

DIPLOMA
PROGRAMME

Teacher Support Material

Information Technology in a Global Society

Internal Assessment



INTERNATIONAL
BACCALAUREATE
ORGANIZATION

For first examinations at HL in 2006
For first examinations at SL in 2004



Diploma Programme
**INFORMATION TECHNOLOGY IN A
GLOBAL SOCIETY**

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International Baccalaureate Organization

Buenos Aires

Cardiff

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*Diploma Programme
Information Technology in a Global Society
Internal Assessment
Teacher Support Material*

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Introduction

This teacher support material was prepared with the assistance of the senior examining team. It should be read in conjunction with the Diploma Programme *Information Technology in a Global Society* (ITGS) guide (published March 2004 for first examinations at higher level (HL) in 2006 and first examinations at standard level (SL) in 2004).

In brief, the requirements for internal assessment for the ITGS course (first examinations at HL in 2006 and first examinations at SL in 2004) are that:

- students at HL produce:
 - a portfolio containing **three** pieces of written work on social and ethical issues based on three different areas of impact (each 800–1,000 words)
 - an extension to **one** of the portfolio pieces (800–1,000 words)
- students at SL produce:
 - a portfolio containing **three** pieces of written work on social and ethical issues based on three different areas of impact (each 800–1,000 words)
 - a project that solves an IT problem set in a social context, consisting of three parts—a **product** developed through the integration of IT skills; a written **report** (2,000–2,500 words); and a **log book**.

The samples of work provided in this teacher support material are actual student work and are presented in their original styles, which may include spelling, grammatical and any other errors. They are pieces of student work that were submitted for the first examination of the new course in May 2004. They have been marked using the assessment criteria in the ITGS guide (published March 2004).

In addition to the samples of work by students there are further notes for guidance on internal assessment. These include: frequently asked questions; ideas on suitable topics; checklists for teachers and students; and a guide for students on writing references.

The purpose of this teacher support material is:

- to provide further clarification of the nature of internal assessment
- to offer guidance to teachers on their role in the production of internal assessment
- to provide further guidance on selecting suitable topics for the portfolio, the project and the portfolio extension, and to assist students with writing and presenting their work
- to show the application of the assessment criteria to samples of student work, and why the samples received the marks they did
- to demonstrate the use of the integrated approach to teaching ITGS described on pages 8–9 of the ITGS guide.

The Portfolio: Guidance for Teachers

Description

All ITGS students must complete a portfolio. The portfolio consists of three pieces of work, each based on a different IT-related news item, and produced as a result of the student's research and discussion with others. Each piece of work must be 800–1,000 words in length.

Each piece of work in the portfolio must be written under the criteria headings set out in the ITGS guide.

Ideally the course should be taught over a two-year period. The pieces of work in the portfolio should be selected from work done by the student throughout the course in order to show the student's maturing understanding of the subject.

The news item must relate, either directly or indirectly, to an area of impact as specified in section 3 of the syllabus. Each of the three portfolio pieces must be based on a **different** area of impact.

Process

1. Explain how internal assessment works. Students should be given a copy of the instructions for the portfolio from the "Internal Assessment" section of the ITGS guide.
2. Set a timetable for the different stages, for example, choosing a news item, first draft, final version.
3. Discuss possible sources for news items and give a number of examples.
4. Approve the news item chosen by the student. There is a portfolio proposal form in this document that may be useful, although it is not compulsory to use it.
5. Give lessons on how to tackle the exercise. Students should be advised on the use and evaluation of sources, notetaking, analysis, and the preferred system for references and the bibliography.
6. Advise the students individually if and when necessary.
7. Read the first draft and advise students on how their work could be improved, but do not annotate the draft heavily.
8. Check and advise about references and the bibliography.
9. Assess all student work according to the criteria in the ITGS guide.
10. Complete the appropriate forms, 3/IA and 3/CS, which can be found in the *Vade Mecum*.
11. Send samples to the IBO for external moderation.

Frequently Asked Questions: The Portfolio

- **How many sources should be used for each piece?**

A minimum of three sources in addition to the news item. These must all be cited within the text.

- **Should the teacher comment on drafts?**

The teacher is encouraged to comment on the first draft but should not heavily annotate or edit it.

- **Should the teacher write comments on the finished piece?**

This is not a requirement but comments can be very helpful to the moderator in understanding how marks have been allocated. Teacher feedback is essential to enable students to improve throughout the course.

- **Can the teacher annotate in pen?**

No. Use a pencil, as the moderator is required to use a red pen.

- **What do I do if I suspect a student's work is not their own?**

If you have reasonable evidence that this is the case, the student should rewrite the portfolio piece. If time does not permit this, make it clear on form 3/CS and submit evidence and reasons for your suspicions.

- **Can all portfolio pieces come from the same area of impact?**

No. Each piece of work must be based on a different area of impact.

- **Is the title of each piece of work in the portfolio important?**

Yes. It should relate directly to the article and should reflect the issue.

- **Does the IT background mean giving an historical account (criterion B)?**

No. The IT background involves focusing on the technologies and the developments that brought about the IT system.

- **What is a trend (criterion B)?**

A trend is a possible progression from the present system that may develop in the future.

- **Students often cannot identify a problem. How can this be avoided?**

Students should be encouraged to submit a topic proposal before beginning to write a portfolio piece.

- **What format should be used in the bibliography?**

Any standard format is acceptable. This should be consistent throughout the portfolio.

- **Do students get more marks if they provide more than two solutions?**

No. Students should provide only two solutions but evaluate them carefully.

- **Can students propose two IT solutions?**

Yes, although it is acceptable for one or both to be non-IT solutions.

- **Can the solutions address different problems?**

No. The solutions must address the same problem.

- **Can the student use explanatory footnotes?**

Explanatory footnotes are not recommended and, if used, must be added to the word count. Explanations are better placed within the body of the text.

- **Can the student use diagrams?**

Relevant diagrams can be very useful to explain a point, particularly in criterion B. All diagrams should be referred to in the text.

- **What extra information is required on each piece of work in the portfolio?**

Candidate name; school name; date; title; area of impact; page numbering; word count.

Introducing the Portfolio to Students

Students need guidance in selecting topics, reading relevant articles, and structuring the portfolio piece according to the criteria.

Selecting a Topic

A form like the one shown on the next page can be used by the teacher to approve the topic for any piece of work to be included in the portfolio. This should be done before any writing begins. In this way unsuitable topics can be identified at this stage.

Reading News Articles

Students need to acquire the ability to gather, analyse and synthesize information. Recognizing which elements in an article provide information about the IT background and the impact of the issue is difficult for many students. They may benefit from reading several news articles as a group and identifying the IT background, impact of the issue, the social and ethical problems and possible solutions. Students need to be aware that all four areas will not necessarily be present in every article and they will need to undertake research to present a piece that meets the requirements of all the criteria. A collaborative class discussion is a useful teaching methodology, but work from this activity must not be submitted for assessment. After sufficient practice, students should be able to find and interpret articles that will serve as the basis for their portfolio pieces.

Using the Criteria Headings

Each piece of work must address the assessment criteria A–E. The assessment criteria headings A–E must be used as sub-headings in each piece of work that is included in the portfolio. This method enables students to present their work in a structured and coherent way.

A form like the one below can be used by the teacher to approve the topic for a portfolio piece. This should be done before any writing begins. Unsuitable topics can be identified at this stage.

Portfolio Proposal	
Candidate Name	_____
Title of Piece	_____
Area of Impact	_____
News Item	_____

	(Author, title, publication, date)
Does the topic relate to ITGS?	<input type="checkbox"/>
Is the area of impact one that has not been addressed in a previous portfolio piece?	<input type="checkbox"/>
Was the news item published no more than six months before you started the course?	<input type="checkbox"/>
Does the article raise one or more social or ethical issues related to an IT system?	<input type="checkbox"/>
Is the problem clear?	<input type="checkbox"/>
Can you think of two viable solutions?	<input type="checkbox"/>
Do you have access to a range of resources on this topic?	<input type="checkbox"/>
Approved _____	Date _____
(Teacher's signature)	

This is an example of a completed portfolio proposal.

Sample Portfolio Proposal	
Candidate Name	<u>A. Candidate</u>
Title of Piece	<u>E-voting: What are the issues?</u>
Area of Impact	<u>Politics and Government</u>
News Item	<u>Mitchell, S. "E-voting first for Canberra" –</u> <u>The Australian IT 26 April 2001</u> (Author, title, publication, date)
Does the topic relate to ITGS?	<input checked="" type="checkbox"/>
Is the area of impact one that has not been addressed in a previous portfolio piece?	<input checked="" type="checkbox"/>
Was the news item published no more than six months before you started the course?	<input checked="" type="checkbox"/>
Does the article raise one or more social or ethical issues related to an IT system?	<input checked="" type="checkbox"/>
Is the problem clear?	<input checked="" type="checkbox"/>
Can you think of two viable solutions?	<input checked="" type="checkbox"/>
Do you have access to a range of resources on this topic?	<input checked="" type="checkbox"/>
Approved <u>A. Teacher</u>	Date <u>23/03/03</u>
(Teacher's signature)	

Portfolio Checklist

This checklist is an example of the kind of guidance the teacher can offer to students.

Criterion A: Presentation of the Issue **4 marks**

- Have you explained an appropriate social and/or ethical issue?
- Does the issue relate to the title of your piece of work?
- Does criterion A set the scene for your piece of work?

Criterion B: The IT Background of the Issue **5 marks**

- Have you analysed the IT concepts and explained the IT terms?
- Have you analysed the trends and developments that have enabled this issue to occur?
- Does criterion B address the technology rather than the history of the issue?
- Is your analysis specific to the topic rather than a general overview?

Criterion C: The Impact of the Issue **5 marks**

- Have you considered all the stakeholders?
- Does criterion C address issues that were raised in criterion A?
- Have you considered social impacts (for example, economic, political, cultural, legal, environmental, ergonomic, health, psychological)?
- Have you considered ethical impacts (for example, responsibility, accountability)?
- Have you evaluated the impact of the issue on society?
- Have you weighed up the advantages and disadvantages?
- Have you assessed the implications and limitations?
- Where appropriate, have you substantiated your conclusions with factual evidence?
- Have you identified at least one related problem?

