM, and the advantage of monetary union among its founding member states all of whom use the East Caribbean dollar as a common currency. The Eastern Caribbean Telecommunications Authority (ECTEL) was established in 2000 as a common regulator for five of the OECS member states: Commonwealth of Dominica, Grenada, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines.

There are several initiatives currently underway in the anglophone Caribbean to achieve 21st century government. These focus on the provision of some form of digital identification (ID) card. Although CARICOM's efforts in this direction seem currently to have stalled, the OECS has recently initiated a large regional World Bank funded project to serve four of the anglophone eastern Caribbean islands: Grenada, St. Vincent and the Grenadines, Dominica, and Saint Lucia. Jamaica and Barbados each has a national project that is relatively far advanced. Trinidad and Tobago and Saint Lucia both have national projects at comparatively early stages in the process. (Saint Lucia is involved in two projects, the regional OECS project, and its own national project.) Belize has a project similar to Saint Lucia's but focussed only on transportation related documents and records.

4. Conceptual Analysis: Pre-Covid projects

The first such initiatives in the region were aimed at facilitating the use of information and communication technology (ICT) so allowing entry to the digital economy and the future use of artificial intelligence systems. In March 2014 the CARICOM Heads of Government mandated research towards the creation of a "Single ICT Space" in the region. Their vision was for a facility built specifically to foster "... economic, social and cultural integration for the betterment of Caribbean citizens" (Caribbean Telecommunications Union, 2017). This project is mentioned here as evidence of a long-term intention on the part of CARICOM towards a citizen-centric ethical implementation of such digital projects. Meanwhile in 2016 the OECS received World Bank funding for a project "Electronic Government Regional Integration Project (EGRIP)". One important component of this project was the setting up of a regional electronic identification system (eID), creating a single unique identifier to facilitate free movement of citizens and businesses within the OECS economic space. Each participating country recorded some degree of success in the project, but the overall goal of the "single unique identifier" was not achieved. (World Bank, 2016)

In 2017 the CTU launched the concept "Towards 21st Century Government" as a continuation of the vision of the Single ICT Space and a way forward for the Caribbean (Caribbean Telecommunications Union, 2017). Government processes could be streamlined and made more efficient using information and communications technologies, particularly the data manipulation processes known as artificial intelligence.

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5. Covid19

While initiatives to implement artificial intelligence based systems to improve the delivery of government services have been attempted over several years, progress has been very slow. Although the need for such action was recognised, there was no sense of urgency. In 2020 this abruptly changed. It suddenly became apparent that concepts that had been considered in a dilletante fashion over several years had now become urgent issues needing resolution as rapidly as possible.

In March 2020 the Covid 19 virus began to make itself felt in the Caribbean, and countries abruptly closed their borders and imposed internal curfews. More than a year later, although most borders have now re-opened, the virus is still a main deciding factor in government policy decisions. Nearly all aspects of life have been disrupted. Most Caribbean states have a major economic dependence on tourism; governments must now find a balance between the health of the citizens and the health of the economy. Education, healthcare and employment, the process of government itself, all must be rethought to limit or remove human to human contact to control transmission of the virus. This is a challenge. It must be factored into any examination of the extent of citizen-centric ethical considerations applied to the implementation of artificial intelligence related systems in the Caribbean.

6.

The current situation in the Caribbean

There are several initiatives currently underway in the anglophone Caribbean to achieve 21st century government. These focus on the provision of some form of digital identification (ID) card. Although CARICOM's efforts in this direction seem currently to have stalled, the OECS has recently initiated a large regional World Bank funded project to serve four of the anglophone eastern Caribbean islands: Grenada, St. Vincent and the Grenadines, Dominica, and Saint Lucia. Jamaica and Barbados each has a national project that is relatively far advanced. Trinidad and Tobago and Saint Lucia both have national projects at comparatively early stages in the process. (Saint Lucia is involved in two projects, the regional OECS project, and its own national project.) Belize has a project similar to Saint Lucia's but focussed only on transportation related documents and records.

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7. Digital ID, regional and national initiatives

In an article in the ICT-Pulse in 2019 Michele Marius discusses what she sees as the four main reasons that a digital ID might be a long time coming in the Caribbean.

> " [M]any Caribbean countries have never had a national ID system in place ... [a]s a result, there is no real precedent or culture, based on having a national ID system, that could perhaps begin to justify the shift to a digital ID system. ... in order for a digital ID system to be truly effective, the siloed approach in government engagement would need to be revisited.
>
> *MICHELE MARIUS, 2019*

Constitutional conflicts may occur, Marius cites the case of Jamaica. She also notes the prohibitive cost and the lack of appropriate local expertise.

