CHAPTER 7

Scientific Animations Without Borders

A CASE STUDY ENGAGING EXTENSION IN NORTHERN MOZAMBIQUE TOWARD A BROADLY APPLICABLE RESEARCH-CREATION-DEPLOYMENT SYSTEMS KNOWLEDGE LOOP

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Abstract

Since 2010, Scientific Animations Without Borders (SAWBO) has collaborated with a virtual network of global and local experts to create more than 80 educational animations in over 140 languages. SAWBO focuses on the delivery of scientifically validated educational content to low-literate learners in developed and developing nations alike, but especially in Africa. While empirical research demonstrates the capacity of these animated videos to effectively educate, transfer information, and elicit buy-in from users, an indispensable component of this success involves translating the content into the locally most comfortably spoken dialect of the animations' recipients. Given the approximately 6,500 living languages spoken globally by people, with 2,000 of them in Africa alone, a key challenge exists to make any such animated educational content accessible to all people, in whatever dialect they speak. As one strategy for surmounting this challenge, SAWBO has created and made freely available an Android-based "SAWBO Deployer App" that allows educators globally to easily access and download any one, or a combination, of these animations—thus making the animations available for both offline viewing, redistribution, or both to other phones in practically any corner of the world. A complementary strategy involves engaging extension agents in a cost- and time-effective way, such that they not only have access to already existing SAWBO-animated content but can also have those materials translated into any needed and most comfortably spoken dialects of local people they serve.

In this case study, we explore how an extension agent in northern Mozambique was engaged virtually by the SAWBO team, collaborated to translate already-available SAWBO-animated content into a locally most comfortably spoken dialect in the area (Lomwe), and then accessed and used those translated videos locally to educate farmers on an agricultural innovation. Results from this study identified three key steps in a research-creation-deployment (RCD) loop that built on remote (online) U.S. university and African extension agent interactions to build the needed capacity to deliver educational materials locally (to farmers in Mozambique): the extension agent (1) determined local needs (researched the local concerns), (2) co-created with SAWBO the local content needed (in terms of languages), and (3) deployed and redistributed that content through the SAWBO Deployer App. While implications from this process are discussed, the deployment component of the loop also provides insights and a basis for future research into content development and deployment in multilingual contexts, developing world contexts, or both. This case study demonstrates how U.S. university programs can engage global partners in a virtual collaborative manner, which is both time- and cost-effective.

Introduction

Mobile Education for Sustainable Development: Information & Communication Technology for Learning

While the utility of digital information and communication technologies (ICT) in Africa have been expanding exponentially over the last decade (Aker & Mbiti, 2010; Asongu & Nwachukwu, 2016; Bello-Bravo, Lutomia, Songu, & Pittendrigh, 2017), the reach and effectiveness of these channels for educational purposes, informational purposes, or both remain in need of further research, especially where use-gaps or demographic exclusion, especially of women and youth, occur (Bello-Bravo et al., 2020; Bello-Bravo & Pittendrigh, 2018; Clouse et al., 2015; Hampshire et al., 2015; Wyche et al., 2016). Nevertheless, educators, extension personnel, and other professionals continue to integrate digital ICT into their educational programs as a way to teach and train people about scientifically proven and other life-critical knowledge and innovations that can help improve the lives of people in rural, remote, inaccessible, or overlooked areas (Bello-Bravo, 2014; Bello-Bravo, Nwakwasi, Agunbiade, & Pittendrigh, 2013; Dlamini & Worth, 2019; Dlodlo, 2009; Dzansi & Amedzo, 2014; Jebet et al., 2018; Lee & Schaefer, 2019).

Among these digital ICTs, the cell phone has emerged as the most widespread, technologically familiar, and affordable form of ICT in Africa, although one with important accessibility caveats and limitations (Aker & Mbiti, 2010; Bello-Bravo et al., 2020; Etzo & Collender, 2010; James & Versteeg, 2007; Mocumbe, 2016; Wesolowski et al., 2012). Acknowledging these limitations, the portability, simplicity, and affordability of mobile phones compared to other ICTs nonetheless make them more suitable for educational knowledge delivery, especially in places where computers, internet connectivity, and electrical infrastructures are limited (Bello-Bravo

& Pittendrigh, 2018; Donner, 2007, 2008). Likewise, Kumar et al. (2010) have recognized the potential of mobile phones for accessing educational content by children in rural areas, and Brown (2003) noted that mobile phones can play an important role in education, especially in developing countries. Ally (2009) also emphasized the accessibility of mobile phones as key for making access to learning materials feasible via mobile devices generally. In particular, this enhanced accessibility of mobile phones vastly increases opportunities for informal learning (Bello-Bravo, 2017).

