

**ENTITLEMENT REFORM FOR EMPOWERING THE
POOR:
The Integrated Smart Card (ISC)**

**REPORT OF THE ELEVENTH PLAN WORKING GROUP ON
INTEGRATED SMART CARD SYSTEM**

**PLANNING COMMISSION
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PREFACE

Efficiency of delivery is increasingly becoming the focus of governmental programmes. This is both on account of an explicit recognition of sub-optimal achievements in reaching the targeted beneficiaries in many of the schemes as well as in curbing wasteful expenditure. Realising this, new tools, particularly application of modern technology is being resorted to in achieving governance and delivery efficiency.

The 11th Plan is focussing on such issues with a renewed focus and vigour than before. In this context, the application of new technology such as smart card to the major welfare/subsidy schemes is being contemplated. In order to work out feasibility as well as modalities of the same the Planning Commission constituted a Working Group on Integrated Smart Card System. The Working Group comprises representatives from all relevant departments and organisations as well as stakeholders from the private corporate sectors.

I am grateful to the members of the Working Group who have brought in their vast experience and shared them both in the deliberations as well as in writing. I particularly appreciate the efforts made by the Director General, NIC in providing a detailed write-up on the technical aspects of a system of integrated smart card. I also commend the efforts of Shri C.K.G. Nair, Convener of the Working Group, in articulating the structure and content of the Report and in preparing the draft report based on the deliberations of the Working Group and the documents/notes submitted by some of the members.

DR. ARVIND VIRMANI

1 INTRODUCTION

The Government of India administers a number of subsidy/welfare programmes targeting the vulnerable sections of society. The degree of success in implementing these programmes is dependent on the level of efficiency of the delivery process. Adopting appropriate tools to achieve this objective should become part of the programme implementation strategy. However, as technological innovation invents new methods, adoption of tools becomes a dynamic criterion.

Multi-Application Smart Cards (MASCs) is one of the technological break-throughs of recent times. MASCs facilitate simplification of procedures and enhancing the efficiency in administering various schemes. The application of this technology cuts across usage; from government to citizens, government to other agencies and between agencies to citizens. The National e-Governance Policy fully recognises the significance of this technological revolution and the need for tapping its potential for various applications in the government to citizens interface.

Conceptually a MASC is like a multi-storied building wherein each scheme is 'housed' in one floor. While the unique ID will manage the main entrance to the building each Scheme administering agency will have the 'key' (password) to enter that floor only. The unique ID will be a key identifier essential in helping removing identification errors of beneficiaries. Moreover inter-scheme benefit duplication could also be tracked using this identifier.

There is a natural tendency to think of the physical card when smart card is mentioned. The Integrated Smart Card System (ISCS) is, however, much more than the electronic card that will be issued to the actual/potential beneficiaries of programs/subsidies.

The entire system consists of a front, middle and back end. The electronic card is merely one part of the front end of the ISC system. Equally, if not more, important are,

Front End

The 'point of delivery systems' that will read/use the smart card.

Middle Office

The middle office(s) that will charge/update the card periodically (month/ quarter/ annual depending on the type of information and the requirements) and transfer information from the front end to the back end and vice-versa.

Back Office

The back office set-up containing the computerized records, guidelines, accounts and management information systems. This requires digitization of existing records, translation of guidelines into form suitable for use in the smart card system and design of protocols for authentication & updating of data. This would have to be done for the identification module and every other module (separately), though there will be common elements.

Given the growing importance of Smart Cards, the Department of Information Technology (DIT) constituted an Apex Committee and two Sub-Committees to help formulate common standards for MASCs in India. While one Sub-Committee focussed on a system of unique identification for each citizen and non-financial applications in the government sector, the other Sub-Committee dealt with financial and banking applications in the public and private sector as well as issues relating to non-financial and non-government applications. The recommendations of these two Sub-Committees, as adopted by the Apex Committee and the DIT, have become the basis of the e-governance initiatives adopted by the Central as well as some State Governments. A few e-governance initiatives include a national level driver's licence (Smart Card Operating System for Transport Application - SCOSTA), citizens friendly land records (*Bhoomi* in Karnataka and *Dharitree* in Assam) and even a pilot on Smart Ration Cards in Kerala.

The concept of a unique national level citizens' identity number was developed from these initiatives as well as aspirations for a Pan-India e-governance system. This unique ID could form the fulcrum around which all other smart card applications and e-governance initiatives would revolve. This could also form the basis of a public-private-partnership wherein unique ID based data can be outsourced to other users, who

would, in turn, build up their smart card based applications. Given the scope, potential and magnitude of e-governance initiatives in the government sector, the application of MASCs for government subsidy/welfare programmes will be a significant step during 11th Five Year Plan, which focuses at new and better ways of managing big ticket government schemes. Global experiences and experiments, particularly in countries such as the US, Malaysia, China, Russia etc detailed in Chapter III and some private sector initiatives lend credence to the tremendous opportunities that could be unleashed by the smart card technology in better management of activities across the spectrum. Therefore, to draw up the contours of MASC applications, particularly for the major subsidy/welfare schemes, the Planning Commission set up the 11th Plan Working Group on Integrated Smart Card System with the composition and terms of references given in the Order at **Annexure 8.1**.

The smart card would constitute a national identity card. For instance the card could contain information on citizenship and voting eligibility (constituency for voting) as provided and checked by the home ministry and the election commission respectively. Secrecy and confidentiality clauses would have to be built into the national smart card system by law. For instance, any person who does not want to avail of any subsidies / entitlements from the government need not provide the information needed for calculating & monitoring the subsidy/entitlement. They would for instance only provide the information necessary to obtain a passport and voter registration card.

Many agencies of government (e.g. CBEC, CBDT, and Home) have proposed identification cards. There are significant economies of scale in having one smart card system for all citizens, with different agencies having their own special modules (password protected access to memory segments) within the card for their specialised needs.

The setting up of a smart card system is somewhat distinct from running it even though there may be economies of scope. The former is very similar to carrying out a (special) census in which the data gathered would be entered into a smart card. There is however an additional, technically challenging component, the simultaneous recording of a photo and a biometric fingerprint so as to minimise fraud. The experience with a similar system used in SEBI MAPIN project suggests that it would be best to sub-contract it to private parties in each State/region. Similarly, the Ministry of Defence runs a smart cards based health scheme, Ex

Servicemen Central Health Scheme (ECHS), implemented since 01 April 2003.

The running of smart card system is very much like the running of a credit card system. All the credit card companies, as well as companies that provide back office services to credit card issuers or marketers, would be interested in competing to obtain the contract for the running of such a system. As a credit card company has to incur a fixed cost in setting up its own credit card system, these companies may be willing to charge below cost if they can share the fixed costs of the public system with their private card systems. This could make a significant difference in the cost of spreading the system to the rural areas. Cash delivery through smart card would be akin to a modern version of the Post & Telegraph department's money order system, already operational with specialised companies that intermediate international/national remittances. The cost of setting up and running a nationwide cash delivery system for the poor would probably be significantly less than that of a commodity related system. The total steady state cost of running this system (including depreciation and return on capital) should be of the same order as the current credit card systems (< 10%).

The identity of the households below the poverty line is not fixed from year to year. The largest turnover occurs because of health shocks followed by natural disasters (droughts and floods) that knock people below the poverty line, while others who have recovered from the shock or have improved their position move above the line. As a matter of abundant caution we could target the bottom half of the population for issue of smart cards (with complete entitlement related information). Annual updating of entitlement related information could be done for those below the poverty line and those up to half this percentage above the line (i.e. if poverty rate, HCR, is 22%, cover poorest 33%). Even disaster related variables could be inbuilt into the smart card through which poor people living in disaster prone areas could be assisted.

MODULES

The electronic smart card would consist of the identification module, the economic characteristics module and several applications modules.

Identification Module

The identification module would have two basic sub-modules. One for permanent and another for changeable identifiers. As many government programs target the household and/or are based on household characteristics the smart card must contain information relevant to linking personal identification numbers to the members of the household. One method is to keep space in the identification module for the nuclear family members and other dependents.

