India's Aadhaar Project: The Unprecedented and Unique Partnership for Inclusion

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ABSTRACT

The burgeoning economy of India still precludes many marginalized individuals at the bottom of the pyramid from obtaining basic benefits and welfare services due to the lack of a proper form of identification. The Unique Identification Authority of India (UIDAI) established a program in 2009 called Aadhaar as a method for providing identification to the marginalized residents of India. The purpose of the identification project was to promote greater social and financial inclusion for all residents in the formal economy of India. UIDAI leadership implemented a public-private partnership that leveraged the strengths of both the Government of India and the private sector, giving Aadhaar the ability to overcome the challenges of a project with such a large scope and size. This comprehensive analysis may provide a broader interest for developing or industrial countries with a model for implementing their own mechanism for the provision of a nationally recognized identification system.

Keywords: *Aadhaar, Biometric Identification, Financial Equality, Public-Private Partnership, Social Equality, Unique Identification Authority of India (UIDAI)*

Introduction: India's Unique Identification System

In many developing countries around the world, the process of social and financial inclusion of all residents is an arduous and convoluted process. The basic concept of having an identity in numerous industrialized nations is taken for granted. Conversely, the luxury of having an accepted means of identification in developing countries is often not offered to many, especially those that find themselves at the bottom of the socioeconomic pyramid. One of the first steps of greater social and financial inclusion of all residents of a common locale begins with providing a basic nationally recognized form of identification.

India is currently the largest democracy and is the second most populous country in the world. India continues to be an emerging democracy to this day with a robust and burgeoning economy. Despite the flourishing economy, many residents of India are unable to obtain basic benefits or sorely needed welfare services because they do not have proper or accepted identification. India has a population of 1.2 billion people and approximately 400 million people are unable to prove their identity (Sathe, 2011). This barrier exists due to the fact that both public and private sector organizations require proof of identity prior to providing any services to residents. The inability to prove one's identity precludes the poor, the

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marginalized, and the underprivileged populations of India from gaining access to benefits and subsidies, applying for welfare benefits, accessing education, opening a bank account, or attaining employment (Greenleaf, 2010; Sharma, 2011).

The goal of Indian government officials in implementing a broad identification system is to successfully address the concerns of national security, corruption, and anti-poverty efforts. There have been many documented cases of fake identities, fraud, and duplication of welfare services across the country, and corruption in India sadly diverts approximately 80% of the funds targeted for its poorer residents (Sathe, 2011). In order to improve the economic situation of all of its residents, the Unique Identification Authority of India (UIDAI) implemented an ambitious and innovative program known as Aadhaar. Aadhaar, which translates to 'support and foundation' in most Indian languages, would allow residents to prove their identity through a unique identity number provided by the officially recognized agency. The issuing of an Aadhaar number would be provided to all residents of India, whether or not they are permanent citizens. The purpose of providing a number to all residents as opposed to only citizens is to have the system be inclusive rather than exclusive. Aadhaar provides residents with an identity, but the issuance of that identification does not constitute rights, entitlements, or benefits.

Aadhaar's objective of providing identification for 1.2 billion people is one of the largest, most distinct, audacious, and ambitious biometric identification programs in the world (Das, Maitra, & Bagchi, 2011; Khanna & Raina, 2012; Mathew, 2014; Sharma, 2011). In India, approximately 42% of the population find themselves at the base of the socioeconomic pyramid, and Aadhaar strives for greater economic inclusion of this largely poor and underprivileged segment of the population. Aadhaar allows these marginalized residents of India to participate in society and to benefit from the tremendous economic growth by giving them a means to prove their identity when obtaining services. For example, approximately only 20% of India's residents have a bank account (Khanna & Raina, 2012; Sathe, 2011). A bank account can be a vital component for working ones way out of poverty, but how does one open a bank account without being able to establish their identity?

The purpose of this comprehensive research is to examine the unique interaction between a bold concept, the integration of modern technology, and the influence of public-private partnerships in the implementation of Aadhaar. Even though this paper only focuses on India's Aadhaar project, the findings and analyses provide a broader interest for the international community on public-private partnerships.

