Higher Still
Notes

www.hsn.pwp.blueyonder.co.uk

Higher
Information Systems

George Kinnear

Release date
27/05/2003
File reference
HSN34440

Higher Still Notes

Higher Information Systems

Introduction

These notes were produced by George Kinnear, who is studying Higher Information Systems. The notes summarise the HSDU handouts given to him by his teacher.

We hope you find these notes useful, and we wish you all the best with your studies.

Please note

You can find Higher Still Notes for other subjects, such as Chemistry, on the web-site:

www.hsn.pwp.blueyonder.co.uk

Information Organisation

Summary Notes

Information Organisation

OUTCOME 1 – Explain the value of information

a) The distinction between data and information is correctly explained.

Data are recorded facts which appear unstructured. Information is data presented in context and with structure. Information has a cost.

b) The uses of information to individuals and organizations are correctly explained.

Planning – deciding in advance what is to be done and how it is to be done.

Plans should take account of risk (ie contingency plans).

Mission	the purpose of the organisation
Objectives	aims or goals to be achieved
Plans	strategies; methods of achieving objectives
Policies	ethical/moral/legal standards which limit behaviour

A **plan** is created to meet certain **objectives** which are defined by the **mission** of the organisation. Any **plan** must comply with the organisation's **policies**.

Levels of planning:

Strategic	top level; clear objectives over long term (3-5 years); little detail in plans, hence wide scope.
Tactical	middle level; follows strategic plan; scale: 1-5 years; more detail created, limiting scope.
Operational	bottom level; tightly focused aims; 1 day to 1 year; highly detailed, very little scope

Control – monitoring performance and comparing this with the expected results of the plan, in order to change the input to the system to make the results more desirable.

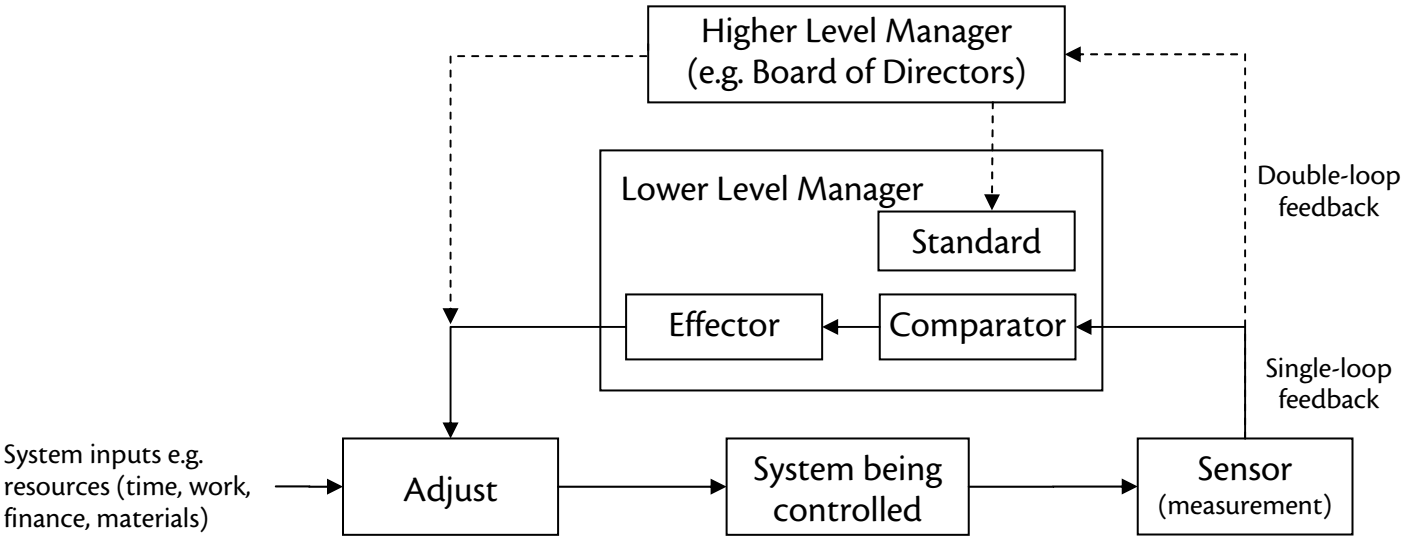
The nature of control differs with management level:

Operational	control is the main function of this level work/result is compared to specific quantifiable terms
Strategic	control more closely linked to planning monitoring progress against plan, perhaps changing the plan itself

Control is needed to respond to unexpected events.

