Managing Knowledge, Learning, and Data for Operations
The World Bank’s Global Themes Knowledge Management unit (GTKM) is a strategic unit that manages the wealth of knowledge that the Bank generates through its operations.

Like many development organizations, the World Bank generates knowledge in everything it does, across diverse activities and throughout the project cycle. Strong structures and approaches to manage this knowledge are indispensable to ensure that this knowledge is used to its full potential, to prevent knowledge loss, to understand what works and avoid repeating mistakes.

Knowledge—one of the World Bank’s most valuable assets, after its people—and its effective management are vital to ensure high-quality development projects, and, ultimately, to deliver development impact. The programs within GTKM align to support the key goal of managing knowledge, learning, and data effectively to facilitate World Bank operations and maximize development impact.

- **Knowledge Management (KM)** works to build a cohesive knowledge management program at the bank to bring value to operational staff and positively impact the broader knowledge agenda. This program draws upon and promotes best practices from partners and clients, and brings together knowledge as a global public good.

- **The Open Learning Campus (OLC)** works to equip staff with operational knowledge and capabilities to tackle the toughest development challenges. The OLC helps transform knowledge from the World Bank and partners into actionable learning for clients and staff.

- **The South-South Experience Exchange Facility (South-South Facility)** enables sharing of development experiences and knowledge among World Bank client countries by supporting knowledge exchange activities. Helping developing countries to share tacit knowledge among themselves around the similar development challenges they face enables them to find solutions that work within their social and economic context.

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**Examples of Supporting Operations**

**Improving Road Asset Management through Geospatial Technology**

**Challenge:** Collecting the geometry and quality of rural roads is vital to maintaining a proper road asset management system; however, this collection process can be prohibitively expensive. As a result, investment decisions and prioritization models are often based on outdated, invalid, and non-spatial road inventories.

**Solution:** In cooperation with the Transport & ICT and Governance Global Practices, GOST sponsored two missions to Vietnam to work with the team leader of the local roads project and local government counterparts to design and implement a series of data collection processes and open source technologies to inventory, map, track, and analyze unmapped rural roads. By integrating spatial information into what is normally a spatially blind table, GOST established a means for gathering and curating data that supports context driven medium term expenditure planning, risk assessment, and relative investment prioritization. The solution included smart phone apps and a web-platform for road quality monitoring and investment prioritization. This modular, low-cost approach is designed to be replicable in other countries at low cost in less time with each iteration.

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**Geo-Enabling Portfolios in Fragile and Conflict States**

**Challenge:** Capturing geospatial project data that is accurate, reliable, detailed, and spatially referenced at a granular level is important in project prioritization, project design, and monitoring and evaluation. While this has always been a desire in the World Bank Group, it has proven difficult at the portfolio scale.

**Solution:** GOST provides on-the-ground training courses in-country, utilizing open-source technologies. While in the field, surveyors use smart phones to fill out digital forms, take photos, record GPS coordinates, and conduct audio interviews, all without the requirements of mobile or wireless network connection. Once network or wireless connection is available, these completed forms and multimedia files are automatically uploaded to a cloud-based server where team leaders can view results, plot project sites and associated survey forms on descriptive maps, and verify the accuracy of submissions in near real-time. This tool will revolutionize how projects are monitored for outcomes. In-country, utilizing big data solutions as strategic tools to address real-world development challenges.

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GTKM
Who We Are
The Geospatial Operational Support Team (GOST) works with geospatial data – that is, data matched to measures of location, from countries and municipalities to specific coordinates – throughout the World Bank. The essence of this work lies in the combination of useful data with a location element. The world of geospatial goes beyond positioning existing types of data, and advances in technology (satellites, drones, cell phones) are causing new data types to emerge. Questions which couldn’t be answered ten years ago can be answered today using this technology.

What We Do
The team provides a variety of services, including advice on how geospatial data can help solve specific problems, purchasing support for data and imagery, and direct assistance for task teams, to help make the World Bank Group a sophisticated consumer of geospatial analytics, and ultimately carry out its development operations in the most cost-efficient and effective manner.

How We Work
In addition to direct support and assistance to task teams that need help, from short-term assistance to long-term engagements that create geospatial global public goods, GOST is creating a set of services and resources to help make geospatial data useful and accessible to teams across the World Bank.

Efficient Spatial Data Management: GOST is creating a consolidated catalogue of geospatial layers that will be available to everyone at the World Bank. This catalogue will grow with demand for commonly-requested geospatial products.