However, the use of mobile phones for informal learning generally requires the following steps: determining which educational content (1) is most appropriate and technically accurate for an identified and given application, preferably in consultation with locally affected populations, (2) is visually, auditorily, and culturally understandable by the local population, especially around the identified local problem, and (3) ultimately provides a pathway for easy (low-transaction cost) use of distributed content in local contexts. As one specific implementation of this approach, SAWBO, a Michigan State University-based program, has deployed key components for this three-step strategy to collaboratively create educational content with a global network of volunteer local and global knowledge experts. For step 1, when possible, this can extensively involve focus groups and problem and solution identification with locally affected populations (Mocumbe, 2016). At other times, such advance work is not possible. A key component in step 2 involves placing any developed educational content into local most comfortably spoken dialects, via additional (usually virtual) collaborations with local technical and dialect experts (including extension agents, students, or other volunteers). This task of translation not only involves moving the linguistic content of the video from one dialect to another but also culturally translating the content's steps so that they are culturally feasible, relevant, and comprehendible in its new cultural (local) context.

Lastly, a key component in step 3 involves ensuring that any developed content has a maximum accessibility to people no matter how resource- or infrastructure-constrained the settings. Here, the SAWBO Deployer App serves to empower extension agents (and other actors) with an easy and low-transaction cost approach for deploying, using, and redistributing such content. In particular, this pathway represents an operationalization of a "two-step approach" for the use of educational content in rural areas, especially within developing nation contexts (Ihm et al., 2015). Such an approach specifically involves using strategies that surmount effects due to local digital divides and also explicitly consider local message recipient-users.

ICT & Mozambique

In Mozambique specifically, although a Mobile Solutions Technical Assistance and Research Project survey (mStar, 2015) found that only 18% of survey respondents indicated that they had internet access, more than 82% had mobile coverage (particularly in Manica, Nampula, Tete, and Zambézia provinces). As of 2018, there were approximately 14 million mobile network subscriptions in Mozambique, down from a peak of 20 million in 2015 (Global Economy, 2019). For the country generally, however, the gender gap and rural-urban divide play a large role. In addition, Mozambique continues to have one of the lowest mobile and smartphone penetration rates compared to other African countries, predominantly due

to cost and that approximately 50% of the people in Mozambique still have no access to energy (Gillwald et al., 2018).

Moreover, given that "Mozambique has about 1,000 public extension workers for the entire country's 3.8 million farming households" (Peterson, 2018), this massive shortage adds to a perfect storm of resource and infrastructure shortages that mandates intense, creative innovations for reaching all of the population who could benefit from critical information around health, agriculture, and other public-interest issues. Thus, unless some unforeseen and unlikely dramatic increases occur in extension agent numbers, the local path forward will instead involve providing platforms that allow extension agents to deploy knowledge in a highly scalable manner at low transactional cost. In this way, northern Mozambique represents a logical place to further research the potential for the previously mentioned "two-step" approach to localization and deployment of appropriate educational content using existing extension capacity.

Learning & Knowledge Transfer

Learning occurs both formally and informally. It is delivered formally at specific places, at specific times, and in specific ways. It is delivered informally virtually anywhere, anytime, through a wide variety of delivery means (Cook et al., 2008; Malcolm et al., 2003; Marsick & Watkins, 1990; Sharples, Arnedillo-Sánchez, Milrad, & Vavoula, 2009; Sharples, Taylor, & Vavoula, 2010; Traxler, 2007, 2010; Watkins & Marsick, 1992; Winters, 2007). This paper focuses on nonformal learning—in part, due to the infeasibility of more formal approach settings in resource-straitened situations in Africa—through the use of an educational App. Such nonformal learning takes place outside of formal classroom settings (Billett, 2002). While it typically "combines individualized (or personal) learning with anytime and anywhere learning" (Motiwalla, 2007, p. 582), to focus primarily on the anytime and anywhere aspect of such nonformal learning (its accessibility) can sometimes prioritize message delivery itself over reception of the message by learners (Winters, 2007). In this study, while activities related to the use of an App—including, but not limited to, downloading, sharing, and uploading educational animations—are necessarily a part of the informal activities that learners explored during their learning experience, how the App successfully guides or orients a user in the process of constructing new knowledge and learning remains critical (Winters, 2007), if not actually more important (Bello-Bravo, Tamò, Dannon, & Pittendrigh, 2018).

