



INTEROFFICE MEMORANDUM

DATE: December 11, 1969

SUBJECT: **A Congeries on the Computer-in-the-home Market**

TO: **Operations Committee**

FROM: **Gordon Bell**

cc: **Jim Bell
Ad van de Goor
Larry Portner**

This memo was triggered by a number of things, and the result will be semi-structural ramblings. The triggering events were:

1. A discussion with Nick on it - - and a suggestion to jot down thoughts.
2. Seeing a DDP-316 computer being exploited by Neiman-Marcus for in the kitchen. (It doesn't do anything much, and if anyone of you has ever used a computer with only a Teletype for loading programs, you'll know it's useless.) Thus we'll do it right-er.
- 3. A lot of work at CMU on networks. Our present one is not way out enough to influence it, but I have students who are beginning to think about it. Thus, if you connect a computer to another larger computer, you gain a lot.
4. I currently have a computer terminal in my home, and can't imagine not having one! Everyone says that you want large central machines -- I say no, why make the telephone company bigger (let's make IBM bigger). Organization theory works against the large central one.
5. The price trend. (The price is that of a car or $1/5 \sim 1/10$ of a house.)
6. Looking at the computer-in-the-car market.
7. I've thought a lot about it; like all questionable ideas there comes a time to expose them.
8. Seeing the news releases on someone in Connecticut that bought an 8 for home.
9. They can conceivably be useful (in the Headstart sense) for teaching children.
10. It is a market of 50,000,000 +.
- 11. It's inevitable, so let's start now to get a headstart on the market.
12. I'm dedicated to bringing computers to the masses.

What would it Do?

1. Teach (children)

- a. My 9 year old wrote an arithmetic program to teach the 6 year old addition and himself multiplication. (My 9 year old while thoroughly enjoyable has only a slightly above average IQ.)
- b. The 6 year old uses it as a desk calculator.
- c. The 9 year old learns about algorithms and is just getting the idea of a program. Aspires to write a tic-tat-toe playing program; only knows JOSS and Perlis's LCC. Prefers LCC because of language richness.
- d. Both children are learning to type.
- e. There are many "canned" teaching programs that can be useful. (arithmetic, spelling, word recognition .)
- f. In upper grades it could be useful for mathematics.
- g. Learn new computer and natural languages.

2. Self-improvement for adults

- a. Learn Programming. My wife is a typical PhD in the Social Sciences, and unlike her students who she can force to take computer programming courses, she learns at home. Other wives can learn programming and algorithms. This creates a source for programmers because the machine teaches programming. Life often becomes tolerable for people once they understand that a good model for most systems they encounter is a small (finite-state) machine. In short, things are pretty predictable.
- b. Learn new programming languages. I was recently forced into really learning LISP (I was teaching it) and it would have been impossible for me without a computer.
- c. Learn new skills. The use would be a typical teaching machine. These include foreign language, vocabulary, typing, accounting, mathematics, etc. These programs might be used in conjunction with a text.
- d. Correspondence courses.
- e. Learn typing.

3. The small home-based self-employed business. (This is a market unto itself, and a fair dinkum product line in the DEC product line sense would be wise to start here because it's really sure fire.) This market includes doctors (who are inherently gadget-addicts and can afford to be), lawyers, etc. The computer is an expense, and with a minute amount of effort we can come up with tasks it can do to pay for itself. The following tasks are generally beyond the mental scope of the average professional (e.g. doctor).

- a. Keep appointments
- b. Write, bills
- c. Keep inventory
- d. Do taxes
- e. Balance checkbook
- f. Order processing
- g. Letter filing

3A. DEC Salesmen. The kinds of tasks would be similar to 3 above. In addition a machine could take in the DEC daily expense sheets and produce the weekly voucher. Since this accounting system was designed to maximize the time spent by DEC secretaries, maybe we don't want to use a computer. On the other hand we could probably put the secretaries to work on something more useful like counting the supporting beams in the mill or something.

4. Play Games

- a. Entertainment for simple games (e.g., my kids occasionally get me into a friendly game of monopoly. This is bad because I hate monopoly, and second, I can't play without winning.) Simple games like rummy, monopoly, etc. could be played in the teaching mode.
- b. Teaching complex games - This is a bit far fetched for a small computer (e.g. my children use the Greenblatt chess program on the PDP-10, to improve their game.)
- c. Poker - For the poker player, he can sharpen up.
- d. Football games, etc. The whole game market.