Criterion D: Solutions to Problems Arising from the Issue

5 marks

- Was this problem identified in criterion C?
- Are both solutions feasible?
- Do the solutions both solve the same problem?
- Have both solutions been explained and evaluated?

Criterion E: Selection and Use of Sources

2 marks

- Is the news item included in the bibliography?
- Does the bibliography include at least three other entries set out in a standard format?
- Where possible, does the bibliography include a range of resources (for example, books, journals, newspaper articles, videos, interviews, URLs)?
- Is the news item attached?

Criterion F: Expression of Ideas Relevant to the Social Issue

4 marks

- Are ideas expressed coherently with supporting arguments and extended relevant examples?

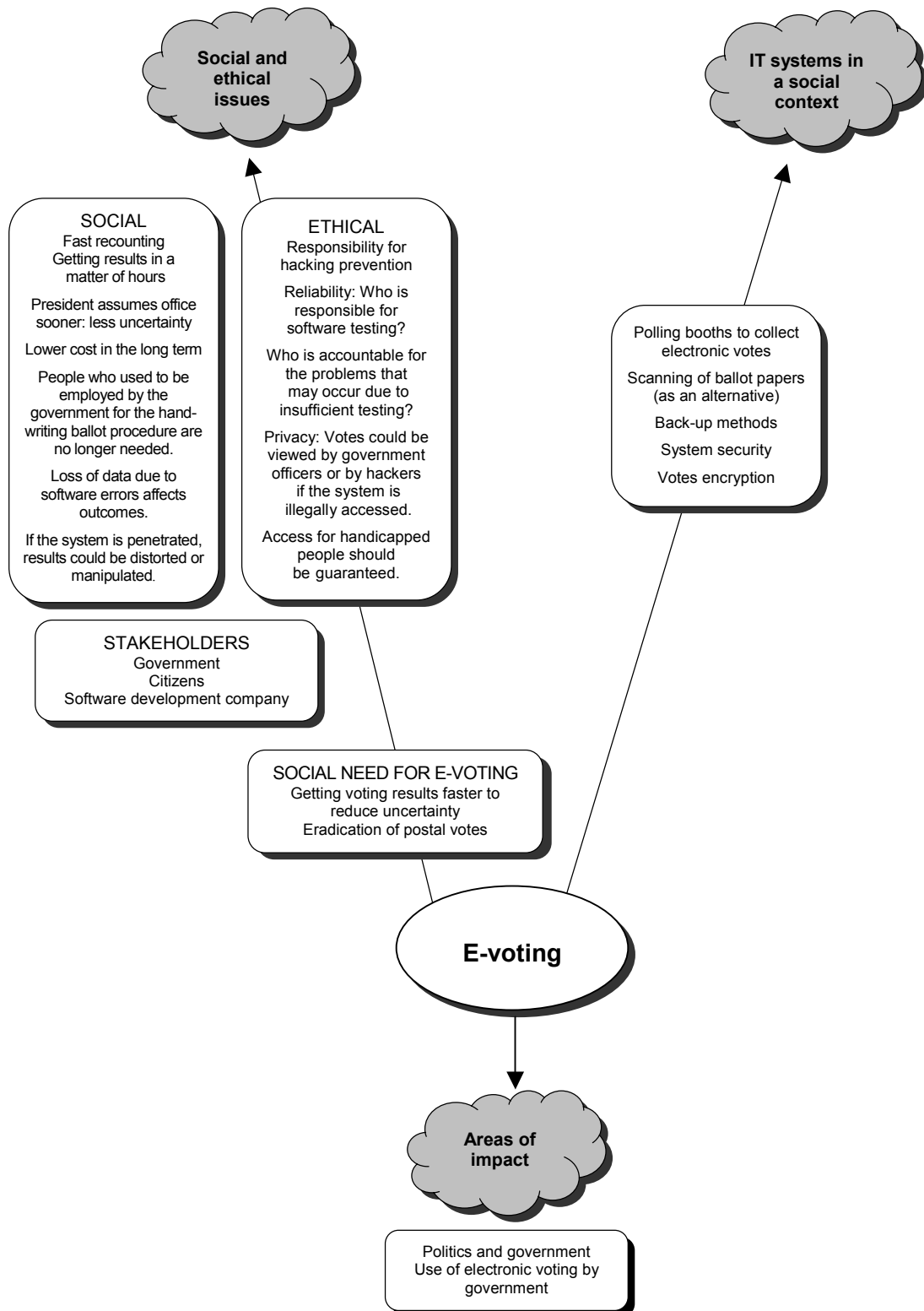
Record Keeping

- Does the piece of work have a title?
- Is the piece of work dated?
- Is the area of impact to which the piece of work relates stated?
- Is the number of words stated?

Brainstorming

It is good practice before the student starts writing to organize ideas according to the three sections: social and ethical issues, IT systems in a social context and the area of impact. A mind map like the one below could be used by the student to document this process.

ITGS Mind Map for Portfolio Piece “E-voting: What are the Issues?”



Sample Teacher Feedback

Teacher feedback on each portfolio piece is essential if the students are to improve during the course. A form like the one shown below could be used by the teacher. This is not an official IBO form but the school could use this one or design something similar.

Portfolio Feedback Sheet

Candidate Name	A. Candidate
Title of Piece	E-voting: What are the Issues?
Word Count 800–1,000 words	1,069 (too long)
Date Written	12/02/02
3/CS Signed by Teacher	✓
3/CS Teacher Comments Included	✓

Criterion A: Presentation of the Issue

Comment	0	1	2	3	4
The issue has been described but needs to be fully explained. In the last paragraph the positive and negative impacts are merely stated.				✓	

Criterion B: The IT Background of the Issue

Comment	0	1	2	3	4	5
This is a very good description but a little more explanation is needed. Detail is needed on the actual voting procedure. How is a vote recorded and how is the voter's name checked off on the roll?					✓	

Criterion C: The Impact of the Issue

Comment	0	1	2	3	4	5
The stakeholders have been clearly identified. Advantages such as speed have been discussed. Disadvantages such as possible bugs, potential illegal access and manipulation of data have been discussed. The initial costs have been considered and long-term cost savings have been highlighted. The positives and negatives have been analysed and the implications and limitations have been discussed. There is evaluation of the impact on society. The problem of reliability has been clearly identified.						✓

Criterion D: Solutions to Problems Arising from the Issue

Comment	0	1	2	3	4	5
The problem is clear. The first solution is explained in the first paragraph. In the second paragraph it is evaluated. The second solution is clear. In the fourth paragraph it is evaluated. The evaluation is clear.						✓

Criterion E: Selection and Use of Sources

Comment	0	1	2
There is a comprehensive list of references set out in a formal bibliography. Throughout the text all facts have been substantiated and the sources have been properly cited.			✓

Criterion F: Expression of Ideas Relevant to the Social Issue

Comment	0	1	2	3	4
All ideas have been clearly expressed and supported by good arguments. There is extensive use of relevant examples.					✓

Portfolio Example 1

Title

Instant Messaging – Blessing or curse to businesses?

News Item

Hu, Jim, P. 2003, “IM: From fad to big business and beyond”,
<http://zdnet.com.com/2102-1104-992391.html?tag=printthis>

A Presentation of the Issue

In March 2003 an estimated 77,000,000 unique users used an instant messaging client, half of the total internet population (Hu; Festa, 2003). Another survey conducted in June 2002 showed that 66.8% and 54.5% of Internet users used instant messaging in Hong Kong and Singapore respectively (NetValue, 2002). The huge popularity of this communications medium has also influenced business. In May 2002 12,600,000 office workers, or 31% of online workers, used some form of instant messaging (Nielsen NetRatings, 2002).

Instant messaging offers many advantages to business: real-time communication, direct file sharing (Tyson, Date Unknown), streaming content (Tyson, Date Unknown), videoconferencing and networking of Internet devices (Hu, 2003). Collaboration of projects and exchange of data between companies will therefore be easier and more efficient (Hu, 2003), resulting in higher profitability.

However, companies are also concerned over security and manageability issues. Many free IM clients today do not offer logging, and consequently companies are not able to monitor the actions of employees, allowing them to casually chat and causing loss of productivity or even leak company documents (Foo, 2003). The file-sharing feature of IM could also potentially create a tunnel through security measures, as viruses may enter through transferred files (Frase, 2001) to corrupt data or steal valuable information. Thus from this seemingly harmless tool, businesses may lose more money than they gain from the benefits of IM, which at the very worst could lead to a company collapse.

B The IT Background of the Issue

The affordability of computers and the widespread use of the Internet have caused people to demand better networking and quicker communications. E-mail for many is too slow, as the other person may not be present to receive it instantly (Hu, 2003) and videoconferencing requires expensive equipment and a broadband connection. IM takes a compromise between the two and consequently has become extremely successful with users.

Corporate usage of IM is expected to grow to 687 million enterprises by 2004 (Guzzo, 2002) whilst a survey of a number of enterprises reported that they will all take up IM by 2007 [Diagram 1] (Hu, 2003):

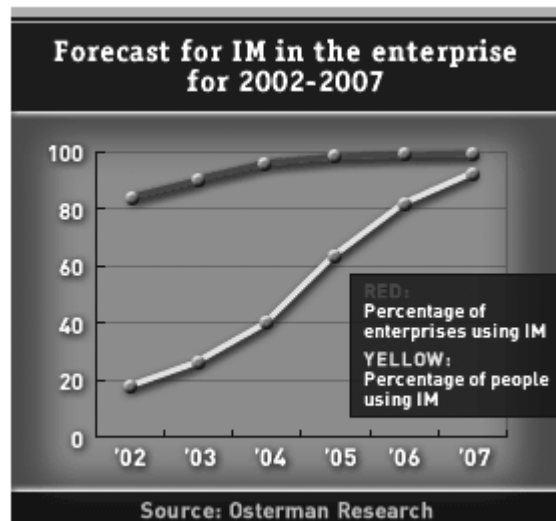


Diagram 1 (Hu, 2003): A survey of IM users by Osterman Research

Most of the IM clients available today work in similar ways. A contact list [Diagram 2 i)] is always present, displaying the other users of the client you wish to communicate with (Tyson, Date Unknown). When one of those contacts is online and using the IM client notification appears, and double-clicking on their icon will open up a window [Diagram 2 ii)] in which instant messages may be viewed and sent (Tyson, Date Unknown). A bar will allow you to type a message [Diagram 2 iii)], and after sending your message will appear in the same window along with other messages typed by your contact(s).