Feedback is the process of using information on performance to alter the input to a system.

Single loop	basic control, adjusting inputs to bring the output in line with a standard
Double loop	involves higher management, who may alter the standard to fit new circumstances



Sensor measures output performance
Comparator comparing the actual with the expected and reporting any deviation
Effector action taken to alter the input

Decision Making – creating alternative options and comparing their merits to select the most suitable one.

Phases
Intelligence finding situations requiring decision making
Design creating possible solutions
Choice selecting and implementing the best option
Review evaluating the choice

Programmed operational decisions with automated responses.
Non-programmed non-routine situations requiring higher management

Management level	Decision characteristics	Information characteristics
Strategic	Long term, large scale resources, much creativity and judgement, usually unstructured, problems difficult to define, infrequent, much uncertainty	Largely external, informal sources important, forward looking, qualitative information important, precision unimportant, instant access not vital, wide ranging, incomplete.
Tactical	↕	↕
Operational	Repetitive, short time scale, small scale resources, usually structured, clear objectives and decision rules, little or no discretion.	Largely internal, mainly historical, detailed, often quantitative, high precision, instant availability often critical, narrow scope, comprehensive.

Certainty one possible outcome, known with absolute confidence
Risk a number of outcomes, each with a probability
Uncertainty unknown number of outcomes, their likelihoods not known

Education – learning from the past or present to improve future results of other information processes.

c) Information is accurately classified as strategic, tactical or operational.

The uses made of the information are used to classify it;

ie information used for strategic planning is strategic information. Also, see the information characteristics on the previous table.

d) A list of personal information requirements is produced.

Planning	aim: degree in computing plan: achieve necessary grades at school
Decision making	What will I have for breakfast?
Control	Have I got enough money for the cinema?
Education	Not going to a particular restaurant because of poor service on the last visit

OUTCOME 2 – Describe the characteristics and sources of information

a) The characteristics of information are correctly described.

Accessibility	The ease of access
Accuracy	The correctness or truthfulness
Appropriateness	Relevance; suitability or fitness
Completeness	Amount of information; omissions
Conciseness	Brevity of information; efficiency
Cost	The price or charge
Legality (including Copyright)	Relating to acquisition, copyright and use
Presentation	The appearance of the information; its aesthetic qualities
Structure	The organisation of the information; its navigation and searching
Timeliness	When information is received; its topicality
Value	Worth or importance

b) The major sources of information are correctly described.

External – from outwith the organisation

Important at a strategic level, where the organisation's environment must be considered.

Published Documentation

eg census figures, telephone directories, opinion polls, maps

Social Contact

Internet (World Wide Web)

Unlike other sources, the information on the WWW does not need to be approved by anyone before it is made available.

When looking at Internet sources, it is important to consider:

Credibility	the trustworthiness of the source
Accuracy	providing complete and timely information
Reasonableness	thoughtful/truthful, objective account
Support	convincing evidence, with corroborating references

Internal – from within the organisation

Marketing and Sales information
Financial information (profits, cash flow, etc)
Documentation (order forms, invoices, manuals)
Intranets

Same technology as Internet, but over a LAN.
All sorts of information and documents can be made available.
Unlike the Internet, concerns about the information's quality should not apply.
Other benefits are:

Cost savings	less paper/photocopying required
Timing	updated information is immediately available
Accuracy	improved consistency, since there is only one version of a document in use

c) The types of media for transmitting information are correctly described.