This paper is organized as follows: (1) the examination of standard approaches of identification in India; (2) Aadhaar's innovative approach in providing identification to all residents of India; (3) an analytical assessment of Aadhaar's implementation process compared to the conceptual framework advanced by Kania and Kramer (2011) on public-private partnerships; (4) the most current updates and outcomes of Aadhaar; and (5) concluding remarks on the challenges and adversity of Aadhaar's future prospects.

Standard Approaches to Identification in India

Prior to the creation of Aadhaar, India did not have a nationally or universally accepted method for providing identification to its residents. Lacking a uniform and standard approach, Aadhaar was conceived as a unique and innovative project to deal with this problem. Previous methods and more traditional approaches to dealing with the problem had

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failed. Typically, government officials and the public sector would attempt to resolve the issue in isolation without coordinating public and private efforts.

Like most places, India's public and private service providers require proof of identity prior to rendering services to an individual. But without a dominant national identification mechanism, service providers establish their own protocols and benchmarks for establishing identification. The lack of a national identification mechanism often leads to the denial of critical services and increases corruption because residents have to bribe government officials in order to obtain services to which they are legitimately entitled (UIDAI, 2014).

As Table 1 indicates, the most standard approaches for identification in India are voter identification, passport, Permanent Account Number (PAN) card, and ration card. The plethora of identification mechanisms leads to multiple and fake identities. The implementation of Aadhaar is meant to curtail these problems and to make obtaining a false identity more difficult by tying Aadhaar enrollment to harder-to-falsify biometric data (Das, Maitra, & Bagchi, 2011).

These four identification methods cover only a portion of the 1.2 billion people in India. The voter identification cards cover the greatest portion of the population, 52.5%. Passports cover a mere 3.5%. PAN cards only cover 6%, and ration cards cover 19% of the population (Lambda & Gupta, 2011). The redundant processes waste time and money, and are inefficiencies that residents stuck in poverty could ill afford.

Voter identification cards are prone to duplications since voters migrate from one area to another and then register for a new card. Passports are rarely used by the underprivileged since they are unable to afford the cost of obtaining a passport and are even less likely to travel. PAN Cards do not require physical verification during the enrollment process, may not have the person's current address, and are not cancelled or withdrawn upon the death of the cardholder. Ration Cards are primarily given to residents at the bottom of the socioeconomic pyramid and are uncommon among middle and upper tier residents. Perhaps more importantly, there is no centralized database that stores information about recipients assigned ration cards. By centralizing and standardizing identity, Aadhaar could address these and other shortcomings of the current systems while also reducing the inefficiency, corruption, and malfeasance endemic in them. Aadhaar consolidates the identification processing associated with each of these agencies into a single mechanism with a standardized procedure.

Table 1: Standard Approaches to Identification in India

	Voter Identification	Passport	Permanent Account Number (PAN) Card	Ration Card
India's Issuing Agency	Election Commission	Ministry of External Affairs	Department of Income Tax	Department of Civil Supplies
Total Issued	600 Million	40 Million	70 Million	220 Million
Population Coverage	52.5%	3.5%	6%	19%
International Recognition	No	Yes	No	Yes

Note: The data are adapted from "A Foundation for Financial Inclusion. Conference on Inclusive & Sustainable Growth," by R. Lamba & M. Gupta, 2011, Proceeding from Institute of Management Technology.

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Social and Financial Inclusion: Aadhaar's Approach to Identification

In 2009, through the leadership of India's Prime Minister Manmohan Singh, the Planning Commission of India established the Unique Identification Authority of India (UIDAI). The former Chairman of Infosys, Nandan Nilekani, was appointed to lead UIDAI. Its objective was to establish a single, nationally recognized means of identification for all of India's residents (Das, Maitra, & Bagchi, 2011; UIDAI, 2014). Aadhaar was developed and implemented as a method for addressing the significant problem of introducing more residents of India into the formal economy, provide greater access to benefits, ensure fair elections, and to prevent further corruption and malfeasance (Greenleaf, 2010; Mathew, 2014; Sathe, 2011; Sharma, 2011; UIDAI, 2014). After a great deal of consideration, Nilekani and his team determined that to ensure uniqueness and to prevent fraud, biometric technology would play a central role in the system. The technological and institutional infrastructure of Aadhaar had to be able to eliminate any duplication efforts or fake identities that were well known to impede the current system.

