Community Revenue Collection System

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This Report from the Field was prepared by Guido Sohne in 2003, and submitted for publication in the Journal of Community Informatics before his untimely death. As both a tribute to his work and dedication to the field of Community Informatics, as well as a valuable resource for the community, the Journal is honored to have the opportunity to share this paper.

The editors.

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Community Revenue Collection Systems

A proposal to implement a proposed community based revenue collection system that is suited for operation in environments with little or no infrastructure.

Why Computerize?

For government to match in performance with the growth and expectations of its constituents, it must dramatically increase its fiscal depth without incurring costly recurring overheads. Automated systems have been proven to be capable of introducing massive efficiencies to business processes that can result in increased revenue.

Applying technological solutions towards the strategic goals for government will be a key step towards transforming government into an entity that can keep abreast of the needs, requirements and expectations of today's modern world.

The benefits of computerizing revenue collection are many but there are some aspects, detailed below, that are especially important to a computerized revenue collection system or otherwise appear to be unachievable using traditional solutions.

Potential Market

It is clear that there are many organizations that should be included in the collection system but for one reason or the other, have been able to avoid or evade paying taxes due to the assemblies. These organizations represent a significant potential source from which revenue can be generated.

With the current manual system of revenue collection, it is not always clear when and where undercollection is taking place. When payments are missed or are collected late without penalty, cash flow is adversely affected, resulting in reduced or late revenue that can be reduced using an automated system.

Problems of Manual or Centralized Systems

A dramatic increase in the size of the current revenue base suggests practical problems mostly in additional overheads and resources required in scenarios where a manual or centralized system is to be utilized.

Problems such as high costs for collection, fraud, underpayment and leakages in revenue could be made worse by massively expanding the current taxable base without the use of adequate computerized solutions.

The problems of tracking and identifying fraud or rogue revenue collectors are only compounded by the usage of manual or centralized systems due to the resources and overheads needed to monitor and control such problems.

A decentralized, automated revenue collection system allows for increased and timely access to information that would otherwise take too much time and effort to generate from the available hard copy records.

Fault Tolerant Technology

In order to be able to reach as many people as possible an automated revenue collection system must be able to function effectively in areas where there are no roads, electricity or telephone services without

which the reach and adaptability of the system will be adversely affected resulting in reduced potential revenue.

Receipt related fraud can be effectively checked by automating all aspects of the cash collection process. This implies that there is a correlation between fraud control and fault tolerance because each aspect of the revenue collection that is not automated is a potential area in which fraud can occur by bypassing programmed checks and balances in the automated revenue collection system.

An automated system should also be readily able to run on commonly available batteries and should be capable of surviving prolonged power outage or complete loss of power by recovering to a reasonable known working condition without loss of critical data when power is finally restored.

Cost-Effective Mobile Technology

Mobility is central to the ability to collect additional revenue in the field. It is not necessary to have an expensive laptop or personal computer when automating a series of simple, well defined business processes in as cost-effective a manner as possible.

The technology required to achieve mobility has historically come at premium pricing. With the broad adoption and dramatically increased unit shipments of cheap mobile computing devices, the cost of achieving mobility has come down drastically.

With time, one can expect equivalent technology to become available at increasingly reduced price points, especially in cases where unit orders are in significant volumes.

Scalability

These challenging requirements point to a low cost, decentralized, mobile computerized revenue collection system capable of handling a vast volume of data in environments with little or no infrastructure.

Scalability also determines the manner in which the system can be deployed, whether wholesale or piecemeal and has the potential to dramatically increase the total cost of the proposed system if it is not designed to be smoothly scaled both upwards and downwards.

A well designed solution to these requirements will enable all the design goals to be achieved in a manner that can scale up to millions of people in order to be viable as a government class solution.

Benefits for Government

Government can mobilize additional revenue by increasing collection efficiency as well as by expanding its revenue base. With increased reach and fiscal depth, the many challenges facing government can be addressed in some measure simply by having access to more financial resources.

As such, the primary aim of computerized revenue collection must be to dramatically increase cash receipts in order to effectively sustain the utility and generate an acceptable return on investment related to the system.