Procurement Support: GOST is creating a “Development Data License” with key vendors. This will help increase access to data through the elimination of duplicated data purchases, deep purchasing discounts, and advantageous data sharing permissions.

Knowledge Capture and Dissemination: GOST is working to integrate spatial data and analysis into Systematic Country Diagnostics (SCDs), by developing a catalogue of geospatial data, maps, and analysis that team leaders can draw on as they prepare SCDs. GOST is also working to help projects use geospatial data for M&E indicators, and is helping to scale pilot activities.

What We Do
The World Bank, like many development organizations, creates knowledge through operations and throughout the project cycle. Indeed, the World Bank has long been recognized as a leader not just in development finance, but also in development knowledge. The Knowledge Management program focuses on this reason on how to better manage this rich knowledge. We want to enable staff to share the knowledge that they learn every day, to access knowledge in ways that are user-friendly, and to use it to enable their work and maximize impact for our clients.

How We Work
To move toward an optimal state of Knowledge Management across the Bank, we have developed a Knowledge Management Action Plan, guided by a comprehensive strategic framework.

The Knowledge Management framework has a number of critical components, including:

Ensuring that processes and new ways of working add value without adding administrative burden; leadership for accountability around knowledge-sharing, ensuring that roles and responsibilities are clear; working to get the right mix of tools and technology; awareness-building about Knowledge Management work across the Bank; getting the right mix of incentives to encourage knowledge-sharing; building a culture of knowledge-sharing; and increasing connectivity among staff, clients, and partners.

Our goal is to create a knowledge-sharing environment at the Bank through a combination of technology, incentives, processes and support, so that staff can easily access what they need to get their work efficient. Making knowledge and information more accessible also fosters productive interactions—across the organization, with clients and partners, and across countries—and ultimately increases development impact.

Drawing on key inputs from external partners and internal stakeholders across the World Bank, we have developed a vision for “what good looks like” for each part of the framework, and identified key action items for “how to get there.” We are working with different operational units to develop and test ways to embed Knowledge Management in the project cycle, working on both tactical and strategic levels. The tactical track focuses on immediate opportunities to use Knowledge Management methods and approaches to help staff now. While we move forward on tactical goals, the strategic track takes on longer-term issues that require more in-depth work. Overall, the Knowledge Management Action Plan supports an ultimate goal of giving practitioners useful knowledge, when they need it, in order to support their work tackling the most difficult development challenges, and to enable them to maximize impact.
Who We Are

The Data Revolution is changing the way data is gathered, analyzed, and utilized in development. Big data is changing the way the World Bank does business. We help the World Bank use the tradecraft of big data analytics to turn data flows from mobile technologies, social networks, satellites and administrative data into actionable insights and solutions.

What We Do

The Big Data program helps World Bank teams and global practices to effectively use big data in their operations. Putting big data into practice has unique challenges. Our client engagements are tailored to deliver the assistance, knowledge, and essential resources needed to overcome the bumps in the road toward mainstreaming capabilities in big data.

How We Work

We work on knowledge initiatives to spark conversation and exchange around ideas and data innovations.

Events—enable opportunities in big data, including south-south knowledge exchange.

Big Data Challenges—surface and incentivize innovative and operationally relevant ideas.

Analytical Products—work with Global Practices to co-create state of plays, solution briefs, case studies, guidance notes, and learning products on big data.

Big Data in Action Workshops—dynamic learning environments for developing ideas, rough prototypes, and action plans.

Examples of Supporting Operations

Haiti Empowers Local Communities to Rebuild with Lessons from Indonesia

Challenge: After the earthquake that hit Haiti in January 2010, Haitian authorities wanted to learn more about disaster responses, and the "how to's" of designing and implementing community-based housing reconstruction initiatives.

Solution: A delegation of officials from Haiti’s Ministry of Planning and Ministry of Interior, as well as nongovernmental representatives, visited three provinces in Indonesia to see firsthand completed and ongoing post-disaster reconstruction projects. During these site visits, Indonesian reconstruction experts, government officials, and community members shared their expertise with the Haitian delegation.

The Haitian delegation drew several key lessons on post-disaster housing reconstruction, including the importance of strong national and local leadership from the government in setting clear goals to hasten the rebuilding process, and how empowering community members could create a greater sense of ownership. Moreover, the delegation gained skills for coordinating and monitoring global aid and stemming corruption in planning and implementing reconstruction projects.