The process of addressing major social issues in today's interconnected, complex, and technology-driven world requires the collaboration and cooperation of multiple organizations. In order to successfully reach the ambitious objectives of Aadhaar, the project was designed as a collaborative partnership between public and private sector organizations (Klitgaard, 2011; Sathe, 2011). Regardless of how innovative and influential a single organization or government agency might be, the project's immense size calls for an approach that could draw upon the resources and talents of a range of organizations. Through collaboration across organizations, the Aadhaar project is designed to leverage both public and private sector resources through the development of sustainable and cost-effective networks. The partnership enables the various stakeholders to meet the technical, regulatory, and legal obligations of the project. Through a collaborative network of public and private partners, UIDAI began issuing unique Aadhaar identification numbers in September 2010 with the goal of covering 600 million residents by 2014 (Khanna & Raina, 2012).

Enrollment Procedure and Protocol

Enrollment occurs through duly designated third-party enrollment agencies. To become an official enrollment agency, an organization is required to go through proper training and testing on procedures and use of the enrollment kit. Each kit is packed into a briefcase and includes the following: a laptop, the enrollment software, fingerprint reader, iris scanner, webcam, laser printer, and monitor (Khanna & Raina, 2012).

Participation in Aadhaar is voluntary for all residents. To enroll, residents can go to any authorized enrollment agency, complete an Aadhaar application form, and present current identification documents. If an enrollee does not have identification documents, they can still enroll with the help of an "introducer" – a person whose identity has already been verified. The "introducer" vouches for the enrollee, sidestepping the requirements for identification documents (Sathe, 2011; Sharma, 2011). The enrollee will then have their biometric data recorded and is entered into the database.

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The assigned Aadhaar number for an individual is connected to all biometric data collected during the enrollment process. A trained enrollment center employee photographs the enrollee, records the iris scans of the eyes, collects demographic information, and takes imprints of all 10 fingers. The demographic information includes the name, address, date of birth, and gender of the individual (Sathe, 2011; Sharma, 2011). Multiple biometric data are recorded in order to enable the inclusion of all residents in India. Fingerprints, for example, can be worn away by physical labor. Since many of the poor residents of India have occupations that require heavy physical labor, a fingerprints-only identification scheme would continue to disenfranchise many of them.

Each enrollee's data is then uploaded to the Central Identification Data Repository (CIDR) for de-duplication. The term "de-duplication" refers to the process where the CIDR checks to determine whether or not the biometric data submitted already exists in the database. If no equivalent record exists, then a unique, randomly generated 12-digit number will be mailed to the enrollee (Mathew, 2014; Sharma, 2011). The unique identification number provides residents with the ability to clearly establish their identity when obtaining goods or services from any public or private organization.

Figure 1 provides the progress of Aadhaar, the most current cumulative Aadhaar enrollment numbers, and the enrollment numbers from July 2013 through June 2014 (UIDAI, 2014). As of June 2014, there were a total of 638,355,285 residents that enrolled for an Aadhaar unique identification number. Table 2 provides the specific enrollment percentage rates of male, female, and transgender residents that have registered for Aadhaar.

