

The Genesis of a Soviet Software Industry — Datamation 1988-06-01 (p.23-25)

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Perestroika—the Soviet policy of industrial reform—is seeding a Soviet software industry. Central planning is out of vogue. Profit-seeking Soviet enterprises are turning to new, independent software cooperatives for help with automation, and many of the co-ops are looking to the West for products.



PROF. VALENTIN M. PONOMARYOV (r.), director of the Leningrad Institute for Informatics and Automation, with a colleague.

BY DAVID HEBDITCH

One thing is clear about the Soviet software industry—there isn't one. At least not as the separate, self-sustaining entity we know it as in the West. But, with the changes now occurring across the Soviet economy, the seeds of an independent, profit-motivated software and services sector have already been sown.

New business opportunities for Western software companies in the untapped Soviet market are emerging, as are Soviet software cooperatives that are actively seeking links with Western firms. Driving this software surge is *perestroika*, or reconstruction, Soviet leader Mikhail Gorbachev's widespread policy of industrial and economic reform.

These trends will have a dramatic effect on the Soviet software community, which has always been limited in its resources and highly structured (see "The Soviet Software Worker"). What's more, the traditional means of distributing systems—from the central ministries and institutes—is being severely shaken up.

The Constructs of Reconstruction

Central to *perestroika* is the decision to make the traditional Soviet enterprises self-accounting. They will no longer have to send their sales revenues to a ministry in Moscow for redistribution. They can keep any money they make, but will be responsible for paying their own salaries and bonuses and for balanc-

ing the books. Hand in hand with this is a new requirement: to be responsive to the needs of the market, be they from consumers or other firms. Investment capital for new ventures and products will have to be raised on business terms from banks if their own reserves are inadequate.

All this is familiar enough in the West, but it is earthshaking in its implications for the Soviet Bloc. Some of the larger enterprises (business units) have been given foreign trading rights. In the past, import-export business was always conducted via specialist foreign trade organizations in Moscow. "They would go through every line of the contracts," says Ants Wörk, the assistant director of the Institute for Cybernetics in Tallinn in

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the Soviet Republic of Estonia. "It would take a year to get clearance for a one-year contract."

One high-tech enterprise still savoring its newfound independence is Burevestnik in Leningrad. The firm employs over 4,000 people in the manufacture and marketing of a range of advanced industrial test systems.

Talking to a Western publication for the first time, Burevestnik's general director Anatoly N. Mezhevich admits that "the leadership here has problems with how things are developing, but we see that it is a change for the better."

Pre-Perestroika Projects Have Problems

DATAMATION encountered some real problems when it studied another project, called Intensifikatsiya-90. Announced in pre-*perestroika* 1986, it is intended to accelerate the introduction of new technology and systems into the Leningrad area—the industrial heartland of the Soviet Union. Claims were made that more than 300 enterprises representing 70% of the area's industrial output and 50% of its R&D effort were involved.

DATAMATION interviewed the director of the Leningrad Institute for Informatics and Automation, which heads the Intensifikatsiya-90 program. Prof. Valentin M. Ponomaryov's outline of the project sounds impressive: "It will involve the intensification [of IS activity] of all parts of the economy: science, industry, transport, building, city systems, education, the environment, and social problems."

In fact, the project's problems run deep. Intensifikatsiya-90 was set up under pre-*perestroika* thinking: funding for it was contributed by the ministries and their enterprises were "volunteered" to participate. It was a classic case of centralized planning. But with their newly bestowed financial independence, how could enterprises such as Burevestnik be forced to participate? There seems little reason to invest development capital with bodies such as the Institute for Informatics and Automation, especially if the various management teams think they could find more effective solutions under their own steam.

"You've got it about right," confirms one high-placed official in Moscow who wished to remain anonymous. "Some of these people are in deep shock. They got the message overnight. It all happened in 24 hours, early in January."

So, Intensifikatsiya-90 and other such grandiose schemes have been made obsolete by *perestroika*. Traditional means of communication, control, and funding between the institutes, the ministries, and the enterprises, have disappeared. Something, however, has to take their place if the economy is to continue to function. For example, one problem that will be encountered by the institutes is the absence of formal channels for getting the results of their research work into the rest of the economy.

