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The future of work: Increasing reach through mobile technology

Laura Greene and Ivanka Mamic
February 2015



Decent Work Technical Support Team for
East and South-East Asia and the Pacific

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Preface

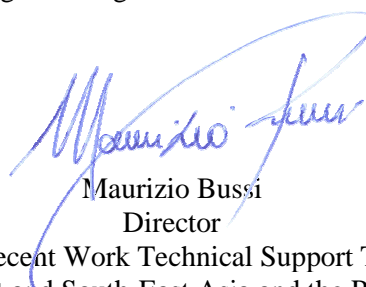
The proliferation and advancement of information and communications technology (ICT) is a crosscutting challenge impacting the world of work across continents. From participants in cooperative banks in Nairobi to taxi drivers in Jakarta, we see epochal changes in the way work and business relations are performed. We observe new ICT-driven business models in organic farms in Cambodia and exponential growth of e-commerce entrepreneurship across China. Firms and businesses of all sizes and types across Asia and the Pacific are increasing their digital engagement. This is expected not only to give the economy a new burst of momentum but also to change the nature of growth and employment patterns.

While it is difficult to predict the exact impact that such technologies will have on the future of work, changes are already being witnessed. Job types have begun to change and the work environment is being transformed. As traditional types of employment decline and work becomes increasingly automated, virtual and dispersed, new opportunities and challenges are being presented to individuals and organizations in terms of access to and provision of decent and productive employment.

In accordance with its mandate for social justice, the ILO is working to advance opportunities for women and men to obtain decent and productive employment through promoting rights at work, encouraging decent employment opportunities, enhancing social protection and strengthening social dialogue processes. New technologies present challenges and opportunities in all the key areas of ILO's work. We are increasingly aware that unless proper policies to nurture job growth are put in place, it remains uncertain whether demand for labour will continue to grow as technology marches forward. Doubts still persist on the prospects for job-rich growth in economic sectors characterized by capital and skills-intensive factors and labour-savings approaches.

This paper contributes to ILO efforts to better understand these opportunities and challenges in order to improve its support for beneficiaries and constituents, both in the Asia-Pacific region and worldwide, in a rapidly changing context. One such opportunity of particular relevance to the Asia-Pacific region is that of using mobile technology to increase and improve low-cost data gathering, support and outreach.

This paper brings together lessons learned on the use of mobile technology for labour rights and development outreach by the ILO and other organizations, and presents mobile technology as a platform for big data collection, analysis and outreach in the changing world of work. To this end, the paper is part of the ILO Asia-Pacific Working Paper Series that is intended to enhance knowledge, stimulate discussion and encourage knowledge sharing and further research for the promotion of decent work in Asia and the Pacific.



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Abstract

The world of work is changing. A major factor contributing to this is the proliferation of information and communication technologies, with mobile technology playing a central role. More and more people are able to access the Internet through their mobile devices. This has empowered them to work from anywhere but it has also led to the decline of traditional forms of employment. In the broader development context, mobile technology has been used extensively to reach beneficiaries and target audiences. Overall, this presents organizations with a challenge but also an opportunity to adapt projects and interventions to new technologies. This paper outlines technological and institutional hurdles related to the future uptake and implementation of mobile technology platforms and the use of mobile technology as a means of outreach.

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Acronyms and abbreviations

3G	third generation mobile Internet connectivity
app	mobile application
BFC	Better Factories Cambodia
BWI	Better Work Indonesia
BWV	Better Work Vietnam
ICT	information and communication technology
IFC	International Finance Corporation
ILO	International Labour Organization
IVR	interactive voice response
LDC	least developed country
MOOC	massive open online courses
OSH	occupational safety and health
SIM	subscriber identification module
SMS	short message service
UNHCR	Office of the United Nations High Commissioner for Refugees
USSD	unstructured supplementary service data

1. Introduction

“Our world, and our lives, are being shaped by the conflicting trends of globalization and identity. The information technology revolution, and the restructuring of capitalism, have induced a new form of society, the network society. It is characterized by the globalization of strategically decisive economic activities. By the networking form of organization. By the flexibility and instability of work, and the individualization of labor. By a culture of real virtuality constructed by a pervasive, interconnected, and diversified media system. And by the transformation of the material foundations of life, space and time, through the constitution of a space of flows and of timeless time, as expressions of dominant activities and controlling elites. This new form of social organization, in its pervasive globality, is diffusing throughout the world, as industrial capitalism and its twin enemy, industrial statism, did in the twentieth century, shaking institutions, transforming cultures, creating wealth and inducing poverty, spurring greed, innovation, and hope, while simultaneously imposing hardship and instilling despair. It is indeed, brave or not, a new world” (Castells, 2003, p. 1).

The above extract from Castells, a renowned communications academic and author of *The Power of Identity*, makes it clear that our world has changed. The advent of the information technology revolution has created a globalised, interconnected world shifting the world of work and communication. This paper will briefly sketch the implications of these changes, how the world of work is shifting, and how best to respond to this shift at this time. It will look at the use of mobile technologies to further development objectives, and how this can improve the efficiency and effectiveness of outreach projects.

This paper serves to contribute to the conversation both within the ILO on the shifting world of work¹ and more broadly. These shifts present new challenges and opportunities to social mandates, and the means through which to engage and communicate with beneficiaries and stakeholders. It is hoped that this paper will help to further labour rights and development objectives in the Asia-Pacific region, including through the work of the ILO, and contribute to helping to manage and ease the transition to the new world of work.

Mobile technology is also presented here as an innovation that has much to offer in terms of facilitating and promoting decent work. It has the potential to significantly improve working life in a number of different avenues ranging from job seeking, improvement in working conditions and training. Ultimately, the issue extends beyond the technology itself; it is about connecting people and creating communication channels. It gives stakeholders a direct role through the ability to voice individual concerns and ideas. Mobile technology can assist in improving organizational processes but also improve working life for workers as mobile phones are fast becoming ubiquitous in society. It offers a new way of working that has the potential to help organizations, both multilateral and others, to stay abreast of the changing nature of work and to promote decent work, and offers an efficient and effective way of achieving these goals.

The paper’s approach is two-fold; it recognizes that information and communication technology (ICT) has contributed to the shifting world of work, but ICT (particularly mobile technology) also provides a new way of reaching stakeholders in the changing world of work.

It should be clear that the term mobile technology is used rather loosely in this paper. While access to smartphones (those that have increased capabilities beyond simply calling and texting and that are able to perform some of the functions of a computer) in developing countries is increasing, a large number of people are still using regular mobile phones. Smartphone penetration rates also vary significantly in the Asia-Pacific

¹ “The Future of Work” was the theme for the Asia-Pacific Decent Work Technical Support Team staff symposium held in December 2013. The discussion at the symposium inspired this paper.

region. Smartphones are said to make up 71 per cent of mobile phones in China, while in the Philippines this is only 15 per cent in 2013 (Nielsen, 2013). The common thread that should be seen in the way in which this paper discusses mobile technology is that it is used to enhance communication and empower individuals through information availability and social connection. By 2015, the Asia-Pacific region is expected to account for approximately 40 per cent of the world's data traffic. Mobile broadband is increasingly becoming the standard access point for the Internet for this region, and the mobile phone is the means through which this has largely been able to be achieved in the context of Asia and the Pacific (AT Kearney, 2011).

2. The world of work disrupted

This section serves to highlight how technology is automating jobs and how information and communication technology is changing how and where people work. Ultimately the shift may not represent the destruction of jobs but it does represent job substitution and job transformation as well as the advent of the dispersed, individualized workforce.

2.1 Automation: Capital vs. labour

In 1933, Keynes predicted that the world would face an age of technological unemployment. He stated that this would be “due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour” (1933, p. 3). Keynes was not necessarily concerned about a permanent state of unemployment but rather a period of adjustment before new demands and new jobs are created. Nonetheless the world of work has been, and is increasingly, facing an interesting challenge. Increasing unemployment is already a reality which will only be exacerbated by these changes, be it temporary or not (The Economist, 2014, p. 6).

The world of work is not new to technological changes or to the concern of exacerbated unemployment that this brings. The historical context for this discussion can be traced back to the Luddite movement of 1811, during which machines were destroyed in an attempt to stop technological progress and loss of jobs, through to the assembly line structure characteristic of the industrial revolution (Frey and Osborne, 2013, pp. 7-9). Industrial revolutions² saw a tension between skills demand and skills supply, and the exacerbation of wage inequalities. By the end of the Second Industrial Revolution the introduction of mass education had seen wage inequality decrease as the supply of skilled labour increased. Overall industrialization led to skills upgrading in the economy. What is referred to as the Digital Revolution (or Computer Revolution or Information Technology Revolution) saw the onset and increase of to the use of computers in the workplace and beginnings of the use of robotics. It is said to have begun between 1950 and 1970 continuing to present day. This period has seen increased job polarization as the share of work for the medium skilled fell while the demand for highly skilled rose sharply and the demand for low skilled workers also rose. This is due to the fact that computers are able to substitute for routine tasks but not for non-routine cognitive or manual tasks. However, this too is set to change as computers are increasingly taking on non-routine tasks (Goos, 2013).

Given that the tension between technological change and skills development is a familiar one, there is still cause for heightened concern over the future of jobs; not only whether there will be jobs but also under what conditions they will take place. With the pace and type of technological advances that are occurring, it is difficult to predict the effect on employment and it is necessary to acknowledge that this time around might be

² Industrial revolutions took place over different periods in different parts of the world. However, the first industrial revolution took place between 1760s and 1850s with the uptake of steam and electric power that enabled hand tools to be replaced with machines. The second industrial revolution began in the 1850s to 1980s and was marked by the increase in use of steel manufacturing (Britannica, 2013).

different. The debate is currently polarized between those who believe in an age of technological unemployment and those who foresee a period of adjustment before new jobs and demands will be created. The heightened concern now is due to the following factors:

1. Previous technological advancement also led to economic growth that in turn spurred job supply and skills development.
2. The financial crisis of 2008 has slowed economic growth and further exacerbated unemployment, placing the world of work on the back foot ill equipped for the changes abreast.
3. The rate of technological change is faster than ever before and is outpacing skills development.
4. Current technology has seen job polarization with demand for medium skilled workers already reaching a low point.
5. The resulting labour market structure is shifting out of physical workspaces and emphasizing the individualization of labour, giving rise to precarious working conditions (Goos, 2013).

