

PHASE ONE COMPLETION REPORT 2017-2019



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EXECUTIVE SUMMARY

This report documents Pulse Lab Jakarta's (PLJ) journey throughout the period 2017- 2019. This was an important phase in the evolution of PLJ as this was the first phase of direct funding from the Australian Government. Presented in the report is the evolution of the way we do business, the way we establish partnerships, and the way we have positioned ourselves in the growing data ecosystem in Indonesia and the Asia Pacific region. With over 60 unique research projects and activities conducted during this period, and around 50 new partnerships with private sector, development agencies and government bodies, the overall output and productivity of the PLJ provides an underlying testament of the value for money as well as the demand for facilities such as PLJ in light of global trends towards further use and integration of digital technology.

Transitions

At the end of 2019, as PLJ fully transitioned into Phase 2, these focus areas evolved into (i) Disaster Response and Climate Change, (ii) Urban Dynamics; (iii) Food Security and Agriculture; (iv) Financial Inclusion; and (v) Strategic Exploration. Three broad societal goals were also established, where PLJ seeks to contribute towards: (1) better use of data in public decision-making, which is expected to significantly contribute towards (2) improved public policy, which would ultimately result in (3) increased public well-being, particularly among vulnerable communities.

Primarily PLJ's work is expected to lead to three main organisational outcomes:

1. PLJ partners are equipped with fit-for-purpose tools and prototypes;
2. Stakeholders increasingly value and demand PLJ partnership; and
3. The data ecosystem is catalysed and strengthened.

Early research initiatives were focused heavily on utilising big data and artificial intelligence to provide insights to policy makers, mainly in the form of prototypes and analytics. However, 2017-2019 saw a strong shift from prototype development to a stronger emphasis on systems thinking approaches, which allowed PLJ to identify ways to integrate its tools into systems used by governments and development agencies. Another aspect of PLJ's growth is the increasing utilisation of human centred design, a problem-solving approach that focuses on the experiences, emotions, and rapid prototyping with service users.

Phase 1 also highlights an increasing need to incorporate thick data--qualitative information that provides insights on human stories, emotions, and experiences--to complement data analytics and help answer questions that big data cannot.

Demand and Partnerships

The 2017-2019 period also shows a significant increase in demand from the public sector for data innovation services. This included:

1. Executive Office of the President of Indonesia and Open Data Lab

2. Bappenas' Economic Affairs team on experimental research projects that integrate different data sources to monitor the dynamics of Indonesia's economy.
3. Indonesia's SDG Secretariat
4. the Secretariat for the National Council for Financial Inclusion (SNKI)
5. Indonesia Fintech Association
6. Financial Services Authority
7. Ministry of Foreign Affairs (MOFA)
8. Jakarta Smart City
9. Bandung City Government
10. UN agencies--including UN Women, WFP, UNICEF, and UN OCHA--and the World Bank.

There was also an increasingly more nuanced understanding of what can be achieved by mining different big data sets among our public sector partners. Bappenas' SDG Monitoring Dashboard, the Satu Data initiative, and MOFA's ALITA Project are prime examples of the extent in which Indonesia's government agencies have a stronger grasp of how data innovation can improve their operations.

2018 saw the start of a significant expansion of PLJ's research portfolio through partnerships with the private sector. Go-Pay, BTPN, Amarta, OLX, and Wow! collaborated with us on a myriad of research projects based on priority areas in Indonesia's National Medium-Term Development Plan (RPJMN). Grab, one of Southeast Asia's largest hailing and logistics platforms, worked with us to understand the dynamics of transportation demand across public and private provisions.

Our work with Visa, the global payments solutions company, looked at ways to encourage Indonesia's flourishing fintech sector to extend its services to the unbanked segment of the population. We also expanded our partnership with Digicel, a major mobile network operator across Papua New Guinea and the South Pacific.

Our commitment to strengthen South-South Triangular Cooperation can be seen not only from our involvement in humanitarian assistance, but also through capacity building and sharing of lessons learned from Indonesia. We expanded our geographic reach from analysing micro-financial transactions in Cambodia, to analysing mobile data for disaster management in the Pacific Islands, to developing a relative wealth index in Papua New Guinea. The benefits of strengthening South-South cooperation come in both directions. The modeling of population displacement in the aftermath of natural disasters in the Pacific Islands lent itself as a model for Indonesia to use mobile network data to understand the impact of the 2018 Central Sulawesi earthquake on local communities.

Outcomes

Importantly, the report captures how the evolution of PLJ's practices correlating with the nature of demands and needs of clients and partners has now been aggregated into outcomes due to PLJ's impact or influence in the following categories:

1. **Operational Impact** - being the positive effects of analytics or prototypes on how PLJ's partner/client organisations' work. This includes (i) "Chain impact" with one product feeding

into and evolving to other products; (ii) Replication of analytics and prototypes by taking into account local contexts; and (iii) Integrating prototypes into existing government systems and allowing organic adoption by the private sector.

2. **Methodological Impact** – being the effects we have had on the practice and application of data science and human-centered design. This includes (i) Methodologies that are attributed to PLJ are endorsed and utilized by governments, international agencies, and higher education institutions; and (ii) PLJ's products and initiatives are used as a template for similar products or as case studies and reference in the scholarship of data innovation for development.
3. **Ecosystemic Impact** – being increased interest and capability of our stakeholders to harness insights from innovative data analyses and non-conventional data sources in line with PLJ's broader mandate to support data innovation. This includes (i) Improved collaboration amongst our stakeholders, including the private sector; and (ii) Promoted data protection and privacy principles as organisational principles and within project life-cycles.
4. **Gender-Related Impact** – highlighting specifically PLJ's work contributing to ensuring better access to services for women.

It is with full acknowledgement and appreciation that the above has only been possible through the institutional support of the Government of Indonesia and particularly Bappenas to be able to operate as a unique laboratory servicing the region's public sector data innovation needs, and the Government of Australia through DFAT for the financial resources required to maintain the core of PLJ's operations.

ABOUT THIS REPORT

The period 2017-2019 marked an important phase in the evolution of Pulse Lab Jakarta (PLJ). Officially, it was the first phase of direct funding from the Australian Government, through its Department of Foreign Affairs and Trade (DFAT)—a partnership that allowed the Lab to undergo key developments in experimenting with the use of unconventional data sources to obtain timely and actionable insights, providing analyses to the Indonesian Government and development partners in the Asia Pacific region, as well as contributing to the development of a responsive data ecosystem in Indonesia and beyond.

Whilst this period is both officially and colloquially referred to as “Phase 1” among our stakeholders and partners, it is a misnomer considering that the Lab had gone through a five-year initial phase prior, also with strong support from the Australian Government through several of its programmes in Indonesia. This report documents the Lab’s journey throughout the period 2017-2019, which was a continuation of previous funding by DFAT through RTI from 2015 to 2017. It lays out the evolution of the way we do business, the way we establish partnerships, and the way we position ourselves in the growing data ecosystem in Indonesia and the Asia Pacific region.

This report will first describe how Phase 1 was set up and continue with the highlights and a summary of the body of work that the Lab had done during that period. The focus of this report, however, will be on how we measured and took stock of the *impact of our work*, which is presented in the subsequent section. The report will then conclude with lessons learned and a look at what the future holds for Pulse Lab Jakarta.

PHASE 1 DESIGN

Pulse Lab Jakarta is a joint data innovation facility of the United Nations (UN) and the Government of Indonesia, via United Nations Global Pulse and the Ministry of National Development and Planning (Bappenas), respectively. Established in 2012, PLJ was the first innovation lab of its kind in Asia, and was envisioned to help close information gaps in the development and humanitarian sectors through the adoption of Big Data, real-time analytics, and artificial intelligence. As we evolved, PLJ now combines data science and social research to help make sense of our interconnected, interdependent, complex world.

With the support of the Australian Government, Phase 1 was set up in 2017 to allow the Lab to build on the experiments, lessons learned, and successes from the five years prior. Furthermore, as part of the UN Global Pulse network, we continued our mission to accelerate the discovery and adoption of data innovation for sustainable development and humanitarian action.

While we observe and align our operations with the broader UN Global Pulse's strategic framework, we also identified focus areas and developed an organizational framework that is uniquely PLJ. By the end of Phase 1, our work primarily focused on:

- Protecting the poor and vulnerable
- Supporting disaster response and humanitarian action
- Improving trade and competitiveness
- Exploring urban and regional dynamics
- Advancing the sustainable management of natural resources¹
- Strategic exploration

Within this framework, Pulse Lab Jakarta adopts a two-track innovation strategy for all its activities, in line with UN Global Pulse's overall strategy:

- Track 1: Innovation Driver
- Track 2: Ecosystem Catalyst

Organisational Logic²

Pulse Lab Jakarta's work aims to contribute towards three broad societal goals:

(1) **better use of data in public decision-making**, which is expected to significantly contribute towards (2) **improved public policy**, which would ultimately result in (3) **increased public well-being**, particularly among vulnerable communities.

PLJ's work is expected to lead to three main organisational outcomes:

1. PLJ partners are equipped with fit-for-purpose tools and prototypes;
2. Stakeholders increasingly value and demand PLJ partnership; and
3. The data ecosystem is catalysed and strengthened.

¹ *Advancing the sustainable management of natural resources* was added as a focus area in 2018. At the end of 2019, as PLJ fully transitioned into Phase 2, the focus areas evolved into (i) Disaster Response and Climate Change, (ii) Urban Dynamics; (iii) Food Security and Agriculture; (iv) Financial Inclusion; and (v) Strategic Exploration.

² An unabridged organisational logic and governance is provided in Annex E

The above outcomes are expected to be achieved through our impact or influence:³

1. **Operational Impact**, which we define as the positive effects our analytics or prototypes have on how our partner/client organisations' work.
2. **Methodological Impact** covers the effects that we have on the practice and application of data science and human-centered design.
3. **Ecosystemic Impact**, which is important given our mandate to support data innovation more broadly.

³ The original terms used were “intermediate outcomes” and “influence.” These terms slowly evolved and by the end of Phase 1, through a series of workshops facilitated by Clear Horizon to develop PLJ's Result Management Framework, we agreed that the term “impact” was more appropriate. It was also agreed that these impacts will be used as the main assessment of PLJ's work during Phase 1.

OUR WORK 2017-2019

When PLJ was first established in 2012, we were one of the first players in the region focused on leveraging big data and artificial intelligence to provide insights to policy makers and development partners. By the end of Phase 1, more and more actors, including those from the private sector, were involved in utilising big data for humanitarian and development purposes--a change that we are delighted to see. We now see ourselves as part of a larger network that works together to realize the potential of data innovation in improving lives and protecting the planet. The 2017-2019 period marks an important milestone in that journey.

A Period of Growth and Evolution

PLJ was originally established mainly--to the point of almost exclusively--to provide data innovation services for the public sector. Most of our early research initiatives were focused heavily on utilising big data and artificial intelligence to provide insights to policy makers, mainly in the form of prototypes and analytics. However, 2017-2019 saw a strong shift in our work from prototype development to a stronger emphasis on systems thinking approach, which allowed us to identify ways to integrate our tools into systems used by governments and development agencies. This, in turn, better ensures successful uptake of our prototypes. Our work with Indonesia's Ministry of Foreign Affairs (MOFA) to make sense of the massive volume of diplomatic correspondence through data analysis and visualisation is a good example of such systems thinking. The geospatial financial access mapping tool, developed in partnership with the Indonesian National Council for Financial Inclusion (DNKI), is another illustration of how systems thinking design allowed better integration of a prototype into an organisation's operating system.

Another aspect of our growth is the increasing utilisation of human centred design, a problem-solving approach that focuses on the experiences, emotions, and rapid prototyping with service users. The human centred design approach had allowed PLJ to develop a thorough understanding of the challenges financial services users faced under our Banking on Fintech research project. PLJ also applied human centred design principles for Indonesia's Satu Data initiative, mainly to model a data governance framework at the local government level.

Finally, Phase 1 saw our increasing acknowledgement of the need for thick data--qualitative information that provides insights on human stories, emotions, and experiences--to complement data analytics and help us answer questions that big data cannot. This is particularly illustrated with our After Dark research, in collaboration with UN Women, that looked into women's perceptions of safety while travelling at night. The research added the human experiences into what may have been in the past for us a single-method data analytics research. Another example is PLJ's collaboration with Empatika on a research commissioned by the World Bank to better understand the experiences of citizens across Indonesia who migrate from rural to urban communities. The research's qualitative approach placed emphasis on immersion, providing researchers with an opportunity to gather in-depth, multidimensional insights from people who made the decision to move from a rural to an urban community, and from those who chose not to make the move. This in turn provided richer insights that complemented analytics on migration patterns that utilised mobile network data.

Catalyzing Public Sector Digital Transformation

Even at the very outset, PLJ was envisioned to be a demand-driven development service provider. However, since big data in development was a novelty when PLJ was established, it took time for us to help our partners understand the potential of our services, while at the same time develop our brand name in big data, AI and, later, thick data and human centred design. By continuing to deliver high-quality services and effectively disseminate related information to relevant stakeholders, we continued to develop the awareness of what digital innovation can offer to the public sector.

In that respect, the fruits of our labor were evident in the 2017-2019 period, as shown by the significant increase in demand from the public sector for data innovation services. With the help of Bappenas and DFAT, our network grew to include various different government agencies and development partners. Starting in 2017, we worked with the Executive Office of the President of Indonesia and Open Data Lab to conduct user research on data governance at district and provincial levels. This in turn led to the development of user-friendly toolkits to help subnational officials collect and share better quality data, which became the precursor of the Satu Data initiative. The latter half of the year also saw us working closely with Bappenas' Economic Affairs team on experimental research projects that integrate different data sources to monitor the dynamics of Indonesia's economy. In 2018 and 2019, we continued to see demands from and subsequent collaboration with Indonesia's SDG Secretariat, the Secretariat for the National Council for Financial Inclusion (SNKI), Indonesia Fintech Association, Financial Services Authority, the Ministry of Foreign Affairs (MOFA), Jakarta Smart City, and the Bandung City Government. Increased demands also came from UN agencies--including UN Women, WFP, UNICEF, and UN OCHA--and the World Bank.

While the increased number of demand for data innovation services from the public sector is a welcome development, what truly stood out during the Phase 1 period is the increased sophistication of those demands. There was an increasingly more nuanced understanding of what can be achieved by mining different big data sets among our public sector partners. Bappenas' SDG Monitoring Dashboard, the Satu Data initiative, and MOFA's ALITA Project are prime examples of how much Indonesia's government agencies are getting a better grasp of how data innovation can improve their operations.

Facilitating Public Private Data Partnerships

Throughout Phase 1, PLJ has strategically positioned itself at the nexus of government and the private sector. This has allowed us to play a leading role in convening data partnerships that generate sustained value for our stakeholders. From the Indonesian government side, PLJ has been described as the R&D data unit of the government. At the same time, we have been seizing every opportunity to work with companies who understand the shared value of their data. PLJ has effectively carved out a niche as a viable partner for companies that are looking to enhance their social impact.

2018 saw the start of a significant expansion of PLJ's research portfolio through partnerships with the private sector. Go-Pay, BTPN, Amarta, OLX, and Wow! collaborated with us on a myriad of research projects based on priority areas in Indonesia's National Medium Term Development Plan (RPJMN). Grab, one of Southeast Asia's largest hailing and logistics platforms, worked with us to understand the dynamics of transportation demand across public and private provisions. Our work with Visa, the global payments solutions company, looked at ways to encourage Indonesia's flourishing fintech sector to extend its services to the unbanked segment of the population. We also expanded our partnership with Digicel, a major mobile network operator across Papua New Guinea and the South Pacific, in using pseudonymised

mobile network data to produce new and better tools to inform policy making and better protect vulnerable populations.

Strengthening South-South Cooperation

During the 2017-2019 period, PLJ continued to strengthen our presence beyond Indonesia. We took proactive steps to share our lessons with governments and development partners in Asia Pacific and learn from their experiences. Our commitment to strengthen South-South Triangular Cooperation can be seen not only from our involvement in humanitarian assistance, but also through capacity building and sharing of lessons learned from Indonesia. We expanded our geographic reach from analysing micro-financial transactions in Cambodia, to analysing mobile data for disaster management in the Pacific Islands, to developing a relative wealth index in Papua New Guinea.

The benefits of strengthening South-South cooperation come in both directions. The modeling of population displacement in the aftermath of natural disasters in the Pacific Islands lent itself as a model for Indonesia to use mobile network data to understand the impact of the 2018 Central Sulawesi earthquake on local communities. This two-way learning process continued to fuel our work in the region. PLJ also continued to leverage its data innovation clinics, which served as a practical knowledge-sharing platform. This is exemplified in 2019, when the Lab facilitated a data clinic with participants from Australia's DFAT and the Aga Khan Foundation Afghanistan, which investigated whether mobile phone data and banking data can serve as proxy indicators of women's empowerment in Afghanistan.

The following pages provide a snapshot of our activities throughout 2017-2019, outlining the areas of work they fall under and their alignment with the two-track strategy described in the previous section.⁴ The projects are grouped together by year and presented chronologically, with blue colored cells indicating projects in 2017, yellow for projects in 2018, and orange for 2019. More detailed accounts of the projects can be found in Annex A.

⁴ In the 2019 Annual Report, the 2019 activities were grouped based on the new priority domains for Phase 2. For consistency of this report, the 2019 activities are grouped based on the focus areas agreed for Phase 1.

Phase 1 At a Glance

[\[Click here for link to table in Google sheet\]](#)

Activities	Protecting the poor and vulnerable	Supporting disaster response and humanitarian action	Improving trade and competitiveness	Exploring urban and regional dynamics	Advancing the sustainable management of natural resources	Strategic exploration	Track 1: Innovation Driver	Track 2: Ecosystem Catalyst
Understanding Population Movement After the 2018 Central Sulawesi Disasters		V					V	
After Dark: Encouraging Safe Transit for Women Travelling at Night				V			V	
Mapping Financial Service Points Across Indonesia	V		V				V	
Mapping Smallholder Farmers in Indonesia to Inform Policies					V		V	
Making Sense of Diplomatic Correspondence through Data Analysis and Visualisation						V	V	
Modelling Internal Migration in Vanuatu Using Mobile Network Data		V					V	
#TabunginAja: Fusing Behavioral Science and HCD for Financial Inclusion	V		V				V	
Applying Big-Data-Based Positive Deviance Approach in Agriculture					V		V	
Nowcasting Inflation to Keep Indonesia's Growth on Track						V	V	
Combining Different Data Sources to Manage Information for Natural Disasters		V					V	
Using Ride-Hailing Data to Inform Transportation Planning and Policy				V			V	
Fintech Challenge Fund Winners 6-Month Pilot: Lessons Learned	V							V
Dataku: Using Data Analytics and Visualisation to Inform Government Decision Making						V		V
Informing National Statistics and Managing Disaster Risks in Samoa		V					V	
Real-time Data for Faster Decision Making in Times of Crisis		V					V	
Comparing Population Displacement Estimates from Mobile Network Data in PNG		V					V	
SDG Monitoring Dashboard	V	V	V	V	V		V	
Satu Data Tooling	V	V	V	V	V		V	
Port Network Analysis			V				V	
ATM Transaction Analysis			V	V			V	
Financial Access Map	V		V				V	
Banking on Fintech: Financial Inclusion for Micro Enterprises in Indonesia	V		V				V	
Microfinance Customers' Journey in Cambodia	V		V				V	
Research Dive: Financial Inclusion	V		V	V			V	
Strengthening Disaster Response Using Mobile Network Data	V	V					V	
Suara Komunitas	V	V					V	
Humanitarian Response to the Sulawesi Earthquake and Tsunami	V	V					V	
A Disaster Monitoring Big Data Tool		V					V	
VAMPIRE		V					V	
Nowcasting Air Quality Using Twitter	V	V					V	
Estimating the Quality of Crowdsourced Translations		V					V	
Analysing Twitter Data Streams to Detect Irregular Events				V			V	
Rural to Urban Migration in Indonesia				V			V	
Analysing CCTV Data to Improve Traffic Safety in Jakarta				V			V	
Poverty Mapping	V						V	
Estimating City-Level Poverty Rates	V		V	V			V	
Flood Mitigation in Bandung	V	V		V			V	
Research Dive: Urban and Regional Development	V		V	V				V

Activities	Protecting the poor and vulnerable	Supporting disaster response and humanitarian action	Improving trade and competitiveness	Exploring urban and regional dynamics	Advancing the sustainable management of natural resources	Strategic exploration	Track 1: Innovation Driver	Track 2: Ecosystem Catalyst
Research Dive: Artificial Intelligence and Machine Learning for Estimating Poverty	V		V	V				V
International Seminar on Digital Diplomacy						V		V
Policy Relevant Collaborative Research	V	V	V	V	V			V
Microenterprise Fintech Challenge Fund			V					V
2018 Collogumotion Series	V	V	V	V	V			V
Data Innovation Clinic	V	V	V	V	V			V
Lab on Wheels Outreach	V	V	V	V	V			V
Optimising Public Transport with Twitter Data				V			V	
Public Perception of Indonesia's Biggest Vaccination Campaign	V						V	
Estimating Socioeconomic Indicators from Mobile Phone Data	V						V	
Public Transport Analysis in the Maldives				V			V	
Low-Fidelity Haze Prototypes	V						V	
A Service Design Toolkit				V			V	
A Guide to Participatory Urban Data Collection and Design				V			V	
Wawasan Satu Data Toolkit				V			V	
Urban Vulnerability Mapping				V			V	
Translator Gator 2	V						V	
Haze Gazer Expansions	V						V	
Vulnerability Analysis Monitoring Platform for Impact of Regional Events	V	V					V	
Cyclone Monitoring Platform	V	V					V	
Maritime Transport Network Analysis			V				V	
Using HCD to Uncover Pain Points at Indonesian Ports			V				V	
Diving into MDGs Datasets to Inform the SDGs	V	V	V	V	V		V	
Identifying Opportunity Areas for Flood Mitigation		V					V	
Data Revolution for PolicyMakers Conference	V	V	V	V	V			V
Research Dive for Development	V	V	V	V	V			V
Ecosystem Mapping of Indonesian Start-ups			V					V
Big Ideas Competition for Climate Change	V	V						V
Improving Mobility in Bandung				V				V
Supporting the Innovation Agenda in Sri Lanka	V	V	V	V	V			V
The Gender Gap in Financial Inclusion	V		V					V
Building Demand for Data Analytics Through Collaborative Research	V	V	V	V	V			V

TAKING STOCK OF OUR IMPACT

Internal learning sessions, as well as discussions with our stakeholders and development partners have emphasised the need to expand our understanding of impact beyond the quantification of effects using measurements common to other development initiatives. Impact for Pulse Lab Jakarta has thus been defined based on our *contributions* to change.⁵ In that light, we have identified three main pathways where our work brings value to our broader stakeholders.

The first is **Operational Impact**, which we define as the positive effects our analytics or prototypes have on how our partner/client organisations' work. For instance, improvements in operational effectiveness and/or efficiency due to the adoption or adaption of PLJ-inspired products, or due to an increased understanding of human-centered design issues are considered here.

Second, our **Methodological Impact** covers the effects that we have on the practice and application of data science and human-centered design. Under this definition, our contributions towards individuals' and organisations' use of existing data in new ways, utilisation of new data sets, or integration of new analytical methods to address existing problems are charted as impact.

Third, there is **Ecosystemic Impact**, which is important given our mandate to support data innovation more broadly. We are conscious that we exist as part of a much more complex data innovation ecosystem, not only in Indonesia, but also within the Asia Pacific region and globally. Where we contribute to key stakeholders participating or partnering differently within this ecosystem, for example in terms of new collaboration or further research, we consider this as an instance of impact.

Thus far, this report has included an honest account of how our experimental nature consequently resulted in our initiatives having mixed levels of success. In that same token, the impact of our more successful initiatives also fall on a spectrum. For instance, some of our prototypes have been fully integrated into our partners' systems, while others are still finding challenges of adoption.

The rest of this section discusses the impacts the Lab has taken stock of throughout Phase 1, under each of the three identified pathways. Each discussion weaves a story that highlights both the impacts themselves, as well as how said impacts have influenced the evolution of PLJ's work.

⁵ To a certain degree, this is a wider definition from the perhaps more popular concept of impact, which refers to the causality of a specific intervention to a set of desired outcomes. Our definition of impact, however, is "fit for purpose" considering PLJ's business of working with partners in exploring, experimenting, and implementing innovative practices. A longer discussion on this is available on: bit.ly/impactforplj

Operational Impact

“The effect our analytics or prototypes have on the ways that our partner/client organisations’ work.”

- **“Chain impact” with one product feeding into and evolving to other products**
- **Replication of analytics and prototypes by taking into account local contexts**
- **Integrating prototypes into existing government systems and allowing organic adoption by the private sector**

Throughout Phase 1, the story of one analytical platform in particular that PLJ developed did not necessarily end when it was handed over to our partner. We quite often ended up building upon and expanding the analytical platforms that we had previously developed. In PLJ’s world, product begets product. The story that started with Haze Gazer highlights the “chain impact” that PLJ contributed to, with one analytical platform informing the next. VAMPIRE is a story of replication that took into account local contexts. Meanwhile, the development of various data visualisation dashboards to complement Bappenas’s Satu Data portal demonstrates PLJ’s impact from using and building upon existing government systems.

Haze Gazer was the first platform in Indonesia that combined satellite images and social data to provide real time insights on potential disasters. The first set of prototypes include the open platform at hazegazer.org and a version of the platform that was installed in the situation room of the Executive Office of the President of Indonesia as part of an integrated early warning system. Haze Gazer then informed the development of a cyclone monitoring system, aptly named CycloMon, for countries in the South Pacific. In turn, CycloMon is now being transformed into a global platform that manages information to inform natural disaster response.

The Vulnerability Assessment Monitoring Platform for the Impact of Regional Events (VAMPIRE) was developed in collaboration with the World Food Programme (WFP). An earlier prototype of the platform provided integrated map-based visualizations that show the extent of drought affected areas, the impacts on markets, and the coping strategies of affected populations in Indonesia. VAMPIRE has now been institutionalised as one of the data and information sources that informs Indonesia’s food security policies. Recognising the merits of the VAMPIRE model, WFP promoted the platform to other governments in the Asia Pacific Region. As a result, PLJ and WFP worked with the Sri Lankan Government to develop another version of VAMPIRE. However, this was not a simple replication; its development took into account the different technical and political contexts that were unique to Sri Lanka. Subsequently, a similar platform was also developed by WFP in Cambodia.

Throughout Phase 1, we have delivered impact by improving the operational effectiveness and efficiency of government ministries and agencies, in Indonesia and beyond. We have done this by working with our partners to develop products that are tailored to their needs and build their capacity to use the data tools and methods that PLJ has developed. In Indonesia, Bappenas has since adopted dashboards developed by PLJ— these include Dataku (which visualises data from Bappenas’ Satu Data portal) and an SDGs monitoring dashboard. In the South Pacific, CycloMon provided insights to manage regular natural disasters that hit the region.

We made a conscious effort to integrate our prototypes into government systems and proactively push for national and subnational governments to take up recommendations that came from our analytics. However, we also discovered that our insights can be taken up by the private sector as well, and this can have a significant impact on the livelihoods of a large portion of the population. A good illustration for this is PLJ and UN Women’s After Dark research, whose

recommendations were taken up not only by city governments but also by Gojek, Indonesia's largest ride hailing app (see also the latter section of this chapter on our gender-related impact).

Our Government of Indonesia partners—in particular Bappenas, the Ministry of Agriculture, and OJK—now have increased capacity to more effectively manage disasters, improve food security, and monitor Indonesia's progress towards meeting the SDGs. We have also helped our partners in the Asia Pacific region to better cope with the effects of climate change by providing them with tools to monitor and effectively respond to other natural disasters. We will continue to work with existing partners and forge new partnerships to further strengthen their capacity to use these tools and explore other ways to improve their operations.

Methodological Impact

“The effects that we have on the practice and application of data science.”

- **Methodologies that are attributed to PLJ are endorsed and utilized by governments, international agencies, and higher education institutions**
- **PLJ's products and initiatives are used as a template for similar products or as case studies and reference in the scholarship of data innovation for development**

More than a dozen different methodologies and applications of data science and social research that PLJ produced have been leveraged, duplicated, or adapted by several national and local governments, international agencies, and higher education institutions. To be more specific, our methodological impact comes in two general forms. The first is the endorsement and utilisation of specific methodologies that are attributed to PLJ; research dives and the incorporation of human-centered design approach in analytical platforms and policy solutions are two main examples of this. The second is the use of our products and initiatives either a template for similar products, or as case studies and reference in the overall body of knowledge on data innovation for development.

In terms of methodologies, PLJ's main contribution to the practice and application of data science is the adaptation, contextualisation, and consistent use of already proven methodologies in policy settings. Oftentimes this means bringing in methodologies that are commonly used in the private sector into the policy realm. Research dives, for instance, utilize the concept of hackathons traditionally used by software companies, but use it instead to analyze data related to development and humanitarian issues. Similarly, human-centred design is traditionally used by companies to design user-friendly products; PLJ overlays the methodology with systems thinking, political-economy analyses, and community-driven approach to produce solutions to development challenges on the ground.

To date, the endorsement and adoption of research dives and human-centred design have been widespread in the public sector, among international development agencies, and even in the private sector. In Indonesia, Bappenas has touted human-centred design as an effective approach to ensure that policy solutions are actually used by targeted communities on the ground. PLJ learnings from a co-design workshop in Ternate to introduce human-centred design approach to stakeholders as a mean to ideate solutions for *Ternate Tangguh* (Resilient Ternate), have been useful for RedCross project in Myanmar, where now they incorporate co-design as ideation phase after a city-wide assessment. Meanwhile, UNDP worked with Thai government partners to design a data dive--a variant of PLJ's research dive--as a process to identify the key priority issues or areas of focus in their Future of Work program.

Our second channel in contributing to the practice of data science in development is via our products. While we make it a habit of building on and replicating our own prototypes, as described in the section above, the methods that we utilized have also been used, assessed, and replicated by other parties without PLJ's direct involvement. After Dark diary study blog is used as an example for designing research instruments in the University of Papua New Guinea's master program on public policy. Meanwhile, VAMPIRE was used as a case study in the beta version of Nesta's collective intelligence design playbook. And USAID expressed interest in learning about our social media imagery method to nowcast air quality after learning about PLJ's Nowcasting Air Quality Using Social Media.

Ecosystemic Impact

“Our contribution to a stronger data innovation ecosystem, both in Indonesia and in the Asia Pacific region”

- **Increased interest and capability of our stakeholders to harness insights from innovative data analyses and non-conventional data sources**
- **Improved collaboration amongst our stakeholders, including the private sector**
- **Promoted data protection and privacy principles as organisational principles and within project life-cycles**

PLJ realizes that contributing to a stronger data ecosystem is crucial to ensure the sustainability of the use of data innovation in development. In that light, we look at the ecosystem in three main components: (i) increased interest and capability of our stakeholders to harness insights from innovative data analyses and non-conventional data sources; (ii) improved collaboration amongst our different stakeholders; and (iii) promoted data protection and privacy principles, both as a core organisational principles and within project life-cycles.

By the end of Phase 1, PLJ has been successful in increasing the awareness, interest, and capability of our GoI counterparts in utilizing data innovation to answer the development challenges that they face. Bappenas is now consistently pushing other ministries and agencies to harness new data sources to inform development planning. To date, we have received more than fifty proposals for collaborative research from Bappenas. And while there are most likely other external factors that influence this increased appetite from Indonesia's main planning agency, our close collaboration with them has most certainly contributed to it.

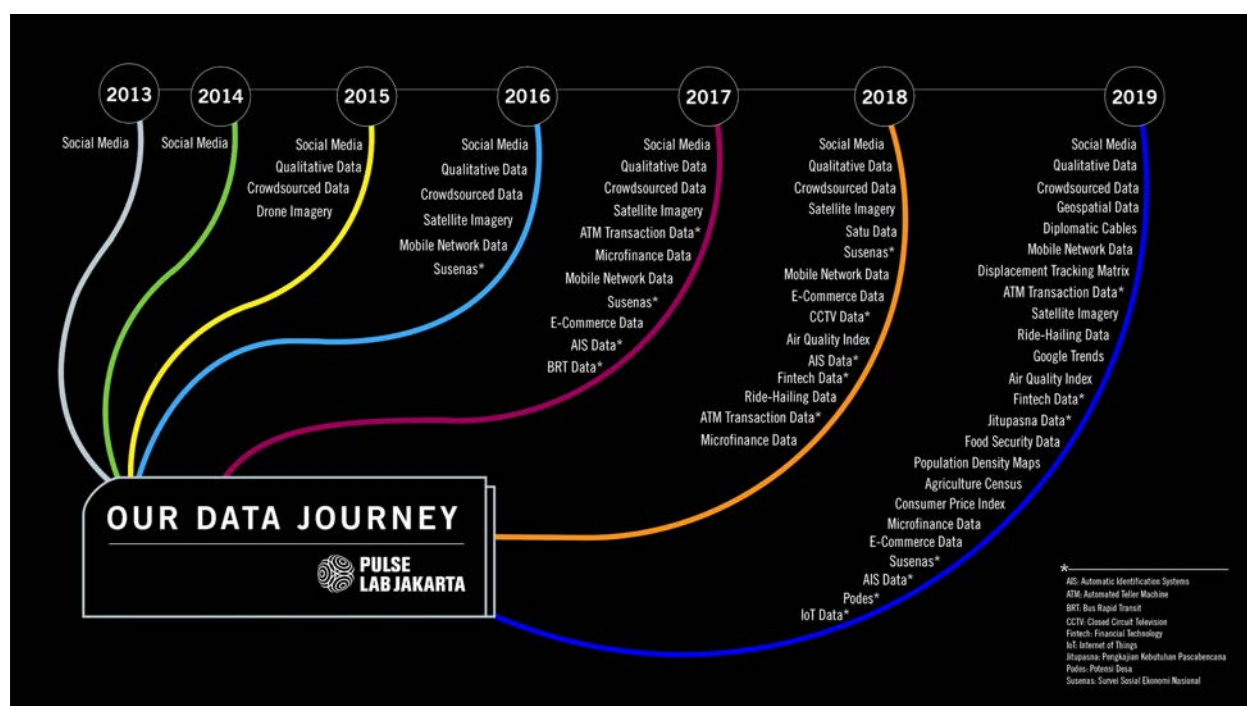
The increased demand for real-time data analytics is also apparent from other Indonesian ministries, as well as from other governments and international agencies operating in the Asia Pacific region. Based on the success of the first International Digital Diplomacy Conference that PLJ organised, MOFA has decided to host the follow up event and invite colleagues from around the region. In the education sector, Indonesia's Ministry of Education and Culture referred PLJ to SEAMEO INNOTECH to initiate discussions or video conference sessions on big data, learning analytics, and artificial intelligence as these relate to the future of education in Southeast Asia. Further out in the region, PLJ's Data Clinic & Mentoring on Women Empowerment in Afghanistan has put data innovation as a viable tool to answer the development challenges in some of the most vulnerable countries in the world.