Increased Collection Efficiency

Leakages that occur because of untimely collection, fraud and under-collection could be reduced by streamlining and automating the revenue collection process.

Penalties may be automatically applied to late payments. Daily reporting of cash receipts and due payments to be collected should be automatically generated by the system.

Control of the Collection Process

The process of revenue collection can be tightly controlled to avoid fraud, evasion and under-collection. Daily reconcilations will have to be made for each collection officer.

The system should be able to automatically remind the collection officer when payments are due and monitor the level of bad and doubtful payments presented by the collection officer, alerting supervisors to possible problems.

Fraud control can be enforced by ensuring the collection device ceases to operate if reconciliation is not performed for a specified time. Further collection will be stopped and supervisors will be immediately alerted to recover the collection device and monies owed.

Efficient Time Utilization

The revenue collection process must mitigate any delays in payments by factoring in the cost of the delay in payment. Actual transactions should immediately alert the collection officer of amounts due, automatically recording actual spot collection amounts. Late collections then become the problem of the payee instead of the revenue collecting organization.

Minimal Training Required

Little or no training should needed to utilize and interact with the revenue collection solution to avoid time consuming, costly and difficult bottlenecks in the collection process such as training of the payee or the collection officer.

If training is necessary, it should be done by means of the collection device itself which should have a comprehensive reference as well as a tutorial for operations.

Future Revenue Streams?

A number of additional services can be offered using the proposed solution. Depending on the expertise and resources needed to implement a given additional service, joint ventures could be established between government and private sector to deliver various additional services.

INSTANT LOTTERY   With imaginative additional services extra revenue can be collected such as via an instant win lottery system that could double a small fixed amount. The payee could, for example, have a chance to double his money.

A suitable probability for the chance to win would ensure that this will result in additional revenue for government and help capture a portion of the lucrative lottery market.

PUBLIC TRANSPORT	A bulk sum could be paid in advance on a periodic basis that will guarantee the payee to travel free of charge on public transport, encouraging the use of public transport services and making transportation expenditures by the payee more readily manageable due to using a prepaid system.
HEALTH INSURANCE	Individuals can make payments that will go towards subsidizing their health care costs by taking advantage of the fact that not everyone falls ill at the same time if they are able to make regular payments towards their health care. Such an additional revenue stream would have to carefully considered and extensive consultation and partnership with insurance and health care professionals would be needed to ensure that the system would be workable.
POLL TAX	A small poll tax can result in massive additional revenue if it can be cheaply applied to many people. The overheads involved in collecting poll taxes can become very high due to the difficulty in reaching many people and determinining if they have duly paid their poll tax. Making the poll tax more effective and less onerous would involve collection of small amounts on a frequent basis from many people. The proposed smartcard solution is designed around making such activity feasible in a cost effective manner.

The Proposed Solution

The proposed solution to computerize revenue collection combines the mobility and cost effectiveness of handheld computers with a plan to increase revenue collection by writing software to implement processes to be determined in <u>Functional Specification</u> after <u>Feasibility Study</u> has been undertaken.

Platform

The proposed solution would utilize handheld computers as mobile databases that hold the information that is needed to conduct transactions and provide services. Data will be stored on smart cards that will be presented by the person being processed by the revenue collector.

Due to the battery powered nature of handheld computers, the system will work where there is no electricity and where there is no telephone service until it needs to be recharged or if there are fresh batteries available.

Widely available handheld computers capable of meeting revenue collection needs can be purchased for as little as $100, implying that an increased depth of computerization for operations can be achieved with handheld computers when compared with traditional desktop computers costing in the region of $1000.

Features

The principal strength of the proposed solution lies in the combination of the mandatory design goals tabulated below.

MINIMAL COST	A computerized solution for revenue collection should cost as little as possible per person using the system. Per person costs can be reduced by buying cheaper units, by buying fewer units or by sharing units between as many people as possible.
MOBILITY	In order to share units between as many people and to make each unit capable of reaching and serving a larger market, units need to be extremely portable and capable of being shared between personnel from a pool of available units.
ROBUSTNESS	The ideal solution will incorporate features that will make reliable operation of the system possible in a tropical environment. This especially includes the software that runs on the system, which should be as reliable and foolproof as possible, surviving prolonged loss of power.
INFRASTRUCTURE TOLERANT	Each unit of the solution must be able to withstand the loss or absence of certain key infrastructures such as electricity and telephone without impairing the ability of the personnel using that unit to collect revenue.
BATTERY POWERED	Ideal solutions will run on battery power, either using standard, disposable batteries bought off the shelf or rechargeable batteries that can be topped up when and where there is power available from a mains outlet.

