



Challenges and solutions in monitoring & evaluating international development cooperation

Exploring the role of digital technologies and
innovation methodologies

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International aid money should be spent wisely. The number of people that are displaced is higher than ever and the world is not on track to reach the Sustainable Development Goals. At the same time, budgets for international development cooperation are limited and the (inter)national urge for accountability of these budgets is increasing. This stresses the importance of efficient and effective spending of development cooperation budgets in general, and of monitoring and evaluation (M&E)¹ budgets in particular. We explore to what extent digital technologies, combined with a diligent application of innovation methodology, could prove to be of help to overcome these challenges.

Recently in the Netherlands, PwC surveyed M&E specialists within Dutch international development cooperation NGOs to understand their greatest challenges in monitoring and evaluation.

Below you will find the four main challenges identified. In the next pages we suggest solutions for each of these challenges.

Challenge indicated by NGOs in the Netherlands	Solution
<p>1. Lack of resources International development organisations and their M&E experts are faced with tight budgets. M&E departments are reporting a lack of resources to perform adequate data collection and analysis.</p>	 
<p>2. Lack of usable data M&E experts report a lack of usable data. When they are unable to collect sufficient data, it is very challenging to perform a proper analysis, draw usable conclusions and make data-driven suggestions to improve development programmes and interventions.</p>	
<p>3. Beneficiaries located in remote areas Sometimes aid beneficiaries are located in remote areas that are hard to reach, and are sometimes unsafe. Apart from dangers for staff and the difficulties reaching the areas, it is often also expensive to send personnel to perform M&E activities in these locations and to collect the necessary data with a frequency they require.</p>	
<p>4. Insufficient uptake of M&E results Most M&E projects and programmes favour after-the-fact evaluations over near-time or real-time monitoring. However, learning from evaluations is often a longstanding process. Much is to gain from shorter learning cycles and implementing lessons learned from monitoring directly into the development projects while they are still running.</p>	



Digital solution



Innovation methodology

¹ Monitoring is the regular collection of information about a project that enables organisations to create insight into the status of the project, allowing them to optimize the programs to achieve maximum efficiency and effectiveness. Evaluation, best conducted by an independent outsider, reviews the achievements (positive or negative, intended or unintended) at the end of a trajectory.

Challenge 1

Mitigating the lack of resources - by experimenting with the potential effective digital tools

M&E experts within NGOs in the Netherlands report a lack of resources to execute their work. Still, their efforts are key to ensure that resources for cooperation and aid are used in a way that maximizes their outcome and impact for beneficiaries. For the M&E budget, therefore, a focal question is: Can data collection and analysis be performed in a more efficient manner? It is often assumed that resource scarcity leaves little room for innovation in the way data is collected and analysed. The use of digital tools carries a perception of high costs and high uncertainty, which causes organisations to refrain from experimenting with them. However, experiments to find out which tools can positively impact daily monitoring and evaluation operations are key to reaching (cost) efficiency, effectiveness and reliability in the long run.



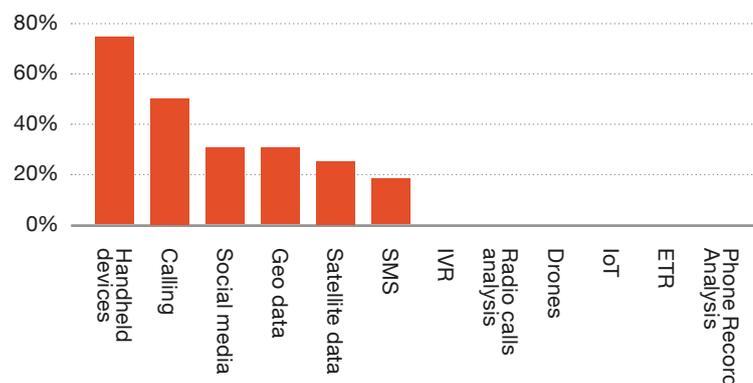
The untapped potential of digital tools for M&E

