

# Building an integrated and digital social protection information system

Technical Paper

# Imprint

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# Acronyms

CRVS	civil registration and vital statistics
DFID	Department for International Development (UK)
DMIS	Disability Management Information System (Zambia)
DRM	disaster risk management
EWS	early warning system
GIS	geographic information system
HSNP	Hunger Safety Net Programme (Kenya)
ICT	information and communication technology
ID	identification document
M&E	monitoring and evaluation
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MIS	management information system
PWD	person with disability
SIAS	Integrated Information System for the Social Areas (Uruguay)

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# 1



Introduction:  
Why a digital and  
integrated system?

Developing a digital and integrated information system is a crucial step in building a national social protection system. It enables the flow and management of information within the social protection sector and between social protection and other sectors such as education, health, agriculture, humanitarian and disaster risk management (DRM). Why? Because the ability of a country to care for its people and respond to their lifecycle needs depends on its ability to identify those who are in need, enrol them, provide tailored benefits and services, and follow up to cater to evolving circumstances. Governments also need to be able to monitor programme impacts and track and adequately plan expenditure. All of these actions require dynamic and real-time data and information exchange if the goal of universal coverage is to be achieved.

**Why digital?** Managing social protection programmes involves the collection, processing, storing and use of data for decision-making and the support of operational delivery. As in other sectors, ensuring these processes are digitised can help to reduce errors and simplify and speed up processes, while better transforming data into information – among other things.

**Why integrated?** While there are benefits to each social protection programme operating its own digital information system, the integration of selected functions along the social protection delivery chain – as well as interoperability with other government systems – can help to reap economies of scope and scale. It can also help to focus on ‘systemic’ outcomes: better understanding of the demand for social protection (e.g. differential needs across population groups and lifecycle stages) and better coordination and monitoring of the supply of programmes to address those needs across sectors.

So, what **benefits** can a digital and integrated social protection information system help to achieve, when designed to address the common risks that digitisation and integration entail? A digital and integrated social protection information system is expected to better serve the needs of the people, by focusing on inclusion; efficiency and effectiveness; accuracy and integrity; and accountability and citizen empowerment (Barca, 2017; Leite *et al.*, 2017; Handayani 2017).

## Inclusion

**Responsiveness and dynamic inclusion:** Increasing the responsiveness and inclusiveness of interventions to serve people in need, dynamically responding to individual lifecycle shocks and stressors (e.g. job loss, disability, childbearing or old age) or large crises (e.g. natural disaster, conflict), as well as enabling beneficiaries to transition between schemes as their circumstances change

**Coordination and linkages:** Supporting the planning and implementation of comprehensive social protection systems including supporting coordination across social assistance programmes and between social assistance and social insurance programmes, as well as links to wider social and economic policies (e.g. for humanitarian aid and DRM) – via enhanced data sharing and comprehensive understanding of needs

**Equity:** Supporting investment – based on objective, comprehensive and comparable information – to address the uneven and unequal provision of social protection across social groups and administrative jurisdictions

## Efficiency and effectiveness

**Reduced burden on people:** Improving the user experience for applicants by lowering documentation requirements and enabling people to apply for several programmes at once, as well as to access selected services/their own information online and via digital platforms, etc.

**Reduced burden on staff and government systems:** Reducing overall paperwork, manual reporting, and other manual and time-consuming activities (e.g. preparation of payment lists and payment reconciliation)

**Evidence-informed decision-making and management:** Increasing access to relevant data at all levels of implementation (including external stakeholders where relevant and secure), to support planning, budgeting and overall decision-making and management

**Lower gaps and duplication in processes and benefits:** Reducing gaps and duplication across programmes and along the delivery chain, establishing common systems across schemes (e.g. for registration, payments, grievances) and reducing both private (on people) and public (on administration) costs

## Accuracy and integrity

**Management of errors and fraud:** Supporting improved processes for identification, verification, validation, processing and analysis to better manage and prevent error and fraud, while improving governance, overall data accuracy and system integrity

## Accountability and citizen empowerment

**Transparency:** Ensuring that the rationale for policy decisions is clearly understood and that all programmes demonstrate accountability to their beneficiaries, civil society, the government and funders (e.g. information shared and compared)

**Oversight, reporting and planning:** Facilitating oversight of multiple schemes and reporting, including ongoing monitoring and evaluation (M&E)

**Feedback, grievances and appeals:** Harnessing digital tools – where relevant and appropriate – to enhance citizen direct engagement, as well as integrating feedback in the form iterative changes to policies and programmes

**Knowledge:** Improving understanding of poverty and vulnerability (including via guaranteeing access to third parties such as universities) to inform long-term policy debates

**Digital innovations:** Enabling broader digital innovations (not just government led) that build on the digital platform to better inform beneficiaries and deliver better services to boost outcomes around a set of common standards, rules and principles

These objectives present an ambitious vision in terms of the ultimate goals countries may want to achieve when building an integrated (digital) social protection information system. Depending on each country's evolving context, history and policy priorities, very different trajectories and investment choices are possible and countries must choose the path that makes the most sense – which means that not all the 'benefits' listed above can, or should, be reaped at once, or at all.<sup>1</sup>

This paper, therefore, builds on recent experiences in countries that have been developing integrated social protection information systems to set out the key building blocks required, while also acknowledging the main risks that will need to be mitigated and addressed along the way. The overarching goal of the paper is to create a

vision for a social protection information system that can guide social protection stakeholders when implementing different pieces of the system. It also aims to assist practitioners to evaluate the state of their information system's implementation and chart the way forward to achieve greater integration within the social protection sector and beyond.

The paper is broken down into the following chapters. Chapter 2 introduces the main components of any social protection information system, at the programme or integrated level. Chapter 3 sets out the three pillars of an integrated information system for social protection. Chapter 4 describes the risks and issues associated with its establishment. Chapter 5 concludes by summarising critical design and implementation choices.

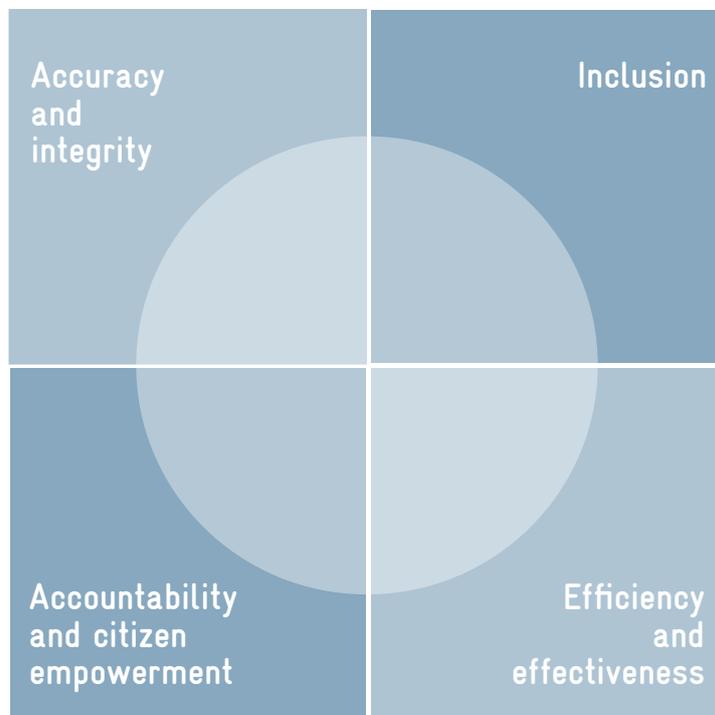
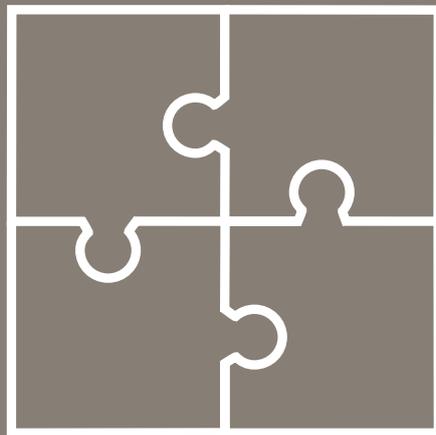


Figure 1: Potential benefits of digital information systems for social protection

<sup>1</sup>See, for example, <https://dfat.gov.au/about-us/publications/Documents/infographic-why-we-need-to-focus-on-policy-and-not-technology.pdf> for an infographic on the topic of desirable policy benefits and the system features required to achieve these.

2



Components

From a practical point of view, digital information systems for social protection are the product of a set of 'components' that work together as a system. Broadly, these are the same at the programme and integrated levels (more on this in the next sub-section), but with the increased integration of social protection systems (and their underlying programmes and delivery systems) information systems can require higher levels of complexity (and underpinning capacity and resources).

## ICT infrastructure

Information and communication technology (ICT) infrastructure refers to the resources and services required for the existence, operation and management of the IT environment of the system. This includes the chosen hardware and telecommunications systems, which will vary depending on the functions performed and country context (e.g. broadband and mobile phone penetration, potential for cloud-based solutions, etc.). For a fully electronic system, the hardware and network infrastructure may include: tablets and mobile phones for data capture; servers for hosting the database and software; firewalls, advanced switches and security systems; and local area networks (LANs) and wide area networks (WANs) for providing access to the system within one, or across several, offices in multiple locations.

Having said this, with the advent of cloud computing it is becoming increasingly unattractive to build physical hardware data centres or server rooms to keep data. This is because physical data centres require the replacement of hardware infrastructure approximately every five years, reliable electricity or backup generators, physical security measures such as CCTV cameras and biometric doors etc., alternative data backup sites in case of disaster and, most importantly, trained staff. The key issue is that a government cannot hand over data ownership and control to a cloud-based solution owned by another entity. Trade-offs and choices must be made in the interest of ensuring the functionality and sustainability of the system against a country's data ownership considerations.

## Registry/database

These are broadly interchangeable terms indicating a data repository and a system to organise, store and retrieve large amounts of data easily. Examples include Microsoft's Structured Query Language (MSSQL) Server and Oracle, and open source ones such as MySQL and PostgreSQL. In the social protection sector, the term 'registry' is primarily used in the context of integration and as shorthand for 'database + software applications that transform data into information' (see below).

## Software

Software refers to the tailored applications that help manage, link (e.g. via application programme interfaces or APIs) and process the data, transforming data into information and analysing/using the information for different purposes (depending on the functions it has been designed to perform). For example, front-office software applications may provide a visual interface for citizens and frontline workers, while back-office software supports the management of business processes and data analysis. Software can be developed to operate on a number of platforms, such as desktop computers, mobile phones, notebooks, tablets and servers. Additionally, it can be built for the web environment. A critical issue for software functionality is interoperability. The issue of interoperability is typically addressed as part of broader national ICT standards and refers to the capability of the software to maintain standards that allow it to be linked to other government platforms, services, databases and registries.

Depending on an evaluation of needs, capacity and budget availability, countries developing software to run their social protection programmes and systems may choose between: minor adaptations to off-the-shelf solutions; the commissioning of bespoke solutions; or in-house development of bespoke solutions. Using open-source software and applying open-design principles should be prioritised where feasible, ac-

knowl-edging the high costs of making changes to proprietary software and the risks of vendor ‘lock-in’. Either way, a modular iterative prototyping approach<sup>2</sup> is typically recommended, because it is an improvement on the traditional waterfall model of system development, where specifications are fully documented before the information system is developed.

