INTRODUCTION

In April 1988 the Soviet scientific journal *Nauka i Zhizn* published a small article advising computer fans what to do if their tape-recorder does not have a counter [1]. I first thought that was a misunderstanding, that this article was placed in the computer section by mistake. It was not! The reader’s attention was called to the use of tape recorders to save computer codes and gave some practical hints how to organize directories on magnetic cassette tape using a standard tape-recorder without a counter (which seems to be presently the most widely produced and sold tape-recorder in the Soviet Union).

If you went to the city of Moscow with a privileged supply of goods of all kinds, to Elektronika computer shop, or the electronics departments of large department stores like GUM and asked for some magnetic media to record picture, sound or computer information, the sellers would look on you with disbelief: are you so uninformed or are you just provoking them? The normal tapes (not to mention videotapes) are chronically out of stock, floppy disks are not yet being produced in USSR . . . The only way you can get them might be on the black market; the price would be even more incredible than the story I am telling you now: Some 50 roubles for a 3½ inch floppy disk. On the official exchange rate it would run to 70–80 dollars. I can illustrate its real costs in another way: three floppy disks for an average monthly salary or two floppy disks for a salary of a postgraduate student in Moscow. When I recently asked a leading Soviet scientist and member of the Soviet Academy whether it is correct that Soviet industry has not yet started the production of this most important instrument for recording the information in the computer age, he answered: “Unfortunately it is so. We have bought licenses for the production of floppy disks, but our industry was not yet able to start it” [2].

It is almost equally difficult to buy a floppy disk in Prague. The state institutions possessing PCs have to plan the purchase of standard floppy disks.
2–3 years (!!!) in advance. However, the situation is still somewhat better than in Moscow. In December 1987 a small batch of floppy disks was imported and sold in Prague. A maximum of 3 were sold at a time, and only for private citizens. One 5\(\frac{1}{4}\) inch floppy disk costs 150 Kčs (at the official exchange rate some 20 US dollars) and the employees of state institutions were purchasing them daily for the state, pretending that it was for personal use. Let me just continue this absurd way of thinking and try to assess the actual costs of one floppy disk in Prague in the autumn of 1987. Taking into account the time spent going between the office and the shop and in the queue, one floppy disk cost the Czechoslovak state, in addition to the 20 US dollars, at least 45 minutes in labour costs. Swedish labour costs in the computer branch (including the social security costs) would be at least 50 US dollars per hour. Remarkably enough we arrive at nearly the same cost of one floppy disk for the state institution in Prague, which does not wish to wait 2–3 years for its floppy disks in the normal planning procedure, as on the black market in Moscow: some 60–70 dollars per one 5\(\frac{1}{4}\) floppy disk. The price in the West is usually around 1 dollar [3].

I decided to start this lecture with these examples from life because they give a very compact summary of the real problems I am going to speak about.

Let me close my introduction with a Soviet anecdote I was told many times during my recent stays in Moscow with several different variations:

Japanese experts were invited to assess the situation of Soviet electronics and computer techniques, and to tell them how long it would take before the Soviet Union would be able to catch up with Japan:

"We thought that you were behind us for 15 or 20 years. But now we have come to the conclusion that it is forever".

The picture given by the anecdote is certainly too dark. But voices from the Soviet press present the situation as being even worse than the anecdote does: in January 1988 the Soviet Literaturnaya Gazeta devoted a whole page to the problem of Soviet PCs: "TOMORROW WILL BE TOO LATE!" Some quotes [4]:

"... It is a catastrophe. No more and no less..."
"... The situation is threatening..."
"... It is a tragedy in all respects: in scientific progress and cultural development, in education where we were not a long time ago ahead... the gap is widening and we risk loosing a place among countries – as leaders of the world community..."
"... We have no choice: either with computers – and with a future, or without computers – and without a future..."
"... We are still on the edge of computerization... the first displays of personal computers are to be seen in schools and homes. What kind of computers are these? In fact there is only one computer – BK-0010. A slow