

# **OPERATING MODELS FOR PENSION SYSTEM REFORMS**

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## INTRODUCTION

One of the most significant economic themes over the next ten years and coming decades will be the reform required by government pension systems. Most Latin American countries, followed by Eastern European nations, have reformed their pension systems. Major economies, among them Russia and China, are currently studying the need to reform their systems. This theme has become so important that it is now an important point in the U.S. presidential campaign.

The common denominator among these reforms is the transformation of common social security systems (the so-called “Distribution Systems”) into systems which to some degree, or in their entirety, invest pension funds in individual investment accounts. The promise of these new systems (“Individual Capitalization Systems”) is that workers receive a pension generated by their own savings. It is not dependent on government subsidies or on future generations.

Individual Capitalization systems represent significant economic and actuarial benefits with respect to the growing social security problem. These benefits will be realized only if the systems operate efficiently and ensure that the pension funds are properly identified and invested in workers’ individual accounts. The operating models and information systems become a determining factor in the success of pension system reforms.

Individual Capitalization pension systems truly test financial systems’ data processing capacity. The number of bank, savings and investment accounts handled by financial institutions has grown rapidly. The sheer volume of information is not the only challenge. There is also the matter of how the information is managed, including how long it must be retained (potentially more than thirty years) and the procedures for making contributions to the systems. Unlike traditional financial systems, in which the person responsible for the account is the one who makes deposits directly, pension system deposits flow from various sources, primarily from employers.

This article is written to bring to the attention of the individuals and institutions responsible for designing and implementing pension system reforms the importance of operating models and information systems. It also proposes design and development strategies and methodologies for the application of technology, which will enable

existing Individual Capitalization pension systems to improve their operations and processes for collecting and distributing funds and other processes in general.

The fundamental administrative change for Distribution Systems under these new Individual Capitalization systems derives from the need to post activity to individual investment accounts for each and every participant in the system. Under Distribution Systems, the responsible institutions (for example, social security administrations) would receive contributions, which were aggregated in a pooled investment account. Social security administrations only keep track of the number of weeks for which contributions were made, but they did not segregate the fund balances represented by contributions made. Upon retirement, pension calculations are based on a formula prescribed by law. They are not based on current investment account balances. Now the responsibility for booking contributions falls on the new system administrators. These balances must be segregated for each participant each and every time a contribution is made.

The principal argument for the new systems is that the benefit upon retirement will be proportional to the individual contributions made during the participant's working life. This argument must be understood and must acknowledge that benefits will be equivalent to contributions actually made to individual accounts. Unlike Distribution Systems, a contribution booked incorrectly to an individual account is a contribution which never existed for the participant and it is a contribution which will provide the participant with no benefit upon retirement.

The principal operational challenge for the new Individual Capitalization systems is how to ensure that contributions made are booked correctly to participants' individual accounts. To achieve this, the information that accompanies the social security contributions must be handled carefully. For Individual Capitalization pension systems, the payment information is just as important as the money it accompanies.

The operating models must not only ensure appropriate distribution and crediting of the funds, it must do so at minimal cost so as not to represent a burden for participants. Operating costs must be kept down, considering both direct and indirect transaction costs. This article proposes that administrative costs should be in line with the indirect costs represented by the models proposed. The indirect costs are costs for

all system participants, costs to correct processing errors, opportunity costs in connection with the availability of the funds, etc.

This article notes that the design of the operating models and information systems associated with Individual Capitalization pension systems is key to ensuring the success of social security reforms. The idea is to make designers and those responsible for the reforms realize how important their task is, so that the same effort put into the economic and actuarial studies underlying the reforms is put into designing the operating models and information systems.

This article presents case studies of recent reforms and how the varying focus on information systems has been directly responsible for the success or failure of the reforms. The article also discusses the impact of operational designs on the costs associated with the new systems, costs directly related to their administration and indirect costs incurred by the institutions involved in the process.

Information technology is advanced enough to allow the new pension systems to operate more efficiently. Advances in database management systems, data analysis systems, hardware and communication such as the Internet allow operating designs to build on existing models. Yet they offer significant advantages, which will translate into greater benefits for participants.

Finally, a general operating model is presented. It can serve as the basis for the design of custom models designed to fit each country.

## **PENSION SYSTEMS**

The operating models adopted by the various countries carrying out reforms of their pension systems depend to a great extent on the scope of the reforms. In cases like Chile, the reform is total and total administration of the systems and processes is turned over to the private sector. In other cases, like Colombia, the reform is only partial. Competition between the pension system managed by the Social Security Institute and the Individual Capitalization system administered by the private sector is maintained. In this system, there are two collection models, which could seem redundant. Argentina is another interesting example. Its system is administered by financial institutions, but the collection process is managed by the Federal Government through its Internal Revenue Service. Then there is the Mexican model, in which the operation is outsourced to the same fund Administrators who handle the individual accounts.

Following are the details of the Mexican and Polish pension system reforms. The comparison highlights the importance of the operating models and how each country opted for a different solution. The contrast in the results deriving from the models presented highlights the hypotheses of this article, that the Individual Capitalization pension system operating and information systems models can be the determining factor in the success or failure of social security system reforms.

### **Mexican System**

The general design of Mexico's pension system reform began in the summer of 1995. It was in that year that the process of amending the Mexican Social Security Administration Law began. That law provided the framework for the birth of a new pension system administered by private institutions. Although early discussions focussed on the economic, political and actuarial features of the reform, even in the earliest discussions the operating models and information systems drew a lot of interest.

Mexico had already had a bad experience in 1992, with the design of the Retirement Savings System ("SAR92"), a pension system accessory. This system required the contribution of 2% of payroll; the contribution was deposited in individual accounts in the name of workers. These accounts were administered by banking institutions.

Not enough care was taken in designing the system's operating model. The responsible institutions were not prepared to administer the volumes of information that the system required. The result could be expected - two years into the SAR92 system there was greater than a 300% rate of duplication of accounts; that is, 40 million accounts had already been added to the system while participants numbered only 12 million active workers.

The people responsible for implementing Mexico's new pension system knew that they couldn't fail again. They were aware that they needed to invest resources and time in the design of the operating models. They had experienced first hand the problems the earlier system had created. It is typical of the governments of the countries introducing similar reforms to attribute little importance to the design of the operating models and information systems. It is only when operating problems become political footballs that they start to pay attention to the issue.

Mexico now has an internationally renowned pension system, admired for its operating model and the information systems supporting it. Even though Mexico's pension system has fallen behind other systems with respect to investments, administration of disability and life insurance and contribution levels, the operating system is considered a model for other countries.

### **The Mexico Case:**

When in 1995 it was decided to carry out a total overhaul of the pension system, a special federal government agency was formed to design the pension administration models (the Mexican SAR Commission). This agency was responsible for designing the economic, financial and actuarial models and for administration of the pension funds. Unlike other countries, because of the bad experience with the SAR92 system, a group of information technology professionals was assigned the task of designing the operating models and information systems associated with the new pension system.

Mexico has been the only country which has attributed equal importance to the economic design and the operating design, spending two years working on the definition and implementation of the operating system.

