

COMMENTARY

Is the Capabilities Approach operationalizable to analyse the impact of digital identity on human lives

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Abbreviations: CA, capabilities approach; CF, choice framework; CRVS, civil registration and vital statistics; GDP, gross domestic product; ICT, information and communication technology; ICT4D, ICT for development; NIC, national identity card

Abstract

Digital identity systems are promoted with the promise of great benefit and inclusion. The case of the Ugandan digital identity system demonstrates that the impact of digital identity systems is not only positive but also has negative impacts, significantly affecting human lives for the worse. The impact on the human lives of digital identity systems can be assessed by multiple frameworks. A specific framework that has been mentioned is the capabilities approach (CA). This article demonstrates that the CA is a framework to assess the impact on human lives that can be operationalized for technology and information and communication technology, including digital identity systems. Further research is required to compare the CA with other candidate evaluation frameworks.

Policy Significance Statement

Person registration and digital identity systems inform policy decisions in many areas, specifically those of government and citizen interaction. The effects of policy on digital identity and person registration can be better captured through an analysis that explicitly considers freedom and the value of human lives. Policymakers applying a broader view of a human will be better able to develop policy for digital identity systems, address the risks to human rights and ensure the freedom of the individual. The perspective of the capabilities approach will broaden the view of policymakers and support them to frame challenges in better ways and provide a more thorough understanding of the impact on individuals of digital identity.

1. Introduction

What happens when you are not recognized? In some situations it may not really matter; if random people on the street do not recognize you it is not that much of a problem. But when the context changes, for example, visiting your bank to request loan or your doctor at the hospital for a check-up or treatment, it becomes a serious problem. If the bank does not recognize you, you will not get a loan, and if the doctor does not know who you are, you may not get treatment. In these situations, a service provider will want to verify your identity and check their administration to see whether you are entitled to a loan or treatment before providing a service. In a society increasingly mediated through digitized registrations and

administrations, the digital registration of you as a person can open up or restrict services for you as an individual, including those we consider basic human rights (Sullivan, 2016, 2018; Hiatt and Penagos, 2019).

This commentary explores the possibility of applying a specific framework, the capability approach (CA), to assess the impact of digital identity systems for individuals. We describe the impact of digital identity system failure on individuals, the CA as a suggested lens to assess that impact, and whether the CA can be operationalized. After that, we identify areas for research to come to a full answer of where and when the CA is the best framework to be used.

2. Digital Identity Systems

Digital identity initiatives are commonly said to deliver benefits of inclusion, banking for all, fraud reduction, provision of legal identity for all, and the enabling of socioeconomic development (Olivia et al., 2019; World Economic Forum, 2020). The best-known examples of digital identity are those of Estonia, which provides an e-ID for its citizens, but also enables e-citizenship¹ for anyone in the world (Tamppuu and Masso, 2019), and the Aadhaar² programme in India, which provides a unique ID to every resident, based on biometrics (Rao, 2019; Singh and Jackson, 2021).

2.1. Negative impact of digital identity systems

When digital identity systems do not work properly, individuals will be denied access to services to which they are entitled. This has a negative impact on these individuals, and can even be the cause of severe harm to human life (Masiero and Bailur, 2021). In India, deaths from starvation have been associated with digitally enforced exclusion from food security schemes (cf. Singh, 2021). In Kenya, migrants and refugees have been barred from essential social assistance as a result of misrecognized IDs (Weitzberg, 2020).

Research indicates that digital identity can sometimes aggravate exclusion, silence voices, and have a negative impact on the autonomy of individuals (Dixon, 2017; Beduschi, 2019; Manby, 2021; Masiero and Bailur, 2021). Other documented cases exist which include situations where people have been excluded from citizenship (Dominican Republic)³ or whose exclusion from a digital identity eco-system has led to the denial of services (Ghana), (Africa Digital Rights Hub, 2020) or where a risk of exclusion exists when countering fraud (Aadhaar, India)⁴ (Drèze et al., 2017). In the context of refugees (Hiatt and Penagos, 2019), it can be demonstrated that the lack of a digital identity programmes can amplify risks and harms in the lives of vulnerable individuals.