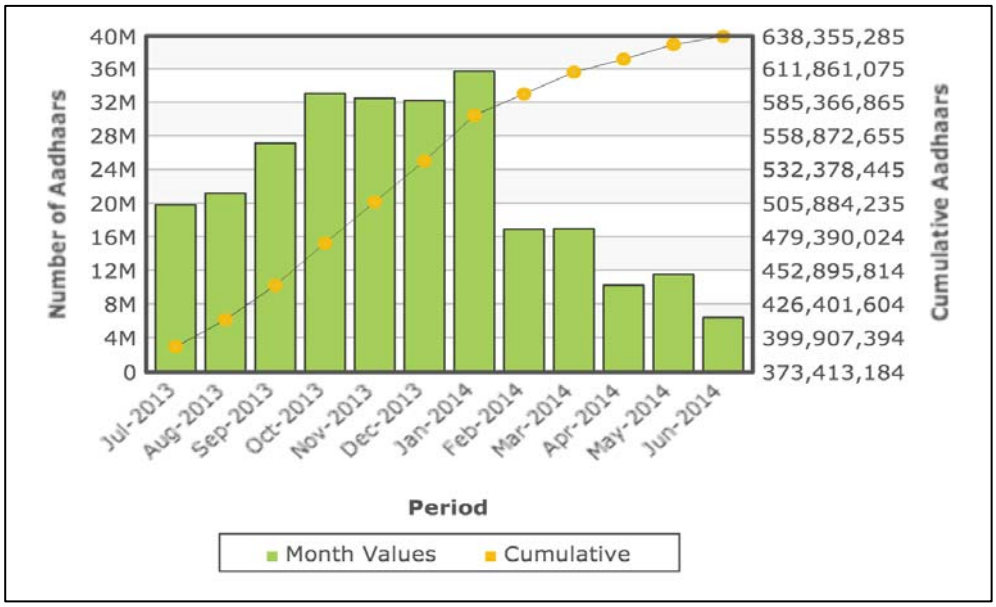

Figure 1: Total Aadhaar Enrollments from July 2013 through June 2014 and Total Cumulative Enrollments. Adapted from the Unique Identification Authority of India (UIDAI), 2014. Retrieved from http://www.uidai.gov.in.

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Table 2: Aadhaar Enrollments of Male, Female, and Transgender Residents

Age Range	Male	Female	Transgender
0 to 5 Years Old	1.91	1.70	0.0002
6 to 15 Years Old	10.04	8.86	0.0010
16 to 30 Years Old	16.09	14.50	0.0020
31 to 45 Years Old	12.32	12.07	0.0017
46 to 65 Years Old	9.36	8.78	0.0012
66 Years Old and Above	2.28	2.08	0.0003

Note: The data are adapted from the Unique Identification Authority of India (UIDAI), 2014. Retrieved from http://www.uidai.gov.in.

Aadhaar Project History

The disparity between the increase of community demands and the diminishing public resources that are available to meet social needs have become conspicuous in many countries around the world. This paradox has led to the propagation of projects utilizing public-private partnerships. Public-private partnerships are able to combine the strengths and abilities of the different sectors in order to meet the expectations of different stakeholders.

Aadhaar project's history, including discussion of the social and political context, is described above and in detail elsewhere (Khanna & Raina, 2012; Mukhopadhyay, Muralidharan, Niehaus, & Sukhtankar, 2013; Sathe, 2011; Sathe 2014). Rather than restate what has already been well documented, the authors frame the project's history in terms of key success factors and how well Aadhaar has lined up with Kania & Kramer's (2011) foundations for success in a public-private partnership.

Key Success Factors

In order for Aadhaar to be successful, challenges need to be overcome that can broadly be placed into three categories (Khanna & Raina, 2012): organizational, technological, and behavioral. Additionally, Khanna & Raina identified that an enrollment ecosystem, an application ecosystem, and device ecosystem need to be cultivated (see Figure 2). While a "perfect score" on every factor is not required, failure on any one factor could lead to the failure of the project as a whole.

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Aadhaar Partnership Ecosystem

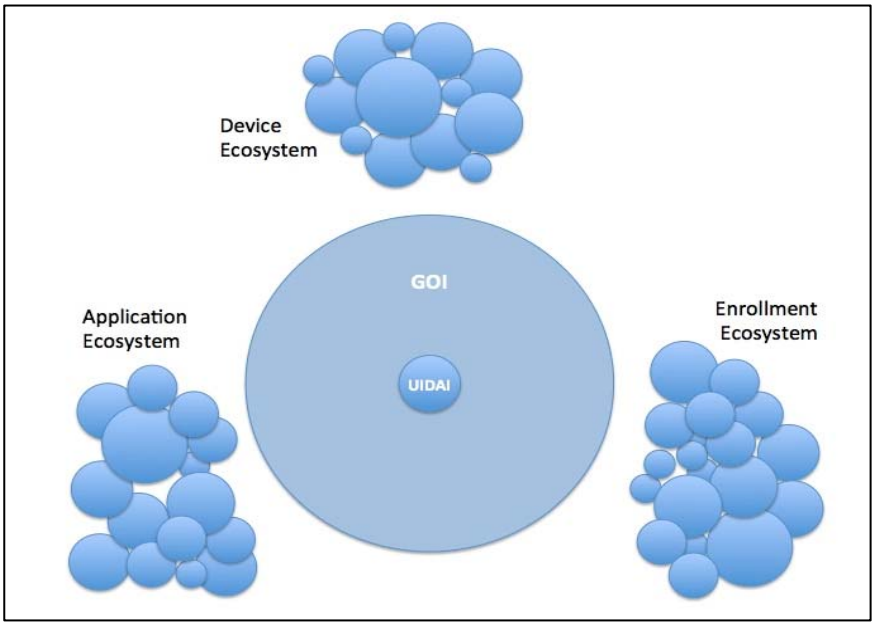

Figure 2: The Aadhaar Public-Private Partnership Ecosystem.

