

Trip Report

Vladivostok, Russia, 14 March 1996 to
23 March 1996

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Executive Summary

All equipment is in place and local area networks have been installed in the central administration and all five raions. All outstanding purchase orders should be closed, two without final payment due to non-delivery of some items.

The Automated Financial Management System is in routine operation. Its reports have been accepted officially and it has been requested by the city of Tomsk. The Economic Planning Statistics (EPC) database is in operation and is the basis for regular publications of demographic and economic indicators. Entirely different approaches have been taken in developing these two applications. Both applications are successful, but the two approaches have different advantages and disadvantages.

The overall positive impact of this project is clearly evident. This is impressive given a comparatively small investment, early exit of the long-term advisor due to health problems, and a three-month delay in delivery of the final set of computing equipment due to Customs problems. In fact, installation of networks in raion finance offices was completed only two weeks ago. The study tour to cities in the United States has had an immense impact on the officials who participated, as it has in other project cities. Credit for what has been achieved must go to the fine staff of RTI/MFM/Vladivostok, the local software developers and trainers working with the Project, and our counterparts in the city administration.

Completing all scheduled development, training, and deployment activities by the end of April is a major challenge. Continuing assistance by funding additional user training and assistance in the raions, as well as expanding the base of trained users in the administration, would help to ensure a much greater long-term impact.

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Trip Report

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Introduction

Background

RTI's Municipal Finance and Management project is in its final stage in Vladivostok. MFM Long Term Advisor James Alloway finished his assignment November 30, 1995. Remaining in the RTI/MFM/Vladivostok office are two RTI Russian staffers, Natalia Derevyashkina and Alexander Belov. Ms. Derevyashkina is overseeing completion of software development and training for city and raion finance departments. Ms. Derevyashkina is also responsible for general project administrative and financial matters. Ms. Derevyashkina is scheduled to close the site officially at the end of April, 1996. Mr. Belov is overseeing completion of ADP systems hardware and software installation and related training. Mr. Belov is also overseeing completion of development and training for the Economic Planning Statistics database. Mr. Belov is scheduled to finish his duties at the end of March, 1996.

The largest and final shipment of computer equipment cleared Customs in January, 1996, after three months of delay resolving the VAT tax waiver. The Automated Municipal Finance System (AMFS) software, being developed for departments of finance by a local firm, is scheduled for completion before the end of April. Activities include changes and additions to the software, completion of documentation, installation in all five raion offices, and user training in the raions. Municipal finance specialist and RTI subcontractor Mahesh Reddy made his final visit in February to direct AMFS development. RTI Chief of Party in Russia Al Sharp also visited in February to monitor progress.

Purpose of Visit

The purposes of this visit were as follows:

- C to inspect the installation of the computer and networking equipment;
- C to verify whether equipment and software provided by the Project appear to be good operating condition;
- C to determine whether equipment vendors had fulfilled the terms of outstanding purchase orders;
- C to evaluate the impact of the general ADP approach taken at this site and the likelihood that progress will be sustained.

Computer Related Procurement

At the beginning of my trip, three Purchase Orders (P.O.) had not been completed. These consisted of the following:

- C a purchase order to R-Style for computer equipment, software, and training,
- C a purchase order to TAICHU for communications equipment, software, and training, and
- C a purchase order to Prim-7 for computer equipment and training.

The following sections detail the status of these orders at the time of this visit and recommendations for concluding them.

C **Purchase Order 73536 (R-Style)**

I met with R-Style's representative, Provotorov, Igor Vitaliavich. He signed letter agreeing that they had not delivered certain items and would not be paid for them. With A. Belov and R-Style, I visited all equipment installation sites in the city administration and the raions. I verified that all equipment had been installed. Exceptions are some Epson 870 dot-matrix printers that remain in their boxes in the raions. The Raion System Administrator or the Information Department should install these printers within the next two weeks. Network wiring is complete and generally neatly fastened to the walls. Hubs are wall-mounted. R-Style agreed to label both ends of every cable in the raions within one week. The Information Department will oversee this work. The Information Department has drawn network topology diagrams for the raions.

With the exceptions noted in the letter of agreement with R-Style, I am satisfied that they have delivered all other equipment and services described in P.O. 73536. I recommend paying them the adjusted remainder.

