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Supporting Digital Health and Digital Inclusion

An Occupational Therapy Perspective

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Digital technologies (DTs) are increasingly prevalent in global everyday life and considered as tools to bridge health inequalities relating to the urban–rural divide. Occupational therapists can optimize the fit between people, activities and DTs, though little is known about rural practice. The study aimed to understand rural occupational therapists' view of DT and identify its perceived impact on practice. Fourteen occupational therapists from six countries were recruited through social media and email. Data were collected through an online questionnaire and either a one-to-one interview or online group discussion. Influenced by grounded theory, the data were analyzed using thematic analysis and constant comparison with current literature. Three themes emerged: DT was identified as pervasive, having a multi-dimensional impact on modern rural *citizenship*; DT interacted with the concept of *being available*, regarded as complementary to face-to-face contact; and therapists engaged in dynamic technological *actions* and *ideas* responding to diverse needs. Participants embraced the changing importance of DT in their clients' daily lives, used personalized approaches and adapted practice to the evolving DT landscape. This study indicates the profession may offer insights for health and social care providers and digital health developers. Collaboration on inclusive provision may reduce health inequalities and meet rural communities' needs.

- Healthcare
- Digital technology
- Inclusion
- Rural–urban divide
- Occupational therapy

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THE RURAL-URBAN DIVIDE IS WIDELY associated with lower health status, reduced access to health, transport, technology and education and stifled economic growth (Reed *et al.*, 2014; E. Roberts *et al.*, 2015). Digital technology (DT) is argued as a panacea for these citizenship issues; however the digital divide is contentiously viewed as increasing and leading to digital and social exclusion (Reed *et al.*, 2014; E. Roberts *et al.*, 2015; Park, 2015; Erdiaw-Kwasie and Alam, 2016). This is a complex issue with population dispersal and terrain cited as driving up costs and preventing access to rapidly increasing resources and internet speeds (Reed *et al.*, 2014; Salemink *et al.*, 2015; World Economic Forum, 2015).

Despite this paradox, digital health is readily identified as providing opportunities for rural healthcare providers globally to address health inequalities (Chedid *et al.*, 2013; Department of Health, 2014; Ward *et al.*, 2015; Vallury *et al.*, 2016). Indeed, rural health practitioners have consistently demonstrated higher levels of uptake in eHealth initiatives than their urban counterparts (Heisey-Grove, 2016). The practices of occupational therapists are regarded as unique in the rural context, being isolated and generalized in nature, while contending with large distances and diverse caseloads (Chedid *et al.*, 2013). Occupational therapy is a health profession focused on facilitating people and communities do the things they want and need to do to have a fulfilling life (World Federation of Occupational Therapists (WFOT), 2013). The term “digital health” is poorly defined, but often used as a broad term to encompass all and more of the following: e-health, mobile health, telehealth, wearable health devices, personalized medicine and applications.

Accessing digital health is dependent upon access to, and skill in using at least some digital technologies (DTs) (i.e. smartphones, mobiles, computers, tablets, internet, social media platforms). However within the lives of rural citizens, the meaning and importance of DTs more generally are not understood (Wilson, 2016). Occupational therapists have expertise to analyze the demands presented by the pervasive nature of DTs alongside their clients’ physical and cognitive capabilities (Nygard and Rosenberg, 2016). Furthermore, they can facilitate participation in aspects of citizenship which involve DTs and understand their impact on daily life. Urban findings rarely translate successfully into rural contexts; and how rural occupational therapists are currently utilizing DTs directly with their clients is little explored (Mulder *et al.*, 2010; Chedid *et al.*, 2013).

Consequently, this study aims to understand the professional view that rural occupational therapists take of DT, and the perceived impact this has on their professional practice and the health and fulfilment of their clients.

Methods

This study used qualitative methods with the collected data analyzed through a process of open coding, constant comparison and; as theoretical saturation was not reached, thematic analysis. The themes were progressively tested,

revised and refined against the original data for their consistency, clarity and fit (Braun and Clarke, 2006; Charmaz, 2013). This researcher-active, comparative approach ensured an accessible and trustworthy framework for interpreting meaning in the data (Braun and Clarke, 2006).

Consistent with constructivist grounded theory principles, the literature review is embedded throughout the report to support both the positioning and discussion of the findings (Charmaz, 2013).