An example of an efficiency increase, in both data collection and data analysis, is a shift from using paper-based surveys to surveys on handheld devices. If possible for the targeted group of respondents, information can also be collected through SMS

texting, Whatsapp messaging, or online surveys. Many M&E experts have made this shift already. Nevertheless, many other digital solutions seem to remain unexplored. A survey we conducted among M&E experts presented them with digital tools for data collection and analysis. All surveyed experts admitted they don't use half of them. That this is not always a well-considered choice, can be derived from the fact that more than half of the respondents are not familiar with many of the tools mentioned, and thus have not explored whether they could be helpful. The tools that most respondents are unfamiliar with include Interactive Voice Response (IVR), Sensors connected to the Internet of Things (IoT), Phone Record Analysis, and Electronic Transaction Records (ETR) of for example cash based support programmes. There seems to be untapped potential. IVR for example, a tool with the capacity to gather large amounts of quantitative and qualitative data by interacting with mobile phone users through pre-recorded voice material, can improve the reach of data-collection efforts to less literate populations, and can generate great efficiency gains in data collection and analysis. To ensure inclusivity of beneficiaries who are less familiar with technology, researchers could supplement IVR with face-to-face surveys. Anonymized phone records can be used to understand refugee integration in a specific country and mobile network analysis can inform disaster response.

Exploring the potential of the tools that are not yet commonly used for M&E could increase the efficiency of their activities by reducing manual and administrative tasks for M&E experts. Respondents to the survey do recognize an awareness gap on the use of digital technologies in their work, and they jointly express their concerns for a lack of knowledge on how to best collect and analyse data (click [here](#) to learn more).

Figure 1 Digital tools used by respondents





A way to overcome the high cost/high uncertainty paradigm: starting small

The apparent hesitation to leverage the potential of digital tools may well stem from concerns about costs and uncertainty. What if one invests heavily in an unfamiliar digital technology and it turns out to be a big waste of money? Indeed, investing heavily in a tool that looks potentially beneficial and offloading it onto an organization will most probably not result in the desired effect. In addition, testing new technologies without knowing their effect on beneficiaries – which are often vulnerable populations – is an unacceptable risk. Yet, if you start with small experiments to uncover the potential for your organization, uncertainty decreases.²

It is important to innovate in a structured way. Small experiments—or as we like to call them: design sprints—are cheap, fast, and low-risk. Typically, sprints take only about two intensive weeks of work in which one (1) maps the problem in detail, (2) understands the exact problem, (3) searches for a solution, (4) prototypes, and (5) tests. When these short experiments prove either successful or not, swift action can be taken to adjust projects or redesign experiments, ultimately finding the right solution that fits the challenge. Only then—after a proof of concept has increased the certainty of success—there is a need to invest for organization-wide expansion (click [here](#) to learn more).



A human-centred design approach to increase the effective use of resources

Often the design of a development programme is laid out by headquarters' staff years before an intervention. This is especially troublesome when a new type of intervention is implemented or a new technology introduced. The likelihood of success increases when organizations adopt a human-centred design approach. Such an approach requires putting beneficiaries at the heart of the programme design process, and to achieve a thorough understanding of their needs and wants, e.g. through co-design workshops. Interaction with beneficiaries is often already ingrained in

international development organisations as they typically have a large local presence. However, this local presence should not only be used for the implementation of programmes. Local staff can also work directly with those who are experiencing the hardships the intervention aims to solve when designing and testing new interventions. It can bring a sense of dignity and empowerment to beneficiaries when seeing them as customers, and thus focusing on their preferences. Consequently, the chance of meeting actual, rather than perceived needs increases radically. A great example of this is the increased use of cash assistance programmes, which literally turn the program beneficiaries into customers.

M&E experts can play a crucial role in fostering a human-centred design approach by developing M&E frameworks that are not only based on impact creation (does the project deliver the benefit expected?), but that also include actual value creation (is this something beneficiaries want?). While the latter is an integral part of the criteria of 'relevance' as part of the DAC Criteria for Evaluating Development Assistance by the OECD, the emphasis of the evaluation is often on whether the activities and outputs of the programme are consistent with the intended impacts and effects.

In conclusion, small investments to explore the seemingly untapped potential of digital tools can be a game changer in how to deal with limited resources in the long run. Subsequently, to increase the success of these investments, beneficiaries should be put at the centre of the design.

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² To learn more about thinking big but starting small, the book *Lean Impact* by Ann Mei Chang discusses how to increase social good by applying innovation methodologies to a.o. nonprofits, social enterprises, government agencies and foundations.