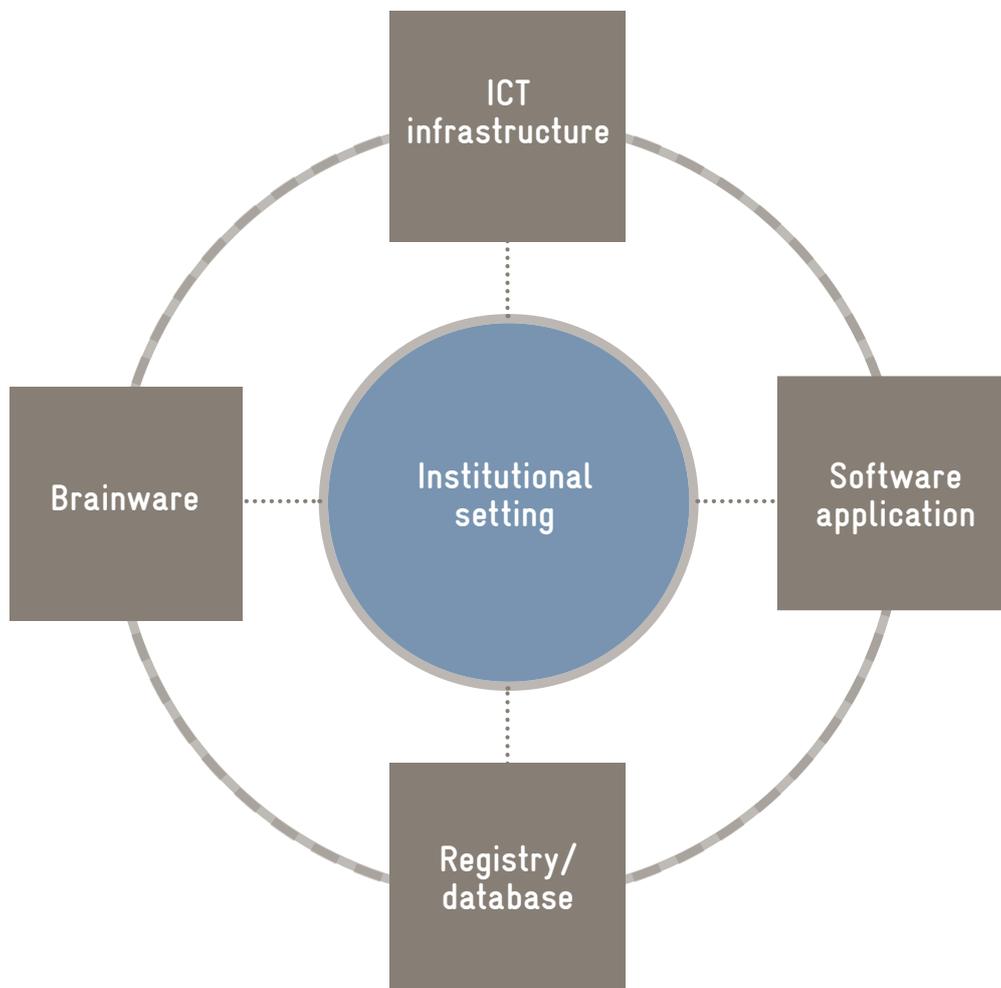


Figure 2: Components of digital information systems for social protection

<sup>2</sup> Whereby the system model is designed and used to customise and incorporate feedback from users. This tailors the system to suit the needs of those primarily involved in its use and enhances a sense of local ownership that is essential for its success (Barca 2017).

## Brainware

Brainware refers to human resources. A sufficient number of competent and adequately trained human resources are needed at all levels of administration and with a broad range of skills (e.g. bridging IT and sectoral knowledge). As well as a strong understanding of social protection policy objectives, key skills include:

**IT skills:** Database administrators, network administrators, system developers and administrators, security specialists, data entry clerks, etc.

**Programme management and business process engineering skills:** Professionals who understand the delivery systems of existing social protection programmes and the needs of end-users, including how these can be better addressed via digitisation and integration

**Analysis skills:** Experts in economics, statistics and quantitative data analysis; for instance, research staff define the ranking formulae (if any – e.g. proxy means test), appropriate poverty percentages and other statistical models for data analysis

**Promotion and capacity building skills:** Supporting coordination and data sharing across multiple stakeholders as well as promoting understanding/‘buy-in’ of the system and its functions (via training, newsletters, workshops, a dedicated website, etc.)

The exact number of staff required to manage the system will vary greatly from country to country, depending on the design choices, functions pursued and country context. A comprehensive assessment of staff requirements should be undertaken as part of establishing the units responsible for managing the system.

## Institutional setting

Weaving across all the other components is the institutional setting that underpins the information system. Especially for countries pursuing an integration agenda, there is a need for political will, accompanied by efforts to guarantee sustainability beyond electoral cycles. This includes: embedding systems in policy and legislation, ensuring a clear governance framework, allocating a multi-year budget, and enforcing procedures, standards and principles to ensure sustainability beyond electoral cycles. In this section, we discuss each in turn.

### Policy and legal backing

Policy and legal backing for:

**The social protection sector:** The vision for the integration of the social protection system (at policy and operational levels) should be clearly spelt out in the national social protection policy or strategy.

**The social protection information system and its underlying registries:** The more these are embedded in policy (e.g. functions, roles and responsibilities) – and ideally in legislation – the more likely it is that system sustainability can be guaranteed. For example, Kenya and Uganda have used their social policies to define a model of integrated data management. Chile’s social registry, the Registro Social de Hogares, was established in 2008 through a presidential decree (Decreto Supremo No. 160), which specifies how the personal data of applicants and beneficiaries is protected and how inter-institutional agreements should be regulated. The law stipulates the role of the Ministry of Social Development and the rights and obligations for use and access to data by other state agencies (Barca, 2017). Furthermore, the law vests responsibility for maintaining accuracy with each institution.

**Broader e-governance:** This means creating an enabling environment and addressing key risks such as data privacy. In countries that have adopted a coordinated e-government framework, there is often a specific ministry/agency responsible for setting technology standards and putting in place laws on data protection. Such an e-government legislative framework ensures an enabling environment for the social protection sector by: creating awareness about the benefits and risks of e-government systems (i.e., building digital competence); setting context specific standards and rules for

data exchange (including incentives for data sharing); enforcing digital and data protection laws; and championing the rights and responsibilities of citizens with regards to their data.

## Institutional/governance framework

The information system requires clear ownership at the highest levels of government and institutionalised coordination mechanisms (e.g. steering committees, MoUs, etc.) describing the roles and responsibilities of each institution to truly drive vertical and horizontal collaboration (Barca & Chirchir, 2014; Barca, 2017; Leite *et al.*, 2017). For instance, in Uzbekistan, the Social Protection Registry project is administered by a cross ministerial committee led by the Ministry of Finance. The steering team is supported by technical specialists on ICT and the Ministry of Labour and Employment Relations. The steering and technical team shepherd the design and implementation of the integrated data systems in consultation with contracted suppliers.

## Budget

The costs of information systems are sometimes grossly underestimated, especially systems operating at an integrated level (see Chapter 3). A sustainable information system requires the allocation of a multi-year budget encompassing a wide range of costs, such as:

**System development and uptake:** Hardware, software and operational expenses (e.g. infrastructure, electricity, testing and feedback, technology/user training, auditing, insurance, etc.)

**Data collection:** If not computed separately

**System maintenance and use:** Including hardware replacements, software upgrades and scalability, ongoing training and feedback

**Business process development and maintenance:** Including investment in outreach, communications, recertification, audits and spot checks

## Procedures, standards and principles

Information systems require a set of procedures, standards and principles governing the collection and use of data. These should build on broadly endorsed experiences such as international data protection and data quality standards and the Principles for Digital Development and can be crystallised within operational manuals and guidelines. Such guidelines have been developed in Kenya, Uganda, Malawi, Ethiopia, Brazil, Chile and Indonesia<sup>3</sup>, among other places.

## How do these differ at programme and integrated levels?

These components are broadly the same at the programme and integrated levels, as illustrated in Figure 3 (see also Chapter 3). The main difference is the increasing level of complexity required at higher levels of integration (Barca & Chirchir, 2014; Barca, 2017).

**Programme-level:** At this level the overall system is often referred to as a programme management information system (MIS) – see also Pillar 1 below. This is defined as a system designed for an individual social protection programme that converts raw data into meaningful information, thus providing a useful report to its users or that supports operational processes.

**Integrated level:** Several terms for an integrated MIS have been used in the literature. In this document we use '(integrated) social protection information system'. This is defined as a system to manage the flow of information between and across social protection programmes and beyond.

<sup>3</sup>As an example, see Indonesia's Unified Database Management Standards: <http://www.tnp2k.go.id/images/uploads/downloads/Book%20%20Indonesias%20Unified%20Database%20for%20Social%20Protection%20Programmes%20Final.pdf>.

Components

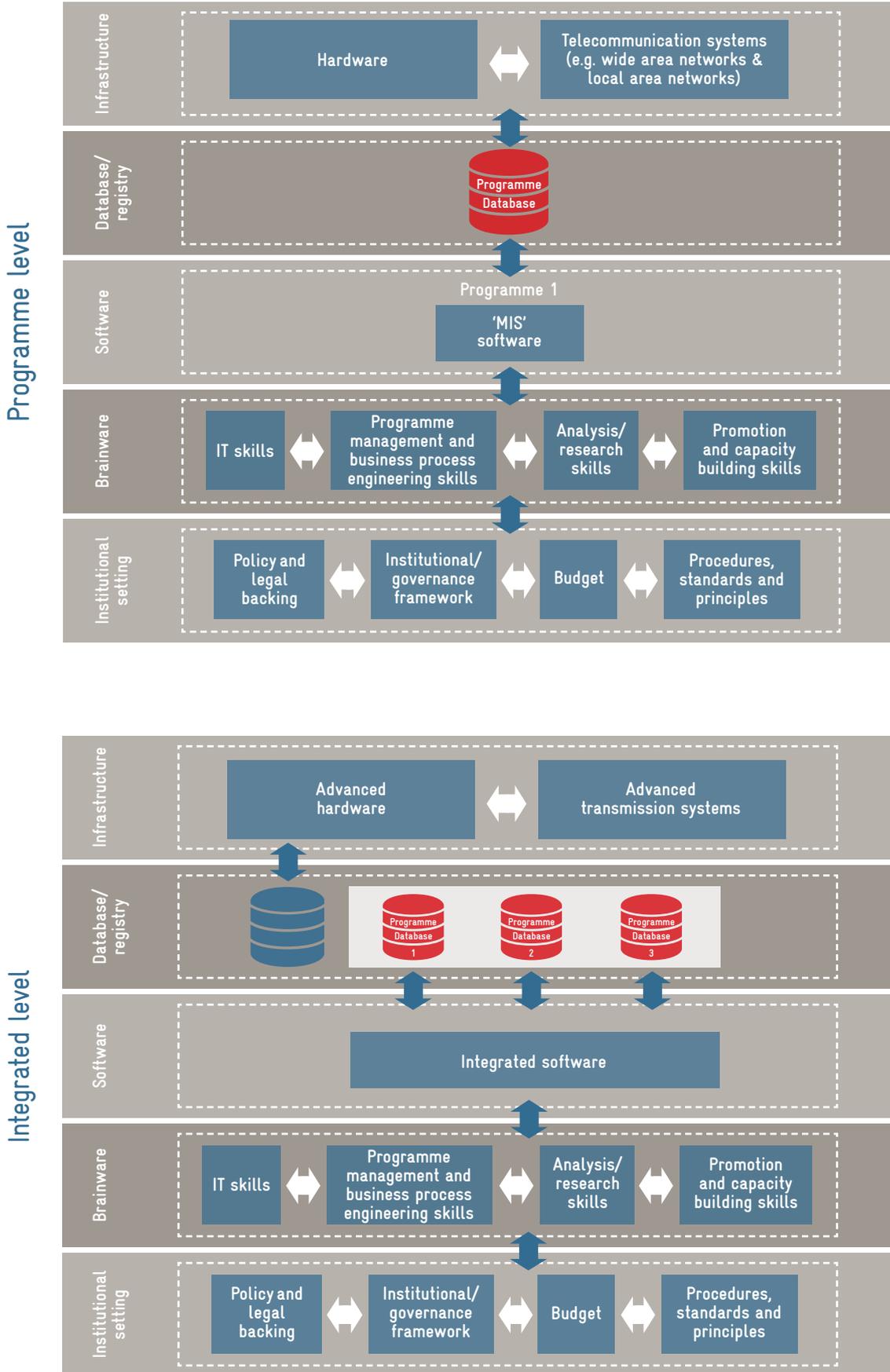
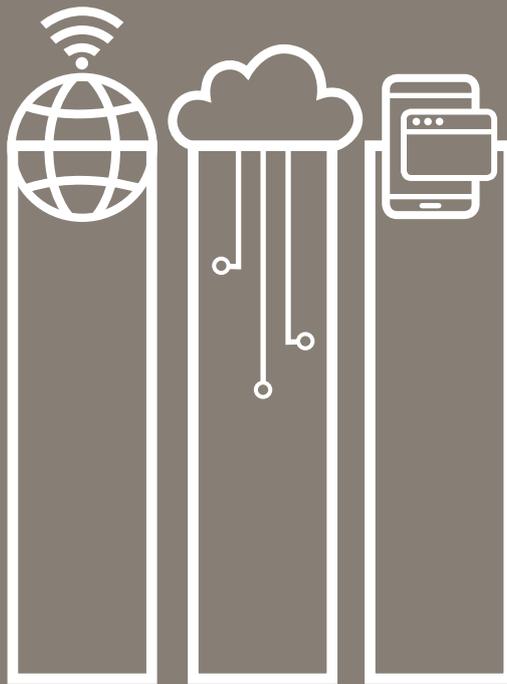