A unique individual identifier that can be used online is essential for the provision of government services online. This authentication would likely be made concrete as a digital ID card. The digital ID card is currently among the most contentious issues surrounding the implementation of 21st century government in the region, (and indeed worldwide). While there is little concern and distress over the almost continuous surveillance practised by social media, Caribbean citizens have been taught to be very distrustful of perceived "government surveillance" as might occur in the creation of a digital ID.

Recently Covid19 has created a change in people's thinking. The world is being forced into carrying out its daily living online. Without the alternative of physical presence, the possibility of a digital identity becomes much more convenient and attractive. And convenience is currently the most frequently used "spoonful of sugar", to persuade the citizen that after all trust is possible. At least theoretically Covid19 has forced both government and citizens into a situation of common cause.

Several countries already have physical national ID cards with plans to replace these with digital cards. Countries without an existing national ID card are planning to launch a national ID card programme (Marius, 2021).

This research has found several projects in the Caribbean that connect in some way with the concept of 21st century government, generally at the initial point of providing unique identifiers for citizens. One regional project, undertaken by the OECS, involves four states – Dominica,

Grenada, St Vincent and the Grenadines and Saint Lucia – with the aim of facilitating free inter-state movement of people for reasons of health. Four national projects, in Barbados, Jamaica, Saint Lucia, and Trinidad and Tobago, are looking to create digital identification cards to facilitate the provision of government services. One of these four, Saint Lucia, which is also involved in the OECS regional project, is experimenting in a national project using the digitisation of driving licences and of transportation related government services as a preliminary to creating unique citizen identifiers and a digital ID card for access to government services. Also of interest is a project recently completed in Belize which focuses solely on the digitisation of driving licenses and of records and processes at the Ministry of Transportation. These projects are presented in Table 1 below.

Table 1: **Digital transformation projects in the Caribbean**

Region/Country	Main digital trans-formation	Physical product	National Institutional Partners	International Partners	Ethical considerations and social reactions
OECS Dominica	Unique identifier	Digital ID	4 state govern-ments	World Bank	Ability of global consultants NRD to perceive local concerns; 4 sovereign states to be brought to agreement; health basis means highly sensitive data will be involved.
OECS Grenada	Unique identifier	Digital ID	4 state governments	World Bank	Ditto
OECS St Vincent and the Grenadines	Unique identifier	Digital ID	4 state governments	World Bank	Ditto
OECS Saint Lucia	Unique iden-tifier	Digital ID	4 state governments	World Bank	Ditto
Barbados	Unique iden-tifier	National digital ID			Insufficient consultation
Belize	Transportation related records	Digital driver's license	Ministry of Transportation	Government of Taiwan	Partnership with foreign government; is this a preliminary to a digital ID?

Region/Country	Main digital transformation	Physical product	National Institutional Partners	International Partners	Ethical considerations and social reactions
Jamaica	Unique identifier	National digital ID		Inter American Development Bank (IDB)	Insufficient consultation; First Act rejected by Supreme Court as unconstitutional. Work ongoing on revised Bill based on improved consultation.
Saint Lucia	Transportation related records	Digital driving license	Department of Public Service Modernisation, Government of Saint Lucia digiGov		Current project is very successful and has popular support and approval; although final objective of digital ID has always been explicit, it may not have been completely comprehended by citizens.
Trinidad & Tobago	Unique identifier	National digital ID			Little evidence available as this project is just beginning

To be successful, and ethical, digital transformation projects need to keep in mind several basic principles: the perimeters or scope of the project; the attitude or mindset of all the actors who will be involved and particularly of the leaders; the need for those involved to work together as a team; the need to establish a rational sequence of project activities. (Spanyi, 2021)

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8. Regional initiative

The Organisation of East Caribbean States (OECS) is an economic union of the anglophone small island states that form the south reaching arc of the Lesser Antillean archipelago. The OECS project has the stated intention of a very complex collaboration across and within countries. Four of the seven full member states - The Commonwealth of Dominica, Grenada, Saint Lucia, and St. Vincent and the Grenadines - are currently the subjects of the development of an action plan and conceptual design for the complete implementation of the OECS unique ID. The rationale in this case is the facilitation of the revised Treaty of Basseterre which promises freedom of movement among OECS states. The OECS is engaged in a World Bank funded project, using the consulting services of a European consortium of companies, (Norway Registers Development NRD, n.d.). The emphasis in this project is free movement in the context of health, so provision must be made to authenticate access to medical records. This raises particular issues of privacy and data security.