Participants

A purposive sample of occupational therapists were recruited via social networking sites (SNS) and email. The research participants trained through WFOT recognized programmes, which signified parity of professional standards. In the absence of a common global definition, the participants were asked whether they self-identified as practising rurally.

Data collection

An online questionnaire opened during November and December 2015 with two onward methods nominated by recruited participants: discussion via SNS group open to the end of March; or one-to-one, audio-recorded, semi-structured interview via telephone or videoconferencing, completed in February 2016.

Interview questions to participants emerged inductively, beginning with initial coding of free text questionnaire responses. The questionnaire had first invited participants to lead the direction of the discussion by sharing their thoughts, experiences, considerations, reflections and ideas relating to DT use in practice.

This flexibility and responsiveness supported participant-focused engagement and offered maximal convenience for occupational therapists across different time zones.

Data analysis

Interviews were audio recorded and analyzed direct from repeated listening to retain the richness and authenticity of the original expression. Participants were given the opportunity to check transcripts. The group SNS discussion was imported into an editable format and given equal consideration in the analysis (Braun and Clarke, 2006). Codes generated from the original questionnaire responses remained as a source of comparison with the new data arising.

All data were openly coded, thematically analyzed and interpreted by the main author with further examination and discussion with the second author. The interpretations were finalized prior to comparison with the literature to allow for maximal emancipation of the findings (Charmaz, 2000).

Ethics

Ethical approval was granted by the University of Cumbria on 9 November 2015.

Findings and discussion

Fourteen rural occupational therapists (pseudonyms given) were recruited to the study from Australia, England, Kazakhstan, Scotland, Sweden and the United States of America. All completed the questionnaire and a sub-sample of eight participants joined the SNS discussion (four actively participated), while four opted for interviews via telephone or videoconference.

Participants:

- ▶ Revealed a unique understanding of what DT means for successful citizenship and participation in rural contexts
- ▶ Synthesized this contextual view in respect of the role and impact of DT in the lives of their clients and colleagues and explained the resulting processes they undertook
- ▶ Detailed what DTs they use, their ideas and plans and their belief that more exists than could be known about, with new potential being tapped all the time

These three identified themes were derived from the coded responses (Figure 1). The relationships between the themes were examined and conceptualized in a model (Figure 2). These are discussed in relation to the literature below.