It should be noted that in much of the research at this point, the analysis is from the perspective of the Organisation for Economic Co-operation and Development (OECD) and middle income countries, with limited insights on the potential effect on low-income countries. However, given the propensity of developing countries to leapfrog in terms of technologies, the arguments appear to be relevant over and above their current focus.³

Over the past decades there has been a transition to the knowledge economy where knowledge has taken precedence over physical labour; and machines have replaced physical labour. Since the 2008 financial crisis, 44 per cent of United States firms have reduced their employee headcount by introducing automation (McKinsey Global Institute, 2011, p. 14). This process is only likely to continue to be exacerbated by the increasing intelligence of machines, leading to more and more mechanization and automation of jobs. Up until this point technological progress has largely remained out of the human domain. The current age sees technologies that are able to take on an increasing variety of cognitive tasks (Frey and Osborne, 2013, p. 19).

The automation of jobs has seen labour being replaced by capital resulting in an increase in demand for highly skilled labour (McKinsey, 2012, p. 10). Evidence exists in support of the argument that some highly skilled jobs are increasingly at risk of becoming automated in the years to come. These include accountancy, legal work and technical work. In fact, up to 47 per cent of job categories are open to being automated in the next two decades. An unknown factor in the future of work is the type of and availability of jobs. New demands will be created and technological unemployment may only be a temporary phase as the economy adjusts, assuming that future generations are suitably skilled to take on the new types of work. However, there is a possibility that the accrual of wealth to the skilled will be exacerbated by the shift to capital, leaving the rest with fewer and fewer employment opportunities and declining or stagnant real wages (The Economist, 2014, pp. 2-5).

An example of the shift in skills is 3D printing. While 3D printing has the capability to reduce the demand for manufacturing and assembly jobs, model makers and workers with knowledge of raw materials and electronic blueprints may be necessary. Thus, while it is predicted that 3D printing will destroy jobs it will also create jobs, just as the industrial revolution did (Seligson, 2014).

Previously it was thought that machines would only be able to take on routine tasks whether they were manual or cognitive in nature. However, computers have now advanced to the stage where they are able to do more than routine tasks. Examples of this include the self-drive car, the use of drones for delivery purposes,

³ Technological leap frogging may not be true for all technologies but the mobile phone is an example of how developing countries were able to bypass other communications technologies, such as fixed line telephones (The Economist, 2008).

handwriting analysis and translation exercises. Much of this is a consequence of availability of big data and the increased ability to handle and process big data. Additionally the declining cost of robotics is also contributing to its widespread use (Frey and Osborne, 2013, p. 21). Currently, estimates indicate “sophisticated algorithms could substitute for approximately 140 million full-time knowledge workers worldwide” (Frey and Osborne, 2013, p. 19). This in a world that already faces a shortage of 202 million jobs presents the global economy with a whole new world of challenges (ILO, 2014a).

Frey and Osborne (2013) undertook predictive research on the future of work. They discuss some of the bottlenecks that are currently preventing the computerization of non-routine tasks and then outline the implications for the world of work. These bottlenecks include:

- Perception and manipulation tasks: Identifying irregular objects in unstructured environments or handling irregular objects. This could be rectified through task design and simplification.
- Creative intelligence tasks: Here the difficulty for machines lies in people’s capacity to make creative values clear enough to be encoded, not in actually generating unique outputs.
- Social intelligence tasks: The ability to recognize and respond intelligently to human emotions is still problematic for machines

The degree to which work becomes automated and the pace of the transition to automation are dependent on the need to overcome bottlenecks. For some bottlenecks the solution may simply lie in the creative restructuring, breaking down or simplification of tasks that indicates that computerization could extend to “any non-routine task that is not subject to any engineering bottlenecks” (Frey and Osborne, 2013, p. 24). It is only those jobs or tasks that are subject to these bottlenecks that are unlikely to be automated in the near future.

Frey and Osborne (2013) show that sales, service, and office and administrative support are among the occupations that are most likely to be automated in the near future. A plateau may follow the first wave of automation as the bottlenecks listed above could potentially inhibit further automation until these can be overcome. Thus, there are a substantial amount of jobs in the risk category that are likely to become computerized in the near future, with others soon to follow suit.

As some jobs become automated there is likely to be increasing demand for highly skilled workers. As illustrated earlier, technological advancement has brought about the decline of the medium skilled worker and the rise of the knowledge worker. Given that there is often a shortage of highly skilled workers or a skills mismatch, in order to fulfil the need for highly skilled workers many organizations have begun to disaggregate jobs. On a practical level, this means that the routine/non-specialized tasks are separated out from the work of the highly skilled individual, removed from their work and automated or outsourced, largely influenced by ICT and paving the way for the virtual worker.

2.2 ICT is changing jobs

In an effort to position the reader to better understand the dispersed, flexible worker this section will first explore the ICT and mobile context. This illustrates the power and ubiquity of the mobile phone while also highlighting some trends that should be borne in mind for future uptake of mobile technology interventions. While automation is driving job transformation, and possibly job losses, ICT is also changing where and how people work. “Technology is changing the nature of work: as companies redefine how and where different tasks are carried out, they require new skills and new employer-employee relationships” (McKinsey, 2012, p. 1).

2.2.1 ICT and the mobile context

This section draws from a comprehensive study conducted by the Information Technology Union based on 2011 data. While the data is slightly outdated the trends nevertheless indicate that mobile penetration, mobile data and mobile use will continue to grow, particularly in developing countries, in the coming years.

Globally the mobile penetration rate stood at approximately 86 per cent by the end of 2011. Large increases were experienced in the developing world in the decade between 2001 and 2011, by 2011 the mobile penetration rate stood at 78 per cent; this should be seen in comparison to penetration rate of 122 per cent in the developed world.⁴ This is the first time a particular technology has been this ubiquitous. The biggest driver behind the uptake of mobile phones is that of the increase in competition, both in terms of service provision and in terms of mobile phone brands, which has resulted in both affordable services and devices (ITU, 2012, p. 2). The introduction of prepaid services brought with it more user control over costs and allowed those who cannot afford, or who cannot access, post-paid subscriptions to also benefit from the technology. It is anticipated that the mobile market will continue to grow over the next few years. However, as can be seen from the penetration rate, in some developed countries the number of mobile phones currently exceeds the number of people. The continual updates in technology means users are also continually updating their technologies, meaning that a saturation point may be elusive.

Perhaps the biggest contributing factor to the appeal of the use of mobile technologies is that of low barriers to entry in terms of affordability and literacy requirements. Today, mobile phones are both affordable to buy and use. They do not need any specialized skills and only require low levels of literacy. They are also portable. This ensures access at all times which contributes to factors such as privacy, ease of reporting and ease of engagement. The portable nature of the mobile phones encourages people to use them as an instantaneous “push and pull” device. They are able to send out information as and when they think of it and they are able to receive information as and when a query arises.

One significant trend in mobile use is the shift in traffic from mobile voice to mobile data traffic. This is a trend in both the developed and the developing world. In fact, a sharp growth rate of 76 per cent was experienced in developing countries between 2001 and 2011 in mobile Internet connections (ITU, 2012, p. 3). More devices now have the technological capabilities required to access the Internet, and these devices are becoming more affordable.⁵ Service providers are also making mobile Internet more readily accessible and as such more people have access to the Internet through mobile devices. Again, the expansion of mobile data is attributed to the reduction in cost to access and network expansion largely driven by increased competition in service provision.

Younger people tend to be online more than older people. Overall, 45 per cent of the world’s Internet users are under the age of 25. This, combined with the fact that uptake of mobile users under the age of 25 is high, means that there is a broadening youth audience both online and using mobile phones. This audience would have the potential to be significantly impacted through outreach through mobile technology (ITU, 2012, p. 7).

Asia and the Pacific is an interesting region as the countries within it are ranked among the highest and lowest on the ICT Development Index.⁶ This is largely due to varying degrees of development and persistent

⁴ A penetration of over 100 per cent exists because some people own or use more than one mobile phone

⁵ TechChange, 2014. US\$10 feature phones (mobile phones that can access the Internet) are becoming more readily available. In addition, smartphones can now be bought for under US\$50.

⁶ The index ranks country performance on the provision of ICTs.

inequalities. The highest ranking country is the Republic of Korea and the lowest is Papua New Guinea. Among the most dynamic countries are Fiji and Viet Nam, which both shifted upward in the ranking by 5 points between 2010 and 2011.

The most dynamic indicator for the region is that of mobile penetration. Again, this region displays vast differences in mobile cellular penetration. However, it should be noted that it has displayed an upward trend over the past decade and that in the coming years it is likely that mobile phone penetration will continue to grow. This is likely to occur even in countries that are currently lagging behind, including Nepal and the small island States, as they continue to display year on year growth.

There are large variances in the mobile penetration rates for the Asia-Pacific region between the countries, with most countries tending towards at least one mobile phone per person. While more discussion will occur in section 4.2, it is important to note that interventions that intend to use mobile phone technologies should not only take into account overall saturation levels but also look particularly at the target population. It is likely that some people have more than one mobile phone or mobile subscriptions while others have none. Cultural factors, such as individual versus shared mobile phone use, are also likely to play a role in saturation levels.

2.2.2 Rise of the virtual worker and the precariat

Developments in ICT mean that routine jobs, as described above, can be outsourced to almost anywhere in the world, creating a far more flexible, temporary, and dispersed labour force (McKinsey, 2012, p. 3). The virtual worker refers to someone who works to complete a specific task for an employer from any location (i.e. through means of an internet connection and a computer or mobile phone). For example, a doctor is able to outsource his/her consultation write-ups and merely make voice-notes during the course of the consultation, saving time and energy for the specialized worker, while also creating new employment potential for transcribers.

Companies are able to engage workers through the Internet as and when their services are needed. Websites such as oDesk and Elance have made the disaggregation and outsourcing to varied geographic locations and costs possible. This has also brought workers who prefer to work from different locations, from home, with more flexibility and on more differentiated types of work to the market place. The increasing use of the virtual worker is also bringing previously marginalised workers to the job market. In more rural locations, phenomena such as impact sourcing⁷ offers companies the opportunity to lower labour costs but create positive social goods by tapping into talent that may not have access to employment opportunities before. Companies such as Digital Divide Data have been instrumental in both bringing employment opportunities to more remote locations and creating the support structures (access to Internet, education and training) necessary for previously marginalized and rural workforce to the job market.

The virtual worker has the potential to help solve the skills and labour market problems (such as better use of high skilled workers time and the skills-gap or skills mismatch) but it also comes with new risks and increased vulnerability as it deviates from standard employment contracts and increasingly externalizes the workers from the companies. As jobs become scarcer and labour more individualized this could further perpetuate the race to the bottom and exacerbate income inequality, as companies are now able to “tap lower-cost pools of talent in less costly locations” (McKinsey, 2012, p. 7).