Research into adult education has long recognized that connecting any knowledge to be delivered to the lived realities of its recipients is a key need (Knowles, 1980; Vygotsky, 1978). On the "user" side of an educational App, then, mobile content learning where the learner can choose the content from the App and more interactively control the experience of using it may likely better afford this connecting relevance in contrast to less interactive, less personalized interfaces. At a minimum, linguistic translation of the content into locally most comfortably spoken dialects of the recipient indispensably helps to connect users to content (Bello-Bravo, 2017; Szulanski et al., 2004), especially within postcolonial settings in Africa where dialect variance has social consequences and can often reproduce social inequalities (Bunyi, 2008; Kiramba, 2018). Importantly, however, this linguistic translation cannot be text-based only if it would reach the widest possible demographic

in an area—not only due to nonliteracy in some dialects but also because many local dialects in Africa have no printed form (Bello-Bravo & Pittendrigh, 2018; Ong, 1982).

Lastly, both formal and informal learning in rural Africa, whether though ICT, traditional extension services, or in more official school settings, face the familiar set of "wicked problems" (Rittel & Webber, 1973) that plague resource-straitened environments, including lacks of infrastructure, resources, and personnel; geographical remoteness; the reproduction of social inequalities (inadvertently or not); and bureaucracy and corruption (Aker, 2010; Anastasios et al., 2010; Benor & Harrison, 1977; Berger et al., 1984; Christoplos, 2010; Cunguara & Moder, 2011; Kiramba & Harris, 2019). It seems generally a given, even commonplace, that if we would meet the United Nations' Sustainable Development Goals, then an imperative exists for the development of maximally cost-effective, resource-efficient, and widely scalable solutions for knowledge dissemination around critical areas such as agriculture, crop-pest management, public health and disease prevention, and social equality for women, children, and other marginalized persons (Bello-Bravo & Pittendrigh, 2018; UNESCO, 2017).

Strategies for Solutions

Given the unlikeliness of an expansion of extension personnel numbers adequate for reaching every demographic in a country that would benefit from a public-interest messaging campaign, this effectively mandates the development of some variety of "viral," "do it yourself," or "training of trainers" intervention approaches that can leverage these several current inadequacies of personnel, resources, accessibility, and management (Bello-Bravo, 2010; Quizon et al., 2001; van de Fliert et al., 1995). The "mobile ESD" (education for sustainable development) systems approach operationalized by SAWBO (Bello-Bravo, 2018a; Bello-Bravo, Tamò, et al., 2018) represents one such cost-effective, resource-austere, and highly scalable method that successfully effects learning gains and knowledge retention not only in message recipients (Bello-Bravo, Tamò, et al., 2018; Mocumbe, 2016) but also among extension or activist community educators disseminating knowledge (Bello-Bravo, 2019; Bello-Bravo et al., 2020; Bello-Bravo, Lutomia, & Pittendrigh, Under Review).

As a support for mobile ESD, SAWBO has developed a Deployer App that allows anyone with a smartphone and internet access to select and download educational animation content from a digital library of more than 80 topics in more than 140 languages, including but not limited to animations for agricultural improvement and pest control, disease prevention and general health, food and water safety, and other local issues that people identify as affecting them (Agunbiade et al., 2010; Bello-Bravo, Diaz, Venugopal, Viswanathan, & Pittendrigh, 2010; Bello-Bravo & Pittendrigh, 2012). Because localization of content is critical and central to effective mobile ESD, SAWBO collaborates with local translators and college youth to expand and make available to everyone the variety of dialects that each animation has been translated into (Bello-Bravo, Olana, Enyadne, & Pittendrigh, 2013; Bello-Bravo, Olana, & Pittendrigh, 2015). This critical need, however, also comes with particular challenges.