Mexico's position was ideal, it could draw on the experience gained in implementing pension systems with various operating models (Chile since 1981 and Argentina in 1994). It had the SAR92 experience in handling individual accounts. Mexico also had plenty of time to study these experiences and design a model tailored to the reality of its institutions.

The first decision to be made was whether or not the operating model would follow the Chilean model (a decentralized model in which each institution is responsible for managing its own information and processes) or the Argentine model (a centralized model in which one central institution is responsible for the appropriate handling of the information). In Mexico both options were seriously considered and alternative models were designed to suit the realities of the country. It was decided to adopt a centralized operating model with one agency responsible for the efficient handling of the information.

Following are the reasons for adopting this model:

Because of the political significance of the reform and the past experience, the success of the system from the outset had to be ensured. In order to ensure success, responsibility could not be delegated to institutions which did not yet exist - retirement fund administrators (AFORES) -. Therefore, it was decided to centralize this responsibility.

The reality of Latin American economies is such that it requires careful oversight of financial institutions. Mexico had recently (in early 1995) experienced a bank crisis which was in part due to a lack of banking controls and oversight mechanisms. Upon initiating a pension system overhaul, particular emphasis had to be placed on the mechanisms for overseeing the handling of funds contributed for workers' pensions. This task was made easier by establishing one central agency responsible for information and funds flows.

Mexico's new pension system was to serve two needs which together required the centralization of operations; workers were to choose the institutions that would administer their pensions, eliminating pressure from their employers and unions, and the administrative burden on employers of satisfying their social security obligations had to be eased.

These circumstances created the need for a system which:

- ❑ Gave workers the option to choose their pension fund Administrators without disclosing their choice to external agents (employers, social security administrations, unions);
- ❑ Established one central agency, with specific obligations as to its operation and detailed requirements for its oversight by the federal government;
- ❑ Established an agency that could develop a centralized operating system quickly (over a period of one year) and ensure that the technology would be updated on an ongoing basis;
- ❑ Used the infrastructure of the institutions that would be involved in the program;
- ❑ Had a mechanism for ensuring compliance with payment obligations that would facilitate contributors' administrative processes;
- ❑ Ensured constant tracking of the flow of funds allocated to the individual accounts of the workers participating in the system;
- ❑ Ensured clear identification of participants' funds and avoided the problems experienced in the past with SAR92; and
- ❑ Resolved the problems experienced with other countries' pension systems, such as multi-affiliation.

The next decision the authorities carrying out the overhaul had to make was choosing an institution responsible for handling the data and processes.

Mexico, in line with its philosophy of decentralization of government responsibilities, defined the operation of the pension information databases (information required to operate the new pension system models) as federal government property. The government could then outsource its operation to government or private agencies. It

thus left the development and operation of the systems to firms specializing in this field and protected its power to oversee all elements of the system.

The decision to outsource the operation of the database to the very firms that would participate in the administration of the pension funds was equally important. It thus created incentives for the proper operation of the company (Administrators' revenues would be directly contingent on the operating capacity of the institution responsible for handling the information and the processes) and for continually decreasing operating costs (the Administrators themselves bear the company's operating costs through fees).

The plan then had to be negotiated with all the government institutions directly or indirectly involved in the process, and the final operating designs had to be sketched out. To achieve this, an interagency committee was established. It involved representatives of all the government institutions responsible for the new Social Security Law. These meetings were attended by high-level officials of all institutions and were held over a period of more than two years.

One determining factor in the success of the new system was the direct participation of the government officials responsible for social security. These working meetings included discussions of all the operating details of the new system with the directors of the key institutions.

In the end, they came up with a design which altered the operation of all the institutions involved, as well as the operations of the employers and banking institutions participating in the system developed under the new law.

Mexico's new pension system operating model has proven to be in the vanguard of social security models anywhere in the world. Two years into its operation, more than 19 million employer contributions have been processed. This represents more than 130 million contribution collection transactions. All the while, the system has been operating very efficiently.

Before the Mexican system, no system anywhere had handled such volumes of information. The Mexican system processes nearly twice the transactions processed by other countries with similar systems. Thanks to the robust design of the operating

processes and information systems, the Mexican system has maintained a high level of efficiency and information control.

### **The Case of the Polish Pension System**

In contrast to the Mexican system operating model, we can look at the case of Poland. There was a complete pension system overhaul in Poland of the dimensions of other countries such as Argentina, Chile and Mexico. Poland has a three-tier system. The Individual Capitalization pension fund administration is the second tier. The first tier is the traditional universal system (although it now has individual records) and the third tier is a voluntary system administered by employers.

The Polish system was overhauled in 1998 and the new law took effect in April, 1999, after considerable delays. The system required all workers under 30 years of age to participate in the new system, that workers between 30 and 50 years of age elect the system that best suits them and that those over 50 years of age remain in the old system.

It is interesting to note that Poland began work on design of the social security plan by establishing the Interagency Government Office for Social Security Reform. This office was established in 1996 to draw up proposals for the new system and draft the new legislation and implementing regulations. It had more than two years (as in Mexico) to design all the operating models for the reform.

Just like in Mexico, it was decided to operate the system through a central agency for collection and future distribution of contributions. In the case of Poland, it was decided that the Social Security Administration (“ZUS”) would develop the required operating systems.

Being one of the first countries in Eastern Europe to overhaul its pension system, there were certain expectations for the Polish system. There was great pressure both internally and from abroad to demonstrate that the experiment begun in Chile in 1981 and adopted in the rest of Latin America could be successful in Poland.

Attention centered on the ability of a country like Poland to transform its pension system to a system administered by private agencies. The political and economic change was so significant that the operational challenges were ignored. One can assume that those responsible for designing this significant reform committed the same mistakes committed in Mexico in 1992, underestimating the operational challenges.

While considerable effort was put into the political, economic and financial aspects of implementing the overhaul, the operating model was left to the Social Security Administration. It was then subcontracted to a Polish software firm. The information systems design and operating work were carried out in secrecy.

Another structural problem in the design of the Polish model was the lack of definition of responsibilities. While the Interagency Government Office drafted the laws, the new institution responsible for oversight ("UNFE") revised the rules and ZUS developed the operating systems. There was no coordination among these three institutions involved in designing the operating model for the pension system. Even though the system that was designed would impact most of the working population, companies and the financial system, nobody thought it was necessary to consult all the participants.

The design of the Polish system included defects that were hard to overcome:

- ❑ There was no unique identification number for the individual accounts;
- ❑ No effective system was designed to register workers with the pension fund Administrators;
- ❑ No one paid attention to the concept of reconciling funds with the accompanying data - data took a back seat in the system;
- ❑ Not all the institutions involved were considered in the model design process;
- ❑ Too little emphasis was placed on the standardization of the data throughout each process;
- ❑ The need for correction of inconsistencies in the systems was not considered;
- ❑ There were inadequate filters to prevent the inputting of inconsistent data into the databases; and
- ❑ There was insufficient coordination among the agencies responsible for the design and implementation of the operating models;

The system, even though it was launched in April 1999, had many operating problems. These problems have been splashed across the Polish and international press. The institutions responsible are continuing the process of restructuring and correcting the problems generated. The operational problems have become a political problem. As yet, only 25% of the contributions that should have been distributed to Fund Administrators, and therefore to the individual accounts of workers, have been turned over.

