

Information and Communications Technology in Land Administration Projects

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Application of Information and Communications Technology (ICT) to land related projects is now a widespread phenomenon, through both donor-supported interventions and autonomous development. Since the mid-1990s the World Bank has been increasingly involved in ICT land project implementations. The advantages have proven substantial in reducing the time required to complete transactions, improving access to information by the public, as well as other government agencies, reducing the costs of data acquisition, and contributing to standardization of system design. The successful application of ICT to land projects has increased since the 1990s, as lessons from the first tier of programs became clear and were subsequently applied. This note summarizes the demonstrated advantages of ICT application, as well as the key lessons learned.

ADVANTAGES OF ICT APPLICATION TO LAND PROJECTS

Data Acquisition – Data acquisition is more feasible and costs less by applying ICT than often-used technology that are quite sophisticated. The use of high, but robust, technology for data acquisition (satellite imagery, digital orthophotos, CORS, GPS) provides more simplification, increased efficiency, less cost, and greater accuracy. In Cambodia, for example, 1 million properties have been registered in both graphical and

attribute terms starting from a situation with almost no data was available. The cost per property, applying orthophoto-interpretation and field adjudication, was about US\$8. These costs can typically run US\$20 or more in other settings. A similar approach is currently being piloted in Andhra Pradesh, India, whereby parcel boundaries are adjudicated in the field with digital orthophotos on laptop. Cost benchmarking of this approach has not been carried out, or at least is not yet available.

System Standardization – Introduction of automated systems brings with it a review of existing paper-based data classification and management procedures, including the formats in which data is submitted to the land registry and cadastre. Anomalies in system operation are found across regions within a country. Systems automation allows for a comprehensive review of these existing practices and their standardization on a national level, which in turn results in improved efficiencies in systems operation. ICT application can also spur a rationalization and simplification of the forms utilized in interactions, both internally as well as with the client.

Data Access, Service Standards, Planning, and Governance – Inherent in the application of ICT is improved data access. There is now a long list of project cases where customer service standards have benefited substantially as a result. The ready availability of digital land data facilitates government land use planning. It can also improve linkages with third parties, such as financial institutions involved in mortgage lending, and civil society organizations.

IT solutions can improve governance. Web based solutions have improved transparency and can improve the security of tenure. Accessible information on who-owns-what tangibly hinders grand corruption. Along with the standardization and streamlining land registration operations noted above, application of ICT can cut down on gate keeping and information capture, which are often sources of petty corruption.





At the same time, there is issue about equal access to web-based information. Arguments have been put forward that this can act to skew information access in favor of the better-off segments of the population, which can clearly be the case where internet access is restricted. Strategies to balance information access need

to be developed and put in place. Various states in India are working to make available land records and land registration data at the local level through a system of village kiosks. The business logic is to piggyback these with other government services. Punjab Province in Pakistan has decided to invest in local level land records service centers that likewise can evolve into providers of a broader set of government services and information. The establishment of tele-centers in a number of Central American countries has improved access to information and services at the local level.

Indonesia has introduced a system of mobile land registration offices, which brings the system to the client. To prevent duplication of data, this service, known as LARASITA, is conducted using laptops that are connected to the main database through wireless connectivity (WLAN). Aside from reducing possible information distortion and deceptions due to using intermediaries to access registration services, LARASITA aims to expedite the process of land titling.