Challenges in Translation

Whether translation is an art or simply a craft may never be settled (Ajiboye, 2016), but a broad consensus acknowledges that it is rarely, if ever, a mechanical, one-to-one movement of meaning from one dialect to another (Filkins, 2016; Hofstadter, 2018; Kelly, 1979; Metleaeva, 2016). Beyond these always-present challenges to translation, for translation of scientifically validated educational content into locally most comfortably spoken dialects in rural Africa, additional challenges arise. Many African dialects have no print version and thus are spoken and used by people in an oral-only paradigm (Ong, 1982). To correctly place into a local dialect some of the unavoidably technical scientific distinctions or concepts used in a video (even after framing those concepts in the least-technical way possible) not only often requires a metaphorical use of language but also a sufficiently cultural understanding of the locale by the translator able to decide which metaphor will correctly carry the intended scientific meaning. Braçaj (2015) describes this challenge as perhaps the most difficult task facing a translator. As such, this task involves not simply translating dialect but translating culture (Fernández Guerra, 2012).

For these reasons, it takes a particular set of skills to translate scientifically validated educational video content into locally most comfortably spoken dialects. In this study, the extension agent Euphrates José John (EJJ) had previous experience as a translator, particularly around translating Portuguese (the national dialect of Mozambique) into local dialects, including Lomwe and other lesser-known dialects. Tasked with being an agent to train others on the use and deployment of the SAWBO Deployer App and associated tools, he initially garnered participatory interest from others simply by informing people in his network (family, friends, and acquaintances) about the availability of a new and interesting technology that was particularly important for areas such as agriculture and healthcare—two issues of both national and local import to Mozambicans (Armand et al., 2019; dos Anjos Luis & Cabral, 2016).

Case Study: Toward a Research-Creation-Deployment Loop

Background

From 2013 to 2017, the SAWBO team in collaboration with researchers from Iowa State University and the Instituto de Investigação Agrária de Moçambique (IIAM) in Maputo, Mozambique, researched knowledge gaps in bean value-chain pathways to develop and test an intervention into those gaps. This research included focus group discussions with Mozambican farmers to identify both a perceived major problem (postharvest loss of beans for use in next season's planting) as well as various feasible, culturally relevant, and cost-effective solutions to that problem. From these criteria, one solution using hermetically sealable jerrycans emerged as the best fit for local farmers, after which researchers conducted a six-month proof of concept for farmers to demonstrate this solutions' efficacy for securely storing postharvest beans. Also using any feedback from focus farmers on

the procedures involved in this technique, SAWBO produced a short video animation describing the postharvest storage process in eight key steps and then had the video translated into the locally most comfortably spoken dialect (Lomwe) for general dissemination to farmers in 10 villages in Gurúè District in northern Mozambique. Quantitative measure of knowledge transfer during this study found a very high (91.3%) rate of knowledge transfer (Mocumbe, 2016), while this current two-year follow-up measured a 97.9% knowledge retention among farmers for this value-chain intervention (Bello-Bravo, Abbott et al., 2019).

Scaling up the pool of available translators for the widest possible number of local dialects represents a key component for increasing the reach of any mobile ESD knowledge-dissemination campaign (Bello-Bravo & Pittendrigh, 2018). Another key element involves incorporating a feedback loop to capture local users' insights and experiences as inputs for further refining or reworking existing animations (or developing new ones in light of local people's concerns or desires). These two goals, taken together, form what we call an information and communication for development (ICT4D) research-creation-deployment (RCD) loop.

This project explored one such RCD loop between SAWBO and a local extension agent contact in Gurúè District, Mozambique. While the background research (described previously) generated content that was locally deployable using the SAWBO Deployer App (Mocumbe, 2016), the extension agent, EJJ, subsequently assessed what other needs in the community might be met through other existing SAWBO animations. Through virtual collaborations, EJJ and SAWBO collaborated to translate an additional 36 animations into Lomwe and uploaded them via the App into the SAWBO library so that they were available and could be integrated into other local extension programs by anyone with internet access. EJJ also used the video and Bluetooth functions of his smartphone to display, share, and further redistribute the animated videos to local people. While future work may identify still other existing animations needing translation into Lomwe, the potential also exists for the development of entirely new animated video content based on local people's expressed desires or needs as reported to the local extension agent.