In a webinar on OECSTV (2020) titled "Single unique OECS ID: What does it take?", a team of three people from the NRD consulting firm explains the background to the concept of a digital ID. One of the speakers bases part of his explanation on the aphorism "You need to count people to make people count" which suggests something of a data collection focus in the objective of the project. The plan is to issue a unique number to each citizen at birth. The number will terminate at the death of the citizen but must be unavailable for re-issue to avoid confusion. The opinion of the consultants was that a unique number is an easier and cheaper basis for creating a unique identifier than using biometrics that require special processes and equipment. They comment on the need for interoperability and mutual trust since the system is proposed to cover four independent states. This will require harmonisation of legislation.

Between 2008 and 2013 the possibilities for such harmonisation were explored by the International Telecommunications Union's (ITU) HIPCAR project (CARICOM, 2021). The work of the Steering Committee, supplemented by in-depth multistakeholder consultations in each participating country produced model legislation, guidelines, and recommendations for use individually or regionally. These reports are available for guidance. An ethical consideration which is frequently forgotten is the obligation, where possible, to avoid waste of previously expended resources.

The OECS has the advantage of having a joint regulator, the Eastern Caribbean Telecommunications Authority (ECTEL), with three components – A Council of Ministers, a regional Directorate, and a National Telecommunications Regulatory Commission (NTRC) in each Member State. The five member states are Commonwealth of Dominica, Grenada, St. Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines. Since 2009 ECTEL has been working on an Electronic Communications Bill for member states to modernise the Telecommunications Act currently in place. Government and technicians consider this legislation to be critical for the success of both the OECS digital ID card and the digital ID process that has been begun in Saint Lucia by revision of the system of issuing driving licenses. So far, St. Kitts and Nevis is the only member

state to have passed the Electronic Communications Act (ECTEL, 2021). It is not a party to the unique citizen identification project.

The NRD consultants also considered the issue of the inclusion of biometric data, for example fingerprints. The issue of biometric data raises another case for ethical debate because of the opportunities it may afford to governments for control and surveillance. The consultants firmly recommend using a unique number to serve as the authentication mechanism but recognise that other data may be required to make a physical connection between the unique number and the physical self of the person in question. The most familiar way of doing this in the case of an ID card is to use a photograph.

Since not all births occur in hospital (where registration can be centralised) it will be necessary to have compulsory registration to support the right for all citizens to a legal identity. The tension here occurs over which data should be included in the physical representation of this authenticated identity – the digital ID card – and by whom and how that data can be accessed. The right of the citizen to know what data is linked to the card must also be protected and facilitated. The OECS project seeks to facilitate travel among the four member states for purposes of health, so some type of access to medical records is likely to be provided. This type of information is particularly sensitive and vulnerable and must be given effective protection by the system.

Overall, the webinar cited above suggests that the consultants to the project are taking care to include ethical considerations in the planning of the project. They stress the important role to be played by leadership. This recalls the importance identified earlier of the mindset and capacity of leaders and leadership will. The issue of where the data required and generated for this project will be stored will need further attention. Extra-regional storage raises ethical concerns, regional storage capacity and reliability are still problematic, although they are improving rapidly. As the project unfolds towards implementation, the extent of application of these considerations will become clearer.

It should be noted that the ethical concerns are being made explicit at the very early planning stage of this project before any necessary choices and decisions are made. The information is freely available online, although one might question how far that availability extends to citizens who may lack digital competence.

9. National Initiatives

Barbados is planning to replace its existing ID cards with digital cards. In the race towards digital transformation and "e-compatibility", Barbados is in the lead in the anglophone Caribbean. A very recent, Inter-American Development Bank (IDB) Report, originally in Spanish, titled "Digital Gap in Latin America and the Caribbean: Annual Broadband Development Index", García Zaballos et al. (2021) reports that for the period 2018-2020 Barbados held the 31st place in global rankings (p. 31). This was an improvement of 11 places over the previous report.

