

From Under the Rubble:

Computing and the Resuscitation of Romania

How does an entire country return to life?

The dictatorship of Nicolae and Elena Ceaucescu turned Romania into a political, social and economic wasteland that was vividly pictured in the world media after the overthrow of the Stalinist couple in December 1989. Their regime left the country in shambles: with an old or mangled physical plant, a currency worthless abroad and nearly worthless at home, a legacy of secret police abuses, terrible health and sanitary conditions, and a highly centralized, warped, and inefficient scientific and industrial infrastructure.

Computing Under the Old Regime

Elena Ceaucescu personally ran the Romanian science and technology (S&T) sector. At several meetings during the past year, Romanian scientists have repeatedly told me of an administration that capriciously controlled budgets and appointments, determined national priorities, purged capable people for political reasons, censored and confiscated mail and manuscripts, and denied foreign travel, journal subscriptions, and equipment to scientists. To add insult to injury, the S&T community was compelled to ritually thank her for her beneficence and leadership.

Nevertheless, Romania managed to develop an indigenous computing industry and academic community since the 1960s. Computing was

favorable under the Ceaucescus, presumably because of its progressive image and its potential both to decrease the need for the import of products with broad applicability and to provide hard currency earning exports of value-added products.

The two largest production facilities are the Computer Manufacturing Company (ICE) and ROMCD. ICE makes micro- and minicomputers, the latter first started under a license with France's CII. ROMCD's main products are disk drives and high-speed impact printers. It is the oldest surviving joint venture with an American company in Eastern Europe, having been formed in 1974 with the Control Data Corporation. Both make licensed (ROMCD) or unlicensed (ICE) copies of U.S. products, and import their most advanced micro-electronic components from the USSR, the West, and the Far East. For example, ICE builds IBM/PC-like microcomputers and a functional duplicate of Digital's VAX 11/730 known as the Coral 8730. ROMCD's best-known product has been a 58Mbyte voice coil disk drive that it licensed from CDC in 1977.

The activities of both companies were severely limited by Ceaucescu's isolationist policies, weak indigenous R&D capabilities, centralized govern-

ment control of all major industry, a lack of domestic supporting industries, undemanding internal markets, and COCOM export controls. Consequently, these companies suffer from many of the problems that were common in the USSR and all the East European Communist countries—such as very long production runs for products that are obsolete by world standards. Most Romanian-made products were used domestically, although ROMCD had a steady, but modest, hard currency export market.

The leading educational institutions have been the Polytechnic Institute and the Center for Perfecting of Cadres Development (the Romanian



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ILLUSTRATION BY DENNIS A. HUGRIM

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acronym is CEPECA). Both were opened in 1967. The principal computing program at the Polytechnic is a five-year undergraduate degree under the Faculty of Control and Computer Science. CEPECA was started as a United Nations academic center for teaching management and computing methods to mid-level managers and engineers from Romania and Third World countries. From 1974–89, CEPECA operated under the Communist Party and the Academy of Social and Political Sciences as a training center for rising Party technocrats.

Although a member of the Warsaw Pact and a participant in some agreements that partially integrated the Soviet and East European computer industries, Romania's participation hardly extended beyond some rhetoric and formalisms. Its computer-related imports and exports with its "fraternal socialist brothers" were minuscule.

In spite of the existence of an indigenous industry, there were a lack of visible computer applications, (e.g., for railroad or airline ticketing systems). It is very likely that the majority of Romanians had never seen an operating computer under the old regime.

From Under the Rubble

Three examples will serve to illustrate the nature and extent of the mess left by the old regime—and of how difficult it will be to rebuild.

Bucharest. Much has been written about the huge palace that the Ceaucescus built in the center of Bucharest. The Western press has used words like "grotesque," "monstrosity," and "totalitarian ugliness" to describe these dictators' gigantic monument to themselves. But on first sight this clean, white, marble

building does not seem all that bad. One must spend time in central Bucharest, walking or driving through block after block of similar buildings, to appreciate the real horror of the Ceaucescus' master plan. It comes with the realization that much of the resources of this desperately poor country were sunk into these massive, incomplete, badly constructed, sterile, white marble buildings—and in the process, much of the historic old city was destroyed. Scores of construction cranes stand idle. For most of the year since the Ceaucescus' demise, the nearly destitute people of Romania were caught in the bind of having to choose between the two enormously costly and bleak alternatives of either tearing it all down or completing it.

There is a computer in this national tragedy. It is being used by architect Mariana Celac to try to build a graphics database to digitally reconstruct the destroyed old city, and of the deteriorating pieces that remain, in as much detail as possible. Many of these computerized images will have to be built from people's memories. Gathering information for her two-year effort "is complicated by the old regime's attempt to destroy the memory of the past along with its physical reality. People like Celac, who tried to take photographs before and during the demolition, had their cameras and film confiscated and occasionally were beaten. When City Hall decided that a new map would be needed for the area, it did not cut a new printing plate but etched over the old one" [1].

And what does Ms. Celac hope to do with this database? Given the staggering amount of white marble in place, and the recent decision of

the present neo-communist government to complete the Ceaucescus' project, her options are pitifully limited. She hopes it can be used to help get passages and some open land cut out from among the Ceaucescus buildings, and that these openings and the remaining portions of the old city might be rebuilt using the plans in her database [1]. But the economic condition of Romania—one of the slowest of the East European countries to embrace private enterprise or attract foreign investment—is such that most of the rebuilding is likely to be in her computer for some time.