Figure 1 Analytic process to identify themes

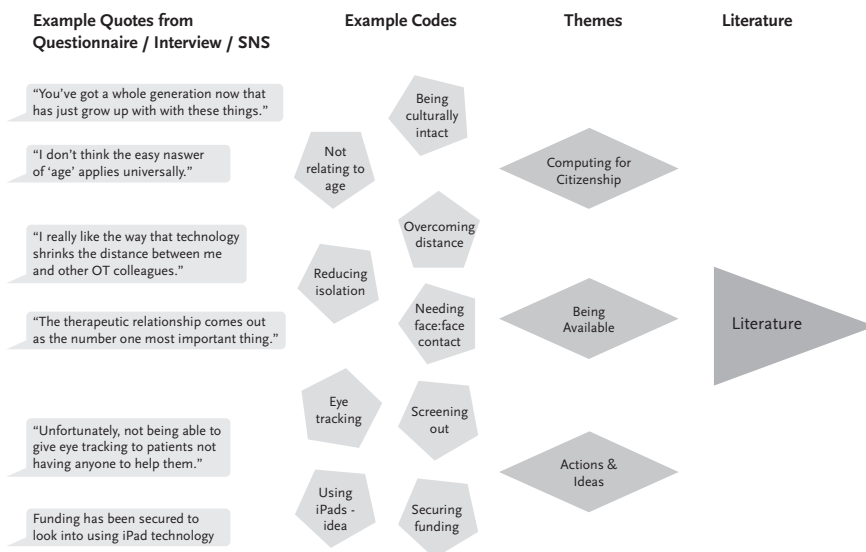
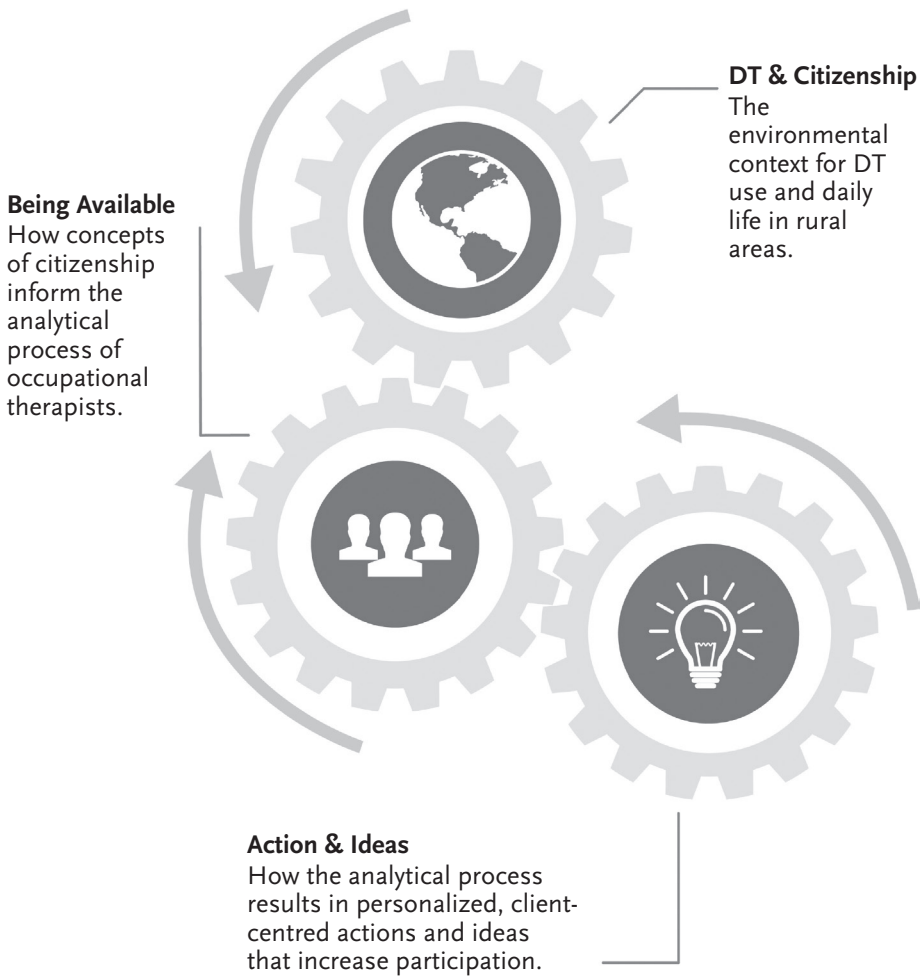


Figure 2 Consequences and interactions between the themes



DT for citizenship

I met a woman with [motor neurone disease], she was 90 [...] she said; “I love playing Facebook games. That’s what’s important for me [...] to pass time with Facebook games.” [...] I think that occupational therapists have a really important role; to be there to, to understand that to be online, to be on a computer ... It’s kind of hard to be a citizen today if you don’t know how to use a computer (Alex).

Significant in this extract is an appreciation of how DT interacts with performance in daily living and optimized participation in social, leisure, vocational, educational and financial contexts. Barriers to participation are understood to emerge across these multi-contextual domains as a result of lack of access to, or skill in using DT.

Alex demonstrates openness about who utilizes DT and what it subjectively means to the user. The statement acknowledges that an older person using a computer for Facebook games is noteworthy in its challenge to socially held preconceptions. Indeed, Kongaut and Bohlin (2015) asserted the importance of “pointing out” (p. 750) to the older population the benefits of mobile broadband devices for watching the “news and documentaries”. However, Vroman *et al.*'s (2016) detailed analysis of activities undertaken by 198 people aged over 65 demonstrated the need for an open attitude towards the online habits of older adults. Among its many findings were that 44% of respondents played online games with 11% gaming socially.

That familiarity with DT might follow generational or cultural indicators was commonly questioned, with preparedness for utilizing DT perceived as a shifting entity with increasingly few people occupying the spectral pole of “alien”:

There's a bit of a mix ... some older people don't have access to internet and the idea of a smartphone probably just horrifies them. But there are others and I don't think it's particularly age-dependent. [...] albeit that family might help to support them in setting those things up (Jordan).

