Technical English

for Computer Science

Week 2

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The Processor

adaptor boards *registers* *microprocessor*
clock *conductive* *buses*
system board *accumulators* *input or output devices*

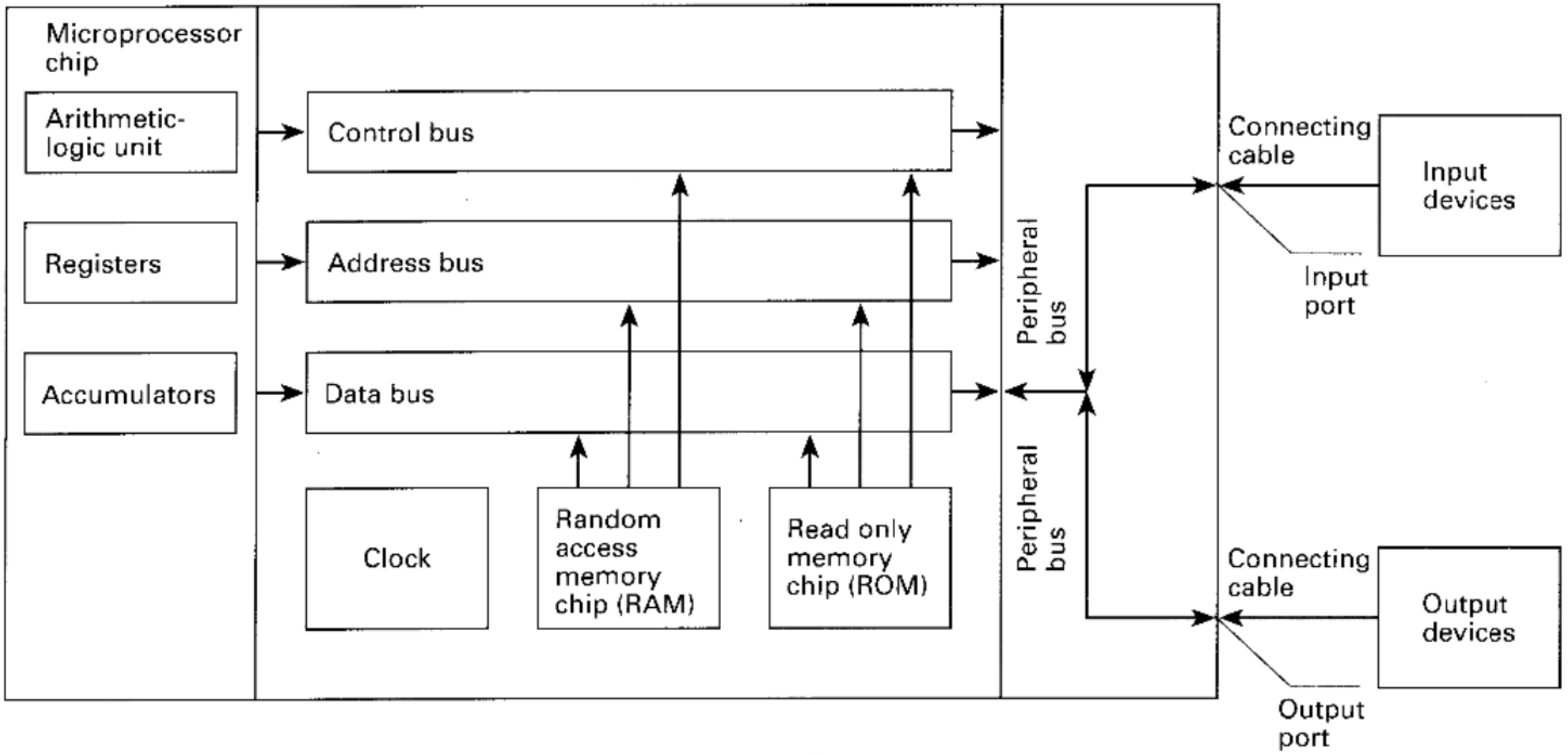
Structure of the processor

The processor consists of a [1] _____, which is a circuit board on which are mounted [2] _____ chips, memory chips, and other components linked together by [3] _____ lines or channels in the form of control, address, and data [4] _____. In addition, a processor has [5] _____, which are electronic circuits providing specialized functions such as graphics, or which connect a system board to [6] _____. The system board also consists of electronic devices, such as an electronic [7] _____ for controlling the speed of operation; [8] _____, which store numeric data during the course of processing; and various [9] _____, including sequence control register, address register, and function register.