What the research demonstrates that despite the benefits that digital identity systems can bring, people, or sometimes groups of people, are excluded or marginalized. In the worst cases, the digital identity initiative can become an instrument of control and repression in the hands of a government if used as part of a surveillance approach (Glowacka et al., 2021).

2.2. Ndaga Muntu: Digital identity in Uganda

In Uganda, the national digital identity system is called Ndaga Muntu. It aims to provide every citizen with an identity that can be used in both the physical and the online world to access a wide range of services. This identity solution is the national identity card (NIC), a physical card with a machine-readable zone containing biometrics of the holder (fingerprints and facial features).⁵

¹ <https://www.e-resident.gov.ee/become-an-e-resident/>.

² <https://uidai.gov.in/>.

³ <https://theconversation.com/how-some-countries-are-using-digital-id-to-exclude-vulnerable-people-around-the-world-164879>.

⁴ <https://thewire.in/rights/aadhaar-pds-ration-cards-jharkhand-jpal>.

⁵ This is somewhat like the Aadhaar Card. Aadhaar is a unique 12-digit identity number that comes with an Aadhaar Card, <https://uidai.gov.in> and <https://paytm.com/blog/aadhaar-card/what-is-aadhaar-card/>.

The initial design of Ndaga Muntu as a national security system rather than a social development programme for civil registration had exclusion as a significant objective: exclusion of those considered non-Ugandan, a security risk, or criminals. This design has and is impacting the building and operation of Ndaga Muntu, and unfortunately, exclusion has also happened to some of the poorest and most marginalized citizens.

2.2.1. Harm due to digital identity

A significant part of the adult population, estimated at between 23 and 33% (CHRGJ, ISER and UW, 2021), has not yet received a card, although several services have already started to make the card a stringent requirement. This meant that not having a card leads to exclusion, for example, to the right to healthcare for women. This is documented in the case of Rebecca, who when she arrived at hospital pregnant, bleeding, and with back pain but without a NIC, was told she would not be treated unless she produced her NIC. She did eventually receive treatment. Another case demonstrates exclusion from the right to social security for the elderly: Okye, an 88-year-old man, is blind, frail, and unable to move without assistance. When registering, he could not prove his age as he had no birth certificate (not uncommon in his situation) and could not provide an exact date. Consequently, he was registered as 79 years old. The Senior Citizens' Grant (SCG) is available to those over 80. His physical condition and financial situation mean he cannot travel to the district office or pay the fees necessary to correct this error. Meanwhile, he continues to miss out on the SCG cash transfer for at least another year.

Not having a national digital identity may not only restrict free travel but can also put a person's citizenship in question, since the card has become the primary means of proving citizenship. And with that, the card becomes the determining factor in the question of whether an individual can fully participate in society or not. Without a Ndaga Muntu, a person cannot open a bank account, receive medical care, buy a mobile phone, or make use of many other services.

But having a card does not automatically mean inclusion. As the case of Okye shows, even with a card senior citizens must still be personally authenticated at service centers to receive their money. Conditions that need to be met can work as an exclusionary factor, such as having to travel a physically challenging long journey or having readable fingerprints. Fingerprints can be worn away for example by years of manual labor, something which is also seen in India⁶ and elsewhere (Gelb and Metz, 2018). Sometimes, limited or no access to equipment such as fingerprint scanners or card readers is also a factor.

3. The CA as Candidate to Assess the Impact of Digital Identity Systems

Digital identity systems are contextual in their design and operation, and there are many digital identity systems and many differences between them (Anand and Brass, 2021). These systems are further characterized by path dependency (Kubicek and Noack, 2010; Brugger et al., 2014; Goodstadt et al., 2015; Tsap et al., 2019) and the context and culture they operate in and are part of Pappas et al. (2019). Digital identity systems and should be considered with a framework that addresses these aspects.