Most participants identified a need for varying degrees of social or family support to facilitate engagement with DT, which correlated with findings in the literature. The Vroman *et al.* (2016) study demonstrated that the presence of family support was instrumental in building and sustaining DT use among older adults in rural areas. Furthermore, DTs were understood by participants in the current study to be inaccessible without help for some members of society who experience limitations resulting from physical or cognitive impairments. This offers further insight and consistency to Vroman *et al.*'s key finding that people living with chronic conditions and disabilities were least likely to use DT.

The concept of a spectrum aids a diametrical understanding among rural occupational therapists that for many individuals, DT is an intrinsic and innate aspect of participation in daily living. Between “virtual” and “in real life” constructs, concepts of identity and belonging were seen to alter. An appreciation of this fluidity was seen to impact how therapists in this study developed a holistic view of both clients and colleagues. Between these two realms, differing degrees of synchronicity were understood to exist entwined with issues of comfort, control and privacy.

In perceiving higher levels of preparedness to use technology, the cultural norms and physical demands of the virtual and technological world could hinder participation, resulting in alienation and reduced self-efficacy. Whereas cultural intactness could facilitate a sense of belonging, and mastery that enhanced participation:

I think there are a range of reasons why some people do not want to use [DT]: they don't want to look foolish [...], they worry about how time consuming and costly it is, [...] about privacy and confidentiality (Sam).

That is the way that they communicate with everybody in their world ... People seem much more comfortable with interacting with their phone! (Jess)

DT-based communication was seen to increase the convenience, quantity and quality of inter-professional and client-centred networks and interactions. Consistent with several publications, these aspects were considered pertinent to overcoming the geographical isolation and travel barriers posed by rural dwelling (Thinnes and Padilla, 2011; Chedid *et al.*, 2013; Deloitte, 2015; Vallury *et al.*, 2016; Ashburner *et al.*, 2016). DT use among study participants and the wider literature alike was seen to facilitate the acquisition of knowledge for clients (Gardner *et al.*, 2016; Ashburner *et al.*, 2016), and professional communities (Chipchase *et al.*, 2014; Kingston *et al.*, 2015, Ashburner *et al.*, 2016), while posing challenges for assessing quality of information. This study similarly identified that low institutional priorities, delaying the provision of affordable, reliable and fast rural internet services, limit the potential for technology to impact knowledge enhancement (A. Roberts *et al.*, 2015; Ashburner *et al.*, 2016). This was regarded as being exacerbated further still where the costs of living in rural areas were higher than associated incomes.

Face-to-face interpersonal relationships, of a professional and personal nature, were recognized by participants and wider literature as not diminishing in their significance to support health and well-being (A. Roberts *et al.*, 2015; Ashburner *et al.*, 2016; Wilson, 2016). Even among young people, a SNS was used to sustain face-to-face networks rather than build remote new ones (Waite and Burke, 2015). Understanding the importance of face-to-face relationships for community cohesion was commonly identified by participants as a key element of successful practice in rural environments. This was equally the case for sustaining local inter-professional relationships. Accessing DTs is recognized by participants as having individually distinct meaning and significance to people in rural society.

Being available

The occupational therapists related that their understanding of DT's role in society led to an increased ability to be available for their clients, one another and their managers. The portable nature of some DTs and their intactness to daily living enabled occupational therapists to share examples of providing discreet and immediate therapeutic support: "If someone was out [needing support in social situations] ... nobody would think too much of somebody having a look at their phone" (Jordan).

Should workplace policies facilitate this, access was enabled to immediate peer-to-peer mentoring and evidence-based practice. This was regarded as especially relevant for rural practice where generalization and diversity of skill were viewed by some participants as a necessity. Concurring with Chedid *et al.* (2013), associated time and required facilities together with a lack of infrastructural connectivity in rural mobile working presented barriers to uptake of this *modus operandi*.

This concept of "being available" revealed the complex nature of integrating DT with client-centred working in rural occupational therapy practice. Participants analyzed the potential of clients to engage with DT, or adapted

non-technological activities before deploying DT to facilitate engagement. A. Roberts *et al.* (2015) advocate for clients to be involved in the designing of eHealth applications in order that they are operable within a client's physical capabilities. This paper advocates that working with occupational therapists may improve and streamline the development of fit-for-purpose digital healthcare.