Reading

Use the information in the reading passage and the diagram to help you match the terms below with the appropriate explanation or definition.

A processor consists of many different electronic circuits and devices for performing control functions, arithmetic and logic operations, and data transfers. Data may be transferred from backing storage to the internal memory or from the internal memory to the arithmetic unit by means of conductive channels known as buses. The part of the processor which controls data transfers between the various input and output devices is called the control unit.


Microprocessor chip
Arithmetic-logic unit
Registers
Accumulators
Control bus
Address bus
Data bus
Clock
Random access memory chip (RAM)
Read only memory chip (ROM)
Peripheral bus
Peripheral bus
Connecting cable
Input devices
Input port
Connecting cable
Output devices
Output port

1	microprocessor chip	**a**	used to send address details between the memory and the address register
2	registers	**b**	consists of an arithmetic-logic unit, one or more working registers to store data being processed, and accumulators for storing the results of calculations
3	accumulators	**c**	a group of signal lines used to transmit data in parallel from one element of a computer to another
4	control bus	**d**	groups of bistable devices used to store information in a computer system for high-speed access
5	address bus	**e**	an electronic circuit, usually a quartz crystal, that generates electronic pulses at fixed time intervals to control the timing of all operations in the processor
6	data bus	**f**	used for storing part of the operating system and application software known as 'firmware'; can only be read; cannot be written to or altered in any way
7	clock	**g**	used to store numeric data during processing
8	RAM	**h**	a group of signal lines dedicated to the passing of control signals
9	ROM	**i**	used for the temporary storage of application programs and data; can be written to and read from

Portable Computers

Discussion

- How small do you think computers can usefully become?
- To what extent does the size of a computer influence what it can be used for?

Before reading text, match these words with their definitions

a	clipboard	**1**	surface on which pictures or data are shown
b	stylus	**2**	electrical force
c	screen	**3**	pattern used as a guide for creating letters or characters
d	grid	**4**	individual dot on a computer screen
e	voltage	**5**	network of lines crossing at right angles
f	pixel	**6**	pointed implement for drawing or writing
g	template	**7**	portable board with a clip at the top for holding papers

Catherine Bull investigates

This week: software

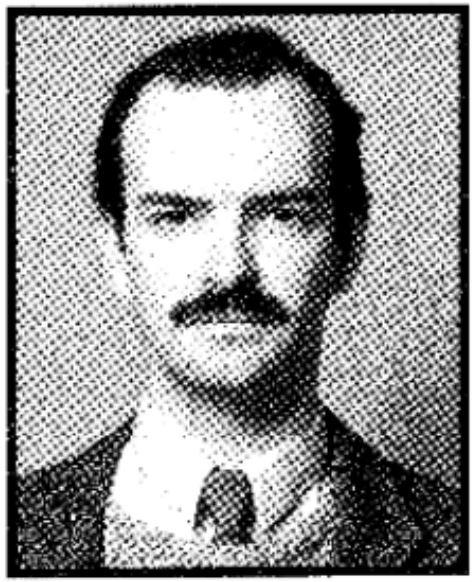
Software technology is getting more complicated. Developers have to cut through a jungle of computer languages, operating environments, and shifting standards to choose how they'll create their software. It's not an easy job. Software purchasers will have to live with the results for years to come. Which advances in software technology will prevail? Which ones will be just a flash in the pan?

I chose four well-known software developers and asked each to talk about current and future trends in software technology. Their comments reveal some common and diverse themes.