⁷ Impact sourcing refers to using business process outsourcing to benefit marginalised or low employment or impoverished communities by sourcing skills from these areas and providing support to the communities through infrastructure and training so that they may take on the work

While the advent of more remote and dispersed work can be seen as useful for both workers and employers (Kosseck and Hannum, 2011), the abovementioned trends also indicate that workers are now, and will become increasingly, more flexible, temporary and individualized. A consequence of this is that there is an increasing gap between the standard employment contract and the reality in the world of work. This contributes to the rise of precarious work, meaning that workers more vulnerable and worker organizations are weaker. Box 1 illustrates the potential mobile technology has to further weaken worker organizations by diminishing their role in crucial labour market activities such as wage negotiations.

The notion of the rise of the precariat as a quasi-social class is closely tied to the rise of the virtual worker. The precariat refers to a class of people who lack the traditional forms of labour-related security. These consist of the following: i) labour market security – opportunities to earn income; ii) employment security – protection against unfair hiring and dismal terms; iii) job security – opportunity to maintain employment as well as upward mobility; iv) work security – health and safety protection among others; v) skill reproduction security – opportunities to gain and make use of skills; vi) income security – assurance of adequate income that is protected by minimum wage and social security; and vii) representation security – access to a collective voice in the labour market (Standing, 2011, p. 10). There are numerous contributing factors to the rise of the precariat, overall it is a movement towards the commodification of labour and away from traditional employment contracts, leaving workers vulnerable, without access to traditional safety nets, and facing much uncertainty. It is an outcome of the changing world of work. The ability of people to work from anywhere has benefited some, allowing those who wish to telecommute to do so, but also seen a rise in people taking on small short term and piecemeal work and continuing to fall further and further out of the workplace (Standing, 2011).

With many social benefits currently linked to traditional employment contracts the new world of work poses a significant challenge to the traditional mechanisms of social protection. Flexibility also means that workers are increasingly external to the company and less likely to receive social protection through their employment. Discussion has taken place on shifting the responsibility for social protection away from the employer and providing it through other means, such as social protection floors. This may offer a solution but it would put an additional administrative and cost burden onto governments, some of which may be ill equipped to deal with this (The Economist, 2014, p. 6).

Overall, this gives rise to a challenge for the multilateral organizations promoting social justice, particularly those with a normative focus, in terms of addressing the movement away from traditional employment contracts and the social protection pressures this brings. As workers, employers and their respective representatives begin to change, so responses need to continue to support the labour market as a whole but also the workers who are affected by the shifting world of work. If workers are increasingly outside of the traditional workplace, finding ways to reach them forms an integral part of this response.

3. Mobile technologies

This section discusses the use of mobile technologies in the development arena and illustrates the variety of uses available. It explores some examples of the use of mobile technologies within the ILO with a focus on the Asia-Pacific region. This section also focuses on the implications of mobile technologies on labour in the region.

3.1 Mobile technologies in development

The discussion in section 2 on the changing world of work noted that ICT is changing where and how people work. Mobile technology forms only a piece of the technological picture but it is an important one. The discussion also illustrated that it is unprecedented that such a large number of people have had access to a single technology. It is not just the smartphone, it is also the feature phone⁸ which bring Internet access, and even low-end phones open up both text and voice communication channels. Mobile technology has become the method through which people, including ILO beneficiaries, are communicating. Mobile phones can be used anywhere, further contributing to the dispersion of the workforce) and more and more people are using their mobile phone to access information. The prevalence of mobile phones has also given rise to new workplace structures as illustrated in box 1.

Box 1
Example of impact of mobile technology on labour market activities

Ongoing strikes in the South African platinum mining sector saw three of the world's largest platinum mining firms taking new steps to resolve the longest and most costly strike in the history of the sector. The strikes turned violent and deadly as some members of the Association for Mineworkers and Construction Union began to prepare to return to work. Facing a long court battle to return to work, the firms decided to resort to new measures and bypass the Union by contacting the workers directly to reach a wage agreement. Mass mobile phone messages regarding payment offers were sent out to the workers who were then able to respond with a 'no' or a 'yes' and interactive voice response systems were used to survey workers' willingness to return to work on the basis of the current wage offer. The mobile phone became the technology that allowed the traditional system of wage negotiations to be bypassed.

Source: Reuters, 2014.

The rapid uptake of the mobile phone has brought with it the capacity to scalably reach people in dispersed locations through a technology that they are already using. Broadly speaking, mobile technologies have begun to lead changes in the social, political and economic spheres. Within the broader development context mobile technologies have been used for data collection, information dissemination, field support, financial inclusion and transparency. This has manifested itself in interventions in areas such as health, education, governance, agriculture and banking. Farmers have access to pricing information through text messages, HIV/AIDS patients are reminded of their doctors' check-ups, workers are able to send remittances without the use of banks and people have organized opposition to oppressive regimes through the pervasive power of social media. Table 1 summarizes these interventions and provides an example of the application of the mobile intervention.

⁸ Feature phones have the ability to access the Internet but lack the functionality of a smartphone.

Table 1. Examples of mobile technology use in development

Uses	Mobile technology	Example	Advantages	
1	Data			
1.1	Data collection	SMS, ¹ texting applications	Jana: Uses airtime incentives to get people to respond to surveys via SMS or texting applications. Helps with collecting information and gaining a better understanding of the market.	Increased access to target audiences wants and needs. Incentivizes use.
1.2	Data mining	SMS and IVR ²	Mine The Gap: Alternative to social auditing. Provides direct interaction with workers through mobile technologies. In addition, for every interaction with a worker a nominal amount is donated to a charity of their choice. It also acts as a whistle-blowing mechanism.	Increased transparency and access to worker voice
2	Information			
2.1	Dissemination	SMS, mobile website and USSD ³	MAMA: information is disseminated to expectant mothers to assist with maternal health.	Decreased knowledge gaps and access previously marginalized people
2.2	Access	SMS and USSD	Wikipedia Zero: works on partnerships with mobile network operators. Individuals are able to send an SMS with the topic they would like to receive information on. The information is then returned to the device. The project is currently operating in Asia and Africa and where possible in the local languages	Decreasing information and knowledge gaps
3	Field support	Mobile application	CommCare: records patient data such as location, diagnosis, referrals and next of kin. Allows health workers to record distances driven and access information on the go	Information access to workers in remote locations, improving their ability to work
4	Learning	Mxit platform	Mxit Reach: uses the Mxit platform (an internet chat platform that runs on the majority of mobile phones) to run educational interventions or to provide support to those in need and students.	Low-cost and scalable
5	Financial inclusion	SMS	MPESA: mobile banking for those who cannot afford traditional bank accounts. Bypasses the traditional banking system and uses mobile money.	Low cost and user demand driven

¹ Text based communication between mobile phones. ² Interactive voice response (IVR) allows computer interaction with people through the use of voice. ³ Unstructured supplementary service data (USSD) is a protocol used by mobile phones that allows real time communication/connection with the mobile network operators. Services using USSD include callback services, mobile money and location-based services. This is available on basic mobile devices.

3.2 Mobile technologies for labour

3.2.1 Addressing challenges in the world of work

The context provided in the previous section indicates that there is ample opportunity to exploit this technology for social good and economic improvement. As there is fairly limited research on this topic specifically, the discussion in this section draws from a recent report issued by the Vodafone Group, *Connected Worker* (2013). This report examined how mobile technologies could best be used to improve working life, particularly in emerging economies, for workers, employers and governments. The six potential intervention opportunities were identified as a result of a labour market and worker needs analysis in 12 markets, namely the Democratic Republic of the Congo, Egypt, Fiji, Ghana, India, Kenya, Lesotho, Mozambique, Qatar, South Africa, Tanzania and Turkey. The labour market challenges were identified from an employer and employee perspective and then matched with existing mobile phone technology interventions that have the potential to resolve or improve these challenges from both perspectives. The study modelled, based on some assumptions and data trends, the number of people that could be impacted and the operational benefit that could be realized by 2020 (Vodafone, 2013). Although the study focussed on those 12 markets, the challenges uncovered are applicable worldwide, particularly in Asia and the Pacific.

Access to work, and skills shortages

Box 2

Illustration of the challenges of access to work and skill shortages for the year 2013

- There were 200 million people unemployed globally, which is expected to rise to 208 million in 2015. Approximately 73 million of the unemployed are youth.
- Key labour market facts for the Asia-Pacific region include high rates of informal/agricultural employment that are poorly paid and insecure in South Asia (ILO, 2014a).
- In South-East Asia and the Pacific the working population is expected to outpace the working population in the years to come, resulting in skills shortages. Employers in Japan, Hong Kong (China), India and New Zealand all report facing talent shortages (Manpower, 2013).
- East Asia has seen low employment growth matched with weak labour force growth, barring technological replacement of jobs, this may also result in slow economic growth (ILO, 2014a).

While workers, particularly the youth and those in rural areas, face difficulties in finding work, employers face skills shortages and difficulties in recruiting individuals with the right skillsets. This is a problem that has persisted and one that mobile technology is helping to address. Ummeli, a mobile application (app) that runs on the most basic devices, was developed in South Africa and is currently expanding to other African countries. It aims to serve as the “LinkedIn for the bottom of the pyramid” (Ummeli, 2014) and connect workers to jobs and employers to workers.

Online job applications and online job searching now characterise the mainstream employment market but it is often costly for individuals without ready access to the Internet or computers to apply online. They need to use internet cafes, scan and print, go to national employment agencies to register as a jobseeker, or travel to different places of work to enquire about employment. These are often costly exercises that may return little (Ummeli, 2014; Vodafone 2013). Some of these hiring methods widen the gap between employers and

workers. Ummeli aims to bridge the gap and bring these people into the job market through their mobile devices.

Youth unemployment is a challenge throughout the world of work. Youth are particularly vulnerable given the knock-on effects of unemployment and its long-term damage to employment prospects. Given that mobile phones are mostly likely to be owned and readily used by young people, the mobile phone offers an opportunity and an apt intervention to connect them to the world of work.

Platforms such as that of Ummeli, offer the opportunity for the jobseeker to create an online profile, connect with other jobseekers, read articles and perhaps even further ones skills through online training, volunteerism and internships. The employer can upload jobs and browse jobseekers. The use of the mobile website is free (traffic from the partner Vodacom's network is not charged). Ummeli currently only works on feature phones but will eventually work on any GPRS enabled device through extending the service through USSD (Ummeli, 2014).