SAWBO-Extension Agent Online Collaboration

Over a one-year period, SAWBO team members collaborated with EJJ remotely (via digital communications) to identify existing SAWBO animations that EJJ and his team determined would be logical and beneficial for use locally, and then deployed those animations to local people. This collaborative RCD loop process had eight basic elements: (1) EJJ and his team researched and identified animations for local use and translation; (2) SAWBO provided English scripts of those videos to EJJ; (3) EJJ translated those scripts into local and national dialects (Lomwe and Portuguese), iteratively working with SAWBO as necessary to ensure the scientific accuracy of the translation, and (4) then made voice recordings (using his phone) that were emailed back to SAWBO; (5) SAWBO overdubbed the videos with the translated script, (6) checked them for accuracy and quality with EJJ and his colleagues, and (7) then uploaded the translated videos to the SAWBO Deployer App database for access by anyone who wanted to use

them, (8) including EJJ, who then downloaded, shared, and redistributed the content using the SAWBO Deployer App in his own local extension activities.

In-Field Use of SAWBO Deployer App & SAWBO Animations

This study explores the RCD loop capacity of one cost-effective, resource-efficient, and (potentially) highly scalable knowledge-dissemination system at two levels: thus, (1) it describes the processes by which an extension agent (EJJ) used the SAWBO Deployer App and SAWBO animations to teach use of those materials to college students (particularly as potential future translators of SAWBO content), and (2) explores qualitative data from students around the use, relevance, and attractiveness of the SAWBO RCD loop approach. Findings from this study not only offer further insights into the efficacy of the SAWBO mobile ESD approach generally but also insights for practitioners who wish to actionably scale-up campaign messaging to wider numbers of people and demographics than are currently being reached.

To recruit students for training in the use of the SAWBO Deployer App and SAWBO animations, EJJ made educational visits to schools where, in collaboration with already present ICT teachers, the students were introduced to the SAWBO program. ICT in schools was first promoted in 1997 by SchoolNet Mozambique and subsequently launched in 2002 as a flagship program of the National ICT Implementation Plan, with a goal of promoting access to ICT in all secondary schools in Mozambique (Isaacs, 2007). Recruited trainees were from four provinces in Mozambique, where trainings also were conducted. In all, 221 trainees were recruited, with a total training time of 69 hours 7 minutes overall and 2 hours 8 minutes per training session.

Recruited participants at each training session, divided into groups of five, were instructed in methods for accessing, downloading, and installing the SAWBO Deployer App on their phones, and then introduced to its use and interface by the trainer, EJJ. Importantly, although all of the students' phones could play videos, none of them were smartphones. As such, these (and other digital-access activities) were performed by students on their own phones using the trainer's (smartphone) WIFI connectivity, and access to the internet. This kind of provision of accessibility to knowledge recipients by trainers exemplifies ICT4D scalability.

Among digital ICTs (for example, laptops, desktops, tablets, mainframe workstations, WebTVs, mobile phones, and other devices), in Africa, mobile phones (and usually not smartphones) constitute the most widespread and technologically familiar type (Aker & Mbiti, 2010; Brouwer, 2010; Duncombe, 2016). Consequently, although the trainer introduced participants to new processes for downloading, installing, and using the SAWBO Deploy App interface (including the use of its menu, filtering by topic, language, or country, downloading and locating videos using URLs as alternative options, and then sharing and receiving videos with others through online and offline, Bluetooth, and other methods), he did not have to spend training time on the basics of performing such actions on a mobile phone. In contrast, for instance, Tata and McNamara (2016) highlighted training delays due to near-total nonfamiliarity among participants with

how to use computer interfaces (including no familiarity with how to use a mouse). The kind of recipient familiarity with the technological means for training in this study not only facilitates ease of training overall but also helps to make the key link between the knowledge to be transferred and the already lived realities of the participants (Knowles, 1980; Vygotsky, 1978).

Results & Discussion

Following the training, an open-ended, group interview was conducted to collect data on the participant experiences of the training and the use of the App. While trainees expressed an interest in continuing to use the SAWBO Deployer App—especially for useable information on healthcare and agriculture they could also share with friends and family members—they noted that online use might be limited due to the costs of internet access; indeed, mobile data in Mozambique is among the top 10 most expensive for Africa (Oludimu, 2019). The trainer explained that not only are downloadable SAWBO videos size-minimized (while maintaining image quality), he also clarified that once video content has been downloaded onto a phone, it can then be further shared (using Bluetooth or other means) without have to re-access the internet—which, in many cases, may not be feasible if the internet is not accessible in a given area.