Challenge 2

Overcoming the lack of usable data - by using additional types of data collection

Many respondents to our survey indicated that a lack of data is at least somewhat of a challenge for them. This is interesting because, for organisations in other sectors, it is currently often the abundance of data that complicates the creation of insights.

on digital media such as Twitter and Facebook and processing that into structured insights. Social media data can be classified geospatially and sentiments and keyword frequency can be analysed. UN Global Pulse has demonstrated the potential this has for international development and humanitarian action.³ For example, to understand the impact of the Every Woman Every Child Movement, evaluators searched Twitter for keywords to track spikes, trends and possible connections to real life events. PwC has used social media analysis for clients for example to find out in which cities in the Netherlands the discussion on migrants escalates negatively and why. This way of analysing sentiment can be highly relevant for cooperation and aid programmes.

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 3 See the website of UN Global pulse (<https://www.unglobal-pulse.org/projects>) for inspiring examples

Collection of data actively provided for the purpose of M&E

Looking at the data sources the survey respondents use, we can conclude that they primarily use data actively provided by beneficiaries requested to do so specifically for the relevant project or programme. Of course this is a very relevant information source as this reveals information that can answer not only “what” but also “why” questions. This type of data is collected for example by the use of surveys (either paper-based or on handhelds) or interviews. Other types of data are being used to a much lesser extent, such as passive data and non-purpose active data.



Collection of data actively provided, but not for the purpose of M&E

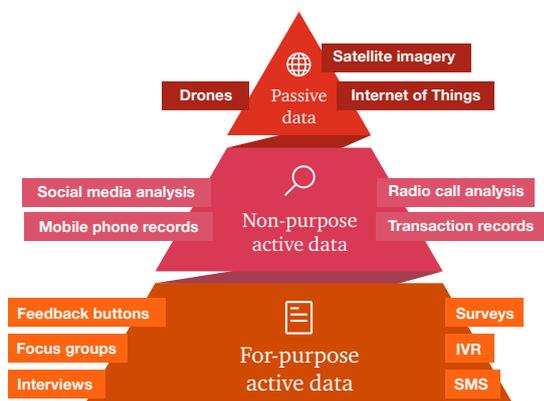
Non-purpose active data is data that is actively provided by beneficiaries, but not requested specifically for the purpose of M&E, such as social media information. Social media analysis is the process of gathering data from conversations



Collection of data passively provided

Passive data is information not actively provided by beneficiaries. This data, such as geodata from satellites or drones, can also provide valuable insights for monitoring and evaluation. These types of passive data are used by only 14% of the respondents to our survey. The United Nations took a big step to increase the use and impact of data in the humanitarian sector by establishing the Centre for Humanitarian Data in the Hague as part of the city of The Hague’s Humanity Hub, which makes extensive use of passive data.

Figure 2 Types of data collection



The use of non-purpose active data and passive data is an interesting addition to active data collected directly from the beneficiaries because it adds objective information, but also because it allows for much more frequently collected monitoring information. Including and combining these different types of data in M&E research increases the richness and the reliability of the data and opens up previously impossible ways to triangulate M&E information. This greatly contributes to being a data-driven and flexible organisation.

Challenge 3

Accessing beneficiaries in remote locations - with remote sensing and geodata

Beneficiaries of aid are sometimes located in remote areas. It can be a costly undertaking to send M&E specialists to these locations, especially if an aid programme calls for frequent or even continuous collecting of monitoring information. IVR and SMS can prove valuable in such situations, but do not function in offline or mobile-scarce locations. As discussed in Challenge 2, looking at different types of data collection, and in this case especially passive data, can prove to be valuable to collect useful information in remote locations.



Remote sensing

Remote sensing technologies enable M&E specialists to monitor ongoing changes from a distance. Many different available tools make it possible to identify and trace the location of e.g. humanitarian deliveries and to visualise this information on (interactive) maps. This requires GPS-enabled devices attached to humanitarian goods or carried by people. An example of an application in the development sector is a cooperation between the WUR and the University of Huambo, Angola, resulting in the use of remote sensing for suitability maps for three different crops: beans, maize and potatoes.

As counterintuitive as it might seem, one can even use Internet of Things (IoT) devices such as sensors off the grid, with no internet or mobile phone coverage. IoT devices can be solar powered and data can be stored on monitoring devices or mobile phones for later transmission to the internet for analysis. Organisations can use IoT devices as a remote monitoring technology to improve performance by e.g. monitoring remote water, energy and infrastructure projects. This could consist of placing a motion sensor on the doors of a water-/sanitation facility to track frequency of use or measuring the water quality, for example.