Promoting Forests and Reducing Carbon in the Kyrgyz Republic and Tajikistan

Challenge: National forest authorities and specialists in the Kyrgyz Republic and Tajikistan wanted to learn about forest management and reforestation policies, and how to register for the Clean Development Mechanism (CDM) of the Kyoto Protocol.

Solution: Government officials and forestry specialists from the Kyrgyz Republic and Tajikistan visited Moldova to see carbon sequestration and afforestation initiatives implemented in the field. Moldovan experts then traveled to the Kyrgyz Republic to conduct workshops on carbon sequestration techniques and Clean Development Mechanism (CDM) documentation.

Officials from the Kyrgyz Republic and Tajikistan learned how to register for the Kyoto Protocol’s Clean Development Mechanism (CDM) for carbon trading and sequestration, which can generate revenue for further expansion of carbon-reduction programs. The Kyrgyz Republic also began implementing a trial program to reintroduce forests. Furthermore, the exchange rebuilt a network of forestry institutions and individuals that had dissolved after the collapse of the Soviet Union.

We provide technical assistance to support WB teams working with data.

Operational Pilots—our data scientists support operational pilots with transformational potential to scale into World Bank operational diagnostics, lending solutions, advisory services, and monitoring products.

We provide essential resources and work.

We work with the Information Technology Solutions and Development Economics Data Groups to stand up infrastructure to enable big data analytics.

Cluster Computing—powerful computing infrastructure to process big data and sophisticated algorithms.

Data Science Tooling—analytical tools and software, like R, Github, and Python—to help economists, statisticians, data scientists collaborate on analytical products that can be easily shared and reused.

Community of Practice—the Big Data and Data Science Community of practice provides a platform to showcase big data solutions and opportunities for networking, knowledge sharing and learning.

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Property rights are critical to economic growth. The project developed a smartphone app called "RoadLab," which in effect harnesses moving vehicles as probes that detect real-time road conditions by using smartphone accelerometers to monitor and report the roughness of travel over stretches of road. This technology can be spread quickly, as an app, across the globe—and when coupled with recommendations on policy options and lessons learned on maintenance, this is a very powerful tool globally.

**Examples of Supporting Operations**

**Big Data in Action to Monitor Electricity Access**

**Challenge:** In much of the world, access to electricity is uneven, irregular—and undermining development and welfare. Understanding and improving rural electrification and lighting improvement projects are critical to poverty alleviation and shared prosperity.

**Solution:** The Nightlights.io tool visualizes nighttime satellite data to understand electricity access and is particularly useful in regions characterized by low power loads, small numbers of dispersed users, limited infrastructure, and erratic service. The data and approach is open source and it will be used in other regions, including Sub-Saharan Africa.

**Big Data in Action for Agricultural Measurement**

**Challenges:** Reliable data on crop productivity is essential for policy decisions that will improve agricultural yields and reduce poverty. Traditional approaches to measuring yields and productivity are resource-intensive and difficult to implement.

**Solution:** High-resolution satellite imagery, handheld GPS device data, and machine learning to provide evidence and inform policy to help improve the productivity of smallholder farmers. This approach is now planned for use in several Sub-Saharan African countries where similar lack of knowledge on yield is preventing effective policy and programs.

**Big Data in Action for Rural Transportation**

**Challenge:** Well-kept roads connect people to public amenities and reduce travel time, vehicle operation costs, and crash risks. In order to maintain road networks, government agencies must develop cost-effective asset management strategies, but many have only limited resources and poor understanding of road infrastructure conditions from road users’ perspectives.

**Solution:** The project developed a smartphone app called "RoadLab," which in effect harnesses moving vehicles as probes that detect real-time road conditions by using smartphone accelerometers to monitor and report the roughness of travel over stretches of road. This technology can be spread quickly, as an app, across the globe—and when coupled with recommendations on policy options and lessons learned on maintenance, this is a very powerful tool globally.

**Big Data in Action for Property Rights**

Deploying Unmanned Aerial Vehicles to understand property rights in Kosovo.

**Challenge:** Property rights are critical to economic growth and social stability, yet almost 75 percent of the world’s population lacks access to formal systems to register land rights and secure ownership.

**Solution:** Use UAVs, handheld and cloud computing to accelerate registration of property rights in a fraction of the time of conventional survey approaches. Software tool, algorithms and guidance notes are open source for easy implementation.
Who We Are
Development practitioners and decision-makers in developing countries want to learn from each other’s achievements and failures. Where can they turn for real-world, current and practical information to tackle development challenges? To a virtual Open Learning Campus (OLC)—a vast, unique ecosystem of customizable and just-in-time curricula, lessons, tools, conversations, and communities to help World Bank clients, partners and staff update their knowledge and co-create solutions.