Like Ummeli, Souktel's JobMatch service targets young people. The service is operating in the Occupied Palestinian Territory and Morocco. This mobile phone service has been running since 2006 and works through SMS, connecting jobseekers to employers in real time. Jobseekers are able to register for the service by sending an SMS to a dedicated number and then creating a mini-curriculum vitae (CV). This CV is then matched to current vacancies and the jobseeker is sent a list of suitable openings with contact numbers. The process is similar for the employer who creates a profile for the vacancy and is then sent a list of suitable candidates. The results are reduced job search and hiring times as more and more people find jobs through the platform (Souktel, 2014).

Capturing worker feedback for improved working conditions and workforce productivity

Box 3

Illustration of the challenge of working conditions and workforce productivity

- The ILO estimates that approximately 21 million people worldwide are victims of forced labour, and 168 million children subjected to child labour.
- Only 20 per cent of the world's population has adequate social protection and approximately half have no protection at all.
- 1.1 million people die each year from occupation-related diseases or accidents in Asia and the Pacific.

Source: ILO, 2014c.

It has been demonstrated that improvements in working conditions also lead to improvements in workforce productivity. While employers face efficiency and worker retention challenges, workers face harsh working conditions, income poverty, and health and safety risks. In order to promote social responsibility within organizations and to improve efficiency it is important that these concerns are addressed holistically (Vodafone, 2013).

An additional aspect to this continuum is the mounting pressure from buyers for improvement in working conditions in supply chains, as buyers feel increasing consumer and regulatory pressure to ensure that their products are produced in a responsible manner. Currently the means through which some buyers aim to improve the working conditions in the supply chain is through social audits. However, these place a fairly heavy burden on the supplier to conform to often-conflicting buyer codes of conduct and merely provide a

static assessment of the factory status at a current point in time. The Tazreen fire and the Rana Plaza building collapse in Bangladesh have only further highlighted the need for more real-time, up-to-date information, as opposed to static snapshots, and called for more supply chain transparency and increased supply chain responsibility.

One response has been to address supply chain transparency from a demand side perspective. There is a movement by activists and non-governmental organizations to promote education in society and equip consumers with information about labour standards and practices of different companies. One example of this is an application created by FreeToWork, which provides ready access to this information that can then be used by consumers to inform purchasing decisions and to address the issues from the demand side (FreeToWork, 2014). Another example of this is the Good Guide, which also uses an app to provide consumers with product or brand ratings using health, society and environmental indicators. While this type of application is aimed at the developed world, the potential for impact in the developing world could be realized through demand-side reduction or further activism (Good Guide, 2014).

An example of applications that seek to capture worker feedback is that of Labor Voices and Good World Solutions' Labor Link. Labor Voices provides early issue detection, grievance mechanisms, benchmarking of working conditions in factories and broadcasting of information to workers among other things. Recently Labor Voices undertook a survey of worker feedback of suppliers in Bangladesh. The survey was conducted through interacting with workers in their native language through their mobile phones. In light of the recent incidents in the Bangladesh garment industry it is anticipated that this will help to provide feedback as to the real picture of working conditions in the industry and how best to improve them and production efficiency. The results of the survey conducted in Bangladesh with 250 participating workers in 12 factories indicate that many workers had not received fire training, there were underage workers in the factories, and workers often endured abuse for mistakes or falling production rates. The increase in transparency and the provision of real time information, with the necessary technical support, has the potential to help workers, employers and brands. One result has been that Wal-Mart is implementing a Factory Safety project with its suppliers in Bangladesh to be directed by Labor Voices (Labor Voices, 2013).

Through their Labor Link product, the non-profit organization Good World Solutions offers a similar service. Labor Link offers a variety of use cases from data collection, worker feedback and monitoring of evaluation for high-risk issues such as working hours and sexual harassment and for low risk issues such as assessing community needs. In terms of using the service for surveying working conditions, it works in such a way that workers need only place a missed call to Labor Link and then they receive a call back from the IVR. Voice is specifically used to overcome literacy challenges and the cost burden is not borne by the end user. The surveys usually focus on one particular topic such as health and safety or gender discrimination. Labor Link currently covers 60,000 workers in nine countries. Labor Link has been used to monitor and evaluate education and training initiatives and isolate worker grievances, giving companies deeper insights into their supply chains. Elevate, an auditing company, used Labor Link to measure wages, benefits and turnover of 1,200 garment workers in Tirupur, South India. The survey found that 80 per cent of respondents were not receiving legally mandated health benefits. Marks and Spencer has also undertaken a survey to measure supply chain workers' financial literacy and health and nutrition knowledge. The technology helped it to reach 20,000 workers and measure its progress on delivering on its goal to train 550,000 workers in its supply chain by 2015 (Good World Solutions, 2014). Overall, the studies outline that outreach through mobile technology enables greater reach and broadens understanding of working conditions and productivity in supply chains by capturing the voices and feedback of more workers.

Improving worker skills and training

Box 4 **Illustration of education gaps**

- Global literacy rate was approximately 84 per cent in 2011, indicating that 774 million people lacked basic literacy skills.
- The lowest rates of literacy are found in South and West Asia, and in sub-Saharan Africa.

Source: UNESCO, 2013.

Education forms an important part of the process of bringing people to the job market as well as important part of stimulating organizational efficiency and supporting occupational safety and health (OSH) and worker well-being. Job finder applications have the potential to provide training or inform people about training offered. However, applications solely devoted to training also have the potential to upskill individuals both in company training programmes and to help to better match skill sets to employer needs. For example, this could include OSH training, food safety training or more general education such as reading, writing or technical skill training.

There are an increasing number of massive open online courses (MOOCs) which have enabled people to access education that was previously inaccessible to them. The success of MOOCs can be replicated through mobile technologies to bring education and on-the-job training to more people. Mxit, an instant messaging application that is able to run on any feature phone, also uses its platform to assist school children with maths education. It provides a forum in which students and tutors interact at almost no cost. A more advanced example of an education platform aimed at tertiary education is that of Coursera, a platform that offers MOOCs in partnership with universities, and has developed an app. Mxit is available on the vast majority of mobile phones, whereas the Coursera app is only available on smartphones and other mobile devices. This implies that an application such as Mxit would have a broader reach in markets where smartphone penetration is low.

Coursera, together with InZone and the Office of the United Nations High Commissioner for Refugees (UNHCR), is currently bringing education to refugee camps by setting up virtual learning zones and using Coursera through personal computers as opposed to mobile devices (Moser-Mercer, 2014). Using platforms such as Mxit would allow the employer to implement training courses that would both increase working conditions and worker productivity. This would also help to limit the cost of the training, as it is easily replicable and available at a very limited cost.

Financial security and secure payment methods

Box 5 **Illustration of lack of access to affordable formalised financial services provision**

- Approximately half the world's adult population (2.5 billion people) do not make use of formal financial services for loans and savings.
- Those who do not use formal financial services include 1.2 billion people in Africa, Asia and the Middle East, and approximately 800 million of them live on less than 5 dollars a day.

Source: KPMG, 2013, p. 7.

The rise of mobile money has provided an opportunity to “bank the unbanked.” With many jobs residing in the informal sector and many unable to afford the cost of maintaining a bank account, the use of mobile money has provided these individuals with the benefits of a bank account and financial inclusion at a significantly reduced rate. The opportunity from the side of the employer is that it will enable them to transition from expensive cash payments that come with security risks to a more automated online system. Mobile money has the potential to be integrated with existing payroll systems reducing the administrative burden on the organization.

The most successful mobile money/banking intervention has been that of MPESA. It is used by thousands of people in Kenya and is becoming more institutionalised as it becomes commonplace for payroll purposes. The government exam board recently used the system to pay examination supervisors across the country. This significantly reduced the cost of the payments and the administrative burden (Vodafone, 2013 p. 25).

Bringing the unbanked into a more formalized but affordable banking system also provides the opportunity for financial inclusion of the world’s poor as income and financial records can be obtained and verified. The International Finance Corporation (IFC) focuses on access to finance, among other things. The organization is active in a number of partnerships that seek to foster financial inclusion, including mobile money. The IFC works with banks, microfinance institutions and other financial service providers to champion financial inclusion in five regions. The IFC currently has financial inclusion projects with DineroMail, Fino, Suvidhaa, Yellow Pepper and Interswitch. All of these projects provide innovative, ICT and mobile-based means through which banking and financial solutions can be provided those without access to formal banking systems (IFC, 2013).

3.2.2 Mobile technologies in ILO work in Asia and the Pacific

This section discusses the current use of mobile technology within the ILO’s technical cooperation portfolio in the Asia-Pacific region. The examples of ILO initiatives serve as a form of knowledge sharing and inspiration for future interventions within the labour and development sphere.⁹ The discussion here outlines how the ILO is responding to the opportunities that mobile technology has created along with some of the lessons-learned from ongoing and completed interventions.¹⁰

Promote project

The aim of this project is to reduce the number of child domestic workers by improving the institutional capacities of domestic workers’ organizations to effectively support and promote decent work for domestic workers. Indonesia is the main focus area of the project, with expansion into other countries planned for the future. The overall aim is to develop capacity of stakeholders in order to allow the institutional players to learn from knowledge sharing in the region. To this end, one particular project component focuses on the use of ICT systems that will link domestic workers to information that they may need, and to educational, legal and social resources. The intention is also to use ICT systems to document and report instances of exploitation. While the use of ICT in this project is still in the pilot phase, it is worth outlining how the ILO intends to reach domestic workers through the use of ICT-based communication, and to collect lessons learned further down the line (ILO, 2014b).

⁹ Two other ILO applications, Checkpoints and Infostory, proposed for smartphones or tablets are currently in the concept note phase.

¹⁰ Information for this section was collected through various means, including interviews, information exchange via email and directly enquiring within the ILO Regional Office for Asia and the Pacific, the ILO Decent Work Technical Support Team and the ILO Country Office for Thailand, Cambodia and the Lao People’s Democratic Republic.

As noted earlier mobile phones are particularly important for human interaction and facilitating community building. This is particularly the case with migrant domestic workers who use their phones to create support communities and facilitate meetings with other domestic workers. There are approximately 52 million domestic workers worldwide of whom over 80 per cent are women (ILO, 2014b).

Intervention description

The ILO Promote project is developing a platform for an SMS Gateway and a complaints mechanism for domestic workers. The following activities are to be conducted as part of the strategy to facilitate ICT-based communication and to use mobile phones:

- A knowledge-sharing workshop will be conducted with various domestic workers' organizations to discuss topics including using mobile phones to organize meetings.
- Social media training will be provided to domestic workers' organizations to improve their capacity for advocacy and narrative collection and promotion through mobiles and Internet channels.
- An SMS gateway is being developed in order to allow domestic workers' organizations to interact with domestic workers and vice versa via SMS.