Geodata

Geodata – data captured e.g. by drones or satellites – combined with geographic information systems can rapidly increase the information available on hard-to-reach locations. Geodata allows the user to observe (changes in) certain geographic areas. The development of smaller, lightweight, intelligent, network-connected and sometimes autonomous geodata tools has increased the accessibility of this technology. They provide an accurate and relatively cheap means of gathering information such as population numbers and -density or the status of wildlife or agriculture, without the need for on-site staff. Automated intelligence applied to this data can, for example, extract and classify objects such as dwelling types. This information can then be used as proxies for other indicators such as the poverty level. Another advantage to geodata collection by drones is that it can create real-time insight.

Of course, depending on the information need and circumstances, also simpler offline feedback tools can be used to collect information remotely, such as offline feedback panels on which beneficiaries can provide their feedback by pressing different buttons.

Digital tools can help to reach beneficiaries in remote locations. Remote sensing and geodata are only some examples of how data can be collected at lower risk and/or costs, and thus with a higher frequency and reliability.

Challenge 4

Ensuring the uptake of M&E results - with incremental learning loops and additional indicators

One of the most reported challenges for M&E experts is insufficient uptake of M&E results. 88% of the respondents state they encounter this problem, of which nearly one third finds the uptake of M&E results a big challenge. Monitoring insights are essential to facilitate learning and continuous improvement. But how does one start to implement continuous learning and improvement within an organisation? International development programmes are implemented in places where the world seems to change even more rapidly than elsewhere. When applying new technologies in such circumstances, uncertainty only increases and traditional M&E frameworks and monitoring indicators might not be sufficient to generate the required insights quickly. Dealing with a rapidly changing world and high uncertainty is exactly why tech companies started to develop specific innovation methodologies. International

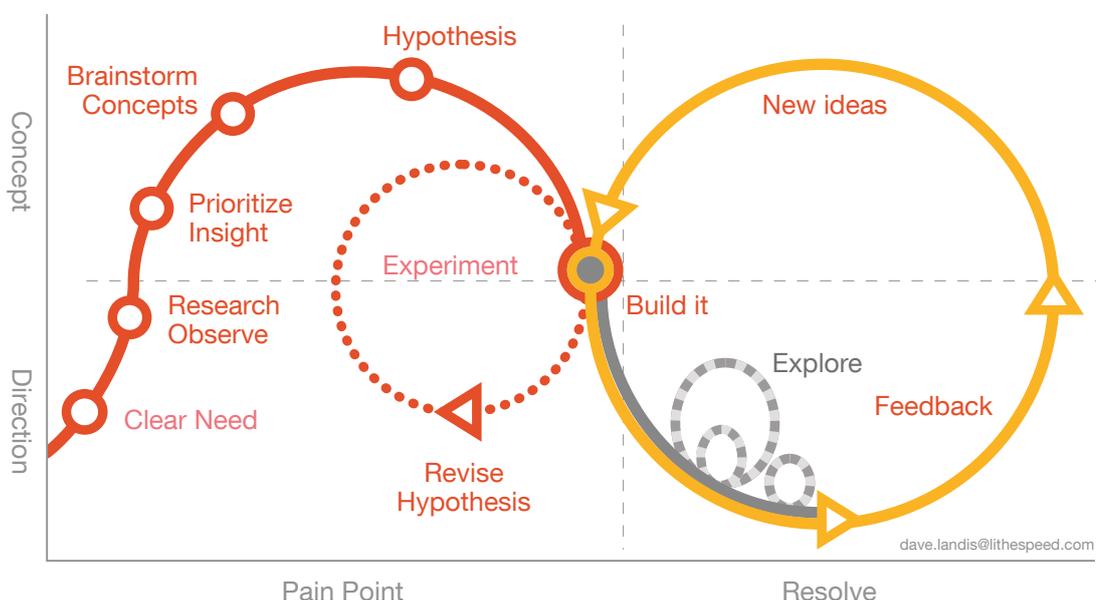
development organisations can greatly benefit from their insights.



Feedback loops to ensure continuous learning

To ensure the process of learning as quickly as possible, organisations are increasingly using the Build-Measure-Learn loop. This is a feedback loop where a hypothesis is tested by first building an experiment with the minimal version of the change to be tested. Setting up an experiment can consist of testing a new technology, but can also be testing a slight change to the intervention design. The key is to use the minimal change needed to test the hypothesis. For testing a new application of technology, this minimal change can therefore also be a storyboard or building a first prototype made up of paper and glue (and a little bit of

Figure 3 Learning loops



imagination). This is especially true if it is not the technical feasibility that is tested, but rather the effects on the user. Consequently, one measures, or monitors, the change collecting the most relevant data to validate or reject the hypothesis. Based on the measurement one can learn, draw the right insights from the monitoring data, and make an informed decision about whether or not this is a fruitful path to further iterate on. If the iterations demonstrate a fit between the problem to be tackled and the solution proposed, this can lead to a well-founded decision to start a pilot.