In addition, a button on the client may allow you to share files with other users [Diagram 2 iv)]. This will open up a TCP port and upload the file to the other person's hard-disk directly.

If you have a microphone and/or a web-cam, some IM clients may also allow voice conversations and teleconferencing functions [Diagram 2 v)]. “Tabs” may also be included to display streaming content, such as stock quotes [Diagram 2 vi)].



Diagram 2: An example of an IM client - MSN Messenger 6

C The Impact of the Issue

Instant messaging affords business many advantages. Because IM is free, companies can cheaply communicate in real-time with clients and/or business. File sharing without IM would be a lengthy process, usually done by uploading and then downloading e-mail attachments, which is obsolete compared with IM's direct transfer features. Voice conversations and videoconferencing are not only supported in many IM clients, but can be performed without previous notice. In situations such as the worldwide SARS virus outbreak, face-to-face meetings are not possible, and thus companies hope that IM will be able to serve as a substitute (Konrad, 2003). Streaming content such as real-time stock quotes (Tyson, Date Unknown) can also be integrated into clients. All this would improve productivity and cause higher profitability for companies.

However, it may be argued that IM may cause employees to chat casually with contacts (Glasner, 2002b), wasting Internet bandwidth, and thus productivity both for themselves and for other employees will be lowered.

Security concerns also arise with file sharing, as it opens tunnels through firewalls. A file received by employees may carry undetected viruses (Frase, 2001), which then may destroy files or steal company information and transmit them to a hacker. If this happened, company secrets with financial value may be stolen and company servers would be down, severely reducing productivity.

Lack of logging functions on current IM clients affect manageability, and companies fear they are breaking the law in not recording conversations with customers (Glasner, 2002b). This inability to track the actions of employees may also provide an avenue for them to share out confidential company documents to other people (Foo, 2003), thus losing money for companies, and to send messages which include harassment and discrimination (Guzzo, 2002), thus creating a hostile workplace for employees.

Overall the concerns over security and manageability, as well as the lack of effective solutions to combat them, have been the biggest issue for businesses. IM is further hampered by the lack of interoperability of different clients (Olsen, 2002) and lack of support of languages other than English (Creed, 2001). IM manufacturers are looking into the ways to overcome these inherent problems but still more development is needed for IM to become a viable business option.

D Solutions to Problems Arising from the Issue

Whilst decreased productivity is of great concern, more companies believe that security breaches, such as viruses in received files, are a bigger problem (Glasner, 2002a). Hence one solution is to use anti-virus software (Frase, 2001). Anti-virus software uses virus templates to detect computer infections and runs in the background to scan files whenever they are accessed or created, so viruses should be detected and removed as soon as they are received. The best ones also scan within IM clients, furthering reducing the occurrence of viruses.

The advantages of anti-virus programs are that they detect and remove the majority of viruses; however, they may cause the inconvenience of updating templates regularly on all computers. Also, their effectiveness is reduced, as they cannot detect very new and polymorphic viruses because there is no corresponding template.

Another solution is to implement extra policies. The policies may require employees to undertake compulsory IM training, so that they can be taught scenarios that might compromise security. Other policies may also require that file sharing occur only between employees and trusted contacts, so the risks of receiving viruses are reduced.

Policies are free and easily changeable, however, even trusted contacts may obviously send virus-laden files and policies affords no way in which viruses can be detected and/or removed, so it is ineffective in many cases.

Word Count: 1000

E Selection and Use of Sources

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NEWS ITEM - EXTRACT

"A number of execs and upper management were using AOL Instant Messenger. They viewed it as a tool to communicate with peers, board members and to communicate with one another because e-mail was too slow," said Doug Utley, who was on the information services team at the time and is now product manager for Sprint's Web services conferencing unit. "When that started happening, it became more acceptable."

To Sprint and many other companies, instant messaging has evolved from a teenage fad to a valuable communications tool that is central to everyday business. Companies are using IM not only to send real-time messages, but also to collaborate on projects, exchange data and create networks linking all types of Internet devices.

Assessment Criteria

Criterion	Level	Examiner Comments
A Presentation of the Issue	4 (Maximum 4)	The issue is clearly presented and directly relates to the news item. There is evidence of thorough research as shown by well-cited factual evidence. Both positive and negative impacts are clearly explained. A potential long-term problem is flagged.
B The IT Background of the Issue	5 (Maximum 5)	The student addresses concepts, developments and trends. The developments are highlighted at the start and there is some analysis where the student analyses the reasons for widespread use of IM. Trends are supported by factual evidence and the addition of a graph. Concepts are well explained with the aid of a well-annotated screenshot showing features of the IM screen.
C The Impact of the Issue	5 (Maximum 5)	Stakeholders, ie the company, the employee using IM and other employees are considered. There is a very comprehensive consideration of positives and negatives. Positive and negative impacts are explained, analysed and evaluated. The analysis is backed up with research. Security is highlighted as the main problem.
D Solutions to Problems Arising from the Issue	5 (Maximum 5)	Two viable solutions are explained and evaluated. Limitations are considered.
E Selection and Use of Sources	2 (Maximum 2)	The news item is attached. The piece has been thoroughly researched. Sources are consistently cited within the text and a formal bibliography is included.
F Expression of Ideas Relevant to the Social Issue	4 (Maximum 4)	The ideas are expressed coherently. There are supporting arguments and extended relevant examples.
Total	25/25	

Portfolio Example 2

Title

What are the effects of laptops on education?

News Item

Belanger, Yvonne, 2000, "Laptop Computers in the K-12 Classroom."
<http://ericit.org/digests/EDO-IR-2000-05.shtml> [14 June 2003]

A Presentation of the Issue

Some studies claim that laptops are linked with increased student motivation, improved class attendance, and a "sustained level of academic achievement" (Belanger, 2000). However, negative aspects can also be raised, for example, that laptops prevent students from concentrating on their school work, and degrade learning (Borja, 2000). Not all students can afford laptops to buy a laptop for school, so their introduction has also raised the issue of equality and financial discrimination (Corcoran, 2002).

Laptops at schools have also an extended social impact on global equity, by helping to bridge the digital divide in third world countries (Lent, 2003). The donation of laptops to underprivileged schools around the world not only aids underprivileged students during school hours, but also allows students to bring their mobile computers home to their parents, slowly and comfortably exposing the wider disadvantaged community to the prospects of technology.

B IT Background of the Issue

Laptop usage in U.S. schools increased by 43% in the 2001-2002 school year (Suryaraman, 2002). Last year, 15% of school districts in America were participating in a laptop initiative (Corcoran, 2002). Although desktop computers far outnumber laptops in the school environment, an increasing trend in laptop usage at school has become clear: "The direction we're moving is absolutely away from PC labs" (Suryaraman, 2002). As more and more educational tasks require, or are enhanced by technology, it is predicted to be only a matter of time before a personal computer at school becomes essential as pen and paper (Suryaraman, 2002).

The laptop is small and light enough to be easily carried between classes, and home, by hand. The laptop has become possible with the development of thin LCD monitors, long life batteries, and low heat processors. Stronger built, cost effective models of laptops have been produced specifically for students, such as the I-book or the StudyPro (Belanger, 2002).

Now, with wireless network cards, laptops can share file storage between teachers and students, internet access, and printing facilities, making them as effective as a desktop computer, and more flexible.

C The Impact of the Issue

The use of laptops at school has been claimed to "improve the speed, quality and depth of their work" (Beck, 2002) and to be responsible for a "significant increase on standardized tests" (Learning with Laptops, 2000). Education studies report that these improvements are due to an improved attitude towards learning, as laptops encourage a fun, hands-on approach to education (Belanger, 2002).

Also, disabled or struggling students are benefited by the flexibility of owning and maintaining their own personal laptop. Students with particular areas of individual need can install their choice of programmes that will help them learn more in a school day. For example, a program called Co-Writer can help dyslexic student who are struggling with spelling (Ansary, 2002).

On the other hand, the added mobility and flexibility of laptops have allowed students to become more easily distracted from the focus of education (Borja, 2002). Misuse of technology at school, such as file swapping, pornography, and instant messaging have become more prevalent at schools with the introduction of student laptops.

Education has a great affect on a student's future life, and job opportunities, so the affect of laptops on education quality is an issue of the utmost importance. Weighing up, the motivational benefits outweigh the prospect of added distractions, as such distractions are solvable by teachers enforcing policies at the school.

Lawrence Hardy claims laptops cause economic discrimination against students of lower socio-economical backgrounds, who would not be able to afford to buy their own laptop for school (Hardy, 1999). However, subsidised leasing programmes have made the financial burden to parents more affordable (Hardy, 1999). Resultantly students from all socioeconomic backgrounds will have similar opportunities to use technology both at school and home.

The issue of educational benefit is more important than the financial issue. While the negative issue of financial will lessen in the near future as government and public support grows, and technology costs decrease, the issue of education must be addressed immediately, before lifelong damage might be caused to a student's education.

D Solutions to Problems Arising from the Issue

The main problem regarding laptops is the ability for students to become distracted and become off task.

One solution to the problem of distraction is to create a set of strict laptop usage policies that make clear what is and what is not appropriate at school. The policy should describe what third party programs are allowed to be installed or executed, explain the prohibition of games, outline acceptable use of instant messaging and internet usage, and make clear the situations when mp3s are allowed to be used. By setting up a detailed set of rules there is no excuse for the misuse of computers at school. This policy would be enforced by teachers patrolling computer usage for students who break this policy. If a rule is broken, the student will be given a detention, and be temporally prohibited from using their personal laptop during school hours. This solution is limited as it relies on a student's honesty. It does not really solve the problem as students can hide their mischievous actions from teachers on the other side of their screens

Another solution is to give the teacher of a class the ability to view student laptop usage, through screenshots of what is present on the student's screens. This could be made possible with a small mandatory utility that captures regular pictures from a student's laptop, and passes this information through a wireless network connection to the teacher's computer. The teacher could view a number of student's screens at one time, presented on the teachers screen as small, continually updating thumbnail images. The teacher would be able to notice on his or her screen if a student was visiting an off topic internet sight, listening to mp3s, chatting to other classmates, or otherwise misusing their computer privileges. It involves less personal time and effort and can be used also during the normal teaching process. In such cases, the teacher could confront the student, and make sure they returned back to the task at hand. This solution is limited as it involves a breach of privacy. The purchase of software means it will be more expensive to implement than the policy.