What We Do
Technology is constantly changing the learning landscape. The OLC represents the World Bank’s commitment to harness this global revolution in learning to advance its efforts to lift people out of poverty and boost shared prosperity. The OLC provides dynamic learning opportunities where diverse audiences can access development lessons just-in-time, and in versatile formats—from bite-sized lessons to full-length courses to peer-to-peer conversations. Since we learn constantly, the expansive scope and real-world focus of the OLC ecosystem can contribute to learning and project performance effectiveness.

How We Work
The OLC is inspired by successful models of digital learning, such as the Khan Academy and Massive Open Online Courses (MOOCs), as well as the latest developments in adult pedagogy. These innovations include gamification, learning labs, simulations, and learner-centric activities, such as role-plays, peer engagements, and scenario analysis. To make learning accessible to busy professionals, the OLC offers its curricula through three “schools”:

- WBx-Talks Nuggets of knowledge through talks, podcasts, videos, briefs, and games that provide a just-in-time overview of materials targeted to learner-specific interests.
- WBx-Academy Deep learning related to development challenges and solutions through virtually facilitated or self-directed e-courses, MOOCs, and material from face-to-face courses.
- WBx-Connect Platforms for participants to share knowledge, engage with peers and experts and, find crowd-sourced solutions to development challenges.

The OLC provides just-in-time learning as a central part of the WBG and client operational engagement. It responds to an urgent need to capture and curate tacit knowledge in real-time in forms that are accessible, and interactive. There is a significant body of tacit knowledge available with World Bank operations staff, gathered over years of development experience. The OLC’s pedagogical services, delivered at critical points in the project cycle, helps capture and share this tacit knowledge, for people to learn in real time, engaged with a broader community of development experts.

In addition, bite-sized learning products, which are developed with the assistance of experts working in the development field, provide summary insights that staff and clients can learn and apply with a short turnaround within the project cycle. Practitioners can access the OLC library of cutting-edge content and innovative learning tools at any time and from any place.

Examples of Supporting Operations

Using Text Data and Geo-Location to Map Sensitive Projects

Challenge: The Environment Global Practice (ENR GP) needed to ensure that the Bank’s operations were doing enough to mitigate any adverse impact of their projects on the world’s forest cover.

Solution: The team used text analytics and project geo-locations to provide a list of projects for further scrutiny to ensure that necessary steps were taken to eliminate or mitigate any adverse impacts on forests during the design and execution of these projects. Geo-coded project locations and global forest cover data were used to develop a map of project locations against forest cover data. Text analytics was used to identify sensitive projects, bringing together and identifying information that had already been collected.

Creating a User-Friendly Database for Energy and Extractives Global Practice (EEX GP)

Challenge: Making relevant energy and extractives data easily accessible.

Solution: The Text and Data Analytics team worked with the EEX GP to identify data sources used by project teams to understand the energy sector across client countries. The data was then processed so that practitioners had user-friendly Excel-based tools for SCRD analysis, power utilities benchmarking, and general energy sector data. These tools brought together all relevant energy and extractives data series in one place.

Improving Search Results in the World Bank System

Challenge: Improving the quality of information in, and retrieval from, the World Bank’s internal document repositories can enable staff to access relevant information more quickly and easily.

OLC Online Learning Campus
ACCELERATING SOLUTIONS THROUGH LEARNING
Who We Are
The Text and Data Analytics unit within GOKMU helps practitioners and decision-makers navigate and utilize the wealth of unstructured and structured data, both inside and outside the World Bank. This team helps ensure that the Bank’s collective knowledge effectively informs analysis—whether by tracing information in the extensive documentation produced by projects, or by drawing out insights from the terabytes of data generated by World Bank operations.

What We Do
Given the wealth of qualitative and quantitative information inside and outside the World Bank, practitioners and decision-makers often need help to extract insights from the sea of information around them. The Text and Data Analytics unit provides centralized expertise in extracting these insights and helps map them to development challenges.

How We Work
Working closely with teams from across the World Bank, the Text and Data Analytics unit provides support by automatically extracting knowledge and insights from the wealth of documents and data inside and outside the World Bank.

The data analytics offerings use basic to advanced data analytics, ranging from exploratory data analysis to econometric modeling. These techniques and services help translate structured data into analysis for effective decision-making at all levels in the organization.