An example of Build, Measure, Learn-loops are Google Design Sprints.⁴ They provide an elaborate framework for organizing a sprint. At PwC we have established Experience Centres to help making design sprints a success or to design your own innovation processes.



Rapidly changing environment and intervention needs a new M&E framework and additional indicators

While the overall goal of international development programmes is generally quite clear, the specific actual problem and solution are often less evident and subject to change. In these circumstances, M&E experts will build a theory of change that is necessarily based on assumptions and might soon be obsolete. Therefore, the interventions and outputs in the theory of change should be dynamic instead of static. The M&E experts should then, as quickly as possible, generate insights from monitoring that facilitate the need to learn what works and what does not. Systematically, the most important assumptions in the theory of change will be (in)validated.

But what monitoring information does one steer on when it is yet unknown what the right solution is to a certain problem? And how does one know which of the new ideas is working best? Measuring indicators on sales and clicks in the tech innovation world of course is fundamentally more obvious than measuring indicators on innovation in international development cooperation. However, also in this respect lessons can be learned from methodologies developed for monitoring innovation in other sectors. As the world of international development cooperation is changing equally, or even more, rapidly than in other sectors, measuring whether everyone is sticking to the plan becomes less important than measuring if the plan is leading the implementation in the right direction. Therefore, M&E experts should add an indicator reflecting the speed of learning within a development programme. In other sectors this speed of learning would be the 'speed to market'. For development cooperation this would for example consist of the duration or costs of the testing of a hypothesis. The speed of learning can be measured by indicators on the costs per learning loop, the validation velocity (speed at which critical hypotheses are validated) and the knowledge-to-assumption ratio (amount of unknown assumptions the intervention has). Ideally, the speed at which the effects of changes in interventions are measured should be decreased from sometimes years to weeks or even days.

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⁴ See www.gv.com/sprint/ for a basic DIY guide on Google Design Sprints



Donors can catalyse innovation efforts

Donors can play a key role in encouraging innovation and experimentation within the development cooperation sector. This requires a change from the more traditional course in which success is defined as the successful completion of a project including an implementation that is exactly as planned in the application phase. Donors need to step away from this and define success more in terms of a successful learning curve. The indicators mentioned above – costs per learning loop, the validation velocity the knowledge-to-assumption ratio – are good examples to include in this. This means that projects can fail but still meet their indicators because a lot has been learned.

Donors can implement this in various ways, we mention three examples. Firstly, by redesigning their application process. Often, such applications require a detailed planning, unavoidably based on assumptions as to when and how any desired impact is achieved. It would benefit innovation if this would be focused more on how the organisation has planned to quickly measure and learn whether their efforts

are having the desired results. Secondly, donors can play a crucial role in helping innovations that have been tested and validated to reach scale, and thereby increase the ability of these solutions to address challenges at the global scale. Thirdly, donors can implement a results-oriented approach by including elements of results-based financing in the contract. This can include for example a number of tests (or build-measure-learn loops) as a prerequisite to enter a proof-of-concept phase. This allows the donor to keep control of the progress of the innovation and prevents a long term funding of innovations that are deemed to fail.

Thus, building in feedback loops in de programme design can ensure continuous learning. The methodology used in design sprints is a valuable way for an organisation to start with this structured way of building, measuring and learning. M&E frameworks facilitate getting insights as quickly as possible, and should also measure the speed at which these insights are created. Donors can be important stakeholders in either hampering or enabling international development organisations to use innovative ways of programme design and execution.



The methodology used in designs sprints is a valuable way for an organisation to start with this structured way of building, measuring and learning.

Suggested solutions require the right expertise

In our survey, M&E experts report they lack knowledge to choose the most appropriate data collection (79%) and analysis (87%) tools, and that they are largely unfamiliar with the digital tools mentioned. Social media analysis and drones stand out as tools that most respondents had never used but of which they did see the added value. When asked why the organisations had not adopted them yet, 70% of the respondents indicate they do not have enough expertise and/or knowledge on how to use these tools.