Word Count: 979

E Selection and Use of Sources

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NEWS ITEM - EXTRACT

The future of mobile computing in K-12 education is still uncertain. Laptops may never become as common in classrooms as hand-held calculators. Solutions for issues of cost, technical support needs, security, and equitable access are challenging for many schools. Many schools with laptops, however, remain positive and enthusiastic about the changes observed and benefits their students derive from access to portable computers. Although many laptop programs are young and studies are still in progress, research has shown educational benefits from the use of laptops, particularly with respect to increasing student motivation and creating more student-centered classrooms. Continuing improvements in student portable computing technology as well as models of successful programs may make laptops an increasingly attractive option for K-12 educators and technology planners.

Assessment Criteria

Criterion	Level	Examiner Comments
A Presentation of the Issue	4 (Maximum 4)	The issue in the news item is clearly identified and, with the aid of further research, the positive and negative social consequences are explained.
B The IT Background of the Issue	3 (Maximum 5)	The trends are well explained with cited evidence and the developments are clear. The concepts are, at best, described.
C The Impact of the Issue	5 (Maximum 5)	The impacts have been well researched. Both positive and negative impacts are explained and counter-arguments are presented. Arguments are substantiated by cited research. There is evidence of analysis and evaluation.
D Solutions to Problems Arising from the Issue	5 (Maximum 5)	Two feasible solutions are very thoroughly explained. In both cases their limitations are considered.
E Selection and Use of Sources	2 (Maximum 2)	The news item is attached. The piece has been extensively researched and arguments are well supported by cited sources throughout the text. There is a formal bibliography.
F Expression of Ideas Relevant to the Social Issue	4 (Maximum 4)	The student clearly expresses ideas with supporting arguments and extended relevant examples.
Total	23/25	

Portfolio Example 3

Title

Workers' use and abuse of company e-mail

News Item¹

Kelly, Maura. Your Boss May Be Monitoring your E-Mail. 12/8/99.
Salon Technology.
http://www.salon.com/tech/feature/1999/12/08/email_monitoring>

¹ This sample of student work was not submitted for the May 2004 examination session. It is student work from the previous syllabus that has been modified for the purposes of illustration.

A Presentation of the Issue

“Fourteen million employees - just over one-third of the online work force in the U.S.—have their internet or e-mail use under continuous surveillance at work, according to an analysis conducted by the privacy Foundation in Denver.” (Schulman, 2000) During the past few years, e-mail surveillance in the workplace has become more common. Are you surprised at the fact that your boss could be monitoring your e-mail use? This is one of the many questions raised by people who are concerned about their privacy in the workplace.

There are no known laws that stop your boss from taking such actions as viewing your e-mail. Employers do not necessarily tell you that you will be under surveillance because they think that the employee would gain too much power and prevent e-mail surveillance. (Kelly, 1999)

People know that e-mail surveillance is becoming more common (popular) because industries that sell recording equipment such as cameras and software have noticed that several companies have put in orders for the equipment. (Kelly, 1999) “Companies that monitor employees’ online activities include 20th Century Fox, Glaxo Wellcome, Nike, Duracell, Barclays, Marriott, Texaco, American Express, Premara Blue Cross and Zenith Electronics.” (Shankland, 2001) Government agencies include the U.S. Army, the Small Business administration, the National Park Service and the City of Boston. (Shankland, 2001) “Many firms contend that this “monitoring”—defined by the survey as the storage and review of e-mail, voice mail messages, computer files, and even telephone conversations and videos of employee job performance a tool to measure employee productivity.” (Kelly, 1999)

B The IT Background of the Issue

Your boss needs no subpoena and suspicion the you’ve ever wasted a lot of company time before reading your e-mail or employing surveillance software to track your web surfing habits. The growing number of employers who are monitoring their employees’ activities is a result of the low cost of the monitoring technology. Computers can leave behind a trail that can provide employers with all of the information they could possibly need about an employee’s computer activities.

“There are five methods that employers can use to track employee activities:

Packet sniffers

Desktop monitoring programs

Log files

Phones

Closed circuit cameras

Computer monitoring programs carry such names as Shadow, Spy Agent, Web Sleuth and Silent Watch.” (Bonsor, 2002)

Packet sniffers have been used by computer-network administrations for years to monitor their networks and perform diagnostic tests or troubleshoot problems. (Bonsor, 2002) As data travels back and forth on the network, the program looks at or ‘sniffs,’ each packet. (Bonsor, 2002)

“When a packet sniffer is set up on a computer, the sniffer’s network interface is set to promiscuous mode.” (Bonsor, 2002) This means that it is looking at everything that comes through. A packet sniffer can overall be set up in one of two ways: Unfiltered - captures all of the packets; filtered - captures only those packets containing specific data elements. Packets that contain sought out data are copied onto the hard disk as they pass through. (Bonsor, 2002) A

packet sniffer located at one of the servers of your Internet server Provider (ISP) would potentially be able to monitor all of your online activities; for example, which web sites you visit. (Bonsor, 2002)

“Desktop monitoring programs work differently than packet sniffers.” (Bonsor, 2002) They can monitor every single action you make with your computer. Signals can be intercepted by a desktop monitoring program which can be installed on a computer at the operating system level or the assembly level. (Bonsor, 2002) The person receiving the intercepted signals can see each character being typed and can see what the worker has on this or her screen. (Bonsor, 2002) “Employers can use the desktop monitoring program to read e-mail and see any program that is open on your screen.” (Bonsor, 2002)

Your computer is full of log files that provide evidence of what you’ve been doing. (Bonsor, 2002) Log file is a system administrator that can determine what web sites you’ve accessed.(Bonsor, 2002) Here are a few places where log files can be found: operating systems, web browsers, application, e-mail.

C The Impact of the Issue

Many people that work in offices are blown away by the fact that they are being watched. (Beattie, 2002) Up to 14 million workers are subject to continuous surveillance of their e-mail and Internet use. (Shankland, 2001) Some employers do not let employees be aware that they are being monitored. (Schulman, 2001) There was a point made that the employer should introduce employees of all of the company policies and what that particular company practices. (Kelly, 1999)

Due to e-mail surveillance in the workplace, people have been terminated from their jobs not knowing that they were being watched. (Kelly, 1999) “The New York Times fired 20 employees at a Virginia payroll processing centre for violating corporate policy by sending ‘inappropriate and offensive’ e-mail, and the Navy reported that it disciplined ore that 500 employees at a Pennsylvania supply depot for sending sexually explicit e-mail.” (Kelly, 1999) “Cases such as these come as no surprise: 45 percent of major U.S. companies engage in electronic monitoring of communication and performances, “according to a 1999 survey conducted by the American Management Association (AMA).” (Kelly ,1999)

D Solutions to Problems Arising from the Issue

My first solution would be that employers should tell all employees that they are being monitored. A SHRM survey found that only 36% of companies with e-mail have polices addressing proper usage of the technology, while on 34% have a written policy on workplace privacy. (CNET, 1999)

E Selection and Use of Sources

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Assessment Criteria

Criterion	Level	Examiner Comments
A Presentation of the Issue	3 (Maximum 4)	<p>The student has clearly described the issue in this paragraph and referred to the news item. The student should explain the importance of e-mail to business and society as an essential IT system. To move beyond description to explanation, the student might give reasons for the employer's reluctance to inform employees and/or the increased use of surveillance. The first sentence in the last paragraph does not support the argument. Cameras have nothing to do with e-mail surveillance.</p> <p>While the student has obviously researched the topic, she has not synthesized the information and discussed it.</p>
B The IT Background of the Issue	3 (Maximum 5)	<p>Overall, in this section, the student has described but not explained or discussed the IT background. The information presented in this section could be condensed, so the student could explain the reasons for the development of this technology and provide a balanced discussion of the use of monitoring.</p> <p>The first sentence here is not relevant to the IT background and the student has already made this point. A brief explanation of the trail left by e-mail would be appropriate here.</p> <p>The list is not specific to e-mail. Once again the student needs to extract the relevant information from her research and explain/discuss how it relates directly to the issue. The student presents raw research. She needs to abstract the relevant information and tie it to a discussion of the concepts and developments that have enabled employers to monitor e-mail specifically, not all employee activities. There is no mention of trends.</p> <p>Since all the information is from one source, the student only needs to provide a citation at the end of the paragraph. The direct quotations are unnecessary: instead, the student should explain the concepts in her own words, giving credit to the source at the end.</p>
C The Impact of the Issue	2 (Maximum 5)	<p>The student eventually identifies the ignorance of employees as the key problem. She needs to make this clear at the beginning of this section and tailor the series of facts presented here to illustrate that problem and its impact on employees and employers.</p>
D Solutions to Problems Arising from the Issue	1 (Maximum 5)	<p>The student states two solutions.</p>

Criterion	Level	Examiner Comments
E Selection and Use of Sources	2 (Maximum 2)	The student has six sources and has included a copy of the news article (Kelly, 1999). The list of references uses an acceptable format but should be in alphabetical order. The student has clearly cited sources within the text but a bit too enthusiastically. While it is not perfect, the student is awarded 2 marks.
F Expression of Ideas Relevant to the Social Issue	0 (Maximum 4)	The student has clearly researched the topic but has neither synthesized nor analysed the information. She finds it difficult to discuss and express an argument and this results in a mark of zero.
Total	11/25	

General Comments

This piece is more an example of a draft than a finished product. Especially at the beginning of the course, students often have difficulty interpreting the information and using it within an argument or discussion of their own. Classroom activities that require students to read, synthesize and debate IT issues within a structured context can be used to develop these skills. Students should be guided in these activities by their reading and discussion of the **social and ethical issues** found in the “Syllabus Details” section of the ITGS guide.