Challenges

The use of ICT for communication in the ILO Promote project would ultimately include information gathering, information dissemination and mapping of movements and problem areas. The project faces significant hurdles in terms of being adapted to meet the regulatory and local network requirements in each of the countries planned for future expansion (ILO documents and presentation, 2014).

Work In Freedom

Work in Freedom is a five-year project that aims to prevent the trafficking of women and girls in South Asia and the Middle East. The project promotes education, fair recruitment, safe recruitment and decent work between the country of origin and the destination country. The project takes an integrated approach and looks at countries of origin, which include Bangladesh, India and Nepal. This project aims to use mobile phones to help to protect women at risk of being trafficked and to help migrant workers. The use of mobile phones in this project is also still in the design phase (ILO mission report, 2014).

Intervention description

The ownership of mobile phones particularly among migrant domestic workers is high in both Nepal and Bangladesh (ILO mission report, 2014). Mobile phone interventions can help to facilitate different phases in the migrant workers journey:

1. mobiles facilitate pre-departure education and training to help reduce the risk of trafficking and promote safe migration;
2. mobile phone-based labour recruitment can increase transparency;
3. mobile phones can help to ensure an easier transition to the host country environment by providing a means of communication and social networks; and
4. mobile phones can assist with the reporting of suspected trafficking.

In the pre-migration stage, governments such as that of Nepal and Bangladesh offer face-to-face training on safe migration. Not all prospective migrants attend this training. An opportunity exists to provide the training, or similar training, through mobile phones. This would both expose the migrants to the potential risks involved with migration and provide them with a possible solution or means through which to reduce the

risks. It is proposed that this is implemented practically through the use of a kit. The kit would include a foreign SIM card and key information resources such as how to store identity documents in cloud format, and information on labour rights. Through regular check-ins, mobiles could also help to ensure that workers arrive safely at their destinations as well as assist in locating them, if trafficking occurs.

Mobile phone technologies could assist migrants with finding a job and increase transparency. In a similar fashion to the mobile phone interventions discussed for recruitment, these types of applications would allow migrants easy access to the job advertisements, increase transparency and remove some of the barriers to entry to the job market. This would help to prevent the common problem of fraudsters posing as employment agencies to traffic women.

On arrival in the destination countries the use of support helplines could help migrant workers to report any abuses, irregularities or to seek advice. The mobile phone is also instrumental in helping workers to set up support communities in their new environments. Comparing working conditions, discussing problems and access to job referrals are all benefits of worker support networks. In Lebanon and Jordan workers are already making use of social networking sites, instant messaging applications and SMS to reach out to other workers as well as to official support mechanisms such as embassies. Mobile money services would also be useful in assisting migrants with remittances, reducing some of the administrative and cost burdens associated with this.¹¹

Challenges

The key challenges to implementation of the Work in Freedom project are low literacy levels and use of basic mobile phones, limited to calling, texting and without access to Internet. Low literacy rates are a common challenge in the use of mobile phones for social good and as such the use of voice technologies or pictures and stickers could be explored to overcome this limitation. Significant strides are being made in increasing Internet coverage worldwide and mobile feature phones are becoming significantly more affordable. There are also more mobile phone technologies that bypass the need for Internet or are available on basic feature phones. As such, the technology itself may present less and less of a hurdle in the future (ILO Mission report, 2014).

Better Work

Better Work is an ILO/IFC partnership. The programme aims to improve compliance with labour standards and increase competitiveness in global supply chains. It focuses on the garment sector and is implemented at the country level. The programme deals with a range of actors including governments, factory owners and operators, workers, trade unions, buyers¹² and other supply chain actors. Currently, Better Work is operational in Cambodia, Haiti, Indonesia, Jordan, Lesotho, Nicaragua, Viet Nam and is in the process of setting up operations in Bangladesh. This section will profile the various interventions in Asia and outline some of the challenges faced and lessons learned.

Better Work and Better Factories Cambodia held a collaboration meeting on mobile technology for labour rights in April 2014 with a number of practitioners currently operating in the region. The meeting provided a space for mutual learning and promoted collaboration. Some of the key learnings from this event are reflected in the hurdles faced in implementing mobile technology solutions in section 4.2.

¹¹ The ILO has previously conducted a feasibility study on mobile money for remittances and social security in the Philippines. See Domingo, 2008.

¹² Buyers enter into a formal agreement with Better Work in order to participate and support programme activities at the factory level and at the policy level.

Better Factories Cambodia (BFC)

BFC reports that almost all of its factory workers own a mobile phone (BFC internal review, 2013). IndoChina research reports that 62 per cent of Cambodians own a mobile phone, while less than 2 per cent own a smartphone. The report also indicates that Cambodians use their phones for calling as opposed to SMS, with only 28 per cent of mobile phone users having ever sent a text message previously and less than 1 per cent using mobile data (IndoChina Research, 2013). With a fairly high literacy rate of 84.9 per cent for 2008-12, the use of voice is most likely due to the fact that not all mobile phones have the capability to support Khmer text (UNESCO, 2013).

While media censorship is still prevalent in Cambodia, generally the new forms of media, such as Facebook or other social networks, are subject to less censorship than traditional media. The government actively censors portions of the Internet, yet Facebook subscriptions are said to have risen 32 per cent between September 2012 and September 2013 (Freedom House, 2013). Although the growth began from a low starting point, it is an indicator of improvement in uptake and access. Thus, it can be concluded that Cambodia the potential to use diversified means of communication and mobile technologies.

Intervention description

In terms of mobile technologies, BFC currently makes use of an IVR system for information dissemination and data collection, an app that serves as a guide to the Cambodian labour law, and tablets for factory assessments. These interventions have disseminated information and generated data in terms of what is being accessed, looked at, and what knowledge gaps may exist.

The BFC app is available for free download on iOS and Android.¹³ In order to ensure maximum reach, the app is available in English, Chinese, Khmer and Korean. It features a description of the Better Work programme, information on labour and interactive quizzes. The app covers all aspects of the labour law such as working hours, wages, OSH, hiring and dismissal. It also features a calculator for paid maternity leave. The quizzes are organized by topics and serve to indicate what areas of understanding related to labour law might be lacking among the workers. The use of a quiz and the ability to easily navigate by topic allows the user both to interact with the information and to decide what information they would like to see or receive, allowing the user to somewhat control and design their interaction with the app (BFC internal review, 2013).

Like the app, an IVR system has also been used to educate workers about OSH, personal health and labour rights. The tendency for workers to prefer using their mobile phones for phone calls as opposed to SMS, and the lack of universal support for Khmer Unicode, means that IVR is more effective. The system is free to workers that call from Cellcard and Smart, two Cambodian mobile network operators. The IVR received 5,369 valid calls between the 1 April 2014 and the 30 June 2014,¹⁴ an increase from the first reporting period (1 September 2013 and the 28 October 2013) during which 3,245 calls were considered valid. The IVR takes place in quiz format whereby those who answer the quizzes are entered into a monthly draw for a prize. Workers are able to choose one topic on which they would like to be quizzed. During the reporting period, the largest number of callers (43 per cent) chose to be quizzed on salaries and allowances, followed by OSH and personal health. At the end of the call the workers are able to leave a comment on any aspect of work that they choose (BFC internal review, 2014).

Challenges

The initial challenges included securing internal ILO buy-in and approval, motivating workers to use the services and persuading the mobile phone companies to support the project. Motivating workers to use the

¹³ iOS is a mobile operating system developed by Apple while Android was developed by Google and is used on some mobile devices.

¹⁴ A call is considered valid when the caller stayed on the line for at least a minute and answered one question.

product was an interesting challenge. Ideally people would be motivated to use a product if it met a need, but in this case, there was a need to create an incentive to motivate people to test and use the product, and the lucky draw helped to incentivise use of the app. Interaction through the quizzes returned statistics to BFC on which aspects of labour law and rights were best understood by the workers and which were not. It also revealed that some of the questions were too easy and needed to be improved. The information proved useful for informing BFC's future activities and the continuation of the quiz (BFC internal review, 2013).

The challenge now is to use the data to make the project implementation more effective and efficient. A better understanding and use of the data could improve the overall communication strategy of the project. The advantage of using mobile technologies (and social media) is that there is direct engagement with the constituents and the data that can then be aggregated to generate an accurate reflection of their needs and knowledge gaps.

An interesting by-product of the service is that it has acted as an early warning system. During the labour unrest experienced in the Cambodian garment sector in early 2014¹⁵, workers used the new communication streams to inform BFC of their intended plans to strike. It points to the fact that new communication means have resulted in better and more direct engagement with constituents. This could be used in the future to avert or prevent strikes and promote dialogue.

Better Work Indonesia (BWI)

A baseline survey of workers access to ICT conducted in 2012 indicated that 90.8 per cent of the workers in BWI factories have a mobile phone, 38.6 per cent use the Internet and 29.8 per cent have a Facebook profile. While there are likely to be varying degrees and types of use, this indicates that there is a critical mass of workers that can be reached through mobile technologies in Indonesia (BWI internal review, 2012).

Intervention description

H&M and Disney supported a pilot programme in Jakarta from January to April 2012, where SMSs were sent to 700 workers on topics related to OSH and workers' rights. SMSs were used to interact with workers and union members on key subjects such as HIV/AIDS, and other SMSs were linked to factory grievance procedures. After the initial trial of the SMS service, a survey was done to measure its effectiveness. The findings revealed progress in terms of worker awareness, improvement in worker-management relationships and more awareness from workers and employers of good practice (BWI internal review, 2012). BWI continues to offer this service to factories on a free trial basis for three months, after which assistance is provided if the factory wishes to continue the practice in-house. Ready-to-use messages on topics such as HIV/AIDS and OSH are provided to the factories. In addition, training/information for workers related to activating 3G and selecting cheap Internet packages is aimed at helping to support the transition from SMS-based to Internet-based chat platforms or social media.

BWI's latest worker survey carried out by Tufts University was conducted on tablets. Workers were able to read and hear the questions in order to ensure that literacy levels did not hamper the outcome of the survey. However, this had implications for the worker responses, as the overt nature of the interaction with tablets may cause workers to worry about being implicated for their participation or responses. One of the advantages of using mobile phone technologies lies in enabling workers to interact at their own convenience and in private. The use of tablets may counteract this.

¹⁵ Cambodia experienced extreme labour unrest resulting in government intervention and use of excessive force in an attempt to control the unrest.

BWI also makes use of a mobile website that serves as a wage calculator. Workers are able to access this website via their mobile phones, capture their data and have their earnings calculated, empowering them to ensure that they are receiving the correct wages. In addition, BWI has also developed an app for android devices. This app provides information on labour laws and labour topics of interest to companies, workers and unions, such as collective bargaining and compensation. This app also connects workers to social networking sites such as Twitter and Facebook.