One of the strengths of the CA lies in its adaptability to new situations, context, actors, and their incentives. It is a daily application that does not require a final description of "perfect" (Sen, 2008). From that perspective, it is an approach that can be applied globally in multiple contexts and cultures (Zheng and Walsham, 2008). This addresses some of the aspects of digital identity systems. In addition, the CA recognized that capabilities and opportunities can only be turned into an actual functioning when conversion factors are taken into account. These conversion factors can be as mentioned earlier the ability to travel to a specific location, be able to present readable fingerprints, and the presence of devices to read fingerprints.

⁶<https://www.livemint.com/Politics/Uf5B33ZB2sYKpmLqwMke8O/Aadhaar-fails-MGNREGS-test-in-Telangana.html>.

3.1. *Brief overview of the CA*

The individual and his or her capabilities and opportunities are at the center of the CA, conceptually introduced by Amartya Sen in the Tanner Lectures on the *Equality of What?* in 1979.⁷ The CA considers the individual's desires and whether the individual is able to obtain the desired thing (a state, a function) and in so doing, does not define fairness and justice or freedom in terms of means and things that can be possessed, but rather in terms of options and opportunities; of what the individual could do regardless of whether they already possess it or not. This is an image of human development in which a human being is not defined by what they have, but by the choices, they can make, and thus focuses more on enabling autonomy through options of choice, rather than through individual possessions and property. This also takes into account the context, culture, history, and other aspects of the individual that influence their capabilities. The grounds for the formulation of laws stem from principles, ethics, and human rights, not the other way around (Sen, 2004).

The CA takes a broader and more foundational view of human life and the operationalization requires additional consideration. For example, the establishment of the capabilities individuals wish to have (their opportunities) is something that should be undertaken together with those individuals in a cooperative manner. It is, therefore, worthwhile to examine how CA can be used in relation to digital identity systems, perhaps not only as an analytical framework but also as an exploratory framework.

3.1.1. *How do capabilities work?*

Sen's (2008) critique of existing theories was that merely having primary goods does not necessarily indicate good living, because people differ and live in different circumstances, meaning not everyone can make the same use of the goods in their possession. A focus on capabilities is much more suitable in determining a good life than a focus on the equal distribution of goods. The example used is that of an able-bodied person and somebody in a wheelchair. Both may have equal possessions (say a 1,000 Euros), but is that fair? Is that equal? From the standpoint of goods—yes, both have the same, but from the standpoint of options and opportunities—no. The capacity to move about is not equally enabled by the possession of a 1,000 Euros. If we think it is fair that both individuals should have an equal capability to move around, that means the possessions should not be equally divided; they need to be divided in such a way that both have the same possibility to, say, move around daily for 20 km, regardless of whether they do it or even need to. This represents a capability that is equally enabled, and having that capability says something about what we value in human beings. It is not about what you possess, it is about what choices you can make. Note that in this example the choice for the capability must also be free and equal. The choice options should be equal (capability and opportunity) and the process of choosing and pursuing a specific opportunity should also be fair and free of violation.

3.1.2. *Critique on and development of the approach*

The CA is applied as a lens to development, particularly in the ICT for development (ICT4D) research arena (Oosterlaken and van den Hoven, 2011) and it is from this field of research that there has also been some criticism of the CA; criticism which led to extensive work on the CA approach.

The criticism of the CA focused on its being individualistic (Poolman, 2012), not recognizing the impact of institutions, power, ideology, and hegemony (Zheng and Stahl, 2010, 2011; Zheng and Walsham, 2021), and especially for challenges with operationalization (Robeyns, 2006). Challenges were identified as arising from under-specification, intentional vagueness, and the interdisciplinary approach of the CA.

These critiques led to efforts and developments to expand on the CA, for example, with Critical Theory (Zheng and Stahl, 2011), affordances (Thapa and Hatakka, 2017), technology augmentation (Haenssger and Ariana, 2018), and the dynamic info-inclusion model, 2iD, adapted for financial inclusion (Joia and Santos, 2019).

⁷ https://tannerlectures.utah.edu/_resources/documents/a-to-z/s/sen80.pdf.