Broadcast – from one location to many users

Radio
Multicasting sending a video stream over the Internet
Television including teletext

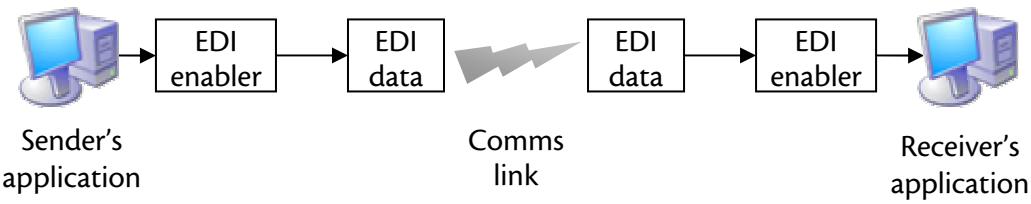
Digital – media stored or transmitted in binary format

Internet/Intranet
CD-ROM/DVD
Digital Television
Video Conferencing

Replaces actual meetings
Once very expensive, but new technology allows it to take place cheaply over the Internet

Electronic Data Interchange (EDI)

Allows computers to exchange business documents digitally



Benefits:

Reduced Costs	no paper/postage bills
Time Saved	no retyping of data
Improved Accuracy	no retyping eliminates errors
Improved Response Times	immediate transactions
Integration	allows all parts of a business to communicate

Paper – information supplied on paper

Benefits – **Portable** in relatively small amounts
No special hardware needed
Problems – **Bulky** can be expensive to transport
Fragile easily damaged (worn/ripped)
Costly especially if many copies are needed

OUTCOME 3 – Investigate the organisation of contemporary information systems

OUTCOME 4 – Explain the social, ethical and legal implications of information systems

a) The social implications of information technology are accurately explained.

Better technology has led to more efficient processors, allowing increased volumes of information to be handled.
A new 'information handling' sector of the workforce has emerged as information systems developed.

> **Telecommuters** work at home and communicate with their workplace through telecommunications links.
> *Advantages*: flexible work patterns, allowing work to be fitted around family life; reduced environmental pressures arising from commuting (eg pollution/congestion)
> *Disadvantages*: possibly leads to a society with poor social interactions; workers may have lower productivity as a result of distractions around the home.

Reduction in labour intensive jobs, coupled with an increase in information-based jobs.
Possible new jobs developing in years to come.
Social deprivation is a real possibility, with a division between those with access to information systems ("information rich") and those without ("information poor").

b) The ethical implications of information technology are accurately explained.

With systems such as the Internet, anything can be made available, so professionals (and also the general public) must follow acceptable standards.

Netiquette – a guide to polite conduct concerning the Internet

Censorship

- Different people are offended by different things, so boundaries are hard to define.
- Control of information could hinder freedom of speech.
- Users could be considered responsible for what they see, since search results usually make clear the general content of the pages.
- Spam: should senders of spam be censored/prosecuted?

Professionals

Many professionals' organisations (such as the British Computer Society) declare a code of ethics, which their members are expected to follow.

c) The legal requirements relating to information technology are accurately explained.

d) The extent and limitations of current legislation are correctly explained.

The Data Protection Act

Data Controllers	people keeping the information
Data Processors	people/companies processing the information held
Data Subjects	the people with information about them recorded

Data subjects can see all the information held about them, and have it corrected if they find errors. Note: they may have to pay administrative costs to do this.

Computer Misuse Act

It is an offence to gain unauthorised access to a computer system.

Unauthorised Access

- Includes trying to use/guess/obtain another person's password
- Penalties: 6 months in jail and/or a maximum fine of £2000

Unauthorised Access with Intent to Commit an Offence

- Applies if another related offence is to be committed, such as blackmail or robbery (not necessarily using a computer)
- Penalties: 2 years in jail and/or a maximum fine of £10 000

Unauthorised Modification of Data

- Offences include deleting another's files, introducing viruses, etc.
- Penalties: 6 months in jail and/or a maximum fine of £2000

Copyright, Designs and Patents Act

Duplication has become economically viable and requires little expense.
Transmission is also easier, for electronic media, and conversion to electronic form is also easier.
Manipulation of electronic versions can make infringements hard to detect.
Monitoring of electronic transmissions is rare, especially due to the impractically large volume of traffic.
Availability of copyrighted works is now far greater, so the temptation to duplicate them is increased.
Exposure to illegal copies has increased, diminishing the importance of copyright in public opinion.