As has been demonstrated earlier, authentication of national identity and the creation of a digital ID card are seen to be important elements in digital transformation and the implementation of 21st century government, but citizens may not be ready to be transformed. The Barbados Advocate newspaper presents both sides of the argument in an editorial: "Are we ready for a digital ID card?" (2021). The conclusion? "It is true, a digital ID is an innovative way of creating efficiency and improving outdated processes within private and public sectors, but it will require significant investment in infrastructure, parish by parish so the new technology can facilitate all rather than a few." A more detailed discussion is offered by Niel Harper in his article on the issue of the Barbadian National Digital Identification (DID) (Harper, 2021). While Harper accepts the potential advantages of the DID, he also suggests that "…without proper implementation, oversight and control, DID can inflict great harm on society …". At the end of his article, Harper proposes a multistakeholder oversight body "to avoid political interference and nepotism" and "accountable to the citizens of Barbados".

Prime Minister Mottley of Barbados has made a connection between the proposed DID and more efficient Covid19 contact tracing. She is also quoted as suggesting, "We want to move as far as possible to a cashless society, because cash itself has become a medium for the virus, as I understand it." (Madden, 2021). The DID is also proposed to be usable for cash transactions, a connection of purpose that Harper (2021) points to as particularly dangerous. Citizens are expressing a concern over privacy and security of information required for the DID, and particularly a concern for the possible collection of biometric data (Jarrahi, 2021). As late as June 2021, the Minister in the Ministry of Economic Affairs and Investment, Marsha Caddle is reported to have claimed that "Barbados' new digital ID has the potential to be transformative, including solving child maintenance and parental custody issues. She also saw it as vital for "care economy" opportunities involving women, who she said bore the brunt of job losses triggered by

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the coronavirus (COVID-19) pandemic." (Barbados Nation News, 2021). The absence of civil society from initial consultations in Jamaica and Barbados has created difficulties for the digital ID initiatives in both countries. With a more inclusive collaboration the projects begin to move again.

Jamaica is setting up a whole new system so that its proposed digital ID will be the first national ID system in the country. This is the culmination of an initiative that began in the early 1970s with the first proposals for a system of National Registration. In November, 2017, the Jamaica National Identification and Registration Act (2017) was presented to the Parliament and passed. The original content supplying background information about the original proposal for a National Identification Number (NIN) and a National Identification Card (NID) has very recently been replaced. The link[1] now gives access through a sidebar to a website[2] labelled "NIDS One ID: Many Opportunities Welcome".

On November 17th, 2017, an article by Martin Henry was published in the Jamaica Gleaner (Henry, 2017). In it Henry outlines very clearly the ethical dangers of the nature of the ID legislation just passed in Jamaica. He argues

American counter-terrorism and national security actions have changed the face of how government in every country in the world controls their citizens. And tighter ID requirements, let no one be fooled, are control tools. … the relationship between government and citizens has fundamentally and progressively shifted from the citizen being regarded by the State as law-abiding and innocent until proven guilty to the citizen being viewed as law-breaking, corrupt, a security threat, and guilty until proven innocent, and who must constantly demonstrate that they are clean. (Henry, 2017)

In 2019 the legislation was struck down by the Supreme Court as unconstitutional (Jamaicans for Justice, 2017). Concerned Jamaican citizens describe the 2017 attempt in this way: "The first attempt to establish NIDS lacked consensus. It was passed amidst intense parliamentary divide, had no formal channel for public input, and was ultimately struck down by Jamaica's Supreme Court because it violated people's rights" (Jamaicans for Justice, 2020). The revised Bill proposed in 2020 is welcomed with three caveats: sufficient time must be provided for public consultation; the Data Protection Act must be operationalised first; the system should be voluntary rather than imposed.

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1 https://opm.gov.jm/portfolios/national-identification-system/%202016,%202017

2 https://www.nidsfacts.com/

As in Barbados, the absence of civil society from initial collaborations has created difficulties for the digital ID initiative. In 2017 the Government of Jamaica set up an "engagement portal" (Office of the Prime Minister, Jamaica, 2017) The outcomes demonstrate that this was inadequate provision for public consultation. Projects in the OECS, Belize, and Saint Lucia all stress the importance of using diverse means to communicate with intended beneficiaries.