To overcome this, the institutes are now allowed to set up small firms. Useful though these firms might be, they still carry the burden that they are the result of the old top-down thinking in the Soviet Union.

They are established to find a market for the ideas and devices created as a result of the research. They are not being formed with the primary purpose of creating ideas and products to meet a perceived market need.

Co-ops Bridge the Gap

Perhaps the answer to all this lies in the Soviet decision to allow citizens to set up their own privately owned cooperatives. These co-ops are intended to fill the gaps left in consumer services by the cumbersome, overcentralized state organizations.

Reaction has been enthusiastic. Over 800 co-ops were formed in Moscow alone last year, and, by the end of 1988, there are expected to be as many as 15,000 throughout the capital city. Some programmers already have set up co-ops, and the number of software specialists in institutes and enterprises indicating an interest in the idea is giving rise to concern on the part of their managements.

The same is true of service engineers. Co-ops, however, must be able to coexist with the existing dinosaur of the Soviet infrastructure. The essential element of co-ops is that they will serve consumer needs, but sources confirm that there was nothing in the newly published law on co-ops that prohibited them from doing business with enterprises and institutes.

To test attitudes to this, DATAMATION put the following scenario to Mezhevich at Burevestnik: how would he react if a group of technicians set up a co-op to field-service the complex systems installed at enterprises in the Moscow area? Would he supply spares?

"Yes," he responds without hesitation, "so long as they can pay for them."

The Soviet Software Worker

The Soviet system doesn't make it easy to develop practical programming skills. Only if budding programmers are very lucky do they get their hands on a computer during high school. At university, students major in subjects such as mathematics, computer sciences, control theory, electronics, and cybernetics. Programming is taught within the syllabus of these subjects and students get terminal access to mainframes or, occasionally, minicomputers and micros.

All Soviet programmers are university graduates and few are trained as software professionals—although this is changing. After graduation, some stay on at college for postgraduate work. Others find posts in one of the various specialized "institutes" or "research centers" under the umbrella of the Academy of Sciences of the USSR. The rest find places in industry and commerce. In Soviet terms, this means the computer department of one of the ministries overseeing a sector of the economy or a business unit (known as an "enterprise").

The requirements for software arise either from the research activities of the institutes or from applications requirements identified within the ministries. So, for example, the Minradprom radio ministry has a number of factories making tv sets. To improve the productivity of these enterprises and the quality of the resulting units, the ministry has a standard production control system based on an SM computer—a Digital Equipment Corp. PDP-11 lookalike. These are shipped to enterprises as they become available. The software may include some sophisticated algorithms (even tested software routines) developed by one of the institutes specializing in control systems, plus applications-level software written by programmers in its own computer department.

Some larger enterprises might have their own programmers. Smaller ones might use the ministry computers on a batch basis. To date, there has been no part of the infrastructure that allows for the development, distribution, and support of software independent of these institutes and ministries. Furthermore, the software does not account for market needs—essentially because no such feedback from the marketplace exists in real life, beyond the letters page of *Pravda*.

East/West Software Trade

Tietoväylä Oy is one of the major distributors of pc add-ons and software in Finland, the Western country with the closest trading ties to the USSR. It has invested in the expensive exercise of converting Lotus 1-2-3 to support the Cyrillic character set and display messages in Russian or English as required. But vice president Jyrki Pöysti explains that the product has been only moderately successful. The reason for this, Pöysti says, is clear: "There are no established channels for selling software in the USSR—there is still no service industry." Consequently, Tietoväylä is limited to selling the product to hardware suppliers that want to include 1-2-3 as part of a system. This is being done by Western traders already established in Moscow. As yet, there is no single Soviet firm able to undertake distribution of the Russian version of the package.

Similarly, licensing is out of the question for the moment: "Only Lotus could do a license deal, but there are no immediate signs of that happening," says Pöysti. So, for now, Tietoväylä's elegant implementation must wait on the sidelines.

Amid the cautious pessimism, one firm is trying to open up the channels. East of Helsinki is the port of Kotka, which recently established Kitec, the Kotka Information Technology Center. Managing director, Heikki Hallantie, has equipped Kitec with a mixture of Soviet and Western technology—everything from an SM 1420 (a Digital Equipment Corp. PDP-11 lookalike) to the Apple Macintosh.