Work Covered

Literature, music, drama, pictures/graphics/sculptures, motion pictures, sounds and architecture.

Not Covered

- Works not fixed in tangible form (eg choreography, improvised speeches)
- Titles, names, phrases, slogans, symbols, designs etc (Trademark law may apply here)
- Ideas, procedures, processes, concepts, devices etc (Patent/Trade Secret laws may apply here)
- Works consisting of common property (calendars, rulers, etc)

Copyright is secured automatically on creation of an original work. Creation occurs when the work is fixed (ie recorded). The copyright notice (eg Copyright 1999 Charlie Burton) is no longer needed, but is recommended.

Copyright generally lasts for the lifetime of the holder, plus 50-75 years after their death. The rights to a work can also be sold/transferred or bequeathed in a will.

Public Domain works have no copyright protection, because:
- The copyright has expired
- The owner has relinquished their rights
- The work cannot be copyrighted (eg US government documents)

The copyright on these works cannot be reinstated.

Fair Use is intended to allow people to access copyrighted works. Such use should generally be not-for-profit, only making copies of small portions, and not detracting from the copyright holder's market.

Computer Application Software

Summary Notes

Computer Application Software

OUTCOME 1 – Select software for specific applications

a) Types of application software are correctly described.

Communication	**Database**	**Graphics**	**Financial**
Publishing	**Spreadsheet**	**Reference**	**Word Processing**

Main purpose – how software will be used
eg word processing – enter/edit/format/print text

Functional Characteristics – what the software is capable of

Help	On-line help; wizards/assistants
Filing	Proprietary/standard formats; other applications'
Editing	Changing spelling; resizing graphics
Sort and Search	Alphabetical/numerical order; automatic searching
Calculation	Page numbers; spreadsheets' advanced functions
Text manipulation	Appearance/formatting; copy/paste
Graphics	Paintings; drawings; charts
Formatting	Changing format/appearance
Page Layout	Orientation; margins; header/footer; columns
Viewing	Scaling; showing comments; colours
Proofing	Check for mistakes – spell check/grammar/thesaurus
Communications	LAN/Internet – e-mail, file-sharing
Printing	Sections of large documents; collating; page order
Customisation	Improve ease of use/productivity, reflect preference
Automation	Macros for frequently repeated actions

b) Factors affecting the choice of software are explained.

Compatability

Processor and Operating System
IBM compatible/Mac; Windows 98-XP/Linux/Mac – must match the system.

Memory
Minimum **available** memory requirement must be provided by the system.

Peripherals
eg CD-ROM, modem, graphics card – software often requires the system to have these available.

Backing Storage Space
Free hard disc space for installation/files must be available on the system.

Functionality

What facilities do you require?
Which software best matches these facilities?
Too much functionality wastes resources (memory, backing storage, money)

Cost

Balance cost against functionality. What can you afford?

c) A number of appropriate software products are considered and one is selected.

d) The selected software product is justified in terms of cost, compatibility and functionality.

OUTCOME 2 – Install and customise application software

a) The factors affecting the installation of software are known.

CPU

Software for an Intel processor (in IBM PCs) is unlikely to run on a Motorola processor (in Apple Macs). Also, the processor must have the required processing power or the software will not work properly.

Operating System (OS)

As newer software generally exploits modern OS functionality, older OSs will not be able to run the software. Different OSs will not run the same software (eg Windows/MacOS).

Peripherals

Input, output or backing storage devices required by the software must be present for it to operate – eg a CD-ROM drive is needed to install software supplied on CD; a mouse and keyboard are needed to use the operating system.

OS Configuration

Functionality such as file sharing (provided by the OS) must be enabled for software which requires it.