Organizational Challenges

Nilekani was required to build an organization of almost 300 professionals, but faced constraints on staffing and structure that a private sector leader would not typically encounter. Roughly half of the team needed to be seasoned, public sector government officials because their experiences navigating the bureaucracy in the government of India would be invaluable. Since Nilekani was well known, it afforded him the opportunity to select officials from a large pool of candidates who were relatively entrepreneurial in attitude and spirit. The other half of the team was to be recruited from the private sector. Top talents, especially technology talents, tend to have salary expectations that generally exceed that of government pay scales. Therefore, Nilekani leveraged his network to obtain top companies to provide the talents he needed, and arrange sabbaticals and other forms of paid leave to secure their services.

Once the team was established, UIDAI was faced with the challenge of crafting a mission and vision for the project that would mobilize the critical mass of stakeholders necessary to be successful. The more information managed by the Aadhaar system, the more valuable it would be to some stakeholders. But with complexity comes a greater loss of flexibility and increased concerns about privacy. Streamlined information capture would alleviate these concerns, but would leave open the question of whether any stakeholders would find it valuable. A balance across multiple dimensions of design had to be struck. After extensive consideration, the final design choice was oriented toward the streamlined options.

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Technological Challenges

The project entailed not just providing identification for individuals, but creating the entire support infrastructure to issue, manage, and verify those identities. First and foremost, residents of India would need to be issued their Aadhaar numbers. This required the development of an enrollment process and the equipment to support it. Server-side processing would be needed to prevent two people from receiving the same Aadhaar number or one person from receiving multiple numbers. Mechanisms for eliminating duplicates and other errors would need to be developed for instances where they may occur (for example, as a result of off-line processing). Lastly, in order to be taken seriously as a form of identification, a means of authenticating Aadhaar numbers "anytime, anywhere, and any way" would need to be developed (UIDAI, 2014).

Behavioral Challenges

UIDAI needed to overcome several important behavioral challenges if it was to be successful. The federated structure of the Indian government affords state and local officials a great deal of authority and corresponding ability to resist national initiatives. Moreover, even if all levels of government were aligned in their support of Aadhaar, there was no guarantee that anyone would actually use it. As a result, there was no way to guarantee the widespread adoption of Aadhaar numbers. Therefore, Nilekani sought an overarching design that people would want to use, which in turn would promote avid and voluntary adoption of the new identification system.

Value-added services were vital to the demand-driven approach that was the cornerstone of Nilekani's vision. Nobody needed an Aadhaar number simply for the sake of the number itself. It was how the number would enable an individual that would make people and service providers want to use the program. But a service providers' willingness to invest in integration with the Aadhaar system only went to the extent that they believed it would be sustained. With new elections come new elected officials who could choose to eliminate the program or change its focus. It is a major concern that, as discussed later in this paper, turned out to be a very real one.

At the outset, there was potential for significant confusion about what an Aadhaar number would do and what it would not do. In some cases, UIDAI needed to explain the very concept of identity to people who had no notion or comprehension as to what individual identity even entailed. Identity can be so closely tied to one's social connections that individual identity is a somewhat foreign concept. Where stakeholders have a preconception of identity, they might apply it to Aadhaar. Wherever government officials, technology providers, service providers, and the general public have preconceptions about Aadhaar, some will be accurate and some will not; likewise, some will be favorable and some will not.

UIDAI needed to address the unfavorable preconceptions, privacy concerns, and the general skepticism about the concept of identity. Some stakeholders were interested in whether or not the number would confer Indian citizenship or grant aid and other social services. Different parties took different sides on these issues and once again UIDAI had a design choice to make. In the end, consistent with the simplicity of the data structure, government officials decided that it would not be directly tied to either citizenship or aid; the number would be tied to residency rather than citizenship. Aid agencies could choose to use

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Aadhaar as a basis for recipient identification and eligibility, but it was decided to not make this a requirement.