In July 1999, the Chairman of ZUS said: "Delays in the transfer of contributions to pensions from ZUS to the private pension funds, were a result of defects in the new Polish pension system legislation".

These two examples highlight the importance of the operating designs and information systems in the success of the Individual Capitalization pension systems. In the case of Mexico, a reform, which to a certain extent was considered incomplete, is an example to follow for other countries around the world, based on the success of its operating processes. On the other hand, in Poland the benefits of the reform have been overshadowed by the problems with its operating designs.

## **OPERATING MODEL FOR OTHER PENSION SYSTEMS**

To delve further into this analysis, the operating models for the Chilean and Argentine pension systems are presented, highlighting the most significant aspects.

### **Description of the Chilean Collection Model**

The collection of pension fund contributions is the responsibility of the Pension Fund Administrators (“AFPs”). These Administrators enter into agreements with external collection agents: banks, *cajas de compensación*, employer consortiums (*mutualidades*) and services specializing in collection (“Servipag”) or their own agencies or offices throughout the country.

The funds must be available to the AFPs within 24 hours of the date of collection. The AFPs must be sent all the documentation for the payments, for their verification process and booking to the individual accounts.

Employers fill out a form for each AFP in which its employees participate. On average, each employer now has employees participating in three different AFPs, which multiplies operating costs. With 200,000 employers, this means that each month around 491,000 forms are processed.

The forms employers must fill out monthly contain detailed information on the employer itself and on each of the employees participating in the AFP to which the form applies, together with the compensation amounts and obligatory and voluntary contributions.

One of the greatest costs, inefficiencies and inconveniences of the process resides in this phase, since employers must generate several forms each month. Some of the information on these forms is repeated on all the forms. Moreover, since in many cases this process is manual and susceptible to errors it forces employers to redo the form, representing a waste of time and man-hours.

This also means that the employer must cut a check for each AFP, generating the same problems cited in the foregoing paragraph. All the forms supporting a payment are verified, put in order and classified by the collection agency, then sent to the corresponding AFP for processing.

For each of the forms the employer completes, the respective AFP must pay the corresponding fee to the collection agent for its payment collection services. The smaller AFPs receive forms representing a percentage greater than their share of the number of workers or participants. For AFPs, the cost of receiving the form is the same whether that form contains one participant or several. In practice, that results in proportionally higher costs for the smaller AFPs.

Once the AFP receives the forms, it enters and validates all the information using computational algorithms and manual reviews. Finally, the contributions are booked to the corresponding individual accounts.

Another problem with the process arises at the AFP to the extent that often times the forms filled out manually by the employer lead to errors of interpretation and the consequent cost of correcting the information.

There is also the possibility that an error by the employer, or a barely legible form or form with missing data could result in it being impossible to identify who certain contributions belong to. This can cause bottlenecks. The clarification of these items requires administrative and internal computational work at each AFP where they are generated.

Furthermore, employers do not keep up-to-date with the changes in AFPs made by their employees, sending a significant percentage of their fund contributions to the wrong AFPs. This means that the AFPs have to carry out monthly processes facilitating the transfer of such funds to the correct AFP. This requires a high degree of coordination of processes and control among all the AFPs. Even though this activity is currently carried out by electronic transmission of files, this is more costly than correcting the information at the source.

While the Chilean system meets the efficiency requirements, it quite obviously does not optimize costs. This translates into a higher level of fees paid by participants.

### **Argentine Collection Model**

This section describes the operation of the Argentine collection system, the participants, processing phases, and timeframes and associated costs.

Participants:

The institutions involved in the system are: the Federal Revenue Service (“AFIP”), the Argentine Social Security Administration (“ANSES”), Retirement and Pension Fund Administrators (“AFJP”), and the banking system.

Process:

Self-employed workers and employers deposit contributions at authorized banks (manually); the information provided in the case of self-employed workers is: taxpayer number (“CUIT”), category under which the contribution is made, the month for which it is made and the peso amount of the contribution; in the case of employers it is: the company’s CUIT, the employee’s social security number (“CUIL”), the month for which it is made and the peso amount of the contribution.

Commercial banks are authorized to send this information to the Clearing House managed by the Central Bank (“BCRA”), the Clearing House reports to the Banco de la Nación Argentina (“BNA”) that the contributions have been credited to the AFIP, the BNA then posts the actual credit to the AFIP/BNA account.

The AFIP, as the centralized revenue collection agency, reconciles the funds received; it then distributes them in favor of the ANSES (distribution) and the AFJPs (capitalization).

The AFIP orders the BNA to credit the employer contributions and those made by plan participants under the distribution system to the ANSES/BNA account. The ANSES also receives a magnetic tape from the AFIP with information on the contributions.

The AFIP orders the BNA to transfer the employee contributions under the capitalization system to AFJP type II bank accounts. The AFJPs also receive a magnetic tape from the AFIP with information on the contributions.

24 hours after receiving the funds from the AFIP, the AFJPs must buy shares to incorporate the funds collected into the net assets of the retirement and pension funds administered by the AFJPs. The AFJPs then have until the 5<sup>th</sup> day of the following month to credit the shares to the participants' Individual Capitalization Accounts ("CCI").

After crediting the shares corresponding to the contribution, AFJPs deduct from the CCIs the total fees (fees for administration and the cost of disability and life insurance).

Costs of the process

The AFIP's total cost (fee of 0.7% of the contribution) is equivalent to US\$4.20 per account per year or US\$29.4 million per year. This fee breaks down as follows:

The AFIP's net cost (fee of 0,5% of the contribution) is equivalent to US\$3.00 per account per year or US\$20.9 million per year.

Bank fee (0.2% of the contribution) is equivalent to US\$1.20 per account per year or US\$8.5 million per year.

The model adopted in Mexico closely follows the philosophy behind the Argentine model, except that in Mexico the process of collecting Social Security contributions is not mixed with the collection of other taxes. Furthermore, in Mexico a private agency is responsible for managing the process, rather than a government agency, as is the case in Argentina.

In Argentina, the operating process functions adequately, although it is believed that costs could be lower. The problem in Argentina is the level of evasion of employer obligations and the lack of efficiency of the Revenue Service oversight processes.

## **RECOMMENDATIONS**

For the design of successful operating models for Individual Capitalization pension systems, the following elements are recommended:

- ❑ Create awareness among all those responsible for the new pension systems of the importance of the designs of the operations and information systems which support the reform;
- ❑ Consider the design of the operating models as of the definition of the very laws and regulations supporting the new pension systems;
- ❑ Assign specialists to design the operating models and ensure that all the institutions that will be affected by the implementation of the law are consulted when creating the designs; and
- ❑ Appoint a government agency to take responsibility for coordinating all the participants in the design of the operating models.