Figure 3: Comparing across programme and 'integrated' components

# 3



Three main 'pillars'

## Three main 'pillars'

A social protection information system can be viewed as an 'ecosystem' involving three main pillars:

**Pillar 1:** Supporting programme-specific operations and functions

**Pillar 2:** Supporting integrated operations and functions across the social protection sector

**Pillar 3:** Encompassing the broader set of registries and information systems, which can play an important

role in enhancing sectoral outcomes (in some countries these may be managed by social protection stakeholders, in others they are managed externally)

Depending on each country's (evolving) trajectory, context<sup>4</sup>, history, needs and policy priorities, this ecosystem of registries and information flows between them may look very different. We analyse each in turn and provide a summary in Figure 4.

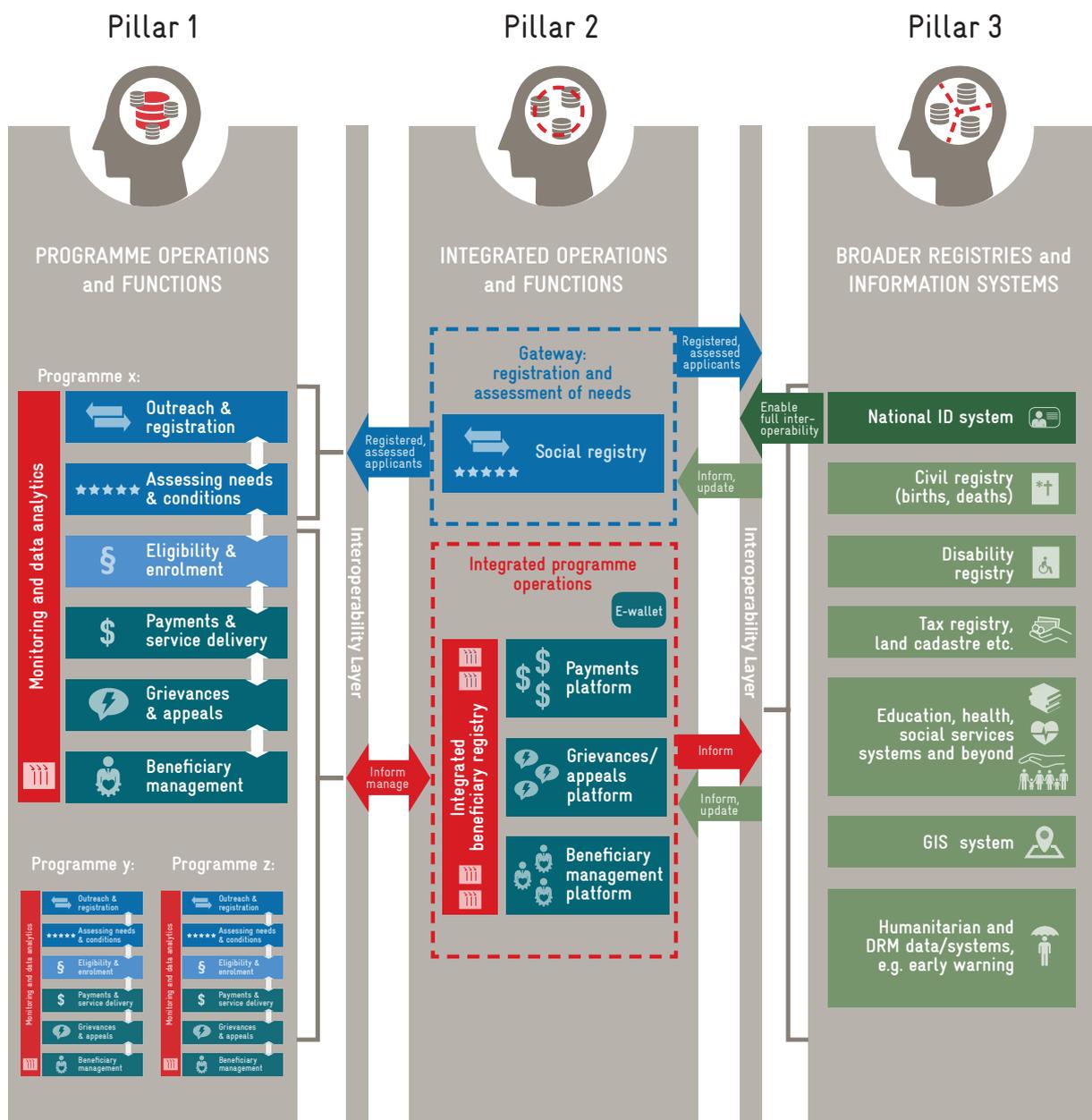


Figure 4: Implementation phases along the social protection delivery chain

<sup>4</sup>Generally speaking, technology adoption should not be construed as a developing versus developed country issue. There are both developed and developing countries that have embraced ICT more than others. In relation to telephony, for instance, mobile phones have leapfrogged landlines in many developing countries, because users never needed to invest in landlines when mobile telephones became an option (<https://ourworldindata.org/technologyadoption>).

## Pillar 1: Programme operations and functions

Each social protection programme in a country entails broadly similar implementation phases along the delivery chain (see Figure 5). Programme MISs<sup>5</sup> – and their associated databases, brainware, etc. – can support the delivery of each of these phases, depending on whether these are relevant for the programme<sup>6</sup> and whether the tailored software application has been designed to do so<sup>7</sup>, e.g. via a tailored module (Chirchir & Kidd, 2011; Chirchir & Farooq, 2016; Barca, 2017; Lindert *et al.*,

forthcoming). Countries offering a variety of programmes, catering to different needs and population groups, may have developed tailored MISs supporting similar functions for each separate programme.

An example of an MIS that supports core services is Uzbekistan's Pension Fund MIS, implemented by the Ministry of Finance, as described in Box 1.

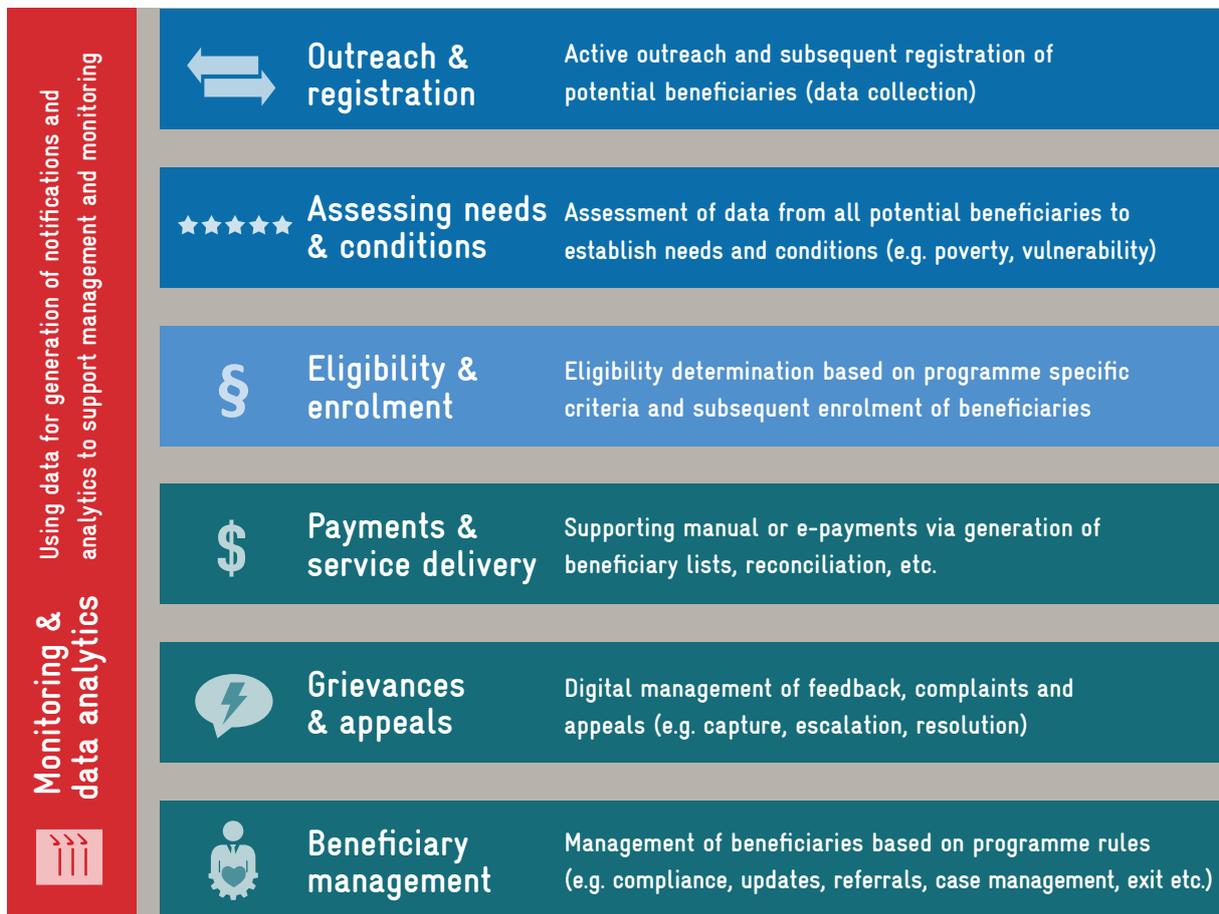


Figure 5: Implementation phases along the social protection delivery chain

<sup>5</sup>The World Bank is moving towards calling these 'Beneficiary Operations Management Systems' (BOMS).

<sup>6</sup>For example, a programme with no conditionality will not need the MIS to monitor compliance.

<sup>7</sup>For example, even for a conditional cash transfer programme, the monitoring of compliance may not be achieved via the programme MIS, but may be manual.

**Box 1.****Uzbekistan's Pension Fund MIS**

Uzbekistan's Pension Fund runs a functional MIS that is used at pension offices across Uzbekistan. Even though the labour book (filled out by employers) is still manual, once data has been keyed in by inspectors, the other processes, such as the computation of pension amounts and production of payrolls, are automated. Through a web portal, the payment service provider, the Peoples Bank, updates the reconciliation details. The Pension Fund MIS also has an alert management system: 1.6 million out of the 3.2 million beneficiaries with mobile phones get a short text message (SMS) notifying them when their entitlement is cashed out. The Pension Fund MIS also has a complaints and grievance module complete with a four-digit hotline and linkages to the Office of Prosecutor General, Single Interactive Services Portal ([www.my2.gov.uz](http://www.my2.gov.uz)), President's Virtual Reception and Ministry of Finance complaints portal.

Source: Adapted from Chirchir (2017)

## Pillar 2: Integrated operations and functions



Some of the core functions along the social protection delivery chain discussed above (Figure 4) can be integrated across programmes running on integrated (digital) platforms that serve multiple (or even all) social protection interventions in the country, as well as programmes from other sectors. This helps to address fragmentation and inefficiencies, while better serving citizens, as discussed in Chapter 1. We will discuss these in turn, noting that these all have complementary functions and not all countries pursue all of these functions at the integrated level.