Study participants and the literature assert that replacement of existing traditional interventions should be client-directed with DT providing additional options for therapeutic support, increasing service availability and reinforcing therapy (WFOT, 2014; A. Roberts *et al.*, 2015; Gardner *et al.*, 2016; Ashburner *et al.*, 2016). This occasionally reduced contact with services by enabling clients to self-manage their conditions according to their personal preference. This point is significantly relevant to policies which aim for DTs to provide a major contribution to rural healthcare and self-management (Scottish Government, 2015; Nesta, 2015). Caution should be exercised, however, as participants highlighted a potential threat to client-centred working in the case of cost efficiency directives.

The places where you have your own iPad to use, have much stricter productivity standards (Sandy).

Where technology was provided alongside increased expectations of reduced contact time and increased therapist productivity, it was regarded as potentially detrimental to the therapeutic relationship. A. Roberts *et al.* (2015) noted the challenges of quantifying the value of face-to-face therapeutic contact, particularly where social isolation was considered a threat to client well-being. This study shared that finding and participants asserted that the social dimension of a home visit held its own intrinsic therapeutic value for some clients. Occupational therapists personalized their deployment of DTs to the habits, skills and interests of the individual, integrated with that person's existing technological environment. This provided the participants with a route to optimizing engagement in both therapy and professional development. Gardner *et al.*'s (2016) study similarly identified that assessing the suitability of DT use with clients should be part of the occupational therapy process, which is evident also in this study:

People that don't have support from friends and family, that don't have previous experience of technology, it tends not to be something that I have pursued. I've explored it, but it's more or less that I've been immediately shut down with that [...]. It is a question that's asked as part of the assessment process (Chris).

Motivation is a key component of Chris's response and it is useful to consider this in relation to Vroman *et al.*'s (2016) study. Although not generalizable to a wider population demographic, they found that among older adults, intrinsic motivation and interest outweighed self-perceived capabilities as a driver for engagement in DT. In this study, participants raised ethical issues and potential injustice associated with increasing DT use where there was insufficient motivation among clients and colleagues alike. They found that to increase DT utilization required a personalized approach which considers appropriate exposure, support, encouragement and time to learn.

Occupational therapists identified family support as a critical dimension to successful incorporation of DT. Utilizing DT to aid ease of communication, minimize disruption to daily routines and maximize convenience for the client and their family were identified as improving quality of service. This was most notably paralleled by Ashburner *et al.*'s (2016) study which detailed the positive impact for parents of children with autism spectrum disorder. By removing the pressure to leave their remote rural homes, disruption-induced stress was not incurred, increasing attention on the service and information provided.

In using DT to overcome distance and travel issues, services were identified by participants as being more economical and efficient, increasing quantity of service. Barber *et al.*'s (2015) evaluation of providing a remote specialist stroke consultation service generated promising evidence of costs savings and reduced lengths of hospital stay. Participants in the current study also highlighted increased ease of contact with, and availability of specialist services through DT. They perceived this also offered the additional benefit of providing a route to promote best rural practice and services. This in turn indicated to occupational therapists that local perceptions of rural service quality would correspondingly improve; a consideration echoed by findings within Barber *et al.*'s (2015) study. DTs were consequently identified in the data as being a worthwhile investment for the additional service benefits they bring.

Actions and ideas

The participants revealed they are prepared to appropriately integrate DT into any aspect of their professional practice. This preparedness saw some responses flowing freely between literal and imagined contexts, creating a challenge in separating future ideas and thoughts from current and historic action.

The data revealed that a range of online communication methods were used inter-professionally and with clients which, concurrent with several studies, included emailing, telephone, videoconferencing and screen sharing platforms (Chipchase *et al.*, 2014; Chedid *et al.*, 2013; Steultjens *et al.*, 2014; Barber *et al.*, 2015). Occupational therapists were using DT to open practice to wider influences and access more diverse sources of support, information and evidence. In so doing, they cited experiences of reduced practice isolation and an increased sense of connection to and beyond their profession:

I use [DT] to be connected to the world, to find work, to network, and to learn. [...], I feel very connected to the rest of the world via online technology (Marty).