The philosophy under which the operating models are designed must always be:

THE INFORMATION IS JUST AS IMPORTANT AS THE MONEY

The success of the systems will depend on the capacity to deposit the contributions in individual accounts. Therefore, the information required for identification of the accounts is crucial. Any contribution that is not supported by consistent information will not be posted to the individual account and will not be part of the participant's benefits upon retirement.

It is with this philosophy that the systems must operate. If the money cannot be deposited correctly in the Individual Capitalization accounts, and thus added to the contributions of the participant in question, the system will begin to generate opposition among the general public and in circles that opposed the reform from the outset. This situation is particularly critical when the systems start up operations. This is when reform opponents will be monitoring it most closely, looking for any element which

would fuel their attack on the new plan and provide justification for returning to the traditional plan.

The Individual Capitalization pension system operating models should adhere to the following principles:

- ❑ Ensure quality and consistency of the information to identify the deposits to individual accounts;
- ❑ Facilitate the administrative processes for performance of the contributors' obligations;
- ❑ Provide sufficient information to support oversight by the responsible agencies;
- ❑ Seek a unique identifier for individual accounts, known to the contributing companies and used by all institutions and entities involved;
- ❑ Develop a precise model for registering workers in the system and creation of the individual accounts (if a centralized collection model is adopted, ensure that the databases supporting the system are developed properly);
- ❑ Develop standard forms for contributors to perform their obligations;
- ❑ Develop efficient systems for reconciling payments;
- ❑ Take advantage of the countries' infrastructure for payment and branch systems, in order to keep operating costs low;
- ❑ Standardize the quality of information among all participants;
- ❑ Funds should not be accepted unless proper receipt of accompanying information can be ensured;
- ❑ Develop efficient systems to correct inconsistencies;
- ❑ Close coordination among all participating entities; and

- ❑ Establishment of filters throughout the process to prevent the input of inconsistent information.

The design of a successful collection model will be contingent on the design of the parallel supporting processes. The creation and maintenance of the databases (whether or not they are centralized) are critical processes to ensure that the collection process works. The processes for registering workers and for transfers and retirements are the processes which ensure the maintenance of a consistent database.

Most of the countries that are undertaking a reform of their pension systems based on individual accounts and administered by private agencies have a unique opportunity to capture up-to-date information on the labor force. The cost incurred by government and private institutions in building these databases is significant. This is an opportunity that should not be wasted.

The quality of the information should be the guiding principle for the registration and database maintenance processes. Ensuring that payments are made with the same worker identification codes used in the registration process is equally important. This process ensures efficient collection mechanisms.

Even if all precautions are taken to ensure that the data entered in the system is consistent, due to the large volumes of information that will be processed, there will be errors. Therefore, the system must include efficient mechanisms for the correction of any error which might arise. There should be automatic mechanisms for early correction of errors. Difficulty in correcting inconsistent information increases exponentially over time as errors accumulate.

## **COSTS**

One of the most controversial elements of pension system reforms is the fees charged for managing the individual accounts. The primary reason is that in the models for pensions administered by the government, administrative costs are generally hidden in the budgets of the institutions responsible for managing the pensions. Under the new system, by allowing the participation of private institutions, the administrative costs become transparent.

One error committed in some countries is to keep costs hidden through public administration of the operating processes. The case of Argentina is one example where processing services were subsidized by the federal government for many years. When costs were made transparent and the government sought to transfer them to the fund Administrators, the cost seemed high. Argentina is now looking at transferring the administration of the processes to private companies and thus achieving more competitive costs.

The case in Poland is similar, with the Social Security Administration responsible for collections, the system's operating costs are hidden. This has led the press to question how the Social Security Administration's budget is being spent on this item.

Without debating whether the administration of the operating processes should be public or private, the need for transparency of system operating costs must be stressed. This is achieved by establishing agencies specializing in such administration – for centralized systems – or by the operation by the same agencies responsible for the administration of the funds, as is the case in the decentralized system established in Chile.

The system costs cannot be seen solely from the point of view of the direct costs incurred in the operation of the processes. This view limits the transparency of the system. In the case of the Chilean system, the cost incurred by the companies making contributions must be added to the costs incurred by the fund Administrators and banks. In the case of Chile, the employer is responsible for effecting payments at various institutions using different forms, thus incurring significant administrative costs.

There are other countries that require duplicating the cost of some processes because of what seem to be purely political decisions. In the case of the Colombian system, since the old system, administered by the Social Security Administration, competes with the private pension fund Administrator system, parallel collection processes had to be established. This represented greater costs for institutions on both ends, as well as for employers, who have to make contributions to both models.

It is a fact that with advances in technology, models which benefit all the institutions involved in the processes can be designed. This would mean lower direct (Administrators, workers) and indirect (employers, banks) operating costs.

The general models presented below consider costs to be one of the most significant variables in the design of an operating model.

What follows is a comparative summary of the operating costs of the Chilean, Argentine, and Mexican systems:

It is difficult to calculate an equivalent cost to compare the cost of the operating processes of the various markets. To obtain an approximate comparison, the concept of cost of the administration of one individual account over a calendar year is used. Thus the total cost of the processes carried by the institutions involved is calculated and then divided by the total number of accounts administered (number of system participants).

The comparison presented is not truly equivalent, since the processes carried out in models such as Mexico include more services than those included in the costs presented for Argentina and Chile. In the case of Mexico, the cost presented includes the processes for account transfers, withdrawals and registration of workers with Administrators. In the case of Chile, these processes are carried out by the Administrators themselves and are not included in the cost presented. With respect to Argentina, the funds collection and registration processes are included. Nonetheless, the costs presented include for all countries the most significant process, processes for the collection and distribution of contributions.

Country	Operating Cost
Argentina	US\$4.20 per account per year
Chile	US\$3.72 per account per year
Mexico	US\$2.84 per account per year

**Source: Calculations based on data produced by the AFJP Oversight Office (Argentina), Procesar (Mexico) and a study carried out by Procesar in Chile**

The Administrators' operating costs incurred by their internal operations must be added to the above figures.

The data are furnished to look at the effect that an inadequate operational design in a given country can have on the growth of individual accounts, since the administrative costs of the central systems and processes will be included in the fees that the Administrators charge their participants and thus reduce the amount accumulated in the individual account.

There is no one model for the operation of Individual Capitalization pension systems that can be applied in all countries. Each country must analyze the situation of its institutions, laws and technological reality to define an ideal design.

Without trying to define a standard model to be applied in any country, the basic elements required for the operation of a pension system administered in individual accounts are listed below. The model presented corresponds to a pension system based on the Chilean model, where the worker or account holder is free to choose the institution that administers his/her funds, where the public and private institutions compete for the market and where companies are obligated to make contributions on behalf of their workers.

The principal features of a pension model such as that described above are:

- ❑ Administration of the pension funds in individual accounts in the workers' names;
- ❑ Administration by independent entities;

- ❑ Workers' freedom to choose the Administrator;
- ❑ Freedom of movement among Administrators;
- ❑ Most of the contributions are made by persons other than the participant (employers);
- ❑ The individual accounts are long term (although they may be transferred); and
- ❑ Competition among Administrators to capture market.