C **Purchase Order 75370 (TAICHU)**

TAICHU canceled our scheduled meeting and shows no inclination to deliver the remaining items under P.O. 75370. They have received several warnings in writing, copies of which are attached. I have a detailed list of the equipment and services ordered showing what has and has not been delivered. The City, through Andrey Naumov, asks us to notify TAICHU that they will receive no further payment under this Purchase Order, and that we have authorized the City to bring legal action against them.

We should close this Purchase Order and notify TAICHU as requested.

A. Naumov asks that we provide the most critical missing items, since they have almost no chance of obtaining these now through TAICHU. These items are listed in a memorandum from A. Naumov and are included in Table 2. They include a magneto-optical disk drive and battery backup units. The magneto-optical drive and disks will be used for backing up and archiving data. It replaces tape back-up units not provided by TAICHU. Tape units exist in some servers, but have a small capacity (250MB) and have not proven a reliable backup medium in this environment. One magneto-optical drive exists and has proven reliable, but is limited to 230MB disks. The UPS units are needed for protecting the file and electronic mail servers from power disturbances.

Only two of six network servers are protected by UPS units now. The PowerChute software and cable are necessary to monitor UPS and power status and to automatically shutdown network servers if necessary. These items are supplemented by items requested by Naumov under the Prim-7 order, as described later. I have reviewed these requests carefully and consider them warranted and well-chosen. A disastrous loss of data due to inadequate backup or power disturbance could cause a fatal loss of confidence in the automated financial management system.

C **Purchase Order 75876 (Prim-7)**

Prim-7 has failed to deliver \$2,500 of materials on P.O 75876. They have been notified in writing that penalties for late delivery are being applied as provided for under the purchase agreement. Penalties applied for non-delivery now exceed this amount. There is no reasonable chance that they will deliver the missing items or pay the penalties. The City, through Andrey Naumov, asks us to notify Prim-7 that we are closing this matter and will not pay the remaining amount.

We should close this Purchase Order and notify Prim-7 as requested.

Naumov asks that the \$2,500 not paid to Prim-7 be used to purchase some of the items listed in Table 2. As mentioned in earlier, I have reviewed the need for these items carefully and consider them necessary to safeguard the data being rapidly accumulated on the City's network servers.

A. Naumov asks to apply some of the funds not spent for additional training in Microsoft Office (Word, Excel, and Access) for twenty persons in the City Administration. This general request is outlined in a memorandum by Naumov. The City has used the same firm and one-week format before and were please with the results. Naumov says that with prompt payment this could be organized within one week. If not completed before the end of this month, it could certainly be completed early in April. The total cost of the proposed training is \$4,004. This training is desirable, of course, but I cannot say that is vital to the operation of the system we have provided under the Project.

Finally, Galina Vishnyakova, Head of the Department of Finance, gave me a letter asking us to replace three Lexmark dot-matrix printers we provided to her department. They find these printers very loud and too slow for their use. They ask that they be replaced with Epson printers, which they have good experience with and are sure will meet their requirements. We cannot exchange the Lexmark printers, since they were formally accepted by the Information Department. Three replacement printers would cost less than \$3,000. This is an awkward request for several reasons. It comes from the head of the department we were charged with helping, the request is made in formal letter, and the cost of a positive response is small. If it is financially feasible, I recommend buying the requested printers as soon as possible. Though a small thing, it has a very high profile with the Finance Department.

All items mentioned, with the possible exception of the training, can be delivered by the end of the month or by early April, depending on when the orders can be issued.

Summary

Table 1 summarizes the status of all RTI/MFM/Vladivostok computer-related purchase orders, showing recommended final payments ("Adjusted Outstanding") for the remaining three open orders.

Table 1. Summary of Computer Related Purchase Orders for RTI/MFM/Vladivostok.

P.O.Number	Firm	Total	Original		Adjusted
			Outstanding	Not Delivered	Outstanding
69861	Bestead	\$ 12,850.00	\$ 5,484.00	\$ -	\$ -
66996	Bestead	\$ 12,745.00	\$ 7,768.00	\$ -	\$ -
67367	IBM	\$ 40,483.71	\$ 15,295.60	\$ -	\$ -
73536	R-Style	\$ 304,088.00	\$ 60,817.60	\$ 3,293.00	\$ 57,524.60
72676	TAICHU				
75370	TAICHU	\$ 45,280.00	\$ 20,376.00	\$ 20,376.00	\$ -
75876	Prim-7	\$ 10,000.00	\$ 2,500.00	\$ 2,500.00	\$ -
76243	Bestead	\$ 27,844.00	\$ 13,042.00	\$ -	\$ -
Total				\$ 26,169.00	

Table 2 summarizes the requests made by the City for equipment needed to replace items not delivered.