This issue clearly comes from the business and employment **area of impact**. Class discussions of case studies in the area of business, and the social and ethical issues involved would give the student the necessary background to discuss the interrelationships within this topic. (For methodologies to help in the analysis of social and ethical issues, see the “Syllabus Details” section of the ITGS guide.) The student should be able to identify the stakeholders in this situation, understand the reasons for company policies on this issue, and present an argument that evaluates the positions of the various stakeholders. An awareness of the importance of e-mail to business should be part of the underpinning of this portfolio piece.

To assist with the development of solutions, students and teachers should consult **IT systems in a social context** in the “Syllabus Details” section of the ITGS guide.

The Project: Guidance for Teachers

What is it?	A project that identifies a problem affecting an individual or group and develops an IT-based solution to that problem. It must be a real problem, affecting real people, not something that is fictitious or artificial. The assessed work is detailed in a log book and a written report of between 2,000 and 2,500 words. The product (for example, a database, presentation, web site) is also assessed.
Who does it?	All ITGS students at SL.
How is the report structured?	The sections of the report must match the criteria laid down in the ITGS guide. Sub-headings must match the headings in the guide for criteria G, H, I, J and K. Criteria L and M are assessed using the product and the log book.
How many words should there be in each section?	This is not specified because projects vary in type and style. However, a suggestion is: criterion G 300–400, criterion H 400–500, criterion I 600–700, criterion J 400–500, criterion K 300–400. In addition, support material such as questionnaires and screenshots should be included in appendices where appropriate.
How many marks is it worth?	It is marked out of 35 and weighted at 20% of the final assessment.
When is it done?	It should be started in the second half of the first year, because a lot of internal assessment work is required for the IB Diploma Programme. If students do not start this early enough, it will conflict with work in other courses.
What can it be about?	Any genuine, real problem to which there is an IT-based solution. However, the teacher must agree it with the student.
What should the teacher do?	<ol style="list-style-type: none">1. Explain how internal assessment works. Students should be given a copy of the instructions for the project from the “Internal Assessment” section of the ITGS guide.2. Set a timetable for the different stages, for example, identifying the problem, analysis and feasibility.3. Discuss possible project topics—there is a list of suggestions in this document.4. Agree the project with the student. There is a project proposal form in this document that may be useful, although it is not compulsory to use it.5. Give lessons on how to tackle the project, emphasizing in particular the importance of a well-defined problem that has a possible solution; the need for a careful analysis and feasibility study; and the production of a clearly documented plan before beginning to implement the solution.6. Advise the students individually if and when necessary.7. Check the student’s log book regularly to make sure it is being maintained in a way that illustrates the progress being made.8. Read the student’s first draft and advise how work can be improved, but do not edit or annotate the draft heavily.9. Check the progress that each student is making with the implementation of the solution and advise as necessary.10. Assess all student work according to the criteria in the ITGS guide.11. Complete the appropriate forms, 3/IA and 3/CS, which can be found in the <i>Vade Mecum</i>.12. Send samples to the IBO for external moderation.

Frequently Asked Questions: The Project

- **Do project ideas have to be related to school?**

Project ideas can come from school, business or individuals. The social need, however, must be a real problem and not fictitious.

- **How much class time should be allowed for work on the project?**

The ITGS guide suggests 20 hours of the recommended 150 hours. Class time is necessary to provide adequate opportunity for the teacher to monitor a student's progress and to ensure that all of the work is the student's own. It is expected that students will spend time outside of class to complete the project.

- **What if the student does not know the software they need or want to use?**

The student will either need to learn to use the software or adjust their IT solution or project idea. It is important for the students to ensure they have the necessary training in hardware and software to fulfill criteria H and I. This is also the reason why criteria G, H and I should be approved before the student begins to make the product.

- **Should the teacher make comments on the student's project report?**

Yes. Teachers are encouraged to write in pencil, in the right-hand margin, explanations of how they arrived at their marks. It is of great value to the moderator to see how teachers have marked a student's work.

- **What is a product?**

A product refers to the end result of a solution (a document, file, program, presentation, web site) that is used to address the social problem the student has identified.

- **When is the best time to start working on the project?**

The day the teacher introduces the project is the best day to start. The first thing students should do is make an initial, dated entry in the log book. This entry could be as simple as: "May 10, 2003— Today our teacher asked us to think about project ideas and potential problems. My first idea is..."

- **When choosing a project idea, is it sufficient that the solution benefits one person?**

Yes.

- **How long does the project report have to be?**

The minimum number of words is 2,000 and the maximum is 2,500. However, this only includes the text of criteria G–K and does not count the text of the log book or information contained in the appendices. The report should also include examples of visual evidence (ie screenshots, diagrams, photos) illustrating all aspects of the process.

- **Does the project have to address a real problem or can it be fictitious?**

The problem must be real, current and able to be implemented. The project should not address previously solved problems but rather real and current issues.

- **Does the project require programming skills?**

No, programming skills are not required.

- **What is the IB moderator going to see?**

They will see the product, the report and the log book. All three elements are sent for moderation.

- **Is a web page enough?**

A web page does not constitute a product. Students using web-based solutions need to develop multiple pages (ie a web site) with active links that are clearly seen to address the outlined problem.

- **Is a poster or brochure enough for the product?**

No. The product should be a substantial solution that clearly uses IT to address a problem. If the product seems to be a trivial solution, an alternative problem or product needs to be considered.

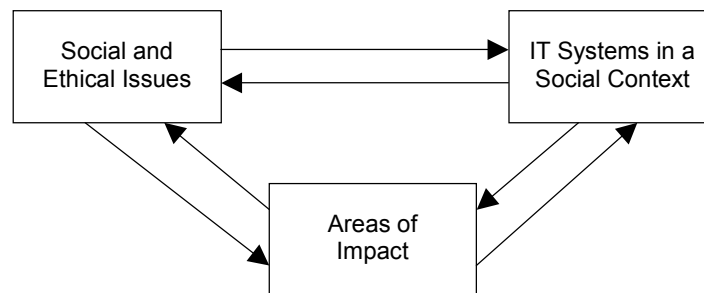
- **What goes in the log book?**

The log book should contain regular, dated entries about what the student has done related to the project. Students are also encouraged to draw rough diagrams, sketches or paste copies of any associated printout documents in the log book that may not necessarily be included in the appendices. The log book should be checked regularly by the teacher, signed and dated.

- **Can the student make several products to satisfy the requirements for the product?**

No. The product should be one item but may require supportive materials (for example, user instructions).

How to Approach the Project



It is important that the project is seen by both the student and the teacher from a human perspective. It is intended to sit as comfortably within the triangular framework above as do the other three assessment components.



Students have a free choice as to which area of impact they wish to use for their project.



Students will then discuss with the end-user and others the social and ethical issues raised by the problem and its IT solution.



Students use IT skills within the social context that they develop in the early stages of the project in order to provide a solution to the problem.

A project can only belong in this course if it is approached from a human perspective.

The Timing of the Project

Teachers have total flexibility in the way the time for the project is organized. Some prefer to block a short, concentrated period of intensive work on the project. Others spread it out over two terms, interspersed with other work. A wide variety of combinations has been shown to be successful by other teachers. It is really the teacher's individual preference that is important.

There are two points that should be noted.

- Students should become familiar with the concepts and focus of the course before beginning to think about a project so it is not a good idea to start it early in the course.
- Some classroom time must be allocated to the project. This is necessary in order for the teacher to be able to supervise the student's work and monitor progress.

A form like the one below can be used by the teacher to approve the topic for the project. This should be done before any work on the project begins. Unsuitable topics can be identified at this stage.

Project Proposal		
Candidate Name	_____	
Project Title	_____	
Project idea is submitted to the teacher.		
Approved _____ (Teacher's signature)	Date _____	<input type="checkbox"/>
Criterion G: Identifying the Problem within a Social Context Completed and submitted to the teacher for approval		
Approved _____ (Teacher's signature)	Date _____	<input type="checkbox"/>
Criterion H: Analysis and Feasibility Study Completed and submitted to the teacher for approval		
Approved _____ (Teacher's signature)	Date _____	<input type="checkbox"/>
Criterion I: Planning the Chosen IT Solution Completed and submitted to the teacher for approval		
Approved _____ (Teacher's signature)	Date _____	<input type="checkbox"/>

Project Ideas

The following ideas are only suggestions of the types of projects that could be undertaken by students. Students should be encouraged to explore several problems before deciding on the one that they will develop. A possible IT approach is suggested for each idea, but it is not a definitive solution. Students should always be encouraged to think of a range of possible solutions to any problem.

- 1. Problem:** There is no organized system of seating in the school auditorium for plays and concerts. There is no system for reserving seats in advance, printing tickets, or keeping records of ticket sales.

Possible IT approach: spreadsheet

- 2. Problem:** A community orchestra has existed for many years without a formal record of pieces performed. There is no record of performances, sponsors or music performed and transposed parts added or removed.

Possible IT approach: database

- 3. Problem:** The volleyball team and coach have no system in place to record game statistics on both team and individual efforts. These statistics would be useful to assist the coach in determining the weaknesses and strengths of the team as well as those of individual players. These statistics would help the coach to plan appropriate practice drills and strategies that address specific individual and team needs.

Possible IT approach: spreadsheet

- 4. Problem:** The school's sports department relies currently on weekly assemblies, monthly newsletters and occasional letters home to parents to communicate game and training schedules as well as results from previous games. There is no means to inform the community more regularly about past, current and future sports news at school.

Possible IT approach: web site

- 5. Problem:** Students do not have a convenient means to record their arrival and departure from school during the school day. Currently, students must sign a sheet of paper, which takes time and does not allow for accurate data about the student's identity, date, time and reason the student has left.

Possible IT approach: database

- 6. Problem:** Students who arrive late at school often miss the morning announcements that are read at the start of the school day during their first class. These students have no way of finding out what important announcements they have missed.

Possible IT approach: presentation on mounted monitors

- 7. Problem:** The art teacher currently has no means of recording previous art assignments. Although examples of previous student work are available, the best pieces are very often kept by the students when they leave the school.

Possible IT approach: database

- 8. Problem:** The creativity, action, service (CAS) coordinator currently maintains only written records of students' CAS activities and hours. The coordinator must write new lists each time she updates the record of students' CAS activities and the number of hours remaining.