**OPERATIONAL CHALLENGE**

Even though countries that have overhauled their pension systems have banking systems that have operated for many years managing individual accounts of millions of workers, the operating reality of the new systems is significantly different, and thus their administration is a challenge.

OPERATIONAL DIFFERENCES BETWEEN THE ADMINISTRATION OF BANKING  
SYSTEMS AND INDIVIDUAL CAPITALIZATION PENSION SYSTEMS

<b>OPERATION</b>	<b>BANKING SYSTEM</b>	<b>PENSION SYSTEM</b>
Account opening	No time restriction	Millions of accounts over very short periods (3 to 6 months)
Party responsible for deposits in the accounts	Made directly by the account holder	Made by third parties on behalf of the account holder
Contribution period	Volume distributed over time	Very high volume on peak days during defined terms
Contribution volume	Low ratio of deposits to accounts administered	Very high ratio of deposits to accounts administered (greater than 50%)

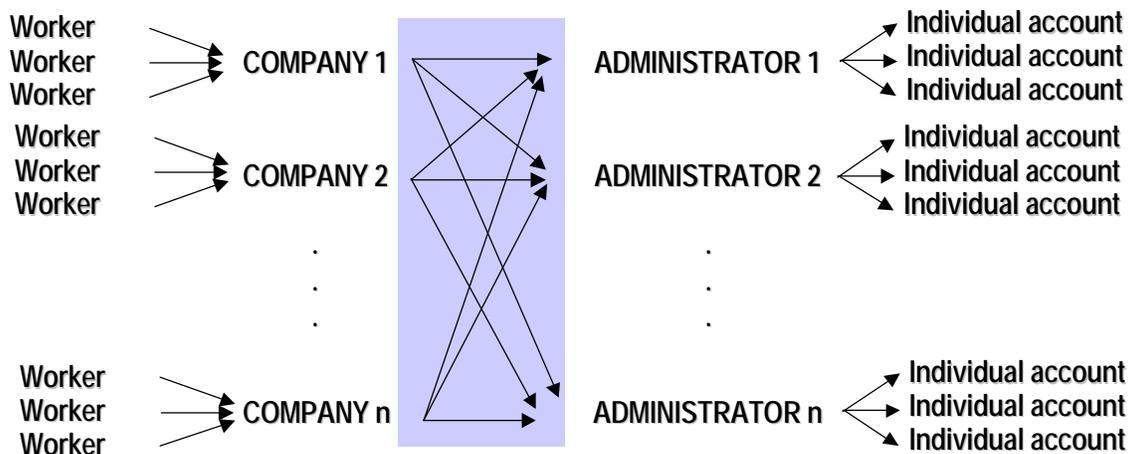
While the banking system receives individual deposits made directly by account holders, pension systems receive millions of deposits in one day, made by third parties. In order to validate the information and carry out adequate control of the processes, technological solutions must be applied.

Many countries that undertake pension system commit the error of not identifying the differences between pension system and traditional banking system operations. This situation causes them to underestimate the operational complexity of an Individual Capitalization pension system and to fail to focus enough attention on the design of the operating models and the information systems required.

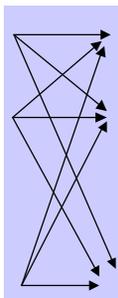
**Operating model**

A model that permits the receipt of millions of contributions in a single day and that supports the correct identification of all these contributions for their immediate investment in the financial markets is required. The processes must support the receipt of these contributions through various mechanisms, and take into account that the contributing entities are not the entities responsible for the individual accounts.

The concept of responsibility for the account becomes an issue when it is noted that the incentives for correct posting of contributions are lacking. The tax authorities establish the incentives for companies to make the contributions by establishing fines and sanctions, but very few countries establish incentives to ensure that the information accompanying the contributions is correct.



**General Model for the Collection Process of an Individual Capitalization Pension System**



The primary objective of the operating models and processes is to have the functionality represented in the graphic.

The objective is: Identify the contributions made by contributors, verify the consistency of the accompanying information and correctly distribute the contributions to the corresponding Administrators.

We will call the central process of the operation, which is a system for collection of contributions, their identification and distribution, the “Collection System”

The **Collection System** is not an independent entity. It must operate based on the definition of parallel information systems and databases. The systems that support it are the:

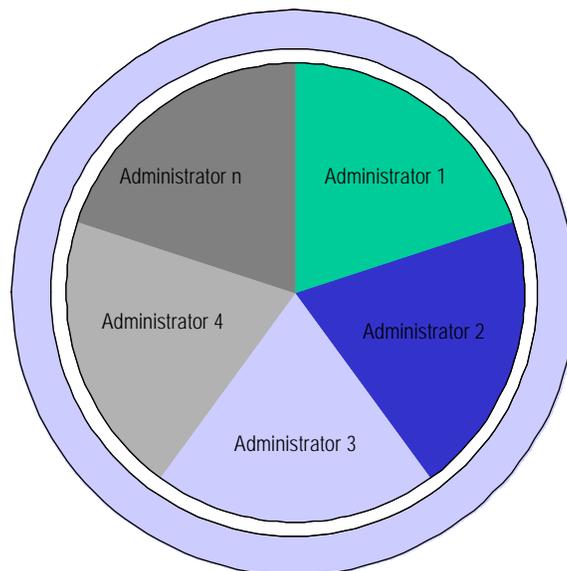
**Sign-up System:** The system workers use to register in the Administrators’ databases and, in the case of centralized administrations, in the central processing database.

**Transfer System:** The system that supports the movement of workers among Administrators. This system is indispensable to maintain consistency of the database information.

**Withdrawal System:** The system that supports the payment of benefits to workers.

The need to maintain the information on workers in databases that also contain the information on the Administrator managing their funds has already been discussed. These databases may be centralized or disbursed, but either way the information in these databases must be created and kept current.

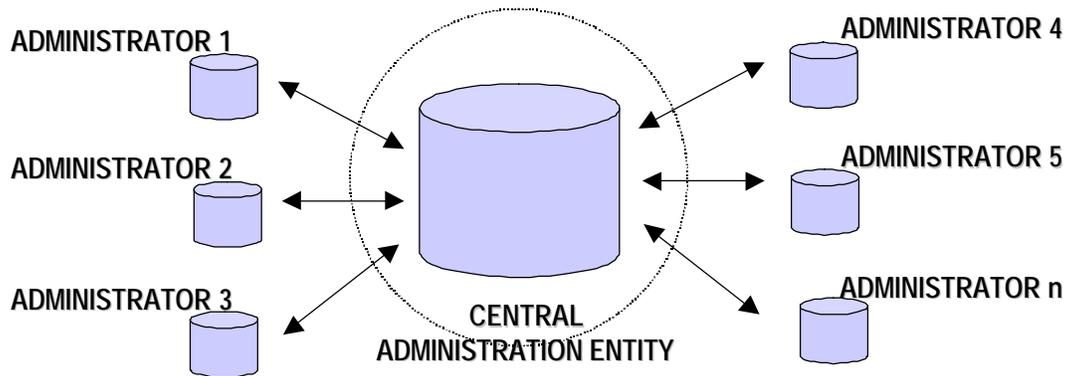
In a centralized system, the information in the Administrators’ databases is replicated in a central database, which could take the form of a database distributed among various sites.