Table 2. Summary of Requested Replacement Items.

Item	Unit	Cost	Quantity	Total Cost	Department
Dot-Mat.		\$ 1,000.00	3	\$ 3,000.00	Finance
Magneto-Optical		\$ 1,502.48	1	\$ 1,502.48	Information Department
APC Smart-UPS 900		\$ 1,850.25	1	\$ 1,850.25	Information Department
APC PowerChute (Network)		\$ 240.40	3	\$ 721.20	Information Department
APC PowerChute (Network)		\$ 1,883.77	1	\$ 1,883.77	Information Department
Training, 20 Persons, MS Office		\$ 4,000.40	1	\$ 4,000.40	City Administration
Total				\$ 17,011.58	

The first item consists of three replacement printers for the Finance Department. These are not critical to system operation, but are very important to the good image of the USAID project. The next five items are very important to safeguard the data being accumulated by the AMFS and Economic Planning Department applications. The last item, training for 20 persons in Microsoft Office, is important but not critical to the operation of the system.

Equipment Installation

C Central Administration

C Server Installation

The server and communication room of the Information Department (ID) is a small room containing six servers and communications equipment. Electrical power appears to be grounded, and all electrical wiring appears new. Network wiring is all Category 3 twisted pair throughout. The network is uniformly 10BASE-T Ethernet. All wiring is neatly clipped to the wall. Care has been taken to cross data and electrical wiring at right angles, and to shield data wiring where the two are running parallel to each other. ID personnel have tested the network cabling to make sure that noise is below permissible levels. The network is based around a Standard Microsystems (SMC) TigerSwitch switching hub, and small unmanaged Synoptics hubs. A Cisco 4000 communications server was delivered by TAICHU, but is not in operation due to

missing manuals and software. The central switch and communication server are on a table. They intend to install a rack system in the server room to organized the accumulating collection of communications equipment.

Servers are all based on Intel processors. One Novell Netware server supports the AMFS software. A Windows NT server supports the Economic Planning Statistics database. Another Windows NT server will be used as a general purpose file server as the network expands. A third Windows NT file server is being used for testing, while a Windows 85 system is in operation as a cc:Mail electronic mail server.

Network Installation

Departmental hubs are mounted on the walls. Network and electrical wiring in hallways is contained in ducts. Ducts for electrical wiring are metal to prevent interference with the network cabling. Network cabling ducts are plastic with removable panels for easy access. Inside offices, network and electrical wiring is clipped neatly to the walls. Network wiring terminates in small boxes with RJ-45 modular connectors. With the exception of some sloppy excess cabling at hubs, installation is neat and professional.

Many network workstations in the Finance Department and Economic Planning Department were in use. Some users were entering data, some producing forms and reports, and other studying the use of Microsoft Office. It was clear that the system is being used actively in all departments with access to the network.

Data Protection

Three of six servers are protected by Uninterruptible Power Supply (UPS) units. Two of these UPS units are borrowed and must be returned to their original locations. Most servers have internal cartridge tape drives for backup. Most of these drives can store 250MB of compressed data. Cartridge tape has proven to be unreliable in Vladivostok's damp ocean-side environment. A small-capacity (250MB) magneto-optical disk drive has proven to be reliable. There did not appear to be a clear regular backup procedure in place for any of these servers. I also found this situation in raions with system administrator's and operating servers.

Though the system is recently installed, data is accumulating rapidly in AMFS and Economic Planning databases. A major data loss could cause a fatal loss of confidence in the system. Lack of UPS units on some servers and lack of a proper regular backup procedure is a dangerous situation. Purchase of a larger capacity, more reliable backup device will help.

The Information Department should be given responsibility for backing up the Department of Finance Netware server so that all servers are backed up by the same ID operations staff. Sergei Mokretsov, System Manager for the Finance Department, currently has this responsibility. However, he has notified the head of the Finance Department that he would like to concentrate on financial planning. No one has been found to replace him yet. Paper printouts are being kept as the primary backup. Weekly backups will be adequate and can be done by Sergei Mokretsov until someone else is given this responsibility.