Systems to be Cultivated

To facilitate overcoming the technical and behavioral challenges, UIDAI cultivated three "ecosystems" of organizations and incentives that would drive the changes far faster than governmental mandate could hope to achieve. First, a network of qualified enrollment agencies would support an enrollment ecosystem. At peak enrollment, it was expected that one million users per day would be enrolled. The challenge would be ensuring that enrollments were all executed with appropriate quality and efficiency and without creating opportunities for corruption to take root. Through a careful training and qualification process, third-party agencies assumed the responsibility for enrolling residents and assigning Aadhaar numbers.

The second ecosystem supported software application development. Banks, utilities, and any other agencies interested in reaching India's 1.2 billion residents could leverage Aadhaar's unique identification number as a basis for their own enrollment processes as well as a file record field label that would facilitate the provision of services. By developing applications integrated with the Aadhaar system, they would lower their customer acquisition and ongoing operations costs while also creating value-added services that would encourage people to sign up for and use their Aadhaar numbers. And with a single identifying number in use across institutions, dramatic improvements in service and a reduction in corruption could be realized. For instance, a government program could make an aid payment associated with a particular Aadhaar number to a bank account associated with the same Aadhaar number, thereby guaranteeing fast, efficient provision of the aid while also eliminating intermediary steps and agents, each of whom present opportunities for inefficiency or graft.

The final ecosystem UIDAI cultivated was for the hardware devices needed to support enrollment and verification procedures. UIDAI is a government agency and not a hardware designer or manufacturer. Therefore, partnering with device companies was inevitable. But rather than simply contracting first the design of approved devices, then their manufacture, UIDAI set technological standards which allowed device companies to creatively develop hardware, often in close support of Aadhaar-reliant software applications. Thus, UIDAI turned hardware manufacturers into contributors to the overall Aadhaar ecosystem.

Foundation for Collective Success

The key success factors provide insight into what must occur in order for the project to be successful. Kania & Kramer (2011) address a slightly different question: What conditions need to be in place for a collaboration of any sort to produce true alignment and achieve powerful results? They identify five such conditions: a common agenda, shared measurement systems, mutually reinforcing activities, continuous communications, and backbone support organizations.

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Common Agenda

Effective collaboration requires partners to share a vision of what the project is trying to accomplish. The more aligned partners are on the project's ultimate objective, the fewer problems that will arise during the implementation process. Partnerships are easy when everyone wants the same thing, but collaborations are much harder when incentives are not aligned. UIDAI crafted an expansive enough vision for the Aadhaar project that a broad range of partners could share in its objective. Nilekani spent much of his first year or two traveling around India to build that shared vision. By the time the launch of Aadhaar occurred, there appeared to be widespread, though not universal, support for its vision. The more partners that are involved in collaboration, the more opportunities there are for cross-purposes to surface. The Aadhaar project involves a large number of collaborators spanning a diverse range of characteristics. So while a common agenda was established, UIDAI will likely be addressing alignment issues over time.

Shared Measurement Systems

Collective impact is difficult to achieve without a means to measure performance across collaborators. For Aadhaar, the key overall operational metrics were highly visible and easy enough for all partners to see: number of enrollees, enrollment response time, and verification response time. Every partner was naturally interested in these measures and UIDAI measured and provided them. Information about measures of financial and other non-operational metrics is scarce, though one might expect the private sector contributors would press for their inclusion in the project. Progress of on-going political support, perhaps one of the most important metrics for a public-private partnership, is also not widely discussed and it is a potential lack of support that eventually casts the entire project in doubt.

Mutually Reinforcing Activities

Nilekani's ecosystem-based design specifically involves participants in such a way that one participant will support and coordinate with other participants. The number of partners active in each ecosystem and the number of devices, applications, and related system outputs easily measure the success of this design. Early indications were generally positive, with some system elements showing mixed performance (Khanna & Raina, 2012).

Continuous Communications

One of the biggest challenges UIDAI faced was promoting cooperation and developing trust among the various partners working on the project. Kania & Kramer said that "participants need several years of regular meetings to build up enough experience with each other to recognize and appreciate the common motivation behind their different efforts" (p.40). The

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number of partners involved either directly in the project or indirectly through the ecosystems made it impractical to have years of meetings with even a substantial portion of the partnership. Therefore, this aspect of the foundation for collective success was set to be a challenge for UIDAI from the outset.