A third separate sub-module would be included for citizenship status. The 'Home Ministry' would have complete control over the citizenship sub-module. The creation of a data base of residents and assignment of a unique ID to each resident is much easier than the creation of a data base of citizens, because of the difficulty of authentication of citizenship and the legal implications that it may have. We are therefore focusing in the first stage on the creation of a residents data base. Given the urgency and the availability of a digital data base with the electronic commission, the starting point of this data base will be adult voters (to the extent authenticated by the election commission. Subsequently other existing data bases will be used to add non-adult dependent members of these adult voters to the data base.

A module for entering basic economic and related characteristics relevant to eligibility for government subsidies and transfers and other programs (including employment, anti-poverty). Thus all such information must be authenticated. Till such time as the relevant information is fully authenticated it may be useful to have an authentication/quality digit in each record to indicate the quality of the information (with fully authenticated and completely unauthenticated the two ends of the quality scale).

The complications arising from joint families with several adult workers and/or common assets and/or common household expenditures (eg. kitchen) would have to be addressed in the design of the economic module. Perhaps there could be two sub-modules one for personal characteristics (e.g. Education, income) and another for household characteristics (joint consumption, assets).

As farmer related subsidies are important, information on land ownership and cultivation could be entered on the smart card (based on land records in the back office computer systems). Till all land information is authenticated, there could be slot indicating the quality of the information.

The success of a smart card based system, however, depends crucially on building up a quality back-end data base as well as in periodically updating and managing that in a professional manner. If the supporting data base is faulty many of the manual system of managing the welfare/subsidy schemes will continue to haunt the smart card based system as well. For instance a PEO study had brought out high levels of inclusion and exclusion errors in TPDS. That is households which are actually poor are not included while others are. These types of errors have to be got removed by the scheme administering agency. The whole responsibility of developing a sound data base and managing it depends solely on the shoulders of administrative agency. Once such a data base is available the smart card system can run it well.

Widespread application of MASCs in a country of continental dimension like India should be based on a well structured, articulated plan of action. This is a long-haul project where changing course mid-stream would be both costly, both in terms of money as well as in terms of its impact on the schemes to be administered. Global experiences also point towards these aspects though technology cycles have now become shorter.

2 UNIQUE ID & MULTI-TASKING

2.1 Unique ID based smart cards

Smart card technology has the required strength, speed, authenticity and efficiency for the process of delivery of government services to citizens. On-the-spot availability of proof of identity, authentic transaction history and entitlement details are required at the point of service delivery. Smart card applications could be adopted for various services including Ration Card, Election Card, Passport, Land Records, Old-Age pension, various subsidies as well as support in housing, health, employment and education sectors. These services require on site/field verification of identity, entitlement details of beneficiaries and application specific data. One major benefit of a smart card is that authentic, application specific data from the individual's card is made available at the place of business transaction. This otherwise could have been achieved only by creating an efficient data communication link and connecting to a Central Service Data base at some remote location, which is very expensive and constrained by limitations of infrastructure. Therefore, the smart card system will not only eliminate the need of a vast data communication link across the country with

very large number of nodes, but also will enhance information access through tamper-proof smart card memory at the point of service delivery. Once it is linked to a national level unique ID, which the government is working on, it makes identification of beneficiaries an easy task, avoiding duplication and reducing all the attendant costs. Multiple applications piggy-backing on the unique ID, both in the government and private activities, can be conceived, as in the case of the US Social Security Number. Depending on the availability of infrastructure (power, communication) different technology options could also be used.

2.2 Multiple Application Smart Cards

Smart Card technology provides the capacity for hosting various independent as well as inter-related applications on the same smart card's micro processor chip without interfering or accessing each others information. Common data elements can be written in one read-only memory space. All applications requiring this common data can retrieve these elements from this location and application specific data elements from exclusive memory space allocated for individual applications. This not only normalises the data memory space requirement of smart card but also structures the data within the card systematically.

Different applications hosted on the card will work independent of each other but at the same time complement the data requirements of other applications. This type of functioning is achieved through a careful and systematic design of the cards' 'Layout Mapping' and the Applications Firewall Architecture. This layout design entails one common area on the card memory known as "Master Object" to be allocated for storing common data set comprising information regarding the card-holder identity details, card specific details and applications directory. Other applications are stored in respective application specific objects on the card memory. In order to protect the card from loading of applications, the Master Object must be owned and managed by an agency which will work as the overall custodian of Card. The loading of authorised applications and access privilege to the Master Object will be controlled by this earmarked agency. This agency will also be responsible for maintaining the Card Life Cycle Management System.

Each central government department concerned with delivery of subsidized services and programs for the poor will be assigned a separate module (segmented memory area) in the integrated smart card. It would have final authority for entry of any data into its allotted module and can specify/police the rules & procedures according to which the updating is to be done. As many of these programs are operationally the responsibility of the State governments, the Central government would delegate these responsibilities to the States. There could also be modules for purely State programs.

In consonance with RTI, the public should, however, have free access to the information entered in any module relating to government programs/subsidies/transfers.

2.3 Cost sharing and public-private partnership

Smart card not only enhances the facility to the primary user who has to maintain only a single card for all/many purposes but also reduces the cost of the project by cost sharing by multiple user agencies. Hosting multiple applications on the same card also reduces the redundancy of data and subsequently memory overheads which would otherwise require repetition of identity-related data in every different card for each application. Applications could include government schemes, public-private partnerships as well as private-private partnerships such as banking operations which will bring in tremendous economies of scale. In the context of the unique ID, part of this data base could be shared with even purely private smart card initiatives such as private banking/financial services on a pay-as-you-use principle.

2.4 Sharing of Unique ID; access control and security concerns

While using multi-application smart card technology, issues of access control and security are very important. They pertain to standards, data sharing, access controls etc. These call for appropriate regulation. These issues are discussed in detail in chapter 6.

2.5 Application of Unique ID to government schemes

There are a few concerns of integrating the unique ID of citizens/residents and welfare schemes of the Government. Welfare schemes such as TPDS and the NREGS are based on the household rather than the individual. So converting all unique IDs in a household into a single unit and thereby arriving at their collective entitlement is a major conceptual and practical

issue. Another issue concerns how to take children into account. As unique IDs will only be given to the adults, at least in its initial roll out, children will not be automatically entered into the data base. These issues need to be fully addressed to cover child-centred schemes such as the MDMS and the ICDS in the unique ID based smart card framework.

There are different ways of tackling these issues. One way could be to use the concept of 'head of the family' as a field. Identifying the female head of family could also avoid gender discrimination. Another solution could be to give information of all majors as well as details of children for the unique ID. In either case, the question of 'collecting' the entitlement also needs to be addressed. For instance, if food entitlements are to be collected from FPS does the 'head of the family' himself/herself need to be present or the presence of other members of the family is sufficient? In the latter, the biometric information of all family members needs to be in-built into the smart card.

3 EXPERIMENTS WITH MULTI-APPLICATION SMART CARDS

Identity (ID) cards are in use, in one form or another in many countries around the world. The type of card, its function, and its integrity vary enormously. Around a hundred countries have official, compulsory, national IDs that are used for a variety of purposes.

The use of sectoral (specific purpose) cards for health or social security is widespread, and most countries that do not have a national universal card have a health or social security card (in Australia, the Medicare Card, in the United States, the Social Security number), or traditional paper documents of identity. The reverse is also true. In Sweden, although there is a ubiquitous national number, there is no single official identity card. <http://www.privacy.org/pi/activities/idcard/> - fn1

The key element of the card, particularly in advanced societies, is its number. The number is used as an administrative mechanism for a variety of purposes as well as a general reference to link the cardholders' activities in many areas.