Our impact on the ecosystem can also be seen in the collaborations that we initiated and facilitated throughout Phase 1. These collaborations have been formed both organically as well as strategically. Within the Indonesian Government, PLJ started with its main and only counterpart Bappenas. By the end of Phase 1, formal partnerships have been established with the Executive Office of the President, Bank of Indonesia, the Ministry of Foreign Affairs, the Ministry of Agriculture, OJK, SNKI, Jakarta Smart City and the district governments of Medan

and Makassar. Outside of Indonesia, we have worked closely with the governments Sri Lanka, Thailand, the Maldives, Afghanistan and Vanuatu.

The evolution of PLJ's partnership with the private sector also strongly affects the ecosystem that supports the use of data innovation in development. For one, most big data sets from which we build value are proprietary data of private companies. Hence, our relationship with the private sector was originally set primarily as one between user and provider of data. Our work using proprietary data has always been geared towards creating public value, but as things progressed, it was clear that they also accelerated the adoption of new research methods and advanced data analytics by our private sector partners, which in turn enhanced their business operations.

The mutually beneficial relationship that evolved between PLJ and private enterprises has attracted more of the latter to contact us to explore the use of their data. The organic recruitment of private enterprises into partnerships with PLJ can be illustrated by our work with Digicel in Papua New Guinea and the Pacific, which was then piqued the interest of one of Indonesia telecoms. The exponential growth of PLJ's data partnership in the course of Phase 1 provides a good sense of the impact that we had on the data innovation ecosystem. The visualisation below illustrates this growth over time. When PLJ started its operation in 2013, we relied almost solely on big data from social media. In the course of six years, we went from one data source to more than two dozens, including those that were provided by the private sector, such as mobile network, ride-hailing, and fintech data. Each of that data source represents at least one data partner, which is a testament to PLJ's contribution to a stronger data innovation ecosystem.



Our final contribution to the ecosystem is related to data protection and privacy. We realize that big data has the potential to revolutionize development and humanitarian practices, but at the same time we are very mindful that there are valid concerns with how the data can be misused. PLJ therefore puts a strong emphasis on data protection and data privacy when harnessing big data for public good.

The UN Global Pulse has a set of guidelines that governs how its lab networks deal with data protection and privacy. It has also set up a Data Privacy Advisory Group, which comprises of experts from both the public and private sector, as well as those from academia and civil society. The advisory group serves as a forum to facilitate continuous dialogue on critical topics related to data protection and privacy.

The data protection and privacy standards set by the UN Global Pulse has guided PLJ's operations throughout Phase 1. Among the standards that we put with the highest regard are the right to use, individual privacy, and data sensitivity. The **right to use** refers to our commitment to only access and use data that has been obtained by lawful and fair means. This includes, where appropriate, ensuring that the data is used with the knowledge or consent of the individuals from whom the data is collected. Respect for **individual privacy** entails that we do not access or use the content of private communication or personal data that was shared with a reasonable expectation of privacy without the knowledge or proper consent of the individual. Finally, under the principles of **data sensitivity**, we employ stricter standards of care while conducting research among vulnerable populations, children, and other persons at risk.

PLJ believes that a strong respect for data protection and privacy should be firmly established in the data innovation ecosystem. During the first phase of our operation, we not only put an onus on ourselves to observe the principles described above, we also require that our collaborators are acting in compliance with relevant law, data privacy and protection standards, and the UN's global mandate. By making this an explicit operating procedure in our work with our partners, we have been embedding the importance of ethical use of data in the data innovation ecosystem in Indonesia and the region.

While we have been promoting data privacy and protection by setting an example, we are committed to play an even more proactive role in this sphere in the next phase of our operation. We already have plans to carry out specific research on data privacy and protection practices in Indonesia. Capacity building or public outreach on the importance of data privacy and protection will also be explored. At the end of the day, PLJ will consider our positive contribution to responsible use of data in Indonesia and the region as one of our most important impact.

Gender-Related Impact

We would be remiss to not include some of our works that contribute to ensuring better access to services for women. One particular impact to note is from our After Dark research, which was a collaborative research between PLJ and UN Women to better understand the experiences of women who use public transportation during night time.

Whilst there had been research on women's safety in public places at the time, due attention had not been given to women who work night-shifts in the small retail sector and rely on public transportation to travel after dark. The human-centred research provided actionable insights on how public transportation services can be made safer and more inclusive for women.

A co-design workshop was subsequently conducted in Medan, one of the three cities where the field research was conducted. Based on the insights gained from the research, combined with an immersive experience from the workshop participants in the After Dark journey, the workshop generated a set of practical recommendations. At its core, the recommendations envision bus stops as part of a broader public safety ecosystem, instead of being merely physical pick-up points.

Coincidentally, the recommendations came as Medan was included in the six cities for which the Ministry of Transportation is implementing a Buy The Service (BTS) programme for public transportation that was to be rolled out in 2020.⁶ In December 2019, the Medan City Government announced plans to implement a number of the recommendations from After Dark as part of the BTS programme. More broadly, the Ministry of Transportation took up the recommendations and disseminated them to all five other cities--on top of Medan--under its 2020 BTS programme.

Policy decisions made by the private sector can also have a tremendous impact on women's access to jobs and services, and this is highlighted by the adoption of After Dark recommendations by Gojek. As Indonesia's largest ride hailing app, Gojek set up "safe zones" or zona aman to improve the safety of women who use their ride hailing service at night. Gojek's own data indicates that 55% of their ride hailing service users at night are women. With the app's over 20 million monthly users, the impact of their policy on women's livelihood and access to service is no less significant than the impact of a government policy.

PLJ's Banking on Fintech Project, which looked at financial inclusion for micro enterprises in Indonesia, also had a strong gender-related impact. As part of the project, PLJ launched a micro enterprise fintech innovation challenge fund, which resulted in nearly 5,000 micro entrepreneurs across 10 provinces in Indonesia accessing fintech services. 72.5 percent of those entrepreneurs are women.

Using the challenge fund they received from PLJ, Amarta, an Indonesian startup that provides small loans to micro entrepreneurs, conducted a youth-led financial literacy training program as part of their lending process to their borrowers, which were mainly low income rural women micro entrepreneurs. The training program was provided via a mobile application "Amarta Go." Meanwhile, JULO, another fintech startup in Indonesia, tested a new loan product that uses an alternative credit scoring system that incorporates smartphone usage behavior data, which is aimed at being more inclusive of women's micro enterprises.

Efficiency: Delivering Impact with Available Resources

Throughout the period of 2017-2019, PLJ received a total of USD 2.4 million (approximately AUD 3.3 million), which was allocated mainly to the Lab's most valuable resources: its staff. At an average of AUD 1 million funding per year from DFAT, the Lab managed to carry out a total of 66 projects across three years in Indonesia and across the Asia Pacific region. More important than the numbers, PLJ was able to deliver the impact as described above--improving the way government and development agencies operate; contributing to the scholarship of methods to use data innovation for development and humanitarian work; strengthening Indonesia's data innovation ecosystem--with only a fraction of the funding that typically goes to DFAT-supported programs in Indonesia. This is a strong demonstration of the high efficiency and value for money that PLJ provides.

A direct comparison of levels of funding between different DFAT-supported programs most certainly does not provide a comprehensive picture. However, it does provide a sense of the value for money that investment in PLJ provides. The Australian Government has supported and continues to support a number of development programs in Indonesia for years, many of which with annualized funding up to AUD 10 million.⁷ With only one-tenth that amount per

6 The BTS program essentially allows city government to buy public transportation services from the private sector. The six cities under the BTS program are Medan, Surakarta, Denpasar, Palembang, Surabaya, and Yogyakarta.

7 Program such as Governance for Growth (KOMPAK), Australia Indonesia Partnership for Gender Equality and Women's Empowerment (MAMPU), MAHKOTA Indonesia, and the Knowledge Sector Initiative all have annualized funding of more than AUD 10 million spread across eight to ten years.

year, PLJ has been able to introduce innovative ways to improve the way the Indonesian government, its development partners, and even the private sector deliver better services to the Indonesian people.

PLJ has also been successful in leveraging DFAT's financial support to attract external funding. Throughout Phase 1, this external funding includes approximately EUR 130,000 from GIZ to utilize a method called "positive deviance" to identify ways to improve agricultural performance, USD 48,000 from the World Food Programme (WFP) Indonesia to advance the vulnerability assessment tool VAMPIRE, and an additional USD 2 million from DFAT for the Banking on Fintech Project that looked at financial inclusion in Indonesia's micro enterprises.

However, PLJ's high performance and ability to attract external funding with a relatively small investment comes with a caution. Because of its relatively small envelope, even a seemingly small cut in funding in nominal terms can significantly compromise PLJ's operation. In particular, any funding cut would inevitably translate to a downsizing, since staffing makes up the bulk of the Lab's expenses. This would naturally lead to a reduction in the Lab's portfolio and the quality of its projects, as well as its ability to attract external funding.⁸

⁸ These considerations are taken into account in PLJ's sustainability plan, to be submitted to DFAT in July 2020.

LESSONS LEARNED

Nearing the end of 2019, PLJ conducted a “portfolio sensemaking” exercise, facilitated by the UN Bangkok Regional Hub’s Regional Innovation Center. The exercise allowed the entire PLJ staff to get together, look at our past work, and reflect collectively on what we had accomplished and identify ways to improve. This chapter draws heavily from that process and identifies three main lessons from Phase 1.⁹

Lesson 1: Strategic direction, project decision making, and portfolio management

Phase 1 saw a significant increase in PLJ’s presence as a data innovation lab in Indonesia and the Asia Pacific region, with a large portfolio covering several thematic areas. To note, a total of 66 projects were carried out in the course of three years between 2017 and 2019. While the volume of work is an achievement to be acknowledged, we learned that our decision making process on what to undertake lacked clear strategic rationale and effective communication within the team.

During the portfolio sensemaking exercise, about 70 percent of the staff presenting their projects in the sessions reported that they were not involved in the decision making process of the projects that they worked on. Staff also reported that they often did not have a clear grasp of the strategic value of the project. This implies a disconnect between decision makers and project executors. This disconnect also extended to project resourcing, which were often not communicated effectively to project team members.

To conclude, while our large portfolio in Phase 1 signals how much our partners valued our work, on the one hand, it also came at the cost of a clear strategic direction and, with that, perhaps stronger impact. Another cost that is equally important is the toll such a large portfolio took on our most valuable resources: our team members. PLJ team members’ technical capabilities, managerial capacity, and drive to deliver high quality work ensured that our services provided benefits for both our clients and the Lab. However, while this is a strength, it was evident that this practice could not continue without taking a toll on the team’s health and wellbeing.

The lack of strategic direction and a seemingly large appetite to take on large numbers of projects across a broad spectrum of topics is perhaps understandable for Phase 1. There was a need to firmly establish ourselves and our brand as a premier data innovation lab during what were still early stages of PLJ. This was effective in terms of the significant increase in our projects and partnerships during the 2017-2019 period. Moving forward, however, we cannot sustain ourselves operating under such conditions. For Phase 2, a clear strategic direction and a better portfolio management will be necessary, allowing us to deliver more meaningful and sustainable impacts. Decision making and resource allocations also need to be carried out through a consultative process with the staff. And perhaps most importantly, as an organisation we are committed to the team’s health and wellbeing.

⁹ An official report of the portfolio sensemaking exercise titled *Intelligence Report Pulse Lab Jakarta December 2019* was shared with DFAT in January 2020, and is also attached as an annex to this Completion Report. The intelligence report has also fed into PLJ’s strategy for Phase 2.

Lesson 2: Team linkages and organisational positioning

In hindsight, we realized that throughout Phase 1, many staff members were only vaguely aware of what other teams were doing-- likely another side effect of having a large portfolio. This resulted in PLJ missing the opportunity of effectively linking projects and leveraging different team's skills and capacity. Cross-team collaborations were not unheard of, but they were few and far between, all of which were more ad-hoc and accidental in nature, as opposed to occurring by design. What is heartening, however, is that when these collaborations did occur, everyone involved was always pleasantly surprised at the value of these collaborations.

The lack of team linkages described above also led to the Lab's inability to fully realize its mixed methods potential. At PLJ, we pride ourselves on our mixed methods capacity, with our portfolio becoming more diverse in terms of the mix between methods relying on big data and those relying on thick data. However, we realized that most collaborations between the Data Science and Social Systems teams were based around events instead of a blending of methods. During our collective reflection sessions, team members expressed that they lacked an understanding of how to approach "the other team" in order to get involved in projects that they found interesting. In short, our mixed method *capacity* had not translated into a mixed method *approach*. In retrospect, there were many projects and analytics that could have been significantly strengthened if only we designed it by combining both our data innovation and social research capabilities.

Another missed opportunity is related to PLJ's growing interest and capability in new analytical approaches. As mentioned previously, throughout Phase 1 we have built a strong brand that is centered around *real-time data analytics and human centred design*. However, during this period we have also built our capacity in *predictive analytics and incorporating behavioral insights*. We realize now that during Phase 1 we did not take the time to determine how to harness these emerging capabilities strategically. We also did not effectively update and communicate our brand to reflect the diversity and strength of our work that came about from the new capabilities that we acquired.

Finally, our collective reflection also revealed that we had yet to effectively select a subset of areas that can differentiate PLJ from other innovation labs in Asia Pacific. While Phase 1 was set up with five focus areas, several of them were very large; "protecting the poor and vulnerable" and "advancing the sustainable management of natural resources," for instance, could include just about any development work. Again, this might be because the need for PLJ to advertise our brand to the widest audience possible in Phase 1. Going forward, however, we will need to start defining more clearly our priority domains, based on our strengths, past demands from our stakeholders, and our staff's own interest.

Lesson 3: Helping partners to maximise the use of their tools

One of PLJ's main objectives is to equip our partners with fit-for-purpose tools. This can come in several different forms, mainly analytical insights, capacity building, and prototyping. With the first two tools, while our methods are innovative (through the use of big data, human centred design, etc.), the process themselves are quite straightforward: our analytical insights inform policy making decisions and our capacity building increases the ability of our partners to make use of data innovation. Throughout Phase 1, we continued to identify ways to help increase the likelihood of uptake of our analytical insights and ensure that our capacity building services are effective and relevant. To illustrate, the After Dark project did not stop with the publication of research; it was followed by a co-design workshop in Medan, one of the three cities where the field research was conducted, from which a set of practical recommendations emerged. This process significantly contributed to Medan City Government's decision to implement some of those recommendations for their public transportation policies.

Our prototypes, however, are a different kind of tool. Our prototypes are never meant to be used indefinitely by our partners in their original form. Instead, they are meant to demonstrate how big data and AI can be utilised to improve their operation. This, in turn, is expected to allow our partners to take the necessary steps to adopt, maintain, or modify those prototypes to fit their needs. Looking back, we have been quite successful in demonstrating how the potential of data innovation for development can be realised. However, there is a mixed track record in terms of how our partners were successful in adopting and maintaining those prototypes in the long run. It should be noted though that the question of whether an innovation lab like PLJ should go beyond developing prototypes and ensure that its partners have the ability to adopt and maintain them is not necessarily straightforward. Developing prototypes already requires a tremendous amount of resources. Providing our partners continuous support to adopt, maintain, and modify those prototypes requires further commitment of resources and time. If this role is also to be undertaken, we would be left with limited resources to develop new prototypes and instead would function as a full-time operator or contractor to develop and ensure effective operation of the tools we developed for our partners.

Having said that, it is still within the interest of PLJ that our partners not only understand the benefits of data innovation in improving their operations, but also have the ability to adopt and integrate said innovations into their organisations. And while it is neither strategic nor prudent for PLJ to function as a full-time operator or contractor for our partners, there is indeed an imperative for us to identify ways to allow our partners to maximise the use of the prototypes we have developed for them. Several alternatives to do this include strengthening the backend of our prototypes, thus making it easier for our partners to adopt and maintain them. Another option is to assist our partners develop a process to search for and procure services of commercial firms that can help them adopt and maintain the prototypes. Training sessions on how to utilise the prototypes that we have been providing to our partners can also include specific elements, which can help ensure that our partners have the knowledge of what is further required to maintain and develop prototypes. This could also be an avenue to obtain new resources to allow PLJ to mobilise and commit project personnel focussed on supporting partners to adopt and develop our prototypes to fully operational systems. In short, arrangements and/or agreements with partners for further resourcing beyond prototypes could be an option to consider also to support the longer term sustainability of PLJ.

WHAT THE FUTURE HOLDS

Phase 1 has truly been an important milestone in PLJ's journey. In the course of three years, we carried out 66 projects, effectively doubled our data sources, acquired and further developed new social research methods to strengthen our data innovation, expanded our services, established partnerships with a myriad of government and international development agencies, and established a strong presence not only in Indonesia, but also across the Asia Pacific.

Moving forward, we are committed to become more strategic and more focused on delivering measurable impacts. Our strategic documents for Phase 2 have included a clearer and more streamlined organisational logic and a more focused set of priority domains. Our organisational structure has also been revamped to allow more efficient use of available resources.¹⁰ Furthermore, PLJ is also committed to be more strategic in further mainstreaming gender equality and social inclusion in its work. This commitment poses a unique challenge for PLJ, since it mainly works using third party proprietary data, which do not provide any personal identification markers, including gender and disability. A strategy to incorporate gender equality in PLJ's work will be developed throughout the second half of 2020.

The success of Phase 1 and the efficacy of the strategy developed for Phase 2 are evident in PLJ's response to the COVID-19 pandemic that started in late first quarter of 2020. Projects related to disaster management in the 2017-2019 period have provided us with both the technical capacity and the network that are required for us to make an expedient pivot towards COVID-19 response.¹¹ Our established brand has also given us the credibility as a competent data innovation lab with mixed method capability, which drew government and development agencies to come to us to explore the use of big data, AI, and human centred design to respond to the pandemic in Indonesia and beyond. Our current portfolio now includes a total of 17 projects that are ongoing or in exploration and 1 concluded project, 12 of which are related to COVID-19 response. Nearly a dozen of the projects in our portfolio came at the request from the following partners:

- Government of Indonesia – BAPPENAS, BNPB, MoTrans, MoFA, West Java Province
- UN Agencies – UNWomen, WFP, FAO, UNFPA Asia Pacific, RCO-Data Strategy
- Donor Agencies and Programs – DFAT (Siap Siaga, KOMPAK, KSI), IDRC/SIDA
- Think Tanks/Research Institutions – MONASH, CSIRO, Empatika, KataData, SMERU

DFAT's continued support to PLJ has been invaluable in allowing us to support government agencies and development partners in Indonesia and Asia Pacific in making full use of data innovation, AI, and human centred design to improve lives and protect the planet. With the unprecedented pandemic in 2020, traditional data sources may not be as readily available while at the same time the need to rely on data increases significantly. In that light, PLJ's work in helping partners utilise alternative data sources only becomes even more important.

¹⁰ See Project Document for Phase 2.

¹¹ A Concept Note of PLJ's response to COVID-19 was shared with DFAT in March 2020. In May 2020, PLJ also communicated to DFAT via email our estimated funding allocation for COVID-19 response for 2020 and the subsequent years as a response to DFAT's request.

As a final note, it was clear by the end of Phase 1 that our partners value our work and many are willing to pay for the services that we provide. Several donor agencies also expressed interest in supporting the Lab with funding for specific focus areas. Meanwhile, with the increasing acknowledgement that data innovation can play an important role in development, competitive-based funding opportunities are becoming more common. PLJ is poised to leverage all of these funding opportunities, hence diversifying our funding sources and further ensuring the Lab's sustainability. Related to that, a sustainability plan is currently being developed and will be submitted to DFAT by July 2020.

We are confident that the next phase of PLJ will be even more exciting. With the successes of Phase 1 and equipped with the lessons we learned from those three years, we look forward to overcoming challenges and seizing opportunities with our partners in the years to come.

Research Activities

2017

TRACK 1

INNOVATION DRIVER

- Data Analytics
- Fit-for-Purpose Prototypes & Toolkits
- Data Platforms
- Strategic Exploration

Data Analytics

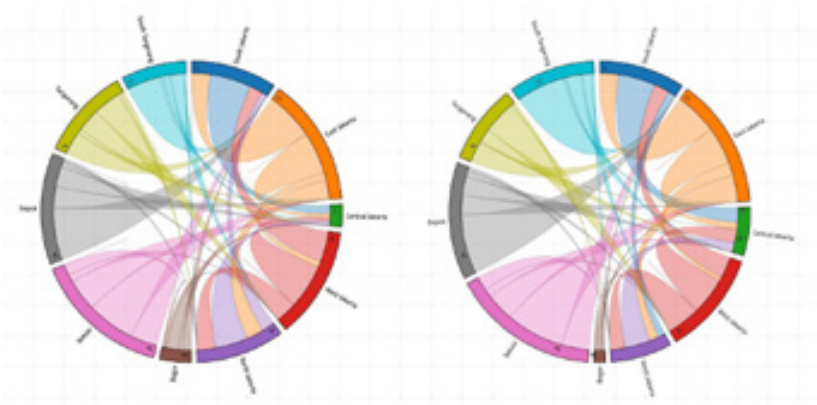
OPTIMISING PUBLIC TRANSPORT WITH TWITTER DATA

SDGs	Area of work
	 EXPLORE URBAN & REGIONAL DYNAMICS

Some estimates for Greater Jakarta put the population at more than 30 million people. Within the boundaries of the city itself, the transport system has to handle 1.38 million daily commuters. In collaboration with Jakarta Smart City and the Indonesian Institute of Statistics, PLJ investigated whether Twitter data could help provide policy makers with regular updates to best optimise public transport.

Origin-destination statistics for the 10 cities in Greater Jakarta were produced from GPS-stamped tweets, by identifying a subset of people who commute between these areas. The initial results were calibrated based on the population distribution and Twitter usage distribution, then verified with the Indonesian Bureau of Statistics' official commuting records.

The very high correlation between the official commuter flows and the commuting statistics inferred from Twitter (visualised in the chord diagram





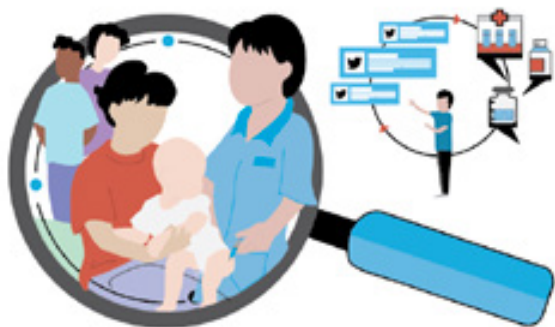
Official commuter flows (left) compared to commuting statistics inferred from Twitter (right)

above) confirms that geo-tagged tweets can reliably fill existing information gaps in the official commuting statistics. Additionally, the research team was able to accurately determine (based on comparison with the Indonesian Institute of Statistics data) the top two destination cities for people travelling from 8 of the 10 origin cities in Greater Jakarta, decreasing the cost related to conducting traditional surveys to figure out such commuting patterns.



PUBLIC PERCEPTION OF INDONESIA'S BIGGEST VACCINATION CAMPAIGN

SDGs	Area of work
	 PROTECT THE POOR AND VULNERABLE



The Indonesian Ministry of Health launched one of its biggest immunisation campaigns in 2017, focused on vaccinating 70 million children against the measles and rubella viruses.

Inspired by one of the Lab's past research projects which was done to understand public perception of immunisation based on analysis of social media signals, PLJ partnered with UNICEF to screen a collection of public tweets (timestamped around the launch of the vaccination campaign) to gain a broad view of Indonesians' perspectives, map influences on social media, and develop a system to flag any upcoming issues around vaccination.

The tweets collected were filtered using a prepared taxonomy and analysed through a series of approaches. The preliminary results indicated that majority of the tweets contained an appeal/invitation for individuals to participate in and support the campaign, while some anti-vaccine sentiments were observed to a much smaller degree.

ESTIMATING SOCIOECONOMIC INDICATORS FROM MOBILE PHONE DATA

SDGs	Area of work
  	 PROTECT THE POOR AND VULNERABLE

Building on past studies which show that data from mobile phones (in particular from call detail records and airtime credit purchases) can be used to understand socio-economic conditions, PLJ conducted research into the potential of using mobile phone data to produce a set of proxies for education and household characteristics.

Using anonymised mobile data from the Pacific island nation of Vanuatu, proxies for four statistical indicators were extracted from mobile phone data that was made available by a local carrier. These indicators included education, household assets, household expenditure, and household income.

The findings of the research confirmed a relatively strong correlation between indicators from the mobile dataset and data from the official statistics provided by the National Statistics Office in Vanuatu. The use of mobile phone data to estimate socioeconomic indicators advances other considerations that seek to develop reliable proxies based on such data to monitor and evaluate the SDGs.

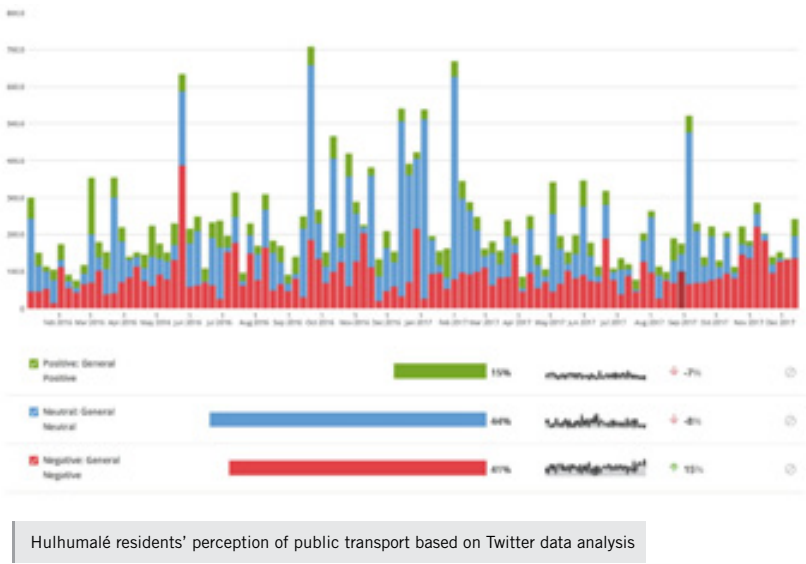


PUBLIC TRANSPORT ANALYSIS IN THE MALDIVES

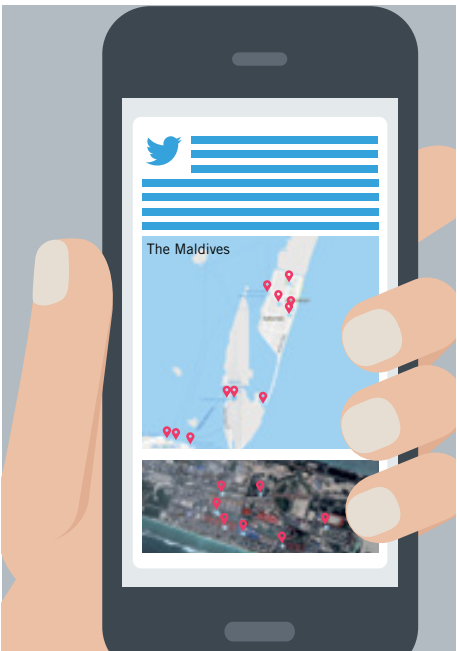
SDGs	Area of work
	

In the late 1990s, the Government of the Maldives began a reclamation project to develop the island of Hulhumalé in order to accommodate the growing population in Malé, the country's capital situated nearby.

Joining forces with our colleagues at UNDP Maldives and UNDP Bangkok Regional Hub, PLJ designed a pair of research projects to investigate urban mobility patterns using origin-destination analysis, and to perform sentiment analysis of public transport using Twitter data in order to better understand people's commuting experiences from Hulhumalé.

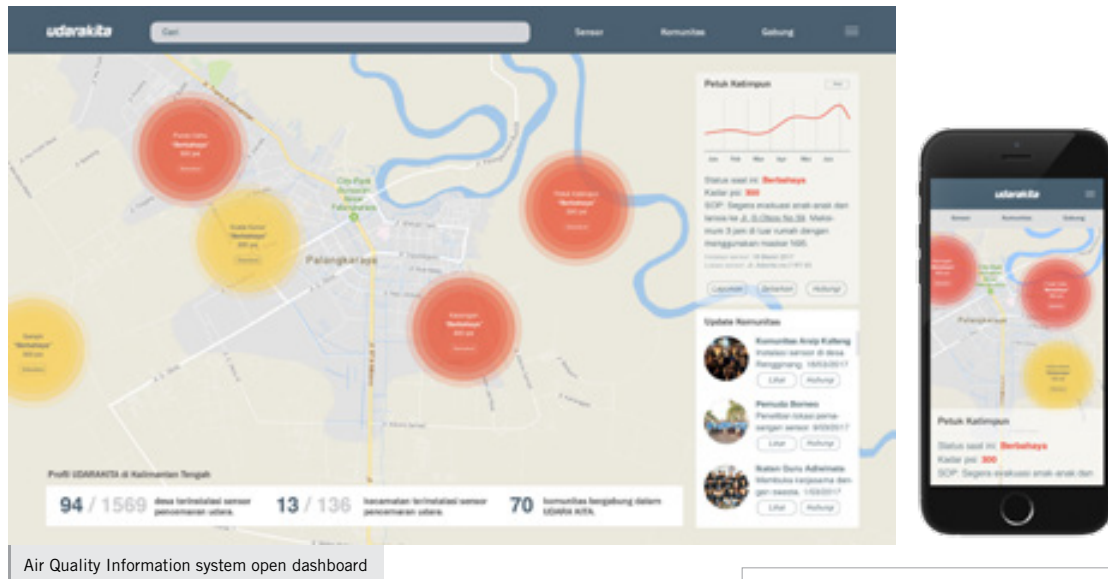


Though unable to conduct the origin-destination analysis due to a lack of geo-tagged tweets among people from Hulhumalé, our research team performed a series of sentiment analysis as a first step. At a macro level, the sentiment analysis (which confirmed that people had more negative than positive opinions of public transport services) was intended to provide a general understanding about citizen perceptions of public transportation, and accentuate any major issues that may be worth examining. The possibility of accessing alternative data sources to capture insights on mobility is being explored.



Fit-for-Purpose Prototypes & Toolkits

LOW-FIDELITY HAZE PROTOTYPES



From disrupted commutes to medical complications, there are numerous accounts in communities across Indonesia about how residents have been affected with the haze phenomenon. Shaped by PLJ's thick data/social research, Reality Check Approach's ethnographic research and the feedback from a preliminary prototyping Co-Design for Change workshop in Jakarta, a set of prototypes was designed to lessen the impact of air pollution from wildfires - designed with human-centered elements that are practical for stakeholders, including students, teachers, parents and community volunteers.

These prototypes include:



- a **school emergency plan** (entails designated locations where children can temporarily attend classes away from haze-concentrated areas);
- a **haze emergency kit** (consists of a mask, goggles, materials to seal open gaps/cracks, and do-it-yourself air filtration device); and
- an **air quality information system** (relies on community involvement as it is a system that requires a network of citizens to collect air quality information using sensors, as well as, to disseminate the information).



The haze emergency kit contains materials that can be used to seal gaps around doors and windows.

SDGs	Area of work
 3 GOOD HEALTH AND WELL-BEING	 11 SUSTAINABLE CITIES AND COMMUNITIES
 PROTECT THE POOR AND VULNERABLE	

A SERVICE DESIGN TOOLKIT

SDGs	Area of work
	 EXPLORE URBAN & REGIONAL DYNAMICS

Understanding the enabling environment of a particular project is necessary for effective development and delivery of service. This includes considering factors such as the social and political contexts and the relevant stakeholders in the network. Yet, navigating these terrains can be complicated and demands extensive amount of time and effort.

Pulse Lab Jakarta participated in a service design initiative to develop a citizen-centric public transportation service in Makassar - The Pasikola. Following the initiative, which was undertaken along with United Nations Development Programme (UNDP) and Bursa Pengetahuan Kawasan Timur Indonesia (BaKTI), we chronicled our learnings on taking an idea from a design sprint to a ready-to-test prototype in a toolkit.



The toolkit provides a guiding framework to help simplify some of these processes—in a practical and efficient way; it gives a bird's eye view of the challenges stakeholders are likely to encounter; and it outlines crucial tasks that need to be considered in order to ensure a top-quality service design and an effective delivery model. The toolkit was also designed with the hope that it may be used to steer the innovation process for conceptualising service design projects: moving from problem identification to tangible concepts, and from concepts to tested pilots.

A GUIDE TO PARTICIPATORY URBAN DATA COLLECTION & DESIGN

SDGs	Area of work
 	 EXPLORE URBAN & REGIONAL DYNAMICS



With more than fifty per cent of the world's population living in urban areas, designing solutions with communities and enabling citizens to be involved in urban planning are good participatory ideals, but how should a city go about doing so?

PLJ teamed up with Participate in Design to compile approaches to urban data collection and design from around the world to answer that question. The guide shares insights into how other cities have done, from initiating participatory urban data collection to realising participatory urban design.

While the 24 samples contained in the guide are not instructional blueprints due to their unique political, social, economic and other contexts, they are useful for replicating active citizen and public participation in imagining urban change.