Availability of RAM

Available memory allows the program to be loaded into memory. **Physical memory** is the total amount of RAM installed in the computer – **available memory** is what is left after the OS and other background programs are loaded into memory. Available memory determines whether or not a program can be used.

Free Disc Space

To install software, files must be copied to backing storage – clearly there must be enough free space to accommodate it. Also consider space for files produced in the software to be saved (eg Word documents).

b) The range of customisation features is known.

Customisations must **improve user productivity**, **enhance ease of use** or **reflect personal preferences**.

Operating System Customisations

These are general in nature – they will affect all applications (eg mouse tracking, double click speed)

Application Customisations

Only affects the customised application. Options vary among programs:

Menus	Add or remove menu commands, or reorganise them.
Toolbars	Choose which toolbars to display; add/remove specific buttons
Keyboard	Add/remove keyboard shortcuts
Colours	Choose colour palate (graphics); change text display colour
Editing	'Drag and drop'; automatic selection
Printing	Proof/Full print; paper size/orientation; watermark
Dictionaries	Add new words to custom dictionary (eg proper names)
Viewing	Rescale the display (eg for visually impaired users)
Searching	Search options (eg whole word; case sensitive)
Formatting	Setting paragraph styles (eg Microsoft Word) – saves time
Templates	Letterhead or other commonly used document layout
Macros	Invoke complex or laborious tasks with a keystroke

c) The installation is completed without assistance and the installed software executes correctly and efficiently.

d) The customisations are carried out efficiently and effectively and improve productivity or enhance ease of use or reflect personal preferences.

e) Legal requirements are known and observed.

Freeware

No charge for the software. No restrictions on copying, distributing or installing. Still, cannot be altered without permission from the copyright holder.

Demonstration software

Usually only parts of the software are provided, in a format similar to freeware, to encourage the user to buy the full version. Functionality (such as saving) may be disabled, or a time limit imposed.

Shareware

'Try before you buy'. Software will be fully functional for a restricted time period – if you wish to continue using the package, you must pay a registration fee.

Commercial software

Software licensed from a company. Different licenses allow different numbers of installtions:

Single User License	Most common arrangement. The software may be installed on one system only. Most licenses allow a backup copy to be made.
Volume License	Allows the software to be installed on a specified number of systems.
Network License	Allows any station on a network to use the software, provided the number of simultaneous users does not exceed a fixed limit.
Site License	Allows the software to be installed on every computer on a specific site, eg school, college or office.

OUTCOME 3 – Explore the advanced features of contemporary application software

a) Use of documentation and on-line help is efficient and effective.

Documentation

Installation Guide	Shows the user how to install the software.
Tutorial Guide	Teaches the user the basic functions of the software.
Reference Guide	Contains descriptions of all the functions the software can carry out. Often runs to hundreds of pages.

On-line Help

Reference Guide	Similar to paper documentation, with the added advantage of fast searching. Harder to lose than the paper equivalent.
Wizards	Performs complex tasks by asking the user for some simple details.
Training	Takes the user through the steps involved in performing a particular task with the software.

b) Exploration is carried out with limited assistance.

c) Exploration is effective in identifying advanced features.

Example – Microsoft Word 97

Filing	Saving to many file types is possible, including files compatible with earlier versions. Word has an auto-save function, which saves a copy of the file periodically. Different versions of the document can also be saved in one file, to allow backups of previous versions to be loaded.
Editing	Text can be highlighted and dragged to a new position without using copy/paste. As mentioned previously, different versions can be saved in one file, so any editing can be reversed easily. Comments can easily be inserted, with comments from different people possible, allowing different proof readers to make remarks
Automation	Macros can be created fairly easily, and advanced users can edit the actual script, since the language used is Visual Basic. AutoCorrect will automatically fix common mistakes in typing/spelling. Templates can be easily saved and loaded, allowing letterheads or standard forms to be produced more quickly.