Possible IT approach: database

9. Problem: Currently kindergarten teachers purchase and maintain their own supplies for the classroom. Inventory records are kept by hand on paper in a variety of formats. This has resulted in the problem of running short of supplies without enough time to re-order for scheduled activities. A large variety of materials is consumed throughout the year and the present system does not account efficiently for their consumption and replacement.

Possible IT approach: database

10. Problem: It is currently difficult for students of IB Diploma Programme mathematical methods to keep track of assignments, deadlines and explanations. Students would benefit from a resource that would provide current information regarding deadlines as well as previous explanations of methods and theories.

Possible IT approach: web site

11. Problem: Students embarking on their extended essay do not have examples readily available that they can browse and use to obtain ideas as well as an appreciation of the scope of the task. Without examples on a variety of topics, students are in the dark with respect to the expectations of the assignment.

Possible IT approach: web site

12. Problem: The kindergarten places children's lunch orders and takes morning attendance using slips of paper that are collected by the school nurse and taken to the office to be recorded, tabulated and used for ordering lunches. The current system is labour intensive, slow and unreliable.

Possible IT approach: database

13. Problem: A school typically has many sports trophies scattered around the school and in students' homes. Who, what, when and where are often forgotten.

Possible IT approach: database

14. Problem: Restaurant guides often focus on the tastes of adults and people with more financial resources than students. Students need a list of recommended restaurants that cater for their needs.

Possible IT approach: desktop published booklet

15. Problem: Encouraging spectators to attend basketball games is difficult. Posters and signs are often ignored because there are so many events advertised in this manner.

Possible IT approach: digital video broadcast on mounted monitors and/or web site

Using the Criteria Headings for the Report

The assessment criteria G–K must be used as sub-headings in the report. This method enables students to present their work in a structured and coherent way.

Project Checklist

This checklist is an example of the kind of guidance the teacher can offer to students and covers all the criteria, G–M.

Criterion G: Identifying the Problem within a Social Context **3 marks**

- Have you identified a problem that requires an IT solution?
- Have you described the problem in a social context?
- Have you explained the shortcomings of the current situation?
- What could be the benefits or outcomes of an IT solution in this situation?
- Have you identified the end-users who will benefit from the IT solution?
- Has the need been determined through discussion with those involved?
- Have you mentioned creating any particular IT solution (for example, web site, database, published document)? If yes, it is **not** appropriate for this criterion.

Criterion H: Analysis and Feasibility Study **4 marks**

- Have you considered two distinct IT approaches that address the problem identified in criterion G?
- Have you compared the advantages and disadvantages of each of the IT approaches?
- Have you justified which IT approach you are taking with reference to its feasibility?
- Have you explained how the IT approach solves the problem?

Criterion I: Planning the Chosen IT Solution **10 marks**

- Will the product provide an IT solution for the problem described in criterion G?
- Is there a realistic plan and time line for managing the project that includes the gathering of necessary information, the making of the product and the testing process?
- Have all of the beta testers and end-user testers been identified?
- Is there a complete design (for example, storyboard, sketches, layout) for the product?
- Have you included sketches, diagrams, charts, screenshots and other evidence in your report that support your account of the development of the product?
- Is there a complete description of all the software (company, title and version) you have used in the making of the product?
- Is there a complete description of all the hardware (model and specifications) you have used in the making of the product?
- Is there a full description of how all of the data used in making the product was collected, including all relevant sources?

Criterion J: Testing and Evaluating the Solution

6 marks

- Were the technical aspects and the content of the product formally tested with written questionnaires for the testers to complete?
- Did you follow the beta test/refine/beta test/refine/end-user test/refine process?
- Was the product on completion formally tested by the end-user(s) specified in criterion G?
- Have you provided a complete description of the testers' evaluations of the product and the refinements that were made?
- Have you included before and after screenshots in order to document the changes you made?
- Has evidence from the questionnaires been included in the appendix of the project report?

Criterion K: Assessing the Social Significance of the Product

3 marks

- Have you considered the possible social effects of the product if it was available on a wider scale or to a wider audience?

Criterion L: The Product

6 marks

- Is the product a solution for the need identified in criterion G?
- Is the product technically fully functional?
- Is the content accurate and complete?
- Is the product a comprehensive solution for a complex task?

Criterion M: The Log Book

3 marks

- Was the log book started on the same day as the project?
- Does the log book contain regular, dated entries?
- Does the log book contain entries that cover the complete period of the project (analysing, planning, testing and evaluating)?
- Have you included a discussion of the informal testing and modification that you have carried out during the development phase?

Sample Log Book Entries

The following two pages demonstrate the handwritten entries that students typically include in the log book for their project. They are taken from the log book related to project example 2 but are included here to show the kinds of entries it is appropriate for students to make for any project. The student has recorded the date, evidence of planning, notes about what has been completed and evidence from various aspects of the product that have been glued into the log book.

It is suggested that the teacher periodically reviews the student's log book to check if it is being maintained properly and to make suggestions about the student's progress. The teacher should write the date of feedback to the student in the log book whenever it is checked.

2-6-01

Outline for "Planning an IT solution"

★ P1 - Discuss what I have already done, and what I'll do to complete the project.

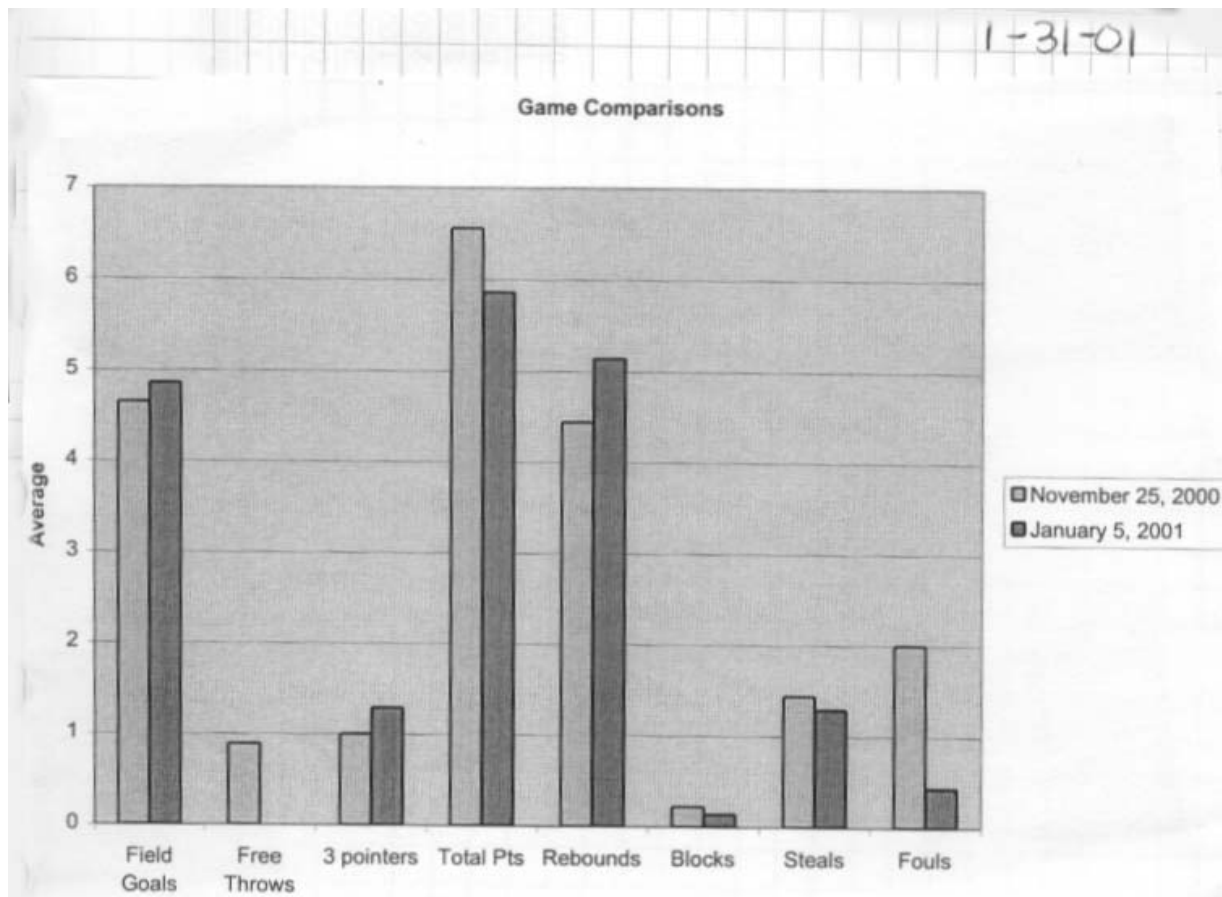
Show examples → - How I got the idea
- Talking to Mr.
- Manually keeping stats
- transferring them to spreadsheet
- making comparison graphs
- Database of averages

★ P2 - Talk about what programs I have used during the project.

I will make sure to show screen shots of my graphs and charts.

2-7-01

I started today by writing a letter to Mr. , asking that he please give me some written comments that I can include in my final project report.



Above is a graph in which I compared two games of the individual player averages. This weekend there are more games, and I will keep statistics using my new score sheets and then display the info on another "game comparison" graph.

Project Example 1

**Diploma Programme Higher Level Physics:
Special and General Relativity**

G Identifying the Problem within a Social Context

For my project I want to meet a need that IB students in international schools around the world may have with their studies.

Many IB students encounter difficulties with their work which may need extra help to solve. If they are attending international schools they may not speak the language of the country where they live and information from public libraries will not be much use. Indeed in remote areas of the world, there may not be such resources available. Some schools are big enough to have their own libraries and students can ask both teachers and other students for help. But this might not be possible in small schools. Some of the schools may have very small groups of students doing the IB, or one might even be the only person in the school studying a particular course. The school may not be able to supply enough of the resources or media for these students to learn effectively. Some general text books cover more of a topic than is needed, but not enough information relevant to a specific IB course. The Internet can contain a lot of unreliable information. It can be difficult for a student to find a resource specifically designed for the IB course.

Often another student working on the same topic knows best what is the most helpful information. It would therefore be very useful for a student to write up an explanation of a difficult topic, including diagrams, examples and references to other places where information can be found. In this way one IB student may be able to help not only fellow classmates, but several others around the world.