Trinidad and Tobago

is at the very beginning of its journey towards a digital ID. In this case it will be interesting to observe in future how far the lessons learned in other countries will inform the process. "The Roadmap to Recovery team has recommended fast-tracking a unique digital identifier to every citizen and legal resident, according to a draft report", with the motivation for the transformation being clearly attributed to the pandemic. "Covid19 has forced the Government, private sector and CSOs to rethink how technology can be leveraged to effectively navigate the crisis and accelerate the recovery process" (Newsday, 2020)

Saint Lucia

, while a party to and sharing information with the multi-state OECS project, is also experimenting with a different approach that has been named the 'digiGov initiative'. (Government of Saint Lucia, n.d.) Rather than immediately aiming for the goal of a unique identifier for each citizen, digiGov is beginning by digitally transforming all of the processes connected with the issue of driving licenses, and the various other interactions between the Ministry of Transportation and citizens, for example, applications for Learners' Permits and Driving Tests, registration of vehicles, payment of Road Tax. Although over the years these interactions have been made quicker and easier, they remain as something of a bone of contention between citizen and government; therefore, they present a win-win opportunity. All parties benefit from an improved system so the project can expect, and so far is receiving, a generally positive response. An opportunity is provided at a small scale to monitor the process for possible errors and abuses, setting the stage for a subsequent much larger project to provide for national identity authentication.

In Saint Lucia, digiGov has already achieved its minor goal; it is possible in Saint Lucia to renew one's driving license online, and registrants will receive reminders before their license expires. Ethically digiGov recognises its responsibility for the protection of users'

data. Work on appropriate legislation and regulation is being carried out in parallel with the setting up of the system. It is transparent at its interface with citizens with information that the legal framework is being reviewed and amended to provide data protection and to protect privacy. The project has big dreams and a long-range vision but has limited its pace to a gradual change, which has proven popular with its clients and is readily accepted. In terms of the driving license project a valuable ethical achievement has proved to be the removal of subjectivity. Because the process happens online there is no longer the opportunity to "do it for a friend". Of some concern is the proposal to include a QR code on the digital driving license which would allow access by the Police to information linked to the individual license. How would use of the code be controlled and monitored, and to which information exactly would the code provide access?

However, many ethical challenges have been anticipated. There is provision to accommodate both of the languages spoken in Saint Lucia - English and Kwéyòl. Gaps in literacy – regular and digital – have also been allowed for, as have challenges with access to devices and access to connections, and financial obstacles. Work is being done on the legislative framework with particular attention to data protection. There is already an active public awareness campaign, which began on social media and has now expanded into the conventional media – radio and television. Radio is still a very effective communications mechanism in Saint Lucia. This has been mainly successful with the driving instructors and the minibus drivers. In Saint Lucia, where the folk language is still a form of French lexicon creole (Kwéyòl), there is a cultural activity of collaboration for which the term used is koudmen. In the anglophone islands other terms exist to signify the same behaviour. Interestingly, in creole, a derivation is proposed from the French term coup de main which has a similar meaning of offering the strength of the hand to assist; the term coup de main also exists in English but in this language the connotation is an ambush, a sudden attack. This suggests that deliberations on these issues might benefit from moving closer to the language of the folk, in which the culture emphasises collaboration rather than conflict. As already mentioned, digiGov began by using social media and radio, media that privilege the language of the folk, to raise public awareness.

One ethical concern about this project is the way in which it masks the eventual goal, a digital ID card depending on a unique identifier, behind the thin veneer of the driving license. On the whole, there is evidence that ethical considerations have been taken into account in the digiGov project.

In Saint Lucia, as the project grows so the collaboration is extended by a system of accretion. Digitising driving records has signalled a need for rectification in the Registry of Civil Status. The Registry of Civil Status holds the records that currently support the unique identities of Saint Lucian citizens. In the proposed new system this Registry would be the obvious actor to create the initial connection between the individual citizen at birth and the unique identifier that authenticates his or her identity.

On 29th December 2021, the Ministry of Health in Saint Lucia announced an extension of the activities of digiGov to the issuing of Covid19 Digital Vaccination Certificates.

(Ministry of Health, 2021) This initiative has also been publicised in various media and in both languages. So far, the service appears to have been accepted by citizens, and a high demand is reported.

Importantly, citizens have been involved in the collaboration from the beginning.

The Government of Belize recently completed a project supported by the Government of Taiwan to rectify and digitise its driving licenses and vehicle registrations. Humes (2021) reports that, "The countries will next work together on a digital inclusion program concerning digital labs, digital literacy and skills and improving Government of Belize portals." This would appear to offer a blend of the OECS methodology in its use of foreign assistance with the digiGov stratagem of beginning with a manageable subset from the range of government-with-citizen interactions. However, Belize has not yet made apparent any intentions regarding ID cards, unique identifiers, and digital IDs. The focus there is the modernisation of the records system for everything to do with road transportation.

It will be interesting to watch, over the coming months, the progress of this range of initiatives. The OECS project is on the grand macro scale using imported expertise; at the other extremity is a micro undertaking, digiGov, relying largely on home grown actors. The OECS project begins with an overview and works its way inwards, digiGov begins at the heart of the matter and works its way out.