In many countries, identification documents are being replaced by plastic cards, which are considered more durable and harder to forge. Card technology companies are well organized to conduct effective promotion of their product, and companies have moved into the remotest regions of the world. Many Asian and African nations are replacing old documents with

magnetic stripe or bar coded cards. The South African Passbook is being replaced by a card. In 1996, a photo ID card replaced the UK drivers' license. The change from one form of ID to another is invariably accompanied by a change to the nature and content of data on the document. While an 'inventory' of the experiments with unique national ID/application of smart cards from across the world is given at **annexure 8.2**, major experiments are detailed below.

3.1 United States Social Security Program

Social Security in the United States is a social insurance program funded through a dedicated payroll tax. It is formally known as the Federal Old-Age and Survivors Insurance Trust Fund and the Federal Disability Insurance Trust Fund program (OASDI), in reference to its three components (OA for retirement, S for widows and survivors income, D for disability income). When initially signed into law by President Franklin D. Roosevelt in 1935, the term Social Security covered unemployment insurance as well, but now the term is used in America to mean only the three benefits for retirement, disability and death which are the three main benefits provided by traditional private sector pension plans that still exist. In 2004, the system paid out almost \$500 billion in benefits, the largest government program in the world.

The acceptability of the Social Security program in the United States has been the near universal adaptation of the program's identification number, the Social Security number, as the national identification number in the United States. A multitude of U.S. entities use the Social Security number as a personal identifier. These include government agencies such as the Internal Revenue Service, as well as private agencies such as banks, creditors, health insurance companies, and employers.

3.1.1 Recent Developments in the US

There are still many in the US without bank accounts. They use pre-paid cards or stored value cards as these cards can be loaded with money and used as a debit card without the need for bank account. While credit card growth has stagnated in recent years, the pre-paid market is booming, as reported in the *Economist* recently. Another feature of the new trend is the

increasing usage of multi-purpose pre-paid cards. These cards increasingly offer services which were traditionally provided by banks. They can be used to store electronic deposits from employers or the government, withdraw cash from machines, transfer funds and pay bills. Advocates of these cards believe that in the near future, prepaid cards will contain credit-like features, such as overdraft protection or loan advances on direct-deposited salaries. This would help citizens without bank accounts to build credit histories facilitating access to loans and other financial products.

3.2 *Malaysian Experiment*

Malaysia launched a smart ID card, *MyKad*, in April 2001. *MyKad* is a government-issued, all-in-one smartcard that performs a wide range of functions such as data processing, storage and file management. The multi-purpose *MyKad* cards incorporate both government and private sector applications onto a single card. It stores citizen data, such as identity numbers, passport information, driving licenses and health information in a single embedded 64K microchip. The card also promises secure access to applications such as automated teller machines (ATM) and government-related online services.

At the end of 2005, all Malaysian citizens over the age of 12 were issued a dual interface contact/contact less smart card as their national ID. With a population of 23 million, the Malaysian program is both one of the world's first national ID card programs and one of the largest issuances of dual interface technology.

3.3 *Experiments Elsewhere*

3.3.1 *China*

In 2004, Chinese authorities began replacing paper national identification (ID) cards with electronic identity cards as reported by Dow Jones. The paper national ID cards contain information regarding a person's nationality, birth date, identification number and the region of birth. The new digital ID uses smart ID technology. The embedded microchip in the plastic card stores an individual's personal information as well as data of all government services beneficiaries receive. The information can be read and checked against databases kept by China's security authorities. 800 million cards will

be in use by the end of the calendar year 2006, according to the Dow Jones report.

3.3.2 Brazil

In Brazil there are two different systems. The first one, the Registro Geral (RG) is a number associated to the official ID card. Although the ID cards are supposedly national, the RG numbers are assigned by the states and a few other organizations, such as the forces. As a result it is possible for a person to have the same RG number as another from a different state (which is usually dealt with by specifying the state which issued the ID card). It is also possible to (legally) have more than one RG, from different states.

The other system, the Cadastro de Pessoas Físicas (CPF) is federal and unique, created originally only for purposes of taxation (a related system is used for companies). One/both numbers are required for many common tasks in Brazil, such as opening bank accounts or getting a driver's license. Generally speaking, the RG system is more widespread but its practical shortcomings have initiated a discussion on merging the systems into a new one based on the CPF.

3.3.3 Russia: Moscow Social Card

The Moscow Social Card was officially launched in early 2002 as the world's first integrated benefits and payment card of its scope. It is an innovative public-private-partnership between Visa, the Bank of Moscow, the municipal agencies and Moscow's subway and railway systems.

The card contains a magnetic stripe, electronic chip, bar code and photograph. Versions of the card include dual-interface chip that allows contact less transactions and that contains personal identity and benefit eligibility details, metro ticketing, health benefit information and medical details.

The card is given to those who receive state aid, including students, pensioners, public employees, members of the armed forces and those who traditionally benefit from reduced or free prices for goods and services, including the Moscow underground system. Beneficiaries use the card for public transit, health and medical insurance, access to government subsidies,

and discount from participating retail stores. They can use it over 45,000 card acceptance locations as well as Visa merchants and cash locations worldwide. Social Card recipients can use it to withdraw money from cash dispensers, bank branches and select post offices, and they enjoy a full range of banking services from the Bank of Moscow. Key district hospitals allow those insured by mandatory medical insurance to register through their cards. As of May 2004, 1.7 million cards have been distributed, of which 30,000 feature the dual-interface chip.

3.3.4 Philippines

The Social Security System (SSS) in the Philippines administers social security protection to workers in the private sector. On the other hand, the Government Service Insurance System (GSIS) takes care of workers in the public sector.

The SSS administers two programs namely:

1. The Social Security Program; and
2. The Employees' Compensation (EC) Program.

Social security provides replacement income for workers in times of death, disability, sickness, maternity and old age. The EC program, started in 1975, provides double compensation to the worker when the illness, death or accident occurs during work-related activities. EC benefits are granted only to members with employers other than themselves.

In the summer of 2005, the Philippines moved ahead with its plan for a single card to be used across the archipelago as driver's license, proof of identity and Social Security membership.

3.3.5 Italy

The Parliament of Italy enacted a law mandating the issuance of optical memory cards as identity cards and residence permits in 2005. Under the legislation, no paper residence permits and identity cards would be issued or renewed after January 1, 2006. Instead, the paper documents would be replaced by electronic residence permits and electronic identity cards. The Italian digital ID card program is called Carta d'Identita Elettronica ("CIE") and is the first optical card-based national identification card program to be deployed within the European Union. The ID card contains an optical

memory and an IC-chip with a micro-processor storing personal information along with a colour picture, fingerprint and an electronic signature. Mandated to start in January 2006, this legislation should result in the issuance of as many as 40 million CIE cards, one to each Italian over five years.

3.3.6 French Sesam Vitale Health Card

France was one of the first countries in the world to introduce large-scale deployment of smart cards as part of a health insurance system. The system, known as Sesam Vitale, was the first completely automatic system in which smart cards were used in the health sector. As of 2005, there are approximately 57 million cards in use.

Health care in France is funded partly by the French government and partly by private insurance companies. This situation leads to a complex process for reimbursement for the individuals involved, both patients and professionals. The old paper system was prone to error, fraud, and long delays before final payment was received.

Sesam Vitale is a highly secure dual-card system. The cards (one for patients and one for health-care professionals) links every individual with health care resources, including public hospitals, private clinics, general practitioners and specialist doctors, nurses, and midwives, all through a secure network. The Sesam Vitale system simplifies the procedure by which health care costs are cleared and also dramatically reduces the risks that refunds to insured patients will be delayed by replacing an annual 1 billion pages of health care information with electronic transactions. The result is that the average reimbursement time has been reduced from up to 6 weeks to 2 or 3 days. In addition, the insurance companies make payments directly to health professionals. The system also tracks health care spending and, in the future, will be used to transfer electronic prescriptions to the health care funds responsible for reimbursement.

4 GOVERNMENT SCHEMES

The Government of India currently operates a number of entitlement schemes targeting different groups of beneficiaries. These schemes relate to food and nutrition, employment and income-security of vulnerable groups.