WAWASAN SATU DATA TOOLKIT



SDGs	Area of work
 	 EXPLORE URBAN & REGIONAL DYNAMICS

For some data stewards working across Indonesia’s public sector, the many uses of the data they collect are not always immediately known. PLJ worked closely with the Executive Office of the President (KSP) to develop the *Wawasan Satu Data* toolkit. The toolkit is aimed at helping data stewards within the public sector holistically understand data governance policies and framework, which are particularly aligned with the draft Presidential Regulation on Satu Data Indonesia.



As facilitators of the toolkit testing workshops in 2017, both PLJ and The Executive Office of the President were tasked with unpacking the content of the toolkit (which includes an array of practical items from storyboards to help streamline data collection flow to a Satu Data dictionary to explain common terminologies used in data governance) and helping participants to understand each component. The testing stage, which is the final step for developing and finalising the *Wawasan Satu Data* toolkit, has three overarching objectives: to understand, plan and build a sustainable data governance system.

Makassar, Kulon Progo, Pontianak and Mojokerto were chosen as the pilot locations for the toolkit testing to help assess data governance guidelines relevant to local government, including at the city and district levels.




URBAN VULNERABILITY MAPPING

In 2015, PLJ provided a grant of 10,000 USD to the Urban Poor Consortium (UPC) as part of its Innovation Mini Grant Competition. The funds were used to conduct a two-month project called Mapping Vulnerability in Urban Communities. Partnering with Peta Jakarta and d-associates architects, UPC piloted a community-led data collection approach in two communities in Jakarta.

Based on popular demand from local stakeholders to learn more about the inner workings of the approach, UPC in 2017 shared its approach to participatory urban vulnerability mapping in the form of a toolkit. It is a step-by-step guide to participatory data collection, management, data visualisation and decision making in urban communities.

One of the long-term objectives of the toolkit is to help citizens identify and articulate their community challenges from their own data.



SDGs	Area of work
 	 EXPLORE URBAN & REGIONAL DYNAMICS



Data Platforms

TRANSLATOR GATOR 2

Creating taxonomies, better known as a sets of keywords, is an important step in analysing social media data. However, building a taxonomy of key terms for less-known languages, including local dialects and jargon, is often challenging.

In 2017, PLJ launched the second pilot of Translator Gator, a gaming platform designed to crowdsource the translation of disaster-related keywords in almost 30 languages spoken throughout the ten ASEAN Member States and Sri Lanka.

Almost 1.8 million activities across four gaming components (translation, evaluation, classification and synonyms) were recorded within 100 days. The platform is a proof of concept which exhibits how translations that have been crowdsourced online can help relevant authorities understand the conversations/behaviours of local communities during a disaster.



Translator Gator user interface







www.translatorgator.org

SDGs	Area of work
 	 PROTECT THE POOR AND VULNERABLE





HAZE GAZER EXPANSIONS

SDGs	Area of work
  	 PROTECT THE POOR AND VULNERABLE

In Indonesia, where forest and peatland fires can be annual occurrences, the Government relies on timely and effective means of tracking and managing the impact of these events.

Haze Gazer is a crisis analysis and visualisation tool, which PLJ developed to provide real-time insights on the locations of fire and haze hotspots; the strength of haze in population centres; insights on the locations of the most vulnerable cohorts; and the response strategies of affected populations (including in-situ behavioural changes).

In 2017, the platform evolved in twofold: 1) it became an open platform, accompanied with a mobile phone version that enables users to conveniently utilise it on the go; and 2) the platform expanded to Singapore where it is also being combined with mobility data to gather insights that can better inform the haze crisis.



PLJ's data engineer explaining features of the Haze Gazer platform to UN Resident Coordinator in Indonesia, Anita Nirody (far right) and other guests during a visit to the Lab.

www.hazegazer.org

VULNERABILITY ANALYSIS MONITORING PLATFORM FOR IMPACT OF REGIONAL EVENTS

SDGs	Area of work
<div> <div>2</div> <div>ZERO HUNGER</div> </div> <div> <div>6</div> <div>CLEAN WATER AND SANITATION</div> </div> <div> <div>13</div> <div>CLIMATE ACTION</div> </div>	<div>  <div>PROTECT THE POOR AND VULNERABLE</div> </div>



www.pulselabjakarta.org/vampire

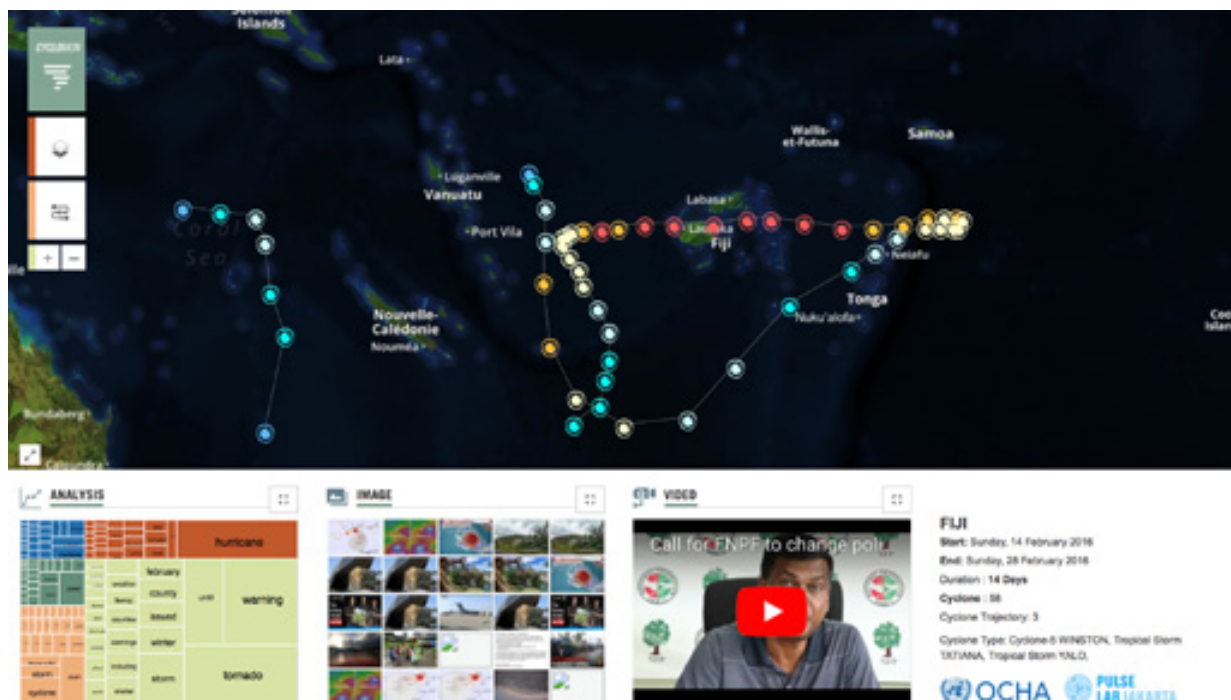
Responding to the challenges which the 2015 El Niño-induced drought placed on communities in Indonesia, PLJ teamed up with the World Food Programme and the Food and Agriculture Organisation to develop an integrated, multi-tier tool that provides near real time analysis on the impact.

Known as VAMPIRE (VuLnerability Analysis Monitoring Platform for Impact of Regional Events), the tool has three layers and utilises several sources of Big Data. These sources include population data, national socio-economic data, household food security data, rainfall anomaly data, standardised precipitation index and vegetation health index.

In 2017, VAMPIRE scaled up to Sri Lanka. Beyond a one-way transfer of tech, it was contextualised to the country with improvements to aid the efforts of Sri Lankan Ministry of Disaster Management. The most recent iteration includes additional databases and indicators that now enable flood impact analysis. The team is currently working to develop additional layers.

VAMPIRE was one of the winners of the 2017 WFP Innovation Challenge.





CYCLONE MONITORING PLATFORM

SDGs	Area of work
<div> <div>11 SUSTAINABLE CITIES AND COMMUNITIES</div> <div>13 CLIMATE ACTION</div> <div>15 LIFE ON LAND</div> </div>	<div> PROTECT THE POOR AND VULNERABLE </div>

Big Data plays a pivotal role in helping disaster authorities to enhance preparedness, including their ability to monitor and respond to natural disasters like cyclones. In 2017 PLJ developed CycloMon, an analytics and visualisation platform with capabilities to monitor action before, during and after cyclones across the world.

Its basic functions rely on a series of automatic processes that collect, analyse and visualise information from weather satellites on the path of a cyclone, combined with insights





www.cyclomon.org

from social media and baseline information on the preparation for and impact of the cyclone on communities.

With functionalities similar to Haze Gazer, our haze crisis analysis tool, CycloMon allows for the exploration of rich, country-specific information mined from various sources of social media, such as text-, image-, and video-based content.

Strategic Exploration

MARITIME TRANSPORT NETWORK ANALYSIS

SDGs	Area of work
	 IMPROVE TRADE & COMPETITIVENESS

Maritime transport is important for economic development in the littoral member states of the Association of Southeast Asian Nations. Global marine vessel automatic identification system, in particular, is a key instrument for analysing the maritime transport network.

Together with academics from across Indonesia, PLJ analysed current port connectivity in South-East and East Asia and the further integration of the existing network under the Tol Laut development plan.

Our analysis indicates that the implementation of Tol Laut can reduce network dependency on Singapore by eight per cent



and on Tanjung Priok by 24 per cent. In terms of network efficiency, when Bitung becomes a hub port for Eastern Indonesia, as foreseen by Tol Laut, the study suggests that this should lead to an increase in efficiency by 20 per cent when compared to the current network.

USING HUMAN CENTERED DESIGN TO UNCOVER PAIN POINTS AT INDONESIAN PORTS



Indonesia ranked 63rd in the Logistics Performance Index in 2016, scoring low in almost all key measures, including timeliness. Together with the Australia Indonesia Partnership for Economic Governance (AIPEG), PLJ conducted a study on how to improve the import experience in

Indonesia to contribute to the country's trade competitiveness.

While the study started out with an investigation into how port dwelling times affect the import process, pain points beyond the dwelling time were revealed, such as the barrier of a distrust of the overall system paired with issues of interrupted information flows.

Among a handful of other implications, the findings suggest that redesigning the current multiplatform online system into a single hub that can track all imported goods would tremendously reduce the administrative strains and burdens.

SDGs	Area of work
 	 IMPROVE TRADE & COMPETITIVENESS



DIVING INTO MDGs DATASETS TO INFORM THE SDGs



The implementation of the new Sustainable Development Goals (SDGs) has brought about challenges, especially concerning data collection and availability. During one of the Lab's Research Dives in 2017, researchers gathered to analyse publicly available data on the previous Millenium Development Goals across 34 provinces in Indonesia.

The team developed a set of proxies for currently unavailable SDG indicators, one of which included *the proportion of population using safely managed drinking water services* (this was done by using multiple measurements including the proportion of population below poverty line, the proportion of population consuming clean water, and the proportion of population with access to improved sanitation).

Along with our team at the Lab, the guest researchers looked at elements of correlation (to discover statistically meaningful correlations among MDGs indicators); causation (to reveal any causal relationship among MDGs indicators); quality of data (to analyse and improve the quality of the dataset); and data disaggregation (to propose a set of statistical methods to disaggregate Indonesian data by gender, age, and at the subnational level) with a view to filling data gaps and better understanding the relationships among the SDGs indicators now being implemented.



Millennium Development Goals (MDGs)



IDENTIFYING OPPORTUNITY AREAS FOR FLOOD MITIGATION

SDGs	Area of work
	 EXPLORE URBAN & REGIONAL DYNAMICS



Community members in Sukagalih, Bandung work together to clear the streets of debris in an effort to reduce flooding.

The Bandung locale has faced repeated flooding over the years. Experts have pointed to the decrease of green space, inefficient waste management system and inadequate drainage capacity as contributing factors. Information pertaining to these factors are scattered throughout different government units—and are often dated.

Considering Bandung's Smart City endeavours on urban development and aiming to identify opportunity areas for flood mitigation, PLJ research team immersed in the community and surveyed multiple stakeholders while uncovering their journeys during these untoward events.

Two key points emerged:

- 1) Flood mitigation is a joint effort that requires cross-institution and cross-administration coordination, covering the scope of preparedness, response as well as recovery efforts.
- 2) While existing throughout different government units, without a sense of holistic coordination, the available data related to floods cannot be properly utilised.

In 2018, our social systems team hopes to expand its research to further unearth community-based solutions.

TRACK 2

ECOSYSTEM CATALYST

- **Connecting Practitioners, Academics & Policymakers**
- **Supporting Communities of Practice**
- **Reducing Barriers to Adoption**
- **South-South Cooperation**

Connecting Practitioners, Academics & Policymakers

DATA REVOLUTION FOR POLICYMAKERS CONFERENCE

SDGs	Area of work
	   



The ongoing data revolution is transforming our ability to sense changes in our economies, societies and environment. To take stock of progress in Indonesia, Pulse Lab Jakarta co-hosted an international conference in February 2017 under the theme, “Expanding the Evidence Base: Government Demand for Advanced Data Analytics in Indonesia”.

With more than 250 participants in attendance over a two-day period, contributions came from researchers, policy makers, activists, data analysts, entrepreneurs, civil society organisations, UN agencies and government representatives. The conference was also co-hosted by KSI (Knowledge Sector Initiative) and the Indonesian Ministry of National Development Planning (Bappenas).

The conference was structured into plenary sessions and data clinic sessions. During the plenary sessions, representatives from the Indonesian government, the UN, as well as from public and private entities addressed a number of topics, including: taking stock of the data landscape, applications of real-time data for decision making, the policy side of data innovation, synchronising and sharing data, forging data partnerships, reconfiguring citizen engagement, and making sense of the overall data.

Data experts among these groups also headed prototype cafe sessions, where they displayed several applications used for real-time data analysis and decision making. Altogether, the prototype cafe sessions were a showcase of work and advanced data analytics tools that can be used to capture citizen opinions, visualise information and provide new insights on behaviour, livelihoods, and economic activity to improve service delivery.

The data clinic sessions, on the other hand, aimed to facilitate direct dialogue between experts and participants on particular topics, as well as to share hands-on skills related to a certain aspect of data innovation. The conference broadly highlighted how new technologies and data could better inform policy making.



RESEARCH DIVE FOR DEVELOPMENT

SDGs	Area of work
	    

To broaden research engagement within the Big Data ecosystem, Pulse Lab Jakarta regular invites analysts and academics to participate in a three-day, hackathon-style research sprint at the Lab. Dubbed 'Research Dive for Development', during this event participants dissect and mash up various datasets related to development and humanitarian issues in Indonesia and across the region.



In 2017, PLJ organised three Research Dives under the themes: statistics for the Sustainable Development Goals (SDGs), trade and competitiveness, and transportation. As customary, a technical report was produced for each Research Dive, which includes technical papers on methodologies, findings and recommendations put together by the teams. Some participants from the Research Dives have also had their papers accepted to national/international journals and conferences.

Since its inception in 2016, participants from 85 universities, 12 government institutions and 5 research institutions/NGOs have taken part. We were also pleased to partner with private sector data partners, such as OLX Indonesia, Twitter, and PT Jasa Marga (Indonesia Highway Corp.), who were all generous to share selected anonymised datasets for us to research.



Our Research Dive tradition centers on giving an opportunity to researchers from different institutions and a variety of disciplines to network and share expertise, discovering new insights that can be useful for policy prescriptions while laying the foundation for new collaborations. A four-city reunion for past participants is being planned for the first quarter of 2018.

Supporting Communities of Practice

ECOSYSTEM MAPPING OF INDONESIAN START-UPS





In Indonesia, social entrepreneurs often face the difficulty of securing credit, especially for marginalised groups that do not have enough collateral. Accessing credit though is crucial for boosting entrepreneurship and promoting self-employment across the entire Indonesian landscape.

One of the patterns observed is that many enablers/investors tend to focus on accelerating the efforts of social enterprises that are located on the most populated island, Java. Thus to expand opportunities to other parts of the country, Platform Usaha Sosial and PLJ designed an online ecosystem mapping tool that surveys the venture capitals of start-ups in Indonesia, in part to help new start-ups find suitable funding support.

Through the use of interactive map visualisation, enablers/investors can see the distribution of social enterprises in Indonesia. The interactive map not only shows their locations, but also displays information about the SDGs parameters, target market, and other information related to social enterprises. At the time of its creation, the tool's database included more than 500 social enterprises.

SDGs	Area of work
 	 IMPROVE TRADE & COMPETITIVENESS

BIG IDEAS COMPETITION

SDGs	Area of work
	 PROTECT THE POOR AND VULNERABLE

PLJ's 2017 Big Ideas Competition - organised under the theme "combating climate change" - received 160 proposals from applicants throughout ASEAN Member States, Sri Lanka and the Republic of Korea. Aligned with the UN's Sustainable Development Goal #13 (Climate Action), the competition sought original, data-driven ideas to monitor climate related indicators.

The first batch of proposals underwent evaluation from a committee of experts with diverse backgrounds in climate change, disaster response and innovation. Following that, 12 proposals were selected to advance to the second round based on the quality of the idea, the importance of the issue addressed, use of more than one source of data, as well as the ability to be implemented.

The competition awarded 11 teams, of which the grand prize went to a team from Myanmar, which conceptualised an application to help monitor and assist in the reduction of methane emissions through insect consumption. The challenge inspired new approaches and facilitated connections between data communities and technology innovators across the region.



IMPROVING MOBILITY IN BANDUNG

SDGs	Area of work
 	 EXPLORE URBAN & REGIONAL DYNAMICS

Nearly two million passengers in Bandung can be transported by *angkot* minibus annually. And yet, only one third utilises this mode of transport, while the number of private vehicles in the city continues to increase.

Following the city government's launch of the Bandung Urban Mobility Project, PLJ along with a few partners (Data Science Indonesia, Hivos and Code4Bandung) kicked off a data-driven initiative to assess the project's progress and to help shape some realistic goals.

Taking the form of a series of ideation workshops with players from local communities, it was revealed that there are several ongoing approaches with similar goals. So, to better



Elementary school students in Bandung participate in a #Walk2School campaign

synchronise current and future activities aimed at improving mobility in the area, we gleaned and highlighted the need to:

- Consider transit-oriented development as a long-term goal.
- Optimise existing capacity with real-time data analytics.
- Improve the public transportation experience.
- Reduce private vehicle usage.
- Transform the behavior and attitude of road users.

SUPPORTING THE INNOVATION AGENDA IN SRI LANKA

SDGs	Area of work
	   



Photos Courtesy of UNDP Sri Lanka

Drawing from PLJ's own experience as an innovation lab, in 2017 we collaborated with UNDP Sri Lanka to assess the organisational and ecosystem readiness for an innovation lab in Sri Lanka. We utilised a human centered design approach during the scoping mission, focused on obtaining the stories, experiences, and needs of those who might be potentially involved and impacted directly by the lab.

The scoping mission took place as the first step in a two-pronged process to develop the Lab. Subsequent to the scoping mission, we conducted a multi-stakeholder workshop, which stimulated some of the lab's approaches and the interaction between different stakeholders to identify potential clients. In addition, we looked at some of the challenge areas that could be tackled in the early phase of the lab, while identifying which approaches and skill sets would be the most relevant for the lab to add value to Sri Lanka's innovation ecosystem.



Supporting the establishment of a Policy Innovation Lab as a safe space to test out innovative policy prototypes, our pre-assessment approach entailed in-depth interviews, concept testing, ideation and prototyping workshops.

Reducing Barriers to Adoption

BANKING ON FINTECH: FINANCIAL INCLUSION FOR MICRO ENTERPRISES IN INDONESIA

SDGs	Area of work
 	 

Micro and small-to-medium enterprises (MSME) in Indonesia employ more than 107 million people, contributing to more than half of the country's GDP. In 2016, the Government launched a National Strategy for Financial Inclusion, which aims to provide regulatory support for banking institutions as they work to guarantee more Indonesians' access to financial services.

With the support of the Department of Foreign Affairs and Trade (DFAT), Australia and in collaboration with the Indonesia Fintech Association (AFTECH),



PLJ kicked off a research project called 'Banking on Fintech: Financial Inclusion for Micro Enterprises in Indonesia'.

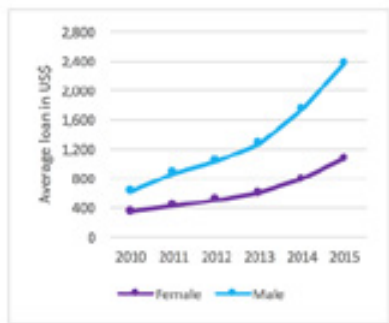
To promote resilience and growth within Indonesia's unbanked micro business sector, the research aims to understand the experiences of early fintech adopters among those enterprises, as well as contribute to the Government of Indonesia's financial inclusion goals by uncovering behavioural and data analysis insights on micro enterprises as potential users of financial technology. We are currently developing partnerships with those who have committed to supporting the financial inclusion agenda and aim to incorporate our findings to create prototypes by mid-2018.

THE GENDER GAP IN FINANCIAL INCLUSION

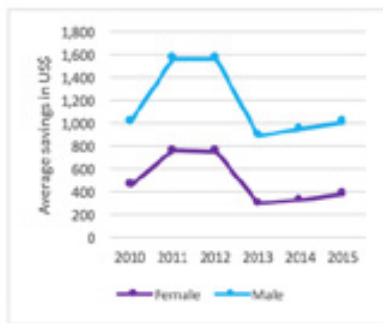
SDGs	Area of work
<div>5</div> <div>Gender Equality</div> <div>10</div> <div>Reduced Inequalities</div>	<div>Financial Inclusion</div> <div>Financial Literacy</div>

Globally, there has been great progress in advancing financial inclusion. However, there remains a gender gap in account ownership, savings, credit, and payments behaviour. The UN Capital Development Fund (UNCDF) SHIFT Programme and PLJ teamed up to support four financial service providers and the regulator in Cambodia in analysing anonymised financial records.

The research project has curated around 5.4 million anonymised savings and loan records from 2.6 million customers to examine savings account dormancy and borrower exit, and to improve financial service usage. Our data analysis suggests that while men and women have equal access to credit and savings services in



(a) Average Loan Amount in US\$



(b) Average Savings Amount in US\$

the region, the actual usage patterns in terms of the loans and savings amounts mobilised are much lower for most women.

These results highlight the need to tailor individual loan products better to the specific needs of women, and that there can be more extensive promotion of term deposits over savings accounts.






BUILDING DEMAND FOR DATA ANALYTICS THROUGH COLLABORATIVE RESEARCH



Policy analysts within Bappenas participating in one of Pulse Lab Jakarta's data innovation clinics.

We teamed up with our main government counterpart, the Indonesian Ministry of National Development Planning (Bappenas), to host a seminar in 2017 showcasing our collaborative research on using new data sources and advanced data analytics to monitor the dynamics of Indonesia's economy.

During the seminar, four different Directorates presented the results of their research to a broader Bappenas audience. PLJ's role in this forum was to moderate the discussion and answer technical questions on data analytics. The bulk of the discussion, however, was between Bappenas sector experts, technical advisors, and policy analysts on how best to utilise new data sources to complement existing analysis on upcoming national planning priorities.

SDGs	Area of work
	   

In addition to discussing the benefits of integrating different data sources, it was also good to observe a lively debate around the flaws and limitations of some of the approaches. Several members of the audience also raised the point that, although concepts like perception analyses can be useful if used appropriately, optimal use of Big Data analytics means looking beyond social media data and thinking critically about which data sources would yield the best insights.



2018

TRACK 1

INNOVATION DRIVER

- ▶ Exploring Insights from New Data Sources
- ▶ Equipping Partners with Fit-For-Purpose Tools and Methods
- ▶ Uncovering Behavioural Insights to Complement Data Analytics





Exploring Insights from New Data Sources

MOBILE NETWORK DATA

Over the course of 2018, Pulse Lab Jakarta made significant progress in mining anonymised mobile network data to inform public policy and humanitarian action. We define mobile network data as the information elements contained in anonymised call detail records (CDRs) created by mobile network operators for billing purposes. CDRs summarise anonymous mobile subscribers' activities, such as phone calls, text messages and data connections, but contain no information on their content. As this data is uniquely detailed and tractable, it can capture information not easily found from other sources at a scale that would be difficult to recreate through other means. Once anonymised and aggregated to appropriate levels, mobile network data can provide a variety of insights with value for development partners. Throughout the year, we conducted mobile network data analysis covering various phenomena including internal migration, socio-economic structures and forced displacement associated with extreme events. These research projects contributed to knowledge and policy on addressing poverty and responding to natural disasters.

RURAL TO URBAN MIGRATION

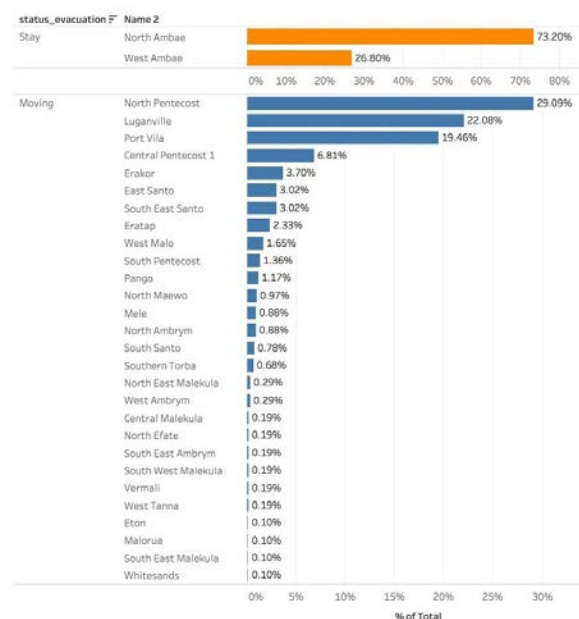
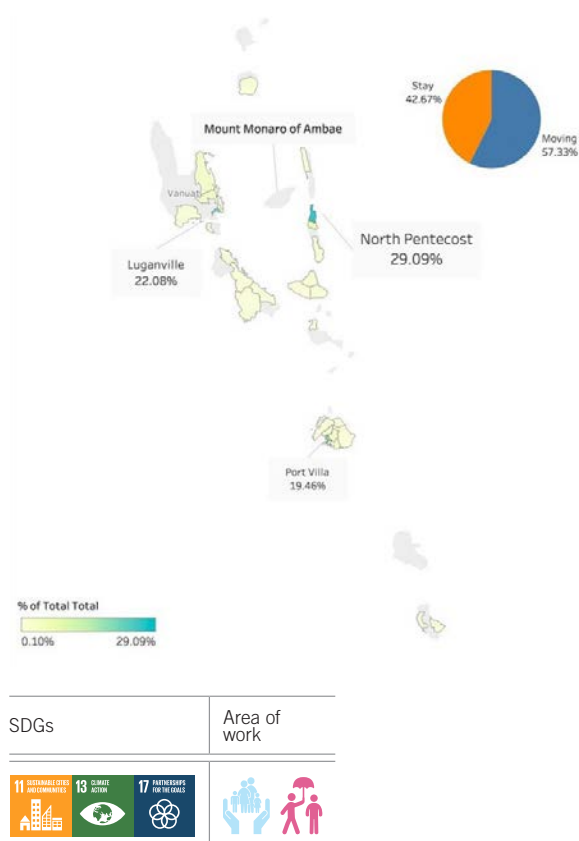
Commissioned by the World Bank, Pulse Lab Jakarta and Empatika conducted research into the experiences of rural to urban migrants in Indonesia. PLJ led the quantitative component of the project which used mobile network data from Telkomsel and XL to develop statistics on the source communities of migrants and magnitude of short term migration to seven major cities across the country. The analysis informed the targeting of the qualitative research conducted by Empatika as well as generated new insights on migration, finding that internal migration is significantly underestimated in official statistics.

SDGs	Area of work
  	 EXPLORE URBAN AND REGIONAL DYNAMICS



DISASTER RESPONSE

In partnership with Digicel, Pulse Lab Jakarta has been engaged in a research project (funded by the UN Delivering Together Facility) to mine mobile network data for insights on natural disasters. Covering the Highlands Earthquake in Papua New Guinea and the Ambae Volcano in Vanuatu, PLJ has developed insights on internal displacement to inform the targeting of humanitarian assistance. Our analysis indicated that not only can mobile network data be used to map evacuations in near real-time, but there is also the potential of building predictive models for evacuee destinations. In Vanuatu, the analysis created operational impact as the Ambae Volcano erupted again in August 2018, and the Government requested insights on citizen displacement, which PLJ delivered in a timely manner.



Insights on the evacuation destinations of anonymous mobile phone subscribers, submitted during the August 2018 state of emergency on Ambae island

Conducting multifractal analysis of the network signals in Vanuatu, we found that regularity existed in the signals. The finding confirms the value of the data set as a source of insights on social phenomena and anomalies, such as natural disasters. Building on this research, we analysed the impact of Tropical Cyclone Donna on population flows and subscriber behaviour in Vanuatu, finding that the data set contained many useful signals of relevance to policy makers. We closed out the year by preparing baseline information on Samoa so that we are ready to conduct analysis and provide useful insights should a cyclone impact the country over the coming months. The preparation included mapping the locations of storm shelters to understand which cell towers might see an increase in load during a cyclone; understanding the ratio between subscriber density and population density to develop rough scaling factors for population flows; descriptive analysis of the different frequencies of commuting and migration between administrative units; and descriptive analysis of the social network.

POVERTY MAPPING

SDGs	Area of work
	

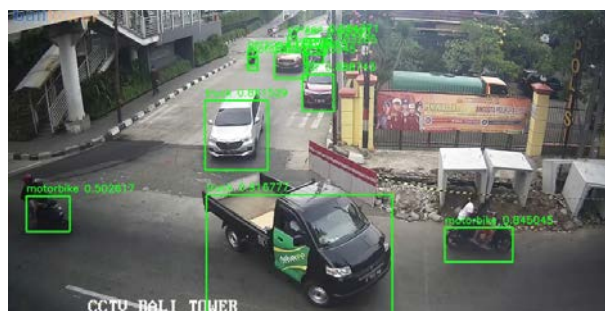


Relative wealth index predictions for Papua New Guinea at the district level

Funded by the UN Delivering Together Facility, and in partnership with UN DOCO, the UN Country Team in Papua New Guinea and Digicel, Pulse Lab Jakarta developed a model to predict wealth and poverty at a high degree of spatial granularity based on mobile network data and a survey of mobile network users. This project was inspired by similar work conducted in Rwanda by a team of academics. Our aim was to replicate the methods and operationalise the approach to inform development practice, which is of particular relevance due to the data sparse context. The predictions from the model will be compared to findings from the ongoing demographic health survey to understand the accuracy of these predictions in the context of the general population - not just mobile network users. The United Nations in PNG is using the findings to target better area-based development programmes, and plans to re-run the model for more frequent impact tracking.

CCTV DATA

USING DEEP LEARNING TO TACKLE TRAFFIC SAFETY IN JAKARTA



Objects are detected and classified into different categories

SDGs	Area of work
	 EXPLORE URBAN AND REGIONAL DYNAMICS

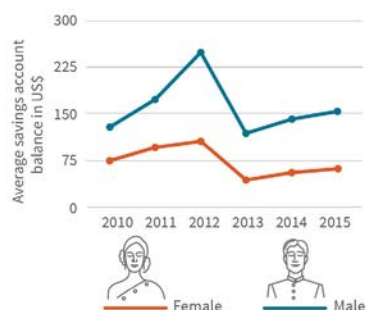
Pulse Lab Jakarta together with Jakarta Smart City had the opportunity to participate in the University of Chicago's Center for Data Science and Public Policy annual Data Science for Social Good fellowship, a summer programme training aspiring data scientists to work with government and non-profit partners on innovative projects with social impact. Our project analysed CCTV data in Jakarta for the purpose of improving traffic safety, and was selected as one of the global challenges that the fellows took on for their three-month programme. Deep learning methods were used to identify objects in the video frames - a task that humans can do well but one that is labour-intensive and hard to scale, making computer vision a more efficient approach. These tasks helped in the realisation of a pipeline that converts raw, unstructured video frames into data on traffic flows and traffic safety. The approach is now being integrated into Jakarta Smart City's information systems, and scaled to cover the 3000 or so CCTV cameras at traffic intersections in Jakarta. A research paper on the project received a Highlighted Paper Award at the NIPS 2018 AI for Social Good workshop.

FINANCIAL DATA

MICROFINANCE CUSTOMER JOURNEY IN CAMBODIA

Average Savings Mobilization by Gender

a) Average Savings Accounts Balance in US\$

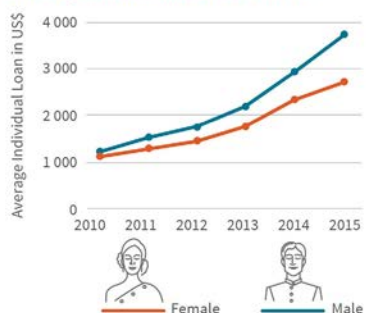


b) Average Term Deposit in US\$

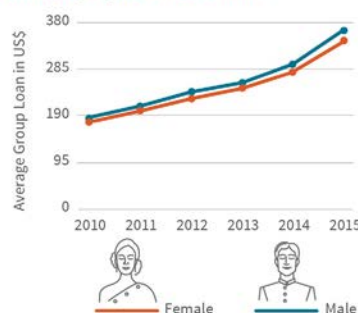


Average Loan Mobilization by Gender

a) Average individual loan amount in US\$



b) Average group loan amount in US\$



Microfinance can improve the lives of individuals who don't have access to traditional banking services, which can be especially useful for low-income earners in times of financial uncertainties.

UNCDF-SHIFT programme together with Pulse Lab Jakarta studied the journey of a group of microfinance customers in Cambodia using data from four leading microfinance institutions, finding significant gender and youth gaps in average loans and savings mobilisation across the country.

PLJ is conducting further studies on customer segmentation, network analysis and adaptive capacity, which are expected to reveal insights on the types of customers, as well as patterns of short and long term resilience to climate shocks. More broadly, the research aims to gather insights on ways to improve microfinance services in order to accelerate national economic growth.



