General Certificate of Education
Advanced Level Examination
June 2011

Information and Communication Technology INFO3/PM

Unit 3 The Use of ICT in the Digital World

Candidate Booklet for the June 2011 examination

To be given to candidates on or after 15 March 2011

There is no pre-release material printed on this page

Information and Guidance

1 On receipt of this booklet, you are advised to check carefully that it is complete and that no pages are missing or illegible. There should be eight pages. If there are any problems you should consult your teacher.

2 The material contained in this booklet is provided for you to use in preparing for Section A of the INFO3 examination.

3 Prior to the examination, your teacher may give you assistance and advice to help you understand the content of this material.

4 You should use the time between receiving this material and the examination to familiarise yourself with its contents.

5 You are allowed to make comments or annotations on this copy of the material but you are **not** allowed to take this copy, or any other materials, into the examination.

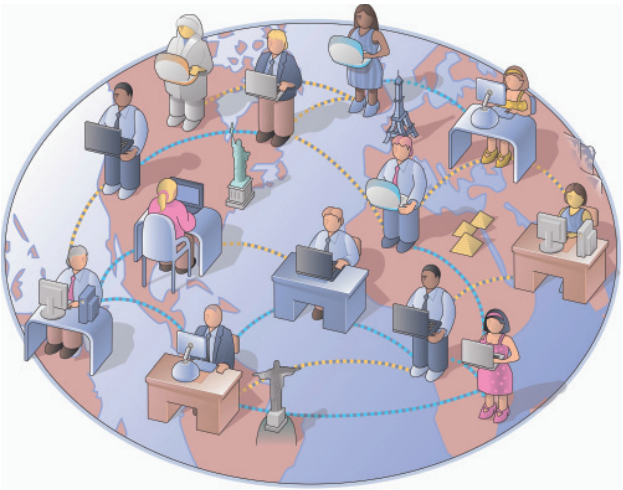
6 A clean copy of this booklet will be provided in the examination with the INFO3 question paper, so there is no benefit from learning the contents by rote.

7 The INFO3 examination is on **Thursday 23 June 2011** (morning session).

Magazine article A

The future of ICT is coloured green

The arguments for reducing energy consumption are well known. Apart from a small percentage generated from sustainable sources, most energy is produced from carbon sources such as oil, coal and gas. This releases carbon dioxide into the atmosphere and contributes to the "greenhouse effect", resulting in global warming.



With ICT accounting for 15% of the UK's office energy consumption, the time has come for organisations to make green computing part of their future ICT strategy.

Without doubt, organisations could benefit by using green computing – and not only from reduced energy bills. Since staff may prefer to work for an organisation with genuine green credentials, the outward perception of the organisation would be improved. Many organisations are already using "green issues" in their advertising and marketing, an example being the major supermarket chains.

How should organisations change their strategy? We already know that

manufacturers of ICT hardware have made some effort, with the EU Energy Star programme and the resulting power management features on PCs and laptops that automatically turn off components such as monitors and hard drives after a certain period of time. But is this enough? What more could be done?

Some argue that users of ICT equipment should save energy by changing their everyday procedures and working practices, such as asking all staff to turn off their equipment when leaving the office or by making increased use of teleworking.

However, there is no guarantee that staff will follow procedures and therein lies the problem.

Changed procedures are **definitely not** the path to green computing. The only certain way of reducing the energy consumed by ICT equipment is to use more energy efficient ICT hardware and to use package application systems where functionality is common across many organisations.

For hardware, organisations should make an inventory of all ICT equipment used, including PCs, laptops, servers, printers and network equipment. Air-conditioning for server and computer rooms should also be included. The energy efficiency of each item should be compared with that of a modern equivalent and replacements made where appropriate.

Apart from the capital expenditure involved, the change to new equipment would not affect the organisation or its systems and operations would be able to continue as before.

For application systems, though, organisations should consider using packages instead of bespoke systems. This is particularly the case with older legacy systems, which often rely on obsolete hardware and unsupported operating system software. Many organisations continue to enhance old legacy systems, even though common ICT application systems exist to support organisational activity. Just consider the waste of resources whenever business or legislative changes are required on these legacy systems.

Of course, replacement of bespoke systems with packages would require significant capital expenditure, although ongoing costs would be reduced by the use of packages. Perhaps a software "scrappage" scheme, similar to that previously used for cars and central heating boilers, could be used to encourage the replacement of old bespoke systems with packages.

The future of ICT is definitely green but this can only reliably be achieved by the use of new equipment and the replacement of bespoke systems with packages. Changed procedures are just not enough.

Turn over for Magazine article B

Magazine article B

How green is your ICT?

It's not easy being green, particularly when it comes to spending money on ICT equipment.

Many of the initiatives being proposed for green ICT involve significant capital expenditure but, following the recession, most organisations are fighting for survival and spending money on green initiatives is not a priority. But changing procedures and practices costs next to nothing, is instant and can reduce both energy consumption and lower costs.

Of course, reducing energy **and** costs is the pinnacle of green ICT and companies usually strive to achieve this by investing in new equipment. But quick wins are possible by changing procedures and practices, including:

- Requiring staff to work from home for most of the working week
- Use of hot-desking
- Restricting staff to just one PC per person - preferably an energy-efficient laptop

- Reducing the times of on-line availability
- Purging storage
- Use of server virtualisation
- Procedures to turn off equipment at the end of the day

Working from home could result in significant energy and cost reductions, particularly if combined with the use of just one laptop per person. However, there are social and technical issues and these can have an impact on workers.

Less fuel would be used for commuting, smaller offices would consume less energy for heating (winter) and cooling (summer), and use of laptops would reduce energy consumption, as they are intrinsically more energy-efficient than PCs.

Another, less obvious, change could be to locate heat-generating equipment, such as servers, printers and copiers in different places in an office, rather than centralised in one area or room. This avoids "hot spots" which cause air-conditioning equipment to work harder in the summer and "cold spots" that result in heating being used less efficiently in the winter.

The Government and the ICT industry could assist the move to green ICT in many ways. For example, the law could be changed to remove the need for disclaimers that most organisations add to the end of emails. This would save server storage, paper and toner. Although server storage is inexpensive to purchase, operating servers over long periods of time is a major consumer of electricity. The Government could introduce other initiatives to assist the move to green ICT – it just needs a little creative thought.

Finally, organisations often use external suppliers for ICT services. These suppliers could be urged to adopt green ICT procedures as a condition of continued business.

END OF PRE-RELEASE MATERIAL

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