The most important schemes are Targeted Public Distribution System, AAY, Mid-day Meals Scheme, Integrated Child Development Services, National Rural Employment Guarantee Scheme and The National Old-Age Pension Scheme. In addition, there are input-subsidies for water, electricity, diesel and kerosene for specific uses. The total expenditure for the major entitlement schemes is estimated at around Rs.74,000 crore and input subsidies around Rs.40,000 crore in 2005-06. In addition, there are a number of services which public agencies provide to citizens in the form of maintenance of land records, provision of driving licences, taxation services, efficiency of which matter both in terms of costs and convenience to the general public.

In 1993-94 the Central government expenditure in the budget category “subsidies” was Rs. 12,682 crore of which Rs. 10,099 crore were for food and fertiliser subsidies. The latter would have been enough to bring all the poor to the consumption level of the person/household at the 25% level. During the same year the Central and State governments together spent another Rs. 14,160 crore on the budget categories ‘Rural development,’ ‘Welfare of SC, ST & OBCs’ and ‘Social Security and Welfare.’ This expenditure would have been enough to bring all the poor to the consumption level of the person/household at the 30% level. These two sets of expenditures (Rs. 25850) would have been more than sufficient to eliminate poverty (estimated at around 36%) in 1993 if transferred directly to the poor and disadvantaged (SC, ST, handicapped, old, poor farmers).”

Similar conclusions have been derived for the year 1999-2000 though the precise poverty rate has been the subject of dispute and debate among academics (op cit). “In 1999-2000 the total subsidies provided by the Central government were Rs. 25,690 crore of which Rs. 22,680 crore were for food and fertiliser. During the same year the Central and State governments together spent another Rs. 28,080 crore on ‘Rural development (RD),’ ‘Welfare of SC, ST & OBCs and ‘Social Security and Welfare.’ Either of these was sufficient to bring all the poor to the consumption level of the person/household at the 30% level, if transferred directly to the poor and disadvantaged (SC, ST, handicapped, old, poor farmers) would have eliminated poverty. Together these subsidies and poverty alleviation expenditures (Rs. 53,770 crore) would have been sufficient to eliminate poverty in 1999-2000, even if administrative costs and leakages used up,” a third of the allocation.

Despite this large expenditure on welfare entitlement programs, there is a common impression that the poor have not benefited from the policies and

programs of the government. Reviews of the PDS system indicate that there is considerable leakage from the system while many eligible household are left out of the system and do not receive the benefits due to them. The integrated smart card system is designed to minimize these leakages and errors and to improve the outcomes. More broadly one can view the ISC system as a means of transferring entitlements to the poor and disadvantaged in a manner that empowers them instead of converting them into supplicants.

Enhancing the efficiency of delivery of major public schemes/programmes and public services is a significant concern of modern civil society. E-governance policies and initiatives of the Government use technological innovation in achieving efficiency. Given the magnitude of the funds involved in these schemes and in light of the reduction of costs through the economies of scale by using modern technology, the use smart cards would be extremely beneficial. The benefits are so apparent that an explicit cost-benefit analysis may not be even required in measuring it. Even a 10% cost reduction would save Rs.12000 crore per year to the exchequer. This is sufficient justification to adopt these new technological tools to bring the multiple schemes of the Government on a single platform of MASCs.

4.1 Need for enhancing efficiency and cost reduction

The need for enhancing efficiency of government programmes and schemes is not only based on just the arithmetic of cost savings. Many of the schemes are plagued by a number of implementation problems. For instance TPDS, targeting around 400 million people and budgeted around Rs.25,000 crore annually, is affected by targeting errors (both inclusion and exclusion errors), spurious beneficiaries, diversion and pilferage and even location specific availability. Although the introduction of modern tools such as smart cards is not a panacea for all these evils, it can solve many of the problems particularly that of targeting errors and spurious beneficiaries.

A number of initiatives using e-governance have already been carried out by some of the states in India. These initiatives include land records (*Bhoomi* of Karnataka), drivers' licences (several states), PAN (All India), bar coded food coupons (Andhra Pradesh) and Smart Ration Cards (pilot scheme in Kerala). These initiatives provide efficiency enhancing services for citizens. MASCs using a unique ID covering major schemes and services

(collectively or individually as determined by the cost-benefit analysis of adding applications) would be a logical corollary of technological scaling up in enhancing efficiency of governance and public delivery system.

Table-4.1: Budget Allocation in Direct Subsidy based programmes

S.No.	SCHEME	RE 2005-06 (Rs. crore)	BE 2006-07 (Rs. crore.)
1.	Food Subsidy	23200.00	24200.00
2.	District Primary Education Programme	600.00	200.00
3.	Mid-day Meal*	3010.96	4813.00
4.	Sarva Shiksha Abhiyaan*	7166.00	10041.00
5.	Child welfare (ICDS, NIPCCD and other schemes, Woman welfare and Nutrition Based Schemes (NNM and Others)	3534.94	4353.00
6.	Rural employment Schemes (Food for Work and EGS)	11700.00	12870.00
7.	Sampoorna Grammen Rozgar Yojana (SGRY)	7650.00	2700.00
8.	Indira Awaas Yojana (IAY)	2475.00	2625.00
9.	Subsidy on LPG and Natural gas for PDS	2930.00	2930.00
10.	Valmiki Ambeddakar Awas Yajana (VAMBAY)	182.62	75.01
11.	Subsidy on imported and indigenous fertilizers	11503.9	11503.9
	TOTAL ALLOCATION	73952.92	76311.61

*For the year 2006-07, some part of the Mid Day Meal (Rs. 2915 cr.) schemes and SSA (Rs. 5831 cr.) has been financed through Prarambhik Shiksha Kosh.

Source: Union Budget, 2006-7, Govt of India.

4.2 Public Distribution System, TPDS and related schemes (AAY, AY)

The Public Distribution System (PDS) and other food-based programmes (AAY and AY) form a composite system of public intervention through which the State has been trying to address the issue of food-insecurity at the household level. The PDS has emerged as the most significant instrument in government policy to moderate open market prices and to ensure food security at the household level by providing foodgrains at assured prices. It operates through a large distribution network of around

4.75 lakh Fair Price Shops, and is supplemental in nature. Under the PDS, the Central Government is responsible for the procurement and transportation of foodgrains up to the principal distribution centres of the Food Corporation of India while the State Government is responsible for the identification of families living Below the Poverty Line (BPL), the issuance of ration cards and the distribution of food grains through Fair Price Shops.

In June 1997, the Government of India introduced the Targeted Public Distribution System (TPDS) to facilitate focus on the poor. Under TPDS, the scale of issuance began with 10 kgs per family per month for BPL families which has progressively increased over the years to 35 kgs per family per month for BPL as well as APL families. Similarly, 25 million 'poorest of the poor' families are covered by the AAY to whom 35 kg of food grains per month is given at highly subsidised rate of Rs. 3 kg of rice and Rs. 2 kg for wheat. AY targets the 'poor old' to whom 10 kg grains are given free of cost. With the nutrition angle also being targeted-which would mean higher allocation of grains or addition of other food items-the food subsidy bill will only increase in the near future: a reason for an all out need at governance efficiency to contain it.

Under the TPDS, identification of BPL families was to be carried out by the State Governments based on criteria adopted by the Ministry of Rural Development (MoRD). However, the total number of beneficiaries was to be limited to the state-wise poverty estimates (1993-94) of the Planning Commission. Against a total ceiling of 6.52 crore, BPL households (as per the poverty estimates of the Planning Commission for 1993-94 and population projection of the Registrar General, as on 01-03-2000), more than 8 crore BPL ration cards have been issued. Similarly against the figure of 18.03 crore households in the country (as per the population projections, as on 01-03-2000 of the Registrar General of India), the total number of ration cards issued is around 22.32 crore. There are inclusion and exclusion errors, as pointed out by a PEO Study. Some of these problems at the operational level also could be addressed by the unique ID based smart card system.