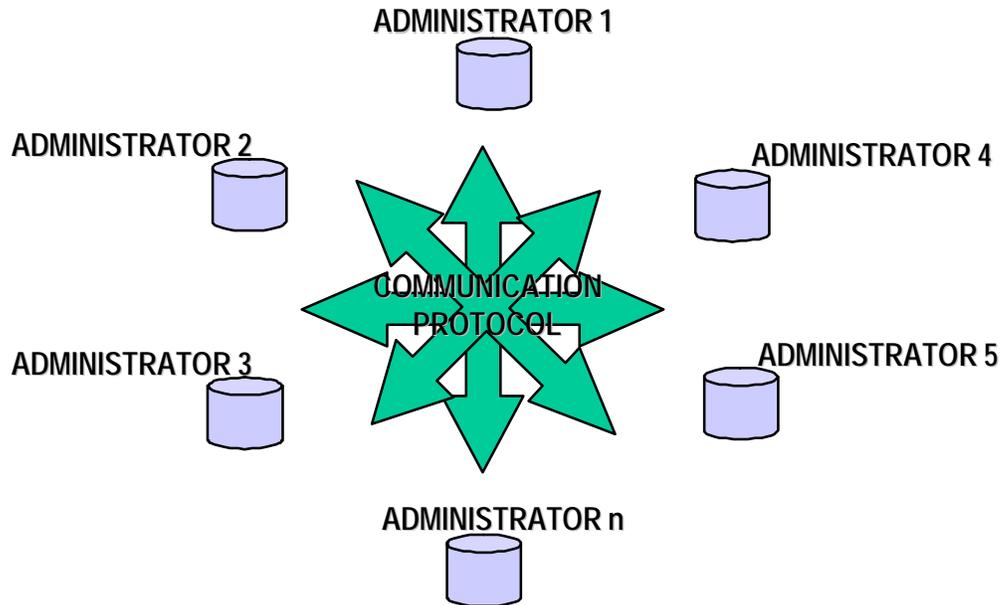
For decentralized systems, the central database does not exist and the system must be capable of operating through communication mechanisms among the various databases.

Whatever is decided regarding the centralization of the databases, mechanisms must be established to ensure communication among the databases of the various entities.

In the case of a centralized database, a communication mechanism is established through a central entity that administers a database containing the information on all the workers registered in the system, with the company that administers their pension funds:



In the case of distributed databases, The mechanism is a little more complex, since it requires the establishment of a communication protocol among the various institutions administering the databases:



The need to connect the databases or to establish central databases derives from the capacity offered to workers in the system to transfer their individual accounts among Administrators. The system in general must establish mechanisms to ensure that each worker's individual account can be identified.

Different countries have chosen different solutions to this problem. In some cases they have left the responsibility to the manual input by the fund Administrators.

In Argentina, although there is a central database, the task of keeping the information current as to the Administrator with which each worker is registered, is done manually by the Administrators in a type of transfers clearing house. In the case of Chile, employers are given the responsibility of knowing the Administrator for each of their workers. If errors by employers are detected, a correction mechanism is required. In Mexico, this effort is left to the central database administration, which is responsible for knowing at all times the Administrator with which each worker's individual account is registered.

Regardless of the mechanism used to ensure communication among the system databases, each one of the processes must fulfill a series of premises that make it functional and efficient. Following is the philosophy behind the operation of each of the central processes:

### **Process or registering workers (account opening)**

Objective:

From the moment of the worker's election, the objective is to register his information with a fund Administrator. The registration must be unique in the system and contain sufficient information to ensure future identification and the posting of his contributions to his individual account.

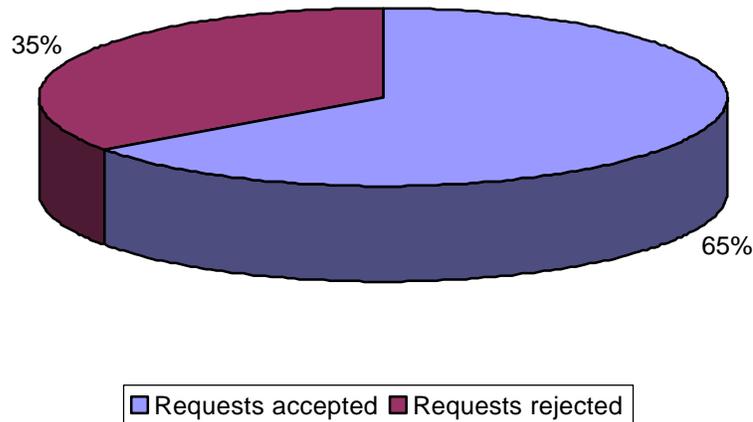
Challenge:

To fulfill the objective of having unique registrations for workers, it must be ensured that the worker in question has not previously registered with another Administrator. This task is complex, since the information provided to open the account could vary in some fields, either because the worker provided incorrect information or because there was some error in capturing the data.

Ensuring unique registrations within a database is complex, (for example, if the worker tries to register with the same Administrator more than once), but it becomes even more complex when the worker tries to register at other Administrators (multiaffiliation).

Due to the high volume of accounts created in these systems, and the short timeframe generally allowed for opening them, the concept of multiaffiliation is quite relevant. The case of Mexico is a very interesting example. Since Mexico established filters in the registration process, the effect of multiaffiliation could be measured. This is measured based on the number of registration rejections by the central company over a given period of time (see following graph).

### Registration Requests (as of July 1999)

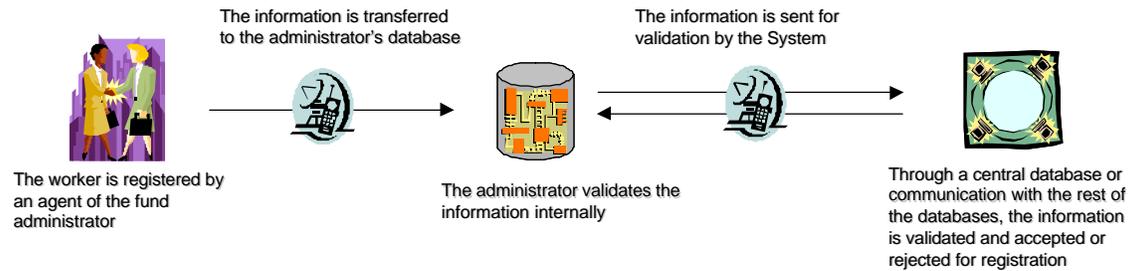


Out of nearly 22 million registration requests as of July 1999, more than 7 million were rejected. Of these, nearly 70% were rejected because of multifiliation. If the required filters had not been established in the Mexican registration system, there would be 5 million duplicate accounts in the system.

The example of Mexico demonstrates the principal reason for establishing some sort of communication mechanism among the Administrators' databases. When there is no central database, the sign-up mechanism requires prior verification checking the databases of all the other Administrators that an account is not duplicated.