APPROPRIATE APPLICATION OF ICT TO LAND PROJECTS

Elaborated Business Case – One of the key lessons in utilizing ICT in operations is the need to start with the strategy and business case. ICT development is not just a hardware/software issue – it includes business process reengineering, and understanding different users and their requirements. The first step, therefore, should be a user needs analysis. This is both for external users (notaries, lawyers, banks, etc.) and internal users (the registrars, clerks, archivist, etc.). It is important for the client (land administration agency) to understand where they want to get to with the ICT implementation and the why, who, how, what, before starting. Several projects earlier failed to do this, which resulted in difficult and long implementation periods, and IT systems that were lacking in buy-in at the local level and only partially responsive to actual business needs. A recommended approach is to agree up-front on service standards to be



met. For example, it is important to consider things such as reduced time for registration or data provision, customer satisfaction measurements (better governance), and improved reliability/ accuracy of information and records. There is also a need to assess up-front the implications for staff reductions, reduction

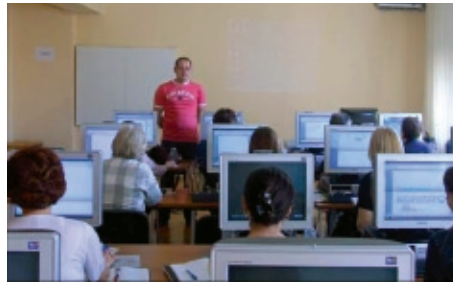
in numbers of offices, reduced space needed for archives as these have good financial implications, but possibly adverse social consequences. The appropriate system design can then be assessed on this basis.

Management Expertise – The Bank and our clients continue to underestimate the need for management expertise in implementing large ICT systems. Not only is good IT knowledge and experience required, but significant contract and project management experience is essential. This lends itself well to incremental ICT development, where the IT professionals can gain management experience as they go along. In addition, training and, most often, international technical assistance (TA) are needed. For the Pakistan—Punjab Land Records Management and Information Services Project, ICT management has been moved from the implementing agency to a parastatal organization with stronger capacities than existing civil service bodies. Early results of this arrangement are encouraging. Another possible model is to have an IT project management work group. This consists of the contractor's IT project manager and the client's IT project manager, plus their teams, who meet on a regular basis. The client's IT project manager's team would include a consultant company that will monitor and supervise system development in coordination with the client. They will 'sign off' on the various stages of development. In addition, a separate independent IT consultant (outside of the working group) with domain expertise is needed on a part time basis to provide an independent review of the consultant company's performance. This avoids a tendency by the consultant to accept too readily the contractor's deliverables and also protects against any collusion between the contractor's and the client's teams.

Phased Implementation – Developing a phased approach to implementation of ICT in land administration systems has usually worked well. One of the key reasons is that the client often does not know what to expect until the system begins to be developed. Often, service standards can be gradually improved over time



as the ability to acquire and manage information, along with other system improvements, is put in place. It is important, however, to have institutional and legal/policy issues resolved up front. Countries often launch into ICT land projects hoping they will provide a way around difficult structural and policy questions. These problems often simply derail the IT implementation.



It is important that project design include sufficient time for system specification and design, and that system roll-out not proceed until this is well in place. Very often completion of system roll out requires more than the standard 5 year project cycle.

Piloting field methods and ICT applications is characteristic of successful projects. However, testing and piloting is often rushed because overall project implementation is running behind schedule. Piloting is far too often focused on the technical solutions alone. The main obstacles preventing the creation of a feasible land register are seldom technical, but mostly financial and capacities related.

In the cases of Kyrgyzstan and Moldova, initial emphasis was on the substance of the new registration systems, with automated systems introduced first in only the higher volume registration offices. Over time, all offices in Kyrgyzstan were automated and a national data system is now being developed.

The strategy being adopted in India and Pakistan is to focus on the first phase of a land administration modernization effort on computerization of existing alphanumeric database systems, with some business process re-engineering and improved inter-agency information flows. More challenging institutional changes, as well as relatively costly investment in spatial data, are now beginning to be addressed or have been slotted for subsequent implementation phases.

The approach to spatial data capture has been similar in East and Central Asia (ECA), where it was found that placing too much importance upfront on acquiring new spatial data can delay important improvement in registration and service delivery functions. ECA countries often have limited digital graphical data to start with and these systems tend to be more complex to build and implement. In other cases, though, such as Georgia and

Slovenia, good use was made of digital orthophotomaps to get immediate access to a wealth of spatial data. This approach is also being followed in Ukraine, Serbia, and Azerbaijan, and was used in the Baltic States. In Armenia, Georgia and Moldova rapid cheap digital spatial data was collected using simple survey methods and a newly trained private sector.