4.3 Indira Awaas Yojana (IAY)

The IAY Scheme is being implemented from the year 1985-1986 to provide assistance for construction/up gradation of dwelling units to the Below Poverty Line (BPL) households belonging to the Scheduled Castes (SCs), Schedule Tribes (STs) and freed bonded labour categories. From the year 1993-94 onwards, the scope of the scheme was extended to cover the

rural BPL from non-SC and non-ST category subject to the condition that the benefits to the non-SC/ST would not be more than 40% of the total IAY allocation. The IAY became an independent scheme with effect from 1.1.1996.

Funding of the IAY is shared between the Centre and States in the ratio of 75:25. Under IAY, the ceiling on construction assistance is Rs.25,000/- per unit in the plains and Rs.27,500/- for hilly/difficult areas; and Rs.12,500/- on up-gradation of unserviceable *kutchha* house to *pucca*/semi *pucca* house for all areas. Till January 30, 2006, about 138 lakh houses had been constructed/upgraded with a total expenditure of Rs.25,208 crore. An outlay of Rs.2625.00 crore has been earmarked for 2006-07.

4.4 Swarnjayanti Gram Swarozgar Yojana (SGSY)

SGSY, launched in April 1999 after restructuring the Integrated Rural Development Programme (IRDP) and allied schemes, is the only self-employment programme for the rural poor. The objective of the programme is to bring the self-employed above the poverty line by providing them with income-generating assets through bank credit and Government subsidy.

4.5 Sampoorna Grameen Rozgar Yojana (SGRY)

SGRY was launched on 25th September 2001 by merging the on-going schemes of Jawahar Gram Samridhi Yojana (JGSY) and the Employment Assurance Scheme (EAS). The objectives of the programme are to provide additional wage employment in the rural areas in addition to food-security, alongside the creation of durable community, social and economic infrastructure. The programme is self-targeting in nature with special emphasis to provide wage employment to women, schedule castes, schedule tribes and parents of children withdrawn from hazardous occupations.

SGRY is a Centrally Sponsored Scheme (CSS) being implemented with an annual allocation of about Rs. 6000 crore (Center and State in the proportion of 75:25) and 50 lakh tonnes of food grains (amounting to about Rs. 5700 crore at economic cost). About 100 crore man-days of employment are envisaged to be generated every year in rural areas. The scheme is exclusively implemented by Panchayati Raj Institutions (PRIs). From 2004-05 the programme is implemented as one integrated scheme where resources are shared by all three tiers viz District Panchayat, Block Panchayat and the

Village Panchayat in the proportion of 20:30:50. Each level Panchayat is an independent unit for the formulation of action plan and executing the scheme. In 2004-05, under the special component of the SGRY, with the States/Union Territories meeting the cash components, the Centre released 26 lakh tonnes of food-grains to the 13 calamity affected States. Under the special component, about 11.65 lakh tonnes of food-grain have been released to the 11 calamity hit States in the current year. An outlay of Rs.2700.00 crore has been earmarked for 2006-07.

4.6 National Food for Work Program (NFFWP) and the National Rural Employment Guarantee Scheme (NREGS)

The NFFWP was launched in November 2004, in the 150 most backward districts of the country, identified by the Planning Commission in consultation with the Ministry of Rural Development and State Governments. The objectives of the programmes is to provide additional resources from the resources available under SGRY to 150 most backward districts of the country so that generation of supplementary wage employment and provision of food-security through creation of need based economic, social and community assets in these districts is further intensified. The focus of the programme is on works relating to water conservation, drought proofing (including a-forestation/tree plantation), land development, flood-control/protection (including drainage in waterlogged areas), and rural connectivity in terms of all-weather roads. The programme is being implemented as a 100% Centrally Sponsored Scheme. Food-grains are also provided to the States free of cost. The transportation cost, handling charges and taxes on food-grains are, however, the responsibility of the States. The NFFWP has been submerged into the National Rural Employment Guarantee Scheme after that Act was passed in 2005. From April 2006 the Scheme has been formally launched in 200 districts and an allocation of Rs 13000 crore has been made in BE 2006-7. It is designed to guarantee 100 days of employment to the need and is expected to cover all the districts in five years. Full implementation is estimated to cost about Rs 40000 crore per annum.

4.7 Valmiki Ambedkar Awas Yojana (VAMBAY)

VAMBAY, launched in December 2001, is a national level housing scheme of the Ministry of Urban Employment & Poverty Alleviation, Government of India for the benefit of slum dwellers. The objective of VAMBAY is

primarily to provide shelter or upgrade the existing shelter for people living below poverty line in urban slums. The target group under VAMBAY is all slum dwellers in urban areas who are below the poverty line including members of Economically Weaker Section (EWS) who do not possess *pucca* shelter.

VAMBAY is a Centrally Sponsored Scheme. With the Government of India providing a 50 per cent subsidy while the States have the option of mobilizing their matching portion of 50 per cent from other sources, such as their own budget provisions, resources of local bodies, loans from other agencies, contributions from beneficiaries or non-government organizations (NGOs) etc. Under this scheme 20% of the total allocation is provided for sanitation and community toilets to be built for the urban poor and slum dwellers. Since inception of the scheme and up to December 31, 2005, Rs.866.16 crore had been released as Central subsidy for the construction/up-gradation of 4,11,478 dwelling units and procurement of 64,247 toilet seats. An outlay of Rs.75.01 crore has been earmarked for 2006-07.

4.8 National Programme for Nutritional Support to Primary Education [Mid-Day Meal Scheme (MDMS)]

Mid-day Meals is one of the major Centrally-Sponsored Schemes administered by the Central Department of Elementary Education and Literacy. In the fiscal year 2006-07, a substantial amount of Rs.5348 crore has been budgeted for this scheme, which is an increase of about 60% over the previous year, which highlights the focus on this nutrition programme being administered by the States but mainly supported by the Centre. Under this scheme, all school children up to the age of 14 are provided with a nutritious cooked meal a day, which serves the twin purpose of providing supplementary nutrition to these school going children as well as retention of the students in schools, reducing the school drop-out rate and enhancing literacy. Being a child-centred programme, special attention is needed in converting the benefits into a smart-card system based on unique ID of adults/citizens so that information relating to the children in every household is properly captured in the smart-card data base.

4.9 Integrated Child Development Services (ICDS)

This is another Centrally Sponsored Scheme administered by the Department of Women and Child Development. Started in 1975, ICDS is

one of the earliest nutrition supplement programmes covering children under 6, pregnant and lactating mothers and adolescent girls. The ICDS is run through the system of *anganwadis* located currently in 7 lakh villages. However, even with this reach, the scheme presently covers only a fourth of the targeted 160 million. For universalisation of the scheme, as directed by the Supreme Court, a substantial step-up in investment as well as outlay is needed. It is estimated that 14 lakh *anganwadi* centres are needed for this purpose and the current outlay of Rs.4450 crore (FY 2006-07) also needs to be increased substantially to achieve the target.

4.10 Other Schemes

There are a number of other welfare/subsidy schemes, both under the Centrally Sponsored Schemes as well as Central Schemes, which support different segments/targeted groups. These include Live Stock Insurance, National Iodine Deficiency Programme, Integrated Women's Empowerment Programme, Integrated Education for Disabled Children, National Merit Scholarship Schemes, Vocational Education and Training, Handloom Weavers Welfare Scheme, Rural and Urban Family Welfare Services and National Old Age Pension Scheme.

The central budget allocation for the major subsidy/welfare schemes, as shown in the table above comes to about Rs.74000 crore. Given the Government's focus on welfare programmes and the expansion considered in many of them such as extending NREGS to all districts and the universalisation of ICDS, significant increases in the outlay of Government subsidy/welfare schemes are on the anvil. The improvement in governance and cost reduction in implementation through new technology will lead to much higher savings in future. Simultaneously, operation of economies of scale and scope and natural cost reduction through use of new technology will widen the positive gap between the cost of implementing new technological innovations and the benefits accruing from them. The failure of the pilot scheme on smart ration cards in Kerala is precisely in not reaping the economies of scale and scope as the pilot was too small (four FPS with about 4000 households) while the capital cost was substantial.

