Digital technologies: interlinkages with megatrends and regional perspectives

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The so-called 'tertiary phase' of the Information Age has revolutionized family life as the internet and mobile devices has enabled efficient communication, global commerce and industry, social interaction and education. Within the family system, information and communications technology (or ICT) facilitates feelings of connectedness and cohesion between family members, an indication of well-being. This includes communication with extended family particularly during times of separation, such as the COVID-19 quarantine or transnational living. ICT has reduced space and time barriers between work and family, enabling parents to assert more agency in fulfilling multiple roles and responsibilities. For children and youth, the integration of technology in education has extended possibilities for learning, both practically to reach learners in remote and rural locations, and pedagogically, through individualizing instruction with creative and collaborative applications. And efficiencies for health care, money management, entertainment and 'smart' living have made life easier for many families, freeing up time for other pursuits. At the same time, there are costs. The flow of information across networks and improper handling of data can leave families open to privacy, security and safety issues which can have severe consequences. As a result, family technology use has ushered in significant new avenues for research that move beyond the descriptive, to identify the impacts of use on individual well-being and development (particularly in the case of children), relational dynamics and indicators of family success.[1] This paper examines technology's influence on two megatrends facing families: urbanization and migration, which address a number of Trask's suggestions to the UN in 2020, and concludes with general recommendations that align with Sustainable Development Goals.

Urbanization

Infrastructure that influences family life - livable cities, efficient governments, industry, and global societies - also are impacted by ICT. Of the 'pillars' of globalization, information has experienced the steepest rise since 2007 (Altman & Bastian, 2021). "Smart' cities impact quality of life through improved emergency services and safety (such as real time crime mapping and emergency response time), transportation efficiencies and traffic reduction, health services (including patient monitoring, air quality information and infectious disease surveillance), and a healthier environment through reduced emissions and waste, and water preservation (Jones,

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[1] For an in-depth discussion of family life and technology, please see Walker (2021), Technology Use and Families: Implications for Work-Family Balance and Parenting Education. Background report for UNDESA, at www.un.org/development/desa/family/wp-content/uploads/sites/23/2021/05/Technology-Families-Background.pdf

2020). E-commerce has blossomed particularly with the COVID-19 pandemic and internet tools have heightened access to a range of resources. Access to the Internet is critical for homeless families to find housing, job opportunities and apply for services (City Bar Justice Center, 2020). Recent developments in ICT enable citizens to express thoughts and needs in novel ways that go beyond discourse to visioning, active planning and creating. Application implementation research has identified aspects that encourage usability and impact (e.g., Wilson & Tewdwr-Jones, 2020). ICT appears to also impact urbanization by contributing to a reversal in the trend toward migration to large cities. After COVID-19 forced many white-collar workers to work from home, employees, and a significant number of employers desire more flexible work arrangements. Employees are finding it less expensive to live and work from home in non-city areas. Working in the gig economy and as digital nomads may contribute to this anti-urbanization trend as well.

Migration - Benefits of Information and Communications Technology (ICT)[2]

Access to the internet is particularly critical when families are mobile or relocate due to immigration, live transnationally, and/or are separated owing to military service or employment. What McAuliffe (2016) refers to as 'the applification of migration' has introduced products that offer efficient transfer across groups, and feelings of empowerment when integrating into new societies (Alancar, 2020; Bauloz, 2021). Groups such as Doctors without Borders (Médecins Sans Frontières) consider the inclusion of charging ports for mobile phones as critical as food, health care and sanitation. (Latonero, Poole and Berens, 2018). Bauloz quotes Collin, saying that 'the successful integration of migrants requires that their technological integration is as important as the social, political, and economic integration traditionally reported in scientific literature' (Collin, 2012, p. 66)

And data systems that track migration patterns, migration needs and locations have improved an understanding of patterns and resource and policy needs. Yet, as Bhabha et al (2021) warn, despite the many potential advantages ICT offers, it is 'value neutral,' and highly dependent on context. And for its potential virtues there are both challenges ICT presents and needs that must be addressed for it to be sufficiently valuable to migrating and transnational families.