The Economic Planning Statistics database is currently small. It accumulates new data on a monthly basis. Batches of new data are entered locally on workstations in the Statistics Office. Once the data has been verified, it is added to the central SQL Server database. The data is available in these two locations. However, a centrally managed backup procedure would add significantly to the security of the system.

The Information Department and Finance Department need to institute proper back-up procedures as soon as possible. The Information Department should prepare a written back-up procedure for all servers and should make sure that raion system administrators are trained to follow this procedure.

Raion Administrations

I, A. Belov, and two representatives from R-Style visited virtually all equipment locations in all five raions. (One or two offices were either locked or occupied with meetings.) At the time of this visit, the equipment had been installed for less than two weeks.

Each raion has a local area network (LAN) consisting of one Novell Netware server and six Microsoft Windows for Workgroups workstations. One workstation is a notebook computer to be used by the Head of the raion administration. Three workstations are to be used by the raion finance department. A XyZEL FAX/modem is connected to the server for data transfer and electronic mail exchange with the central finance department. Each raion has one Hewlett-Packard LaserJet 4M Plus network laser printer and several Epson 870 dot-matrix printers connected to workstations. The server and all workstations are protected by UPS units. The server contains a tape back-up unit. Hubs are wall-mounted, one 16-port 10BASE-T hub per raion. Wiring is neatly fastened to the walls. There are a few locations with some conduit, but these are the exception. The wiring is generally neatly done. Wires are not labeled at either end. R-Style promised to do this within the next two weeks.

I asked about building floor plans with wiring diagrams for the raions. R-Style said that they were able to get a building floor plan for one raion. The Information Department has produced network topology diagrams for each raion. These are nicely done.

Grounded electrical circuits had recently been installed or are being installed. In some cases, this has caused equipment installed by R-Style to be disconnected to allow for the electrical installation. Andrey Naumov, Head of the City's central Information Department said they will reinstall and test all equipment after electrical wiring has been completed. In a few locations (Frunzinsky and First River), some dot-matrix printers remain in boxes. The location of these printers was planned. They should be installed by the System Administrator or the Information Department within the next two weeks. Before the end of this month RTI/MFM/Vladivostok staff should verify that all equipment in the raions is in the planned location, has been reconnected, and is operating.

Frunzinsky raion has been the pilot raion for testing the Automated Municipal Finance System (AMFS) software. The server room was crowded with equipment. This included equipment provided by the Project, equipment purchased by the raion, and equipment provided for use in processing election ballots. Two Project-purchased dot-matrix printers were still in their original boxes. We found some raion-purchased PC equipment at most sites. Equipment provided for use in elections includes Compaq PCs and a TrippLite modem. We found this standard set of equipment in each raion. R-Style, who provided Hewlett-Packard PCs to the Project, also provided the election equipment.

We spoke with the LAN System Administrator in Frunzinsky raion. He had some prior experience with Novell Netware and received training in Netware administration through the Project. He said that the printers had not been installed because he was not yet certain of the best place to put them. In part, he said, this is because not all users have been trained. He also said that they were waiting for a new version of the AMFS software from the Vets Group.

In First of May raion, we found the LAN in operation and the System Administrator, Svetlana A. Izbash, busy installing an anti-virus system. The System Administrator is a last-year student who is likely to leave soon after graduation. The AMFS software has not yet been installed in any raion other than Frunzinsky, and so is not yet available in First of May. Some, though not all, users in this raion have received training in Microsoft Office.

In the remaining raions, Leninsky, Sovietsky, and First River, LAN System Administrators have not yet been hired. Finance department personnel in these raions expressed a need for additional training in Microsoft Office. In First River Raion, the head of the finance department has interviewed and rejected five candidates for LAN System Administrator.

In several raions, it was clear that users were already using the equipment. In some cases, we found users in front of the PCs studying software user guides. In many other cases, we found the PCs not yet in use due to lack of user support through a LAN System Administrator, lack of training, lack of time, and lack of a vital application, such as AMFS. In discussions with the heads of raion finance departments and the central finance department, I found strong support for providing the missing ingredients to put the system into operation. This is clearly the case in the central finance department, where the system is in routine operation and has proven successful in providing vital information. Strong support in the central finance department is encouraging.

The most critical issues in the raions are the installation of the finance software, LAN system administrators, and user training and support. The Additional Work (AW) agreement with the Vets Group includes software changes and additions, installation of the new version in all raions, and training of raion users. Given their existing staff, this is a challenging scope of work to be completed by the end of April, when the Project closes its office completely. Finishing this work is critical to the success of the Project in the raions. Demonstrating the value of the AMFS software, and institutionalizing it in the raions, is necessary to encourage use of the installed LANs and hiring of LAN System Administrators.