In sum, the cost savings emanating from the application of new technology such as MASCs in administering welfare/subsidy schemes of the Government must be seen in a dynamic context of both efficiency enhancement and cost savings.

5 PUBLIC-PRIVATE PARTNERSHIP

The application of MASCs is not limited to the provision of Government welfare/subsidy programmes/schemes to citizens. In fact, the usefulness of this technology is widespread as indicated by the Moscow Social Card example (see Chapter III) wherein applications of about 60 agencies are embodied in a single smart card. In a metropolis, a large number of applications of the smart-card are possible. However, due to varying degree of infrastructure facilities and awareness in a large country like India, applications could be limited to about 10-12 major programmes/schemes in a single card. As such, it is conceived that all major schemes, explained in Chapter-IV could be part of one smart card. Similarly, there could be public-private partnership whereby such applications could be used for linking government services to the citizens and/or involving banks and other related institutions in delivering various services. Services such as utility payment, metro services and job related payment services can be considered as another set of applications.

Public-private-partnership on MASCs could be of two models: (i) the joint efforts of the government as well as the private sector in implementing the government welfare/subsidy schemes and the government to citizens services and (ii) the private sector making use of the unique ID based MASC application for launching their own services like financial services. Even in the former model, such a partnership is needed because smart cards production, issue, infrastructure and delivery of services require several agencies - government and private sector - to come together for successful rollout.

Government agencies can focus on:

- Defining standards of technology and data definitions
- Defining protocols for inter-services and inter-application communications
- Identification of norms/criteria for selection of card-holders
- Develop back-ends for data gathering, processing and storage

Private Sector agencies can deliver

- Production of cards and related products
- Distribution of cards & subsequent maintenance
- Delivery of services such as transactions and payments that use these cards
- Building a network of service providers that accept these cards
- Infrastructure for access to back-ends & gateways

Certain common fields from the unique ID data base can be accessed through the same common identifier for all these applications. It is simply a national registry of data, part of which could be franchised to other agencies, whether they are government departments, government or private utility services providers or financial and other institutions. These agencies can 'borrow' unique ID and related information from the managers of these data bases and load further applications in making requirement specific smart-cards. While the original sources of data can be updated by the data managers, the updating of supplementary parts will remain the responsibility of the service providers. This is a unique case of public-public or public-private partnership in sourcing a common data base and loading additional application requirements.

Such a model of partnership could also lead to cost sharing on a 'use-and-pay' principle basis or a 'pay-as-you-use' basis. This also leads to cost reduction as the common data-base is available to all, avoiding data duplication and tracking the right identity. Of course, the access control and security of such multi-application cards need to be adhered to strictly in terms of the standards laid down by the 'regulator(s)'.

Multi Application Smart Cards have multi-faceted potential for proliferation of e-commerce, e-government, citizen facilitation, and financial services across the country. Their anticipated large scale deployment in the country as well as scope for exports opens-up many opportunities for local manufacturing and R&D in various domains of MASCs.

5.1 Sharing the Unique ID-based Information and Cost

Given the growing number of citizen services provided by the government as well as the private sector, the number of such multi-application smart cards also will vary. The issue of different agencies issuing MASCs for different applications arises. As such, it is important to classify relatively

similar applications into homogenous groups so that each card shares its space and in turn costs among user agencies. Hence the division into the large subsidy/welfare schemes of the government, the citizen services providing utility agencies and the financial applications. Given smart cards' multi-application-multi-agency approach some form of regulation is required; both in terms of the technical aspects of standards, access control and security, as well as in terms of slotting applications into appropriate categories. The increasing number of applications of the smart-card system will bring down cost of cards and per unit cost of the card infrastructure. This results in reduction of capital and operational cost of smart-card applications to the government welfare/subsidy schemes in future. It is therefore important to formulate a broader framework of the multi-application model of the smart-card both in terms of direct cost sharing and indirect cost saving through economies of scale and scope. Though the formulation of models of public-private partnership for MASCs is beyond the scope of this report, the Working Group wanted to highlight and emphasis this point as the cost of implementation of MASCs in government welfare/subsidy schemes could be a major criterion in adopting this new system. Therefore, the Working Group would like to highlight the fact that the initial cost of implementing both the unique ID and extending the unique ID by MASCs to the schemes would be substantial. This cost will substantially reduce in the medium and long-term both on account of technological advancement. Costs will further reduce once the infrastructure for these facilities improves and is made available in all parts of the country. In conclusion, the multi-application public-private partnership models for the smart-card are eminently suitable in cost sharing and efficiency enhancement of various services.

6 TECHNOLOGY PERSPECTIVE, ACCESS CONTROL AND SECURITY

6.1 Multiple Applications and Security Concerns

As discussed in chapter II of the report, smart card technology provides the best possible technological solutions for controlling access to the data inside and making it tamper proof. This is possible due to the presence of a micro-processor chip, a miniaturised computer, in the smart-card. The micro-processor chip operates with the help of an Operating System Software. All the security operations such as card holder authentication, card authentication, card transactions etc. are performed under the complete control of this Operating System Software. As all the

required data for field transaction and required software intelligence is available on the card itself, this eliminates the need of any direct data communication link with the server.

India being a federal polity, many government programmes are run by individual states. This necessitates the applications be loaded by a federal agency and be operable by a similar agency in any state across the country. For the latter application loaded by one government agency of particular domain might be required to be accessed (after due authorization) by another government agency in a different domain. These critical requirements make technological interoperability a paramount requirement. The simplest way to ensure technological interoperability is by evolving common technology standards and also to comply with them in the sub-technological areas of Smart Card physical and electrical properties, Smart Card Operating System, Smart Card security architecture and application specific data elements and electronic card layout

The operating system for the smart-card provides the mechanism for external interface by the card, on-card data storage and retrieval capabilities, implementation and maintenance of security architecture and transaction security. The software development for card interfacing devices requires uniformity in these areas to develop the software for various applications. Although International Standards Organisation (ISO) has laid down standards for Card Operating System (ISO-7816-4,-8 and -9), these standards have left many aspects unplugged. There is a need for implementing agencies to further define a practically implementable set of standards.

6.1.1 Card Security Infrastructure

Smart-card comprises the strength of a microprocessor and thereby has a CPU to run many complex mathematical algorithms in order to implement various cryptographic functions required for implementing card security architecture. Security concerns have to be addressed in sharing the unique ID platform and in controlling the different 'spaces' or segment of MASCs. This is done both in terms of the regulatory structures governing standards and the security infrastructure deciding access control and ensuring appropriate security, as explained subsequently.

6.1.2 Roll-out Model and governance architecture

The roll-out of the Integrated Smart Card based system for the country is no easy task due to its precedence and massive size of the project. Multiplicity of applications, if not envisioned and planned properly, shall only add to the complexity and may result in a non-starter. The roll-out of the project has to involve multiple stakeholders of the project with clearly demarcated boundaries of ownership, roles and responsibilities. While maintaining the different roles, these agencies will have to function in a well coordinated manner to achieve the final objective. Based on the requirements and activities involved, both vertical and horizontal diversification will be necessary.

6.2 Mechanisms For Access Control

Given the multiple statutory layers of the governance factor and the multiple application envisaged in the proposed unique ID based smart card system the stakeholders and their respective role need to be well defined. The stakeholders are broadly the agencies setting the standards, agencies relating to the security infrastructure, card manufacturers, card issuing agencies and applications/schemes management agencies. The agencies setting standards must be at the Central/national level, which will evolve and maintain technology standards for the smart card, its reading and writing devices, Crypto Algorithms Standards. It will also maintain the standards for application name and allocate a structured code for every authorised application to be loaded on Smart Cards. It will also perform testing and certifying the Smart Cards and associated products for compliance with established standards. In a sense, this will be a National Regulatory Agency to be charged with quasi judicial responsibilities and powers for the complete standardisation of the smart card infrastructure in the country. It should appropriately regulate the activities of the card and ancillary product manufacturers, card issuing agencies and interact suitably with team managers and the security agencies. This regulator should be an autonomous agency with the Department of Information and Technology could the administrative department.