Social connections. Connection with family and friends is the primary function ICT serves for migrating families. Popular apps like WhatsApp, Zoom, Line, Facebook and Instagram messaging and Viber can provide free and low-cost ways to communicate. These connections

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[2] For greater coverage on this topic, please see McAuliffe, M.Ed. (2021). *Research handbook on international migration and digital technology.* E. Elgar Online. https://doi.org/10.4337/9781839100611

enable emotional support and reduced stress (e.g., knowing how family members are faring either during migration or back home). Connectivity with familial culture is also useful for unaccompanied minors who are stuck in refugee camps or shelters.

Within these social connections ICT facilitates the fulfillment of familial roles. These include family care regimes, particularly for women whose traditional responsibilities include continuing care for family members and education for their children despite migration. In some cases, migrating women are aided by 'transnational care collectives' in home countries who look out for family members and use ICT to communicate status updates. ICT also facilitates efficient transfers of money between family members, compared with costly efforts in the past that depended on agents, or were time consuming, particularly during large scale disasters when getting support to family members was time-critical. And ICT-enabled documentation of family status and purpose for migration aids in verifying information needed for family reunification and reduces burden on immigration sponsors.

Integration into a new society. While there is room for improvement, digital technology has become a part of nearly every education, health, housing and employment system that families encounter during migration or transnational living (Adkins & Sandy, 2020; O'Mara et al, 2021) The access to mobile technology, and ability to tailor smartphones capabilities to individual needs creates a sense of agency and empowerment (Abujarour, et al, 2021), in part through the ability to stay connected in two places at once. Applications make geolocation, banking, active language learning, access to news and shopping easy, which heighten familiarity with new locations. Local information is often supplemented with that derived from the informal network of social capital built from connections with already-migrated family members and friends.

Blockchain technology is a decentralized system of shared information and digital processing that makes transactions more transparent and within the control of individuals, including transnational families who need exchanges to be speedy, private and at a minimal cost. (Bauloz, 2021; Farenbaum, et al, 2018; Srivistava, 2022). That means that transactions are less likely to go through banks or agents and unable to be penetrated by outside surveillance systems. AI shows promise at the point of entry during immigration, streamlining border control and security and identity checks. Yet appropriate caution is warranted, as AI has also been linked with discrimination particularly in access to information (Beduschi, 2020).

Skills development Technology skills are a constant in reports of future employability in the US and elsewhere (Farbenblum, et al, NAS, 2017). Preparing migrants and refugees with the skills to take on jobs in the tech sector and job skills that rely on tech knowledge and language is a clear way to improve employment sustainability regardless of location or re-integration (Demmans Epps, 2017). Making informed choices about who they work for through centralized employer information banks and advocacy for visa portability regardless of employer are ways that migrant workers are empowered through ICT. Future efforts will address the ethical, legal

and practical challenges of migrant worker apps and developing systems that promote immigrant labor sustainability.

Representation in data sources and social media. Mechanisms for data collection on migration provide useful information about locations, patterns, chronology, and border policies. These allow for visualizations which can frame our understanding of migration and create applications that provide efficiency and can be used for research. As Leurs and Witteborn (2021) observe, "Datafication and automation are the basis for new developments that seek to improve, augment, or substitute human decision-making through overlapping developments, including artificial intelligence (AI), machine learning, and predictive analytics" (pp. 17-18). Yet developer or researcher priority or interpretation can favor certain "truths." The collection of migration data also poses ethical concerns, and open streams of data can exacerbate the threat of predatory exploitation (Babha, et al, 2021)

Without a doubt, inclusion of under-represented voices is a value of social media as a mechanism for expanded public and global discourse. For immigrant families this can be useful in elevating public media campaigns on migration rights and policies and eliminating discrimination. At the same time, it gives a platform to the counter narrative that promotes misinformation and a racist and anti-immigrant ideology that can incite hateful action and bait the news media to further their messages (Culloty & Suiter, 2021). To date regulatory approaches to monitor and censor anti-immigrant messaging have not been successful, thus presenting the need for more attention to impact on public opinion.