Software Applications

Office Automation

Office automation is being provided through Microsoft Office Version 4.3 (Russian), running under Windows for Workgroups Version 3.11 (Russian). This has been installed on all workstations installed under the Project and is the de facto standard for the city administration. Many users have received training in some or all of the major components (Word, Excel, PowerPoint, Access) of the package. Since the computers and networks have been only recently installed, it was not surprising to find use somewhat limited. It was clear that some users were eager to gain some experience with what they had been taught. The Economic Planning Statistics (EPC) system relies heavily on Access, and also involves use of Word and Excel. Users of this system are likely to be more advanced than others. User in the central administration is generally ahead of use in the raions, since equipment has been installed in the raions for only two weeks.

Electronic Mail

The Information Department has designed and begun operation of a comprehensive electronic mail (E-mail) system for the city administration. This is based on Lotus

cc:Mail, a very mature, network-based multi-platform product. The E-mail server is running under Windows 95. They have the English version of the E-Mail interface for Windows for Workgroups clients. Russian messages can be exchanged easily, but lack of a Russian interface is a minor problem for users. A Russian version of the client software is available, but is expensive (18,000,000 Rubles, or more than \$3,000). The city is licensed for 400 cc:Mail client users. There are 23 or so workstations now using this system in the central administration. Many users have received training in the use of the E-mail system.

A remote gateway link with the raions is in place and has been tested. This uses dial-up telephone connections. The server is equipped with a ZyXEL U-1496 modem. Each raion server is equipped with the same type of modem. The E-mail gateway is not operating with the raions yet, since these LANs were recently installed and three of the five raions do not have system managers yet.

This is a well-designed system. It is in operation in the central administration and is ready for operation with the five raions. Credit for this belongs to the personnel of the Information Department.

Automated Financial Management System

An Automated Municipal Finance System (AMFS) is one of two major software development efforts at this project site. Sergei Mokretsov, System Manager for the Finance Department, demonstrated the AMFS system. The software has been built as a turn-key system by the Territorial Industrial Technical Administration ("Vets Group"). Technical oversight for the design from the standpoint of municipal finance has been provided by Mahesh Reddy, an RTI consultant. Day-to-day management and coordination of the effort has been provided by RTI/MFM/Vladivostok staff member Natalia Derevyashkina.

Menus, entry forms, and reports have been designed and programmed specifically to meet the operating needs of the Finance Department. Screen displays are clean, well organized, and easy to understand. Detailed data entry forms closely resemble original paper forms. Reports produced by the system have been officially accepted by the Krai Finance Department. This a significant achievement.

The application meets the day-to-day transaction processing needs of all three divisions within the department and is in use daily. Five or six other persons in the Finance department were using the system when I looked at it. It is clear that it is being heavily used. The Finance Department is able to keep up with pace of data entry using this system. It has been tested for some time in Frunzinsky raion, which served as a pilot for the remaining four raions. It is currently undergoing revision. Documentation and installation and training in the raions is scheduled to be completed by the Vets Group before the end of April.

The software is based on a single-user Clipper database application originally developed by Funzinsky raion. At the start of the Project, the Clipper application was in use only in Frunzinsky raion, the only raion with any significant automated data processing. The AMFS design integrated several separate modules of the original design into a single system and added many improvements. The application supports multiple simultaneous users on a network while protecting the database from corruption.

Development was originally planned to be done using FoxPro. Instead, it has been developed using the C programming language, a locally-developed C-language user

interface library, and Novell's Btrieve database library. The result is a very responsive application with low hardware requirements.

RTI/MFM/Vladivostok recently received a request for the software from the Finance Department of the city of Tomsk. This is yet another example of very successful cross-fertilization of developments in municipal finance under the Project. Credit for this success belongs to Mehesh Reddy, Natalia Derevyashkina, and the Vets Group of developers.

Economic Planning Statistics (EPC)

The other major software development effort is a database of demographic and economic development statistics for the city. This is called the Economic Planning Statistics (EPC) system. I reviewed this work with the developers and trainers hired by the Project. Development of the system has been managed by RTI/MFM/Vladivostok staff member Alexander Belov.