Towns and Villages. The towns and villages of the countryside are divided into two classes: those Ceaucescus "rebuilt" and those he had not gotten to before he was overthrown. The former are grim places whose populations were evicted from their old homes and placed in "new" badly constructed Soviet-style buildings with poor sanitation conditions, little in the way of neighborhood facilities, and often in the shadow of filthy industrial operations. The latter are not infrequently pristine-looking villages where one of the few hints of the 20th Century can be seen in rubber automobile tires on the horse-drawn wagons.

Both the inhabitants of Ceaucescus's "Brave New World" and those he left in the 19th Century share an almost total lack of exposure to the modern information technologies beyond the broadcast media (16.6 TVs per 100 people). For all practical purposes, there are no phones in private rural households. It is not uncommon for an entire small town or village to have less than a half-dozen telephones.

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tion, in May 1990, temporarily brought a computer network to the Romanian countryside. Each of the roughly 40 county-sized election districts and Bucharest supposedly had at least one microcomputer in the district election center, and they were connected to the national center in Bucharest via telephone lines and a simple star-like dial-in topology. Election results for each district were gathered at the local center, tabulated, and forwarded to the national center. So far, I have no information on how well this worked in practice.

Education. Most of the CEPECA's computer-related instruction is provided by its Center for the Management of Information (CMI). Dan A. Farcas helped create the CMI under the U.N. program. In 1982 he was purged by the regime and forced out of CEPECA. Farcas was reinstated as director of CMI in the spring of 1990, a few months after the overthrow of the dictatorship. He was reunited with an old friend—a fully operational IBM 360/40 that he helped obtain 22 years ago as part of the U.N. program.

Farcas and CEPECA hope to modernize their equipment and texts so they can provide contemporary educational offerings. But, as with all efforts to rebuild on the rubble, there are basic problems. For example, what kinds of courses should CEPECA offer? Do they use upgraded equipment to teach the old courses based on the neo-Stalinist economy? Or do they simply teach Western-style MIS courses that are based on economic structures that do not exist in Romania? Or do they teach rudimentary computing skills and wait until the

Romanian economy "finds itself" in some long-term way?

In Search of a Model

How does a political or industrial leadership help such an economy "find itself"? To this end, there have been many internal discussions of which economic and social model to adopt [2]. Among those explicitly considered and favored by a number of Romanian analysts and policy makers are: Sweden, Austria, South Korea, Japan, the U.S., Spain, Switzerland, Turkey, Poland, and Latin America.

In contrast to these discussions, which at times seem almost surreal¹, there are efforts by parts of the Romanian computing community to work out more frugal models for themselves to survive in the post-Ceausescu era. For example, ROMCD's general manager, Ovidiu Calugarescu, hopes his company can license production of machines (and their spare parts) that are obsolete in the West, but which still have a small user base in the hard currency countries and a prospective market in Romania. Given the past history of his company, there is a basis for such a strategy. Theodor Danila, the Dean of the Faculty of Control and Computer Science at the Polytechnic, believes that "by nature Romanians are very industrious, and labor force skills here are above average, and there is a better-than-average adaptability." He thinks they can train students to do internationally competitive systems development work. Everyone is looking for joint

¹One Romanian commentator has asked "how will all those people react who have been told fairy tales about the Austrian, the Swedish, or even the Japanese models and who will get instead food coupons in accordance with the Cuban model?" [2].

ventures with Western firms (e.g., to do contract software development or assemble products from imported components).

But even the most practical strategies are severely handicapped by crushing realities such as an extremely weak economic and commercial infrastructure and the lack of an adequate finance or distribution system. Almost every strategy and hope depends on Western help of some sort. But that help is not likely to be forthcoming, given the continuance of a neo-communist government (ironically elected by an overwhelming vote from the countryside), and as long as Romania has little to offer that is not available as cheaply and in better quality elsewhere.

Western observers often recommend that Eastern Europe needs to acquire better computer hardware and telecommunications equipment. Many in Romania would agree. But there is also the larger and more basic need to develop an economy and society that can nurture these more specific needs. This perspective was recently voiced strongly by Wlad Turski of the University of Warsaw:

The managerial techniques, certainly in Poland [which is in better shape than Romania], are so backward that [a] big improvement would be to bring them to the level of good managerial techniques of, say, the United States back in [the] '30s, '40s, '50s. And you see they were not relying on computers at that time, and that is provable because there were no computers. The use of information technology, the use of information processing sys-

tems, is a very fine tool. . . . But it's a subtle tool, and when you need a heavy job to be done, the use of a fine and subtle tool is usually counterproductive: you break the tool, . . . and you haven't done your job either. What's even worse, you compromise the tool while attempting to use it. In my country, there is a situation of a bank which doesn't know how to cash a check and there comes an expert from abroad that tells them to install computerized teller stations. It wouldn't improve it an iota. They still don't know how to cash a check. They don't know what a discount is. They need to change their managerial

and business practices to the point at which they become dependent on a rapid supply of information. . . . What use is a word processor to somebody who never answers a letter? The most advanced desktop publishing technology will not make people not accustomed to answering letters start answering letters! You have first to make it necessary for the business to function to answer letters. Now, when answering letters becomes a necessity, [a] matter of life or death for a business, then, yes, send them [a] word processor, but not before [3].

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As discussed in greater detail in the first "International Perspectives" column (which appeared in the Jan. 1991 issue of *Communications*), readers are encouraged to send comments, suggestions, anecdotes, insightful speculation, raw data, and submissions for guest columns on any subject relating to international aspects of the information technologies. **G**

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