Access, Digital Literacy and Privacy as Urbanization and Migration Issues

Inequitable access to the internet and to digital technologies means differences in urban and migrating families' abilities to take full advantage of technological efficiencies, access to information, connectivity and interactivity for learning and employment. Encroachments of privacy and data security when using the internet threaten feelings of safety, which affect technology attitudes of migrants.

Access. Global data indicate that on average, at least 77% of the world's population has at least some access to the internet (Schumacher & Kent, 2020), yet the distribution is uneven. Close to 87% of individuals use the internet in developed countries, those in countries with emerging economies report lesser use (47%, on average, from 38% in India to 89% in Lebanon) and those in least developing countries – primarily in Africa – report an average of 19%. Within the continent, country averages range from 4.7% saturation in Western Sahara to 87.2% in Kenya (Internet World Stats, 2020). In Latin America, internet use similarly varies, with countries like Argentina (92.2%) and Costa Rica (85.5%) reporting high saturation, and countries such as

Nicaragua (30.2%) and Honduras (28.7%) with small percentages of internet users within the country population. Since 2015 overall access to the internet exceeds household computer ownership. In other words, the ITU reports that it is no longer necessary to have a computer at home to access the internet. (ITU, 2019, p. 7). For some families, a smartphone provides household internet access. Cell phone ownership is also higher in countries with developed economies (e.g., over 90% in European countries).

Digital literacy. Lack of access and use create a digital skills gap, affecting comfort in basic computer skills which contributes to 'information poverty' for immigrants (Bauloz, 2021). The ITU report that for 40 of the 84 countries with available data, less than half of the population have basic computer skills (e.g., copying a file, sending an email with an attachment) and fewer than half in 60 countries report having standard skills (e.g., installing software). Among immigrants, digital literacy varies widely depending on the age, education and incomes and prior exposure to ICT before migration. Younger migrants are more tech savvy and assist older family members with technology use during immigration. Lack of digital skills also contributes to migrant and refugee negative attitudes about ICT, further widening the divide on access.

During COVID-19, children in families with limited internet and/or computer access fared more poorly in school participation and academic achievement. Pew's US survey of families with children during COVID-19 indicated that 53% said that the internet was essential with 94% reporting that their children's schools were online (Horowitz, 2020). For many families this was a challenge; 29% reported that their children needed to do homework by mobile phone and using public WIFI (22%). These numbers are higher for families who are low income and who live in rural or urban areas. Fully 36% of low-income families reported that their children were unable to complete work at home without a laptop. Other reports indicate a reduction in use of telehealth services by families, including First Nations people, during COVID-19, raising the concern about poor health outcomes in populations at risk of chronic disease (Robertson et al, 2021). As a result, gaps in access only contribute to and exacerbate challenges brought about by disparities in income, education, employment, housing and sanitary living conditions and health care in families' lives.

Experts predict that digital equity will remain a prevalent issue for families in the future (Anderson et al., 2021). As observed in a 2018 UN DESA report, for e-governments to strengthen family resilience through access to information and services, they run the risk of further isolating those with limited digital literacy. Meanwhile, small scale efforts get technology into the hands of families and children in need. For example, through COVID-19 conditions and before, schools distributed devices, routers and WIFI hubs, provided additional technology coaching, and trained teachers to be sensitive to equity and access needs of children and families.