One of the most cited expansions of the CA is the choice framework (Kleine, 2010), which has since been applied in many studies, as Kleine reflects (Kleine, 2019). She proposes that “*the next chapters in the collective story of capabilities approach research will not just be written in university offices and lecture halls but out in the field, in schools, health centres, community halls etc. and in dialogue with local partners.*” This coincides with the observation that many of the debates on CA between scholars have been settled, and “*it is time to move to the phase of using the CA to study problems that need addressing*” (Robeyns, 2017), even hinting at an explanatory use of the CA alongside its use for evaluative and normative purposes.

3.2. Proposing the CA

The CA is mentioned as a potential framework to assess the impact of digital identity systems (Breckenridge and Szreter, 2014; Beduschi, 2019). In a recent theoretical study, capabilities are used as part of a theoretical lens of technology affordance to explore what digital identity does for socio-economic inclusion in the context of Aadhaar in India (Addo and Senyo, 2021). The study examined published evidence of how inclusion was understood and realized through Aadhaar affordances in the Indian socioeconomic context. Inclusion was understood as a development condition that centers on individual well-being. The authors selected the CA in their framework of inclusion because of the centrality of the individual and their needs.

The CA emphasizes what an individual can do or be—what they are capable of—instead of what they have or are entitled to. It is a framework or approach to assess the impact of technology (digital identity systems) on the well-being of the individual. As such it avoids the pitfall of forgetting the broader context in which technology operates and the privileging of only specific behaviors (Steen, 2016).

However besides being a potential candidate and one case of including it in a theoretical approach it is uncertain if the CA could be applied for digital identity systems. Can the CA be operationalized to assess the impact of ICT (and specifically digital identity systems) on human lives and society?

4. Operationalizing the CA: Applied to Technology

How individuals are impacted in their development, be that positively or negatively, can be analyzed in various ways. The case study below shows how a broad and human-centered approach like the CA is used to examine what the real impact is on human lives of technology; in this case, what a mobile phone can do for pregnant women in Nigeria (Dasuki and Zamani, 2019).

4.1. Healthcare in Nigeria

In sub-Saharan countries, many births take place at home, and there is a 1 in 13 chance of a woman dying during pregnancy or of maternal mortality within the first 24 hr of giving birth. Mobile phones can be used to improve the health of these pregnant women by providing medical advice (via a call to a midwife for advice) or requesting help in medical emergency situations (calling an ambulance). But the mobile phone generated even more capabilities for these pregnant women. In the interaction of the technical object (mobile phone) with a nontechnical object (a midwife or a doctor) three themes of capabilities emerged.

- First, pregnant women could *enhance their voice and choice* to push for healthcare quality. For example, free mama-kits containing materials for use during and immediately after childbirth, like bandages and gloves, were supposed to be issued. Some midwives did not distribute these mama-kits to the pregnant women, but sold them to private clinics or required a bribe before handing them out. The mobile phone and a toll-free government number allowed the pregnant women to report such unethical practices and use the mobile phone to contact local media to gain publicity and build public pressure.
- Second, pregnant women could *enhance their access* to emergency services and entrepreneurial activities. For example, calling the midwives instead of having to go to the hospital made access to

care and medical advice easier. It saved time spent traveling and reduced the physical burden and financial costs for the pregnant women. The phone was also used to arrange transport to the hospital and provide notice to midwives and doctors regarding inbound patients. Another example was that of the pregnant woman who ran a small business selling baby products, and who used the phone and WhatsApp to advertise her products, increasing her income.

- Third, the mobile phones *enhanced knowledge, literacy, and social connectedness*. For example, the healthcare district used the mobile phones, via the WhatsApp groups of pregnant women, to inform them about outbreaks of disease and provide preventive care information. The pregnant women also shared information in other WhatsApp groups using their mobile phones, further increasing their knowledge and social connectedness.

The ability to achieve these capabilities was influenced by personal, social, and environmental factors. These factors determined whether the opportunities offered by the mobile phone could be converted into actual outcomes.