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10. Conclusion

Contrary to the original expectations of this researcher, the findings appear to suggest that the governance system is mainly successfully self-regulating. Attempts to introduce aspects which do not display ethical consideration for the human population can be seen to generate an automatic and generally successful push back. On the whole this research has exposed a much more positive situation than originally hypothesised and than originally perceived by most of those who were consulted. Several people working in, or with knowledge of, the world of technology were inclined to be pessimistic about the extent of human-centric consideration. The interview with M. Narcisse, June 14, 2021, was a revelation that ethical considerations could be and were being applied systematically.

The move towards digital transformation for 21st century government, and its concomitant requirement for the authentication of citizen identity has alerted citizens to the possibility that the proposed system can be capable of abuse, and to the need to push to ensure that ethical considerations have a place when the systems are being created. The response of citizens in Jamaica and Barbados is telling, and in Jamaica at least has been effective. There is comfort in knowing that a degree of protection already exists in constitutional provisions (as was the case in Jamaica). Each of the countries under discussion was formerly a colony of Great Britain, and each has a similar post-independence constitution. It is to be hoped that each constitution contains these protections.

As an outcome of recent awareness raising, the 2021 RightsCon online conference included a private meeting at which a group of interested parties discussed possibilities for regional collaboration on human rights issues, one of which is the ethical implementation of AI systems in the region with particular reference to the creation of digital ID cards. The collaboration group comprises members from the hispanophone and anglophone Caribbean, and from Central and South America. That discussion is continuing with monthly meetings and is just one example of a coming together of citizens in their own protection. The issue of the digital ID cards was on the agenda of the Caribbean Internet Governance Forum held in August 2021. It is desirable that such discussions should be replicated across the region to include a broad and diverse range of citizens.

When "artificial intelligence" is discussed, there is a tendency to move directly to the furthest achieved future of that technology, currently "the intelligent agents that receive precepts from the environment and take actions that affect environments" from the Russell and Norvig definition cited above. When we do that, we tend to forget that not everyone is at the same point on the continuum of artificial intelligence. It is also sometimes forgotten that at the basis of this technology there is the inter-relationship of one set of data with another/others, and that this action can be applied to more prosaic tasks than for example the "magical" creation of autonomous vehicles, or of refrigerators that arrange for their own replenishment.

There are ethical vulnerabilities in the apparently ordinary tasks that may be ignored in the

overwhelming desire for convenience. Unfortunately, the awareness of risk and of the need to push back becomes active only at the eleventh hour.

The rallying cry of the persons with disabilities groupings is "Nothing about us without us". This slogan might well be adopted by people in the Caribbean and indeed people in all those parts of the world that are not described as "northern, western, developed" since it is the northern, western, developed world that has created many of the existing AI systems using data from its own region. And even that data is now proven to be heavily biased towards the white, educated, and older male. In the Caribbean, most of the population is not white, our opportunities for education are different, and women have a louder voice and perhaps a greater observed presence in Caribbean society. The culture and values of the Caribbean are different from those of the northern, western, developed world. The labelling and weighting of data, and even the type of data and the way it is collected need to be region-specific.

It is to be hoped that the awareness engendered among citizens by projects to create an authenticated identity will grow into a greater awareness of the extent of the risks and human vulnerabilities associated with the use of AI, and the need to develop a human-centric approach. The mindset that "AI will take over; it's bigger than we are; there's nothing we can do;" is changing to a more proactive and empowered perception of the situation. However, the level of trust still invested regionally in the AI of the big technology companies like Facebook, Google and Amazon, is of continuing concern. This global problem requires a global solution that can be applied regionally.

11. References

Associated Press. (2021, April 9). *Grim view of global future offered in intelligence report. New York Post.* https://nypost.com/2021/04/09/grim-view-of-global-future-offered-in-intelligence-report/

Barbados Nation News. (2021, May 6). *Caddle: Digital ID vital for care economy. NationNews.* https://www.nationnews.com/2021/05/06/caddle-digital-id-vital-care-economy/

Belize News and Opinion. (2021, June 23). *Taiwan completes Belize motor vehicle registration and license system project. Belize News and Opinion on www.breakingbelizenews.com.* https://shorturl.at/bpHS2

Caribbean Community (CARICOM) Secretariat and the Caribbean Telecommunication Union (CTU). (2021, January 18). *HIPCAR project. CARICOM.* https://caricom.org/projects/hipcar-project/