The application is a database of demographic and economic development statistics for the city. Statistics are maintained monthly for each raion and are separated into public-sector versus private sector. Information is entered into the database by the Statistical Office and is the basis for monthly and yearly publications.

The software has been built on the client/server model using Microsoft (MS) Access and MS SQL Server running on a MS Windows NT network server. No custom programming has been done to build the system. Instead, the two developer-trainers have relied entirely on the built-in capabilities of MS Access to construct database tables, forms, and reports. Though the two developers are experienced programmers, they had essentially no experience with Access or SQL Server before they began working on this project. SQL Server is transparent to the users, handling all of the database management and processing chores on the server. The user interface is a collection of Microsoft Access databases including forms, queries, and reports.

The developers have documented the system through a general description of its structure and operation, and a detailed database dictionary. Users refer to this documentation when constructing their own queries and reports.

The developers have spent a considerable amount of time training personnel in the Economic Planning Department and the Statistical Office in the use of Access. Users are able to create their own forms and reports as needed. I was shown several reports including graphs that were constructed by users. In addition, they have shown users how to supplement Access's capabilities with the MS Excel, MS Query, and MS Word. Users know how to extract information from the database into Excel for further analysis and graphing, and into Word for preparing reports.

The system is now being used to produce monthly and annual statistical publications. Users have been trained in these general skills. Data is entered in batches stored locally on network workstations. These batches are checked for errors in entry and logic by running filtering queries. Once a batch of data has been checked for consistency, it is added to the shared data on the server. Windows NT Domain access controls have been used to restrict changes to the shared data to certain users.

No database administrator has been designated yet, but there is recognition that this must be done. These two departments have an agreement with the two developers to provide continued technical assistance on a part-time basis. Data entry and report stations are all on the network and are scattered in the two departments. They were

all in use when I saw them. There were some minor problems with the network, and, as usual, MS Windows. The developers say this is not common.

This is a very impressive achievement. The system is very flexible, able to meet changing needs easily. The approach has transferred valuable skills to permanent staff and has made a major impact on the ability of the Economic Planning Department to provide valuable information to the administration in an efficient and effective way. Credit for the success of this work belongs to Alexander Belov and the two developer-trainers.

Comparison of Approaches

RTI/MFM/Vladivostok provides a good comparison of two fundamentally different approaches to software application development.

The AMFS software is a transaction-oriented application and has been developed using a "turn-key" approach. The software has been written entirely in a higher-level programming language, C. Database management is provided through the use of Novell Btrieve.

Btrieve is a library of C database functions. It has been designed and optimized specifically for the Novell Netware network operating system. The software runs on MS DOS-based client workstations. The user interface is character-based. It makes good use of color, and displays are well-designed and logical. Data is shared from the Netware file server, with record-locking provided through Btrieve library functions. The resulting application has very low hardware demands and very good performance.

Users are limited to a predefined set of choices and actions programmed into the software. This reduces user training requirements while increasing dependency on skilled programming support. Although the software can be changed by a programmer, users are limited to pre-constructed forms and reports.

Skilled C-language programmers familiar with the Btrieve library are required to make changes in the software. This includes everything from adding new reports to making structural changes to the database. The City has a one-year agreement with the Vets Group to provide maintenance, including some additions. Major changes are likely to require a separate contract. As at other project sites in the NIS, very low government salaries and increasing demand in the private sector make it impossible to keep skilled computer professionals in government positions.

The system is limited to the Novell-Intel server platform. Btrieve is written specifically for the Novell Netware operating system. (A version for IBM OS/2 is under development.) Netware is highly optimized for Intel-based PC servers and is currently available only on that server hardware platform. Netware, with the addition of a symmetric multiprocessing (SMP) option, can support several processors in the server, but only Intel processors. Although it currently holds roughly 42 percent of the Local Area Network server operating system market, it has been losing some ground to Microsoft's Windows NT.

Development of the Economic Planning Statistics (EPC) application has taken an entirely different approach. The application is developed using the client/server model and "off-the-shelf" software. Microsoft Access has been used to provide the client user interface. No custom programming has been done. All tables, queries, and reports have been developed using features built in to Access.

This approach is extremely flexible, but relies heavily on skilled users. Once users have

mastered the basic features of the database software, they are able to create their own forms and reports, and create their own local tables. Well-integrated client software, such as Microsoft Office, also allows access to the database from other tools, such as spreadsheets and word processors. I saw examples of this kind of use while in Vladivostok.