SDGs	Area of work
<div>5 GENDER EQUALITY</div> <div>8 DECENT WORK AND ECONOMIC GROWTH</div> <div>10 REDUCED INEQUALITIES</div> <div>17 PARTNERSHIPS FOR THE GOALS</div>	

ATM TRANSACTION ANALYSIS

Pulse Lab Jakarta and the Department of Statistics at Institut Teknologi Sepuluh Nopember investigated whether it is possible to infer the level of income from the mobility data contained in anonymised ATM transactions. The research examined human mobility based on the locations of ATMs where the transactions occur, and their relationship with users’ income levels. Emphasis was placed on low income segments of the population in order to ascertain poverty-related insights. The links between different patterns of human mobility and income that we uncovered are useful for interpreting insights from other big data sets. The results, which are based on debit card transaction records from an Indonesian bank, suggest that with regards to ATM withdrawals, men are more mobile than women, and in general those with higher mobility tend to be younger than 40 years old.



SDGs	Area of work
<div><div>1 NO POVERTY</div><div>8 DECENT WORK AND ECONOMIC GROWTH</div><div>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</div><div>17 PARTNERSHIPS FOR THE GOALS</div></div>	<div><div></div><div></div></div>

FINANCIAL INCLUSION DATA DIVE

Across Indonesia, new data are being generated that provide opportunities for financial institutions and those in the policy-making domain to understand the needs of different communities so as to increase their access to financial services and products. To examine the various dimensions of financial inclusion and its significance for Indonesian society,

as well as the progress made and challenges that are ahead, Pulse Lab Jakarta invited researchers, policymakers and domain experts to participate in a data dive at the Lab with the goal of answering pressing policy and development questions.

The research focused on measuring financial awareness and financial literacy based on social media data; measuring financial access based on information regarding both financial institutions and non-financial institutions; modelling gender-based differences in financial inclusion; and assessing the impact of digital opportunity on financial inclusion. The preliminary results were presented to representatives from the Indonesian Government (the Financial Services Authority, Secretariat for the National Council for Financial Inclusion and Statistics Indonesia), Indonesian Fintech Association and research think tanks who offered comments on how the analyses can be refined to fast track financial inclusion efforts in the country.



Location of Financial and Non-financial Institutions in Pontianak
● Bank ● ATM ● Indomaret ● Alfamart

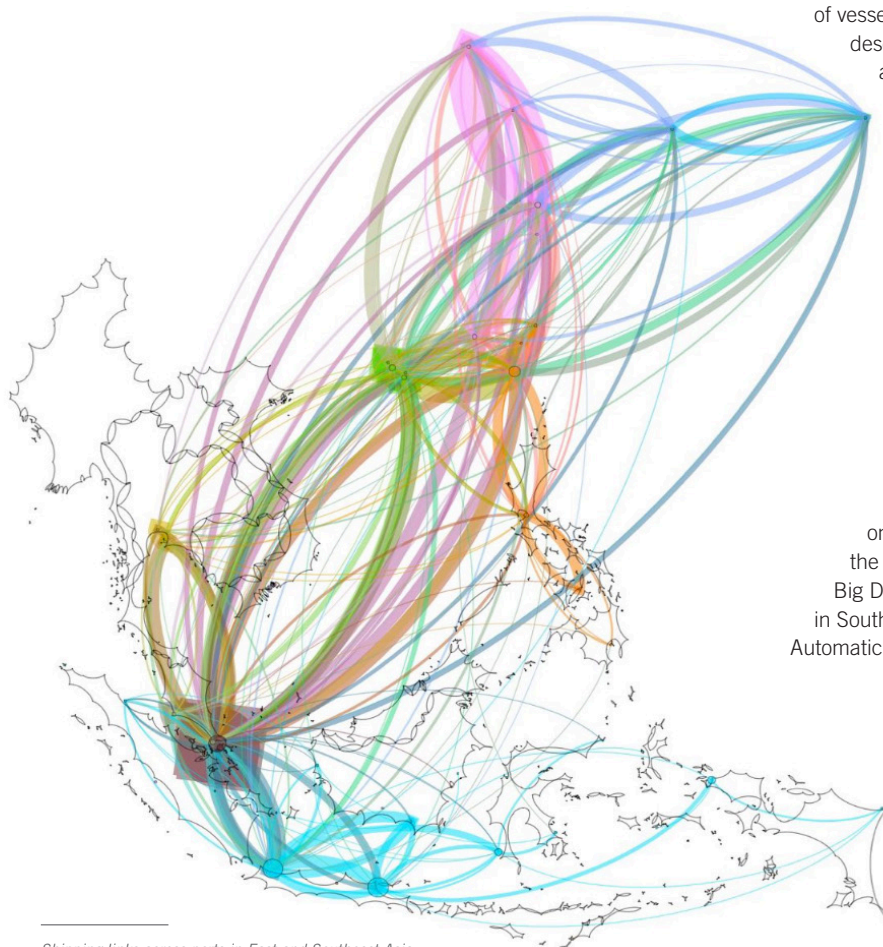
SDGs	Area of work
<div><div>5 GENDER EQUALITY</div><div>8 DECENT WORK AND ECONOMIC GROWTH</div><div>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</div><div>17 PARTNERSHIPS FOR THE GOALS</div></div>	<div><div></div><div></div><div></div></div>

SHIPPING DATA

PORT NETWORK ANALYSIS FOR DEVELOPMENT POLICY

SDGs	Area of work
   	 IMPROVE TRADE AND COMPETITIVENESS

The Automatic Identification System (AIS) is a tracking system used on ships and by vessel traffic services. Alongside its practical application to maritime safety, AIS is useful for research on a variety of topics. Based on a request from the Directorate of Macroeconomics and Statistical Analysis in Bappenas and an initial analysis (conducted at our previous data dive on trade and competitiveness) of port network connectivity using AIS data, further analysis was conducted using the data set with a view to informing maritime development policy.



Shipping links across ports in East and Southeast Asia

The research included developing summary statistics of vessel activity at ports across Indonesia, describing the evolution of the port network across Southeast Asia over the past few years, and predicting how the maritime network in Indonesia and across the region will evolve given specific scenarios -- including with and without *Tol Laut*, a major marine infrastructure investment programme promoted by the Government of Indonesia.

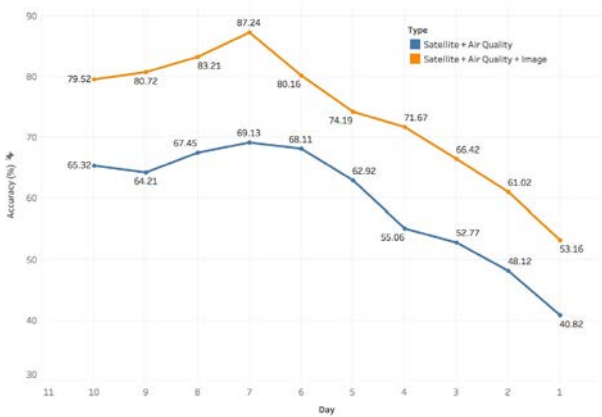
Initial findings suggest that the implementation of *Tol Laut* can reduce network dependency on Singapore by roughly 8 per cent and on Tanjung Priok by 24 per cent. At the 2018 Indonesia Development Forum, one of our Research Dive alumni received the best paper award for her forward-thinking Big Data research on analysing port connectivity in Southeast Asia using Global Marine Vessel Automatic Identification System data.

SOCIAL MEDIA DATA

NOWCASTING AIR QUALITY USING TWITTER



In some communities in Indonesia, real-time air quality information is not available, which is crucial for improving response efforts in regions affected by wildfires and haze. This gap inspired our data science team to develop a model that leverages real-time sensing and integrates social media images. The model produced at best, 87.24 per cent forecast accuracy - an improvement of 18.11 per cent compared to the baseline model (that uses only satellite and air quality information) based on 2014 data from Pekanbaru, Riau. Pulse Lab Jakarta has also been working closely with the National Information Resources Service in the Ministry of Interior Safety of the Republic of Korea to provide technical assistance for a similar model that the Ministry is developing to monitor the prevalence of fine dust particles in the Republic of Korea.



Comparing the performance of both models

SDGs	Area of work
<div><div><div>3</div><div>GOOD HEALTH AND WELL-BEING</div></div><div><div>11</div><div>SUSTAINABLE CITIES AND COMMUNITIES</div></div><div><div>13</div><div>CLIMATE ACTION</div></div><div><div>15</div><div>LIFE ON LAND</div></div></div> <tr><td><div><div><div></div></div><div><div></div></div></div></td></tr>	<div><div><div></div></div><div><div></div></div></div>
<div><div><div></div></div><div><div></div></div></div>	

ANALYSING TWITTER DATA STREAMS TO DETECT IRREGULAR EVENTS

With a view to discovering new approaches that can detect irregular events such as large gatherings and natural disasters in near real-time, Pulse Lab Jakarta analysed Twitter data from eight locations in Greater Jakarta to identify events taking place and then compared their temporal and spatial aspects with signals from the data set. The team was able to detect with reasonable accuracy several events, for example Sunday Car Free Days, based on signal anomalies. The results confirm that social media data can be harnessed to detect special events in urban areas, which may vary across time and space. Early event detection can help city officials with setting up alert measures and improving response time in the event of public emergencies.

SDGs	Area of work
  	 EXPLORE URBAN AND REGIONAL DYNAMICS



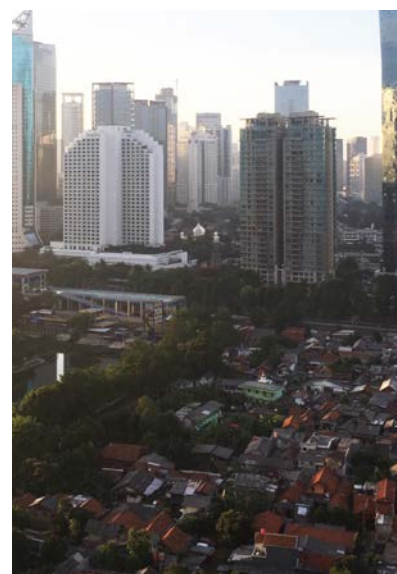
Scores of protestors gather in Central Jakarta during a demonstration

E-COMMERCE DATA

ESTIMATING CITY-LEVEL POVERTY RATES

Beyond business development, e-commerce data can be useful for other purposes, for example as an alternative source of insights on poverty rates. Examining 2016 OLX data that has been aggregated at the city level for 118 cities in Indonesia, our team got together with other researchers during one of the Lab's data dives to test the accuracy of using this data set to estimate city-level poverty rates. Three machine-learning models were developed using Artificial Neural Network (ANN) and Support Vector Regression (SVR) methods. The models were assessed against an accuracy performance metric, which demonstrated that e-commerce data can be used to predict poverty levels within each city with high level of accuracy and significantly low error margins. The results were validated by comparison to poverty level records from Statistics Indonesia (BPS). The research method is being refined to measure poverty rates for other administrative levels, such as at the province and sub-district level.

SDGs	Area of work
   	



CITIZEN-GENERATED DATA

ESTIMATING THE QUALITY OF CROWDSOURCED TRANSLATIONS

To wrap up the second phase of Translator Gator (the Lab's web-based crowdsourcing translation platform), we publicly released the data that was crowdsourced online. Totalling almost 1.5 million gaming activities performed by nearly 4,000 registered players, the complete data set is available for download on TranslatorGator.org and includes disaster-related keywords for almost 30 languages spoken throughout the ten ASEAN Member States and Sri Lanka. We analysed the data set to estimate the quality of the crowdsourced translations, by creating a set of models using features from the language corpora to classify the (a) translators, (b) source expressions and (c) translated expressions. Using two regression models and two supervised learning methods, the results were better than those produced by the baseline approach that relies on peer-review scores. A technical paper detailing the approach and results were submitted and accepted to the 2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining.



4,000
registered
players



1.5 MILLION
gaming activities



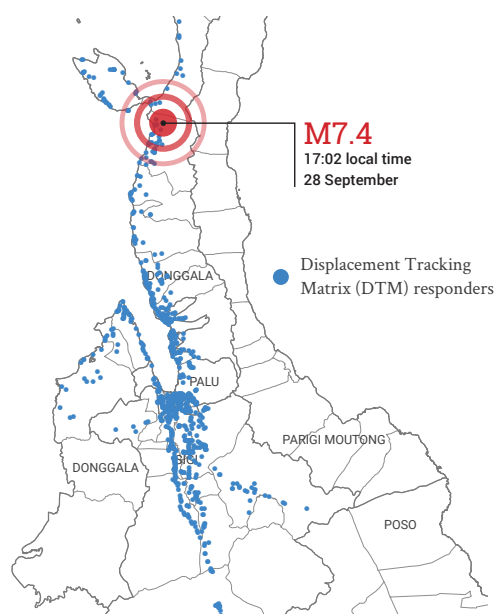
**ALMOST
30 LANGUAGES**

SDGs

Area of work



SUPPORT DISASTER RESPONSE
AND HUMANITARIAN ACTION



Central Sulawesi earthquake response shared in the bulletin's first edition

COMMUNITY ENGAGEMENT NEWS BULLETIN

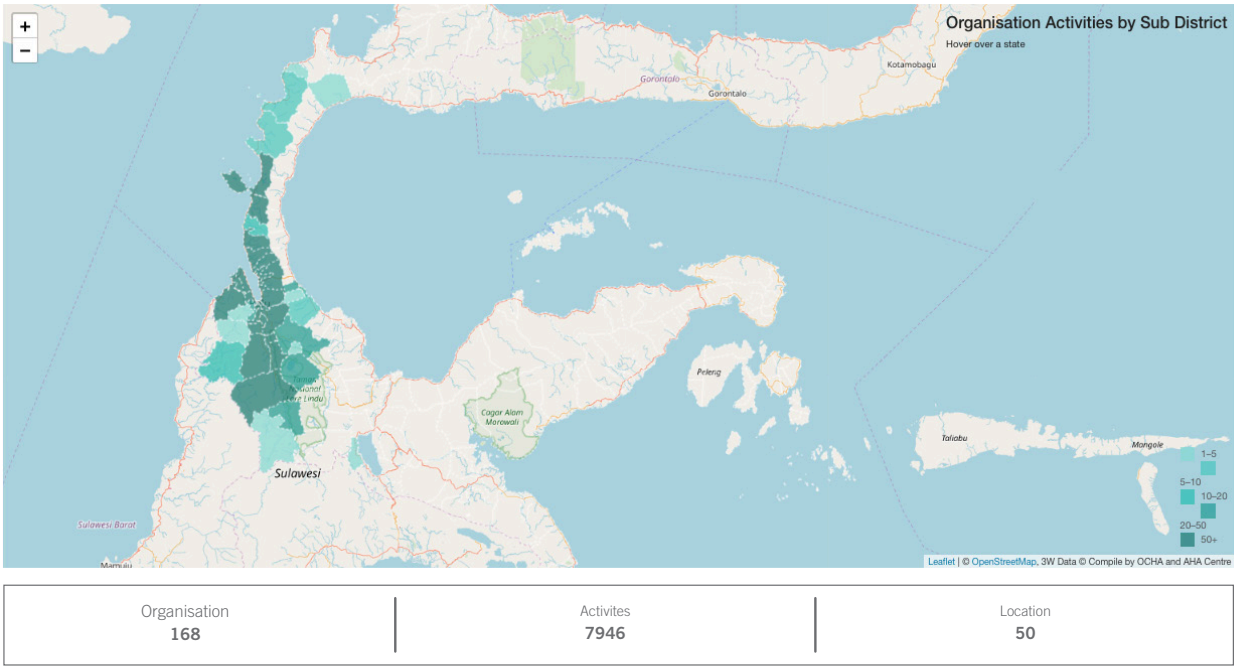
Suara Komunitas – 'Community Voices' – is a community engagement news bulletin that presents feedback gathered from communities affected by the Central Sulawesi earthquake. Developed by PMI (Palang Merah Indonesia) and IFRC (International Federation of Red Cross and Red Crescent Societies) with support from UN OCHA, Pulse Lab Jakarta and UNICEF, the news bulletin is a product of the Community Engagement Working Group consisting of individuals from a range of agencies who meet weekly in Palu to present sector-based updates and feedback as well as coordinate collective action. The tool is designed to help humanitarian responders make decisions and adapt programming by providing insights into what communities are saying as the response progresses. The bulletin is informed by inter-agency community engagement efforts including discussions with affected people, community focus group discussions and radio programmes. It integrates quantitative data and qualitative information that complements the community feedback which humanitarians are responding to.

SDGs

Area of work



HUMANITARIAN RESPONSE TO THE SULAWESI EARTHQUAKE AND TSUNAMI

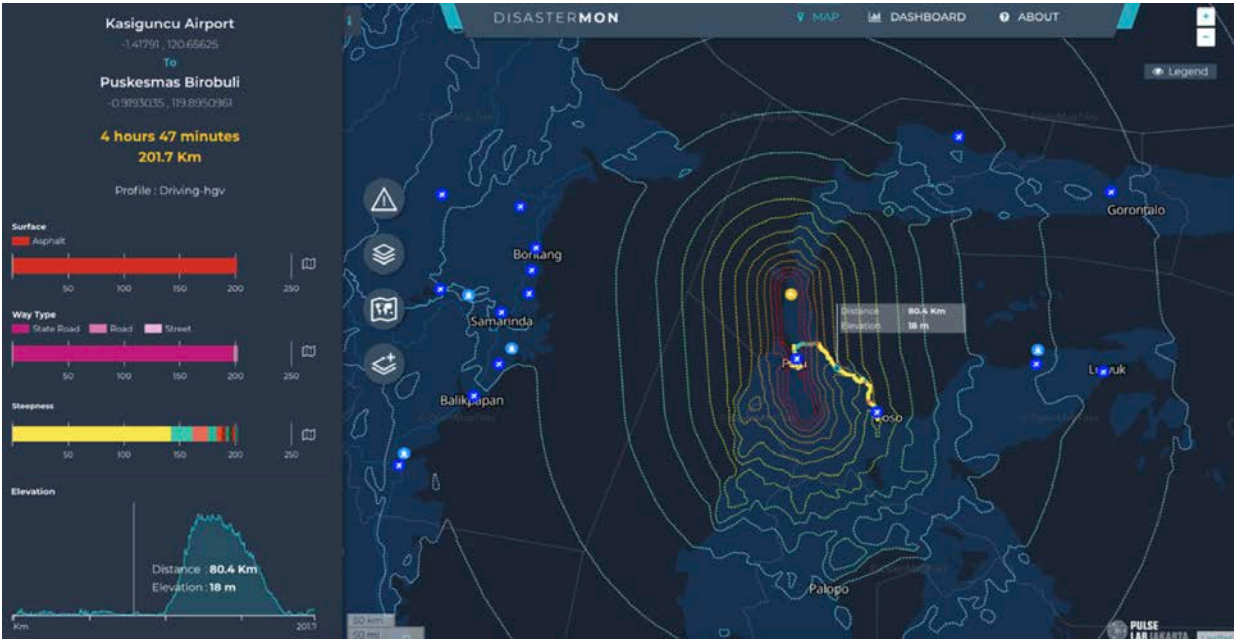


Joining forces to support relief efforts for the September 2018 Central Sulawesi Earthquake and Tsunami, Pulse Lab Jakarta partnered with UN OCHA, AHA Centre and Humanitarian Data Exchange to create a data visualisation dashboard, which highlights the status of ongoing humanitarian response in the region. The dashboard uses the 3W (“Who Does What Where”) data set which UN OCHA and AHA Centre receive from lead clusters and sector agencies (sector-specific coordination group of humanitarian organisations focused on strengthening preparedness and technical capacity to respond to humanitarian emergencies). Providing a visual representation of ongoing response, the dashboard is useful for indicating potential overlaps or gaps in response, as well as enabling the Government and interested organisations to identify potential humanitarian partners on the ground.



Equipping Partners with Fit-For-Purpose Tools and Methods

A DISASTER MONITORING BIG DATA TOOL



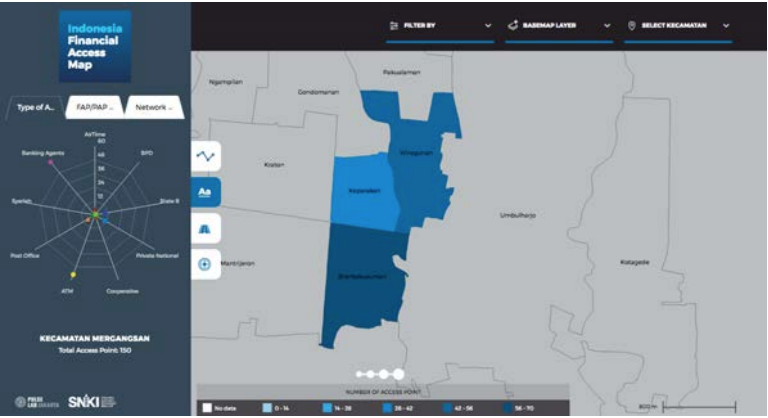
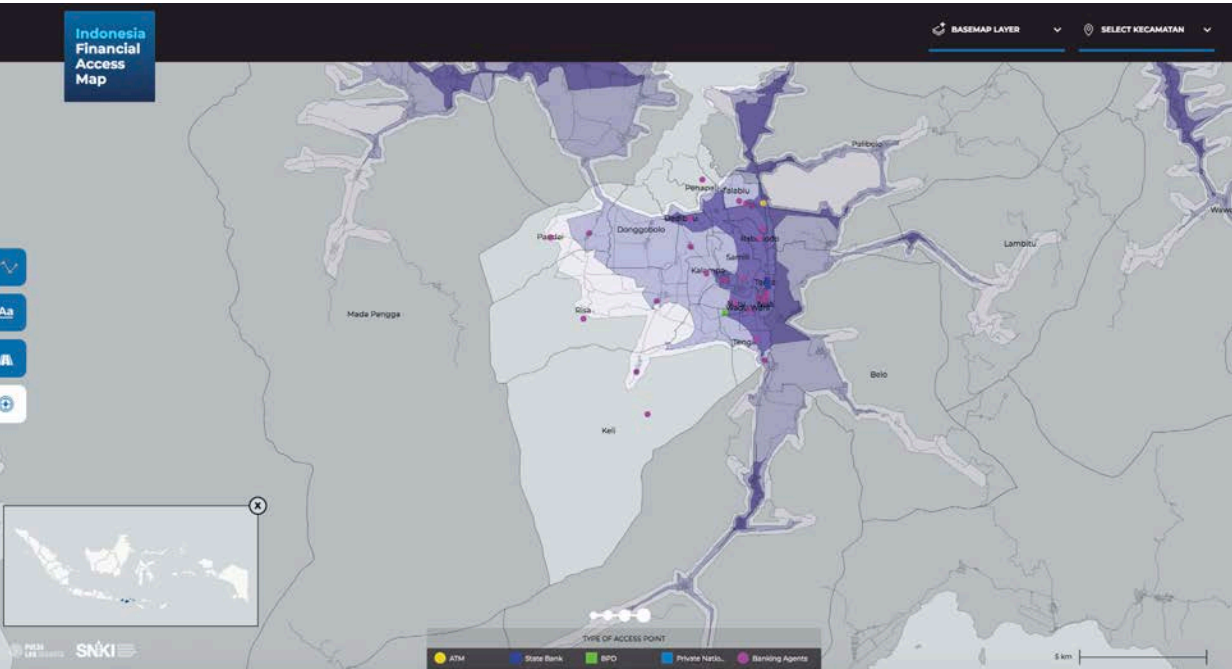
Planning logistics data insight layer

Building on our cyclone monitoring tool called CycloMon, our team at the Lab has been developing an integrated big data analytics and visualisation tool to provide timely insights for natural disaster monitoring, emergency response and management of cyclones, earthquakes, hurricanes and floods in Indonesia and countries in the Pacific region. Nicknamed DisasterMon, the tool features three main data insight layers related to logistics planning, social media communication and socio-economic variables, which are based on multiple data sources, including open data platforms, national statistics, social media, among others. DisasterMon seeks to enhance natural disaster monitoring at the local, national and international

levels using big data, and has the potential to influence future development of automated real-time disaster monitoring systems. The team is also exploring the development of other layers for volcano and wildfire disaster events, as well as the integration of additional data sets such as mobile network data.

SDGs	Area of work
<div>11 SUSTAINABLE CITIES AND COMMUNITIES</div> <div>13 CLIMATE ACTION</div> <div>15 LIFE ON LAND</div> <div>17 PARTNERSHIPS FOR THE GOALS</div>	<div>SUPPORT DISASTER RESPONSE AND HUMANITARIAN ACTION</div>

INDONESIA FINANCIAL ACCESS MAP



Interactive geospatial mapping of regions in Indonesia visualising financial service provision and existing gaps

SDGs	Area of work
<div><div>5</div><div>GENDER EQUALITY</div></div> <div><div>8</div><div>DECENT WORK AND ECONOMIC GROWTH</div></div> <div><div>10</div><div>REDUCED INEQUALITIES</div></div> <div><div>17</div><div>PARTNERSHIPS FOR THE GOALS</div></div>	<div></div> <div></div>

The Secretariat of The National Council of Financial Inclusion in Indonesia (SNKI) together with Pulse Lab Jakarta and Women’s World Banking developed a Financial Access Map dashboard, an interactive geospatial map of regions in Indonesia, that visualises financial service provision and existing gaps. The prototype covers Yogyakarta City and Bima districts and is based on socio-economic, infrastructure and financial services data. The dashboard highlights financial access points alongside per capita analysis, network coverage analysis and proximity analysis of financial access point locations. The prototype was handed over and endorsed by the Council and installed on the server of the National Team for the Acceleration of Poverty Reduction. There are ongoing discussions within SNKI with regards to scaling the dashboard prototype up to the national level.



SDGs	Area of work
	

SDG MONITORING DASHBOARD

Together with Bappenas' Data and Information Centre (Pusdatin) and the SDGs Secretariat, Pulse Lab Jakarta developed an interactive map dashboard to analyse data relevant to the SDGs. The dashboard displays information on the 17 Sustainable Development Goals throughout the 34 provinces in Indonesia, based on 241 indicators. Users can select a particular SDG or a specific indicator from the list available to survey relevant statistical information and progress updates on all 34 provinces. The data used in the dashboard is streamed from the Satu Data portal in Bappenas. The dashboard is currently being utilised by the SDGs Secretariat in Bappenas in bridging data gaps and preparing programme strategies towards the achievement of SDGs in Indonesia.



SCALING UP VAMPIRE ACROSS THE REGION

The Executive Office of the President of the Republic of Indonesia welcomed the latest additions to VAMPIRE, a data tool developed jointly by World Food Programme and Pulse Lab Jakarta to measure the impact of weather anomalies (floods and droughts) on food security. The new features include tabular and graph data visualisation for selected timelines, enabling enhanced monitoring and early warning of weather extremes. More specifically, it includes new layers that show (i) days since

the last rainfall and (ii) flood forecast which gives an idea of likely impact based on crop and population distribution overlays.

At WFP's 2018 Innovation Accelerator Bootcamp in Munich, Germany, a joint team from PLJ and WFP put VAMPIRE through the paces of the bootcamp (focused on taking ideas and prototypes from an early to a mature stage) where VAMPIRE was ultimately pitched to an audience of investors, friends and partners of WFP. VAMPIRE received funding from WFP's sprint programme which is intended to help scale up the tool into a practical solution for the region. In addition, the code for VAMPIRE will be made open source, allowing interested stakeholders to conveniently apply the code and integrate the tool into their operations.

SDGs	Area of work
	

Uncovering Behavioural Insights to Complement Data Analytics



Peer-to-peer lending transaction between agent and customer

BANKING ON FINTECH

With the support of the Australian Department of Foreign Affairs and Trade (DFAT) and in collaboration with the Indonesia Fintech Association (AFTECH), Pulse Lab Jakarta conducted research called *Banking on Fintech: Financial Inclusion for Micro Enterprises in Indonesia* which aimed to contribute to the Government of Indonesia's financial inclusion goals, by uncovering behavioural and data analysis insights on micro enterprises as potential users of financial technology.

Roughly 99 per cent of all businesses in Indonesia are micro enterprises, according to the Ministry of Cooperatives and SMEs. These include small shop owners, street food vendors, and merchants who earn a maximum of IDR 300 million per year -



SDGs	Area of work
   	 

many of whom are unbanked and are unable to expand their business in part due to a lack of access to formal financial services. Despite this challenge, we took note of several digital financial service providers in the country that have started to reach previously unbanked micro enterprises. The main research question therefore was: *Why, and how, despite the same obstacles and behavioural barriers, have some micro enterprises made the leap and began to use these services?*

Our emphasis on behavioural insights stemmed from the realisation that: while financial inclusion efforts should be pioneered by higher-level policymaking, it must also be supported with a clear understanding of the realities of the target users. We employed a human centred design methodology in our research in partnership with three fintech companies that are targeting the micro enterprise segment, namely: BTPN Wow!

(mobile savings account), Go-Pay (mobile payment), and Amartha (group peer to peer lending). We interviewed more than 100 respondents across Jakarta, Bekasi, Sukabumi, Ciseeng, and Banyumas, most of whom are micro merchants who are either users or

agents of mobile savings accounts, mobile payments and peer to peer group lending. Throughout the research, we uncovered various mental barriers that hamper micro merchants' access to financial services; the fintech adoption journey of several micro

“the way in which fintech services are introduced and implemented is more influential than details of the technology itself in micro merchants' decision to adopt a digital financial service”



Regulators, development agencies and fintech companies attending the launch of the Banking on Fintech report

merchants; and the enabling factors that have encouraged these micro merchants to use fintech.

Beyond understanding the users' realities, we learned that, for micro merchants, *the way in which fintech services are introduced and implemented is more influential than details of the technology itself in micro merchants' decision to adopt a digital financial service*. Therefore, rather than recommending products or service ideas, for which there are many latent needs, we chose to translate our insights into a set of practical design principles. These design principles embody our understanding of

the finance and technology-related attitudes and behaviours of micro merchants, particularly the enabling factors that have helped them to adopt digital financial services. These principles can be applied by fintech companies as design directives in developing and testing a variety of solutions for micro enterprises in Indonesia.

The findings from the research report were used to design a Challenge Fund (implemented by the United Nations Capital Development Fund - Shaping Inclusive Finance Transformations programme) aimed at promoting and accelerating the use of fintech for the financial inclusion of micro enterprises in Indonesia. Since its publication in September 2018, the digital version of the report has been accessed more than 1000 times by regulators, development

agencies, fintech companies, and other entities working in the fintech and financial inclusion space. The report has also catalysed a collaboration with the Behavioral Insights Team, a UK-based behavioral science specialist firm, to follow up on the research by developing and running a trial for interventions to encourage active usage of mobile savings account. These activities are expected to commence in the first half of 2019.

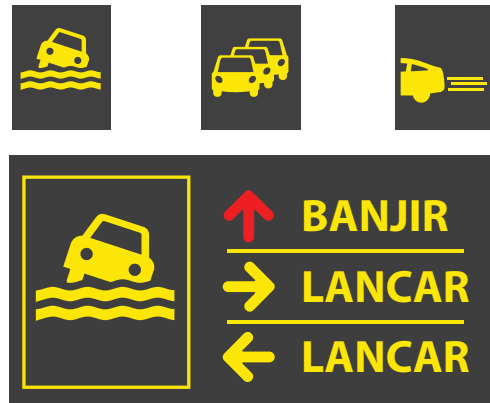


Mockup images showing a traffic light with (right) and without (left) the minitron prototype

URBAN PLANNING & FLOOD MITIGATION

Useful data that can be used to inform flood mitigation efforts in urban areas are often scattered across different government units. In addition, it's not uncommon for these data sets to be out-of-date, creating a challenge for the Government and citizens to effectively prepare and respond to flooding events. Pulse Lab Jakarta teamed up with the Department of Communication and Informatics of Bandung City Government and Labtek Indie (a design research company based in Bandung) to test the usability of a map-based flood information dashboard. To do so, we adopted human centered design to understand the behaviours and needs of those who produce and use the data.

We arrived at these design principles: i) a dashboard should not only rely on conventional data sets that may be difficult for city officials to get their hands on, but should also integrate other available data such as citizen-generated data; ii) a dashboard needs to harness the local 'instinct' to be relevant for users in a local context; iii) a dashboard does not need to be the



development of a technology from scratch - governments can repurpose existing technology and infrastructure to achieve similar goals; and iv) a dashboard should have practical application that can enable inter-agency cooperation.

Based on feedback from the usability testing, the map-based flood information dashboard eventually evolved into a more pragmatic idea of a traffic light minitron* system that can inform citizens of alternative routes to take during a flood. A prototype brief has been submitted to Diskominfo Bandung.

*minitron: an electronic message board

SDGs	Area of work



AFTER DARK: SAFE TRANSIT FOR WOMEN TRAVELLING AT NIGHT



A recent scoping study conducted by UN Women in Jakarta found that women are more vulnerable when travelling after dusk, especially in less crowded areas. This finding inspired a research collaboration between Pulse Lab Jakarta and UN Women to gather insights on women's mobility and travel choices in urban areas, in order to design practical interventions that can improve their safety at night. Insights from the field research conducted in Semarang, Surabaya and Medan challenged the notion that a woman's safety is solely dependent on adequate infrastructure and public facilities.

The research team spoke with 37 women who shared their experiences and perspectives. Four types of personas emerged:

- [•] The Anxious Newcomer**
 who recently migrated to the city;
- [•] The Female Warrior**
 who puts her work above her own safety;
- [•] The Moonlighter**
 who juggles multiple jobs to stay afloat; and
- [•] The Overprepared Strategist**
 who spends a lot of time coming up with defence strategies.

All these personas have different travel routines but their anxiety about travelling at night is a commonality.