### Social registries

Social registries integrate functions such as outreach, registration, and the overarching assessment of needs and conditions across several programmes. They collect and compile individual and household level data on

the socio-economic conditions of potential beneficiaries. They can serve as powerful tools for assessing the demand for social programmes by profiling the specific needs and conditions of various population groups (Leite *et al.*, 2017; Barca, 2017). In detail, social registries provide a single source of information on potential beneficiaries, whether or not they are deemed eligible for, or enrolled in, specific social protection programmes (Leite *et al.*, 2017). The salient feature of a social registry is a standardised registration tool/questionnaire, used to collect data through a census survey, on demand or via integration with other existing databases<sup>8</sup> (see Pillar 3). The digitised data is consolidated into the social registry, in which households can then be ranked, if desired, based on an assessment of their needs and conditions (e.g. using methods such as a proxy means test).

The information from the social registry is shared on a systematic basis with a number of social protection programmes (and their MISs), based on defined data sharing protocols. These programmes apply their own eligibility criteria using the social registry data and – in some cases – their ranking of needs and conditions<sup>9</sup>. While many social registries started out as information systems supporting tax financed social assistance pro-

<sup>8</sup>Examples include income/tax registries, disability registries, and land cadastres.

<sup>9</sup>It is important to note that the function of 'enrolment' is, therefore, programme specific. Social registries do not have information on enrolled beneficiaries unless they receive data back from programme MISs.

grammes, over the years their use has expanded to include other social protection programmes and, at times, social development programmes. For instance, Brazil's social registry, Cadastro Único, was created in 2001 as an instrument to be used by federal social assistance programmes, which were consolidated into Bolsa Família in 2003. However, since then, it has been drawn upon by more than 27 programmes. Broader social services programmes that now make use of Cadastro Único include programmes that grant discounts on social security contributions, credit rate reduction programmes, social technologies, infrastructure programmes and social services (Direito, 2016).

A functional social registry system, as illustrated in Figure 6, therefore, spans the three Pillars discussed

in this section: it feeds information on registered and assessed applicants to the social protection MIS and sometimes externally to other sectors (e.g. health and education), while also receiving information from these (e.g. to complement socio-economic data). Full interoperability is enabled via linkages with the national civil registration and vital statistics (CRVS) or ID system.

Some of the main objectives of a social registry and associated measures of success, alongside key risks and drawbacks, are given in Table 1 (Page 22). An example of a social registry is Indonesia's Unified Database of Beneficiaries, which is described in Box 2 (Page 23).

Three main 'pillars'

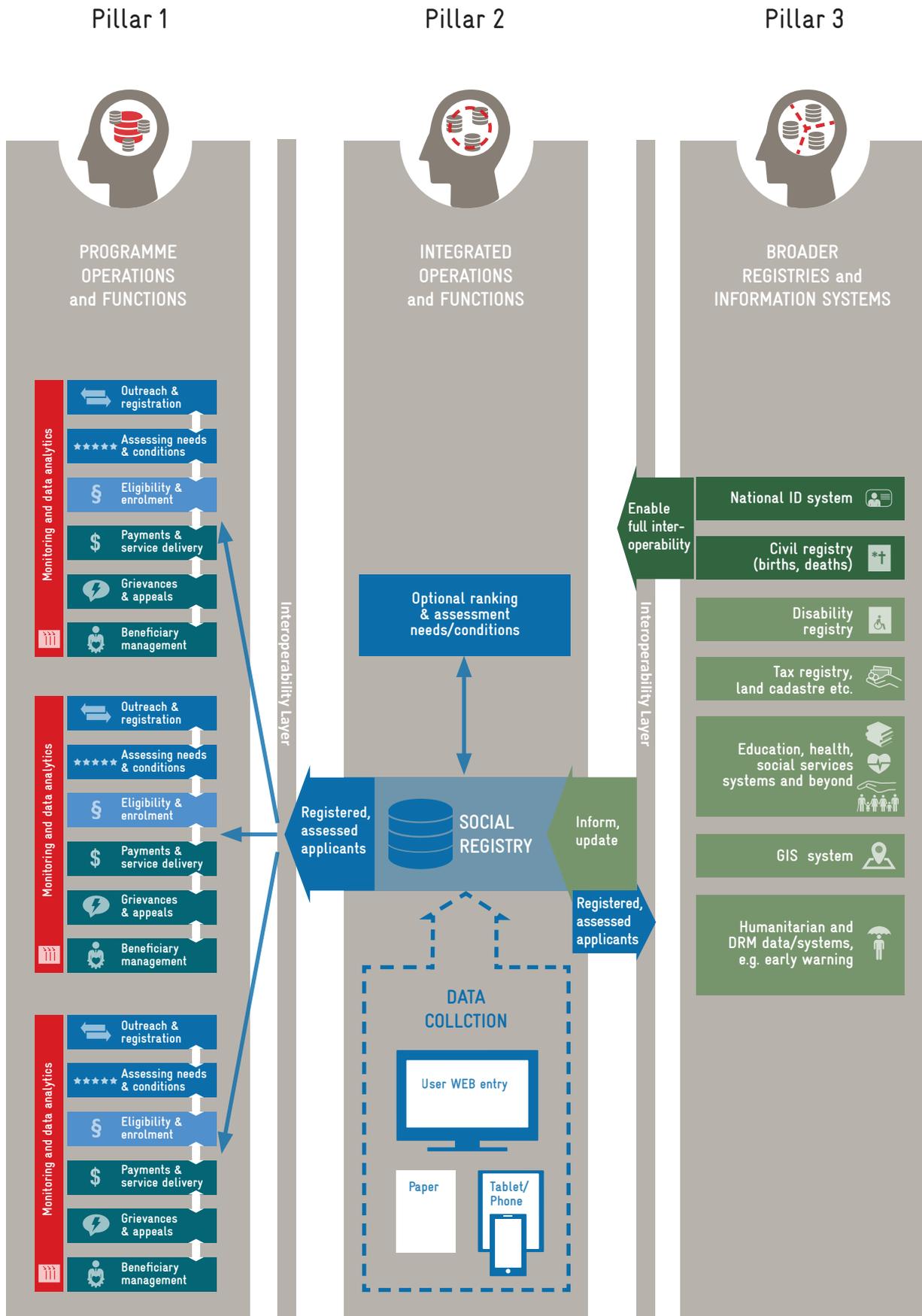


Figure 6: Components of a social registry system

Table 1: Objective	Measure of success
1. Harmonised, coordinated and high quality programme registration	<ul style="list-style-type: none"> <li>• Standardised and harmonised registration forms and procedures, leading to reduced cost of registration across programmes (no duplication of efforts) and easier access for applicants</li> <li>• Strong, consolidated processes to ensure data quality and address potential for error and fraud (supervision, field checks, validation against relevant databases, etc.)</li> </ul>
2. Provision of reliable information for evidence-based decision making	<ul style="list-style-type: none"> <li>• Availability of accurate and up-to-date information on households that may need to access social assistance and support</li> </ul>
3. Improved and transparent applicant selection process	<ul style="list-style-type: none"> <li>• Analytical reports that compare registered applicants against needs</li> <li>• Standardised, transparent selection process for social protection programming</li> </ul>
4. Planning and better coordination across programmes for management of applicants and their needs	<ul style="list-style-type: none"> <li>• Availability of applicants' data, which can be used by multiple programmes in a coordinated manner (for example, households that are poor and have labour capacity are assigned to public works programmes, while those without labour are assigned to social transfer programmes)</li> <li>• Availability of data for shock-responsive programming</li> </ul>
<b>Associated risks and drawbacks</b>	
<ul style="list-style-type: none"> <li>• Social registries that operate in the absence of integrated beneficiary registries (see below) do not hold information on the programmes accessed by beneficiaries (this is not their function), so are not useful for monitoring. Ensuring this bi-directional flow of information is key to the broader success of the information system.</li> <li>• The integration of registration and assessment of needs and conditions across programmes and diverse regions generates the risk of multiple and systematic exclusion across all social sector schemes (this risk is also present when registration/assessment is conducted at the programme level, but it is not systematic). This stresses the need for a strong focus on data quality and the building of mechanisms for dynamic on-demand registration, as well as easily accessible grievance mechanisms.</li> <li>• The wealth of socio-economic information contained within social registries may not be useful/necessary to support programmes that are not poverty-targeted or means tested in any way (e.g. universal pensions, child benefits and individual means-tested programmes). Given the current focus on data protection and data minimisation, the role and function of a social registry may not always be necessary vis-a-vis using civil registries, data integration from existing government databases and minimal additional data collection.</li> </ul>	

Table 1: Objectives, measures of success, risks and drawbacks of social registries

## Box 2.

## Indonesia's Unified Database of Beneficiaries

Indonesia's Unified Database of Beneficiaries was developed in 2011 with the aim of assessing the wellbeing of the poorest 40% of Indonesia's population (by 2015, this was approximately 25.7 million households or 92.9 million individuals). This is arguably the second largest social registry in the world (in terms of total population included, not percentage of national population), after Pakistan's Benazir Income Support Programme's 27 million household database. The database contains names, addresses and a range of other demographic and socio-economic variables and has been used by several social protection programmes in Indonesia to target beneficiaries. Some of the national programmes that have used, but are not electronically linked to, the Unified Database of Beneficiaries data include:

- **Jaminan Kesehatan Masyarakat (Kartu Indonesia Sehat)**, which was launched in November 2014 to replace the Jamkesmas. This programme delivers community health insurance cards to the poorest households to enable them to receive free treatment in government hospitals.
- **Bantuan Siswa Miskin (Kartu Indonesia Pintar)**, which provides transfers from central education agencies directly to students or schools once enrolment, attendance and other criteria have been verified.
- **Program Keluarga Harapan**, which is a cash transfer programme providing direct cash benefits conditional on household participation in locally-provided health and education services.
- **Beras untuk Rumah Tangga Miskin**, also known as Raskin (RASTRA), or the rice subsidy programme, which aims at strengthening food security and reducing the financial burden on poor and near-poor households.
- **Bantuan Langsung Sementara Masyarakat (Kartu Keluarga Sejahtera)**, which is a temporary unconditional cash transfer to compensate for the increase in fuel prices.

Since March 2012 to 2016, there have been more than 700 requests for data and more than 1,000 requests for technical support from the Indonesian National Team for the Acceleration of Poverty Reduction (TNP2K), the agency that manages the database. Data from the Unified Database of Beneficiaries was also used to determine which households should receive social protection cards (Kartu Perlindungan Sosial), which were launched in conjunction with the Temporary Unconditional Cash Transfer initiative to subsidise fuel (Bantuan Langsung Sementara Masyarakat) and the Programme for Expanding and Accelerating Social Protection (Program Perluasan dan Percepatan Perlindungan Sosial – P4S).

Source: Adapted from Chirchir (2016b); Barca (2017)



## Integrated beneficiary registry

Integrated beneficiary registries integrate the data analytics function across several programmes. They provide a consolidated overview of 'who receives what' benefits to support coordination, planning and integrated monitoring. As an example, they can help to assess overlaps, gaps and duplications across multiple programmes, while also supporting the consolidation of other functions along the delivery chain (Barca, 2017; Leite *et al.*, 2017).

In practice, integrated beneficiary registries consolidate information on beneficiaries across existing programmes<sup>10</sup>, acting as a 'data warehouse' – a single point of reference that explains who is receiving what type of assistance, where assistance is received and when assistance is transferred (World Food Programme, 2015). In certain countries, this can be leveraged to establish common delivery systems across multiple programmes (e.g. for payments). Additionally, integrated beneficiary registries act as a nexus of information, providing inter-linkages between individual programme MISs and

other external databases/registries, such as national ID databases, income tax registries, civil registration systems and, if applicable, disability databases and payment gateways (Chirchir & Farooq, 2016). As illustrated in Figure 7, this model, therefore, spans all three pillars: it aggregates data from social protection programme MISs and links to a broader set of registries. The most important is the linkage to the foundational civil registration or ID system to ensure verification of data (unless this has already been achieved via a complementary social registry).