6.3 Multiple Application And Regulation

The Card Security Infrastructure Body could have a multi-tier hierarchical structure taking care of specific security requirement at different levels vertically (National/State) and between different schemes horizontally

interacting regularly with the schemes administering agencies. This body will decide, for instance, the sub-set of unique ID base which will be shared with applicant agencies and ensuring its security as well as in ensuring the security and access control for various parts/floors in the smart card system. It will also evolve and maintain horizontally and vertically inter-operable PKI and SKI based Key Management System. This body could be ideally a part of the Ministry of Home Affairs, given that the unique ID data base will be managed by them.

There will be various card manufacturers and card issuing agencies as the MASCs grows into wider acceptance. However, it will be the responsibility of these agencies to ensure that the standards and system, as decided by the Central Body are fully applied with and all products are tested and certified by this Body to ensure both standards as well as security concerns.

Given the above regulatory and security architecture and schemes and card management system, the roll out model will be as follows: The standards setting body will decide the standards, the card manufacturers will bring out the product in terms of those standards and the card issuing agencies will provide the cards to various users. Different schemes administering agencies will load their scheme in their 'space' in an MASC, access control and security will be governed by the body according to its pre-decided protocol. Development of the standard, security protocol and the product infrastructure could be done in parallel so that once these are in position, the schemes administering agencies could load their data base into the system and operate the same. It is extremely important to properly plan and envision the Integrated Smart-Card System. There must be proper planning for applications to be loaded based on the card configuration. Therefore it is very important that the planners have good idea about the number of applications and the applications themselves, to properly estimate the smart-card configuration and architecture.

Thus the **following steps are essential for launching an Integrated Smart-Card System**, based on the unique ID:

- All stakeholders, described in the roll-out model above, must be in existence, with clearly defined roles and responsibilities.
- Unique ID must be issued to all residents
- There must be a Central Government agency as an overall custodian/regulator of Integrated Smart-Card System.

- Different applications must be hosted in different domain areas of the multi-application smart-card.
- Citizen ID application which consists of identity related information must be accessible to all other applications.
- Concerned department for the specific domain must take the ownership of its application on Integrated Smart Card and must establish the Security Infrastructure for its own application.
- The Government Agency which works as an overall custodian for this system must establish the security infrastructure for the following:
 - Making the card clone proof.
 - Non-tampering of identity details and card-holder credentials.
 - Protecting the card from unauthorized loading of applications. Applications as approved by this agency only can be loaded on the card.
- Before introducing the system, domain applications must create a strong database/register on the back-end.
- While planning the smart-card system, every application domain must conduct proper estimation in terms of expenditure, business model/outsourcing strategy, creation of security infrastructure for its application, creating infrastructure for reading and writing devices at all the points of transaction.
- The Smart Card technology must be an open source technology based on National Standards, over which Government has the full control for the following purposes
 - Horizontal and Vertical Interoperability
 - Vendor independence
 - Level playing field
 - Fair market competition
 - Reasonably low cost of the Card
 - Availability of cards' reading and writing devices from a variety of sources.

In short, the roll out plan has to be well designed, phased and synchronised. The roll out model for a large pilot covering 10 million BPL families is given at **annexure 8.3**.

7 RECOMMENDATIONS

Based on the extensive deliberations and sharing of information, Working Group recommended the following:

- i) The Government may initiate steps to the introduction of Integrated Smart Card System for the major entitlement schemes.
- ii) The ISCS should be based on the national level unique ID being launched by the Ministry of Home Affairs, using a unique national ID as the identifier necessary to avoid duplication of benefits and the beneficiaries thereby helping correct targeting and avoiding Type I and Type II errors.
- iii) The roll-out of the MASCS must be carefully planned and structured giving it long haul nature and substantial investments involved. As such, all steps must be properly laid down before launching the project. The steps involved will be as follows:
 - The unique ID must be available to all residents in the country. A national level regulatory authority, which will be the overall custodian of the integrated smart card, should be in position. This body should be with the Department of Information Technology.
 - Organisational set up for safeguarding card security infrastructure should be in position. This body may be also under the Ministry of Information Technology.
 - The basic standards and protocol relating to card infrastructure technology security must be available nationally with efficient reasonably production base in the country.
 - Back-end data base in security protocol, updating the responsibility and mechanism etc. should be in position with each

scheme/programme administering agency before it is hosted on to the MASCs.

- National Regulatory Authority should launch a massive awareness drive for stakeholders at an early stage of the project itself.
- iv) A single authority would however be needed to co-ordinate the program, and to standardize and maintain the integrity of the overall system. In the start up phase the planning commission can play the role of integrator and coordinator. Once operations are under way, the National Statistical Commission is the best placed to act as co-ordinator and overall owner of the program. As already indicated, the responsibility for maintenance and updating of the individual modules and sub-module of the ISC system would remain with the individual departments/ministries.
- v) A consultant could be hired to work out the operational details of the program for introduction of the ICS system. A committee of concerned ministries (PC, Nat Stat com, Finance, Food, RD) could be set up to firm up budgetary allocations, draw up implementation plans and oversee the introduction of the system.
- vi) A monitoring group may be set up in the Planning Commission to chalk out the action plan as well as to monitor the progress therein.

8 ANNEXURES

8.1 Order Setting Up Working Group

No.12(1)/DP/PC/2005
Government of India
Planning Commission

Yojana Bhavan,
Sansad Marg,
New Delhi-110 001
March 8, 2006

ORDER

Subject: Working Group on “Integrated Smart Card System” for the Eleventh Plan.

In the context of the formulation of the Eleventh Five Year Plan, it has been decided to constitute a Working Group on Integrated Smart Card System.

The composition of the Working Group will be as under:

Pr. Adviser (DP&IE), Planning Commission

Chairman

Members

1. Sh. R.S. Sirohi, Addl. Secretary, Ministry of Home Affairs
2. Director General, NIC
3. MD, FCI
4. JS (TPDS), Department of Food & Public Distribution
5. JS (NREGS), Department of Rural Development
6. Sh. R. Chandrashekhar, AS, Deptt.of Information Technology
7. Registrar General of India
8. Adviser (C&I), Planning Commission
9. Secretary (Food and Civil Supplies), Government of Kerala
10. CEO, SBI Cards
11. MD/CEO, ICICI Bank Cards
12. Sh. Shivkumar, ITC
13. Director (DP), Planning Commission

Convener

Terms of reference:

1. To examine the feasibility of introducing a system of integrated Smart Card for TPDS and other Subsidy Schemes for individuals/households.
2. To work out the modalities of integrating such a system with the proposed unique IDs for BPL families/residents.
3. To suggest processes by which updation, modification, deletion and addition to entitlement can be taken care of.
4. To spell out the operational parameters of introducing such Smart Cards, covering multiple entitlements and agencies.
5. Any other matter relevant to the topic.

The Chairman of the Working Group may constitute Sub-Groups and or co-opt additional members as may be considered necessary.

The expenses towards TA/DA of the official members in connection with the meetings of the Working Group will be borne by the respective offices. Non-official members will be entitled to TA/DA as admissible to Grade I Officers of the Government of India and this expenditure will be borne by the Planning Commission

The Working Group shall submit its report by August, 2006.