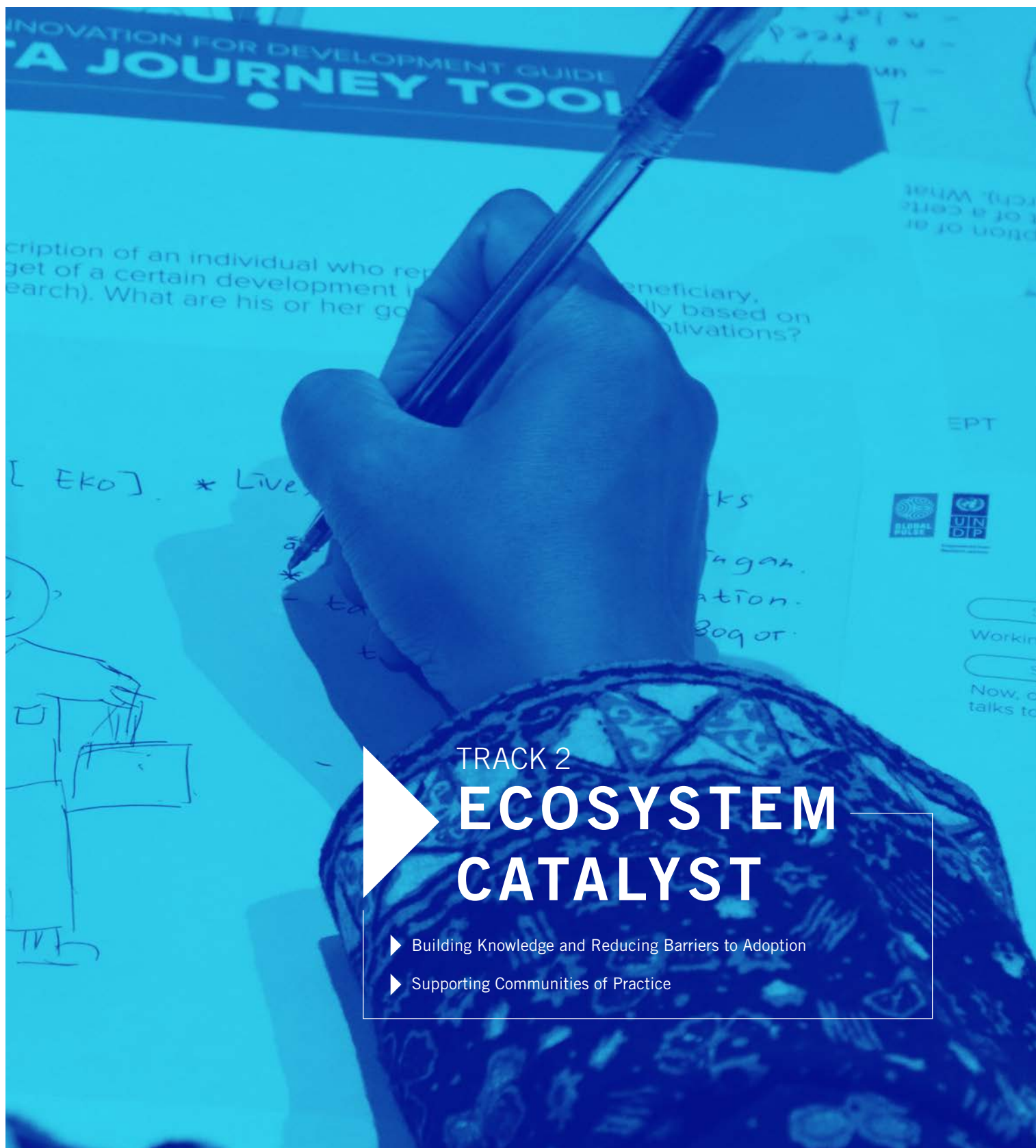
Afterdark Co-Design Workshop



With a view to complementing insights gathered from the After Dark field research, PLJ invited individuals across different sectors to participate in a co-design workshop in December 2018. The workshop was a unique opportunity for these individuals to offer inputs to support the analysis and synthesis phase of the research. The design challenge was narrowed into three areas of intervention, namely: the role of bystanders, improving public transportation services and bolstering law enforcement. Since the design workshop was not so much about the details of each prototype, the emphasis was placed on unearthing new insights and understanding the rationale behind the design ideas. The team is currently synthesising insights from the field research and co-design workshop, which will be published into a Pulse Story research report in 2019.

SDGs	Area of work
   	 EXPLORE URBAN AND REGIONAL DYNAMICS





TRACK 2

ECOSYSTEM CATALYST

- ▶ Building Knowledge and Reducing Barriers to Adoption
- ▶ Supporting Communities of Practice

Building Knowledge and Reducing Barriers to Adoption



INTERNATIONAL SEMINAR ON DIGITAL DIPLOMACY

With the internet and digital technologies now introducing new dimensions to diplomacy, these changes have not only presented new opportunities but also several challenges. How can governments leverage these opportunities? Do diplomats have the “digital know-how” to address these challenges tactically?

Pulse Lab Jakarta co-hosted the International Seminar on Digital Diplomacy with the Indonesian Ministry of Foreign Affairs and DiploFoundation, which served as a roundtable for diplomats, development practitioners, social media enthusiasts



The Indonesian Minister of Foreign Affairs, Retno Marsudi, speaking at the seminar

and civil society members to exchange fresh ideas and approaches on how to both adopt and adapt to digital diplomacy.

The keynote address was given by Retno Marsudi, the Indonesian Minister of Foreign Affairs, who set the tone for the event by highlighting one of the Government's ambitions: "We want to use our digital strength to transform our economy, to connect with positive energy, and to empower our people."

The seminar was packed with rich, in-depth discussions. As underscored in several of the presentations —digital diplomacy goes beyond social media. PLJ shared some of its data innovation research projects for development and humanitarian action, results of which indicated that social media does not only function as a savvy communication tool, but the digital footprints of the millions of users may be useful for improving consular services related to the security and

mobility of citizens abroad and other areas, informing multilateral strategic negotiations, and monitoring the effectiveness of development aid programmes.

However, for governments and diplomats to adjust their mindsets and tactically perform their roles in world diplomacy, capacity building, training and an openness to new approaches must be prioritised. The digital revolution has unapologetically disrupted the ways in which the global community interacts, communicates and even exists. Diplomacy, in particular, is one area that has been clearly impacted and will continue to transform as diplomats embrace emerging tools and approaches. Beyond the takeaways from the seminar, it was clear that it is important for diplomats and governments to gear up for the new digital transformations.

We hope the international seminar has inspired fresh ideas and will inform future approaches within Indonesia and the international diplomatic community.



WAWASAN SATU DATA TOOLKIT

Data governance has many facets to it, ranging from how data is collected to how it is used. Pulse Lab Jakarta and the Executive Office of the President of the Republic of Indonesia have been applying human centred design to model a data governance framework at the local government level. Materialised in a resource known as the *Wawasan Sata Data* toolkit, its objective is to help data stewards within the public sector to holistically understand data governance policies and framework, which are aligned with the draft Presidential Regulation on Satu Data Indonesia.

Several versions of the toolkit were developed in a co-creation process with public sector representatives, each version modified to meet the needs of its users throughout the data lifecycle. The toolkit was tested in four district/city governments (Kulon Progo, Makassar, Pontianak and Mojokerto) and two provincial governments (Yogyakarta and South Sulawesi) in Indonesia. More than 200 users took part in the testing of the toolkit. Since participating in the toolkit testing, several public officials from Kulon Progo, Pontianak and Mojokerto have built on inspirations and insights from the workshop to finalise a set of data governance regulations for their respective regions. The Government of Indonesia is planning to release the toolkits on their data portal when the Presidential Regulation is formalised.



A public official participating in the toolkit testing workshop



SDGs	Area of work
	     



Research Dive participants sharing their preliminary results during closing presentations held at Bappenas

POLICY RELEVANT COLLABORATIVE RESEARCH

SDGs	Area of work
	

Building on previous research collaborations between Pulse Lab Jakarta and directorates within the Ministry of National Development Planning (Bappenas), in 2018 the Lab welcomed a new batch of proposals from several working units. Together with Bappenas' Pusdatinrenbang unit, PLJ assessed the proposals and outlined a list of prioritised projects. The Lab began working on these projects when the list was endorsed in mid-2018, many of which have been completed and the results have been submitted to respective directorates. The remaining projects are expected to be completed in the first quarter of 2019.

Completed Research

1. Analysis of social media data to understand the public's perception of:

a. Foreign debt for development funding

Proposed by the Directorate of Planning and Development Funding, this research sought to gain insights about the public's attitude towards foreign loans and grants received by the Indonesian Government. Using Crimson Hexagon's analytics platform to analyse public tweets with related keywords, the Government was able to glean useful, macro level policy insights on the topic in question. The results will be used to examine any correlation between the public's attitude towards foreign debt and the progress of national development programmes. The results of the analysis have been submitted.

b. Restorative justice for criminal law

In light of Indonesia's crime rate and strain on the country's criminal justice system and correctional

facilities, the Government is considering proper steps to address current and impending issues. To explore the public's perception towards a restorative justice approach, the Directorate of Law and Regulation saw the benefits of analysing public discourse among Indonesians on Twitter with the goal of uncovering insights to inform policy discussions. PLJ submitted the results of the analysis, which are being appraised by the Directorate for future course of action.



c. *Electricity as a public service*

As one of the most vital public services provided, conversations around electricity tend to be pervasive on social media channels. By also employing Crimson Hexagon's analytics platform to analyse tweets, the broad objective of this research was to get a sense of the public's sentiment towards electricity services in order to effectively conduct policy and service reviews with the needs of the citizens in mind. The results were presented to the Directorate of Energy, Telecommunication and Informatics, and will be showcased in 2019 at Bappenas' internal seminar on big data analysis for policy making.

2. Analysing International events

Both the Asian Games and the Annual Meetings of the International Monetary Fund and the World Bank Group were held in Indonesia in 2018. The Expert Staff for Economic Synergy and Funding within Bappenas expressed interest in monitoring the public's reaction towards these events by examining conversations on social media. The expected

output was the development of an assessment template that the Government can utilise when evaluating the impact of hosting future international events that are similar in scale. In addition, the Asian Games in particular provided an opportunity to understand mobility patterns during the Games by analysing Grab's transportation data on people going to and leaving the event venues. The results have been submitted to the working unit for internal use.

3. Developing an inflation monitoring dashboard

Reports on measures of inflation tend to be released with a few weeks lag, which means activating any intervention strategy to reconcile major peaks would also be delayed. Using price data for a set of commodities that influence inflation (both volatile and administered commodities), social media data and mass media data, this dashboard seeks to provide updates on inflation in a near real-time manner. This research recognises the merits of social media data and mass media data as useful information sources, as they provide context for understanding conditions on the ground that may be influencing the inflation dynamics. The monitoring dashboard is expected to be integrated as part of an early warning inflation system. The prototype of the dashboard has been handed over to the Directorate of State Finance and Monetary Analysis.

Research In Progress

1. Correlation between popular university majors and the labour market

Proposed by the Directorate of Higher Education, Science, Technology and Culture, this analysis is being conducted to investigate the relationship between trending university majors and the Indonesian labour market to anticipate the supply and demand dynamics within the Indonesian workforce. For the purposes of this analysis, available data on public university applicants and graduation rates were categorised as supply data, relying on the application rate per major as a proxy to determine favourite majors. On the other hand, data related to the needs of the labour market and current labour market trends from Statistics Indonesia (BPS) (including salary rate, number of job vacancies per profession, etc.) served as proxies for the demand. The results of the analysis which will be visualised in a dashboard are expected to inform the Government's decisions on education curricula design and policies.



2. Data overlays and visualisation to generate new insights on:

a. Agriculture sector

The Directorate of Cooperatives and SMEs requested assistance with developing a visualisation dashboard to highlight available commodities per region, overlayed with visuals of the legal status of the land space being used. The dashboard will use agriculture census data from Statistics Indonesia (BPS) and Government data on land ownership. This project is expected to help inform agriculture-related policy discourse among local governments.

b. Maritime and fisheries

Information that is needed by the Government for effective fisheries management tends to be incomplete, therefore affecting among other things, fishermen's level of productivity. To evaluate the sector's economic performance, there's a demand for real-time and accurate data. The possibility of overlaying maritime and fisheries-related data from the Directorate of Maritime and Fisheries and Ministry of Maritime and Fisheries, in conjunction with satellite imagery and climate data from the National Institute of Aeronautics and Space (Lapan) and the Meteorology, Climatology, and Geophysical Agency (BMKG) is currently being explored.

3. Assessing inter-provincial trade intensity using e-commerce data

Utilising e-commerce data, this research is focused on assessing trade intensity at the provincial level which is of

interest to the Directorate of Regional Development. The datasets that are being considered include aggregated data on goods/commodities, seller/buyer location, and price/value of trade as proxy indicators for inter-provincial trade intensity, completed with Automatic Identification System data on shipping vessels. The goal is to develop a real-time monitoring system for inter-regional trade activities that can be used to identify and assess economically strategic areas, to further accelerate regional economic development. This system would be useful as trade data is typically only available from the Ministry of Trade a few times a year.



4. Utilising mobile network data to identify emerging metropolitan areas and using social media data to explore the public's perception of public services via housing infrastructure

The Directorate of Urban Studies and Housing proposed two research projects on urban dynamics: 1) leveraging Telkomsel's mobile network data to identify emerging metropolitan areas, in particular by looking at commuting flows at morning and nighttime as a determinant; 2) surveying the public's perception of public services via housing infrastructure, in particular by using Crimson Hexagon to analyse a subset of tweets that has been culled based on selected keywords. These two studies are expected to complement traditional survey methods on these subject matters to help the Government formulate inclusive and efficient policies.



The Lab continued its Research Dive tradition throughout the year and based on priority areas identified by the Government of Indonesia, the UN Country Team in Indonesia and other stakeholders, three data dives were held:

RESEARCH DIVE FOR DEVELOPMENT

SDGs	Area of work

Research Dive was conceptualised to broaden research engagement within the big data ecosystem, particularly among analysts, academics and practitioners. By the start of 2018, more than 100 participants from 85 universities, 12 government institutions and five research institutions/NGOs had taken part since the Lab first started organising the event in 2016. In February 2018, dozens of alumni met up for a four-city reunion in Jakarta, Bandung, Yogyakarta and Surabaya to share updates on past and ongoing research.



URBAN AND REGIONAL DEVELOPMENT

This data dive was part of a series of events leading up to the Indonesia Development Forum organised by Knowledge Sector Initiative. Participants were tasked with designing regional development policies, by analysing social events, news media data and its network based on GDELT (a global news media monitoring platform); assessing the accessibility to (emergency) health facilities in Sumatra; monitoring water access for water supply infrastructure planning, by analysing several datasets including municipal waterworks customer distribution data; and inferring energy consumption towards urban development, by combining data on social media activity density and socio-economics statistics.



ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING FOR ESTIMATING POVERTY

Thanks to sponsorship and support from the Knowledge Sector Initiative (KSI) and the Artificial Intelligence Journal, this data dive brought together a full house of researchers and data analysts from academia, development partners, the United Nations and the Government of Indonesia to: measure vulnerability to poverty using satellite imagery; estimate city-level poverty rates based on e-commerce data; use Twitter data to estimate district-Level poverty in Greater Jakarta; and explore the connection between social media activities and poverty.



FINANCIAL INCLUSION

Examining the various dimensions of financial inclusion, the significance of financial inclusion for Indonesian society, as well as the progress made and challenges that are ahead, four research areas were outlined to help answer pressing policy and development questions: measuring financial awareness and financial literacy through social media; measuring financial access based on information from financial institutions and non-financial institutions; modelling gender-based differences in financial inclusion; and assessing the digital opportunity impact on financial inclusion.



Being able to receive on-the-spot peer review from fellow research divers and experts is one of the many benefits of participating in these events. Furthermore, the dives are designed with the awareness that three days of research are not sufficient to generate polished models and approaches that can be immediately replicated or applied, and so participants are encouraged to use the feedback received to inform and refine their research.

The Research Dives are also useful for Pulse Lab Jakarta in identifying domain experts across Indonesian academia who in turn can help Pulse Lab Jakarta with research projects. The technical reports produced after each event explain the findings in more detail, including how the methodologies used may be improved, how other datasets may help to corroborate the findings, and what steps may be needed for policy implementation.

Supporting Communities of Practice



Winners of our Microenterprise Fintech Innovation Challenge Fund with UNCDF-SHIFT at the 2018 Singapore Fintech Festival

MICROENTERPRISE FINTECH INNOVATION CHALLENGE FUND

As a follow up to our Banking on Fintech research project, Pulse Lab Jakarta teamed up with the United Nations Capital Development Fund—Shaping Inclusive Finance Transformations (UNCDF-SHIFT) programme to launch a fund which challenged fintech companies to come up with innovative ideas on how to get micro enterprises digitally included. The fund is designed to provide financial grants to incentivise the adoption and use of digital business solutions for micro enterprises operating in Indonesia. The expectation is that these pilot-ready innovations that are funded will help to increase micro enterprises' use of digital business solutions, as well as encourage safe and formal usage of available solutions, products, services and business models to promote inclusive growth in Indonesia.

The challenge was laid out to fintech companies to create or adapt a product or service for the unique needs of micro

enterprises in Indonesia. Overall, we received 33 applications. A review team made up of industry experts selected 12 projects from 11 fintech companies. The projects shortlisted were invited to a pitching session, where they presented their proposed solutions to an evaluation committee, comprising of representatives from the Indonesian Government (the Financial Services Authority/OJK), development partners (Better than Cash Alliance and Pulse Lab Jakarta), and industry experts (Indonesia Fintech Association and investor representatives). VISA was instrumental in the process and offered an intensive mentoring session for the shortlisted candidates prior to their presentations.

The evaluation committee selected the top six pitches based on a mix of criteria, including originality, impact and scale, relevance to challenge and pitch quality. At the 2018 Singapore Fintech Festival, the six winners had an opportunity to present their proposed solutions to an audience of representatives from various financial institutions, associations and regulators.

1. Amartha: Youth-Led Digital Literacy Scheme

Amartha proposes to train young people among its existing loan customers (predominantly older female micro entrepreneurs) to maximise cellphone use, such as for loan repayments.

2. AwanTunai: Mobile app platform for providing micro enterprise loans

AwanTunai aims to develop a digital system for fast moving consumer goods suppliers that can be used to deliver working capital loans to micro merchants. This credit would replace and formalise the informal kasboncredit that micro merchants provide to customers.

3. Duithape: Cashless payment system for distributors

Duithape plans to develop a cashless payment system that will allow distributors to collect payments from micro enterprises without the inefficiency and risks associated with physical cash pickup, therefore enabling micro enterprises to perform transactions with greater ease and security.

4. Gandengtangan: Digital inventory management and cashless payment app for micro enterprises

Gandengtangan proposes to develop a mobile platform that connects distributors and micro enterprises, as well as offering digital inventory management, cashless payments and credit products. This project is an enhancement of the distributors' traditional loan schemes.

5. JULO: Digital loan product for female micro entrepreneurs

JULO intends to launch a new loan product specifically for female micro entrepreneurs, using its existing app and proprietary data-driven credit scoring algorithm.

6. Modalku: Mobile agent network for micro-financing of micro enterprises

Modalku plans to develop a network of agents to offer micro-loans to underserved or unserved micro enterprises. The loans can be used for a variety of purposes, such as investing in opportunities or to bridge short-term cash flow gaps.

These six projects will embark on the piloting phase in 2019. They will incorporate a number of insights drawn from our Banking on Fintech research to tap into the micro merchant and micro enterprise market. Apart from seed funding, the winners will also receive mentoring from industry experts to help shape and refine their ideas.



SDGs	Area of work



Guest speakers leading a discussion on how big data and technology can help to fight fake news

2018 COLLOQUOTION SERIES

Colloquotion is a monthly sharing session series organised by Pulse Lab Jakarta. It features academics, analysts and a host of other domain experts interested in development issues, data science, human intelligence, as well as their crossovers. In 2018, our series covered a range of topics. The line up of speakers discussed how new types of data sources can help to address and tackle issues related to their selected topic of interest and expertise. Originally organised as a capacity building mechanism for the UN staff in Indonesia, based on a number of external requests from the public and other interested stakeholders, Colloquotion evolved into a public event that encourages an open knowledge and learning dialogue between the speakers and attendees. Twelve sessions were held throughout the year and the video recording of each session is available for learning purposes.

SDGs	Area of work
	

DATA INNOVATION CLINIC

Data innovation offers unprecedented opportunities for evidence-based policy-making, and has been changing the way policymakers and development practitioners address development challenges. But for many who have never been part of this process, 'data innovation' often comes off as ambiguous. As part of a big data for monitoring and evaluation workshop organised by the Development CAFÉ, our team at the Lab ran a data innovation clinic with participants from different professional backgrounds. We approached the clinic with an understanding that data innovation means embracing new and unconventional data sources to better understand challenges and identify opportunity areas—in this case to monitor and evaluate development programmes.

Arming ourselves with UN Global Pulse's Data Innovation for Development toolkit—a practical walkthrough of how development practitioners and organisations can go from idea to implementation—we spent a full day with the participants offering step-by-step guidance on how to go about designing their own data innovation project. Given the limited time, we decided to focus the clinic on three main areas: problem identification; understanding the context from which data is derived; and refining research questions. All three of these are key aspects in



scoping possibilities for the use of alternative data sources for any project. Having a mix of data science and social systems team members facilitating the clinic enabled us to give participants a more holistic view on how a data innovation project plays out in real life.

SDGs	Area of work
	

LAB ON WHEELS OUTREACH

As evidenced by the increasing number of requests for guest lectures and workshop sessions in universities and research institutions across Indonesia, there is increasing appetite to know more about how to use advanced data analytics for decision-making across a range of sectors, as well as how to combine these approaches with more conventional forms of research. Lab on Wheels is a Pulse Lab Jakarta outreach initiative that involves organised visits to academic institutions and development-related organisations where targeted workshops are run to show the potential of these two aspects of our work to a broader audience.

OUR ROAD TRIPS IN 2018 TOOK US TO:



Festagama organised by Gadjah Mada University

Exploring topics related to urban and regional dynamics, our team arranged a data innovation workshop, an exhibition showcasing some of our data analytics tools, and a knowledge sharing talkshow on the use of technology for urban planning, all under a broader aim of introducing new sources of data that can be used to understand urban behaviours and come up with ideas on how to address urban challenges, especially for the city of Yogyakarta.



The Eighth Eastern Indonesia Forum Festival organised by Bursa Pengetahuan Kawasan Timur Indonesia (BaKTI) and Forum Kawasan Timur Indonesia (Forum KTI)

Following up on an invitation from BaKTI to host a side event at the Forum, our team decided to use the opportunity to run a rapid data clinic, focusing on familiarising the audience with the concept of big data, how it is produced, how the Lab analyses it, and its potential usage for social good. We divided the session into three main parts: an introduction to the lab, an interactive data journey exercise to map out how individuals produce digital footprints, and an explanation of how this data can be used by showing examples of our projects.

SDGs	Area of work
	



Scan here to read our blogs and stay up to date with our research activities.

Research Activities



Disaster Response and Climate Change

Understanding Population Movement After the 2018 Central Sulawesi Disasters

Leveraging Pulse Lab Jakarta's advanced data analytics capacity and experience in developing disaster risk reduction data analytics tools gained from prior modelling with Digicel data, IOM joined forces with the Lab to undertake research using data from an Indonesian telecom. In particular, the research aimed to gather insights on internal displacement throughout the most affected districts in Central Sulawesi with a view to developing a proof-of-concept on the feasibility of using mobile network data for effective displacement assessment.

An interactive visualisation was designed to make sense of the results. It communicates the distribution of subscribers in Palu, Sigi and Donggala; highlights the most popular destinations where people travelled to after the disasters; and provides an estimate of the number of displaced subscribers based on analysis of subscribers' movements before and after the disasters. Representatives from the Indonesian Government, United Nations, and mobile telecoms were then invited to participate in a training workshop to discuss how mobile network data can be better

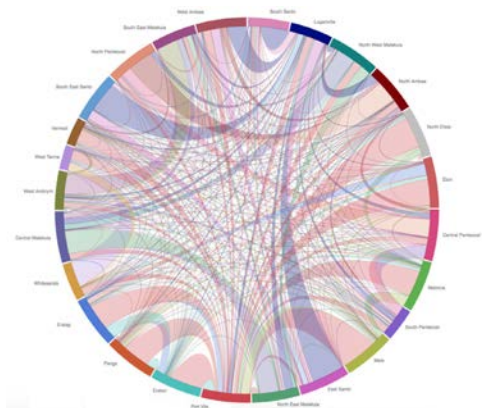


Distribution of mobile subscribers in Palu, Sigi, and Donggala from one of Indonesia's telecoms before and after the 2018 Central Sulawesi disasters

harnessed to support government-led disaster resilience efforts. The workshop was also intended to gather feedback to inform further development of the visualisation dashboard and explore adoption and scaling of the tool to aid future disaster response. How to scale up the tool and nurture an ecosystem in which it can be maintained was a critical part of the feedback discussion. This included inputs on relevant policies that should be put in place to support such an ecosystem, and the best positioned stakeholders to become custodians and ensure its sustainability.

Our analysis demonstrates that by identifying the movement of affected cohorts of a population, we can also ensure that they are not left behind in the Government's disaster response and resilience strategy. The case of the 2018 Central Sulawesi disaster episodes revealed that data on displaced citizens is scarce, hampering the speed and effectiveness of humanitarian agencies in distributing vital resources to those most in need. There's still more research to be done on how mobile network data can be harnessed to inform the Government's disaster response effort, and this proof-of-concept demonstrates the value of the approach and how it can be applied in different disaster scenarios to reduce the scope of impact.

Modelling Internal Migration in Vanuatu Using Mobile Network Data



Visualisation of aggregated movements between different administrative districts in 2017

Understanding the movements of individuals at a national scale is important given its potential to support planning for services, infrastructure and policy. In places such as Vanuatu, modelling movement at such scale has been challenging due to high costs related to generating national statistics. Using call detail records data from Digicel (one

of the largest operators in Vanuatu) that spans the entire year of 2017 (1st January to 31st December 2017), PLJ's team sought to examine trends in the aggregated movements of pseudonymous users over the course of the year. More specifically, the research analysed how individuals move between different districts and how these trends vary.

To better understand the dynamics between different districts, we calculated the standard deviation in the percentage of transitions between each pair of districts. Analysing the standard deviation, we are able to point to which pairs of districts were highly volatile in their numbers of inflow or outflow over the year. The research shows the immense potential of using new sources of data, such as mobile network data, as an alternative to conventional methods of collecting national level statistics. The findings of the analysis were provided to the National Statistics Office of the Government of Vanuatu and the team was encouraged to make further interpretations of the movements, such as whether the communications, social and economic relationships between districts influence internal migration. With the global proliferation of mobile phones and the fine-grained representation these technologies have generated, governments can better understand internal migration that may be induced by natural hazards.

Informing National Statistics and Managing Disaster Risks in Samoa

Pulse Lab Jakarta, through its ongoing partnership with mobile network operator, Digicel, was interested in a proof-of-concept project designed to test whether artificial intelligence, machine learning or predictive analytics can be useful in public sector decision making. With funding for the preliminary research coming from UNDOCO's Innovation Facility, the Lab wanted to explore how operationalising mobile network data and financial transaction data can benefit the SDGs as well as with the implementation of the Sendai Framework for Disaster Risk Reduction.

During one of our missions to Samoa and in discussions with stakeholders, we learned that the disaster

management office in the island quickly gets overwhelmed during a disaster and has no way of accessing real or near real-time information in order to make timely, evidence-based decisions. The hypothesis for this research was thus whether the use of 'new' or non-conventional data sources can be harnessed for better decision making. Initially, we wanted to study the movement patterns of the Samoan population during Cyclone Gita as measured through mobile data usage, but given the logistics delays we faced with purchasing and installing a server at the mobile network operator's data warehouse to allow us to access the data, we missed the cyclone season and had to instead prepare a baseline analysis.

By analysing pseudonymised movements of people through mobile network data and correlating it with evacuation points, we were able to identify that churches

are important storm shelters in Samoa. This analysis assumed that if the churches are indeed important community structures, those churches with weak social networks would need entirely different humanitarian or development assistance in the event of a disaster than those churches with strong networked communities. We can also glean numbers of people affected by disasters through pseudonymised mobile network data which can help build up the evidence base for decision-makers. This project was done in parallel with several other research projects in other Pacific island countries and the methods for modelling education, household characteristics, expenditure and income diversity from mobile network data was published in an academic paper.

During our visit to Samoa to meet and engage with stakeholders and understand the gaps which we felt could be filled through the use of non-conventional data sources, interest in data innovation was heightened. Through our colleagues in the UN office in Samoa, we had great access to government officials who were impressed with the work of the UN Global Pulse lab network and are keen to leverage the opportunities for data innovation not only in Samoa but also throughout the Pacific islands. This has since led to official communication from the Prime Minister of Samoa to establish a Lab in Samoa to serve the Pacific.

Comparing Population Displacement Estimates from Mobile Network Data in PNG



Visualisation showing the displacement of subscribers

This research explored pseudonymised mobile network data as a source of insights on displacement following the Highlands earthquake in Papua New Guinea in February 2018, and compared the findings to the current best practice for displacement tracking, namely IOM's displacement tracking matrix. We also compared the insights against information on the targeting of humanitarian resources, finding that the targeting of surveys and the allocation of humanitarian assistance are respectably efficient.

We hypothesised that by removing the frequent travellers, we were better able to focus the analysis on displaced subscribers, and remove any noise generated by regular commuters, who could also have been displaced but

due to their movements we are less confident of this classification. We thus subset the data set to include only subscribers with an average day-to-day travel distance of less than or equal to 15 kilometres, and use this subset to filter the day-to-day subscriber trajectory data set following the earthquake.

The analysis revealed a high-level picture of earthquake impact on communities across PNG by modelling the relationship between cell tower activity and cell tower distance relative to the earthquake epicentre. The tower activity ratio, which is defined as a ratio between the number of unique mobile phone subscribers connected to the tower and the number of unique mobile phone subscribers connected to the entire Digicel network in PNG over a week, was first calculated. In order to observe the earthquake's impact, we examined these ratios during two time periods, before the earthquake and after the earthquake.

This analysis only examines data from Digicel, which holds a majority market share in PNG. The absence of data from the other mobile network operator, as well as the fact that neither network has network coverage of all populated areas introduces some additional coverage error. Nevertheless, the findings from the analysis offer new perspectives on the quantification of displacement and underline the potential of mobile network data to offer highly valuable information during what are often chaotic days and weeks following a natural disaster.



Ms. Ursula Mueller (centre), Assistant Secretary-General for Humanitarian Affairs and Deputy Emergency Relief Coordinator in UN OCHA was the keynote speaker at the launch

Combining Different Data Sources to Manage Information for Natural Disasters

Pulse Lab Jakarta launched its latest research prototype — an automated, open source platform that integrates multiple non-traditional data sets to aid logistics planning and information management following natural disasters. Ms. Ursula Mueller, Assistant Secretary-General for Humanitarian Affairs and Deputy Emergency Relief Coordinator in the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA), was the keynote speaker at the event, which was attended by a wide audience across the development and humanitarian sectors. During its early development and prototyping, the platform was intended for disaster monitoring, but as the prototype was refined and new features were added, it evolved more into managing information to better inform responses following natural disasters.

The platform is built on an automated data pipeline, allowing it to stream and analyse several non-traditional data sets all in one place. This data pipeline is triggered based on disaster alerts received from the Global Disaster Alert and Coordination System (GDACS), which is a global system aimed at closing information and coordination gaps. Though information that can inform disaster authorities and citizens generally begins to generate right after a disaster hits, such information tends to be managed independently by different responders and information access comes with its

own challenges. As an open source platform, MIND is designed to address these challenges, by publicly providing stakeholders with timely insights on affected areas, the needs of communities, among others.

The platform analyses Twitter data, in particular by examining public geotagged tweets that are within a disaster's geographical parameters, known as a bounding box. It also integrates a pair of APIs from OpenStreetMap and OpenRouteService (an open source route planner developed by Heidelberg Institute for Geoinformation Technology at Heidelberg University) to help identify suitable routes for the transportation of aid and resources. This feature provides information on strategic Points of Interest (PoI) such as schools, hospitals, government buildings, airports and ports, which are important for exploring options for origin and destination points.

A text processing algorithm is incorporated into the platform to extract news articles that are related to a given disaster from a credible news API. Based on the set of articles identified, the algorithm then proceeds to extract figures from the articles that describe an estimation of the number of casualties (words such as victims, fatalities and deaths are used as proxies). The Google Trends feature of the platform gives a sense of what topics people are talking about and the type of content they are searching for. This is an important communication tool that can help government disaster authorities to better contextualise the information they share with the public throughout the disaster response phase. The platform is designed to complement existing disaster response tools and can be modified to meet the specific needs of an organisation. PLJ offered an open invitation to encourage stakeholders across different sectors to participate in its user testing and has since received several requests and interests from disaster management authorities.

Real-time Data for Faster Decision Making in Times of Crisis

Real-time data can accelerate a government's understanding of a disaster's impact, as well as the urgent needs of its population much faster than traditional data sources used in emergencies. The immediate days following a sudden onset emergency are typically focused on crucial decision making and questions about the scope of impact, location of the most vulnerable and resource allocation. Following extensive discussions with relevant humanitarian agencies and stakeholders in Indonesia, PLJ and UNICEF identified a set of challenges that can be addressed through the integration of non-traditional, real-time data sources.

Problem: Collection of data on the movement of people is expensive and time-consuming

Solution: Combine Facebook Geoinights and Mobile Network data to produce real-time displacement maps

During disasters, Facebook provides anonymised, privacy-conscious aggregated real-time data on the movement of people at the town (Kecamatan) level. Under an existing agreement with Facebook, this data is available to UNICEF and some international NGO's (IFRC), at no cost. Whilst rigorous benchmarking is required before deploying this data in decision making, in exploratory work done by PLJ and UNICEF it was revealed that the unweighted Facebook population movement data in the aftermath of the 2018 Palu earthquake was broadly representative of the later confirmed displacement data, and substantially more accurate than other early and informal data available in the 72 hours after the disaster.

Problem: Data preparedness is time-consuming and under-resourced

Solution: Leverage a set of reproducible open source data pipelines that ingest data from disparate sources and presents that data via a common, documented, interoperable API

Humanitarian Data Exchange (HDX) stood out from our survey of potential real-time data. HDX is an open source platform built by UNOCHA that allows UN agencies and NGOs to store, manage and access datasets for instant

analysis, visualisation and comparison. The platform and tools are accessible to both technical and non-technical staff, and allow the design of visualisations and dashboards in a web browser. HDX also leads work on the Humanitarian Exchange Language (HXL) data tagging standard, which enables non-technical staff to easily annotate and validate data and create both summary and map based live data dashboards without the need for coding or use of additional data cleaning or validation resources. These dashboards are suitable for viewing on a range of devices and already function well in low-connectivity and offline environments.