The typical objectives and measures of success, as well as the key risks and drawbacks, of integrated beneficiary registries are set out in Table 2 (Page 26), noting these will vary from country to country. An example of a basic integrated beneficiary registry is Kenya's Enhanced Single Registry, described in Box 3 (Page 27).

<sup>10</sup>Not necessarily all programmes, depending on how the system is operationalised.

Three main 'pillars'

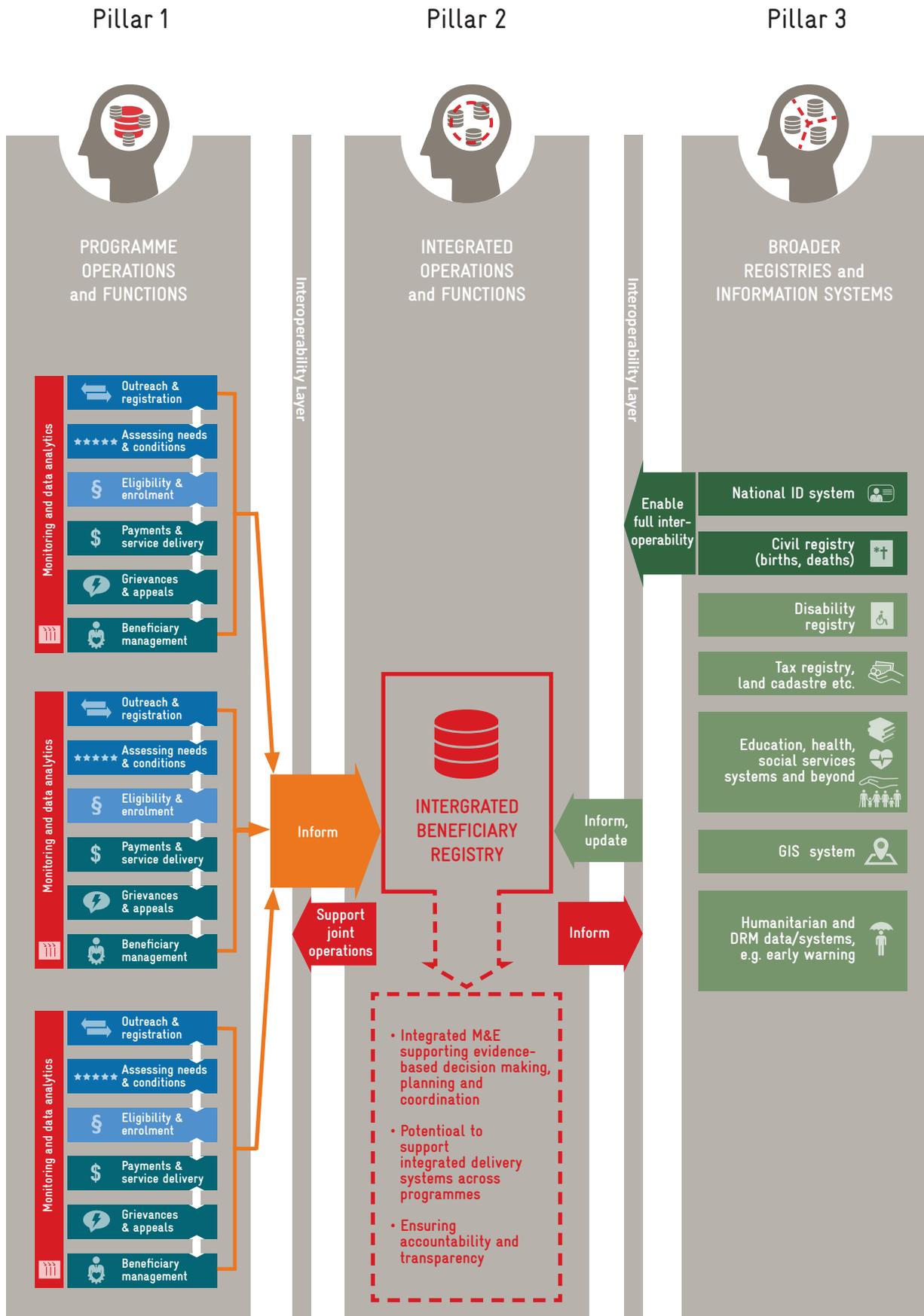


Figure 7: Key components of an integrated beneficiary registry

Table 2: Objective	Measure of success
<p><b>1.</b> Provide reliable information for evidence-based decision making, planning and coordination across the sector</p> <p><b>a.</b> Improve validation of potential beneficiaries, to address error and fraud</p> <p><b>b.</b> Improve management of beneficiary enrolment against agreed targets</p> <p><b>c.</b> Identify and manage overlaps and gaps across existing programmes, strengthening coordination</p> <p><b>d.</b> Assess the effectiveness, impact and sustainability of social protection intervention</p>	<ul style="list-style-type: none"> <li>• Consolidate data across relevant interventions to provide an overview of who is receiving what and when</li> <li>• Deliver comprehensive reporting and analytics – across all relevant programmes – based on approved harmonised performance indicators set out in the country’s social protection M&amp;E framework and annual targets</li> <li>• In contexts with no social registry, consolidate validation of potential beneficiaries against the relevant national ID/civil registry</li> <li>• Provide analytical reports that compare enrolled beneficiaries with planned expansion plans across multiple programmes</li> <li>• Deliver dashboards that compare beneficiaries enrolled against geographical quotas, where relevant across multiple programmes</li> <li>• Produce reports on beneficiaries receiving multiple benefits (in countries where ‘double dipping’ is not allowed, these can be used to address fraud)</li> <li>• Enable linkages (e.g. layering, sequencing) between benefits and services for beneficiaries, to ensure universal coverage of needs</li> <li>• Enable transition of beneficiaries across schemes where appropriate</li> <li>• Provide consolidated information on social protection interventions and their beneficiaries (supply of social protection), to be used for system strengthening and research</li> </ul>
<p><b>2.</b> Enable integrated delivery systems across programmes</p>	<ul style="list-style-type: none"> <li>• Provide a platform for the joint management of selected delivery system functions across programmes (where relevant and feasible)</li> </ul>
<p><b>3.</b> Increase accountability and transparency</p>	<ul style="list-style-type: none"> <li>• Provide a public reporting interface, commonly referred to as a dashboard, which provides a summary of statistics on beneficiaries, disbursements and complaints</li> </ul>

### Associated risks and drawbacks

- The accuracy of data in an integrated beneficiary registry is dependent on the data quality and functionality of the underlying social protection programmes and their MISs.
- The timeliness of data in the integrated beneficiary registry will also depend on the accurate and timely updating of programme MISs and effective data sharing mechanisms (e.g. real time).
- More broadly, the cooperation of different stakeholders across a number of ministries will be critical, especially in scenarios where automatic data exporting may not be feasible

Table 2: Objectives, measures of success, risks and drawbacks of an integrated beneficiary registry

**Box 3.**

### Kenya's Enhanced Single Registry for social protection

Based on the National Social Protection Policy, Kenya's Single Registry is an integrated beneficiary registry that enables the Government of Kenya to link the MISs of five social protection schemes – the Old Age Grant, Disability Benefit, Orphans and Vulnerable Children's Cash Transfer, Hunger Safety Net Programme, and World Food Programme's Cash for Assets – creating a consolidated warehouse of 1.3 million beneficiary households or 6.5 million persons out of population of 40 million (16% of the population). The Single Registry also stores non-beneficiary data from the Hunger Safety Net Programme and other social protection schemes. Furthermore, the Single Registry is linked to the National Registration database, so that programme beneficiaries can be clearly identified by their national ID number.

The Single Registry enables the National Social Protection Secretariat, based in the Ministry of Labour and Social Protection, to access information on all households receiving social protection. This enables them to monitor beneficiaries enrolled against the government's expansion plan for the national social security system, the number and type of programme each household is benefiting from, the accuracy of beneficiary details, timelines of payments, complaints resolved within established time frames, and consolidated programme costs. Importantly, the Single Registry can capture information on schemes that are designed very differently, including the use of distinct selection mechanisms.

Currently, the 'Enhanced Single Registry' is being upgraded with the following components: development of a social registry module for the harmonised registration of targeted social assistance schemes; development of a complementarity module to support automated data sharing and a feedback mechanism; upgrading of the Single Registry dashboards to include other social protection thematic areas, the revised social protection policy, and revised monitoring and evaluation indicators; development of a generic county social protection MIS; and development of automated linkages to other social protection sectors.

Source: Adapted from Chirchir (2016a), Barca (2017); see also Webinar: Kenya's Single Registry – A tool for planning, coordination and monitoring



## Payments & service delivery

### Payments gateway or platform

A payments 'gateway' or 'platform' integrates the approach to payments across several programmes, while also potentially supporting payments across several channels (e.g. more than one bank, as well as other financial service providers). In some cases, these may build upon broader platforms for government to person (G2P) payments adopted by other sectors. An example of a payments gateway is described in Box 4.

Given that multiple programmes sometimes deliver payments in the same location – and at times to the

same beneficiaries – the opportunity to share resources and approaches for payment delivery across the sector offers considerable cost savings and coordination benefits. Moreover, integration offers the opportunity to address the challenges faced by programme payment mechanisms, including lack of choice among beneficiaries, delays in the delivery of payments, authentication of beneficiaries, and low accessibility of payment services in rural and remote areas.

#### Box 4

### Malawi's NAT-Switch Payments Gateway

Malawi's National Switch, commissioned in 2015, supports an integrated technology framework with a set of rules and standards to enable the interoperability of banks and financial management systems in Malawi, specifically the leveraging of digital payment systems. The system is largely funded by the World Bank and formalised by the Reserve Bank of Malawi. The Reserve Bank also regulates and provides oversight of NAT-Switch. NAT-Switch seeks to engage social and micro finance institutions, including mobile money service providers, to integrate into the switch and is currently working with mobile money operators.

Source: Farooq (2017)



## Grievances & appeals

### Grievance and appeals platform

A grievance and appeals (complaints management) platform provides a digital interface to capture, process and resolve feedback, complaints and appeals. It is open for all members of the public, across several programmes. In some cases, these may build upon broader, whole-of-government grievance systems.

In detail, a centralised complaints management system can provide an interface to capture complaints independently from the relevant social protection programme or add the complaint record if recorded elsewhere. The complaints management system would then integrate with the relevant complaints handler (such as the specific programme) or receive updates on action taken,

status, and resolution date. Some countries have developed a national complaints service or platform responsible for handling complaints in order to ensure that all citizens are able to gain access to and enforce national standards (e.g. Uzbekistan's Pension Fund MIS, Box 1). In the absence of such a national platform, a centralised complaints management system for the social protection sector would ensure the provision of consistent and equitable services for beneficiaries of programmes. A social protection sector-wide complaints system also enables the capturing of complaints not attributed to a particular social protection programme, such as complaints related to household data collection by government field staff for targeting purposes.



## Beneficiary management

### Beneficiary management platform

A beneficiary management platform<sup>11</sup> provides a series of functions that cut across programmes and sectors. Depending on a country's needs and priorities, it may be designed to encompass the recurring cycle of updating and verifying beneficiary information and progress, verify and track compliance with conditionalities

for conditional cash transfers (CCTs) and activation requirements in labour programmes, facilitate referrals across programmes, facilitate case management of complex needs, or support exit based on pre-established criteria such as death, among other things.

<sup>11</sup>Note this wording is used to consolidate a broad set of functions into one overarching term. Some actors would refer to this as 'case management' in its broadest sense.

## Pillar 3: Broader registries and information systems

Within this ecosystem, the linkage to a broader set of registries and their related information systems – via a two-way flow of information – can play an important role in achieving intended outcomes (inclusion, efficiency etc., as discussed in Chapter 1). These may sometimes be run by the social protection sector directly, but are most often managed by other sectors and stakeholders externally, increasing coordination challenges and the potential for data politics.