In addition to providing training and consultancy services within Finland, Kitec actively encourages Finland-USSR trade. Its first major success is an agreement with the advertising and marketing monopoly Sovero to set up a database of Soviet and Finnish export companies. The videotex database runs on the center's SM 1420 mini (with a matching system in Moscow) and is accessed from pcs using a package called Mistel that is able to display data in Latin or Cyrillic text. An X.25 interface makes the system accessible from all over Europe.

Softman Oy is a small software house comprised of former employees of one of Finland's biggest engineering firms, Valmet. Its latest project is an example of East-West cooperation in the development of advanced control systems. Softman is producing a portable implementation of Mini-MAP—the standard for manufacturing control systems—in cooperation with the Estonian Academy of Sciences in the USSR. The system has been specified in detail by Softman in Finland, but the code is being written by a team at the Institute of Cybernetics at Tallinn in the Soviet Republic of Estonia. The first customer is Videoton in Hungary.

Although the chip sets to be used in MAP systems are embargoed and cannot be shipped to the Eastern Bloc, this does not apply to the software layers of the protocols which, because they have to be published, can be implemented by anyone. At the LAN level, Softman is planning to use a Finnish-originated Virtual Token Protocol (Ekenet), which is not a product covered by the Cocom ban. This runs at 4Mbps, not far short of the 5Mbps specified for the Mini-MAP.

Seppo Nikkilä, Softman's managing director, solved one problem of project management by shipping to the Tallinn team his own company's development system (based on C) and a batch of cheap pc clones on which to run it. The institute gets to keep these at the end of the project. "The Estonians are very much into C," Nikkilä says. "They have already been using it to write editors and things like that. A Hungarian programmer has been assigned to our offices here to help in the development of a testing harness."

At the Institute of Cybernetics in Tallinn, Raul-Roman Tavast, head of the Control System Department, confirms that the programming of the Mini-MAP system was almost complete: "Testing at a module level has gone well and we are now ready to start linking the whole system together for further trials." At Espoo near Helsinki, Nikkilä has total confidence in the skills of the Estonians.

Nor are they dependent on the West for software product ideas. While visiting the Institute, DATAMATION was shown a package called ExpertPRIZ. The program (written in Pascal this time) is a consultative system based on an earlier package called MicroEXPERT that runs under MS/DOS on pcs and is suitable for engineering design problems. As well as capitalizing on the Institute's AI research, ExpertPRIZ has an excellent user interface combining windows, menus, and interactive graphics—and all in English. The marketing rights already have been swiped up by Scandinavian Pc System Inc., Old Greenwich, Conn.

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He adds that he'd "welcome" direct competition with his own service office in Moscow, implying that service support was more trouble than it was worth.

One Software Co-op In Moscow

At least one software co-op has already been set up in Moscow. Access to hardware is a problem, though. Such are the shortages that any available computers have to go to the military, university, and business sectors, while home computers are a rarity. What's more, the only customers a software co-op could have would be ministries, enterprises, and of course, other co-ops. The Moscow co-op is reputed to be in negotiation with an American software house concerning possible distribution deals. If computer service co-ops are allowed to have foreign trading rights, this will give Western companies a direct link to the Soviet market for the first time.

Can the co-ops make a difference, though? Unlike the rest of the Soviet economy, co-ops are bottom-up entities—in other words, they are created by people in response to a five-year plan. It is inevitable, therefore, that the co-ops will be much more responsive to market needs. Indeed, the co-ops had better be sensitive to the market—their survival will depend on it. Paying customers will be the only source of income for these operations. In addition, this close contact with the market will have the effect of encouraging the co-ops to expand. For example, a co-op supporting a specific enterprise will be the first to learn of any new requirements and will be tempted to meet them.

The talent of Soviet programmers cannot be questioned. The potential for co-ops is that this talent will be brought into close touch with market needs. When that happens, the computer software and services sector will mushroom. The only thing that might prevent this is a decision by the Soviet government to restrict the scope and activities of co-ops. But, as with other aspects of the Soviet's economic and social reforms—*perestroika* and *glasnost*—this will be like trying to get toothpaste back into the tube. ■

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2022-06-25 19:07