Custom Software

The battery powered, highly mobile and infrastructure tolerant features of the handheld computer combined with the development of software that can effectively control, monitor and increase revenue collection activities will result in a robust system that can meet the requirements described in Why Computerize? while providing the desired Benefits for Government.

The negative impact of inadequate or incomplete software that has not been expressly designed to accomodate the business processes of government could seriously impede the desired benefits for revenue collection.

To avoid this, business process will be documented in a Functional Specification that will serve as a basis from which software will be developed to meet the design goals as well as conform to a functional specification.

Basic Solution

Software written for the basic solution will be focused on enabling the operator of the device to record transactions in the field.

Periodically, data will be downloaded on the device for the purpose of making possible predetermined collection routes and set collection priorities and guidelines for operators of the device. Data that has been collected will periodically be transferred to other systems for storage, analyis and reporting.

The main advantage of the basic solution lies in the reduced cost of the equipment as compared to the

smartcard solution. Certain complexities with the smartcard solution such as the loss or destruction of smartcards are also avoided by the basic solution.

Smartcard Solution

The basic solution, unlike the smartcard solution, requires that data for transactions be preloaded onto the handheld computer. Without accurate and sufficient data, a transaction will only be able to record new data instead of being additionally able to analyze previous transactions. Such an approach is generally better suited for information collection activities rather than transactional activities.

This disadvantage of the basic solution is worsened because data needs to be preloaded into a device with a small memory, and having access to less data limits the mobility advantage of using a handheld computer.

The smartcard solution improves on the scalability, reach and scope of what is achievable using the basic system by guaranteeing access to complete historical data by storing it on a smartcard. Having eliminating the need to preload data for transactions, any handheld computer should be capable of servicing any transaction.

Additional future modules, services or products could be added on to the smartcards by planning for the expansion of the system, primarily in the area of investing in smartcards with larger memories.

With up to date and complete historical data available, late or missed revenue due could also be taken into account and factored into the payment due. Analysis of the historical data can be used to influence an amount to be collected based on specific predetermined criteria. Smart software can result in fewer potential loopholes in the system.

Since each transaction is recorded both in the smartcard and in the handheld device, the fault tolerance of the solution is also improved to the point where the loss of the handheld computer in the field does not mean that the data is completely lost.

Long Term Prospects

In the near future such devices with equivalent capabilities will appear at lower price points that will facilitate wider implementation of the same concept, with the same software that works with the original mobile technology device given to the payee.

Implementation Strategy

Feasibility Study

Discussions need to be made with the various stakeholders to determine how the system should actually function and project how much additional revenue can be generated in various scenarios to assess the total costs and benefits.

Functional Specification

A technical specification based on results of the discussions will describe in detail how the system will operate.

This specification will be used to document operational and technical objectives that the system will have to conform to in such a manner that an independent contractor would be able to supply an adequate solution given the information contained in the specification.

Prototype Development

A working prototype solution will be implemented in close collaboration with the various stakeholders with the goal of having a working system no matter how basic, right from the beginning that matures into a trusted, familiar and tested product.

Pilot Project

A limited number of the products will be tested in the field to ascertain whether the solution will be able to be adopted on a large scale. Based on the feedback, it will be possible to determine whether such a system could be made to work on a large scale.

Implementation

Depending on the cost/benefit and availability of financing, a number of the products will be made operational and actual revenue collection will be able to commence.

Upgrades

New software modules that represent additional products and services that will function with the payee mobile technology device will be periodically introduced on an as needed basis.

No changes will be need to be made to the mobile technology devices and handheld devices except to load them with additional software, perhaps to transact with higher value, niche revenue streams.

This process will be similar to repeating stages one to four for each additional product.

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