One of the subjects that stands out as being particularly demanding is Higher Level Physics, especially *Option G: Special and General Relativity*. This topic has the reputation of being extremely difficult to understand, which can make Physics students insecure about studying it. It is also a very theoretical subject, because most of the experiments cannot be performed in a school Physics laboratory, since they require speeds close to the speed of light, so students good at practical assignments may not be very enthusiastic about the topic.

I find this subject extremely interesting, therefore I would enjoy creating a guide through the Special and General Relativity course in order to help anyone interested in it, but especially other IB students. It could include sections briefly describing each point, as well as sample questions to clarify difficult parts, and references to other resources. This could easily be achieved using an Information Technology solution.

H Analysis and Feasibility Study

Two possible IT solutions are a web site or a booklet.

Web Site:

This would act as a guide through the special and general relativity option of the IB Physics course. It could be laid out on separate web pages, each addressing one aspect of the topic. A 'table of contents' page would offer links to each page on the site, and there would also be links between the pages, offering visitors a clear overview and the possibility to check a specific question quickly.

Advantages:

A web site would be available internationally and therefore especially suitable for IB students.

Web pages could include a number of attractive visual effects - colour, images, animations, movies, links, etc.

A clear overview can be made with links to all the sections.

As I have the resources needed to create a web page and put it on-line, there would be no costs.

For users with the access to the internet, the web site would be free and pages could be printed at little cost.

A web page could offer sample questions from previous exam papers for those who want to test their understanding, with answers listed on a separate page.

If any doubts arise on points announced on the web site or any support is needed, an e-mail address can be provided to contact me.

The web site can be updated at any time with the corrected mistakes or clearer explanations.

Disadvantages:

Access to the web site would be restricted to people with a computer and internet access.

Having to boot up a computer and connect to the internet may be inconvenient.

Ergonomic issues could also hinder use of this site regularly. For instance, reading pages of material off a monitor can damage eye sight, and some people are uncomfortable sitting up in front of a computer to study.

To create a web site, three items of software would be essential: a text editor to write HTML code, an image Editor to include graphics, and an HTML browser to view the final product. Other software may be necessary for certain features.

Booklet:

Like the web page described above, this booklet would include descriptions to all sections relevant to the special and general relativity course. Each section could have a sample question, with the answers listed in the back of the book. Pages can be numbered, so that sections can be easily found using the *table of contents* page. Also, a booklet could include images to help understand points made. The greatest success would be if teachers gave copies to students as a revision booklet in forthcoming IB years.

Advantages:

A booklet can be referred to regularly in any place and at any time, resulting in it being an effective piece of learning material for the final exams.

Pages can be numbered and a contents page and index provided to make it easy to refer to.

Diagrams can be provided to aid understanding.

Disadvantages:

Only a few people would be able to use it, as it will probably not be made available world wide, only circulated around school.

The cost of producing the book (printing and paper) would be high; colour printing is much too expensive to be feasible in diagrams.

Once the book has been produced, it can not be updated any more, meaning that any mistakes or unclear statements cannot be corrected.

Three IT tools that would be necessary to create a booklet are a Word Processor, to write the text in the first place, an image editor, so that graphics can be included, and a layout program, to make the book look professional once it is finished. Other software may also be necessary to add some features.

Evaluation:

Though both offer feasible arguments, I thought that the advantages of the web page exceeded those of the booklet - especially that it could be made available to a much larger number of people, could be updated and would be a more communicative tool in that students using it could get in touch with me to comment.

I also had to take my experience into account. I have had a lot more experience producing web pages than booklets, and would have to spend time learning new applications to create a booklet.

For these reasons, I have chosen the web site for the final product.

I Planning the Chosen IT Solution

The solution is the first of those described in the previous section: a web site intended as a guide through the specific and general relativity option of the IB Physics course. This is the option which I thought would offer the wider opportunities of use.

Collecting information for the content: (Time scale: September)

This is available to me in the form of lesson notes, text books and other material from the school library.

Making the product: (Time scale: September-October)

The design of the web page will be simple, using tables for layout. I have chosen not to use frames, as I had no necessity for them and some browsers (particularly text based ones) tend to have difficulties displaying them I chose a well laid out, simple page design as this often looks a lot better than a complex one that is badly laid out; I would also prefer spending more time on the content of the website, than the design. Also, the usage of anything other than HTML, CSS or JavaScript has been omitted, Java, Shockwave, Flash or other such tools often require browser Plugins, which may be tedious to install, and may not work at all with some OS'. It is also very tricky and time consuming to create a well presented web site with those tools.

Each page will be laid out similarly, with one common background colour (green) and a table of 80% width and a white background colour, aligned to the centre in which all images and text will be displayed. This white table will have several smaller tables within it, to allow text to be indented slightly, depending on whether it is a title, a sub-title, or explanation. A picture of this basic layout can be found in my log book in the appendix.

Important statements as well as sample questions will have their own tables with a different background colour, so that they stand out in comparison to the rest of the page. The text colour will most commonly be black, with different colours for links. I have chosen Verdana as the standard font; Verdana is common but not in universal use do backup fonts will be provided; including Tahoma, Arial and Helvetica.

In total there will be 13 separate pages, each with a 'next', 'previous' and 'home' (to the index page) link at the top and bottom. These pages include a table of contents, a sample IB data booklet, a reference page, an 'about' page, an answer page, and a page for each section I am planning on explaining. Those pages will also have sub-sections when relevant, to explain individual concepts more precisely. (Please see Appendix for screenshot of index page).

Hardware:

I will primarily be working on two computers, a PC running on Intel's 686 architecture and familiar software; and an iMac to work on the project during school time.

Details of the hardware I will need to produce and test the web site are shown in the table below.

Required Hardware	
<i>PC</i>	
Central Processing Unit	Pentium II, 266 MHz
RAM	288 MB Physical, 512 MB Swap
Hard Drives	Maxtor, 5200 RPM, 10.3 GB, Format: BSD Fast File System
	Fujitsu, 5200 RPM, 4.2 GB, Format: 2 nd Extended File System
<i>iMac</i>	
Central Processing Unit	PowerMac G3, 300 MHz
RAM	192 MB Physical, 193 MB Virtual
Hard Drive	19.7 GB, Format: Macintosh Hierarchical File System

Apart from the hardware listed above, Iomega zip drives as well as zip diskettes will be used to transfer data between the two computers. This will involve using VFAT formatted 100 MB Zip diskettes, that both computers are capable of accessing and reading.

Software:

The table illustrated on the below illustrates all the software needed for the creation of the web site; including an HTML editor and an image editor to create a web site. As well as this, other software will be used to add a few less common features to the web site, such as displaying graphs and formulae.

<i>Required Software</i>		
Description	Name	Version, Company¹
Operating Systems	MacOS	Version 9.0, Apple
	FreeBSD	Version 4.3-Release, BSD Licence
Word Processors	OpenOffice	Version 5.2, GPL
	Word	Version 2001, Microsoft
Image Editor	The Gimp	Version 1.2, GPL
HTML Editor	Vi Improved	Version 5.0, gPL
Miscellaneous	LaTeX	Version 3.1459, GPL
	Latex2html	Version 2000.1 Beta, GPL
	GnuPlot	Version 3.7.1 Stable, GPL
	HTML Tidy	Version 04aug00, MIT Licence

Word Processors:

These will be used for writing the text, and spell-checking. Both OpenOffice and Word handle Microsoft Rich Text Format (RTF) documents. I have chosen this format as Unix and MacOS use different characters to note certain instructions (such as the ending of a line) in normal text documents, which causes problems when porting files one system to another. Both choices, OpenOffice and Word, have the advantage that they are already installed on the machines I am intending to use.

Image Editor:

The Gimp will be used for creating images. It offers support for compressed image formats, suitable for a web page. These include portable network graphics (PNG), and Jpeg (JPG) images.

HTML Editor:

I have chosen Vi Improved to be my standard HTML editor, as I have configured it to offer syntax highlighting, which can help produce a web site, and also helps me avoid errors in code. As well as this, I may have to resort to SimpleText whilst modifying code on the Macintosh, although this will only seldom be done, due to the problems while converting Unix text documents to Macintosh text documents, as pointed out earlier on.

LaTeX:

I am experienced in using TeX for layout purposes, and consider it the easiest solution to implement formulae into my HTML document. LaTeX files can be converted to HTML using the program LaTeX2HTML, which will convert to images all characters that cannot be displayed in HTML (such as the Greek alphabet). This will be more efficient than attempting to learn to use a graphical tool to display formulae.

GnuPlot:

This is the tool I am intending to use for displaying graphs, of which I will then take snapshots, to be shown as images on the web page. These graphs can ease the understanding of some of the points.

HTML Tidy:

This is a useful program provided by the World Wide Web Consortium (W3C) that detects any syntax errors in HTML documents, and tries to convert them to the W3C standards used by most popular web browsers. Most of the HTML documents I am planning to write will be created in a text editor, meaning that such errors could often occur. Most of the browsers with which I am planning to test my web page can handle such erroneous pages quite well, so I would not be able to detect any errors in any other way.

Communication Technologies:

In this case, web browsers are to be used for testing and accessing the product once it has been set up on a web server. Having a web site that consists of HTML documents, a web browser will most commonly be used to view it; and the table below illustrates all the web browsers I am intending to use to test the product with:

<i>Communication Technologies</i>		
Description	Name	Version, Company
Web Browsers	Opera	Version 5.0 Beta 3, Opera Software
	Mozilla	Version 0.9.5, GPL/LGPL/MPL
	Internet Explorer	Version 5.0, Microsoft

The software listed above includes the most common items used with the internet, Mozilla being the probably most popular Netscape derivative, and Internet Explorer being the standard browser delivered with a popular operating system. Opera is a convenient third option, being the browser I personally use most.

I am not planning to do extensive testing with Netscape Navigator version 4.7 and Lynx, but will use them to make sure that the pages show up appropriately.

Network Technologies:

To make the web site available to the public, a number of network technologies will be used; primarily the HTTP server used to allow the web site to be available on the internet, but also File servers, used for back-up purposes. The specific network technologies used are:

<i>Network Technologies</i>
AppleTalk File Server
Apache HTTP Server, version 3.3.19, GPL

The file server is an essential part of the intranet of the school, and runs from the school's local server. I can make use of this by saving all relevant files to this project in my own personal folder, located on this server, to which no-one has access to other than me and system administrators. The disk on which I will save my documents is regularly backed up on tape, therefore it serves as an ideal backup location, other than local hard drives and Zip diskettes, for all files I will create.