Additionally, despite efforts to place the video voiceover into accurately local speech, some participants nonetheless raised questions about unfamiliar accents in the recording and recommended including more specifically local dialects on the App. This highlights the exceptional importance of dialect variation in the delivery of audiovisual media (Bello-Bravo, 2018b), insofar as a perceived inaccuracy of language, dialect, or accent can affect how a message is received, if it is not simply dismissed outright (Abbott et al., 2017; Bello-Bravo, 2017; Szulanski et al., 2004). In fact, differences of accent within the same dialect often provide essential orienting clues when strangers (and especially youth) encounter one another (Kaviti, 2015); in many cases, accent can prompt perceived prejudices by one group about another (Rombo & Lutomia, 2016). In Africa, facing the challenge of translating educational material into as many as 2,000 dialects (to say nothing of the rest of the world) may already present an insurmountable task; to further account for every accent exponentializes this problem. Alternatively, and similarly to how EJJ answered participant concern about the costs of internet access, research has found that a facilitator-led discussion following mobile ESD content presentation yields even higher learning gains than mobile ESD alone (Bello-Bravo, Zakari, Baoua, & Pittendrigh, 2018). As such, if message recipients register accent differences as impacting message delivery (whether due to cultural factors or difficulties in understanding), the facilitator or trainer is on hand to field those concerns or effects.

Participants stated that the most useful SAWBO App content included videos for cholera prevention, prevention of malaria using bed nets, tuberculosis prevention, the effectiveness of oral rehydration solutions, biocontrol of the bean pod borer (*Maruca vitrata*), and microfinance. Given that Mozambique has the third highest incidence of malaria in the world and has experienced recurrent epidemics of cholera over the last two decades (Aide et al., 2019; Langa et al., 2015), that the participants' expressed interest in videos related to these concerns illustrates a connection of that educational content to the lived realities of the learners (Knowles, 1980; Vygotsky, 1978). Importantly, EJJ selected these videos to show based on his research that such issues are

relevant to Mozambican people, but the later feedback from the participants themselves confirming that relevance is a key part of the RCD loop well; that is, out of the total range of videos that EJJ selected, these six topics in particular especially elicited interest with participants. Participants also stated that the training information was structured in such a way that it was clear, brief, easy to understand, and shareable offline through simpler means (nonsmartphones) with the ability to receive and play videos.

With respect to determining how likely trainees would be to recommend the training sessions to others, most agreed that face-to-face interaction was important for first-time users to familiarize themselves with the SAWBO App, especially for people who had no previous interaction with video tutorials. This echoes the finding that people training in ICT can prefer face-to-face (rather than computer-only) instruction (Tata & McNamara, 2018). Other participants suggested that occasional refresher trainings would be useful, consistent with findings from a very wide range of disciplines, but often medical and health, or ICT domains (Ablah et al., 2009; Eriksson et al., 2011; Loeb et al., 2009; Pouezevara et al., 2014; Sawyer et al., 2014). While the achieved benefits or optimal timing of refresher training remain open questions (Ganju, 2015; Woollard et al., 2006), besides reinforcing past training, such refreshers would also offer opportunities for past participants bringing in word-of-mouth (new) participants and also introducing all participants (old and new) to any new video content added to the SAWBO Deployer App database since the last training. This might be an optimal, or only, opportunity for past participants to re-access the internet if they have not, since the last training, been able to use the Deployer App online.

Conclusion

The long-term goal of SAWBO is to develop a platform that is accessible to extension agents globally who can download and use such content locally. Such content needs to be both of international standards of content accuracy (being backed by scientifically valid expert input) and yet localized such that the content is both understandable in a local context and appropriate for the experiences lived by the target audiences. Extension agents in developing nations are often too few, and they have limited resources, in comparison to the large networks of people they serve. Engaging them in content developed, in terms of adaptation to local languages, through virtual collaborations, has the potential to in turn provide them with accessible materials that they can use when and where they deem fit with their own clientele. However, their experiences also potentiate the opportunity for co-research efforts in the field with platforms like SAWBO to drive future content creation and more effective deployment strategies toward the concept of an RCD loop. However, the ultimate goal is to build a large enough pool of localized content (both in language and content) to allow development extension agents to have a broad, but localized set of extension tools for their efforts, whereby the supporting research helps to drive recommendations toward the most effective use of such content.

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