Privacy and online safety. Online technologies enable telecommunication companies' access to data about the user; data that can be sold to market products and create a digital footprint that the user (including a child) has little control over. Cybersecurity breaches occur in schools, public access points (such as libraries), and from workplace-issued devices as well personal computers. Identity theft and access to financial and health data are threats families face. And the level of digital literacy for many individuals may only exacerbate these issues. More than half of early teens 12 to 15, for example, believe it's easy to delete their information online (Commonsense Media, 2018).

For migrating families, using the internet and digital technologies present privacy risks. For many migrants, particularly older adults, suspicion around the privacy of data and surveillance is a barrier to ICT use (Adkins & Sandy, 2020). Traffickers can seize on migrants as revenue sources (particularly homeless teens and women), using algorithms that track phone use and social media accounts, blackmail family members to prevent violent crime and assault, particularly against youth. Smugglers or traffickers can also exploit the Internet, social media and popular software applications to recruit customers from migrant youth, usually those traveling alone, to arrange trafficking services including the provision of fraudulent travel documents, and to make and receive payments. As result of heightened use of the internet, data has become a critical commodity and its worth increases as more is produced. The control of the flow of data has become an indicator of democratic governance. While some degree of control is beneficial for security, authoritarian governments' restrictive data practices encourage surveillance and affect cross-border data flow, digital products, and internet enabled services.

Women who are victims of intimate partner violence witness the ways in which ICT can both challenge the lives of migrants and provide valuable services. A recent review on technology-facilitated domestic violence (TFDV) observes that immigrant and refugee women face multiple structural layers of oppression and social inequality so that the use of digital technology to promote sexual harassment or violence becomes an unaddressed issue (Henry, et al 2022). Typical behaviors of TFDV include stalking, receiving harassing texts and pictures, tracking, restricting technology access, and using technology to access and control devices, gaslighting and impersonation (e.g., messaging that leads the individual to question their sanity). From interviews with immigrant women, the authors determined two major barriers to victims receiving support: language and legal. Often immigrant women are reliant on partners or perpetrators (including extended family) to translate. They also experience low digital literacy. From a legal standpoint, the women voiced that police often didn't view TFDV as serious as physical, financial or other types of harm. It was also challenging to gather sufficient evidence for action to be taken. The authors call for a multifaceted approach that is culturally sensitive and includes education and training. Sabari et al (2022) observe that immigrant women often cannot or do not want to seek in person assistance due to immigration status, transportation or social isolation. Immigrant women observe challenges to using ICT services due to partner presence,

partner device monitoring, language challenges or the lack of technology access. And they noted a number of methodological suggestions for ICT to be most useful to them (e.g., reminders to delete evidence of contact, using 'safe' words when talking).

Safeguards in policy standards that apply to all families, including immigrating families, such as COPPA privacy protections and the General Data Protection Regulation in the European Union are useful by restricting access to social media by age. The newly formed 5 Rights Foundation advocates for policy action as the UN Commission on Child Rights Article 25 has extended children's rights to online environments. Industry recommendations for privacy dictate that children are not tracked nor profiled online, nor subject to ads based on their online activity; that children be able to easily modify the personal information they choose to share; that families educate themselves on privacy options, and agree not to share children's information without their consent.

General policy recommendations

Policy recommendations regarding families and technology applicable to the identified interests of migration and urbanization, that reflect the UN's Sustainable Development Goals include the following:

1. Ensure access to the internet, to higher speed internet, and to devices for communication and access to the internet. Attend to equity issues to ensure level access and digital skills for immigrant and transnational families across the trajectory from preparation for migration to settlement and potential re-entry.
2. Help family members gain digital literacy skills to use the internet comfortably and safely for social connectivity and integration into new communities.
3. Empower immigrants, particularly women, with skills to deploy technology in work, and as members of the tech sector.
4. Attend to regulation and policy for the ways in which immigrants are represented in data sources, viewing data as a public good. This includes attention to public discourse and to policies that safeguard immigrant children and families from surveillance, privacy invasions and threats from traffickers.

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