Social media, primarily Facebook, is also being used to disseminate information to the workers. However, it appears that the current use of Facebook is linked back to the website where additional information is shared. This, along with the interactivity of the Facebook page could be revised and improved for effective communication.

In addition to these existing efforts, BWI is also exploring e-books as an alternative to physical copies of information handbooks. This would ensure ease of availability and reduce environmental impact and the cost associated with producing and distributing guides and manuals. However, this assumes the accessibility and ease of uptake and use of e-books from the stakeholders.

Challenges

BWI reported that it has faced a challenge in terms of the cost of the SMSs. This is for the project itself and for worker engagement. Workers reported being reluctant to respond because of the cost associated with the SMS. BWI is currently attempting to negotiate with the mobile network operators and create communities for which the cost could be reduced.

There has been mixed success with the social media endeavours. This is attributed to the lack of Internet access and the lack of understanding of the platform. It has also been attributed to privacy concerns. Some training needs to be given to the workers on how to use social media platforms, particularly in relation to privacy settings that may help to allay their concerns of not wanting their employer to note their complaints or interactions. Competitions related to OSH, run through Facebook, were used to promote OSH and incentivise the use of Facebook. However, BWI is currently exploring how to better integrate and use Facebook as a form of communication.

Better Work Vietnam (BWV)

Viet Nam sees mobile penetration rates of similar levels to that of Indonesia but faces a highly controlled media environment, which extends to social media (Freedom House, 2013). Thus, there are limited options available for engagement with workers outside of the traditional communication paradigm.

Intervention description

BWV piloted an SMS communication system between July and September of 2012. The SMSs were intended to increase worker understanding of labour law and safety and health, along with a variety of other issues. Initially the SMSs were sent out weekly by BWV and these were agreed upon with the management of five participating factories. The programme gave the factories a new means of outreach. In total, five factories and 1,400 workers registered for the service. The initial intention was to move the service to a free SMS platform called Mimo but this service was discontinued before it was possible to make use of it. The buyers then funded the service for an additional three months and then the factories were asked to take over the cost of the service (US\$40 per month). None of the factories were prepared to absorb the cost and thus the service was discontinued (BWV internal review, 2012).

BWV used mobile communication to disseminate information with little two-way communication. This is reflected in some of the lessons learned from the pilot in that there needs to be more done to gear the communications to a younger age bracket who are used to seeking out information as opposed to only receiving it.

Challenges

The immediate challenge to the initiative that prevented it from continuing was the dissolving of the free SMS platform, Mimo, and the lack of affordable alternatives. Furthermore, the service was only able to reach 500 workers per factory, which meant that some workers could not make use of the service. The sustainability and scalability of the initiative hampered its success. Perhaps the wider problem is the value proposition. The value added for both the workers and the factory is not firmly rooted in demand. The push-centred approach as opposed to user-centred approach may be why none of the factories wanted to fund what was a fairly low cost operation.

Other problems that were encountered had to do with the frequent change in mobile numbers and the association of mass messages with spam, particularly in Viet Nam where SMS spam is commonplace. The push nature of the communication, decided in advance by BWV and factory management meant that there was little interactivity and was unlikely to capture a young audience, used to pulling or filtering information through various platforms.

BWV has received some additional funding to pursue a pilot project on improving worker empowerment and engagement. As such, they will begin to explore new means and methods of reaching the workers through mobile technologies.

4. Expanding the use of mobile technology for labour rights

4.1 Opportunities

It is imperative that the means of outreach evolve in response to the shifting world of work in order to remain relevant to beneficiaries and stakeholders. In some cases employers and worker organizations may need to adapt their ways of working in order to keep up with and better reach those which they represent. The important consequences of the changing world of work are as follows:

1. potential loss of jobs leading to increased unemployment;
2. increasing gap between traditional employment contracts and current employment contracts;
3. individualization of labour;
4. rise in precarious work and the challenge to traditional social protection mechanism; and
5. increasing skills deficit and job polarization.

For an organization like the ILO, working to fulfil its mandate for social justice and promote decent work, these form important concerns. Overall, the role of employers, workers and governments is shifting along with the world of work. Mobile technologies present an opportunity to improve delivery in the development arena on decent work goals, technical backstopping and research and data analysis. Mobile technologies, and their propensity for data generation and data collection, provide the means to tap into real time information,

develop more targeted responses and maximize constrained resources. The discussion below briefly outlines some of the potential uses based on the earlier review.

4.1.1 Responding to the changing world of work

The transition to online contracting and business process outsourcing has brought with it challenges to old models of social protection, which were largely accommodated through the person's employer. As more and more people shift to flexible, globally dispersed types of employment, the pensions, medical support and other forms of social security traditionally provided by the employer have fallen away. Questions of whether it is necessary to provide a new form of social protection for these digital age workers and how best to provide social protection have arisen. As mentioned earlier, a possible solution could be to shift the source of protection mechanisms from employers to the government by establishing social protection floors. This brings with it the challenge of ensuring correct identities in conducting transactions, as currently social security payments often have to be made in person, in cash with many people travelling great distances to collect government assistance. Further challenges include the administrative burden on governments and additional taxes being levied on individuals to support the system.

In response to the challenge of conducting transactions and the administrative burden on government, mobile phone technologies offer a solution both in terms of payment mechanisms and identity authentication. Referred to as "mIdentity", it provides the opportunity to have a digital national identity, or corporate identity depending upon which level the intervention is focussed. This provides additional verification and security through the use of digital signatures such as pin codes. This intervention has knock-on consequences for other interventions such as mHealth where doctors could provide digital signatures to authorise medication dispensation or workers could verify their identities for their employers. MIdentity has been said to have "the potential to supplement national ID schemes thus enabling, for example, secure transfer of pensions and social benefits via mobile money" (Vodafone, 2013 p. 19). The threat of identity theft is still high, particularly given the rapid turnover of mobile numbers and SIM cards. However, the additional digital signatory through pin codes and government policies that support number portability would mitigate this risk somewhat. This concept is already in action to a degree in India where "MobME" offers a digital signature that can be embedded into any mobile phone and is the legal equivalent of any physical signature. This type of intervention could be an innovative response to the social protection challenge.

There is potential for data collection and data analysis, such as big data, to provide organizations with insight, early warning, and to allow better use of aggregated and disaggregated data to develop a better understanding of the changing world of work and to develop more targeted responses. As technology finds its way into the hands of more and more people, the scope for data collection is increasing. The users now create the information; allowing data gathering in real time and in varying shapes and forms. For instance, "By analysing patterns from mobile phone usage, a team of researchers in San Francisco is able to predict the magnitude of a disease outbreak half way around the world. Similarly, an aid agency sees early warning signs of a drought condition in a remote Sub-Saharan region, allowing the agency to get a head start on mobilising its resources and save many more lives" (World Economic Forum and Vital Wave Consulting, 2012, p. 2). A United Nations initiative called Global Pulse is currently looking at how best to use big data in the pursuit of development goals. The idea is to be able to better track and respond to global and local socio-economic trends through the use of real time, big data (UN Global Pulse, 2014). The cost of gathering and analysing data is significant for development agencies. Big data offers the opportunity to make use of decentralized data, gathered in real time to lessen the burden on traditional data gathering means and free up resources for better informed and targeted interventions.

An example more specific to the world of work is the rise of workforce analytics and the increasing use of big data in the hiring of employees. Combining performance data with personal characteristics and creating online tests has provided more information who would fit best into what roles and has removed other biases such as gender or race in hiring practices (Forbes, 2012). Embedding this kind of information into tools such as Ummeli may help to smooth and speed up the hiring processes, ensuring greater employee retention and smaller lag times between jobs. Workforce analytics are also able to reduce labour costs by analysing historical information and producing optimum combinations of types of employment such as full time, part time and temporary. Improving productivity through improved scheduling has the potential to reduce unnecessary worker overtime and increase organizational productivity. The ILO Country Office for Indonesia and Timor-Leste (CO-Jakarta) is currently using big data (although not necessarily that collected through mobile phone use) to help analyse and assess factors that keep women out of the workplace and perpetuate discrimination in hiring and wage setting. The project is an ongoing example of cooperation between the CO-Jakarta and the Pulse Lab Jakarta (UN Global Pulse, 2013).

4.1.2 Responding to challenges in the world of work

Jobseeker platforms

The potential for using a platform such as those described above to assist jobseekers, even within ILO projects, is vast, particularly in collaboration with national employment agencies and in countries where youth unemployment is of concern. The mobile penetration rates and the young populations in the Asia-Pacific region represent an opportunity to bring a critical mass of jobseekers and employers to the mobile platform. The Asia-Pacific region has approximately 60 per cent of the world's youth population (UNESCAP, 2013). Achieving a critical mass of users on mobile employment platforms is a significant initial hurdle, but these platforms have already demonstrated their potential for success, indicating the potential to overcome this hurdle if the platforms were suitably adapted for each national context.

Bringing governments and training institutions to the platform is also of significant importance. This could make training more accessible, which would help to close skills gaps and inform jobseekers of relevant training opportunities such as obtaining drivers' licenses, or technical skills such welding or brick laying or even first aid training. The combination of job search and training has the potential to assist in altering future unemployment trends.

As was described earlier, the shift in the world of work to decentralized, ad hoc and virtual work means that more jobseekers have access to different types of work through online platforms such as oDesk or Elance. These platforms provide an opportunity for organizations, including the ILO, to adapt to non-traditional types of work that are likely to characterise a large portion of future workers. Those organizations would also benefit from the data generated from the use of such applications. Important information pertaining to skills, skills gaps, unemployment, job-search time and employer needs could be gathered in real time through the use of such applications, and analysed to improve the efficiency and focus within projects and other activities.

Improvement in working conditions

Perhaps the biggest market for these types of interventions lies with a project such as Better Work. This project is built on the principles of improving working conditions alongside efficiency. These two aspects are seen as complimentary and the focus is pushed throughout the assessments and factory improvement plans. Harnessing worker input and promoting engagement both in terms of setting goals for improvements and in carrying out necessary changes could lead to dramatic increases in efficiency, as the workers deal with the actual processes on a day-to-day basis. If improvements are to be made, tapping into their knowledge is a good way to discover ways to enhance processes. Given that the project is generally using SMS or IVR systems and worker surveys, using an app such as Labour Voices would allow the project to provide a survey, grievance and information dissemination system through one channel. The information from this could then

be used to improve factory working conditions, environmental sustainability and profitability on an individual level, and as a means to collect macro data at an industry level, and improve training materials in the supply chain. Generating insight at an industry level could be particularly important in terms of ensuring targeted responses, designing future interventions and measuring improvements.