Caribbean Telecommunications Union (CTU). (2017, December 14). *Towards 21st century governments. Citizen-Centric, Seamless Government.* https://ctu.int/21st-century-government/

Caribbean Telecommunications Union (CTU). (2020, February 11-12). *Theme: Digital Transformation - Do it! Overview of the 4th Caribbean ICT Collaboration Forum.* https://www.ctu.int/wp-content/uploads/2020/01/4th-CICTCF-February-11-12th-2020.pdf

De Cremer, D., & Kasparov, G. (2021). *The ethical AI-paradox: why better technology needs more and not less human responsibility. AI and Ethics.* https://doi.org/10.1007/s43681-021-00075-y

Department of Regional Development and Environment (DRDE), Executive Secretariat for Economic and Social Affairs Organization of American States. (1991, June). *The case of the Mabouya Valley in Saint Lucia. Integrated Land Development.* https://www.oas.org/dsd/publications/unit/oea53e/begin.htm

Eastern Caribbean Telecommunications Authority (ECTEL). (2021, May 31). *The Federation of St. Kitts and Nevis passes Electronic Communications Act (EC Act). ECTEL News.* http://shorturl.at/aeoKP

Economic Commission for Latin America and the Caribbean (ECLAC), *Digital technologies for a new future (LC/TS.2021/43), Santiago, 2021.*

Field, H. (2021, June 21). *"A 'building the plane as you fly IT' Moment": Q&A with TWITTER'S ethical AI lead Rumman Chowdhury. Morning Brew.* https://www.morningbrew.com/emerging-tech/stories/2021/06/21/building-plane-fly-moment-qa-twitters-ethical-ai-lead-rumman-chowdhury

García Zaballos, A., Iglesias Rodríguez, E., & Puig Gabarró, P. (2021, June). *Brecha digital en América Latina y el Caribe. Informe anual del índice de desarrollo de la banda ancha.* http://shorturl.at/sDL59

Government of Saint Lucia. (n.d.) *Ministry of the Public Service. digiGov Portal.* https://digigov.govt.lc/portal/mvvmc/eservices/sldgPublicPortal.public.home

Harper, N. (2021, March 6). *Too many unanswered questions: The Barbados national digital identification (DID). Niel Harper Blog.* https://nielharper.com/2021/03/06/too-many-unanswered-questions-the-barbados-national-digital-identification-did/

Henry, Martin (2017, November 17th). *NIDS and the intrusive state The Gleaner* https://jamaica-gleaner.com/article/focus/20171119/martin-henry-nids-and-intrusive-state

Humes, A. (2021, June 23). *Taiwan completes Belize motor vehicle registration and license system project. Belize News and Opinion.* https://www.breakingbelizenews.com/2021/06/23/taiwan-completes-belize-motor-vehicle-registration-and-license-system-project/

Jamaicans for Justice. (2020, October 26). The new NIDS: An opportunity to do things differently. Jamaicans for Justice. https://jamaicansforjustice.org/the-new-nids/

Jamaicans for Justice. (2021, March 30). The National Identification and Registration Act, 2017. Jamaicans for Justice. https://jamaicansforjustice.org/download/nids2017/

Jarrahi, J. (2021, March 31). Digital ID accelerates, faces obstacles across the world. Biometrics News. https://www.biometricupdate.com/202103/digital-id-accelerates-faces-obstacles-across-the-world

Johnson, K. (2021, March 7). Building AI for the global south. VentureBeat. https://venturebeat.com/2021/03/07/building-ai-for-the-global-south/

MacEacheran, M. (2021, June 22). A unique job on England's most dangerous peak. BBC Travel. https://www.bbc.com/travel/article/20210622-a-unique-job-on-englands-most-dangerous-peak

Madden, M. (2021, January 7). Govt pushing to get digital ID CARDS rolled out. Barbados Today. https://barbadostoday.bb/2021/01/07/govt-pushing-to-get-digital-id-cards-rolled-out/

Marius, M. (2020a, June 5). Meaningful connectivity: What is the standard, and is it realistic? ICT Pulse - The leading technology blog in the Caribbean. https://www.ict-pulse.com/2020/06/meaningful-connectivity-standard-realistic/

Marius, M. (2020b, July 17). Rural broadband: Can we narrow the ICT connectivity divide in the Caribbean? ICT Pulse - The leading technology blog in the Caribbean. https://www.ict-pulse.com/2020/07/rural-connectivity-narrow-ict-connectivity-divide-urban-areas-caribbean/