As illustrated in Pillar 3 of Figure 4, these principally consist of core registries such as CRVS systems, national ID registries, disability registries and income tax/land cadastre registries. Other relevant registries and information systems include those from health, education and social services; geographic information systems (GISs); and humanitarian and DRM data/systems (e.g. early warning systems). The following section provides a description of these registries and information systems.

### Civil registration and vital statistics systems and national ID registries

CRVS systems and national ID registries are two related information systems and perhaps the most useful registries that can be linked to social protection registries and programme MISs in any country. CRVS systems store vital information across the life cycle of the country's citizens and residents. Their data can be used to pre-populate, verify, validate, and update information on life events (e.g. births, deaths, marriages, etc.) to be used for the delivery of social protection. As an example, birth certificates serve as an important identification document during registration of target populations for any social protection programme. For programmes with eligibility criteria related to age (e.g. child benefits or old age pensions), birth certificates enable beneficiaries to prove their eligibility (ISPAP, 2016) and could even be used to automatically trigger

registration (prior to enrolment). Similarly, digitised death certificates can be very useful for any programme, especially pensions, because they help to verify deceased beneficiaries (e.g. as in South Africa).

National ID registries keep identification records, usually for the adult population. Foundational ID systems<sup>12</sup> can support the identification and authentication of individuals and the authorisation of payments, with potential benefits in terms of interoperability between registries (via a truly unique identifier), as well as the reduction of error and fraud (ISPAP, 2016; Barca, 2017).

Overall, there is a strong link between CRVS systems and national ID registries, although they perform different functions. For example, civil registration documents such as birth certificates are often the basis for issuing foundational IDs. In terms of data, most CRVS systems and national ID registries keep essential information such as the name, date of birth, and address of individuals, as well as the names and dates of birth of their parents/guardians. They usually allocate a unique identifier, which is typically assigned immediately when data is collected from the individual or once the dataset is entered into the database. For CRVS systems, data collection is mostly done on an on-demand basis in health facilities or through other designated single windows. For national ID registries, whether foundational or functional, data is usually initially collected by census and then updated on-demand.

The typical objectives and measures of success of CRVS systems and national ID systems – with respect to social protection – are set out in Table 3 (Page 31). An example of a national ID registry is India's Aadhaar's registry, which is described in Box 5 (Page 33).

<sup>12</sup>There are two forms of national IDs: functional IDs, which are created to serve the function of a specific programme (such as IDs created by a social registry for each registered household member) and foundational IDs, which are created for the entire population (Gelb & Clark, 2013). The decision to go with a functional ID (as in Brazil) or a foundational ID (as in Thailand and Mauritius) is a political rather than a technical one – and is not in any way social protection specific (ISPAP, 2016).

Table 3: Objective	Measure of success
<b>National ID systems<sup>13</sup></b>	
<p><b>1.</b> Provide inclusive, reliable and accurate identification, authentication and authorisation services for social protection applicants and beneficiaries</p>	<ul style="list-style-type: none"> <li>• Access barriers for social protection applicants are reduced (enhanced access to IDs can support inclusion in social sector schemes where these are a formal requirement for eligibility)</li> <li>• Registration and enrolment data quality is enhanced through cross-checks, validation and de-duplication (where relevant)</li> <li>• Beneficiaries are authenticated at paypoint and authorised by payment service provider, reducing potential for fraud and corruption</li> <li>• Access to financial services enhanced as 'Know Your Customer' requirements fulfilled</li> <li>• Trusted unique identifier enables interoperability, increasing potential for a wide variety of functions (e.g. using other government databases as data sources, M&amp;E and transition of beneficiaries across programmes, better planning and budgeting, etc.)</li> <li>• Depending on legal framework, enhanced portability of benefits, internally and potentially across countries</li> </ul>
<p><b>2.</b> National ID systems are strengthened and made more inclusive</p>	<ul style="list-style-type: none"> <li>• Linkage of ID system with social protection system acts as an 'incentive' for registration of hardest-to-reach and most vulnerable households and individuals, helping to address the 'identification gap' (with long-term impacts)</li> </ul>
<p><b>3.</b> Facilitate an audit trail down to the recipient of social protection, thus increasing transparency and accountability while reducing programme leakages</p>	<p>Enables (also discussed above):</p> <ul style="list-style-type: none"> <li>• De-duplication: a check to ensure that no person is entered in the relevant social protection database more than once<sup>14</sup></li> <li>• Removal of ghost (people whose identity does not exist and has never existed) and quasi-ghost beneficiaries (people who exist, but whose identity is used fraudulently by others in a context where there is no way of ensuring authentication)</li> </ul>

Table 3: Objectives and measures of success of a CRVS or national ID system

<sup>13</sup>Note that many of these benefits can only be reaped when a national identity is truly unique, digital and universal (i.e. covering 100% of the population).  
<sup>14</sup>"Given social protection is often targeted at households and not individuals, true de-duplication would involve a check on any household member who has indirectly contributed to that household being deemed eligible or receiving a higher benefit level (e.g. where the criteria involves a dependency ratio, households may have an incentive to include additional members)", however, this data is often not collected or stored (Barca & Makin, 2018).

Table 3: Objective	Measure of success
<b>CRVS systems</b>	
<p>4. Provide inclusive, reliable and accurate data to support the management of social protection applicants and beneficiaries</p>	<ul style="list-style-type: none"> <li>• Access barriers for social protection applicants are reduced (enhanced access to CRVS can support inclusion in social sector schemes where these are a formal requirement for eligibility)</li> <li>• A reliable basis for identification and authentication functions is provided</li> </ul>
<p>5. Enhance responsiveness to life cycle risks</p>	<ul style="list-style-type: none"> <li>• Planning and programming improved (e.g. programmes triggered to respond to life-cycle risks: e.g. health centre notifies when woman is pregnant and registration for a maternal health programme is triggered while child is in-utero; civil registry notifies when child has completed birth registration or adult has reached their pension age to trigger a benefit, etc.)</li> </ul>
<p>6. Support increased transparency, accountability and reduction of fraud</p>	<ul style="list-style-type: none"> <li>• Identification and authentication functions supported</li> <li>• De-registration via death registration (potentially also migration) triggered</li> </ul>
<b>Associated risks and drawbacks</b>	
<p>Linkage of social protection systems to ID and CRVS systems can:</p> <ul style="list-style-type: none"> <li>• Lead to the profiling of populations and exacerbate exclusion from social sector schemes where national ID and CRVS systems are not themselves inclusive (which is often the case in contexts where an explicit effort has not been undertaken to address significant uptake barriers faced by the poorest, marginalised and most vulnerable)</li> <li>• Lead to significant privacy concerns and potential for misuse of data, especially when IDs are used as a unique identifier to enable interoperability across government (and sometimes external databases) and where biometric technology is used</li> <li>• Exacerbate rather than address corruption and enable the adoption of proprietary and expensive technologies that do not fully address the needs of sectoral users</li> </ul>	

Table 3 (cont.): \_\_\_\_\_  
Objectives and measures of success of a CRVS or national ID system

## Box 5

## India's Aadhaar registry

An Aadhaar number is a 12-digit random number issued by the Unique Identification Authority of India (UIDAI), a statutory authority established in 2009 within the Ministry of Electronics and Information Technology. According to rules, residents of India who voluntarily apply and meet set criteria are issued with an Aadhaar number. The key requirement is provision of minimal demographic information by the applicant during the enrolment process (name, date of birth or age, gender, address, mobile number [optional] and email address [optional]) as well as biometric information (ten fingerprints, two iris scans, and a facial photograph).

By 2017, more than 1.14 billion people had been issued with an Aadhaar number, making it the largest digital identity programme implemented by a national government in the world. In terms of usage, Aadhaar had authenticated 139 million people and 44.7 million accounts had been opened using Aadhaar's e-KYC (Electronic Know Your Customer) service, making it an integral financial inclusion instrument in India. The key services provided by UIDAI in support of Aadhaar include verification of the Aadhaar number, verification of email/mobile number, locking/unlocking of biometrics, linkage of Aadhaar and bank account status, and provision of Aadhaar authentication history.

In the context of social protection, Aadhaar is being used across programmes in India to enable Direct Benefit Transfers (transfers directly to beneficiaries' bank accounts) and to authenticate and authorise the payment of transfers to beneficiaries. Nevertheless, the first years of implementation came with several challenges in terms of beneficiaries failing to authenticate their identity biometrically – and, therefore, receive their entitlement (often because of worn out fingertips and other technical challenges such as lack of connectivity). These issues and broader concerns have led to widespread societal backlash against Aadhaar, including:

- Critiques of the data privacy protection provided by law, as well as in the technical architecture and safeguards for Aadhaar (especially following a set of data breaches)
- Critiques of the extent to which citizen's consent for Aadhaar is truly informed and free (a recent Supreme Court ruling has upheld Aadhaar as constitutionally valid, yet limited its compulsory use for many services including social protection)

Source: Abraham *et al.* (2017); Barca & Makin (2018)

## Disability registry

To coordinate disability issues, many countries have established dedicated institutions responsible for the registration and assessment of persons with disabilities (PWDs). Data from the disability registry could use-fully be linked to social protection programmes, and vice versa, to mainstream support to PWDs.

Disability is a cross-cutting social protection issue. For instance, in some countries, PWDs are provided with disability grants, while in others, such as Zambia, top up allowances are provided. To arrive at the ideal scenario, where eligibility for different benefits, including benefits related to disability, can be consolidated and transferred at once to the respective beneficiaries, the integration of social protection registries and disability registries is key. But, this comes with specific technical implications. For instance, if disability registries and social or integrated beneficiary registries are kept separate, they must assign the same unique identifier to a particular individual. Conversely, a disability registry could be fully integrated into a social registry and the assessment of disability could be part of the normal social registry enumeration process.

Disability registries maintain essential information on each individual PWD, including disability ID, name, national ID number, sex, physical address, level of education, date of birth, marital status, occupation, contact phone number, skill level, nature and type of disability,

and next of kin. Most of the disability registry data is collected on demand through offices (single windows) of the disability agencies. The data collection exercise usually entails a two-stage process: applicants are registered at the disability agency office followed by a medical assessment to determine the nature and type of their disability. In terms of linkages, there are two ways of populating the disability registry: The first is primary data collection by disability agencies. After data is collected in this way, a link can then be established with social protection programme MISs, social registries or integrated beneficiary registries, depending on the chosen integration approach in a country. The second way is to collect disability data through social protection agencies. In this approach, the social protection programmes or social registries collect data on disability (mainly type and nature of disability). This data, if standardised, especially in terms of the disability classification and methodology of assessment, can be shared with the disability registry.

The typical objectives and measures of success of linking disability registries to social protection information systems are set out in Table 4 (Page 35). An example of a disability registry is Zambia's Disability Management Information System, as described in Box 6 (Page 36).

Table 4: Objective	Measure of success
<p>1. Provide comprehensive, high quality and up-to-date information on PWDs to support social protection delivery</p>	<ul style="list-style-type: none"> <li>• Trusted classification of PWDs for use by external actors</li> <li>• Registration and enrolment of PWDs simplified, standardised and streamlined</li> <li>• Transfers to eligible individuals/households increased</li> <li>• M&amp;E dashboards and reports on PWDs and the types of services they are accessing provided</li> <li>• Data used to plan new or improve existing policies for PWDs</li> <li>• Better linking of PWDs to complementary services, alongside social protection</li> </ul>
<h3>Associated risks and drawbacks</h3>	
<ul style="list-style-type: none"> <li>• <b>Single entry point:</b> Like social registries, a disability registry creates one entry point. If policies are in place to only provide services to registered PWDs, then unregistered PWDs could be excluded. However, this issue can be resolved by establishing a functional on-demand registration mechanism for PWDs that is accessible across the country. Of course, the issue of disability assessment is complex. It entails establishing a standardised procedure for assessing the degree of disability, which is undertaken using two main approaches, each with pros and cons: (i) functional assessment using the Washington Group assessment methodology<sup>15</sup> and (ii) medical assessment.</li> <li>• <b>Stigmatisation:</b> Depending on the degree of acceptance of PWDs in society, individuals may be hesitant to use on-demand registration points for assessment of disability and to establish eligibility for benefits.</li> <li>• <b>Data protection:</b> As is true for social registries, data stored in disability registries is highly sensitive. Key issues that should be addressed include data collection and protection mechanisms and procedures for granting data access.</li> </ul>	

Table 4: Objectives and measures of success of a disability registry

<sup>15</sup>See <http://www.washingtongroup-disability.com/washington-group-question-sets/short-set-of-disability-questions/>

## Box 6

## Zambia's Disability Management Information System

In 2015, the Zambia Agency of Persons with Disabilities (ZAPD) developed the Disability Management Information System (DMIS) to ensure that an updated list of persons with disabilities is maintained and managed in Zambia, as mandated by the Persons with Disabilities Act of 2012. With the help of an IT specialist from the Ministry of Community Development and Social Welfare, ZAPD identified the key functional requirements of the system, which were the basis for the development of a web-based DMIS that enables registration of PWDs across the country. The DMIS supports the registration of PWDs, assessment of their disability status at a health facility, production of a disability card, referral of PWDs to service providers and production of reports.