Integrity of the database relies on protections built into the system, and on an on-site database administrator. The administrator is responsible for making any necessary structural changes to the database and for ensuring that controls remain in place to protect the data from corruption.

The system is not restricted to a single platform. MS Access is available for all Windows platforms, including Windows for Workgroups, Windows 95, and Windows NT Workstation. Microsoft SQL Server has been selected as the database server. MS SQL Server runs under Windows NT Server, which is available for a variety of processors, including Intel Pentium, DEC Alpha AXP, or MIPS R4xxx processor(s). Platform choices are further expanded by the use of standard Structured Query Language (SQL) to communicate between client users and the database server. This allows MS SQL Server to be replaced by an alternative SQL database server, such as Oracle or Sybase SQL Server. Conversely, it allows access to the data via other SQL-compliant client software, such as many popular Geographical Information System (GIS) products.

The requirements of these two applications are different. AMFS must deal with more frequent transactions in a secure way while meeting official reporting requirements. EPC must deal with less frequent transactions with flexible output formats. Both applications appear to be very successful now. There are reasons to believe that the second approach will be successful in the long-run in this environment. The turn-key approach relies heavily on skilled programmers for maintenance. Skilled programmers cannot be retained on government salaries. The city must pay competitive rates for their services. The off-the-shelf approach invests in training long-term employees. These persons are less likely to leave government employment soon. Also, the resulting system is much easier to change without relying on outside skills. Given the uncertainty of government structure, careful combination of these two approaches, minimizing investment in custom programming, may be the best approach.

Impact

Baseline

An initial assessment was done in July, 1994. It found the city had no integrated financial management system, a few Intel 80286 and 809386 personal computers, and no computer networks. One raion, Frunzinsky, had developed a single-user database system for financial management. Budget management was done manually or using spreadsheet software. The central administration had one computer system manager. One of five raions had a computer system manager.

Automated Data Processing Plan

The Project Automated Data Processing (ADP) Plan was developed by February, 1995. The approach used by the Project in the city of Nizhny Novogorod, adapting American Management Systems' (AMS) Local Government Financial System (LGFS) software, was rejected as too expensive. Instead, the ADP Plan called for developing two major applications using local expertise: an integrated automated financial management system based on existing software in Frunzinsky raion, and an economic planning

database. The ADP Plan called for early installation of a "Starter Set" of networked computers for training and application development, and a much larger "Basic LAN System" to support application deployment in the central administration and all five raions.

Results

All equipment is in place and local area networks have been installed in the central administration and all five raions. The Automated Financial Management System is in operation and is being revised and enhanced. The Economic Planning Statistics (EPC) database is in operation and is the basis for regular publications of demographic and economic indicators. The central Information Department has been strengthened and expanded significantly, and has taken a leadership role in ADP planning for the city.

The overall positive impact of this project is clearly evident. This is impressive given a comparatively small investment, early exit of the long-term advisor due to health problems, and a three-month delay in delivery of the final set of computing equipment due to Customs problems. In fact, installation of networks in raion finance offices was completed only two weeks ago. The study tour to cities in the United States has had an immense impact on the officials who participated, as it has in other project cities. Credit for what has been achieved must go to the fine staff of RTI/MFM/Vladivostok, the local software developers and trainers working with the Project, and our counterparts in the city administration.

Central Administration

Major changes have taken place in the central Finance and Economic Planning, and Statistics departments. Sergei Mokretsov, System Manager of the department, reported that personnel are not doing less work than before, but are doing more productive work. For the first time, they can see the entire operation and understand how it works. Before, they did only their own tasks mechanically without understanding the linkages. He says that the system has made huge changes in the operation of the department.

Galina Vishnyakova, Head of the Finance Department has a computer installed on her desk. She uses it regularly to get answers to questions from city administrators. The AMFS software is being used routinely and is of key importance to her ability to respond to questions from above. She said that the system has improved the speed and accuracy of the work done in the Finance Department.

Nina N. Timinskaya, Director, Far Eastern State Statistics Committee, is very enthusiastic about the assistance of the Project. She proudly showed several publications profoundly influenced by her visit to the United States. These included a monthly statistics publication and two annual statistics publications. She says that the 1995 statistics yearbook is ready for printing now. The EPC application is providing the basis for these publications. She said that the use of the new technology had made it possible for them to publish statistics by raions and by public versus private sector for the first time.