Sd/-
(S. Sridharan)
Joint Secretary to the Government of India

To,

Chairman & Members of the Working Group

Copy also to:

P.S. to Deputy Chairman, Planning Commission
P.S. to MOS
P.S. to all Members of Planning Commission
P.S. to Member-Secretary, Planning Commission
Advisers/Head of Divisions, Planning Commission
Plan Coordination Division, Planning Commission
Adm./Accounts/General Branches, Planning Commission
IFA Unit, Planning Commission
Information Officer, Planning Commission

8.2 Smart card applications: global experiments

Country	Scope of Project	Card Type	Biometrics
Argentina – National ID	46 million	2D barcode	Fingerprint
Australia – Passport	20 million		Face recognition
Austria - National ID (Social Security Card extended to national ID)	8 million (expected to begin deployment in 2003)	Chip	Considering
Belgium – National ID	10 M by 2003 (deployment begins 2003)	Chip	Considering
Botswana - National ID	1 Million	Chip	Fingerprint
Brunei – National ID	400,000 (launched in 2000)	Chip	2 Thumb
Cambodia - National ID	8 million	2D barcode	Fingerprint
China - National ID	1.3 billion	Contact less Chip	Considering
Columbia - National ID	2.5 million	2D barcode	Fingerprint
Egypt - National ID	42 million	2D barcode	Fingerprint
Estonia - National ID	1.34 million (Launched Jan. 2002)	Chip	No
Finland - National ID	5 million	Chip (Java)	Fingerprint
Hong Kong - National ID	6.8 million in 4 years (1.2 million to be issued in 2003)	Chip (Multos)	Fingerprint
Italy – National ID	55 million	Chip, Optical	Fingerprint
India – Driver’s licences	Deployed 2 million in Gujarat (other States considering)	Chip	Thumb
Jamaica – Voters Registration	1 million	Chip	Face
Japan - National ID	1.2 million issued, 10-50 million potentially	Contact less Chip	Considering
Lithuania	4 million	Chip	
Macao - National ID	540,000	Chip	Fingerprint
Malaysia - National ID	22 million (approximately 2 million deployed, completion by 2007)	Chip	Face and 2 thumb
Mexico - Voters Registration	55 million	Chip	Fingerprint

Namibia – Welfare payments	120,000	Chip	Fingerprint
Netherlands – ID & Passport	15 million	Contact less Chip	Considering
Philippines – Social Security considering National ID	40 million	2D barcode	Fingerprint
South Africa - National ID	deployment 30 million (begins in 2003)	Chip	Fingerprint
Spain – TASS (Social Security)	40 million (7 million issued)	Chip magnetic	Fingerprint
Sweden	40,000	Chip	
Sultanate of Oman	1.2 million	Chip	Fingerprint
Thailand	40 million	Chip	
UK Asylum Seekers	100,000		Fingerprint
UK - National ID (Entitlement Card)	59 million	Considering	Considering
USA – TWIC	12–15 million	Chip	Evaluating
USA – Driver’s Licence	280 million	Considering	Considering
USA DCD Common, Access Card	4.3 million initially up to 23 million	Chip magnetic	Testing Stage
Yemen	5-9 million (deployment began 2000, to be completed 2005)	2D barcode	Two finger
Zimbabwe – Social Security	1.5 Million (deployment began 1999)	2D barcode	Considering

8.3 MASC Rollout Plan

Hire two consultants to flesh out the broad outlines given below. Evaluate and execute one of the two.

Broad Plan

1. Identify two states, and within each state identify complete districts so that the total BPL family count is about 50 lakh in each state.
2. The pilot project will only target food entitlements and one other benefit from one other identified agency for BPL families.
3. Tender and outsource complete data collection for all target families, including photo, fingerprint, address information and all other data. This database is available with the SCIA (Smart Card Issuing Authority).
4. The smart cards to be issued to everyone of the target population will have the structure as in figure 1.
5. The smart card to be used will have the broad specifications as in Figure 2
6. Two agencies will be identified that handle benefits for BPL families. For Example: food subsidy (civil supplies) and Employment Guarantee Scheme (DRDA)
7. For each agency the touch points where ID holders will be physically reached are identified. For the case of food, ration shops.
 - One ration shop for every 1000 families.
 - Total ration shops for 1 crore families will be 10,000.
 - At each ration shop a smart card enabled terminal device (as described in figure 3) will be deployed, with the suitable application software.
8. SCIA will issue the smart cards with the user data, and write all the SI-S9 keys of the application areas. For the pilot project, all the cards will then be passed on to the food agency. SCIA also securely transfers the Digital certificate D1 and the corresponding key S1 to the food agency.
9. The food agency now has secure access to area A1 of all smart cards and

to no other areas on the cards. Of course the public area is readable by all agencies. The food agency now uses its own database to create basic data for each ID card in area A1.

10. The cards are issued to one crore families.
11. Each user can then take the card to any of the ration shops in the neighborhood to obtain the benefits. Indeed cards will reflect the exact amount of entitlements received and the ration shops will have the data of which ID holders received how much etc.
12. In parallel, if the next user agency of, say EGS is identified and becomes ready to use the smart cards then, SCIA securely transfers another D-S pair to that agency to enable the utilization of the cards already in the field. Of course, every card needs to be touched by this agency to securely use its database contents to initialize the data. Subsequently field touch points (terminals) will be able to use Application area A2 for its purpose.

The important aspect of this roll out is that all user agencies that will use the smart card need not be identified before the issue of smart cards. For an agency to put in the reliable backend database, create the processes for using the smart card, building the application software on the terminal device etc., are substantial efforts.

If we wait for such readiness from 9 agencies before any smart card is issued, then the project will never take off. On the other hand it is not possible to withdraw and change ID cards in such large nos ones issued. The proposed plan allows for phase 1 roll out of application with out the need to roll-back any smart cards or applications already on the field.

A second major benefit of the plan is that the government can decide and allot two of the nine areas for the private sector. Access to the areas A8-A9 could be auctioned on a national level competition basis. The winners of the bids will be

given the secure access to A8-A9 by the transfer of the digital certificates. It is likely that an agency that consolidates private players into a consortium will bid for an application area. An application area in the national smart card is a major resource.

This will bring in substantial revenues that will offset the initial cost of deployment.

COST WORKSHEET

Smart cards

Cost of a smart card of the required capacity could be in the range of Rs. 50-75.

Assuming the higher end for the first 4 crore cards (Assume 4 adults per BPL family)

4 x 75 = Rs. 300 crores

Smart card Terminal device

Device with printer, fingerprint reader and software – but no GPRS/Phone (off-line device with built-in SAM module)

Rs. 12000 in volume of 15000

Total cost = Rs. 12 crores

S1-S9 - Crypto signatures created by SCIA, using distinct digital certificate
D1-D9.

D1-D9 - Distinct digital certificates that will be securely handed over to nine
different agencies Ag1-Ag9

Ag1-Ag9 - Nine agencies that will independently utilize the nine application
memory spaces on the smart card.

Figure 2

Commercial Smart Cards Specifications

Cards should be compliant with the following Standards:

1. ISO7816
2. Euro Master Visa (EMV)

These cards use 3-DES (two key version i.e. encrypt with k1, decrypt with k2 and encrypt with k1) algorithm for authentication and message integrity check. It's also necessary that they should have at least 128KB of storage space.

The following cards are some of the cards that support the above mentioned standards:

- i. GemPlus MPCOS EMV
- ii. Schlumberger Payflex

Usually these cards are used for the following applications:

- i. Access Control
- ii. Electronic Purse
- iii. Identification

Figure 3

Smart card enable Terminal Device

Cost Rs. 12000/ in volume of 10000

Capabilities

Built-in SAM

Monochrome QVGA touch screen display

Keyboard

Battery operated

Printer integrated

Smart card reader/writer

fairly rugged

USB ports to connect to PC/network

No built-in radio

Software

Simple off line software that efficiently replaces the current books in a ration shop. Keeps accurate track of ID's to whom goods have been supplied. Summary of transaction between the download from central office PC till uploading back.

- Prints bills for each transactions
- Updates smart cards

Each terminal will have a built-in SAM module that is created using the secure digital certificate of the operating agency. This will ensure that the terminal is able to modify only the specific memory area in the smart card and no other. Similarly without this step no other terminal can access or modify any application memory.