Source: Adapted from Chirchir (2016c)

## Income/tax and land cadastre registries

Especially where programmes are means tested, data from tax registries, land cadastres, and car registration agencies etc. can be linked to social protection data to aid the assessment and verification of self-reported information for assessing the needs and conditions of potential beneficiaries, supporting the prevention of error and fraud. Many middle-income countries use means testing to assess a family's financial status to qualify for social protection programmes. This process entails validation of the economic condition of the applicant using income databases. In a country where there is a unique ID and an electronic income tax registry, the applicant's income could be verified against that on the income tax registry. For example, in Uzbekistan, the integrated social allowances MIS automatically determines the level of eligibility of applicants by comparing verified income against a configurable national minimum income threshold. Similarly, in South Africa, the Social Security Agency runs cross checks of its recipients against the South Africa Revenue System database to validate income levels, an important proxy for means testing.

Income tax registries maintain essential information on each individual's tax information, such as a personal identification number (PIN), national ID number, name, tax category, date of registration, occupation, address and income tax obligation. The income tax registry data is primarily collected in two ways: through submission by employers and through on-demand registration by eligible tax payers at single windows (online) or through the tax offices. In terms of linkages, there are typically two main links to the income tax registry: firstly, from the national ID registry to authenticate tax payers' details and, secondly, between social protection registries (an integrated beneficiary registry or social registry) to verify the income of the applicants for social protection programmes. Like social protection programmes, a tax registry should maintain accurate information for all tax payers.

An example of a programme MIS linked to an income tax registry is China's Dibao MIS, described in Box 7.

## Box 7

## China's Household Asset and Income Verification System

In order to manage its social assistance system, China's Ministry of Civil Affairs established the Dibao MIS and a verification system for income and property information based on a complete personal ID system. A computerised MIS has been established based on these two systems. Currently, a network of systems has been established in most regions of China, following the administrative structure of township, county (municipality), province and national level. A Household Asset and Income Verification System (HATVS) is used to check the applicant's information from relevant government administrations and commercial services, such as household registration administration (to check the family members), tax administration (to check income), vehicle administration (to check vehicle ownership), employment and social insurance administration (to check employment status and social insurance involvement), bank, commercial insurance and stock services (to check saving, insurance purchase and stock swapping).

Source: Adapted from Chirchir and Hongwei (2019)

## Education, health and social services systems

Serving the multi-dimensional needs of individuals and households is not something that can be achieved solely via the social protection sector. Data exchange with other social sector information systems can enhance overall coordination and planning, while also enabling practical benefits such as monitoring compliance of co-responsibilities (as in Turkey), pre-populating selected information (e.g. education status) and supporting the assessment of needs and conditions, as well as linkage with other sector schemes (e.g. scholarships, social health insurance).

As an example, an integrated social protection information system can be linked to case management systems underpinned by a strong social work system, which ensures the referral of social benefit applicants to additional complementary services, such as psychosocial support, health care, housing and education. It is also worth noting that where governments have functional social services, the role of social workers is to ensure that vulnerable populations access services, but do not duplicate functions that are delivered by other government departments such as health, education and housing. In that respect, social protection information systems provide a rich resource in terms of data for planning, especially between demand for services by vulnerable populations and supply by providers of social

services and benefits. Additionally, case management systems allow for targeted support to different categories of vulnerable people such as children, pregnant women, and PWDs, to ensure that other non-financial needs are met.

However, social work, health, housing and education sector information systems in many developing countries are predominantly manual. Data on key indicators is collected on paper at the sub-national level and consolidated into electronic national monitoring reports.

Except for a few higher-middle income countries, such as Chile, Uruguay and Turkey, most countries, therefore, do not have automated linkages between social protection information systems and health, social services and education systems. On one hand, information collected in an aggregated form (such as in an education MIS, social services MIS or health MIS) is often not of immediate use for the social protection sector. On the other hand, there are considerable ethical reasons for not linking social protection MISs to sensitive information systems from other sectors, especially health. The link between social protection MISs and broader social sector systems is exemplified by Uruguay's Integrated Information System for the Social Areas (SIAS), described in Box 8 (Page 38).

## Box 8

## Uruguay's Integrated Information System for the Social Areas

Uruguay has achieved remarkable poverty reduction outcomes through investment in social protection across life cycle programmes (medication subsidies, child grants, and near universal old age pensions). Its award-winning SIIAS is a comprehensive information system serving the social protection sector. Besides supporting social protection functions, SIIAS also has a high-level case management system, full panel statistical database and consolidates information for the social sector (education, health, labour, social security, and food subsidies). SIIAS contains information on 3.2 million beneficiaries (out of a population of 3.4 million) and is linked to 57 programmes from 16 public institutions.

Source: Adapted from Chirchir and Hongwei (2019); Hartmann (2016)

## GIS system

A GIS system is an information system that manages geospatial data on infrastructure, households, service providers, assets and so forth. A GIS system can help answer questions about the location of an object in three dimensions: longitude, latitude and elevation, which cannot be defined by two-dimensional systems (Ochieng, 2018). When overlaid with data from the social protection sector, it can support monitoring, coordination, planning and operations that are tailored to the needs of specific areas/locations. For instance, by overlaying beneficiaries and pay points, it is easy to determine the distances travelled by beneficiaries to each pay point and compare those to the established programme standards. Similarly, mainstream social protection programmes and complementary ones can be compared using the GIS coordination tool, to assess the spatial distribution of coverage across programmes. Other common uses include the identification/targeting of households in disaster prone or affected areas and the tailored planning of public works programmes to respond to local needs (rainfall, soil composition, etc.).

There are two ways to establish a GIS in the social protection landscape: either by integrating GIS directly into individual programme MISs, social registries or integrated beneficiary registries or by linking to a dedicated GIS tool (used by other sectors). Ideally, a social registry or a programme MIS could be designed to capture GIS as part of the data collection exercise. This GIS data would then be transferred to the programme MIS and integrated beneficiary registry.

Whatever the solution adopted, there are two datasets required to create a GIS tool serving the social protection sector: administrative data and social protection programme operational data. Both datasets must be standardised for ease of integration, which is essential for reporting and mapping functionality.

- GIS administrative data should primarily come from government statistical agencies and survey agencies. Examples of GIS administrative data include administrative units, health facilities, schools, transportation, water bodies and towns.
- Social protection programme GIS data can be collected during registration (i.e. during door-to-door census survey data collection or home visits). The social protection programme MISs and registries provide information to the GIS tool on key performance indicators, such as registered households, enrolled beneficiaries, paid beneficiaries and exited beneficiaries.

The typical objectives and measures of success of integrating GIS data into social protection information systems are set out in Table 5, noting that these vary from country to country.

GIS coordination tools have been successfully applied in the social protection sectors in India and Malawi. In India, the GIS coordination tool has enabled the world's largest rural public works programme, the Mahatma Gandhi National Rural Employment Guar-

antee Act (MGNREGA), to generate economic and ecological benefits, as well as increase synergies between climate change and social protection outcomes (Birdsall & Von Roenne, 2018). In Malawi, the GIS coordination tool, Kalozero, enables the geographic

representation of social protection data and aids in social protection decision-making processes (Farooq, 2017). The application of GIS in MGNREGA is described in Box 9 (Page 40).

Table 5: Objective	Measure of success
<p><b>1.</b> Better and spatial M&amp;E and reporting: mapping is a powerful way of translating data into meaningful information understood by many users</p>	<ul style="list-style-type: none"> <li>• Availability of single point of reference for geo-spatial information across social protection</li> <li>• Innovative and interactive mapping interfaces that make data interpretation more meaningful and intuitive</li> <li>• A technological solution that is scalable to integrate additional layers of geo-spatial information</li> </ul>
<p><b>2.</b> Better planning, monitoring and distribution of resources across social protection programmes: reliable information supports evidence-based decision making</p>	<ul style="list-style-type: none"> <li>• Better (visual and geo-spatial) understanding of:                             <ul style="list-style-type: none"> <li>- needs across locations with different characteristics (via registration data)</li> <li>- beneficiary coverage (via data on beneficiaries)</li> <li>- programme activities/services (e.g. registration points, paypoints etc.), resource distribution and capacity (e.g. number of staff)</li> </ul> </li> </ul> <p>These help to support: (i) spatially-tailored planning/design; (ii) spatially-tailored implementation (e.g. geographical and criteria-based decision making); and (iii) spatially-tailored M&amp;E.</p> <p>More generally, the potential to spatially overlay social protection data and external datasets (such as population, poverty indicators and other parameters) supports data-driven and evidence-based decision making.</p>
<p><b>3.</b> Greater accountability supported by transparent GIS data</p>	<ul style="list-style-type: none"> <li>• Overlays multiple indicators for comparison across regions</li> <li>• Filters and drills down capabilities for social protection indicators to support analysis and decision making</li> <li>• Supports data quality assessments (DQAs) by providing insights into the data</li> </ul>

Table 5: Objectives and measures of success of a disability registry

Table 5: Objective	Measure of success
<b>Associated risks and drawbacks</b>	
<ul style="list-style-type: none"> <li>• Because of the complexity of the data structures captured or recorded in a GIS, it may be difficult to analyse some data leading to incomplete information.</li> <li>• There are many GIS technology tools with varying capabilities. The GIS tool used must be customised to the needs of the social protection system to maximise its analytical capability.</li> <li>• Because the GIS tool consolidates data from different sources across different departments, there is a need to maintain standards to achieve data accuracy.</li> </ul>	

Table 5 (cont.): Objectives and measures of success of a disability registry

Box 9

GIS usage by the Mahatma Gandhi National Rural Employment Guarantee Act

Established in 2005, MGNREGA aims to improve the rural infrastructure, augment land and water resources, and strengthen the livelihood resource base of the rural poor by providing a minimum guarantee of one hundred days of wage employment in a financial year to every household whose adult members are willing to do unskilled manual work. To coordinate its activities, MGNREGA has designed and deployed innovative technology that integrates remote sensing and GIS. A GIS coordination tool supports integrated natural resource management planning by local councils (Gram Panchayats) to take decisions about implementing activities that are part of MGNREGA. In terms of outcomes, GIS has led to improvements in decision making, for instance, by providing access to technology such as computer modelling, the GIS tool helps MGNREGA to design more durable assets that factor in local conditions such as rainfall, soil quality and landscape characteristics.

Source: Steinbach (2016)

## Humanitarian and DRM data/systems (e.g. early warning systems)

The humanitarian and DRM sectors often collect and manage information that can be usefully linked to the social protection sector. Important examples include: data from early warning systems (EWSs), which can be used to trigger responses to shocks via the social protection sector, and data from past humanitarian responses (e.g. vulnerability assessments), which can be used to feed data into existing social protection registries. The

opposite flow of information may also be relevant, with humanitarians potentially piggybacking on social protection data to support the expansion of routine social protection caseloads in response to covariate shocks. While a full account on this topic can be found in Barca and Beazley (2019), Box 10 provides an example of an early warning system serving Kenya's Hunger Safety Net Programme (HSNP).