Marius, M. (2021, March 5). Can we balance the efficiency, privacy and crime fighting potential of digital ids? ICT Pulse - The leading technology blog in the Caribbean. https://www.ict-pulse.com/2021/03/can-we-balance-the-efficiency-privacy-and-crime-fighting-potential-of-digital-ids/

Martineau, K. (2021, April 16). Toward deep-learning models that can reason about code more like humans. Tech Xplore - Technology and Engineering news. https://techxplore.com/news/2021-04-deep-learning-code-humans.html

Matwin, S. (2021, February 10). Let's get real about AI by Stan Matwin. Project Syndicate. https://www.project-syndicate.org/commentary/myths-of-ai-machine-learning-and-human-intelligence-by-stan-matwin-2021-02

Ministry of Health. (2021, December 29) Launch of COVID-19 Digital Vaccination Certificate. http://www.govt.lc/news/launch-of-covid-19-digital-vaccination-certificate

Newsday. (2020, June 7). Roadmap committee recommends e-id for nationals. Trinidad and Tobago Newsday. https://newsday.co.tt/2020/06/07/roadmap-committee-recommends-e-id-for-nationals/

Norway Registers Development -NRD Companies. (n.d.). Case studies - Unique ID for Grenada, Dominica, Saint Lucia and St. Vincent and the Grenadines. OECS - Organization of Eastern Caribbean States. https://www.nrd.no/en/stories/unique-id-for-grenada,-dominica,-saint-lucia-and-st-vincent-and-the-grenadines/43

OECSTV. (2020, August 27). Single unique OECS ID: What does it take? YouTube. https://www.youtube.com/watch?v=CgO-ij0NSVA&t=1494s

Office of the Prime Minister, Jamaica (2017) National Identification System (NIDS). Engagement Portal. https://www.nids.gov.jm/

O'Hagan, C. (2021, July 2). AI Ethics: Another step closer to the adoption OF UNESCO's Recommendation. UNESCO. https://en.unesco.org/news/ai-ethics-another-step-closer-adoption-unescos-recommendation-0

Ram, J. (2021, March). Digital transformation in the Eastern Caribbean. Economic Growth through Digital Transformation. https://www.eccb-centralbank.org/files/Growth%20and%20Resilience%20Dialogues/5th%20Growth%20and%20Resilience/Background%20Paper%20-%20Justin%20Ram.pdf

In collaboration with:

Ratcliffe, S. (Ed.). (2018). Oxford essential quotations (6th ed). Oxford University Press.

Ray, T. (2021, April 30). Ethics of AI: Benefits and risks of artificial intelligence. ZDNet. https://www.zdnet.com/article/ethics-of-ai-the-benefits-and-risks-of-artificial-intelligence/

Russell, S. J., & Norvig, P. (2020). Artificial intelligence: a modern approach (4th ed). Pearson.

Scherer, M. U. (2016). Regulating artificial intelligence systems: risks, challenges, competencies, and strategies. Harvard Journal of Law & Technology, 29(2), 353.

Smets, L. & Deyal, Z. (2018, November 20). Artificial intelligence and the Caribbean. Caribbean Development Trends. https://blogs.iadb.org/caribbean-dev-trends/en/9397/

Spanyi, A. (2021, March 7). Intelligent automation depends on these 4 cornerstones. VentureBeat. https://venturebeat.com/2021/03/07/intelligent-automation-depends-on-these-4-cornerstones/

The Barbados Advocate. (2021, February 28). EDITORIAL: Are we ready for a digital ID card? The Barbados Advocate. https://www.barbadosadvocate.com/columns/editorial-are-we-ready-digital-id-card

The Enterprisers Project. (2020). What is digital transformation? https://enterprisersproject.com/what-is-digital-transformation

The National Identification and Registration Act- Jamaica (2017). http://shorturl.at/gnFJP

UNESDOC. (2020, September 7). Ad Hoc Expert Group (AHEG) for the preparation of a draft text of a recommendation on the ethics of artificial intelligence: First draft of the recommendation on the ethics of artificial intelligence. Unesdoc Digital Library. https://unesdoc.unesco.org/ark:/48223/pf0000373434

Valencia, A. (2020, August 14). The Caribbean: A private sector's challenge to increasing productivity and growth – part II. Homepage. https://idbinvest.org/en/blog/development-impact/caribbean-private-sectors-challenge-increasing-productivity-and-growth-0

World Bank (2016, September 21) Supporting eGovernment systems in the Caribbean https://www.worldbank.org/en/results/2016/09/21/supporting-egovernment-systems-in-the-caribbean

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