Personal factors that hindered conversion include illiteracy (not being able to read, including SMS and WhatsApp messages and not being able to use a mobile phone), and not being able to pay for a mobile phone or the subscription to a provider. Environmental factors that hindered conversion included poor telecommunications infrastructure and lack of electricity, for example, being unable to charge the battery of the phone for days. The social factors that hindered conversion included the condition of the women's health (whether they were actually able to use the phone or remember to use it) and not having the time to spend on using the mobile phone (because in this culture the woman is expected to undertake most of the household responsibilities and family care).

In the analysis, the CA⁸ addressed the technical objects (mobile phones), the nontechnical objects (midwives), and the sociotechnological factors that facilitated or impeded the capabilities. The approach looks beyond the instrumental metrics of, for example, the number of mobile phones issued or the costs and addresses the actual outcomes and impacts in the lives of the pregnant women. It is able to take into account the context and sociocultural factors, and the participatory approach chosen by the researchers allowed the pregnant women to define the capabilities they valued for themselves, avoiding the imposition of capabilities upon them that might be due to research bias or a mismatch with what the women actually wanted and needed.

The results show the impact on the lives of the pregnant women, and these findings can in turn inform policy-making to improve their lives.

4.2. Other case studies of operationalizing CA for technology and ICT

A brief review of other case studies that have used the CA reveals that it is not only used and operationalized but that with regard to technology, it does indeed explicate and describe human development beyond traditional economic approaches based on gross domestic product (GDP) metrics.

The case studies reviewed included:

- How the CA was to analyze the impacts, and allowed for a broad assessment of human development, considering people's heterogeneity, as well as evaluating individuals as an end in themselves, in the case of a "bank boat" offering public services to riverine population (Joia and Santos, 2019)
- How CA and affordances were used as a theoretical lens, identifying conversion factors and facilitating discussion in Kenyan study circles for ICT (Hatakka et al., 2020);
- How the CA coupled with global and intercultural ethics perspectives, provides a rich human-centered view of the benefits, drawbacks and ethical risks of the benefits, drawbacks and ethical risks of cloud computing for African countries (Wakunuma and Masika, 2017);

⁸ Specifically, the "technology augmented CA" was applied.

- The CA provided provides a theoretical lens that addresses the multiplicity and complexity of empowerment and participation of a pre-paid electricity billing system, and how it has empowered people (Dasuki et al., 2014);
- The CA as a conceptual good fit and “well-suited to the study of innovations (such as mobile money), support a systematic and holistic analysis and address how people are empowered by opportunities to pursue well-being goals” (Adaba et al., 2019);
- The CA together with Kleine’s Choice Framework to identify areas of capability enhancement, reflect on the framework used, suggest a practical research design, and address theoretical specifications deemed important in operationalizing based on mobile phone usage and whether it contributes to development and to capability enhancement in Southern Ghana (Yim and Gomez, 2018).

5. Conclusion

The CA is applied successfully to assess the impact of technology on individual level as the cases demonstrate. It is expected that it can be operationalized and used to analyze and discuss digital identity systems and how they impact human lives and freedoms. The CA also provides a perspective to describe what can be done to improve human lives. What a digital identity can do for an individual, and even what it should do, can be described with the CA.

The cases do not indicate how the CA compares to other approaches that analyze the impact of technology on individuals and society. That would be another venue of research to conduct.

Finally, the fact that digital identity is such a foundational, interrelated, and interdisciplinary topic makes the CA a particularly fitting approach. As Robeyns says, “there is an increasing recognition that many important questions cannot be studied properly without a unified framework or conceptual language in which all the social sciences and humanities can find their place. The CA may well form the nexus connecting existing disciplinary frameworks, precisely because its concepts bring together people’s well-being and the material resources they have, the legal rules and social norms that constrain their capability sets, and so forth ... it could also link evaluative and normative frameworks to descriptive and explanatory frameworks, rather than leaving the normative frameworks implicit” (Robeyns, 2017, p. 214).

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