Backbone Support Organizations

Since the government of India sponsored Aadhaar, UIDAI was by mandate the backbone support organization for the Aadhaar project. With a staff of less than 300, it could not be a direct contributor of much in the way of project implementation. Instead, it was the designer and coordinator of the project, responsible for planning and managing the project from inception to rollout. Wherever support beyond UIDAI was required, other government entities were tasked with providing it.

Aadhaar: Outcomes, Updates, and Future Directions

Sathe (2014) describes the myriad issues that the project was facing as the initial five years mandate wound down, including Nilekani's departure from UIDAI and the shifting political landscape to name just two. The latest news from India suggests that Aadhaar's future is continuously evolving and developing. Lower-than-expected enrollment numbers and relentless attacks in the media are increasing the pressure to eliminate or radically modify the project. An article published in India's Business Standard newspaper best captures the project's future. The article described the Aadhaar project as a rollercoaster ride embroiled in controversy and stated that a total revolt threatens Aadhaar's very existence (Agarwal, 2014). Statements by government officials, including India's Home Minister Rajnath Singh, alluded that the National Population Register would start issuing National Identity Cards to be used in implementing the Direct Benefits Transfer (DBT) program. This statement was widely viewed as an indicator that UIDAI's current role as an authenticator for DBT will be concluded (Sharma, 2014).

The recent national elections have amplified the debate. In spite of his public support for Aadhaar when it was launched, India's new Prime Minister, Narendra Modi, seemed to ride the wave of declining support for the project. During the campaign, Modi questioned how Aadhaar funding was spent and insisted that the whole project was an apparatus for standard cronyism and corruption. Modi alleged that Aadhaar would not solve the problems it purported to solve. According to Modi, "Congressmen were dancing as if it (Aadhaar) was an herb for all cures" (Niti Central Staff, 2013, p.1).

Prime Minister Modi's Historical Position on Aadhaar

While Modi was the Chief Minister of the Indian state of Gujarat, he not only implemented Aadhaar, but supported collecting more resident information beyond what was required (Datta & Langa, 2014). But as the Bharatiya Janata Party's nominee for prime minister, Modi was unrelenting in his attacks on the Aadhaar project throughout the election cycle. And in the

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weeks immediately following his election as prime minister, Modi did not softened his opposition to Aadhaar. Skeptics might attribute Modi's shift from advocate to opponent as just another example of a politician motivated more by political expediency than by concern for the public welfare.

Developments since the Election

Recent enrollment rates have been disappointing, perhaps due at least in part to the negative media coverage surrounding Aadhaar during the campaign season. In February 2014, monthly enrollments plummeted to approximately 17 million from the 35.8 million enrollments recorded just one month prior. In June of 2014, the number dipped further, to only 7.61 million enrollments (UIDAI, 2014). Critics of the Aadhaar project charged that this upsurge in enrollment was a pyrrhic success because the United Progressive Alliance (UPA) led government aggressively pushed Aadhaar for its own political aggrandizement. Former Prime Minister Singh and former Chairman of UIDAI, Nandan Nilekani, were both heavily vested in the success of Aadhaar and both of are affiliated with UPA.

Modi's position aside, Aadhaar's prospects have been further cast into doubt by a number of recent Supreme Court (of India) rulings. The Court challenged the constitutionality of Aadhaar and expressed growing concern over privacy and national security implications – concern that has only fueled attacks in and from the media. Perhaps the most important ruling was that Aadhaar numbers could not be made a precondition for receiving government benefits. In March 2014, India's Financial Minister Chidambaram stated, "Aadhaar needs to be re-thought completely" (The Financial Express, 2014, p.1). The statement was a clear indication that Aadhaar might not survive under the new government. In June of 2014, Modi abolished the UPA-established committee on Aadhaar and transferred its functions to the Cabinet Committee on Economic Affairs (The Times of India, 2014). At a minimum, eliminating UIDAI's privileged position in the government and effectively positioning it as just another Cabinet function is a major reduction in status and could be argued to be a precursor to further reduction if not outright elimination.