The text analytics methods in use include text clustering, sentiment analysis, topic identification, document classification, text extraction, entity extraction, and concept mining. These varied techniques help ensure that operational teams can leverage the best available knowledge as they work to achieve the World Bank’s goals of eradicating poverty and boosting shared prosperity.

Examples of Supporting Operations

Accessing and Visualizing Multi-Sectoral Data in a Spatial Context

Challenge: Solutions to many development problems are hampered by the poor availability of spatial data. How can you easily find out which areas in Madagascar are susceptible to cyclones? Or which areas in India have high child malnutrition? Or what are the major exports of Vietnam are?

Solution: The OLC offers curriculum that enable learners to apply spatial data from interactive maps, satellite observations, and economic trends in order to not only identify where problems occur but how solutions can be developed. Through tutorials, for example, participants can explore how spatial information enables better planning for a city or river basin to promote sustainable development.

Planning and Design of Sanitation Systems and Technologies

Challenge: Learning about effective sanitation planning and behavior change is critical for improving the living conditions of the poor in developing countries.

Solution: The OLC offers interactive, experiential learning on how to implement affordable sanitation solutions. This also includes learning about tools that could accelerate behavior change, shifting the approximately half a billion persons worldwide still practicing open defecation to utilizing sanitary toilets. The course is offered in English and French, with subtitles in Spanish and Hindi to reach this diverse audience.

Financing for Development: Unlocking Investment Opportunities

Challenge: Implementing the ambitious global development agenda requires trillions of dollars of financing. How can we unlock investment opportunities to finance this critical work and help the poorest and most vulnerable?

Solution: In this Massive Open Online Course (MOOC) a large and diverse audience is engaged to learn about Financing for Development; raise their awareness on broad issues and opportunities in development finance, familiarize them with key concepts and approaches, and encourage participants to consider what actions might be taken within each of their contexts to support this agenda. A mix of government, private sector, and international organization leaders from around the world delivered course lectures.
Who We Are

The Global Delivery Initiative (GDI) is a collaborative effort of over 40 partners across the development field—multilateral and bilateral organizations, non-governmental organizations, country governments, academic institutions—who aim to create a collective, cumulative evidence base of delivery know-how to inform development practice and improve implementation. GDI has created a governance structure, with the secretariat currently housed in the World Bank’s Science of Delivery team, and with the World Bank and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) co-chairing the steering committee.

What We Do

GDI works to connect practitioners to share knowledge and operational know-how on implementation processes, what worked and what didn’t. It leverages data to help practitioners anticipate delivery challenges, and supports the documentation of implementation process to help practitioners understand how interventions worked in context. GDI uses a variety of approaches, including a comprehensive online platform, to catalyze knowledge flow across sectors, institutions, and regions.

How We Work

The GDI Learning Program provides workshops and trainings that enable practitioners to deepen their knowledge about practical tools and methodologies to operationalize delivery know-how, capture evidence on how to address delivery challenges, and connect with others who are working on these themes.

Examples of Supporting Operations

Using Evidence to Preempt Delivery Challenges

Challenge: Delivery challenges often arise unexpectedly in the course of even the best-prepared projects.

Solution: DeCODE draws on historical data from a number of GPs and external partners to create an evidence-based system that helps project managers anticipate and preempt delivery challenges based on sector, region, and a wide range of other contextual variables.

Documenting Implementation Processes and Solutions to Share Delivery Know-How

Challenge: Information on processes of implementation and how these were effected by delivery challenges remain under-documented. This is a significant problem, because knowledge on how practitioners confronted challenges during implementation can offer rich insights, and help practitioners to emulate the successes, and avoid the mistakes, experienced in other projects.

Solution: The Global Delivery Library offers a variety of resources—including case studies, delivery notes, video testimonials, and toolkits for adaptive management—that have been contributed by partner organizations. These products provide access to a wide range of knowledge on “the how,” and document implementation processes in their context. They draw on tailored blends of original research, interviews with implementers, and conversion of program documents like Implementation Completion and Results Reports, evaluations, and scholarly papers to produce user-friendly products focused on delivery challenges and operational know-how. These resources offer a user-friendly way to help practitioners understand how delivery processes occurred—and how delivery succeeded and failed—in projects relevant to their own work. Products in the Global Delivery Library have been used in diverse contexts: from improving water and sanitation, agriculture, and governance in Nigeria, to supporting a team preparing a health project in Indonesia, to helping the Mexican government assess the efficacy of a social inclusion project.