Training

Within outreach projects there is often an emphasis on training and support in order to help ensure the sustainability and longevity of the impact of the projects. The use of mobile phone technology to support this type of engagement and intervention could introduce an element of scalability into the projects. Online training courses that can be accessed through mobile devices could be rolled out to businesses, schools, and employment agencies and used to support trade union members. Currently ILO projects, such as enterprise development projects, make use of training programmes. Converting these training sessions into digital format, particularly for mobile platforms, could help to reduce costs and scale the project. Additional support and training could be made available to ensure the ongoing success of the interventions. There is also potential to use the feedback applications in conjunction with mLearning. This would enable data collection and more focussed training to be developed. The Better Work project could also use these interventions for on-the-job training, particularly in areas such as safety and health for workers, or for employers on effective management.

Mobile money

ILO projects such as the Better Work programme and migrant labour projects have the potential to use mobile money. The potential also extends beyond the ILO into labour rights organizations and to employers in general. For example, this intervention could help Better Work to improve payment transparency with regards to overtime, leave and any deductions. This would lead to a win-win situation for workers and employers as fewer disputes and administrative issues would arise as a result of improved transparency. For migrant labourers the same benefits could be realized but the increased benefit of ease of transferring remittances, as well as help to bypass any difficulties they may experience in opening formal bank accounts often due to the need for extensive documentation and lengthy administrative procedures.

4.2 Challenges

Having outlined the specific application in existing projects and elaborated on some potential uses for mobile technologies, this section provides an overview of the technological and institutional challenges that may be faced in the uptake and use of mobile technologies. This analysis of challenges and potential solutions will be of use to the ILO and other entities that seek to apply mobile technologies in their projects.

“The adoption of a given new technology, and the embedded facilities it has, is influenced by the restrictions and availabilities that this new technology brings. Those combined with the final user needs, will lead to dissimilar appropriation processes” (Castells et al, 2004, p. 41). Thus, the propensity for uptake of mobile phone technologies and the success of the interventions realized through these technologies is dependent on a number of factors. In this case these challenges lie both with the application of the technology and within organizations themselves.

4.2.1 Design and technology challenges

Each intervention should be designed for a specific national or local context. Factors such as target population, cultural use patterns, regulation, cost-to-access, handset variations, literacy rates, and network

coverage should be taken into account. The other challenges pertain to how to motivate people to use the intervention and whether or not the intervention can be scaled. Table 2 summarizes these challenges.

Designing for national and/or local context

There are a number of factors that need to be taken into account in order to design an intervention that is suited to the national or local context, depending on the scale of the project. Taking these into account will prevent an ill-suited intervention that people are unable to use effectively.

Target population

Age plays a role in access to technology, the type and the frequency of use. While initially mobile phones were targeted at adult members of the business community, young adults have emerged as appropriators of SMS and Internet services as opposed to the traditional voice uses that are preferred by the older adult population. Younger people are more likely to have access to the technology, to use it for more than voice communication and to use it on a daily if not hourly basis (Castells et. al, 2004, p. 47). Thus, how people in the target market use their devices is an important consideration in designing a mobile technology intervention.

Cultural use factors

There are numerous cultural factors that influence mobile phone use. Some of these may manifest in whether mobiles are shared or only used by one person, whether it is acceptable to make or receive calls in public places, and practices such as purposefully missed calls (Canton, 2012). This serves as a reminder that mobile technology interventions need to be tailored not only to the ICT context of the country, but also to the cultural context in order for them to be useful and effective. An example of this would be the use of IVR technology for the interventions in Cambodia in the BFC project where voice is preferred over text messaging because support for Khmer Unicode is not universal.

Usage patterns can reveal more than just linguistic challenges. They can also indicate how people like to use their mobile phones. A preference for voice or text presents different challenges and opportunities for mobile phone technology interventions. While a mobile phone technology could be used to change communication norms, as is the case with MPESA, interventions should also reflect cultural and usage norms. For example, when attempting to reach younger populations it may be best to use instant messaging platforms and create stickers for use on data driven, free applications such as Viber, Line, Whatsapp or similar platforms. Respecting use patterns can help to ensure that people will successfully adopt the intervention.

Regulatory context

Each intervention should be adapted to the regulatory context of each country. It is important to consider regulations when determining the applicability and replicability of certain interventions in different country contexts. There are also certain regulatory constraints and restrictions on communications that may also inhibit mobile phone uptake and use. These could include tax burdens, industry competition, price regulation and number portability issues.

For example, currently many mobile service providers feel that the low penetration of mobiles in Bangladesh is due to the tax on SIM cards and 3G (Mobile Development Intelligence, 2014). The Government has begun to make efforts to reduce this tax but the tax burden is still placed on the consumer. This raises the cost for consumers and places an additional cost-to-access burden on them.

Number portability is said to be related to increased competition and a drop in the prices of mobile service providers, and means that the additional administrative costs associated with switching networks is significantly reduced and the market sees increased competition. The opening of the market will further decrease the barriers to entry. Currently, Hong Kong (China), India, Japan, Malaysia, Pakistan, the Republic of Korea, Singapore and Sri Lanka are among the countries that support number portability. However, the conditions under which number portability can occur are also important. In some cases people are charged for this facility and this may not be appealing – particularly to those who are using prepaid SIM cards (ITU, 2012, p. 84).

Another example of regulatory contexts that affect the use of mobile for development is legislation in Kenya which prohibits the sending of mass SMSs (Mobile Development Intelligence, 2012). Tailoring interventions to the regulatory context at the national level is imperative.

Network coverage

Network coverage is a major factor in ensuring the success of mobile phone technology interventions. While only approximately 10 per cent of the world is now without mobile network coverage, the percentage of those without coverage in the least developed countries (LDCs) is at approximately 40 per cent (UNDP, 2012, p. 14). Twelve countries in the Asia-Pacific region are considered to be LDCs. While this is likely to change in coming years, it could be argued that the demand for coverage in rural areas from the business sector does not exist. Therefore, these areas may remain uncovered and perpetuate the digital divide (UNDP, 2012, p. 14).

Strategies for intervention in different markets need to consider the level of coverage and the network infrastructure in either the area or the country in which they plan to use the mobile phone technology. For instance in the Philippines, “the largely urban population is almost entirely covered by cellular service, but geographically only 50 per cent of the country is covered. In India 40 per cent of the country has areas coverage, which reaches only 60 per cent of the population” (Vital Wave Consulting, 2011, p. 4). In addition, network infrastructures would also have implications for the use of voice or text based interventions. Text-based interventions require less bandwidth than voice-based interventions and thus the volume of traffic and the networks capabilities to handle the traffic flows need to be assessed.

Literacy rates

Literacy rates pose a significant challenge to using text-based interventions. As noted earlier, South and West Asia have some of the lowest literacy rates in the world. This challenge is further exacerbated when mobile phones do not support the local language. Text-based interventions offer cheaper implementation, the opportunity to refer back to the message, and lower technical setup capabilities than voice interventions. Voice interventions offer richer content, the potential to reach more people and more scalable cost models in the long term (but also have higher set-up costs). Voice-based interventions offer the most immediate solution to the literacy challenge (Mobile Development Intelligence, 2013). Thus the use of voice versus text-based interventions should be carefully considered.

Access to handset and variation in type of handset

While more generally the current trends in ICT largely focus on the effects and opportunities created by smartphones, it is often the case that many people do not have access to these advanced, more expensive technologies due to the cost of purchasing the phone, and the cost of purchasing data needed to make full use of its functions. There is much evidence to point to the fact that smartphones are becoming cheaper and access to mobile services and the Internet is becoming more affordable. However, there has also been progress made in the types of information that can be accessed through the older, more basic, mobile phones. For instance, people are able to send an SMS to Wikipedia Zero, which in turn, returns information on the subject through an app. This provides information to people free of data charges. Thus, while communications are limited to

the platforms available to stakeholders, there is much that technology can do to bring new forms of communications to older, more basic devices and hardware. In order to maximise reach, the simplest possible technology should be used.

Cost-to-access

In order to persuade people to use mobile phone technologies it must be affordable. Particularly in developing countries and for low-income individuals, the amount spent on running a mobile phone may represent a significant portion of their income. In order to reduce the cost of access and prevent the end user from bearing the cost burden, the support of the mobile network operators is important. Otherwise mechanisms of reducing the cost burden should be built into the strategy of the interventions.

The success of the MPESA banking platform has been attributed to the existing demand/need for this type of service – i.e. banking the unbanked – and to the flexibility of the donors and network operators in backing novel and untried ideas throughout the project, both from the private sector and from the mobile service providers. In the case of MPESA, the market for the innovation existed, demand could be leveraged, mobile network operators were fully supportive and proactive, and well-coordinated donor funds ensured that the innovation was enacted (Maserio, 2013, p. 7).

In order to lower the cost burden, both for the donor and for the person interacting with the mobile technology, the cooperation of mobile phone companies is essential. Partnerships with mobile network operators should be explored where possible. The advantage for them exists in the increased traffic through their network if the intervention is network specific. Perhaps collecting a captive market, or developing a community for which lower prices could be negotiated, might be a solution to prevent the individual, who should benefit from the mobile innovation, from having to bear too much of the cost burden. In some cases, agreements with mobile network operators that make it free to use/access the mobile phone technology would also remove the cost-to-access burden for the end user. Both Ummeli and Souktel report partnerships with mobile network operators and being imperative to their success (Mobile Development Intelligence, 2013).

In addition, if mobile phone companies were to make it part of the suite of apps/features available on the mobile phone, as is the case with Ummeli and Vodacom, it could increase the organic traffic flow and the use of the mobile website or phone technology.

Other solutions to the cost-to-access challenge could include the distribution of free airtime and/or airtime incentives for using the mobile phone technology. Furthermore, where voice technologies are being used, a free call back feature could resolve this problem and allow people to access and use it at their own convenience.

Participation and use

An important hurdle to address both strategically and on a practical level is incentivising use. First, the technology should address a demand or a need and user value should be carefully established in order to ensure participation and use. From here, specifically with data collection use cases, there could also be an incentive that is more tangible than the prospect of long-term advantages to prevent attrition.

One such solution for immediate reward has been the distribution of airtime to those who participate. The opportunity also exists for the individuals to be paid in mobile money for their participation in surveys or data collection exercises. Mine The Gap!, a company that undertakes surveys for clients using mobile phones,

takes a different approach and donates a nominal amount of money to the charity of the participant's choice in exchange for their participation.