4A. Musical Instrument

5. Quantitative Analysis

- a. Bookkeeping/budget/cash flow. (My wife took this problem as a vehicle to teach herself programming.) She wrote a program in which one enters monthly expenditures in about 20 categories and the program holds the data. It can be retrieved, summed over months, plotted (as bar graph) cash flow calculated, etc. She may incorporate checkbook control too. As a by-product, the data is all set to be used to make out the income taxes.
- b. Income tax figuring . A good program would know the ways to help cut the tax for the user.
- c. Stock portfolio analysis. For those who need it, such a program could be written.
- d. Insurance - checking. (Get rid of those guys who sell insurance.)
- e. Food buying. The user could give constraints, and a linear program could optimize the diet (e.g. so many turnips, pork, milk, etc.) and then proceed to plan menus. This program might need updating every 6 months for food costs. Food lists in terms of storing recipes and quantities - especially
- f. Time analysis. For those concerned that they waste time, an analysis program could help them.

6. Filing/ Editing

- a. Use for mailing list at Xmas time, print your own Xmas card labels.
- b. Keeping phone numbers, addresses.
- c. Keeping files of all collecting hobbies: stamps, shells, slides, etc.
- d. Keeping personal library file
- e. Keeping bibliographies
- f. Doing indexes for books.
- g. Holding and typing letters.
- h. Memos, papers
- i. Books (try one out with DEC tech writers)
- j. Personalized letters to your Senator, Congressman, Governor, President, etc.

7. A Calendar

- a. Anniversaries, birthdays
- b. Appointments
- c. Automatic reminders (baking, pick up children, etc.)

- d. Day-to-day appointments.
- e. Medical records - when children should be vaccinated and for what.
- f. Remind me to put up storm windows, flush water softener, clean furnace filters, etc.

8. Control (These are a bit way out)

- a. Furnace, air conditioning, climate control (many loops in a plant control sense). Close windows when it rains.
- b. Burglar alarm - Sense inputs, call police, make sure doors are locked at night.
- c. Run dishwasher or other device which have relatively complex time sequences.
- d. Provide a control system for a constant-temperature-constant pressure water system (shower)
- e. Control lights.
- f. Private music controlling with own choice.

9. Future

- a. Play complex games - e.g. chess
- b. Print letters in the home. I would like to eliminate the post office, because it's getting senile. Also if we can have that money for a network, the network is more feasible.
- c. Shopping in the home (from cable TV)
- d. Print newspapers, too.
- e. Order books, magazines, etc.
- f. Scan periodical for keeping informed as to what to read.

What Would the Computer Look Like?

At least initially, I think the computer should be a fairly straightforward small computer. Eventually there should be scopes, but since the LINC's have never had hard copy, maybe you can get away with just scopes. It would have a keyboard, and probably hardcopy output. As an added bonus, an electric typewriter is a nice thing to have around the house. (preferably a Selectric) You might give the computer an extra connection to the phone line, so that when it got into trouble, it could call up the nearest large time-sharing computer to get help. (When it's trying to get most vitamins for the lowest cost in a diet.) Also, it seems absolutely necessary to have some form of low cost, but rather painless input media for new programs. The Cassette

cartridge looks great to me for this. Thus, we can visualize having something like a program of the month club to which the subscribers belong. It would not be a kitchen computer, ala Honeywell/Nieman-Marcus -- but a "family room" game room, study computer.

What Would the Software Look Like ?

For the kinds of programs we have been talking about I would strongly recommend that most programs be applications programs. In the cases where the user is learning about programming, it should be at a fairly high level.

In order to get lots of programs written, because variety will sell the deal, and also since some users would also write applications programs, the systems should be written at a very high level. I think FOCAL is almost at a high enough level, provided it has better string facilities, and the ability to work with files. On the bookkeeping program my wife wrote, it is only a page of code, and it has lots of string manipulation embedded in it. In the case of dedicated machines, and for the tasks we are talking about, the language can be very, very slow (interpretive) as long as it is powerful.

How to Proceed

There seems to be several ways one could proceed, all of which say we should spend sometime thinking a bit more before we act.

1. Just agree to spend some time thinking about the configurations, and then go on to write some of the basic software, and then distribute a number of computers to see how they would be used. Some machines could be either loaned or purchased by DEC employees, e.g. salesmen, engineers, programmers, technical writers. (I'm not volunteering yet).
2. Carry the idea forward a bit, get an approach, and then get a software company to get in bed and then try to peddle it. The software company really makes out in this deal, because it is sold like a record of the month club. (That's also appropriate to the people generating the software, because there could be glossy record-cover-like covers. Just picture for a minute a glossy photograph of Harris Hyman and his nimble coding pencil, as author of a Parcheesi program .)
- 3, I'd like to get somebody to work with me on this . . .

Now _____

Soon _____

Later _____

Never _____

(Check one.)