PEOPLE : IMPLICATIONS

After our sketchy survey of people's requirements when using computers, we can make a shot at laying down specifications for facilities which should be provided by operating systems. Clearly, this specification is incomplete : it lists too few points, and does not pursue the analysis to a sufficient level of detail. You might like to consider what points have been missed, and what details are needed, in the light of your own experience.

It is useful to regard the requirements as *abstractions*. The next step, for which we need more detailed analysis, is to define carefully the details of the abstractions we want, then to define some sort of *interface* – typically, though not necessarily, something like a procedure call – which we could use to provide the service. This interface can then be used by high-level software, and it must be provided by lower-level means, which might be hardware or software.

It is important that the high-level system need not know anything about the machinery of the lower-level implementation. This is the software engineering principle of *information hiding.* If scrupulously adhered to, it insulates the development of the different levels of the system from one another. Reflect on the importance of getting the interface definition exactly right.

WHAT DO PEOPLE NEED ?

PEOPLE IN GENERAL :

- A machine to do the work. (We'll call it *the computer* for convenience, but anything capable of doing the required job would do.)
- Machinery to use the computer.
- A way to instruct the computer system to do what they want. What they want is, generally, to perform some action on some object. (In individual cases, action or object may be implied, or multiple.)
- Facilities to do the things they want.
- Assistance and information on what the system provides, and in case of difficulties.
- Means to store things between working sessions.

IN A SHARED SYSTEM :

- Safety from interference by other people.
- Means of communication with other people.

ADMINISTRATIVE PEOPLE :

- Ways of keeping track of who is using the system, and to what extent.
- Ways of sending out bills.
- Information about system performance.

SYSTEMS PROGRAMMING PEOPLE :

- Ways of writing the system software.
- Application programmer interfaces.

THE SYSTEM MUST PROVIDE :

- A computer – something which will store instructions and data, and automatically follow the instructions.
- Some devices with which people's instructions can be communicated to the computer system, and the system's response returned to the people, and whatever is needed to make it work.
- A way to identify the action and the object which define the task to be performed.

- Means to perform commonly required actions.
- A way of answering people's questions, and offering useful advice, information, and assistance as required.
- A reliable long-term storage device.

IN A SHARED SYSTEM :

- An effective security system.
- An effective communications system.

FOR ADMINISTRATIVE PEOPLE :

- A registration system.
- An accounting system.
- Means of collecting system performance statistics.

SYSTEMS PROGRAMMING PEOPLE :

- Languages.

QUESTIONS.

Why must the computer be able to store both instructions and data ?

Do all these implications spring from the altruistic ideal of helping people to get their work done ? Are there any other motives ?