Both ECA and South Asia benefit from the existence of basic spatial data (usually at least 15 years old, and in the case of South Asia often 50 or more years old), that can serve as a relatively low-cost initial basis for parcel identification requirements. Alphanumeric data for both cadastre and registration can be integrated at the start. In ECA, this approach has usually been combined with institutional reforms that facilitate access to available spatial data for the registry. Good examples of this are Kazakhstan and Kyrgyzstan.

System Maintenance and Sustainability – The application of high tech solutions to a critical legal system such as a land register should only be done once the capacities to maintain are ensured in full.

During design, development and implementation, training for IT staff, project managers, and users need to be considered. But training for users should focus on the business, not on the IT. Often ICT developments include changes to processes and standardization and staff in decentralized offices do not know the new way of doing business. Learning how to use the computer will not help them do their jobs – they need to understand the business and changes to the processes and this cannot be left to IT trainers. So training must be comprehensive and timely and this should be included in the ICT project timeline from the start. However, training without a proper business case has proven ineffective as well. Upgraded IT skills make people employable in both public and private sectors and if salaries remain nominal and working conditions poor, key people will soon leave.

Usually, manual and computerized systems operate side-by-side for a period of time. It is important that the project design considers the timeframe for conversion from the paper-based system to sole operation of the computerized system. This requires foresight in terms of the legal and regulatory measures that are necessary to give legal force to the digital system. Continued parallel running of the two systems not only imposes

net additional costs in comparison to the paper-based system taken alone, but runs the risk of divergence between the systems over time and possible discrediting of the automated system.

Self financing agencies, which have flexibility in defining their salary structure, are better positioned to retain relevant IT capacity than agencies that rely on budget funding and are restricted with general government staff salary levels. If sustainability of an agency's IT capacity is questionable, outsourcing provides an opportunity for increased sustainability. Clients may have reservations with outsourcing on the basis that the register management is "a government duty." However, there are some examples where outsourcing has worked well. This has been the case with computerization of the deeds registry in a number of Indian states, such as Maharashtra and Karnataka. In these public private partnership (PPP) arrangements, the private sector is responsible for service delivery, and maintenance and operation of the IT systems, while the public sector is responsible for oversight and ensuring adherence to policy and legal requirements. Interestingly, in the Indian cases, software development proceeded separately, relying largely on parastatal capacities. In the more traditional "build-own-operate" or "build-own-operate-transfer" models, experience has been limited and not as encouraging. In the Philippines, under the Land Titling Computerization Project, attempts were made to computerize the system of registration of deeds on a "build-own-operate" model with disappointing results. General IT capacity in the private sector is very good throughout the world. Capacity built in the private sector is often the most sustainable way of maintaining a public data system. However, even outsourcing IT management and maintenance requires advanced IT capacity, but naturally less in terms of the number of the skilled people required than any other alternative.

The establishment and maintenance of computing facilities is a risky undertaking when insufficiently skilled IT staff is available. It might frustrate end-users when the computer center fails to deliver a trustworthy and reliable ICT-support. Increasingly ICT-dependent organizations outsource their computer center, making another organization responsible for daily operations, through service level agreements. Organizations such as Google/Earth or Google/Map even keep systems and data available without any customer-service agreement providing services from the shelf. Web services allow countries to run guaranteed land information systems and databases, and to use services at any government level by staff not necessarily trained in ICT. Even in countries where enough ICT capacity is available, organizations have opted to change their ICT-architecture into web services to get rid of the burden of daily technical maintenance. These web services might, moreover, be composed as package solutions based on standardized best practices, such as core domain models, enterprise software, and GIS integration software.

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