Another important factor is the creation of partnerships. In order to create an inclusive atmosphere particularly around using technologies for data collection, the creation of partnerships is key. For instance, Good World Solutions, a company using mobile phone interventions to promote transparency in supply chains, reports that it asks the factory management if it would like anything to be established through its surveys and such information is collected on behalf of all parties in the supply chain as opposed to only the buyer or direct client of Good World Solutions.

Partnerships also facilitate knowledge and content exchanges that help to better inform and hone the intervention. Ummeli's partnerships with training institutions helps bring publicity to the training institution and Ummeli can also share the data collected from the mobile website users with the training institution. This data may provide insights into what types of training are necessary. Similarly, Ummeli's partnership with the private sector, namely TomTom,¹⁶ helps to resolve a business problem and to create jobs. Micro tasks such as the logging of locations for TomTom can be crowd-sourced, relieving the organization of a fairly labour intensive task, and creating jobs that are currently remunerated in airtime.

Scalability: Type of intervention

One of the hindrances to the endurance of mobile technology intervention is a suitably cost effective means to maintain, scale up and improve the management of the operation. Similarly the cost burden of expanding the interventions may prevent it from being sustainable in the long term. Thus, scalability should be established early on. If networks or call centres are unable to handle traffic, it will negatively impact the user experience and prevent them from using the technology.

The use of voice or text messages interventions should be carefully considered for their longer-term scalability and cost implications. The cost of text interventions scale proportionally to the increase in reach whereas the use of mobile data based interventions may not face this problem. The distribution platform can also help to ensure that the intervention is cost effectively scaled through the generation of organic traffic. Providing ready access through mobile network operator decks would be one such solution, along with careful consideration of the appropriate intervention strategy based on data or voice.

Exploring partnerships with technology companies may also present a potential solution to the problem of scalability. Linking the applications to existing infrastructures such as Google Earth is one option, as the Malaria Consortium did to map malaria outbreaks. This allows for a global reach and bypasses the need to adapt to national and regulatory contexts. Reaching out through Facebook Zero is another alternative which tackles many challenges as it reduces/removes cost to access, is scalable and has an existing audience. Additionally, Microsoft's acquisition of Nokia's Devices and Services Unit could see more mobile-for-development applications. Although its global market share is only 25 per cent, Nokia phones hold a big share of the market in the developing world (Hatt and Burchell, 2013). Therefore, embedding mobile technologies for development on the Nokia devices may present an interesting opportunity.

¹⁶ A supplier of navigation and location products and services such as global positioning system (GPS) technology.

Challenges	Description	Potential solutions
National and local context	Cultural and target market use patterns: voice vs. text preferences, shared vs. private phones	Adapt to national context in all cases Carefully consider use of data, text or voice. Future trends also play a role.
	Regulatory context: communication restrictions, number portability, taxation, allowances for SMS broadcasts	Partnerships with mobile network operators or information technology companies
	Network coverage and infrastructure: coverage in areas of proposed interventions and overall network capacity to handle call or text volumes	Support for competitive policies and MNOs to provide connection to those in remote areas
	Other factors: electricity connection to charge mobile phones	Explore specific solutions such as solar chargers
	Literacy: low literacy rates are a challenge. In some cases, mobile phones do not support the local language (or in case of migrants do not support use of other languages).	Use voiced based solutions, stickers or pictures to communicate messages. Ensure local language is used Distribute mobile phones with pre-installed Unicode
		Cost to access: user often needs to bear the cost burden that could prevent uptake.
	Accessibility: varying handset types and different rates of smartphone penetration pose a problem. A homogenous intervention over varying technology is difficult	Build to the lowest platform Assess smartphone penetration rates
Participation and use	Incentivising use	Strong value proposition and short term incentives Partnerships with stakeholders
	Obtaining permission for participation and registering people for use	Attach to existing support systems such as clinics or resource centres
	Overload of messaging	Consider not only the content but also the frequency and length of messaging
Scalability	Cost effectiveness of scaling the intervention: Reliant on network capability to handle increased traffic. Network capacity determines the ease of managing the expansion	Text is more scalable than voice, and data more scalable than text Partnerships with IT companies Ensure a suitable platform Take into account when choosing the distribution platforms

Table 2. Key challenges

4.2.2 Institutional challenges

Having outlined some of the challenges faced in designing and implementing mobile technology, there also exists some challenges that may prevent further uptake or use of mobile technology in organizations. The challenges presented here are based on ILO experience and are intended to help the ILO and other

organizations prepare for further uptake of mobile technology interventions. Some challenges are outlined below.

1. **A strategic shift:** The changing world of work calls to better engage stakeholders and respond to real demand through the use of new technologies. New technologies require a new way of working. In addition, global, multilateral institutions need to create a more global approach, rather than a regional or country approach. It also needs to position itself so that it is equipped to respond to the changing world of work and remain on the forefront of addressing trends and challenges.
2. **Understanding the technical capabilities and the demand:** Given the drive to ensure that projects deliver on their objectives and organizations deliver on their mandates there needs to be a better understanding of how stakeholders are currently using mobile technologies and the barriers to use. A survey could be undertaken to assess the technological capabilities of potential stakeholders. This would assist the organization in understanding the needs of the stakeholders and the level at which the interventions could begin. For instance, training may need to take place to ensure that the stakeholders are able to use the interventions. Any lessons learned from the role out of other similar initiatives, such as knowledge sharing platforms, should be captured and examined.
3. **Expertise:** Expertise is fundamental to the success of mobile technology interventions. If in-house expertise were lacking, it would be useful or even necessary to hire new staff members with capabilities and experience to move forward. A cluster/team of internal champions who are motivated and interested in keeping up to date with developments in the field, coordinating action between projects where applicable, and assisting projects to design and implement interventions would be a good way to drive the use of mobile technology forward.
4. **Private sector engagement:** Much of the knowledge of these technologies and the technical expertise lies in the private sector. Non-governmental organizations and multilateral organizations such as the ILO need to explore engagement with the private sector, particularly with mobile network operators. As organizations explore further use of mobile technologies, there should be more engagement with companies, development agencies and practitioners that are currently undertaking work of this nature. There is a lot to learn from them, as much work has already been undertaken in this arena. On a broader scale, perhaps cooperation/engagement with global companies such as Google and Facebook could be undertaken.
5. **Lack of awareness and knowledge sharing:** Within organizations there is often limited awareness of current activities both within the organization itself and within the broader labour or development sphere. Targeted actions need to be taken to inform and sensitize staff to the existence, scope and applications of mobile technologies. This will serve to broaden the understanding of the topic within the organization, allowing staff members to identify avenues through which they might make use of the interventions in their work. This would also provide a forum for knowledge sharing across projects, allowing for best practices to be discovered and oversights to be prevented.

5. Conclusion

The ILO's mandate is to promote social justice through, inter alia, providing services to its tripartite constituents, and setting norms and standards for labour within the world of work, based on how the organization understands and perceives constituents' needs. However, the constituents and the world of work itself are changing, both in the way they work and the way they communicate. In order for the ILO to continue to remain relevant and essential in this sphere, it needs to ensure that it is responding to the real needs and demands of its constituents and preparing for changes. The direct communication ability of social media, the data generated as a by-product of everyday life and the increased capabilities for data analysis has brought with it the ability to generate real-time information of the world of work. In this context and with a view to maintaining meaningful relationship with its constituents, the ILO needs to continue to add value in this changing world. This is true for other types of organizations working in the field of labour rights and broader development. Responding to the real needs of stakeholders is imperative to serving these needs and achieving the objectives of the organization.

A theme that runs through the success of particular mobile technology interventions is that a strong value proposition will create demand, and in turn, lead to sustainable use. This is also true at a more macro-level. Evidence shows that in order to get people to use services it is important to demonstrate that they add real value. Thus, if a need is served, convincing people to change their habits, to effectively "opt-in", is relatively easy, and other norms may even begin to shift and change. This has implications for how organizations operate and offer services in the twenty-first century. The new technologies bring with them new ways to reflect real demand and achieve direct engagement with constituents. The challenge for organizations is to find ways of understanding what this demand is, and how to respond to it.

This paper has sought to contribute to the conversation on mobile technologies and what this means for the field of labour. It has also aimed to contribute to the conversation within the ILO about the implications for its projects and core business. The review showed that there is wide scale use within the development arena, increasing uptake of interventions for labour rights and ILO projects are beginning to shift to using communication and outreach strategies based on ICT. However, there is still much potential to be realized.

For the ILO, potential exists both in terms of improving the effectiveness of its projects, and in to respond to the shift that is already taking place in the world of work and play an active role in managing it. An enhanced use of mobile technologies in ILO projects would support the delivery of project outcomes, the collection of data to inform future projects and expand the reach of the projects. As such, mobile technologies also offer an avenue to support the differing social protection structures that may be necessitated through an increasingly flexible and decentralized workforce.

Within the greater development space, the interventions involving mobile technologies are numerous and involve diverse uses. SMS interventions are being used for health care but also for disaster relief. Although the objectives and fields differ, ultimately, the use of mobile technologies in projects leads to win-win results for beneficiaries and the organization. Improved access to new forms of data, and better means of data collection and analysis give the organization the opportunity to use data to improve its work. As the shift will take time, and access to more developed technologies will also increase over time, a dual approach is needed whereby organizations are able to reach those on more developed devices and prepare for the time when most people will have access to these devices, but also continue to use the simplest forms of interventions to avoid excluding people who lack access to more developed devices.

Opportunities exist to learn from efforts that have already been undertaken, both by the ILO and in the greater development sphere. Reviewing and learning from the numerous successes and failures could help place organizations in a better position to apply this learning and carry out more successful interventions of a similar nature in the future.

In summary, technology has been a disruptor to the world of work. It has presented the ILO and other organizations with the challenge of remaining relevant in the changing world of work. To remain relevant, these organizations need to add value. This report has showed that there is much opportunity to use mobile technologies to both ensure that organizations are responding to real demand and creating value for their beneficiaries.

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The future of work: Increasing reach through mobile technology

The world of work is changing. A major factor contributing to this is the proliferation of information and communication technologies, with mobile technology playing a central role. More and more people are able to access the Internet through their mobile devices. This has empowered them to work from anywhere but it has also led to the decline of traditional forms of employment. In the broader development context, mobile technology has been used extensively to reach beneficiaries and target audiences. Overall, this presents organizations with a challenge but also an opportunity to adapt projects and interventions to new technologies. This paper outlines technological and institutional hurdles related to the future uptake and implementation of mobile technology platforms and the use of mobile technology as a means of outreach.

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