Aadhaar has not been without its successes, however. Approximately 640 million people have been enrolled, which is consistent with targets published during the initial launch. Some of the project's goals have become a reality for many residents. For example, millions of disenfranchised Indians have been able to establish a personal identity. For individuals on the fringe of society, this is no small feat. With such widespread enrollment, the Aadhaar number is now permeating Indian life. For example, in the state of Kerala where enrollment has surpassed 90%, ration card beneficiaries will receive new ration cards with their Aadhaar number embedded in the cards (Biometric Technology Today, 2013).

Aadhaar's ecosystem and public-private partnership structure may be its greatest strength. Aadhaar's implementation momentum does not reside entirely within the bounds of government or even within a narrow set of government and private organizations. Rather, the project has a broad array of organizations with a vested interest in its ongoing evolution and success. Therefore, even if India's government has the desire to eliminate the program, the process may be difficult. The same forces that precluded UIDAI from mandating its adoption might now preclude the new government from shutting the program down completely. The dynamics of a program being in a decentralized governmental structure are hard to anticipate even if information is readily available. Because Aadhaar is a decentralized program, the task is made even more difficult. Beyond high-level criteria, performance measurements are being

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evaluated across the array of contributing organizations, if they are being measured at all. Decentralization makes it very difficult to understand what is going on with Aadhaar at an operational level or how to eliminate a program of its magnitude.

In a somewhat surprising turn of events, in July 2014 Modi announced the support for the continuation of the unique identification system and the goal of reaching 1 billion Aadhaar enrollments as soon as possible (Singh, 2014; Tewari, 2014), this despite his previous opposition to the continuation of Aadhaar. This announcement brought a swift end to the uncertainty and speculation surrounding to the future of Aadhaar. Given Modi's shifting stance on Aadhaar, it is an open question whether this latest position will stand the test of time.

Moving Forward and Future Directions

In addition to the number of open issues that have already been highlighted, there is the clear opportunity for future research into the effectiveness of the structure and procedures employed by UIDAI in the Aadhaar project. Process simulation and analytical techniques such as discrete event, system dynamics, and agent-based modeling could identify key bottlenecks, systemic interactions, and emergent behaviors that would not only improve Aadhaar's processes but also those of future widespread information infrastructure projects. Quantitative and statistical analyses would provide a broad evaluation of Aadhaar's overarching performance regarding inclusivity, satisfaction, and accuracy.

Cumulative enrollment figures are not a good indicator of whether Aadhaar has reached its goals. It does not, for example, indicate the number of people that have actually used their Aadhaar number in order to obtain services. Residents might have enrolled in Aadhaar but, in fact, may have never used their unique identification number to obtain government or private services due to other obstacles or impediments. Future research could examine whether or not the number of bank accounts, government services, or cell phone accounts being opened by marginalized residents have increased in conjunction with enrollment.

Qualitative analysis on the effectiveness of Aadhaar is also important. Focus groups, in-person interviews, or other methodologies should be employed to assess satisfaction and other qualitative factors surrounding the implementation and user adoption of Aadhaar. It will be important for Aadhaar and other future information infrastructure programs to understand residents' experience before and after acquiring an Aadhaar number. For residents that have not enrolled, it is especially important to understand the source of their hesitation. Such information is vital to improving the quality of service, driving enrollment, and minimizing political opposition.

Conclusion

India is one of the first countries in the world that has initiated a biometric identification system for all residents (Sharma, 2011). Aadhaar's transformative aim to provide the 1.2 billion people of India with a uniform means of identity provides residents with an upward mobility that the current system lacks. The process of social and financial inclusion of all residents in India will remain a contentious and controversial subject. The analysis conducted by this research has determined that the public-private partnership, when compared to the

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framework established by Kania & Kramer (2011), was relatively successful in creating and implementing a complex biometric identification system. Kania & Kramer's (2011) foundations for collective success reveal that despite some challenges, many aspects of the partnership were firmly grounded. As this research has illustrated, the benevolent movement of greater empowerment of the poor, underprivileged, and marginalized Indian residents into the formal economy is still being met with resistance and defiance by some elements of Indian society.

The success or failure of the Aadhaar project remains to be determined. Even though the detailed analysis focused on biometric identification system in India, the practical application and findings of the public-private partnership can be applied in a broader perspective. Whether Aadhaar is successful or not, the outcomes and implications will be a notable indication for other nations to determine if the application of a biometric identification system should be adopted in the interests of their own residents.

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