Diversify the pool of M&E experts

Monitoring and evaluation is a job typically performed by experts with a social science background. However, increased complexity of data collection and data analysis means M&E staff needs to be well equipped to deal with these intricacies. Training the existing staff base (e.g. through a digital-upskilling programme) or hiring new expertise might be necessary. Even though experts with a social science background remain important in M&E activities, experts with STEM-profiles (Science, Technology, Engineering and Mathematics) and designers would certainly be an asset. The ultimate proof for us that multi-competence teams can provide new insights, are the results from the [Hackathon for Humanitarian Aid](#) that we organised together with the Ministry of Foreign Affairs and the University of Leiden. 75 programmers, data analysts, policy makers, aid experts and refugees developed 12 prototypes in 36 hours, trying to find ways to give people in need a voice. This inspired a team to test whether a chatbot can assist a radio in Sudan with direct communication with the listeners that report events.

PwC has an Experience Center which consists not only of advisory experts but also of programmers, user experience designers, industrial designers, and other creative professionals that allows your organisation to experience what a (organisational) change will mean for beneficiaries. Prototyping, mock-ups, and simulations will help to rapidly gain insight into the next steps.

Only generate digital data that you can protect

A lack of knowledge and expertise can imply risk. Insufficient understanding of the impact of data breaches, confidentiality, or data protection and privacy laws, may result in ethical challenges or unforeseen negative consequences. For example, the analysis of electronic transaction records of cash based support programmes can provide valuable insights about beneficiaries' preferences or fraud. However, the risks of metadata ending up in the wrong hands should not be underestimated. Additionally, as humanitarian organisations collaborate with new (financial) institutions and engage in new activities such as cash transfers, they should abide by international privacy and data protection standards. This underlines the importance of well-trained and well-equipped staff. Do not use technology when collected data cannot be adequately protected and is so sensitive that it could put people at risk. It is critical to develop a thorough understanding of who has access to the created (meta-)data in the specific context, and to take necessary action for data security.

Do not reinvent the wheel

Issues that development cooperation organisations are trying to solve are often highly complex and inevitably connected to multiple stakeholders and institutions in their specific societies. This means development organisations face a hard time solving important issues on their own. Facing current challenges requires new relationships with public organisations, companies, research institutions and citizens to reach sustainable solutions.

Also more practically, there is a lot to learn from pilots and projects that have already succeeded (or failed!). The expertise gained by others, from within or from outside the sector, may help to bridge knowledge gaps and quickly benefit from best practices and lessons learned. It is helpful to reach out to other organisations that have succeeded in implementing new technologies or tackling complex issues with innovation methodologies.

“ “ *When asked why the organisations had not adopted tools they see value in, 70% indicates they do not have enough expertise and/or knowledge on how to use these tools.*

Conclusion

M&E professionals report that they encounter a number of challenges with data collection and analysis. Firstly, they face a lack of resources and usable data, especially for beneficiaries in hard to reach locations. Additionally, there is currently insufficient uptake of insights from M&E. Exploring new ways of data collection by using digital tools can complement current data and enrich the insights. Collecting data digitally can also reduce costs and (therefore) increase the possible frequency of the data collection. Innovation methodologies ensure that experimenting with applying digital data collection tools does not equal high costs at high uncertainty, as it puts the focus on starting small and experimenting fast. This methodology can also be used to quickly learn what parts of an intervention are working. M&E then becomes a central component of a programme to enable quick measuring and learning.

Originally, innovation methodologies are developed for complex environments of extreme uncertainty in tech companies. Working in complex and

extremely uncertain environments is of course equally, if not more, true for organisations active in international development aid. Although innovation has become a popular term in the development sector, and there are examples of organisations in the development sector that are leading by example, there seems to be a gap between the potential and actual (large scale) implementation. The development sector cannot be compared to tech companies and, arguably, innovation in the development sector is much harder than in the tech sector. The international development sector faces specific obstacles such as highly restricted budgets and working with vulnerable people for whom the notion of experimentation may seem irresponsible. We believe that if we apply innovation methodologies, adapted and applied to this specific sector, it can greatly benefit the sector to increase the value, reach and impact of its efforts. Just like private sector companies use new technologies and innovation methodologies to maximize their shareholder value, international development cooperation can use them to their advantage to maximize impact.

Contact us

Anton Koonstra

*Project and Programme Management,
Competency Leader (Netherlands)*

PwC Netherlands

T: +31 (0)88 792 33 03

E: anton.koonstra@pwc.com

Sanne Maas

*Project and Programme Management,
Senior Consultant*

PwC Netherlands

T: +31 (0)88 792 76 95

E: sanne.maas@pwc.com