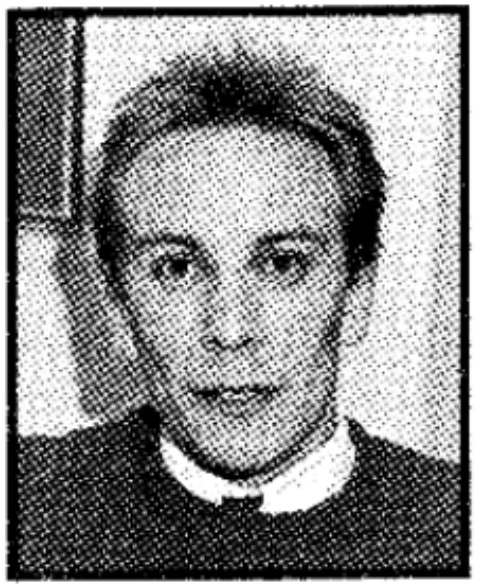
I began by asking them if they thought that software purchasers are getting what they need? What should developers be doing differently to give purchasers a better product?

Mary Evans 'In general, I think people are getting what they want – there are a lot of creative things being done with paint software, word processing, DTP (desktop publishing) systems, and the like. Do users want more? Of course! Users will always want more. The computer is an incredibly powerful tool, and any software that makes it easier, faster, more creative, or more cost-effective will inevitably be in demand. But I'm generally optimistic about the way things are going at the moment. I think most of the major software manufacturers are able to read the market quite well.'

Gerry Harper 'I'm afraid I completely disagree with Mary. I just don't think that software purchasers are getting the technical support they need. While the products are getting more and more complex, and more and more expensive, it seems that support is starting to be thought of as an additional business opportunity. More generally, I've thought for some time that applications are getting too big, and that they're trying to do too much. Yes, they're versatile and powerful, but they're also often overwhelming. I think what we need are simple little programs that are easy to understand and use, and that work together to accomplish more complex tasks.'



Matt Andrews 'I really can't agree with that. To imagine we can just go back to "simple little programs" just ignores the complex needs of many of today's software users. No, I'm sure that you can't stop progress. Suppliers know what their customers want – they just can't supply it quickly enough. I've studied the market very closely, and I've found that purchasers' needs seem always to exceed the capability of the available software by a constant time-frame of about six to twelve months.'



Bob Bolton 'I think users are getting what they want, provided that their needs fit the off-the-shelf application. Specialized software is usually so specific that it should be written in-house for businesses. Developers should add features that the customer needs, not what they think customers want. Some effort should be made to get feedback from the users before making an upgrade so that the proper features are added.'

Each of the following comments from the text is followed by two paraphrases. Decide which paraphrase (**a** or **b**) is closer in meaning to the original comment. Remember to look at the comments in their original context.

1 'Developers have to cut through a jungle of computer languages, operating environments, and shifting standards...' (line 1)

a The huge number of languages, environments, and standards makes life difficult for software developers.

b Software developers have to act to reduce the number of languages, environments, and standards which currently exist.

2 'Their comments reveal some common and diverse themes.' (line 8)

a They talk about ordinary and wide-ranging topics.

b They agree about some issues, but disagree about others.

3 'I think most of the major software manufacturers are able to read the market quite well.' (line 20)

a Most software manufacturers understand what consumers want.

b Most software manufacturers know how to influence users to buy more of their products.

4 '...it seems that support is starting to be thought of as an additional business opportunity.' (line 25)

a Increased technical support is a means of making software more attractive to businesses.

b Software manufacturers are using the fact their products are complex to start selling technical support to their customers.

5 '... purchasers' needs seem always to exceed the capability of the available software by a constant time-frame of about six to twelve months.' (line 37)

a It takes about six to twelve months for purchasers to understand fully the software they buy.

b The software customers want now what will only become available in about six to twelve months.

Which of the four speakers do you most agree with? Why?