The Polish model did not anticipate the problem of multifiliation and filters sufficient to prevent it were not established. This resulted in the multiplication of accounts in the system since the start-up of operations.

General Process:



The key to the registration process is in the validation effected internally, with the corresponding Administrator's information, and with the rest of the system, based on the confirmation of the registration with a central database or with a communication system among the databases for the rest of the system.

### **Process of transferring accounts**

Objective:

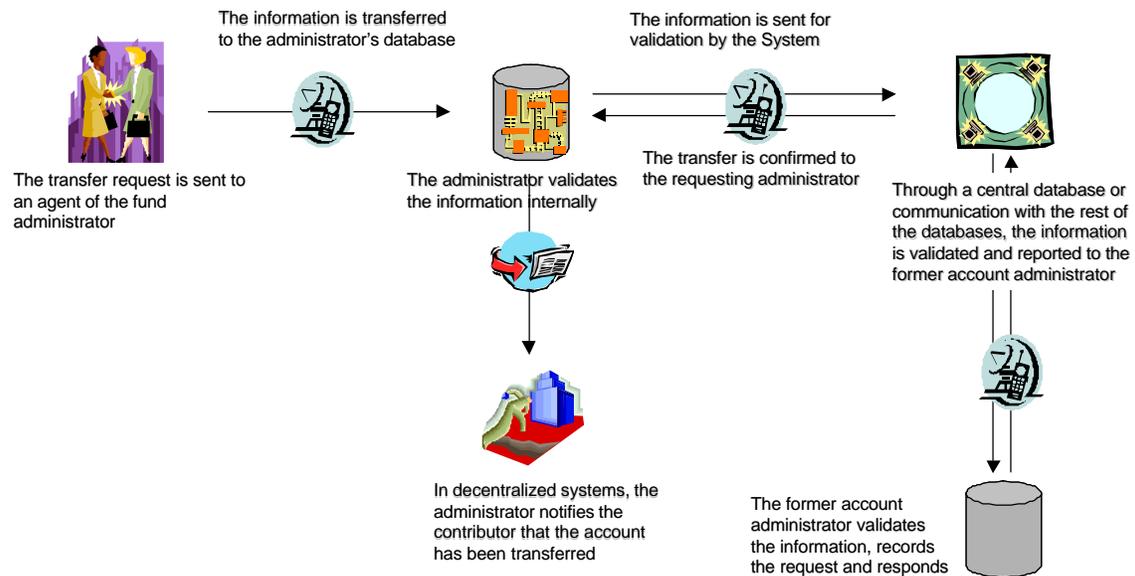
To permit workers free movement of their individual accounts among fund Administrators, while maintaining the integrity of the information in the databases. It is important that the funds transfer and collection processes be synchronized in order to avoid having funds sent to the wrong Administrator.

Challenge:

One of the principal features of Individual Capitalization pension systems is the competition among Administrators. One result of this competition is better services and better yields for workers. To create competition, workers must be able to transfer their individual accounts from one Administrator to another. This transfer of individual worker accounts requires a mechanism very similar to the registration mechanism, which facilitates communication among Administrators for the identification of the new destination of the funds.

General Process:

The general process is very similar to the registration process, involving communication between two Administrators, the former individual account Administrator and the new individual account Administrator. It is important that the entity responsible for the distribution of the funds be informed promptly of any transfers made, either by input into a central database or by notification to the contributor in models such as Chile's.



**Withdrawal process**

Objective:

Ensure the identification of the person eligible for the withdrawal (payment of benefits), locate the corresponding individual account(s) and process the benefit payment.

Challenge:

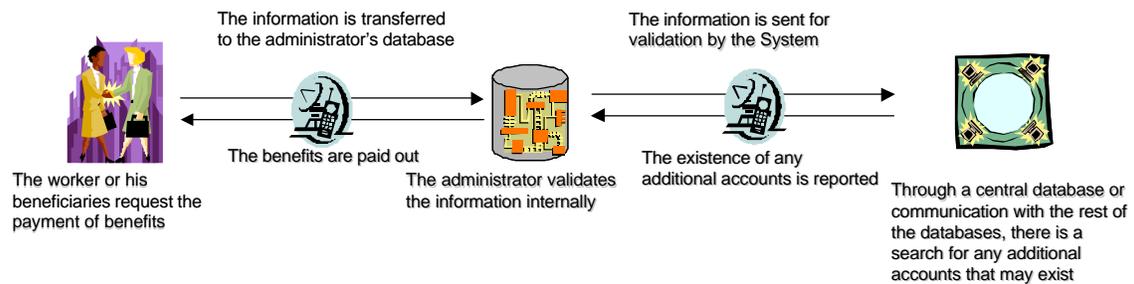
The ultimate objective of any pension system is the payment of benefits to participants. This article has shown that a worker's benefits are going to be directly contingent upon the quality of the information on the individual accounts and the capacity the system has had to correctly identify each of the contributions.

The withdrawal process must ensure the precise identification of the worker in question and must have the capacity to locate the individual accounts which the worker has had over the course of his working life (because of inconsistencies or problems with the information systems, the possibility of the creation of more than one account must be considered). It is in this phase that the operational problems of a system come to light.

This process must ensure that the system databases are updated to post any additional contribution received.

General Process:

The process requires a communication mechanism among the system databases in order to locate additional accounts that may have been opened in the name of the same worker.



As can be deduced, in the processes described above, databases distributed throughout the system at various Administrators must be consulted and updated. The communication required to keep the system up-to-date is crucial to its operation.

### **Process of collecting contributions and posting them to individual accounts**

There are differences among the operating philosophies for the collection process in countries that have adopted pension system reforms. This process is centralized in some countries and independent in others. Yet it should be noted that in those countries that maintain decentralized collection processes, such as Chile and Colombia, there are centralized mechanisms for registration and transfer processes. It could be argued that if the elements to operate centralized processes exist, the best collection process option is a centralized model such as the one designed by Argentina and used by Mexico and other countries.

The model proposed below is based on the philosophy of a centralized model, operated by a central database or by a communication process among the fund Administrators holding the information on the individual accounts.

Objective:

Ensure the correct identification of contributions to forward them to the Administrator holding the individual account, so that the funds are invested in the corresponding investment funds and posted to the worker's account.