Problem: 4W/5W Tools are cumbersome and take time away from disaster response

Solution: 5W, Leverage existing technologies to create a standardised, massively streamlined 5Ws reporting workflow

The process of completing a 5W's questionnaire can be complicated and is prone to data entry errors as it requires many data post-processing steps before becoming available (and soon after becomes unreliable or out of date). Using Natural Language Understanding NLU, 5Whats can understand responses and ask clarifying questions to ensure that activities are being recorded in the correct location and have sufficient detail, while reducing reliance on spreadsheets and manual, computer based data entry. UNICEF has invested in, and open sourced the conversational reporting platform Rapidpro. Operating over SMS, Whatsapp and other instant messaging platforms, it allows for structured data collection in a conversational flow, without imposing additional workflow requirements or cognitive load on field and information management staff who may already be overburdened.

This research exploration has unearthed the need for the adoption of innovative tools that can surface relevant real-time data in a timely and interpretable fashion during times of crisis. Going forward, the goal is to make existing public data sets and ones available to UNICEF more accessible through reproducible data pipelines; test the prototype of our data analytics and visualisation tool that demarcates affected areas; as well as gather user feedback and scope the feasibility of applying machine learning applications to existing data sets (such as predicting movement of people post-disaster using historical Facebook Geoinights and Mobile phone CDRs).



Urban Dynamics

After Dark: Encouraging Safe Transit for Women Travelling at Night

City governments nowadays are adopting sophisticated technologies and near real-time data to improve planning and service delivery to enhance citizens' quality of life. Known as the smart city approach, the aspect of the discourse regarding women has focused on improving mobility. However in order to be able to navigate through these fast-advancing, urban cities, women sometimes have to develop their own safety mechanisms because smart cities do not always mean safe cities. Pulse Lab Jakarta teamed up with UN Women to conduct research on how women navigate public transportation in the evening time.

Aptly called the After Dark research, the overarching goal was to understand the mobility patterns and perceptions of safety among women workers who regularly travel at night. The research was guided by the following questions:

- How do women perceive safety when using public transportation at night?
- What factors influence women's perception of safety when travelling at night?
- What are the challenges that impact women's mobility and travel choices?
- How can transit systems be improved to encourage safe transit for women travelling at night?

There's a scarcity of research on the safety of women who work night shifts in small retail industries and use public transportation to commute at night in urban areas. Yet in Indonesia, this group of



women is quite significant, as the Ministry of Finance reports that they make up around 40 per cent of this sector's workforce. The focus of the After Dark research was therefore narrowed to focus on the experiences of women who may be employed as shop attendants, cashiers, restaurant servers and in other small business enterprises. To expand the understanding about women's safety and mobility choices in urban areas beyond the Greater Jakarta locale, the research was conducted in Medan, Semarang and Surabaya.

This After Dark research focuses on the individual experience rather than the systemic factors; it delves into what "being safe" means for women who regularly travel at night; and it examines the emotions and beliefs influencing women's travel choices. The research was thus designed to gain insights about every aspect of a woman's travelling experience from the first mile to the last mile; and every stop in between. We approached this research with the understanding that a woman's mobility, for instance, returning home from work at night, should not be fragmented into safe and unsafe dilemmas — every part of the journey should be safe.

Thirty-seven women respondents from three cities participated in the research. These women recorded their travel experience over four days in a diary, which served as a springboard for our researchers to conduct



further in-depth interviews. As part of the research, a few of the respondents were shadowed on their journey home at night, which provided researchers with an actual, real-life context to help synthesise information and analyse findings. Preliminary findings from the fieldwork were shared in a co-design workshop with a diverse group of participants to obtain feedback and elicit ideas for intervention opportunities.

We found that the respondents' perceptions of safety exist on a spectrum — it is not simply a dichotomy of being safe or unsafe. While their overall nighttime travel experiences are influenced by a range of factors, the quality of public infrastructure, efficiency of transportation services and women's own sense of familiarity with their surroundings stand out. Regardless of how the women perceived travelling at night to be, they all acknowledged that it was part of what they had to deal with having to work night shifts.

Instead of limiting their mobility due to security concerns, they try to find ways to keep going such as building their own protection mechanisms. These mechanisms help them to reduce dependence on friends, family, fellow passengers and onlookers when travelling at night. The main challenge that emerged is two-fold: it is about how to reduce the burden that is placed on women to maintain their safety, and what steps can be taken to build safe and inclusive cities.

We identified five opportunity areas for intervention:

1. Repositioning Organda (a land transportation organisation that was established by a Ministerial Decree in 1963) to lead the angkot reformation by implementing and monitoring vehicle and driving guidelines to meet safety standards.
2. Reimagining designated angkot (a type of transportation that transports passengers in the city area with the use of small buses and passenger cars) stops

3. Encouraging street vendors to become street wardens
4. Designing a newcomer starter pack for migrant workers
5. Enabling bystanders to take action

To mark 2019's 16 Days of Activism Campaign against gender-based violence, a public discussion was held in Jakarta to share findings from the research and trigger open conversations on how to create safer and more inclusive public spaces for women and girls. The UN Resident Coordinator in Indonesia and the Ministry of Transportation's Head of Research and Development opened the discussion and highlighted the timeliness of the research and the importance of bringing together key stakeholders to explore ideas for user-centred solutions.

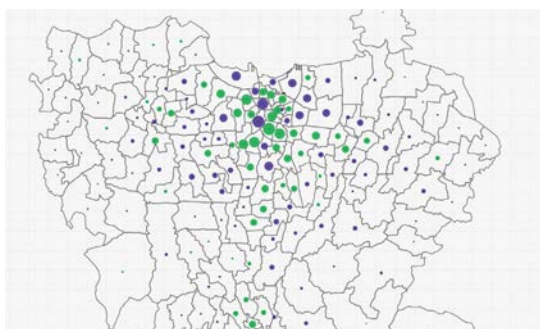
Similar messages were echoed during the panel discussion which included representatives from the Medan Transportation Office, Coalition for Safe Public Space (KRPA), Gojek and UN Women. We are heartened by the intent of Medan City Government to adopt recommendations of the After Dark research as part of the Ministry of Transportation's new Buy The Service (BTS) programme, which upon implementation next year may serve as a useful case study for other cities throughout Indonesia. The After Dark research contributes to a much broader discourse on creating safe and inclusive public spaces for all, and the report presents a variety of opportunities for intervention.

Using Ride-Hailing Data to Inform Transportation Planning and Policy



INDONESIA

Ride-hailing apps have significantly transformed transportation in Indonesia, yet there is much research to be done on their potential to support national development goals. In Greater Jakarta for instance, not everyone uses public transport as some commuters prefer private transport for convenience. Having data-supported insights on segments that are underserved by both public and private transport services can, therefore, help city planners and policymakers develop an integrated transport system. In partnership with Grab, PLJ started off by crunching anonymised driver's GPS traces in Greater Jakarta during August 2018 to get an understanding about ride-hailing inflows/outflows at the sub-district level.



The visualisation above shows traffic patterns in Greater Jakarta as inferred from Grab's anonymised GPS data

To better communicate the results of the analysis, the team generated a set of interactive visualisations to show traffic patterns in Greater Jakarta as inferred from Grab's anonymised GPS data. The visualisation also shows traffic flows during weekdays and weekends. Differences in traffic patterns in several sub-districts were observed. For example, sub-district Menteng (one of the busiest office and business areas in Jakarta) shows higher traffic during weekdays compared to weekends. An opposite trend is seen in commercial and tourist areas, like Bekasi Selatan and Bogor Tengah sub-districts. When the Asian Games took place in Jakarta in 2018, we also saw an opportunity to further explore these dynamics and assess the impact on economic growth and resilience at the subnational and national levels. Going forward, PLJ will act as Regional Data Partner for Grab-UN research partnerships.

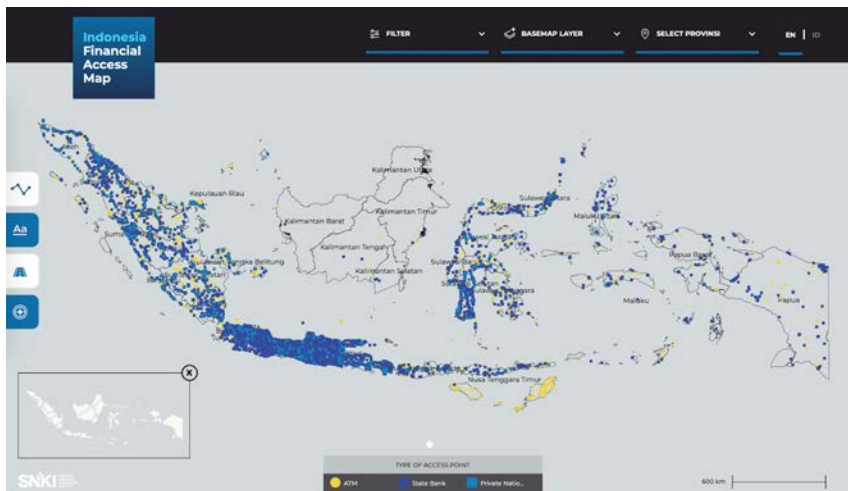
THAILAND

The rapid urbanisation that Asia is in the midst of has brought attendant economic benefits from economies of scale, but has also meant that our cities are choking. The rising levels of traffic lead to significant productivity losses that come with being stuck in traffic, whilst also increasing pollution levels with greater emissions. Efficient transportation planning and management requires spatio-temporal data of high frequency. Leveraging an ongoing data partnership with Grab, and partnering with GIZ Data Lab and the Office of Transport and Traffic Policy and Planning of Thailand through GIZ Transport and Climate Change in Asian Programme, PLJ initiated work to explore the feasibility of ride-hailing data to both inform transportation policy and planning, as well as to develop proxy measures of air-quality at high spatio-temporal resolution for the Bangkok metropolitan region.

The initial research shows that ride-hailing data could potentially provide a range of needs for transportation planning and management, both in terms of data points as well as in terms of modelling such as traffic speeds, nowcasting congestion, and macroscopic traffic flow modelling. It also suggests that even with a low number of actual sensors for calibration, models developed through the use of ride-hailing data coupled with other data sources including those from satellite imagery, could potentially infer air quality at high spatial and temporal resolutions.



Financial Inclusion



Mapping Financial Service Points Across Indonesia

Focused on how to support policymakers in improving financial service points' availability and access in terms of proximity, Pulse Lab Jakarta partnered with the Indonesian National Council for Financial Inclusion (DNKI) to design an interactive geospatial mapping tool with the aim of charting the various financial service points across the country's archipelago. Prototyped using data from Yogyakarta City, Yogyakarta and Bima District, West Nusa Tenggara, the tool visualises financial services points and existing gaps based on socio-economic infrastructure and financial services offered. Together with SNKI and Women's World Banking (WWB), we explored a few ideas and fine-tuned them along the way, resulting in a prototype visualisation dashboard.

Multiple datasets were used to develop the interactive visualisation dashboard, enabling policymakers to explore data layers and indicators that are relevant for improving financial access, and more broadly financial inclusion. These data sets range from financial and telecommunications data to geospatial and demographic

data, which have been collected by Government institutions such as the Financial Services Authority (OJK), the Ministry of Communication and Information Technology, Statistics Indonesia (BPS), and National Team for the Acceleration of Poverty Reduction (TNP2K) to name a few.

By visualising the information, we sought to enhance policymakers' analysis and decisions towards the broader

objective of financial inclusion. The tool features indicators beyond the conventional measurements of financial inclusion, for instance branches per capita or ATMs per 100,000 people — which typically do not factor in where people live in relation to financial service points. Important information related to financial service points were added and categorised into Financial Access Points (FAP) and Potential Access Points (PAP). Eight indicators were integrated for the financial access points, namely: the availability and locations of State banks, Regional banks (BPD), Private banks, Joint Venture banks, Sharia banks (BPR Syariah), Banking agents, Cooperatives and ATMs.

The visualisation dashboard is designed with a modular orientation to accommodate additional data sets. Building the prototype, we only used data from two districts in Indonesia, which allowed us to do rapid prototyping and testing. Nevertheless to scale up the Indonesian Financial Access Map across the country, relevant data for other parts of the country will be required. PLJ has handed over the prototype of the interactive geospatial financial access map to the Indonesian National Council for Financial Inclusion (DNKI), where it'll be enhanced for future usage at national-scale for more informed and timely policy making.

Fintech Challenge Fund Winners 6-Month Pilot: Lessons Learned



Six Indonesian FinTech companies were awarded seed grants towards the end of last year as part of the Microenterprise Fintech Innovation Challenge Fund which Pulse Lab Jakarta implemented together with the United Nations Capital Development Fund — Shaping Inclusive Finance Transformations(UNCDF SHIFT) programme. Taking on insights from the Lab's Banking on FinTech:

Financial Inclusion for Micro Enterprises in Indonesia research, the winners tested a variety of ideas related to the value of human intermediaries (agents), alternative credit scoring, financial literacy and cash light practices.

The challenge fund was a catalyst to help these six local fintech companies incorporate microenterprises as an important part of their business models. The 6-month pilot programme nonetheless was only the beginning; our winners plan to take the insights from the pilot and expand and improve their business solutions. There are plans to begin digitising micro merchant receipts, incorporating crowdsourced information for quality assurance via community surveyors, and geographic expansion of their business offerings. The plans for scaling and sustaining the business solutions show that microenterprises are becoming more of an integral part of business for fintech companies.

The piloting phase provided a practical platform for experimentation for the participants who may not have otherwise had the opportunity to pilot initiatives in their organisations. Although lessons from the piloting phase provided a foundation for understanding the opportunities and barriers for using fintech for financial inclusion in Indonesia, we acknowledge that the 6-month pilot programme has only scratched the surface with a limited sample in limited geographic locations. We were grateful for the close support from the Australian Government Department of Foreign Affairs and Trade (DFAT), Asosiasi FinTech Indonesia (AFTECH) and the Indonesian Financial Services Authority (OJK) during the programme, as well as VISA, Oracle, and Deloitte for their mentorship support for the winners in undertaking their experiments.

The Winners by Areas of Experimentation

 The Value of Human Intermediaries	AwanTunai AwanTunai proposed a digital mobile application system to replace the kasbon credit system for micro merchants. They later shifted their model to offer the working capital loans instead to fast moving consumer goods distributors who work with the micro merchants.	Gandengtangan Gandengtangan proposed a digital mobile platform for distributors who work with microenterprises to offer a digital credit system to create a closed-loop payment system, along with the ability to have digital inventory management and cashless payments.	Modalku Modalku proposed a strategy of using an agent-based acquisition model (sales agents and surveyor agents) to reach micro enterprises for microloans.
	Amartha Amartha proposed to introduce a financial literacy training as a part of their lending process to their borrowers (low income rural women micro-entrepreneurs) via a mobile application, Amartha Go. They also proposed reaching non digitally savvy borrowers by introducing digitally savvy youth agents who are trained in using the Amartha Go app.		
	JULO JULO proposed a new loan product that uses an alternative credit scoring system that incorporates smartphone usage behavior data which is aimed at being more inclusive of women's micro enterprises.		
 Cash Light Practices, Digital Payment System	Duithape Duithape proposed to develop a digital cashless payment system that will allow distributors to collect payments from micro enterprises without the inefficiency and risk of physical cash pickup, enabling micro enterprises to perform transactions with greater ease and security.		

#TabunginAja: Fusing Behavioural Science and HCD for Financial Inclusion



The Behavioural Insights Team (BIT), Pulse Lab Jakarta (PLJ) and Secretariat of the Indonesian National Council for Financial Inclusion (S-DNKI), formed a partnership in 2018 to apply human-centred design and behavioural insights to develop and trial innovative approaches to improve financial inclusion. The project aimed to encourage bank account usage, more specifically regular deposits made into agent-based bank accounts. Such accounts rely on agents to help their neighbours to sign up for accounts, help customers conduct bank transactions such as deposits and withdrawals, and act as general financial services advisory and support.

To test our ideas in the real world, we thus partnered with a large Indonesian bank that offers agent-based banking. We designed an 8-week long WhatsApp campaign called #TabunginAja (#JustSaveIt), implemented between March and May 2019. The messages, consisting of pictures with short messages, comics and text, were sent to agents, asking them to encourage their customers to save the change from purchases at the agent's shop or street food stalls. The messages built on a number of insights from the behavioural sciences, such as goal-setting and rules of thumb.

The qualitative evaluation showed that the implementation of the campaign was labour intensive and messages therefore did not always reach all agents. Among the

agents who received the messages, the content was positively received - indeed, some agents already actively encouraged customers to save their change or had previously done so. Among the agents interviewed, however, none of the agents to whom the idea was new started the habit of asking customers to save their change as a result of the campaign. This was in part due to structural barriers, such as a lack of liquidity among agents. The results of the quantitative evaluation also indicated that customers in the intervention areas were 10-percentage points less likely to make a deposit in May 2019 than those in control areas. We believe, however, that this is due to randomisation failure as it seems highly unlikely that a relatively light-touch intervention would have such a large impact on the outcome of interest.

As we were not able to determine the overall impact of the campaign and its implementation was associated with a cost (human resources necessary to send out the messages), we cannot recommend its roll-out across the agent-based banking system in Indonesia. However, we think that the project and its results display important lessons for agent-based banking and financial inclusion policies in Indonesia, specifically around innovating to improve financial inclusion and enhancing the effectiveness of the agent-based banking system. We thank S-DNKI for partnering with us, and look forward to developing and testing more innovative approaches to ensure every Indonesian can eventually benefit from access to appropriate financial products.



One of the comic strips shared during the campaign



Food Security and Agriculture

Mapping Smallholder Farmers in Indonesia to Inform Policies



As the world's population continues to increase, governments have been stepping up efforts to ensure that citizens have access to safe and adequate food supply. The Sustainable Development Goals are also undergirded in the ambition to end hunger, which is crucial to sustain humanity. Collaborating with the Directorate of Cooperatives and Small and Medium-sized Enterprises (SMEs) in the Ministry of National Development Planning (Bappenas), Pulse Lab Jakarta developed an interactive visualisation and analysis dashboard that uses the latest agriculture census data to identify smallholder farmers, with respect to the commodities they produce and the size of their landholdings to generate insights that can inform policies relevant to SMEs in the agriculture sector.

Consisting largely of smallholder farmers (defined as having landholding less than two hectares) and large plantations, millions of Indonesians depend on the agriculture sector to earn their everyday livelihoods. Smallholder farmers, who typically come from agriculture-dependent households, are also part of the segment of SMEs in Indonesia. Information nonetheless regarding SMEs (in the case of smallholder family farmers) that contribute to the agriculture sector remains limited. Having a better understanding of how many of these smallholder farmers exist; the kinds of commodities they produce; and the land size used can enable the Government to provide more fitting support.

The agriculture sector in Indonesia is vast, yet not all smallholder farmers are recognised in official statistics. The 2013 Agriculture Census, the latest of six agricultural censuses ever conducted in the country, is the most comprehensive data set currently available. Within this data set though, there is no indication of which farmers are considered SMEs. Through discussions with Bappenas' Directorate of Cooperatives and SMEs, we thus decided to experiment with land size as a proxy to determine smallholder farming SMEs. For instance, farmers with landholdings less than one hectare were categorised as SMEs for the food crops category. While for the horticulture category, farmers with landholdings smaller than half a hectare were classified as SMEs.

Once the data was processed and the classifications for smallholder farming SMEs for each agriculture category was established, our next move was to prototype a visualisation and analysis dashboard that could cover all 34 provinces in Indonesia, including data on the national and sub-district levels. The dashboard was intended to not only present the data collected in a way that was digitally interactive (allowing users to easily switch between provinces and survey commodities of interest), but also do so in a visually appealing way. After rounds of iterations alongside our Bappenas colleagues to ensure optimum user experience, we came up with a prototype that allows data overlaying and multiple presentation views.

The dashboard also provides useful visualisations on the amount of land that is used for a particular category of agriculture, which helps with categorising which farmers fall into the SMEs segment. Having an understanding about the type of agriculture commodity, the size of landholding, characteristics of the farm (and the related household) used for production can provide the Government with useful information that can inform resilience efforts when smallholder farmers experience economic shocks. Using the data from the 2013 agriculture census as the single data source, the dashboard was developed as a rapid prototype.

Determining smallholder farming SMEs is multidimensional and to be more accurate, we cannot rely on the size of landholding alone. Therefore in 2019, the Directorate for Cooperatives and SMEs showcased the features of the

dashboard to other ministries and government institutions to discuss how the dashboard could be further developed by integrating additional data sets from other ministries to provide a more comprehensive understanding about how the agriculture sector intersects with other areas of national development, as well as to come with a multidimensional proxy for smallholder farming SMEs.

Moving forward, Bappenas as the custodian of the dashboard, is positioned to explore additional data sets from other ministries (especially with the Satu Data initiative now being implemented) to also ensure the livelihoods of smallholder farmers are safeguarded through long-term resilience planning.

Applying Big-Data-Based Positive Deviance Approach in Agriculture



In developing countries, agriculture production systems and households that manage these systems are complex and varied. Knowledge and data collection activities undertaken by government agencies tend to fall short of capturing this complexity and variety across both spatial and temporal dimensions. In Partnership with GIZ Data Lab, PLJ undertook a scoping project to understand the potential of big-data driven “positive deviance” (land managers who are exposed to similar conditions, but are faring better than their peers in the same group). The primary objective of the research was to identify the behaviours, strategies and factors employed by the positive deviants and develop interventions to facilitate the adoption of those strategies.

Our study population included villages in Indonesia having at least one household growing rice. From the 2013 agricultural census, roughly 40,000 villages covering almost nine million rice growing households were identified based on this criterion. The agriculture census provides troves of data, which is potentially noisy

because the data set was not developed for the purpose of identifying positive deviance per se. Since the census data is collected across three cropping seasons in 2012-2013, all the data could be leveraged but the performance measure would need to change to reflect the seasonality across the year. To maximise the identification of outliers and to maintain the interpretability of the results, we aimed to remove noise and extraneous variables that could potentially impact the final result.

Our early findings confirm that positive deviants can be identified by analysing key variables within data sets, but to reach a more conclusive result additional datasets and contextual experts are needed to corroborate findings. This pilot was an opportunity to start the discussion about what a “positive deviant” means for agriculture production and its broader implication for sustainable development. Though our method investigated yield proxies, as a measure of agricultural performance, higher yields are not necessarily sustainable. However, methods to increase yield can have long-time impact on community, environment and even agricultural performance over time.



Discussing how big data based positive deviance approach might be used to identify rice farmers in Indonesia who are performing better than their peers



Strategic Exploration



Nowcasting Inflation to Keep Indonesia's Growth on Track

Inflation is the average change in percentage based on a general price index, but in many cases an increase or decrease only becomes evident on a monthly and annual basis. This lag delays a government's ability to take a swift course of action. Pulse Lab Jakarta and the Directorate of State Finance and Monetary Analysis within the Ministry of National Development Planning have been developing a fit-for-purpose inflation monitoring tool, which can generate same-day inflation information to advise decision and policy makers working in the economic policy domain.

While a few days lag may seem insignificant for consumers, at a national scale a negative outcome could have an adverse effect on the population. Nowcasting therefore enables daily assessments to ensure that the Government is informed in a timely manner and can plan interventions to cope with such an outcome. Initial discussions between our data science team and representatives from the Directorate of State Finance and Monetary Analysis about the possibility of developing a nowcasting model began in 2017. We considered several traditional and non-traditional data sets to investigate whether they could aid near real-time orientation.

After extensive exploratory data analysis, the data set from Bank Indonesia's Strategic Food Commodities Price Information Centre showed some positive results. This data set contains daily-updated price data of ten strategically selected commodities: rice, red chillies, cayenne peppers, shallots, onions, cooking oil, sugar, beef, eggs and chicken. To gain a comprehensive measure of domestic inflation, we also considered housing prices and automotive prices.

The model we developed can successfully 'nowcast' the rate of inflation within a running month with 72 per cent accuracy and an average error rate of 4 per cent. The working model was initially tested in the second week of November 2018, and generated a 3.15 per cent year on year inflation rate for November 2018. We compared the model's result with the official inflation rate published by BPS in the first week of December that showed a rate of 3.12 per cent. Whenever one or two of the data sets were removed, the model showed varying results that were not close to the officially published inflation rates. This suggests that the current model relies heavily on all the data sets being used to prevent any statistical disturbance.

The model has received recognition from the Bappenas Minister, Bambang Permadi Soemantri Brodjonegoro, and the Minister has encouraged his team to explore additional features that might be relevant for policy makers across the Indonesian Government. The Directorate is also planning to present the inflation model to the National Inflation Control Team and Bank Indonesia as a national planning and strategy tool to help monitor the inflation rate for a running month. This nowcasting tool will be integrated as part of the Bappenas' Situation Room that will be launched soon.

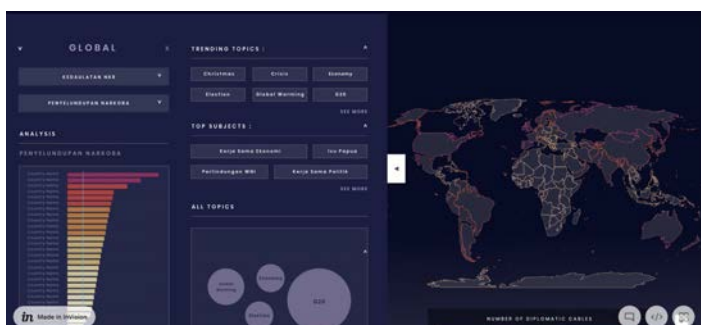
Dataku: Using Data Analytics and Visualisation to Inform Government Decision Making

To complement the Indonesian Government's data governance initiative known as Satu Data, Pulse Lab Jakarta alongside the Ministry of National Development Planning (Bappenas) developed a data visualisation tool to provide government officials with an at-a-glance, data informed view on particular development topics. The tool is being tested with potential users within the Ministry for feedback, and will become a cornerstone in Bappenas' Situation Room for planning, implementation, monitoring and evaluation.

Known as DatakuID, the tool visualises near real-time data that is made available through Satu Data Indonesia portal APIs. While this portal houses several complex data sets

that can be leveraged for effective policy making, making sense of the data often comes as a challenge. To address this challenge, Bappenas' Data and Information Centre initially explored a few ideas with Pulse Lab Jakarta's data analytics team, from which insights were garnered that later informed the development of the data visualisation tool. DatakuID is designed to ingest data from the Satu Data Perencanaan Pembangunan portal, then visualise and present them in an intuitive, concise and attractive format to inform decision making at the subnational and national levels.

The tool is built with much agility, which makes it adaptable to other datasets that may be added in the future from the Satu Data portal, including datasets from other ministries.



Making Sense of Diplomatic Correspondence through Data Analysis and Visualisation

Collaborating with the Indonesian Ministry of Foreign Affairs, Pulse Lab Jakarta have extensively explored and produced a machine learning visualisation tool to help staff understand their diplomatic correspondence between the Ministry and their diplomatic staff abroad. To facilitate dialogues with foreign governments and other stakeholders, analysts within MoFA are required to produce summaries of diplomatic cables for each country for diplomatic staff, government officials and the Minister. Currently, these summaries are generated by analysts reading, annotating and summarising large volumes of diplomatic communications, which is time intensive and a large volume of communications are unable to be read and incorporated into analysis reports.

Subsequent to user research conducted within the Ministry, we identified one clear need inside the department that was amenable to a machine learning solution: Understanding, classifying and making accessible their diplomatic cable data. PLJ began a collaborative process of ideation and design, and concepts and mockups were presented at an early stage of the project to clarify the need and ensure that our proposed solution would be usable and practical with the existing workflow of the staff within the Ministry. Based on feedback from these mockups, we made substantial changes to our proposed design and presented a second round of prototypes. This resulted in a set of tools that can reliably extract metadata and text data from MoFA diplomatic cables, and can automatically classify new incoming cables using the taxonomy provided by MoFA. The tool enables MoFA to analyse, locate and make sense of their large volume of correspondence and improves analysts' abilities to provide relevant, timely and accurate advice.

Academic Papers and Publications

Academic Papers



2017

“Social Media Insights for Sustainable Development and Humanitarian Action in Indonesia”

International Conference on Data and Information Science

“Better Informing the Situational Information on Haze Crises in Southeast Asia and Its Impacts on Human Mobility in Singapore”

CIKM Analyticup on DataSpark Mobility Open-Task Challenge

“Statistical Analysis of Postal and Trade Network Data within ASEAN Countries and Beyond”

7th International Seminar on New Paradigm and Innovation on Natural Sciences and Its Application

“Understanding the Effects of Traffic and Weather Conditions on Public Transport Use in Jakarta”

CIKM Workshop on Big Data Analytics for Enhancing Public Transport (Big Transport)

“VAMPIRE and PRISM - New Vulnerability Monitoring Platforms on Food and Livelihood Security in Indonesia and Sri Lanka”

3rd Conference on Data for Policy

“Keyword Expansion for Understanding Events in Indonesian Tweets”

ICML Workshop on Interactive Machine Learning and Semantic Information Retrieval

“Mining Social Media to Inform Peatland Fire and Haze Disaster Management”

Journal of Social Network Analysis and Mining

“Nowcasting Commodity Prices Using Social Media”

Journal of PeerJ Computer Science

“Nowcasting Commodity Price with Google Trends and Twitter”

Korea Computer Congress

“Estimating the Indicators on Education and Household Characteristics and Expenditure from Mobile Phone Data in Vanuatu”

5th Conference on the Scientific Analysis of Mobile Phone Datasets (NetMob)

“Inferring Commuting Statistics in Greater Jakarta from Social Media Locational Information from Mobile Phone”

5th Conference on the Scientific Analysis of Mobile Phone Datasets (NetMob)

“Collaborative Translation to Better Listen to Citizen Feedback and Voices on Public Sector Programmes”

5th Collective Intelligence Conference



3rd Research Dive Technical Report - Statistics for SDGs



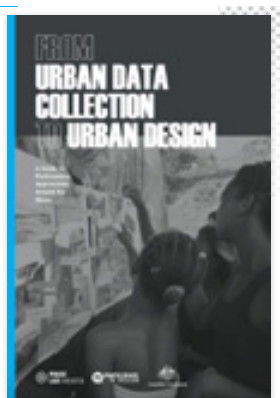
4th Research Dive Technical Report - Trade & Competitiveness



5th Research Dive Technical Report - Transportation



How a Social Lab can Support the Change Agenda in Sri Lanka



From Urban Data Collection to Urban Design: A Guide to Participatory Approaches Around the Globe

PUBLICATIONS

2018



6th Research Dive Technical Report
- Urban and Regional Development



7th Research Dive Technical Report
- Machine Learning and Artificial
Intelligence for Estimating Poverty



8th Research Dive Technical Report
- Financial Inclusion



Stories of Change: Haze
Gazer and Vampire



Examining Customer Journeys
at Financial Institutions in
Cambodia



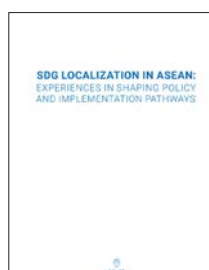
Banking on Fintech:
Financial Inclusion for Micro
Enterprises in Indonesia



2017 Annual Report



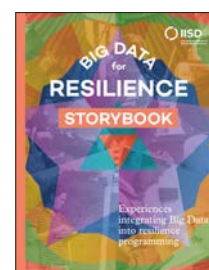
Chapter Contributed in:
Knowledge, Politics and
Policymaking in Indonesia



Chapter Contributed in: SDG
Localization in ASEAN -
UNDP



Chapter Contributed in:
The Atlas of Innovation for
Economic Stability



Chapter Contributed in:
Big Data for Resilience
Storybook

▶ ACADEMIC PAPERS

“Estimating the Quality of Crowdsourced Translations based on the Characteristics of Source and Target Words and Participants”

International Conference on Advances in Social Networks Analysis and Mining 2018

“Nowcasting Air Quality by Fusing Meteorological Data, Insights from Satellite Imagery and Photos Shared on Social Media using Deep Learning”

International Conference on Advances in Social Networks Analysis and Mining 2018

“Predicting Evacuation Destinations due to a Natural Hazard using Mobile Network Data”

International Conference on Informatics and Computational Sciences 2018

“Big Data for Development Indicators and Social Policies”

International Conference on Population and Social Policy in a Disrupted World 2018

“Improving Traffic Safety Through Video Analysis in Jakarta, Indonesia”

Annual Conference on Neural Information Processing Systems 2018

Academic Papers

Understanding Aggregate Human Behaviour Changes in Response to a Natural Disaster in Vanuatu via Mobile Network Data Analysis

16th International Conference on Information Systems For Crisis Response and Management

The Potential of Crowdsourcing to Advance the SDGs by Fostering Local and Global Collaboration

Data For Policy 2019

The Disaster-related Dictionaries in Multiple Asian Languages by Crowdsourced Translations to Support Sustainable Development Goals

Data for Good Exchange by Bloomberg

Data Analytic Platform for Logistics Planning and Information Management Following Natural Disasters

Data for Good Exchange by Bloomberg

Modelling Wealth from Call Detail Records and Survey Data with Machine Learning: Evidence from Papua New Guinea

IEEE International Conference on Big Data

Data Analytic Platform for Logistics Planning and Information Management Following Natural Disasters

Australasian Aid Conference 2020

Comparing population displacement estimates from mobile network data and other sources

Internal Displacement Monitoring Centre (IDMC) journal - Global Report on Internal Displacement

Using Social Media Imagery to Nowcast Air Quality

The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2019 (Computer Vision for Global Challenges)

Publications



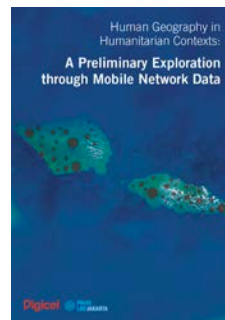
Annual Report 2018



After Dark:
Encouraging Safe Transit for
Women Travelling at Night



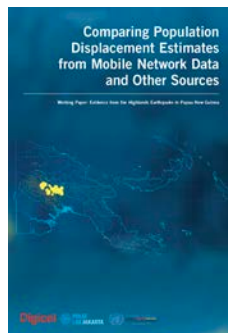
Samoa Scoping Mission
Report



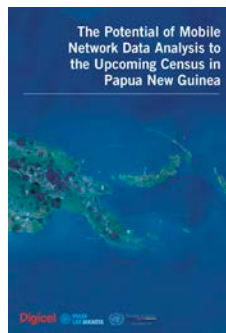
Human Geography in
Humanitarian Contexts:
A Preliminary Exploration
through Mobile Network Data



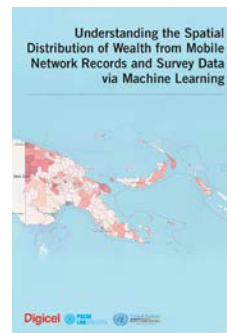
9th Research Dive
Technical Report:
Household Vulnerability



Comparing Population
Displacement Estimates
from Mobile Network Data
and Other Sources



The Potential of Mobile Network
Data Analysis to the Upcoming
Census in Papua New Guinea



Understanding the Spatial
Distribution of Wealth from
Mobile Network Records and
Survey Data via Machine Learning

Capacity Building and Outreach

Outreach

2017

As part of our efforts to contribute to the discourse on data innovation and data analytics, as well as to promote harnessing digital data sources and artificial intelligence for social good, Pulse Lab Jakarta has hosted, organised, facilitated and contributed as resource persons in a range of national and international events. Below is a timeline summary of our activities throughout the year, many of which were conducted in collaboration with our partners from government institutions, the private sector, academia and civil society organisations.