Using the line references given, look back in the text and find words or phrases in the text that have a similar meaning to:

1 penetrate (lines 1–5)
2 changing (lines 1–5)
3 win, survive (lines 5–10)
4 buyers (lines 10–15)
5 understand (lines 20–25)
6 flexible (lines 25–30)
7 too big/complex to manage (lines 25–30)
8 achieve (lines 30–35)
9 go beyond (lines 35–40)
10 information about a product/service (lines 40–45)

Computer networks

Computer networks link computers by communication lines and software protocols, allowing data to be exchanged rapidly and reliably. Traditionally, networks have been split between wide area networks (WANs) and local area networks (LANs). A WAN is a network connected over long-distance telephone lines, and a LAN is a localized network usually in one building or a group of buildings close together. The distinction, however, is becoming blurred. It is now possible to connect up LANs remotely over telephone links so that they look as though they are a single LAN.

Originally, networks were used to provide terminal access to another computer and to transfer files between computers. Today, networks carry e-mail, provide access to public databases and bulletin boards, and are beginning to be used for distributed systems. Networks also allow users in one locality to share expensive resources, such as printers and disk-systems.

Distributed computer systems are built using networked computers that co-operate to perform tasks. In this environment each part of the networked system does what it is best at. The high-quality bit-mapped graphics screen of a personal computer or workstation provides a good user interface. The mainframe, on the other hand, can handle large numbers of queries and return the results to the users. In a distributed environment, a user might use his PC to make a query against a central database. The PC passes the query, written in a special language (e.g. Structured Query Language – SQL), to the mainframe, which then parses the query, returning to the user only the data requested. The user might then use his PC to draw graphs based on the data. By passing back to the user's PC only the specific information requested, network traffic is reduced. If the whole file were transmitted, the PC would then have to perform the query itself, reducing the efficiency of both network and PC.

In the 1980s, at least 100,000 LANs were set up in laboratories and offices around the world. During the early part of this decade, synchronous orbit satellites lowered the price of long-distance telephone calls, enabling computer data and television signals to be distributed more cheaply around the world. Since then, fibre-optic cable has been installed on a large scale, enabling vast amounts of data to be transmitted at a very high speed using light signals.

The impact of fibre optics will be considerably to reduce the price of network access. Global communication and computer networks will become more and more a part of professional and personal lives as the price of microcomputers and network access drops. At the same time, distributed computer networks should improve our work environments and technical abilities.

Read this summary of the text and fill the gaps using the list of words below.

Computer networks link computers locally or by external communication lines and software [1] _____, allowing data to be exchanged rapidly and reliably. The [2] _____ between local area and wide area networks is, however, becoming unclear. Networks are being used to perform increasingly diverse tasks, such as carrying e-mail, providing access to public databases, and for [3] _____. Networks also allow users in one locality to share resources.

distinction	*fibre-optic*	*protocols*	*synchronous*
distributed systems	*LANs*	*queries*	*workstations*
environments	*parses*	*screen handling*	

Distributed systems use networked computers. PCs or [4] _____ provide the user [5] _____. Mainframes process [6] _____ and return the results to the users. A user at his PC might make a query against a central database. The PC passes the query, written in a special language, to the mainframe, which then [7] _____ the query, returning to the user only the data requested. This allows both the network and the individual PC to operate efficiently.

distinction	*fibre-optic*	*protocols*	*synchronous*
distributed systems	*LANs*	*queries*	*workstations*
environments	*parses*	*screen handling*	

In the 1980s, at least 100,000 [8] _____ were set up world-wide. As [9] _____ orbit satellites have lowered the price of long-distance telephone calls, data can be transmitted more cheaply. In addition, [10] _____ cable has been installed on a large scale, enabling vast amounts of data to be transmitted at a very high speed using light signals. This will considerably reduce the price of network access, making global networks more and more a part of our professional and personal lives. Networks should also improve our work [11] _____ and technical abilities.

distinction	*fibre-optic*	*protocols*	*synchronous*
distributed systems	*LANs*	*queries*	*workstations*
environments	*parses*	*screen handling*	

Using the line references given, look back in the text and find words that have a similar meaning to:

1 unclear (lines 15–20)
2 place (lines 25–30)
3 carry out (lines 35–40)
4 cost (lines 70–75)
5 world-wide (lines 80–85)

Now look back in the text and find words that have an opposite meaning to:

1 disparate (lines 10–15)
2 conflict *v* (lines 30–35)
3 preventing (lines 70–75)
4 tiny (lines 75–80)
5 increase (lines 80–85)