The quality of this work is very high, with extensive use of graphics. She was most impressed by publications she saw in Milwaukee and Dayton, and has tried to emulate them. These publications are being distributed to the Mayor, the heads of the raions, and other city officials. Some monthly results are published in the newspaper.

Raion Administrations

The impact of the Project in the raions remains to be seen. Local area networks have been installed in raion administrations for only two weeks. Most raions have installed grounded electrical circuits for the equipment. Two of five raions have system administrators; others are searching for them. The AMFS software is scheduled to be installed in all raions before the end of April. Some users have received basic training in Windows and Microsoft Office. Electronic mail with the raions has been tested, but is not yet in full operation. Most of these elements should be in place by the end of April. Having seen that most of the critical ingredients are there, I am optimistic that they will be successful in making the system work.

Sustainability

Institutionalization

The AMFS software is being actively used and is relied on by the city administration. Reports produced by the system have been officially accepted by the Krai Finance Department. The EPC system is also being actively used, and is the basis for regularly publications. There is ample evidence that the city already finds both applications very useful and has integrated them into operations. This should encourage the city to find the technical support and operating funds necessary to keep the system going and to continue to develop it.

Technical Support

Custom Applications

The city has a one year agreement with the Vets Group to maintain the AMFS software. The city also has an agreement for continuing assistance from the developer-trainers of the EPC application. The staff of the Information Department are providing qualified support for associated communications and networking. A precedence has been set for contracting for outside technical services when necessary.

Computing Infrastructure

The quality, organization, and direction of the Information Department here are impressive. The department has about four persons, including A. Naumov. There are also programmers or other computer technical support personnel in some of the individual departments. These include Sergei Mokretsov, who supports the Department of Finance.

The Information Department is proactive in trying to meet what they perceive as the needs of the administration. Andrey Naumov, Head of the Information Department, has submitted a long-term ADP plan to the Mayor. This has been approved. Every other department I spoke to said that they depended on the Information Department for support and that they got help quickly when they needed it. This kind of healthy relationship is completely missing in some other project cities.

I raised the issue of keeping good technical support staff, both in the central administration and in the raions, with Galina Vishnyakova, Head of the Finance Department. She said this is a problem due to very low government salaries. We discussed some alternatives, such as relying on several part-time students. She said another option is for the City to give some other kind of incentives such as a free apartment. She said she would pursue this, and salary increases for such positions,

with the Deputy Mayor. She depends on the AMFS software, and on getting data from the raions. I am optimistic that this will be resolved by the city in some way.

Operating Costs

Sergei Mokrestov prepared a conservative estimate of operating costs for, including consumable supplies, custom software maintenance, and custom software development. He submitted this to the administration and is certain that the necessary funds will be explicitly placed in the next budget. It is very encouraging that someone has explicitly raised this issue. There is evidence that the city administration is aware that these costs exist.

Continued Support

One of two remaining local project staff members, Alexander Belov, will leave at the end of this month. The remaining staff member, Natalia Derevyashkina, will remain until the end of April to supervise additional work on the AMFS software and deployment in the remaining four raions.

A three month Customs delay in delivery of the Basic LAN System set of equipment delayed many ADP activities to the very end of the Project's life. Many significant things have been accomplished, but the city has only recently been faced with expanding the system to the raions. Completing all scheduled development, training, and deployment activities by the end of April is a major challenge. Continuing assistance by funding additional user training and assistance in the raions, as well as expanding the base of trained users in the administration, would help to ensure a much greater long-term impact.

Annex A: Principal Persons Contacted

RTI/MFM/Vladivostok
Belov, Alexander A.
Derezyashkina, Natalia

Far Eastern State Statistics Committee, City Statiska Office
Timinskaya, Nina Nikolayeva, Director

Information Department
Naumov, Andrey Vladimirovich, Head
Mekhed, Alexsi, Systems Engineer
Vorbjev, Pavel, Systems Engineer

Finance Department
Vishnyakova , Galina S., Head
Chikrashova , Olga, Chief, Revenue Division
Mokretsov, Sergei Anatoliavich, Systems Manager, Chief Expert Programmer

R-Style
Provotorov, Igor Vitaliavich, Chief Computer Person

Territorial Industrial Technical Administration (“Vets Group”)
Ulkin, Sergei Aleksandrovich, Manager
Ognev, Igor Anatoliavich, Technical Manager

EPC Developers/Trainers
Izergin, Vladimir
Kozhuhouskiy, Sergei