Communication There is strong Web integration, as hyperlinks can be created and used, and documents can also be saved as web pages (in HTML format). Files can be opened as read-only since only one user on a network can edit a file at any one time

Formatting Attractive templates and clipart are available to use easily. Complicated column arrangements are possible, with different sections having different numbers of columns. Text wrap can take several forms, including 'square', top and bottom' and 'tight' – where the wrap points can be customised to run the text round a graphic

Proofing Sophisticated spelling and grammar checks can be performed, and a thesaurus is available. Proofing comments can be inserted. Spelling or grammar errors are automatically underlined.

OLE Object Linking and Embedding is fully supported; Excel charts can be inserted, as well as music and images, or videos. Word documents can also be inserted into other applications.

d) Description of advanced features is accurate and concise.

OUTCOME 4 – Evaluate and compare software products

a) The products are evaluated in terms of key characteristics.

b) The products are compared in terms of key characteristics.

Cost

Compare the stated costs of the software (consult resources). To evaluate the cost, you must consider the other characteristics of the software – is the more expensive software worth the money?

Compatibility

Processor and Operating System

Compare the requirements of the software. Is it possible to exchange files with users of different OSs? What file formats is the software compatible with?

Memory

How much available memory does each piece of software require?

Peripherals

Does the software require special peripherals?

Backing Storage Space

How much space does the software take up?

Functionality

State any similarities in the features available, and then concentrate on the differences which exist.

Ease of use (including user interface)
Perhaps conduct a simple task in both packages and see how easy it is to do. Consider the menu commands and keyboard shortcuts available, and any notable features of the interface which you think make it easier to use.

Speed
This can be compared along with ease of use – is one package notably slower when performing certain functions?

c) The evaluations and comparisons are accurate and concise.

d) Use of technical terminology is correct.

OUTCOME 5 – Describe contemporary developments relating to application software

a) The developments relate to the application software and are non-trivial.

Speech-to-text	Embedded Hyperlinks	Embedded Artificial Intelligence
Ease of use	Functionality	Productivity

b) The developments are described in a historical context.

Using a microphone, a user can speak to the computer. The audio signal is processed and the computer software can recognise words in human speech – the software then enters this text as if the user had typed it. In order for the computer to accurately recognise words, users usually have to spend considerable time training the software by reading aloud set passages of text display on the monitor

Hyperlinks are pointers which direct users to other files or pages – when clicked, the browser takes the user to these files.

In applications hyperlinks can often be inserted, and which allows authors of word processing documents to refer to sources, or suggest further reading.

The AI checks the text input by the user as it is typed. In Microsoft Word, the AutoCorrect feature will automatically change common typing errors (eg "teh"→"the") and correct mistakes in grammar. These automatic changes reduce the time the user spends manually checking spelling and grammar, so allow the user to become more productive. The AutoComplete feature in Word also improves productivity since commonly used text can be easily inserted after only a few characters are input by the user. This also improves accuracy as the AutoText is perfectly duplicated, eliminating typing errors.

c) The stimulus to change is identified.

The technology needed to run such systems is largely in place, with good quality audio processing, sufficient processor power and free memory. Also, consumers are pushing the development – software developers will have a good market for their software, as it makes computing easier and more accessible to users. 71% of teenagers would prefer to speak than type.

As the Internet has grown in popularity (Bill Gates famously sending a memo to all Microsoft staff to announce the company's intention to lead the field) developers are being forced to include Web functionality in applications.

Developers of word processing software (eg Microsoft) were under pressure to create more functionality to increase user productivity, in order to gain a competitive edge in the market. For users, more advanced proofing tools were widely requested and developers used a form of artificial intelligence (AI) to provide these tools – the AI automatically checks and correct errors in the user's input.

d) The descriptions are accurate, concise and technically correct.

e) The social, ethical and legal implications of the developments are accurately described.

Ethical

This development may cause the forced redundancy of thousands of typists.

Legal

Users may unintentionally access illegal content on the Internet (eg pornography)

Social

Spelling and grammar will suffer since people will expect the AI to correct them – when there is no AI (eg writing), they may be unintelligible.