## Box 10

## EWS as a trigger for social assistance for Kenya's HSNP

The HSNP routinely transfers cash to approximately 100,000 poor households in the arid and semi-arid drylands of northern Kenya. However, the programme differs from many others as it has also registered almost all other households in the four participating counties – nearly 300,000 – and pre-enrolled them, giving them bank accounts and programme cards. These households do not receive routine transfers, but some are eligible to receive ad hoc payments from HSNP in a drought, as measured using a vegetation condition index that automatically triggers the cash transfer. The index uses remotely sensed satellite data that indicate, at certain pre-agreed levels, a 'severe' risk of drought, in which case affected sub-counties are allocated resources sufficient to cover 50% of their population, or an 'extreme' risk of drought, where the additional allocation permits scaling up to 75%. The emergency payment was first triggered in April 2015. An internal review noted that it was generally successful, with transfers being disbursed to 90,000 temporary beneficiary households within just two weeks of being triggered, and that the use of the vegetation condition index was justified. The emergency payments have been released several times since then, from 2015 to 2017.

While this is an internationally recognised example of the benefits of linking EWS to social protection, it should be noted that it was developed for a recurrent, slow-onset shock, where the investment required for such an approach (e.g. pre-enrollment of all households) is leveraged – and justified in terms of enabling early action – over time.

Source: Barca and Beazley (2018)

## A note on information flows

It is important to stress that as important as each individual 'piece of the puzzle' discussed above is are the information flows between these (represented as arrows in Figure 4). These flows could be achieved via full interoperability: the ability of a system to share information with other independent systems using common standards and unique identifiers. However, this is not only a technical challenge, but one that requires ex-ante alignment of legislature, organisational business processes and semantics (joint definitions and interpretations) – a journey that several countries around the world are embarking on in the context of a broader vision for e-government. There are also ad-hoc options for data exchange that are widely adopted (the simplest being periodic exchange of files via email, CD, or other means and algorithmic matching of individuals), each presenting significant challenges.

Whatever the approach to data exchange, it is worth keeping the following in mind:

- Focusing on the information needs of each user, via joint planning and prioritisation: This should be

done while also ensuring that the amount collected and shared is the minimum necessary to meet clearly defined and articulated purposes – alongside broader protections to ensure data privacy.

- Focusing on information flows in all directions: This means horizontally within the sector and beyond, as well as vertically across all levels of administration. As an example, information flows from social protection registries to other sectors can support planning and programming that better caters to the needs of the population. On the other hand, information flows from other sectors can support the pre-population of data, triggering of events, and validation of data collected, etc.
- Building a common 'infrastructure' and language: This can be built upon over time and will include developing clear (and ideally open) data standards and common requirements, as is increasingly being achieved within the health sector.

# 4



## Challenges and risks

Developing coordinated programmes and integrated information systems to support these poses significant technical and coordination challenges, which increase the complexities and costs of ICT projects and hinders the achievement of such initiatives (Ruggia-Frick, 2016). Moreover, given that technology is a means to an end, the desire to establish an integrated information system for the social protection sector must be carefully weighed against emerging threats to social protection applicants and beneficiaries, such as violations of privacy, unauthorised data sharing, covert surveillance and social control. Additionally, platforms supporting social protection information systems can be hacked or scammed (Sepúlveda Carmona, 2018).

This section presents the challenges of developing an information system that successfully delivers against intended outcomes (see Chapter 1), as well as the risks and issues that need to be considered and mitigated when establishing such a system. More broadly, it is important to stress that any design choice should be supplemented by a scoping/feasibility study and needs assessment to clearly define: whether the country needs an integrated system; the approach to be used to establish such a system; and the contextual requirements and risk mitigation strategies for the system.

## Key challenges

### Complexity and costs

The complexity of designing and iteratively implementing a digital and integrated information system that fully responds to the – changing – needs of users at all levels of administration, while also placing people at the centre, is often under-estimated. The time and cost, not only for set-up, but also for take-up, maintenance and continuous adaptation, needs to be addressed. Ultimately, the cost for people to access and use the system needs to be minimal, and the benefits tangible to all: this is not easy to guarantee in contexts with little prior experience with digital systems. If not, the risk is failure (the new system is not used, or worse, creates a significant setback). For instance, an ICT project for the United Kingdom’s National Health Service was eventually abandoned in 2011 after a staggering GBP 10 billion had been spent (ISSA, 2012).

### Coordination and data politics

Information is power and a digital and integrated information system working across the social protection sector and beyond concentrates that power, leading to coordination challenges and data politics (e.g. unwillingness to share data and cooperate to achieve common objectives). Coordination issues are also exacerbated in a governance structure where each institution is autonomous and not obliged (e.g. legally) to cooperate with the others in terms of data sharing or use. An ‘infrastructural’ whole-of-government approach is required to remove these silos.

### Lack of critical capacity and risks to sustainability

In contexts where the required capacity is not housed in existing units, agencies or ministries, development and maintenance tasks can be contracted out to the private sector or supported by development partners (often tied to conditions). This can pose serious threats in terms of system ownership and longer-term sustainability, especially in contexts where social protection business processes are nascent and evolving.

## Starting ‘too big’

Delivery systems and social policies evolve over time, evolution is not linear, and starting points matter. Investments and efforts to develop simple, but well-designed, systems – based on a clear assessment of the status quo and future needs – are essential before adding other features. The risk, again, is failure. Whereas high income countries often have well-established social protection processes, some underpinned by legal mechanisms, this is not the case in many low and middle-income countries. In fact, social protection programmes in many developing countries require a significant strengthening of business processes, financial management, and monitoring and evaluation systems to build a fully-operational information system serving the sector. Although nascent and evolving business requirements can make it easy to build an information system ‘from scratch’, as there are fewer legacy system challenges, the rapid evolution of business processes makes the entire design challenging from technological, governance and change management perspectives.

## Lack of broader infrastructure

Telecommunication links are often unreliable in many rural areas, a factor that hampers the capacity to fully operate an online information system. For instance, a number of social protection programmes still transport paper from their districts to the national level for data processing. Although many software applications can operate in offline mode, there has been greater demand in the recent past for real-time data capture, analysis and reporting. So, telecommunication infrastructure is a key issue and, if unresolved, can lead to inefficiencies and delays in decision making. Countries such as Malaysia have addressed this by strengthening their broadband network concurrently with their social protection information system (Barca, 2017).

## Key risks

### Data privacy and security

The right to privacy is a fundamental human right, enshrined in Article 12 of the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights (ICCPR), and ILO’s Social Protection Floors Recommendation 2012 (No. 202)<sup>16</sup>, as well as the constitutions of most countries. Yet the digitisation of information and integration across multiple sources can expose data subjects to multiple risks (such as hacking, data loss, misuse; see Barca, 2017 and Sepulveda Carmona, 2018 for details). For example, there have been several recent examples of unauthorised data handling and access to ID/social sector databases (Barca & Makin, 2018).

### Systematic exclusion and automated profiling

Digitising approaches to data collection, processing and citizen interfaces (e.g. a digital payment system) can introduce new and different risks of exclusion compared to ‘traditional’ approaches. When linked to systems for the automated profiling of individuals and households, based on information that may be incomplete or unverified, these risks can be exacerbated – unless explicitly addressed. This is especially the case in contexts where registration and the assessment of needs and conditions is integrated across programmes and diverse regions, generating the risk of multiple and systematic exclusion across all social sector schemes. This stresses the need for a strong focus on data quality, as well as easily accessible grievance mechanisms. Recently, European governments have endorsed the General Data Protection Regulation, which states, in Article 22, that: “The data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her” (European Parliament,

<sup>16</sup>This explicitly calls on states to “establish a legal framework to secure and protect private individual information in their social security data systems” (paragraph 23).

2016). While this applies only to European Union countries, the principles should be taken into account in the development of an information system for the social protection sector and appropriate safeguards should be put in place. Furthermore, it is not known yet whether this legislation may affect European donors supporting the implementation of information systems in developing countries.

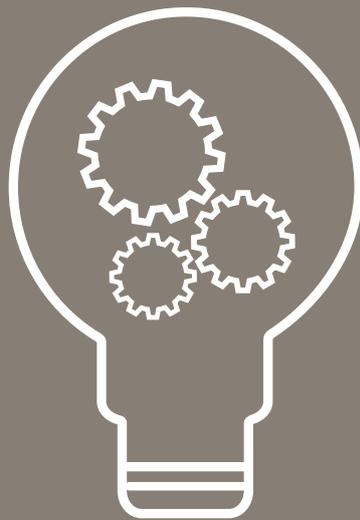
## Digital austerity

Another risk is that the information system will be used to effect “reductions in the overall welfare budget, a narrowing of the beneficiary pool, the elimination of some services, the introduction of demanding and intrusive forms of conditionality, the pursuit of behavioural modification goals, the imposition of stronger sanctions regimes” (Alston, 2019).

## Loss of human interaction

There is a risk of “eliminating human interaction and compassion [which] are likely to be indispensable components in providing at least some welfare recipients with the care and assistance they need” (Alston, 2019). The consequences of this are eloquently reported in *Automating Inequality* (Eubanks, 2018).

# 5



Conclusion:  
Critical design and  
implementation choices

The aspects discussed in the chapters above do not illustrate the full scale of the variability of design and implementation choices across countries, which ultimately affect the performance of the social protection information system as a whole. These choices vary over time, depending on a country's starting point, and evolving constraints and opportunities. This chapter briefly touches on some of the most critical questions that can be used to assess the potential performance of any system against its desired objectives.

### What functions and data flows are prioritised and how do these design choices ultimately respond to the needs of users?

For example:

- Is digitisation only at the programme level, via 'programme MISs', focused on programme-specific delivery functions?
- Is there a focus on the integration of the 'gateway' functions of registration and assessment of needs and conditions via a social registry?
- Is there a focus on the integration of data across programmes to enhance oversight and accountability, while enabling common delivery systems across programmes (via integrated beneficiary registries)?
- Is there a focus on integration beyond the social protection sector, to enhance whole-of-government efforts and a people-centred approach?

### What outreach and intake strategy is used and how is data kept up-to-date?

The use of census survey approaches or 'on demand' approaches, or a strategic combination of these, for the registration of new applicants, can lead to very different outcomes and have implications for the updating of information in the future. 'Touchpoints' for the updating of data via digital interfaces (e.g. a website or app) and data exchange can also play an important role.

### What % of the population is covered?

The percentage of the population covered within the information system can vary from less than 5% to almost 100% of the population (depending on the policies and programme design choices), with obvious implications – especially if the data is used to support the selection of beneficiaries.

### Whose data is collected and stored and how is the potential for exclusion explicitly addressed?

Depending on the approach to data collection, validation and updating – as well as programme specific qualifying conditions (e.g. citizenship requirements) and eligibility criteria – certain categories of individuals and households may be systematically excluded if strategies are not in place to address this. Again, this has important implications if the data is used to support the selection of beneficiaries.

### How is data verified, validated and stored?

Data quality and overall trust in the information generated can vary significantly and are core to the system's success.

### What data is collected and stored?

Depending on the user programmes and broader use-cases, very different variables might be collected and stored.

## How is data used for monitoring and evaluation, management, accountability, knowledge generation and evidence-based policy making?

Digitised data is not useful per se, but only if systematically transformed into information and used to improve programme design and implementation – yet many countries lack the data analytics capacity to reap potential benefits.

## Interoperability and data sharing – where is data flowing to and from and how is that operationalised?

This depends on the nature of the unique identifier used, data sharing architecture selected and approaches to data standardisation adopted, among other (political and institutional) aspects.

## How is data privacy and security guaranteed?

This depends on the legislation and implementation of privacy by design principles.

Overall, this paper has illustrated that the development of an integrated social protection information system is at least as much a political process as it is a technical process. While choices on the aspects discussed in the paper will vary according to the country, visionary government leadership, that is also consultative across stakeholders, emerges as a good practice when developing an integrated and digital social protection system.



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