JANUARY

World Data Forum

Cape Town, South Africa

UN Global Pulse showcased its work on data innovation around the SDGs during two sessions it hosted on 'Big Data Innovations for Sustainable Development' and 'Working with Big Data and New Data Sources'.



FEBRUARY

Assessing the Technological Turn in Humanitarian Action Policy Discussion

Singapore

PLJ discussed the potential of using Big Data for humanitarian action and disaster risk management in the Asia Pacific region.

International Conference on Data Revolution for Policy Makers

Jakarta, Indonesia

PLJ in collaboration with BAPPENAS and KSI convened policy makers, data analysts and other stakeholders to explore the opportunities and challenges of utilising new data sources for policy making.



IFRC Flood Resilience Innovation Conference

Jakarta, Indonesia

PLJ described how emerging digital datasets can support flood resilience, and emphasised the need for humanitarians to venture out and meet with innovators who are engaged on the frontline.

MARCH

Research Dive 3: Statistics for SDGs

Jakarta, Indonesia

PLJ brought together statisticians from across Indonesia to analyse data from the MDGs as a means to support the implementation and monitoring of the SDGs.



Lab Visit: Kaveh Zahedi - UNESCAP Deputy Executive Director

Jakarta, Indonesia

iData Studio Regional Workshop

Bangkok, Thailand

PLJ outlined how certain data innovations and human centered design methodologies have become useful for transforming insights into action through a collaborative design approach.



APRIL

IEEE Pacific Visualization Symposium Seoul, South Korea

PLJ exhibited UN Global Pulse's storytelling project on 'Rescue Signatures in the Mediterranean' that shows the magnitude of ongoing rescue operations and enables an interactive analysis.

NetMob Conference Milan, Italy

PLJ presented findings on two of its mobile phone data analysis research projects: (a) Using Twitter data from mobile phone to produce commuting statistics in Indonesia and (b) Using mobile phone data to produce socio-economic statistics in Vanuatu.

Lab Visit: Haoliang Xu - Asst. Secretary General of the UN/UNDP Director of the Regional Bureau for Asia and the Pacific Jakarta, Indonesia



Buka Warung: Media & Blogger Jakarta, Indonesia

PLJ in association with TEMPO Institute organised an open lab event for media personnel and new media bloggers, which sought to address challenges related to data journalism.

International Conference on the Digital Economy: Security and Privacy in the Big Data Era Jakarta, Indonesia

Pulse Lab Jakarta facilitated the visit of UN Special Rapporteur on the Right to Privacy, Professor Joe Cannataci, to give a keynote address at the international conference on 'Security and Privacy in the Big Data Era' which was organized by Padjadjaran University. The conference helped highlight how protecting the security and privacy of the public will boost confidence and trust and encourage growth in the digital economy.

MAY

Global Landscapes Forum: Peatland Matters Jakarta, Indonesia

PLJ described the features of its real-time haze analysis platform known as Haze Gazer, which is designed to provide insights to enhance response strategies for disaster management authorities.

Australia-Indonesia Youth Leaders Seminar Jakarta, Indonesia

PLJ gave an overview of the Lab's projects which utilise digital data for social good during a TED-talk event held at the Australian Embassy in Jakarta.



Photo credit: Australian Embassy, Indonesia

Humanitarian Data Exchange Workshop Jakarta, Indonesia

PLJ together with UNOCHA facilitated a workshop session which explored innovative methods for generating insights from complex datasets to support efforts in the humanitarian field.

Data Innovation Clinic with Bandung City Governments Bandung, Indonesia

PLJ in collaboration with HIVOS and Data Science Indonesia facilitated a sharing session with the Department of Communication and Informatics (Diskominfo) and the Agency of Planning, Research and Development (Bapelitbang), in which they explained how Big Data may be leveraged for policy making in Bandung.



JUNE

AI for Good Global Summit Geneva, Switzerland

PLJ highlighted the Lab's data analytics projects during a panel discussion on how governments, private sector industries and stakeholders today are using Artificial Intelligence for social good.

Collective Intelligence Conference 2017 New York, United States

PLJ presented the findings of the first phase of the Lab's Translator Gator project (designed to crowdsource development related keywords), and discussed emerging approaches that can be used to monitor citizen feedback on public sector programmes.

Forum on Innovative Data Approaches to SDGs Incheon, South Korea

PLJ echoed the importance of the ongoing data revolution, given the demands of the complex SDGs, particularly focusing on how improvement in how data is produced and used may be used to close existing data gaps.

4th WeGO General Assembly Ulyanovsk, Russia

PLJ's Urban and Regional Dynamics Lead served as one of the judges for the WeGO (the World Smart Sustainable Cities Organisation) Smart Sustainable City Awards and chaired a session on 'Internet of Things (IoT), Big Data and Analytics'.



Behavioural Exchange 2017 Conference Singapore

PLJ surveyed a set of approaches related to how new digital data sources and real-time data analysis techniques may be useful in shaping and informing public policy decision making process.



JULY

Indonesia Innovation Forum 2017

Jakarta, Indonesia

PLJ moderated a panel discussion themed on ways to improve innovative research and technology application in Indonesia.

Lab Visit: Members of the Australian Parliament

Jakarta, Indonesia



AUGUST

Indonesia Development Forum (IDF) 2017

Jakarta, Indonesia

PLJ showcased VAMPIRE (an early warning system for climate impact) during a session on technology and inequality, as well as its analysis on Transjakarta passengers travel behaviours during the 'Ideas and Innovation Marketplace'.



ASEAN Strategic Policy Dialogue on Disaster Management 2017

Singapore

PLJ took part in the ASEAN strategic policy dialogue on disaster management, speaking in particular about how big data can add value to improve planning and preparation efforts.



Research Dive 4: Trade and Competitiveness

Jakarta, Indonesia

PLJ in collaboration with OLX Indonesia hosted 17 academics and researchers from diverse disciplines to dive into various new types of data to explore the dynamics of trade and competitiveness in Indonesia and across the region.



SEPTEMBER

UNDP GCPSE's Disruptive Technologies for Government Conference

Singapore

PLJ's Head of Office participated in a panel discussion, addressing the opportunities and challenges of embracing new technologies that have been changing the way governments operate.

3rd Sankalp Southeast Asia Summit

Jakarta, Indonesia

PLJ discussed the importance of experimentation and prototyping in the social impact space.



Asia Pacific South 3DEXperience Forum

Surabaya, Indonesia

PLJ contributed to a panel discussion, focusing on some of Indonesia's smart cities and the use of technology to assist in urban planning and design.

OCTOBER

Strategic Dialogue on Poverty and Inequality in Asia and the Pacific Bangkok, Thailand

PLJ discussed several innovative methods and complementary data that can support research, and enhance knowledge and policymaking in Asia and the Pacific.

IDEAFEST

Jakarta, Indonesia

PLJ explored through an interactive dialogue how new technologies can help communities start a social movement as well as measure its impact.

2017 International Conference on Sustainable Development Goals Statistics Manila, The Philippines

PLJ presented a selection of its data innovation projects and discussed the potential of integrating different data sources to monitor the SDGs.



Embassy Briefing

Jakarta, Indonesia

PLJ hosted a group of representatives from different foreign embassies in Jakarta during a coffee morning, and featured some of the Lab's flagship projects.

PLJ Buka Warung with Bappenas

Jakarta, Indonesia

PLJ organised a sharing session for members of the Directorate of Maritime and Fisheries within Bappenas to present updates on some of the Lab's work around using new data sources to generate insights for public policy.



NOVEMBER

General Lecture at ITB, ITS & UI Bandung, Surabaya, Jakarta, Indonesia

PLJ organised a lecture series at three universities on the topic of Big Data, Thick Data and their overlaps.



Research Dive 5: Transportation

Jakarta, Indonesia

PLJ invited researchers and domain experts to participate in its research sprint on transportation, analysing toll data, traffic CCTV data, public transportation and social media data to improve traffic management.

United Nations Climate Change Conference (COP 23)

Bonn, Germany

PLJ highlighted the benefits of its collaboration with government partners and other stakeholders, and discussed how it designs innovation projects to help achieve the SDGs in Indonesia.



4th UN Conference on Big Data for National Statistics

Bogota, Colombia

PLJ presented three of its projects as case studies for data collaboratives for the SDGs: nowcasting food prices, commuting statistics from social media and VAMPIRE.

Australia-Indonesia Fintech Exchange

Melbourne & Sydney, Australia

PLJ led a session on the opportunities of fintech for financial inclusion and presented its project to support financial inclusion for micro enterprises in Indonesia.

DECEMBER

Python Conference 2017 Surabaya, Indonesia

PLJ described how it designs service APIs for Big Data sources to a group of Python enthusiasts from across Indonesia.

The International Conference on Data and Information Science (ICoDIS) 2017

Bandung, Indonesia

PLJ led a discussion on how emerging digital data sources, such as social media, can be used responsibly for social good.

Asian Development Bank - Big Data for Sustainable Development for Humanitarian Action Seminar

Manila, The Philippines

PLJ discussed how different types of big data, including social media and satellite imagery, can provide real-time insights not only to decision makers but also to citizens.



Expert Group Meeting on Data-Driven Smart Government

Manila, The Philippines

During the Expert Group Meeting on data-driven smart governments organised by UNESCAP, PLJ presented on how Big Data may be used to advance sustainable development.

Data Visualisation Workshop

Bandung, Indonesia

PLJ's visual designer underlined the importance of data visualisation in today's data-rich world, unpacking some snazzy examples and the concepts behind them.



OUTREACH

2018

JANUARY



GovPay Summit
Jakarta, Indonesia

PLJ co-hosted the Summit and in line with the event's theme on urban tech, also facilitated a roundtable with several governors to discuss innovation priorities for their respective regions.



Data for Smart City
Bandung, Indonesia

PLJ talked about how emerging data sources can help to improve efficiency in public service delivery.



Satu Data Workshop
Pontianak, Indonesia

PLJ, KSP and the Government of Pontianak organised a workshop to trial the Satu Data toolkit with public servants.



Indonesia-Australia Digital Forum
Jakarta, Indonesia

PLJ presented on the merits of harnessing technology for smart, agile, and responsive government.



United Nations ECOSOC Youth Forum
New York, USA

Our research assistant shared case studies to demonstrate how big data can improve youth development and engagement.



Lab Visit: ITU Secretary-General Houlin Zhao
Jakarta, Indonesia

FEBRUARY



Harnessing Big Data in the Agriculture Sector Seminar

Depok, Indonesia

PLJ presented some of its work focused on using big data analytics to improve food security.



Lab Visit: DFAT's Chief Innovation Officer

Jakarta, Indonesia



Lab Visit: The UK's Office for National Statistics Data Science Campus

Jakarta, Indonesia

Colleagues from the Campus presented its project portfolio and shared its experience in growing data science skills across government.

MARCH



#SDGDataLK

Colombo, Sri Lanka

PLJ presented its work at the symposium to highlight the benefits of using big data for evidence-based policymaking.

GPSDD Data for Development Festival

Bristol, UK

PLJ co-hosted a session discussing the role of ethics and privacy in data mining.

Regional Workshop on Strengthening Multi-Hazard Early Warning Systems for Pacific Island Countries

Denpasar, Indonesia

PLJ showcased some of its data analytics and visualisation tools developed to strengthen humanitarian action.



University Visit: Bandung Institute of Technology

Bandung, Indonesia

PLJ presented some of its research projects leveraging big data for urban planning and development strategy.

APRIL



University Visit: University of Indonesia

Depok, Indonesia

PLJ gave a lecture to students from the Faculty of Economics themed on big data integration for economic policymaking.



Makassar Innovation Lab Design Thinking Workshop

Makassar, Indonesia

PLJ assisted BaKTI to organise a design workshop for government officials involved in establishing the Makassar Innovation Lab.



Lab Visit: Deputy Head of Mission at the Australian Embassy in Jakarta

Jakarta, Indonesia

MAY



UNLEASH Singapore Singapore, Singapore

PLJ facilitated various design sessions aimed at transforming ideas into solutions related to SDG #11.



UN Data Literacy Workshop Bangkok, Thailand

PLJ spearheaded a three-day data literacy workshop organised for Resident Coordinators and Heads of Agencies from across the Asia Pacific region.



Lab on Wheels: Festagama UGM Yogyakarta, Indonesia

PLJ organised a data innovation workshop and data analytics exhibition to showcase its projects on big data for urban planning.



International Telecommunication Union (ITU) Asia-Pacific Regional Development Forum 2018 Bangkok, Thailand

PLJ presented its work on big data for development to telecom regulators and government officials from information and communications ministries in the Asia-Pacific region.



2nd Artificial Intelligence for Good Global Summit Geneva, Switzerland

UN Global Pulse shared expertise from AI projects built with partners and engaged in conversations to support ongoing innovation efforts and partnerships.

JUNE



WFP's Innovation Accelerator Bootcamp Munich, Germany

PLJ stress tested the scaling model of VAMPIRE - our drought-monitoring prototype - as part of the accelerator, which culminated in a pitch to an audience of investors.

JULY



The 4th International Conference on Indonesian Architecture and Planning (ICIAP)

Yogyakarta, Indonesia

PLJ discussed how real-time data streams from new digital technology can improve urban and regional planning.



Indonesia Development Forum

Jakarta, Indonesia

PLJ presented its Banking on Fintech research in a session focusing on unlocking the potential of digital economy for regional development.



Launch: The Atlas of Innovation for Economic Stability

Jakarta, Indonesia

PLJ hosted the launch of the Atlas of Innovation for Economic Stability, which presents 63 examples of policy, programme and technology innovations.

DATAKALI

Jakarta, Indonesia

PLJ talked about how big data and emerging technologies are revolutionising development practices.



Coffee, Croissants & Prototypes - UN Country Team in Indonesia

Jakarta, Indonesia

PLJ provided updates on some of its recent and upcoming projects to colleagues from the UN Country Team in Indonesia.

International Conference Series on Advances in Social Network Analysis and Mining (ASONAM)

Barcelona, Spain

PLJ presented the results of its nowcasting air quality research using social media, as well as on the quality of crowdsourced translations via TranslatorGator.

International Conference on Population and Social Policy in a Disrupted World 2018.

Yogyakarta, Indonesia

PLJ presented an academic paper on big data for development indicators and social policies.

AUGUST



Data Innovation Clinic with Development CAFÉ

Jakarta, Indonesia

PLJ ran a data innovation clinic as part of a big data for monitoring and evaluation workshop organised by the Development CAFÉ

SEPTEMBER



Innovation Labs World

Singapore, Singapore

PLJ gave the keynote address for the summit and presented some of the Lab's ongoing projects related to the SDGs.



Interministerial South-South and Triangular Cooperation (SSTC) Conference

Bali, Indonesia

PLJ discussed emerging issues on population and development, as well as how the 2020 census can benefit from big data.



MRT Jakarta Cafe Talk

Jakarta, Indonesia

PLJ shared its research project on big data for commuting statistics with representatives from MRT Jakarta.

OCTOBER



World Data Forum
Dubai, UAE

PLJ and Digicel talked about how mobile network data can strengthen humanitarian response.

UN Data Literacy Workshop
New Delhi, India

PLJ facilitated discussions on emerging big data sources and their implications for the SDGs.



Inter-regional Preparatory meeting for the Mid-Term Review of the SAMOA Pathway
Apia, Samoa

PLJ participated in the Interregional Preparatory Meeting for the Mid-term Review of the SAMOA Pathway that took place in Apia, Samoa in late October 2018. PLJ is contributing to the design of new and sustainable partnerships that address the key challenges of the Small Island Developing States (SIDS) particularly on climate change and resilience.

NOVEMBER



Lab Visit: Buka Warung with MRT Jakarta
Jakarta, Indonesia

PLJ shared how advanced data analytics can support MRT Jakarta services to suit the needs of commuters.

UN Data Literacy Workshop
Bangkok, Thailand

PLJ, together with the UN Development Group, conducted two Data Literacy workshops for senior UN leaders from across the Asia Pacific region in 2018. Topics such as demystifying alternative sources of data for decision making, big data and ethics and how private sector partnerships for data collaboratives were prioritised.



International Conference on Informatics and Computational Science (ICICOS)
Semarang, Indonesia

PLJ presented its research on using mobile network data to predict evacuation destinations during natural disasters.

DECEMBER



After Dark: Co-Design Workshop
Jakarta, Indonesia

To complement insights gathered from the After Dark field research, PLJ invited individuals across different sectors to offer inputs to support the synthesis phase of the research.

Data Dive with OLX Indonesia
Jakarta, Indonesia

PLJ and OLX analytics team conducted exploratory analysis using OLX data to investigate the correlation between rising and falling real estate prices and Bank Indonesia's official data.



UNCT Meeting with UNESCAP Executive Secretary
Jakarta, Indonesia

Bringing Together Researchers to Better Understand Household Vulnerability

In partnership with the macroprudential policy department at Bank Indonesia, Pulse Lab Jakarta brought together a cadre of Indonesian researchers across government, academia and the private sector for its 9th Research Dive for Development. The primary goal of the research-event was to better understand financial vulnerability in Indonesia at the subnational and national levels through the use of traditional and non-traditional data. This unique collaboration, which leveraged the Lab's advanced data analytics capacity and Bank Indonesia's domain expertise, facilitated a series of thematic research sprints specifically to:



Researchers analysed a range of data sets to gather insights to inform macroprudential policies

- Understand the housing mortgage default rate in Indonesia
- Identify indicators of household indebtedness at the provincial level
- Use fintech data to assess customers' financial vulnerability
- Evaluate how natural hazards impact loans-at-risk

Recognising the potential of big data and how it can be harnessed effectively to inform its ongoing and future work, Bank Indonesia sought to explore how these emerging data sources can also be used to formulate macroprudential policies to mitigate systemic risks and help strengthen the overall financial system.

The research participants were grouped based on their research interests and worked closely with domain experts, who provided feedback on how to approach the assigned research tasks; what datasets may be useful; and the type of research methodology that might be most applicable. Preliminary results from the research sprints were shared with key stakeholders who attended the closing presentations and were later made available in a technical report submitted to Bank Indonesia.

Insights from the research sprints:
bit.ly/researchdive9



Urban planners from across the globe participated in PLJ's Lab on Wheels at the 55th ISOCARP World Planning Congress held in Jakarta

Lab on Wheels: Triggering Conversations on the Use of Non-Conventional Data

When Pulse Lab Jakarta first envisioned the concept of Lab on Wheels, there were two main goals in mind. The first, encoded into the name itself, was to promote PLJ's data analytics work to a broad audience. Second, through a variety of activities engaging participants during these outbound junctures, the intention was to advocate data literacy and trigger conversations on the use of non-conventional data in more diverse contexts. Thus when the International Society of City and Regional Planners (ISOCARP) invited the Lab to participate in its 2019 forum in Jakarta, the team at the Lab saw this as yet another opportunity to share our work with a different audience.

The academic spectrum of participants ranged from undergraduate students to urban planners with PhDs. We thus tailored the content to their specific contexts and took into consideration that their jobs already brought them into close contact with data on a regular basis. An interactive session built on and supported by two "studio cases" (one on Transit Oriented Development and the other on the historical preservation of Jalan Suryakencana in Bogor) was designed to facilitate the discussions.

In demystifying "big data" for these young professionals, PLJ sought to demonstrate the uses of non-conventional data for urban planning

in everyday life, as well as address the limitations. Using a participatory approach, we unpacked our commuting statistics research that uses Twitter data and mapped it to the participants' own daily journey. While some of the participants were already familiar with big data, presenting an actual, specific, real-world use case from our own portfolio enhanced the ideation stage. This further built our credibility with the audience, as we weren't just speaking "theory" but also demonstrating analysis of experiential evidence.

The Lab's efforts paid dividends in how the session was received by the participants. The overall feedback indicated that this hands-on session did not only help the participants to appreciate the increasing use of non-conventional data to improve everyday life, but importantly in stimulating their creative thinking to innovate in their respective fields of work.

Behind-the-scenes preparations for Lab on Wheels:
bit.ly/labonwheels3

Building Capacity for Data Innovation in the Public Sector

Throughout 2019, Pulse Lab Jakarta organised, facilitated and participated in a series of data clinics and workshops as part of the Lab's broader efforts to promote and build capacity for data innovation in the public sector. Below is a snapshot of our key events:

MARCH



Data Innovation Clinic

Jakarta, Indonesia

PLJ hosted colleagues from Aga Khan Foundation, Australian Department of Foreign Affairs and Trade (DFAT), InnovationXchange, The Ethics Centre and Roshan Telecom for a three-day data innovation clinic at the Lab focused on exploring the different contexts in which data innovation takes place and discussing why it is important to adapt our mindset and processes accordingly.

APRIL

Dataku: Data Visualisation Workshop

Jakarta, Indonesia

PLJ organised a training workshop with representatives from the Ministry of National Development Planning (Bappenas) aimed at exhibiting Dataku, a data analytics and visualisation prototype that the Lab developed to enhance the Ministry's work and decision making processes.

Statistics Indonesia Data Workshop

Jakarta, Indonesia

PLJ participated in an internal data training workshop with Indonesia's national office of statistics, Statistics Indonesia (BPS), to identify new and emerging data sets that can be used to complement survey data sets and analytical approaches.

Inflation Dashboard Showcase

Medan, Indonesia

PLJ showcased a prototype of its nowcasting inflation dashboard at Medan State University's Faculty of Economics to gather feedback on its ongoing development and potential uses for policy makers working in the domain of economics.

MAY

UNDP Data Innovation Clinic

Istanbul, Turkey

PLJ served as one of the mentors during the clinic, which was organised by UNDP Regional Hubs in Amman and Istanbul, and facilitated a dialogue on how thick data from the depths of human stories can complement big data analytics.

JUNE

Big Data Regional Workshop on the Use of Mobile Phone Data for Official Statistics

Jakarta, Indonesia

PLJ exhibited several of its research projects and prototypes leveraging mobile network data for decision making to participants from ten national statistics offices in the region during a hands-on, knowledge sharing session.

JUNE

1st Workshop on Computer Vision for Global Challenges

California, The United States

PLJ's proposal to the Computer Vision for Global Challenges (CV4GC) initiative was selected as one of the final 17 challenge winners. During the workshop, the Lab presented the model it designed to nowcast air pollution and received expert feedback from the computer vision community on how to refine its development.

SEPTEMBER



Pulse Lab Scoping Mission

Apia, Samoa

A team from PLJ spent several days in Samoa meeting and consulting with potential partners and stakeholders across government, academia, development and the private sector to obtain feedback and their support towards the establishment of a Global Pulse lab in Samoa.

OCTOBER

Disaster Risk Reduction & Mobile Data Workshop

Jakarta, Indonesia

PLJ and IOM invited representatives from the Indonesian Government, United Nations, and mobile telecoms to participate in a training workshop to discuss how mobile network data can be better harnessed to support government-led disaster response.

Ministry of Agriculture Big Data 101 Training

Bogor, Indonesia

PLJ facilitated an introductory workshop on big data analytics attended by researchers from the Indonesian Agency for Agriculture Research and Development (Balitbangtan) to highlight how emerging big data sources can improve monitoring of agri-food systems.

NOVEMBER

After Dark Co-Design Workshop

Medan, Indonesia

To come up with interventions that are practical and designed in a way to meet both prevailing and future needs of women who travel at night, PLJ invited representatives from government institutions, local NGOs, academia, as well as designers, technologists and generalists from the local community to participate in co-design workshop held in Medan.

Positive Deviance in Agricultural Performance Workshop

Bangkok, Thailand

The GIZ Data Lab organised a joint workshop with experts and collaborators from Pulse Lab Jakarta, the University of Manchester, the GIZ agriculture and food cluster Thailand and UNDP Regional Innovation Centre Bangkok to further work on the application of the Big Data-based Positive Deviance approach in the agricultural sector in South East Asia.

Knowledge-Sharing Engagements

There has been overwhelming demand to share PLJ's accumulated knowledge and experience, marked particularly by the growing number of invitations and requests the team has received for involvement, collaboration and services. From academic conferences to development forums, this timeline includes a selection of our knowledge-sharing engagements throughout 2019.



JANUARY

GovPay Summit Jakarta, Indonesia

PLJ shared its experiential knowledge on how new data sources can mitigate challenges related to disaster preparedness and response during a roundtable discussion on disaster management.



OLX Indonesia x Data Science Indonesia: Data Talks Jakarta, Indonesia

Discussing how to build strong measurement and data tracking capabilities to drive better decision making, PLJ underlined growing opportunities that exist in Indonesia for the use of e-commerce data for macroeconomic analysis.



FEBRUARY



AI for Social Good Workshop Doha, Qatar

PLJ discussed how the application of machine learning and artificial intelligence has enhanced its work to advance development agendas in the Asia Pacific region towards the achievement of the SDGs.



MARCH

Duck, Cover and Hack 2019 Jakarta, Indonesia

In observance of International Open Data Day, PLJ moderated a panel discussion organised by U-INSPIRE on how open data can be repurposed to improve how well governments and communities respond to natural disasters.



ASEAN Workshop on Disaster Reporting and Big Data for Disaster Management Jakarta, Indonesia

PLJ mapped the evolution of its disaster risk reduction tools over the years and emphasised the importance of developing these use cases to build the capacity of disaster management authorities throughout ASEAN Member States.



APRIL

SNKI Financial Inclusion Sharing Session Jakarta, Indonesia

On the invitation of the Secretariat for the National Council for Financial Inclusion of Indonesia, PLJ and the UK's Behavioural Insights Team facilitated a sharing session on how human-centred design and behavioural insights can be used to accelerate financial inclusion in Indonesia.

4th Indonesia-United Nations Consultative Forum Jakarta, Indonesia

PLJ shared how it has used its experience developing innovative solutions in Indonesia to connect with various non-traditional development partners across the region and contribute to South-South cooperation agendas.



Launch of Malaysian SDG Dashboard Kuala Lumpur, Malaysia

PLJ presented a snapshot of various tools it has been developing in Indonesia to help the Government monitor progress of the SDGs, focusing on the benefits of using open data and crowdsourced data for policy making.

World Resources Institute TalkShow on Data for Climate Change Jakarta, Indonesia

PLJ showcased several proofs-of-concept the Lab has developed over the years around disaster response and climate change to illustrate how these tools can both empower citizens on the ground and better inform governments' decision making.



Smart City: How smart can we go? Jakarta Indonesia

As part of the University of Indonesia's guest lecture series on big data, PLJ discussed how data from new technologies can be leveraged by city planners to not only develop smarter cities, but create ones that are also inclusive and more sustainable.



MAY

Information Systems for Crisis Response and Management Conference

Valencia, Spain

PLJ presented its research on understanding aggregate human behaviour changes in response to a natural disaster in Vanuatu through the application of mobile network data analysis.



AI For Good Global Summit

Geneva, Switzerland

PLJ emphasised the importance of harnessing emerging real-time data and artificial intelligence to help develop innovative tools that can be scaled up to monitor progress of the SDGs at the local and national levels.



JUNE

4th International Conference on Data for Policy

London, United Kingdom

PLJ weighed in on the policy discourse about the potential of employing a participatory approach via crowdsourcing to advance the SDGs and unpacked results from some of its key crowdsourcing initiatives.



Bukalapak Design Research Conference

Jakarta, Indonesia

Pulling lessons from field research conducted, PLJ talked about the importance of sharing the often unspoken stories and insecurities related to doing field research and steps that can be taken to avoid future pitfalls.



JULY



Indonesian Development Forum

Jakarta, Indonesia

PLJ shared snippets from its After Dark research which focused on night-shift women workers who use public transportation to travel at night, underscoring how safe and inclusive cities influence economic productivity.

Service Design Indonesia Meet-Up

Jakarta, Indonesia

PLJ shared learnings from several of its service design research, discussing how and why participatory design approach can be used to improve public service delivery across Indonesia.

Lessons Learned Sharing Session with AFTECH

Jakarta, Indonesia

The winners of our the Microenterprise Fintech Innovation Challenge Fund shared lessons learned with other fintech players in Indonesia based on their experimentation tapping into the microenterprise market.



AUGUST

12th ATRANS Annual Conference Bangkok, Thailand

PLJ made a case for the use of non-conventional data sources to improve mobility, by presenting proofs-of-concept from its urban dynamics portfolio that integrate big data from new technologies and apply machine learning approaches.

Human-Centered Design Workshop Jakarta, Indonesia

PLJ facilitated an introductory workshop on human-centered design for Awantunai, one of the winners of the Fintech Innovation Challenge Fund, discussing the importance of understanding the needs of micro entrepreneurs.



SEPTEMBER



Regional Conference on Digital Diplomacy Jakarta, Indonesia

Pulse Lab Jakarta moderated a session on the role of digital diplomacy during crises, describing how real-time data from non-conventional data points might be used to inform timely decisions.



ASEAN-China-UNDP Symposium 2019 Hanoi, Viet Nam

On the theme of how governments should go about building an inclusive innovation system that benefits the most vulnerable, PLJ emphasised the role of technology and big data in addressing the shortcomings of the existing system.

Financial Inclusion for Micro Enterprise in Fintech Summit and Expo 2019 Jakarta, Indonesia

PLJ moderated a session that brought together policy makers and fintech companies who are working to advance financial inclusion in Indonesia, particularly among micro entrepreneurs.



Statistics on Gender and the Environment Expert Meetings Bangkok, Thailand

PLJ led a discussion on the benefits of tapping into unconventional data sources to obtain actionable intelligence for policy makers, specifically related to gender and the environment.



OCTOBER



3rd South-East Asia Forum on Implementation of the SDGs Bangkok, Thailand

PLJ shared highlights of the work it has been doing with big data to shape development practices and humanitarian action throughout the Asia Pacific towards the balanced implementation of the 2030 Agenda.

Asia Pacific Urban Forum Penang, Malaysia

Under the theme Smart Governance and Society, PLJ underscored why coming up with innovative solutions means more than just developing “smart tech”, explaining that technologies should be user-centred to address the existing and prevailing needs of a society.



Climate-Smart Agriculture Conference Bali, Indonesia

PLJ exhibited ongoing research from its food security and agriculture portfolio to demonstrate how agri-food systems can be monitored at higher resolution using non-traditional data sets.



CGIAR TRUST Convention 2019 Hyderabad, India

PLJ described the value of using non-conventional data sources and new data analytics methods to complement traditional approaches to inform programming geared towards sustainable living and food security.

Nesta's Collective Intelligence Conference

London, The United Kingdom

PLJ described how its disaster response and climate change tools have transformed over the years, emphasising how the needs of end users have changed and why implementation does not conclude an innovation's life cycle.



NOVEMBER

National Coordination Meeting on Governance Goods and Services Procurement 2019

Jakarta, Indonesia

PLJ pulled insights from its Banking on Fintech research to facilitate a discussion on how the adoption and application of ICTs among micro merchants in Indonesia can accelerate economic growth.



12th Asia Pacific Future Trends Forum

Jakarta, Indonesia

Addressing the challenges of bringing digital network and artificial intelligence to healthcare, PLJ shared use cases of how big data has improved citizens' quality of life and can transform national healthcare services.



Economics of Cash-In/Cash-Out Agent Networks in Indonesia seminar

Jakarta, Indonesia

During a session on micro savings, PLJ presented its joint research with the UK's Behavioural Insights Team on using human-centred design and behavioural insights to find and test innovative ways to improve financial inclusion in Indonesia.

Save the Children – Regional Leadership Meeting

Jakarta, Indonesia

PLJ showcased some of its flagship innovations to facilitate a discussion on how the use of big data can be effectively leveraged to inform disaster response and protect the most vulnerable during times of crisis.



DECEMBER

IEEE International Conference on Big Data

Los Angeles, The United States of America

PLJ presented its data analytics research on modelling wealth in Papua New Guinea using call detail records and tele-survey data during a special session on machine learning and big data.



Meet Young Scientist

Jakarta, Indonesia

As part of Tempo's Media Week, PLJ contributed to a roundtable dialogue with other Indonesian researchers and scientists about how the adoption of big data by government institutions is creating clearer pathways for data-informed policies.

After Dark Report Launch

Jakarta, Indonesia

To mark the 16 Days of Activism Campaign against Gender-Based Violence, PLJ participated in a public discussion to share findings from the After Dark research and trigger conversations on how to create safer and more inclusive public spaces for women and girls.

Media Coverage

Media Coverage

2017

FEBRUARY

BAPPENAS Supports Data Revolution for Policy-Making

“Bappenas Dukung Revolusi Data Bantu Perumusan Kebijakan Publik”

Source: Berita Satu, 22 February 2017



MARCH



Indonesia Promotes The Use of Data for Policymaking

Source: Digital News Asia, 2 March 2017

“As the largest economy in the Southeast Asia (SEA), Indonesia is one of the founding members of the Open Government Partnership (OGP), a multilateral initiative to promote transparency, fight corruption and harness new technology to strengthen government.”