I like to think I've escaped the bubble of being in my own world! Sometimes the easiest solution to a professional need is to ask and SNS have opened that up. My own practice is much less centred on just my own experiences, but I learn from others too (Taylor).

For practice development, SNSs provided a more dominant tool, with professional conduct considerations being of prohibitive concern for some occupational therapists. However, for most this did not outweigh the motivating benefits of convenience and immediacy despite the often time-consuming process of sifting for quality information. Maintaining balance in the virtual environment was appreciated by some therapists as a challenge, which occasionally required therapeutic attention or self-management strategies. This aspect is seldom identified in the literature with only Kongaut and Bohlin's (2015, p. 751) study drawing attention to possible inappropriate use and "addiction".

Use of DTs for therapeutic intervention was identified as divergent and extensive, to achieve equally divergent and extensive outcomes. This is supported by the stated nature of generalist rural practice and the need for diverse knowledge to meet diverse needs. Prevalent were utilizing and adapting existing DTs along with building or providing needs-specific apps, software, websites and forums for peer-to-peer information exchange and guidance. So too, were accessing self-management e-learning modules and signposting to small pieces of assistive hardware that enabled performance by compensating for physical, cognitive or social deficits. Websites and apps were also in development to support isolated rural workforces, including new entrants, in accessing context-relevant, evidence-based practice and approaches.

For those therapists whose practice involved distributing expensive specialist DT, the feeling of responsibility in ensuring its use was evident in the responses. Clear guidelines and limitations were necessary to ensure successful outcomes and the screening out of inappropriate cases. For those clients well-matched to these DTs, there was an opportunity to facilitate maximum ease of participation in daily life. Re-engagement in social interaction occurred and education in using DT facilitated mastery:

... It's really slow when using eye-tracking. The learning curve is quite long. That's why we want to meet the patients as early as possible ... we want to give them the time to practice. So family is very important and if you can't use your hands, it's quite hard to start up the computer ... Unfortunately, if they don't have anyone, we can't give them an eye-tracking device, as it's so hard to manage by themselves [...] Most of them learn very well ... [client] is the best eye-tracker I've seen. She could take my job (Alex).

Participants revealed they were happy and enjoyed the experience of using or even simply signposting clients to DTs. They shared an interest in researching the many changing options available. A sense of threat and concern that practitioners themselves may become alienated by the speed of change was minimally discernible in the data and echoed in the findings of Chedid *et al.* (2013). The participants agreed that there is greater potential and scope for utilizing DT than can be exploited within practice and that it is challenging to keep abreast of suitable developments. Ideas were expressed for future digital healthcare innovations with timescales shared for the unveiling of current plans in development.

Limitations

A small but realistic sample size was recruited for the scale of the research and demonstrated alignment with its global aims. However, the transferability of the findings is limited by the potential for greater divergence by country which may be revealed through a larger sample size. The divergent nature of international occupational therapy practice was not accounted for in this study and could be an important interrelating factor. Furthermore, recruitment materials were only available in English, precluding participation from many international contexts. However, given the similarities pertaining to the international studies featured, the findings of this study may indeed be applicable to rural contexts around the globe.

Conclusion

Rural occupational therapists appreciate the multi-dimensional nature of DT in citizenship for optimizing performance at the societal, practice and individual levels. They understand the complexities surrounding its potential to streamline rural healthcare and reduce health inequalities. They are able to analyze the individual barriers, cognitive, physical, motivational or social, which limit participation. Occupational therapists actively question established sociological patterns of DT use to adopt personalized, client-centred approaches to digital healthcare. The outcomes for clients include more meaningful and impactful therapy, attuned to existing habits with increased ease of assimilation into daily life. These skills enable occupational therapists to promote digital inclusion and address tensions between digital healthcare initiatives and uptake in the daily lives of rural citizens. Occupational therapists could therefore usefully collaborate with digital health developers and could be valuable contributors to digital inclusion strategies for health and social care providers. They could give voice to the most marginalized rural citizens and reduce health inequalities using their unique perspective on DT as a dimension of citizenship.

Key messages

- ▶ Occupational therapy may be able to offer opportunities for health and social care providers and digital health developers.
- ▶ Collaboration with occupational therapists on inclusive provision may also reduce health inequalities and meet the needs of rural citizens.

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