Challenge:

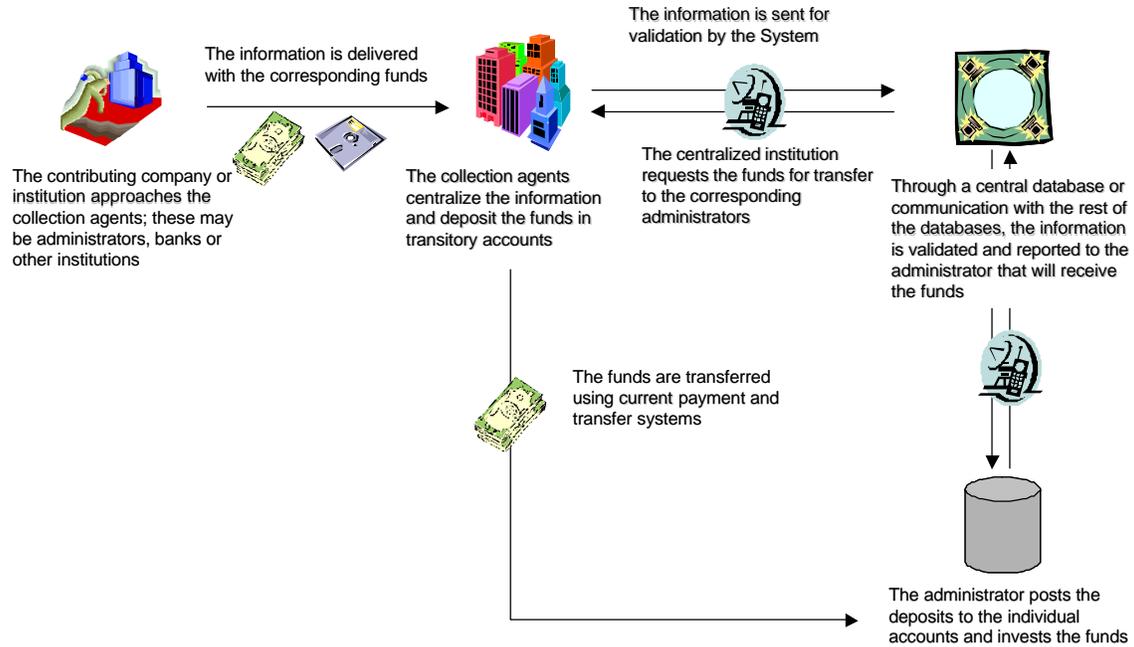
Social security collection processes provide that contributions are, for the most part, made by companies or employers. This creates the need to receive a very high volume of transactions over short periods of time (most companies make their contributions on the last day permitted by law).

The information furnished with the payments will be the only element that will allow for the correct identification of the contributions. If there are errors in the information, it will be very difficult and costly to correct them.

An equally significant challenge is to carry out this process over a very short timeframe, ensuring that the returns generated during the payment processing periods is credited to the individual accounts.

The collection process is contingent on the worker's information being up-to-date at all times in order to avoid having funds sent to an incorrect Administrator. In the case of collection models such as that used in Chile, this function is the employers' responsibility.

General Process:



## **INFORMATION TECHNOLOGY**

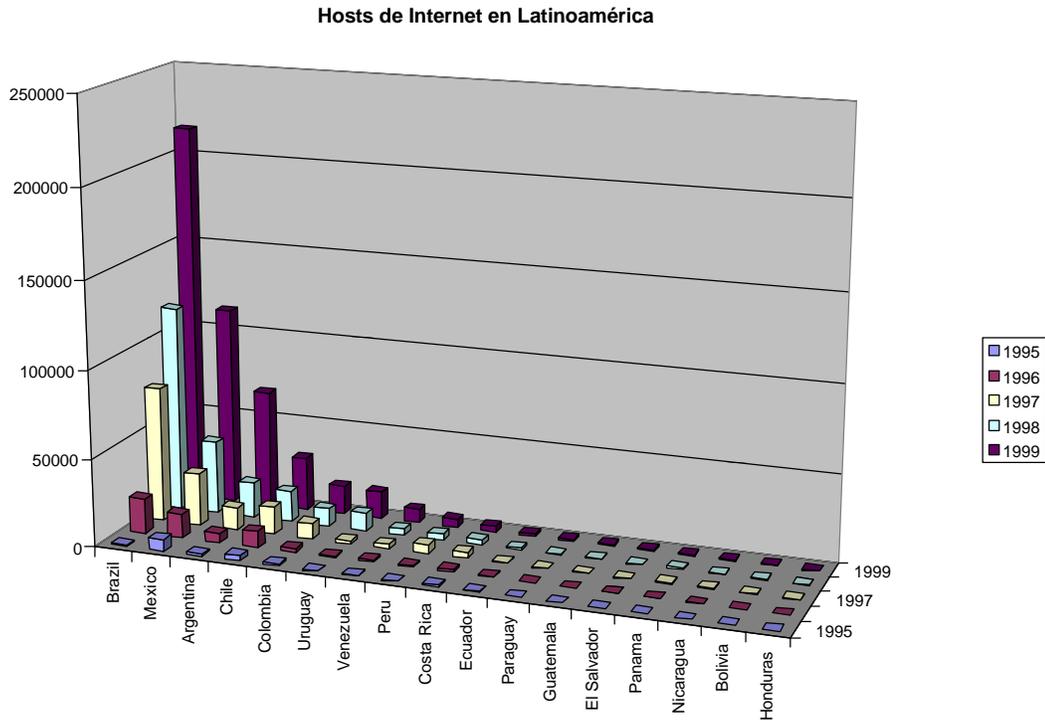
Technological advances facilitate very efficient designs for pension system operating models. Currently, Mexico has one of the most advanced models, although it has not taken full advantage of recent technological advances. When Mexico's system was designed (early 1996), the Internet was already in use in Latin America, although there were very few users and it was only used for non-critical applications. At that time it was necessary to develop a model that would work immediately with Mexican companies. Thus, certain technological aspects of the design had to be limited.

Some countries, such as Mexico and Chile, have recently undertaken efforts to modernize the collection processes utilizing Internet technology.

Any new collection systems should consider utilizing the Internet as a means to exchange information between contributing companies and the institutions responsible for the administration of the individual accounts, for decentralized systems, or with the centralized institutions in the case of systems such as those in Mexico and Argentina.

Upon defining portals for the collection of contributions, there is an opportunity to interact with contributing companies and to ensure the quality, consistency and timeliness of the information accompanying contributions. Thus, inconsistencies and errors can be rectified before the information is input into the system.

The following graphic shows the growth in the number of Internet hosts in each Latin American country (source: University of Texas, Austin)



As the graphic shows, there were approximately 13 Internet hosts in Mexico in 1996. By 1999 the number had grown to more than 110,000. This growth is quite impressive and lays the groundwork for the redesign of models based on this new technology.

It is expected that electronic commerce in Latin America will grow from nearly 160 million dollars in 1998 to more than 8 billion dollars by the year 2003. This growth trend shows the confidence that individuals and companies have in carrying out commercial transactions over the Internet. Therefore, using the Internet for payment services in general and for obligations such as social security will be common in coming years.

Another technology, which facilitates improved services for pension system account holders, is database and data analysis management systems technology. Until a few

years ago, databases were maintained on operating systems that did not allow for the timely analysis of information. The recognition of trends and the location of information regarding customers, because of the high volume of data, required costly efforts by information technology departments. Now, with the Datawarehouse and Client Relationship Management (CRM) concepts, there is the opportunity to significantly improve customer services, in this case for workers who hold individual accounts and for companies obligated to effect payments.

The technological advances offer the basis for the design of highly efficient operating models capable of overcoming the problems described in this article. However, it is important to remember that technology alone will not resolve these problems. It is imperative that regulations be drafted taking into account the complexity of pension system operations. They must provide a solid basis to support the technological solutions.