Navigating Indonesia's Data Innovation Ecosystem: A Reflection

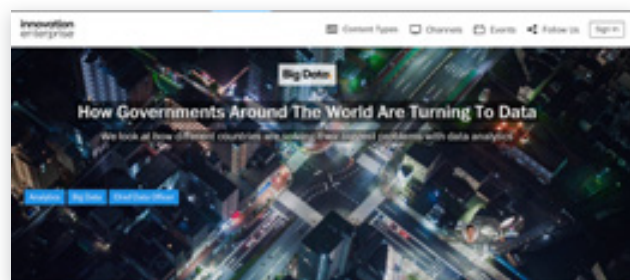
Source: Nesta, 10 March 2017

MAY

How Governments Around The World Are Turning To Data

Source: Innovation Enterprise, 10 May 2017

“According to recent research by Garner, a quarter of government CIOs believe that a lack of digital skills are a barrier to achieving their goals, and chief among them is data science” skills.



JUNE

Gotong Royong Terjemahkan Bencana (Crowdsourcing Disaster Keywords)

Source: KOMPAS, 14 June 2017

Wildfires' 'killer haze' tracked with Twitter as it spreads

Source: New Scientist, 29 June 2017

JULY

Two Paths to Supporting Grassroots Innovation

Source: [Stanford Social Innovation Review](#), 18 July 2017

“An innovation experiment in Indonesia yields insights on how international development organizations can effectively foster innovation within the communities they aim to help.”

Wildfire Prevention and Risk Reduction for Children's Health and Wellbeing (part 2)

Source: [BaKTI News Edition 138 page 1](#), June-July 2017

PASIKOLA, Petepete Anak Sekolah (PASIKOLA, Petepete for students)

Source: [BaKTI News Edition 138 page 1](#), June-July 2017

AUGUST



Mapping Innovation Humanitarian Aid

Source: [Nesta](#), 4 August 2017

How Indonesia's President monitors food security

Source: [GovInsider](#), 24 August 2017

SEPTEMBER

Enhancing Resilience to Extreme Climate Events: Lessons from the 2015-2016 El Niño Event in Asia and the Pacific

Source: [ReliefWeb](#), 7 September 2017



OCTOBER

How Indonesia Cut Malaria Reporting by 19 Days

Source: [GovInsider](#), 25 October 2017



NOVEMBER

In Conversation with... Derval Usher, Head of Office for Pulse Lab Jakarta

Source: [Centre for Public Impact](#), 3 November 2017

Sustainable Eating and Climate Change

Source: [The Jakarta Post](#), 21 November 2017

DECEMBER

Designing Conversations on Public Service Delivery

Source: [Open Government Indonesia](#), 27 December 2017



MEDIA COVERAGE

2018

01
JANUARY

Research Collaboration with Pulse Lab Jakarta

Pulse Lab Jakarta discussed research collaboration with Pusat Unggulan Iptek (PUI)

Source: Pusat Unggulan Iptek (PUI), 23 January 2018



Minister reveals priorities for Indonesia's One Data policy

"Every minister has his own data, they are quite resourceful; but the problem is, sometimes the data are not accessible to other ministries or agencies."

Source: GovInsider, 26 January 2018

02
FEBRUARY

Tackling Sri Lanka's climate change with data



Tackling Sri Lanka's climate change with data

"As countries grapple with climate change, emergency response and preparedness teams are put to the test. But in today's connected world, data analysis can be the most powerful tool of all."

Source: GovInsider, 6 February 2018

Inovasi Pasikola Akan Terima Penghargaan Internasional

Pasikola receives an international award.

Source: Media Sulsei, 09 February 2018

Bringing banking to Indonesia's Small Businesses

"There is great potential for fintech to transform small businesses, which account for 99% of all businesses in Indonesia."

Source: GovInsider, 13 February 2018

03
MARCH

Government of Indonesia Integrates Big Data into Economic Management

"... economic stability-enhancing innovations that empower the world's poor and vulnerable people in managing and investing with confidence in their future."

Source: Crowd360, 12 March 2018

WFP Indonesia Country Brief, March 2018

"The new features of VAMPIRE developed jointly by WFP and Pulse Lab Jakarta include tabular and graph data visualization for selected timelines allowing for enhanced monitoring and early warning of weather extremes and their impact on food security across the country."

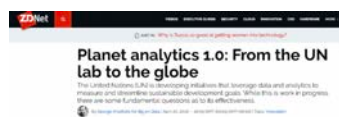
Source: ReliefWeb, 31 March 2018

04
APRIL

Social media insights for sustainable development and humanitarian action in Indonesia

"We observe that the insights gained by using Twitter data... further our real-time understanding of the situation and user behavior changes."

Source: IOP Science, 12 April 2018



Planet analytics 1.0: From the UN lab to the globe

"UNGP is also clear that at this point that the Pulse Labs are primarily innovation labs working on proofs of concept. This is a step in the right direction..."

Source: ZDNet, 20 April 2018

05
MAY

Big Data for Resilience: A New Approach to Strengthen Development Pathways?

"The emergence of very large datasets is becoming particularly relevant for understanding the complex nature of vulnerability, as well as for improving the ability of systems to absorb, adapt, and potentially transform in the face of shocks and stressors."

Source: IISD, 24 May 2018

06
JUNE



Kondisi Terumbu Karang Indonesia kini dan Betapa Bahaya Jika Ia Punah!

"Colloquotion's discussion session also evaluated how Big Data innovations can contribute to providing better information about the sustainability of coral reefs."

Source: IDN Times 26 June 2018

07
JULY



Beyond Social Media: The Indonesian MFA To Address Challenges and Opportunities of Digital Diplomacy

"The seminar involved a number of engaging discussions and provided real-life examples of everyday interactions and challenges."

Source: Kemenlu, 12 July 2018

Tantangan dan Peluang Media Sosial dalam Diplomasi Digital

"Digital diplomacy connects individuals, we call it grounded diplomacy, between humans and diplomacy..."

Source: Social Innovation Exchange, 12 July 2018

Data for Social Good Case Study: VAMPIRE, Pulse Lab Jakarta

"This was more than just a transfer of tech, but a contextualisation of the tool to the specific context, adding several improvements."

Source: Social Innovation Exchange, 12 July 2018

10
OCTOBER



Lab looks at data to develop Small Island Developing States

"Samoa has great potential to utilise Pulse Lab, and with a growing generation of digital natives it would be a missed opportunity not to take advantage..."

Source: Samoa Observer, 31 October 2018

11
NOVEMBER



Comprehensive Data Needed in SDGs Implementation

"The One Data Initiative is expected to be in line with the government's efforts to monitor the SDG... to design localized road maps and manage specific targets."

Source: DPR, 02 November 2018



Big data sits at the table of sustainable development

"In a bid to better harness this rapidly changing new sector, governments, business, academia, international organizations and civil society groups discussed the data challenges of the 2030 Agenda."

Source: Global Landscape Forum, 05 November 2018



Modalku Menangkan Tantangan dari UNCDF-UN Pulse Lab

Modalku wins challenge from UNCDF and UN Pulse Lab

Source: Warta Ekonomi, 14 November 2018

Startup DuitHape dapat Pendanaan dari Badan PBB UNCDF

Indonesian startup, DuitHape, chosen as one of the best startups in the Micro Enterprise Fintech Innovation Challenge Fund

Source: Tempo, 21 November 2018

GandengTangan Kembangkan Aplikasi Pinjaman Usaha Mikro

With funding from UNCDF and UN Pulse Lab Jakarta, *GandengTangan* is targeting 5,000 small shops to get loans via its services in 2019.

Source: Warta Ekonomi, 16 November 2018

Julo Sabet Penghargaan Microenterprise Fintech Innovation Challenge

"Julo hopes that with the funding assistance from the UNCDF, this will help realize Julo's vision in supporting financial inclusion in Indonesia."

Source: Bisnis, 27 November 2018

12
DECEMBER



Kick Off Satu Data Kalimantan Barat

"Work and build West Kalimantan with Data."

Source: Kalbar Online, 03 December 2018

Media Coverage

2019

JANUARY

Festival Praktik Cerdas Lokal for Sustainable Development in Indonesia

"Through Lab on Wheels, Pulse Lab Jakarta shares information to stakeholders in eastern Indonesia about the benefits of using new data sources for public policy as well as for planning and evaluating development programmes."

Source: BaKTI, 29 January 2019

FEBRUARY

The Importance of Data in Decision Making Process

Source: SWA Online, 7 February 2019

Disaster Management and Strategy, The Crucial Part of Smart City

Source: Medcom.id, 18 January 2019

Female Leaders Share Experience in Advancing Women's Participation in STEM

Source: Magdalene, 25 February 2019



Data Science for Social Good: Move Fast and Fix Things

"...collaborating with UN Pulse Lab Jakarta to improve traffic safety in Indonesia through video analysis."

Source: Imperial College Business School, 25 February 2019

MARCH

Think Equal, Build Smart, Innovate for Change

"Innovation and technology have shown incredible progress touching every aspect of our lives. Innovative approaches in urban planning show the best results when women are consulted and included in the planning and decision-making processes."

Source: The Jakarta Post, 8 March 2019

Julo Fintech, Easy Online Loans with Low Interest

Source: DuniaFintech.com, 8 March 2019

Readiness of National Statistical Systems in Asia and the Pacific for Leveraging Big Data to Monitor the SDGs

Source: Asian Development Bank, 18 March 2019

Hub members collaborate with Jakarta Lab of UN Global Pulse

Source: The Allens Hub, University of New South Wales, 19 March 2019

AI for International Development

Source: Data Science Campus, 26 March 2019

What we're reading... on collective intelligence #4

Source: Nesta, 25 March 2019

APRIL

Why Micro Merchants are Less Interested in Using Financial Technology Services?

"The research from Pulse Lab Jakarta also highlighted that the main pain point is not about adopting financial technology, but instead about how to retain fintech users."

Source: The Conversation, 26 April 2019

MAY



Pulse Lab Jakarta Launches Natural Disaster Logistics Planning Information Platform

"The national disaster logistics planning information platform collects various information about the current disaster in an area. This platform provides information about a disaster that is happening to the party responsible for the disaster."

Source: Voice of Indonesia News, 8 May 2019

Communities Across Indonesia Still Face Water Problems: A Consolidated Effort is Necessary to Ensure Access to Clean Water

Source: Kopernik, 20 May 2019

JUNE

People-centric technology targets disaster displacement

"Pulse Lab Jakarta's methods have led to the development of CycloMon, which tracks satellite data on the path of cyclones, and Haze Gazer, which wraps in user-generated data and has been adopted by Indonesia's government to monitor wildfires..."

Source: SciDev.Net, 10 June 2019

JULO distributed fund from UNCDF to women micro entrepreneurs

Source: kontan.co.id, 11 June 2019

JULO is trusted by UNCDF to help women micro entrepreneurs in Indonesia

Source: techinasia.com, 15 June 2019

JULY

Is Artificial Intelligence the frontier solution to Global South's wicked development challenges?

"Some of the examples of automated translation and voice recognition systems include 'Translator Gator' developed by Pulse Lab Jakarta (Indonesia) to invite people to create taxonomies, or collections of keywords, in lesser-known languages and dialects ..."

Source: Towards Data Science, 5 July 2019

Use of Big Data in Achieving Sustainable Development Goals

Source: BioEnergy Consult, 11 July 2019

SEPTEMBER

MIND – the UN's New Data Analysis Platform for Disasters

Source: Social Media for Good, 6 September 2019

Foreign Ministry Partners With UN Big Data Lab, Australia in Digital Diplomacy

"Pulse Lab will also help digitalise correspondences between the ministry and Indonesian missions abroad."

Source: The Jakarta Globe, 10 September 2019

Natural disasters fuel environmental degradation

Source: SciDev.Net, 13 September 2019

Data for Good Exchange 2019 Preview: Prosperity & Peace Track

Source: Bloomberg, 17 September 2019

UN Global Pulse Lab for Big Data to Support Inclusive Development

Source: Samoa Global News, 19 September 2019

Samoa to host big data centre for the region

Source: Samoa Observer, 19 September 2019

Southeast Asia must find the right balance in ride-hailing regulation

Source: Nikkei Asian Review, 27 September 2019

OCTOBER

- Juries, data gaps, and software intermediaries: Nesta's collective intelligence Conference**
Source: Science Practice, 24 October 2019

Photo: / Science /

Lab looks at data to develop Small Island Developing States



- Lab looks at data to develop Small Island Developing States**

"Governments come to us with problems they need solving, and we develop a prototype to solve it."

Source: Samoa Observer, 31 October 2019

NOVEMBER

- Balittas Dalam Training Workshop on Big Data 101 for Agricultural Research**

Source: Indonesian Sweetener and Fiber Crops Research Institute (Balittas), 5 November 2019

- BNPB Supports Efforts to Strengthen Refugee Information Systems**

Source: National Disaster Management Authority (BNPB), 22 November 2019

- Palembang UIGM Lecturer Shares Experience from PLJ's 9th Research Dive**

"Discussions with participants that come from different backgrounds often push researchers to get out of their comfort zones and be open to accepting new insights."

Source: DuniaDosen.com, 27 November 2019

DECEMBER

- UN Women Praises Gojek's Efforts to Assure Women's Safety**

Source: Tempo.co, 11 December 2019

- Efforts to Create A Sense of Safety for Women Travelling at Night**

Source: Fimela, 11 December 2019

Anti-harassment report in Indonesia pushes for bystander intervention

Asia News Network / Publication date 17 December 2019 / 23:01 MYT

Share ●●



Passengers were to board the train only. TransJakarta bus at the Stasiun Harmoni, Jakarta's 7th largest station. The bus is equipped with a security camera. Only a security camera at the station and public transportation is not sufficient to ensure women's safety. (Jurnal Indonesia) (Jurnal Indonesia)

Apriella Rindhi was taking the train from Bogor to Jakarta when she saw a man sitting too close against the back of a female passenger, who looked uncomfortable and helpless. Apriella moved by her side and started talking her about the train routes.

On seeing that his victim was no longer alone, the man stopped.

"The victim was scared of [what I had done] and thanked me, saying that some things would have happened if I had not intervened," said Apriella, who is studying at Jakarta State University.

Yusuf was not as fortunate as the woman on the train. He was asked to help her when she was walking home in the upscale South Jakarta neighbourhood of Kuningan Barat, one night last year after work.

- Step up, step in: Anti-harassment campaigns urge bystander intervention**

"After Dark explores what being safe means for women and strategies on taking public transportation at night in three major Indonesian cities – Medan in North Sumatra, Surabaya in East Java and Semarang in Central Java."

Source: The Jakarta Post, 16 December 2019

- Anti-harassment report in Indonesia pushes for bystander intervention**

Source: The Phnom Penh Post, 17 December 2019

- Big Data: Asia's newest socio-economic ally**

Source: Telecom Review Asia, 20 December 2019

Organizational Framework and Governance

ORGANISATIONAL LOGIC

Pulse Lab Jakarta's work aims to contribute towards three broad societal goals:

(1) **better use of data in public decision-making**, which is expected to significantly contribute towards (2) **improved public policy**, which would ultimately result in (3) **increased public well-being**, particularly among vulnerable communities.

PLJ's work is expected to lead to three main organisational outcomes:

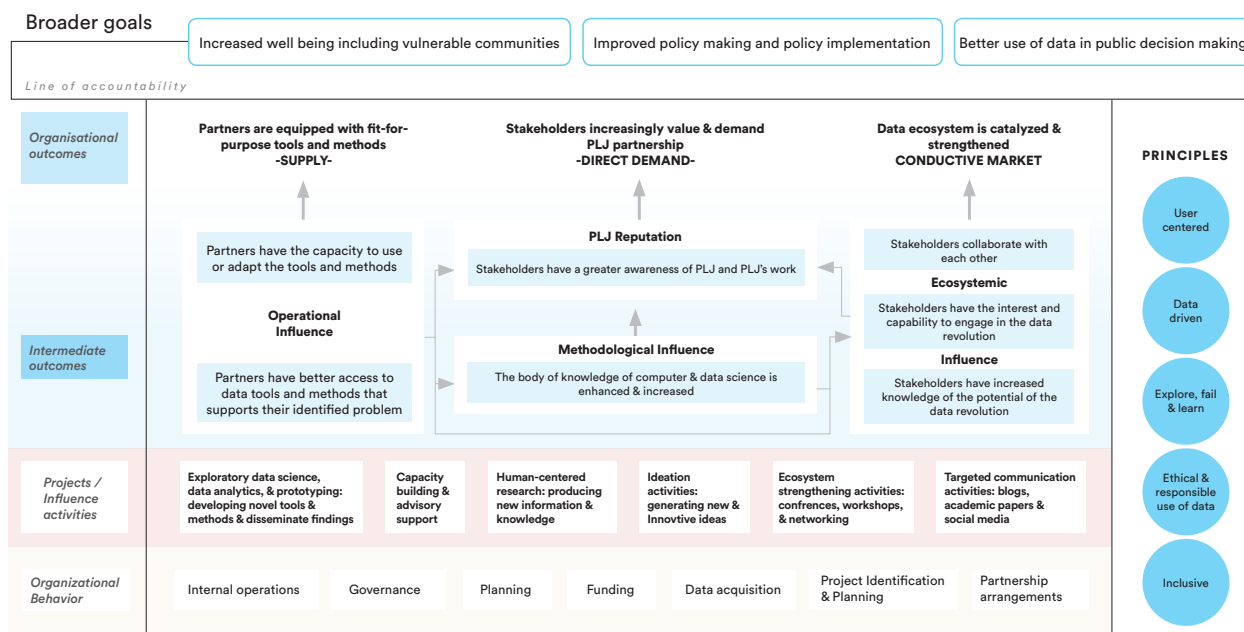
1. PLJ partners are equipped with fit-for-purpose tools and prototypes;
2. Stakeholders increasingly value and demand PLJ partnership; and
3. The data ecosystem is catalysed and strengthened.

The following principles drive the manner in which PLJ operates and cut across all the work of the Lab:

- User centered
- Data driven
- Explore, fail and learn
- Ethical and responsible use of data
- Inclusive

In practice, the types of activities we do to achieve our organisational goals include:

- Exploratory data science, data analytics and prototyping - including developing new tools and methods and disseminating findings;
- Human-centred research - producing new insights and knowledge on the interface between communities/individuals and data;
- Ideation activities - harnessing new and innovative ideas from citizens;
- Ecosystem strengthening - contributing to the discourse on Data for Development and the interaction between key stakeholders;
- Capacity strengthening and advisory support to key partners; and
- Targeted communication activities to broaden awareness on data innovation.



GOVERNANCE

The Lab's activities are guided by a Steering Committee which comprises of representatives, in equal measure, of the Government of Indonesia and the UN in Indonesia. The Steering Committee provides overall guidance and strategic direction for the Lab. PLJ also has a Technical Committee which meets on a regular basis (most recently in December 2018) to discuss the progress of activities. The Technical Committee reports to the Steering Committee.

PLJ continues to maintain technical coordination with the Ministry of National Development Planning (Bappenas) as its main government counterpart. The Steering Committee has advised PLJ to continue building upon successful research and proof-of-concepts that have already been done, in addition to exploring new areas of work. The team at the Lab is also being encouraged to explore the feasibility of possible options to sustain the work of the Lab beyond donor grant funding.

PLJ presents its work plan to the Steering Committee for endorsement on an annual basis, and our research and development activities are guided by the priority areas of the Government of Indonesia through the 2015-2019 RPJMN (Rencana Pembangunan Jangka Menengah Nasional) and the UN through its Partnership Development Framework (UNPDF). This work plan also takes into account the Sustainable Development Goals as well as the recommendations of the Data Innovation Mission of August 2014 that was led by Bappenas and based on the Government of Indonesia's agenda.



2030 Agenda for Sustainable Development



INTELLIGENCE REPORT

Pulse Lab Jakarta

December 2019

Prepared for

Pulse Lab Jakarta

Prepared by

BRH Regional Innovation Centre

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Introduction

Pulse Lab Jakarta (PLJ) is entering into the second phase of its evolution as a data innovation lab. It has recently received a second injection of core funding from the Australian Government, and the work that the Lab has done over the past five years has positioned it as a significantly influential player in Indonesia's data innovation ecosystem. The Lab's work has also received recognition more broadly across the Asia-Pacific region and with this recognition, demand for PLJ's technical expertise has also increased. In addition to the growth of its portfolio of activities, the past year has seen PLJ go through major changes in personnel, organisational structure and funding levels.

As it embarks on the next chapter of its evolution, PLJ wanted to apply Portfolio Sensemaking as part of its organisational effort to increase coherency amongst its initiatives and identify what parts of its portfolio can be harnessed to accelerate the impact of its work.

Conducted over the course of three days (4-6 November 2019), PLJ's Portfolio Sensemaking exercise aimed to:

1. Use the process of Portfolio Sensemaking to holistically examine the current portfolio of activities, including looking at interlinkages across activities, needs, resources, relationships and ways of working
2. Reflect collectively on the cohesion and effects of PLJ's portfolio of current projects/initiatives
3. Identify insights and actionable intelligence to help PLJ accelerate the impact of its work

This document represents the emerging claims, propositions and actions articulated during the Sensemaking exercise, and structures these into strategic arguments that will support PLJ to determine and commit to a course of action that over time will accelerate the effects of its Portfolio of activities. The basic structure of a strategic argument is depicted in Figure 1.

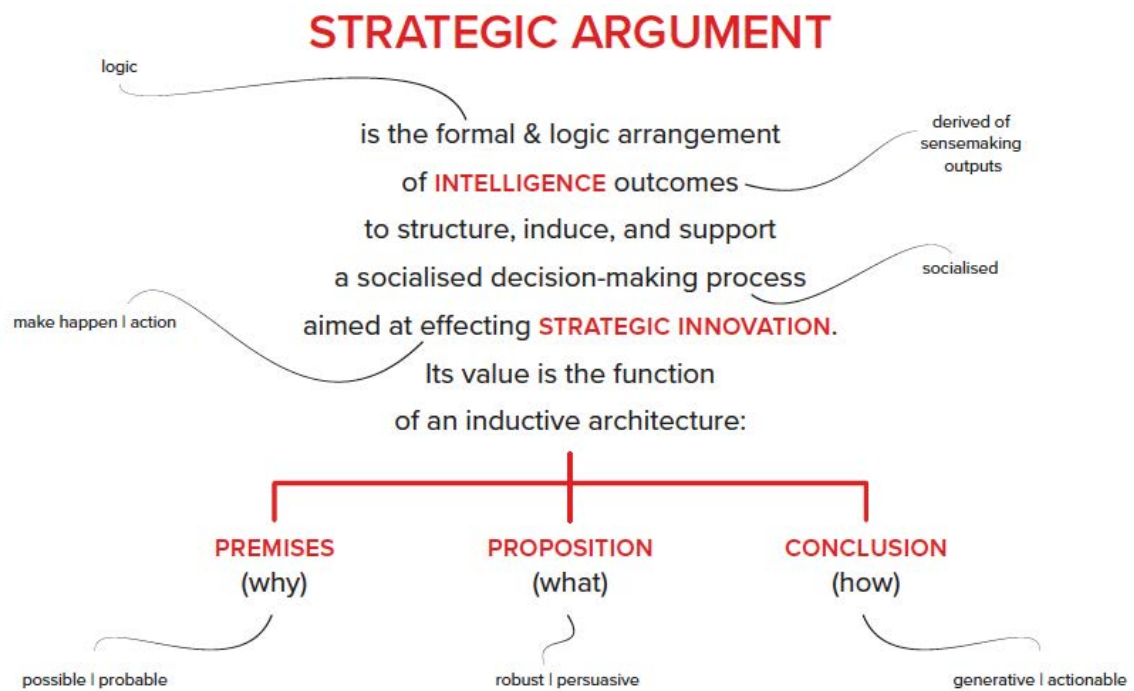


Figure 1: Structure of a strategic argument (Source: Axilo)

Claims

Claim A: Project decision-making

The Lab's current decision-making process on what project to take on **lacks strategic rationale as well as clear and effective communication**. Among other things, this is shown by the generic and more technical "needs" statements made during project presentations, instead of a more strategic articulation of what problem exactly each project is trying to address.

Moreover, approximately 70% of staff presenting their projects during the Sensemaking process were not involved in the decision of whether or not the Lab should take the project on, and they often do not have a clear grasp of the strategic value of the project. This points to a **disconnect between those that make decisions and those that execute projects**. What also emerged from the Needs insight map as well as from discussions around projects such as *CAQMxKopernik* and *Positive Deviance – Agriculture*, was that the **resource needs of projects are often not communicated effectively**, especially to team members who will be in charge of technical execution of the projects.

The need to take on large numbers of projects has been driven in part by the uncertainties in PLJ's core funding stream last year, which was crucial to its survival. This propelled the Lab to secure resources and diversify funding sources to be able to maintain its operations. However, **PLJ has remained in "survival mode" long after it received its current tranche of core funding** in March 2019.

As emerged through the Ways of Working insights map, PLJ team members' technical capability, their capacity to take on large volumes of work, and the pride they take in being able to deliver high quality outputs usually ensures that these projects produce both good products/services for the client as well as benefits for the Lab. While this is a strength, it is also evident that **this practice is starting to take a toll on the team's health and wellbeing**.

Claim B: Project and team linkages

Insight maps on Needs, Resources and Ways of Working highlight the fact that many staff members are not fully aware of what other teams are doing – but when they are, they can quickly see connections that can be leveraged.

Cross-team **collaborations are more ad-hoc and accidental in nature, as opposed to by design.** But when these collaborations occurred, such as on the IOM project, everyone involved was always pleasantly surprised at how much value the collaboration gives.

While the Lab prides itself on mixed methods approaches, most collaborations between the Data Science and Social Systems teams are **based around events instead of a blending of methods.** During discussions, team members expressed that they **lacked an understanding of how to approach “the other team”** in order to get involved in projects that piqued their interest.

Claim C: Positioning

Five years on from its initial establishment, PLJ has built experience, expertise and skills in a wide variety of domains and problem spaces. The Resources insight map shows that the Lab's current brand is centred around real-time data analytics and human-centred design, but there is a growing interest and capability in **predictive analytics** (such as ones trialled in the *Predicting Wealth* and *Predicting Fisheries Production* projects) and **addressing behavioural barriers**, as tested under #TabunginAja.

However:

- The Lab has yet to determine how to harness these emerging capabilities strategically
- It has not yet updated and communicated its branding to **reflect the diversity and strength** of the Lab's work based on its current portfolio of activities.
- It has yet to fully capitalise the learnings and capabilities gained from its various experiments in order to select a subset of areas and domains that can differentiate it from other innovation labs in Asia and the Pacific.

Claim D: The Invisible Work

Pulse Lab Jakarta is acknowledged for its work and its capabilities in:

- **Facilitating data partnerships** – where the Lab often brings together multiple data owners within a particular problem space, in addition to supplying its data analytics capability. Examples of these include the *Predicting Fisheries Production* project facilitating cross-ministry data access, and the *Labour Market Analysis* project combining labour data from the Ministry of Manpower with private job market data from partners like Kalibr and Julu.
- **Consultative project management** – where the Lab invests a lot in scoping work before designing a project or activity, including trying to obtain a much deeper understanding about the information needs of a partner organisation as well as their existing resources and capabilities. Examples of this include conducting a co-design session with DisHub Medan based on the insights of the *After Dark* research, and designing a bespoke data clinic for DFAT and its partners for their planned work on monitoring women's empowerment in Afghanistan.
- **Bridging communication between technical and policy stakeholders.** Examples of this include *#TabunginAja*, where insights on potential behavioural intervention were discussed with government policy makers; and *Research Dives*, which brings together policy makers in articulating research questions for the data dives, domain experts who are across the subject matter, and researchers who analyse datasets.

However, **we don't often highlight these capabilities when we are talking about our service offerings** – nor do we often recognise these as **valuable pieces of work that should be adequately resourced**. This is evidenced in the way team members talked about their projects during the Sensemaking session: when talking about interventions, what is most often cited are the technical achievements of the projects and not necessarily the background work that goes into making these achievements possible. Not stating this sort of value add upfront often causes partners – especially government units and other development agencies – to position the Lab as a **subcontractor rather than a partner**.

The Lab is fortunate to have **highly competent in-house expertise** in facilitating partnerships, consultative project design and management, and cross-domain communication. These team members also have a high capacity to take on a high volume of work, which has the effect of making this type of work seem effortless and easy. **This renders almost invisible the amount of effort and resources that is actually needed for this work.**

Claim E: Playing a bridging role

There is a **high demand**¹ for PLJ's role to **bridge partnerships**² between private and public sector partners, leading to **valued policy insights**³ for policy makers in Indonesia and regionally. In addition to the Lab's technical expertise, this demand is also due to the **principles**⁴ and **values**⁵ that we uphold.

¹ This is shown by the range of different partners and clients that the Lab has, as depicted in the Relationships insight map.

² PLJ has been successful in facilitating access to private sector data as shown through projects like *Labour Market Analysis* and *Research Dives*. The Lab is a "value-added connector" – but a question that would require considering is whether some partners value this more than our technical capability.

³ Policy-relevant insights were generated through *After Dark*, *Satu Data*, our partnership with GRAB, and our series of projects with Bappenas.

⁴ These principles include being cost-effective; using open data and open software as much as possible; modular design that can be customised to the needs of the client; iterative experimentation; and applying a mixed-methods approach.

⁵ These values include ethical use of data; gender visibility; and context-appropriateness.

Claim F: Intent

As evidenced by our series of projects with Bappenas, policy makers are looking to PLJ for **analytical support** to address increasingly complex development challenges. They are especially interested in **insights derived from alternative data sources** in order to improve their own capability to respond to emerging issues.

Propositions

Proposition 01: Good governance

To build a more effective and forward-thinking relationship with key governance stakeholders that understand and support the role and function of Pulse Lab Jakarta, **we need to finalise a strategic framework for 2020-2024**, that:

- is aligned with national and global agendas (e.g. Indonesia's Medium-Term Development Plan / RPJMN and the UN's Sustainable Development Goals);
- responds to emerging trends and issues;
- is operational and realistic;
- is measurable, with clear markers of progress and avenues to pilot if required;
- is endorsed by our formal governance structure;
- is fully "owned" by the team.

ACTION:

- Review national and global agendas and regulations:
 - RPJMN
 - Perpres 39/2019 on Satu Data
 - Perpres 9/2016 on Satu Peta
 - UNSDCF (WG4)
- Get a small team together and – referring to the Sensemaking workshop's processes and results – agree on:
 - PLJ's priority domains
 - "branding"
- Establish priority list of documents to be finalised for endorsements
- Draft outline of Strategic Framework / "Roadmap" and seek Bappenas' initial response
- Establish timeframe and divide responsibilities for finalising Strategic Framework

Proposition 02: Organisational structure

To better manage our work – and to do so in a way that ensures our team’s health and wellbeing – we need a **new organisational structure with clear work protocols**. Having this will enable us to strike the balance between **optimum workload** and maintaining a **vibrant, happy and healthy team**.

This proposition hinges on **two main features**:

1. The **design of sub-team structures that incentivises cross-team collaboration** by creating interdependencies based on distinct capabilities. This also needs to include strengthening our admin and operations backbone.

ACTION:

- Extend current contracts to enable proper recruitment for new structure
- Get new org chart approved by UNDP as soon as possible

2. **Clear and transparent business processes** that are followed consistently by **all team members**. These processes would cover each component of a project cycle, and would directly support the implementation of the Lab’s Strategic Framework (*see Proposition 1*).

ACTION:

- Create Strategic Framework [RR, PK]
- Schedule time to discuss Annual Work Plan [PK]
- Create 2-3 user journeys of PLJ projects to identify typical project life cycle [MA, MF, FT]
- Form a knowledge management committee to set up systems and processes in January 2020 [volunteer – TBD]

Proposition 03: Communications

To be better recognised in terms of the **roles and functions** PLJ plays in the broader ecosystem, as well as to better manage **expectations and partnerships**, we need to:

1. Create, promote and maintain a clear branding of Pulse Lab Jakarta that highlights our domain expertise, principles, values and achievements.
2. Develop an effective strategy to communicate our brand, which requires us having:
 - Clear target audiences / groups
 - Clear and effective communication channels, which include strategic events held by PLJ and key events that PLJ should attend
 - Effective communications media
 - Competent and resourced communications personnel

ACTION

- Create **updated branding** for PLJ. This requires having the new Strategic Framework in place.
- Develop **annual communications strategy**. This requires having the new Strategic Framework in place.

Proposition 04: Managing strategic partnerships

To establish and maintain PLJ's position and reputation in informing policy making, we need to foster long-term strategic partnerships that align with the Lab's capabilities and intent.

Features of this proposition include:

- A way of mapping key partners, networks (including networks between our key partners), and domain experts that enables us to clearly see our relationship assets
- A shared understanding across the entire PLJ team of the standard requirements for entering into a partnership, as well as what would be "deal breakers" (conditions that would require us to cease pursuing a potential partnership, or ending a current one)
- Clear handover protocols or service-level agreements for the Lab's completed projects

A prerequisite for this proposition is a completed Strategic Framework for 2020-2024.

ACTION

- Create list of partners and types of partnerships
- Break down partners' contribution against ours
- Clearly define who our strategic partners are

Proposition 05: Reduce current workload

We need to take a look at our current portfolio of projects to see which projects to drop, in a way that:

- Still maintains PLJ's reputation as a reliable partner
- Maintains the high quality of our work
- Maintains the morale and spirit of our most affected staff
- Capitalises on existing data partnership agreements
- Helps us to see our priority areas and our skills

ACTION

- Expectation setting for PLJ team
- Develop a set of questions to review projects [SL, MA, by 11/11/2019]
- Have project-based meetings, 30 minutes per project [SL, MA, by second week of December 2019]. These meetings comprise:
 - Fact-finding
 - Developing a shared understanding of the project amongst team members
 - Agreement on project continuity
- Executive decision (if needed) on projects to cut down
- Health and wellbeing check-in and reassignment of staff, if needed
- Communicate decisions to partners [by end of December 2019]

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