The HTTP Server is also located on the school's server, and allows my web page to be made available over the internet. It runs on Apache HTTP server software which is thought to be relatively appropriate for HTTP servers. The school has a direct connection to the internet, meaning that it should be connected constantly unless it is being maintained. Its registered domain name makes it accessible through most public DNS servers.

Evaluation of the plan:

I thought the plan worked out quite well. By intending not to have an extremely complex web site, I had enough time to concentrate on the actual contents of the page, and assure that everything made sense and was correct, which was my main aim of this product. Though the product had been done on time, my plan lacked an adequate time-line, as a result of this, the write-up ended up being delayed by a considerable amount.

J Testing and Evaluating the Solution

This section focuses on refinements I made to improve the quality of the site, and on evaluation of the site by 2 testers.

Testing and Refinement 1:

The first tester was Mrs Stoppe, an English teacher, to ensure that the language was used appropriately, and made me aware of spelling and grammatical mistakes. I chose her to be my first tester as the web site contains a lot of text, and I am not a linguist.

She went through the page with me, making me aware of several spelling and grammatical errors, which I then corrected. Apart from that she found one dead link to the answers page, shown in screenshot 1 (see Appendix).

I addressed the last statement she made: “I think that the project should be expanded”, in section W.

Testing and Refinement 2:

One of the main points of criticism from this tester was that the alignments of some of the tables was not correct on pages that displayed images. This was because the image width was greater than the table, and instead of compressing the image it expanded the table. To fix this, I stopped the table just before the image, and started it again below the image. Before and after screenshots, showing the results of the changes, are displayed in screenshots 2 and 3 (see Appendix).

Apart from this it was also suggested to complete a few sections I had forgotten about. This was done. I did not see any urgent necessity for any change in colour although I would have responded if time allowed.

K Assessing the Social Significance of the Product

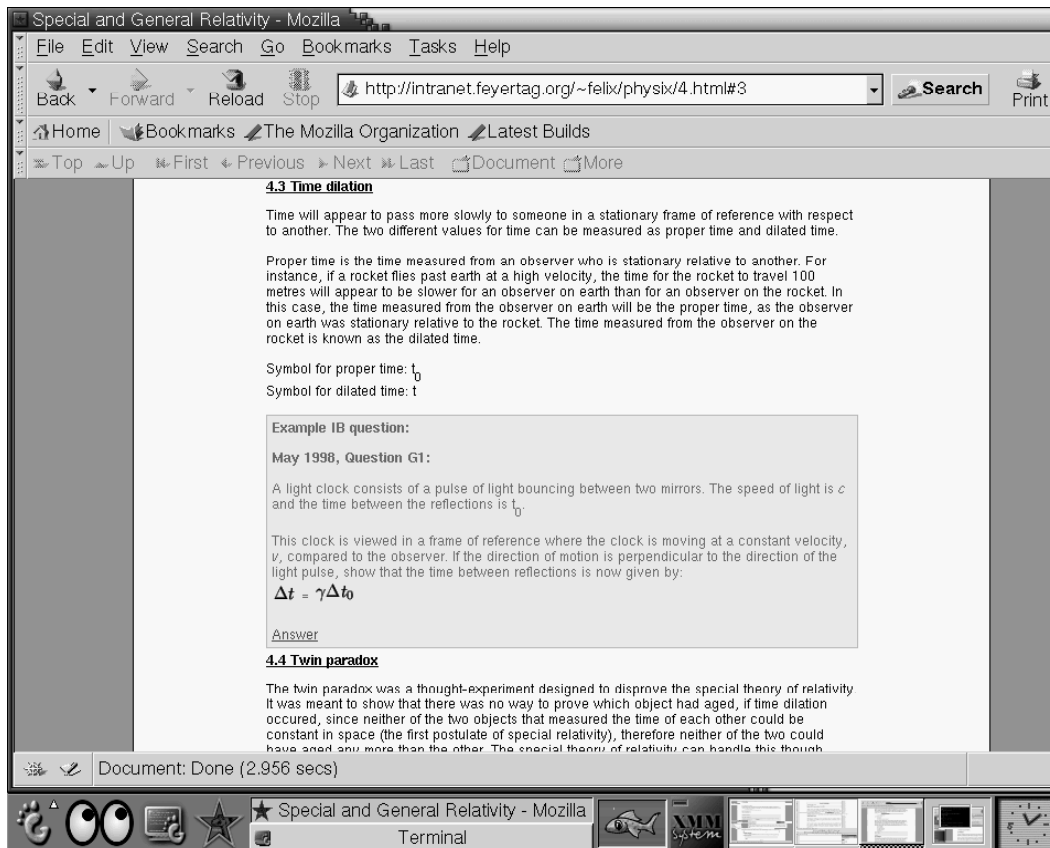
This project attempts to provide one example of how IB students across the world can communicate with one another about their studies. The idea behind it could be expanded so that, over time, other students could use the same framework and tools to create sites on other topics in the IB Physics syllabus (for a Physics net), and also other IB subjects. IB teachers could also be involved to check the quality of sites. A central organisation (e.g. the IB office or the ECIS) could coordinate a project involving many different schools, include quality controls and then advertise it to IB students around the world.

There are especially cultural (educational) and economic aspects to consider. In large schools there are plenty of opportunities for students to communicate about their work, but in many parts of the world there are small schools where students may be working alone, because there is no one else doing the course nearby. This project could get a global community of IB students sharing their ideas.

Compared with this, there are economic questions to think about. It is useful for an individual student (like myself) to make such a web site since it helps one's own understanding to write about a topic. If people write back this will help me too. This is one reason why people contribute their work freely over the internet. Schools could encourage more students to do this without it costing money by offering CAS credit. It would however cost money to control the quality and the technical side of the project - for example by teachers checking contributions. If this does not happen, a lot of rubbish could land on this 'IB net' since students could upload misleading information.

Appendix: Screenshots

Screenshot 1



Screenshot 2: Before

Special and General Relativity - Mozilla

File Edit View Search Go Bookmarks Tasks Help

Back Forward Reload Stop <http://intranet.feyertag.org/~felix/physix/5.html> Search Print

Home Bookmarks The Mozilla Organization Latest Builds

Top Up First Previous Next Last Document More

IB Physics: Special and General Relativity [back home next](#)

5.0 Space-Time

5.1 Notion of Space-Time

The conception of space-time is that space exists in four dimensions, three of which are space: the first being a straight line along the x axis, the second being the y axis, allowing 2-dimensional images to be displayed on graphs, and the third being a dimension going into the graph, allowing 3 dimensional objects to exist. All of these dimensions are perpendicular to each other. The fourth dimension represents time, which allows objects to move from one point to another.

Because the fastest speed possible is c , you would only be able to perceive an event earliest after the time it would take for light to reach you, leaving you with a restricted area on space-time graphs (more about this in the next section), which is the area from which no information is available yet.

5.2 Space-Time Diagrams

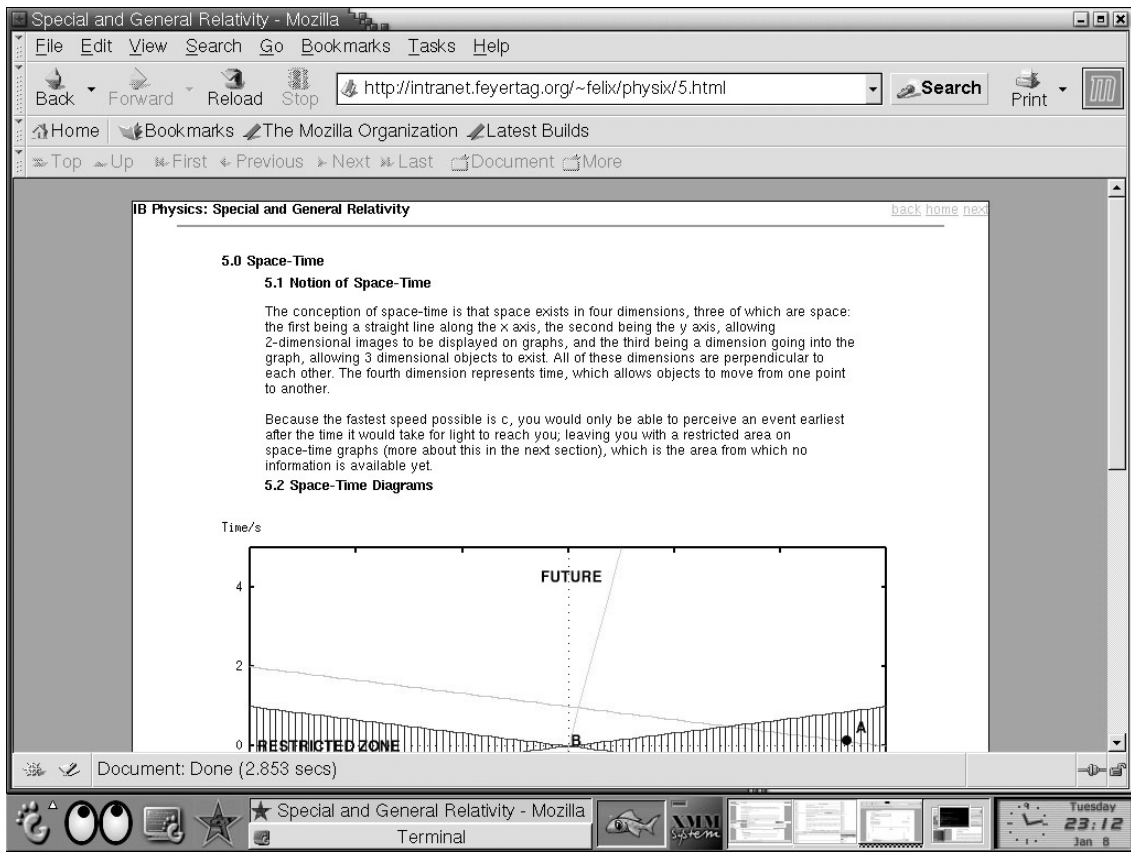
Time/s

Document: Done (1.884 secs)

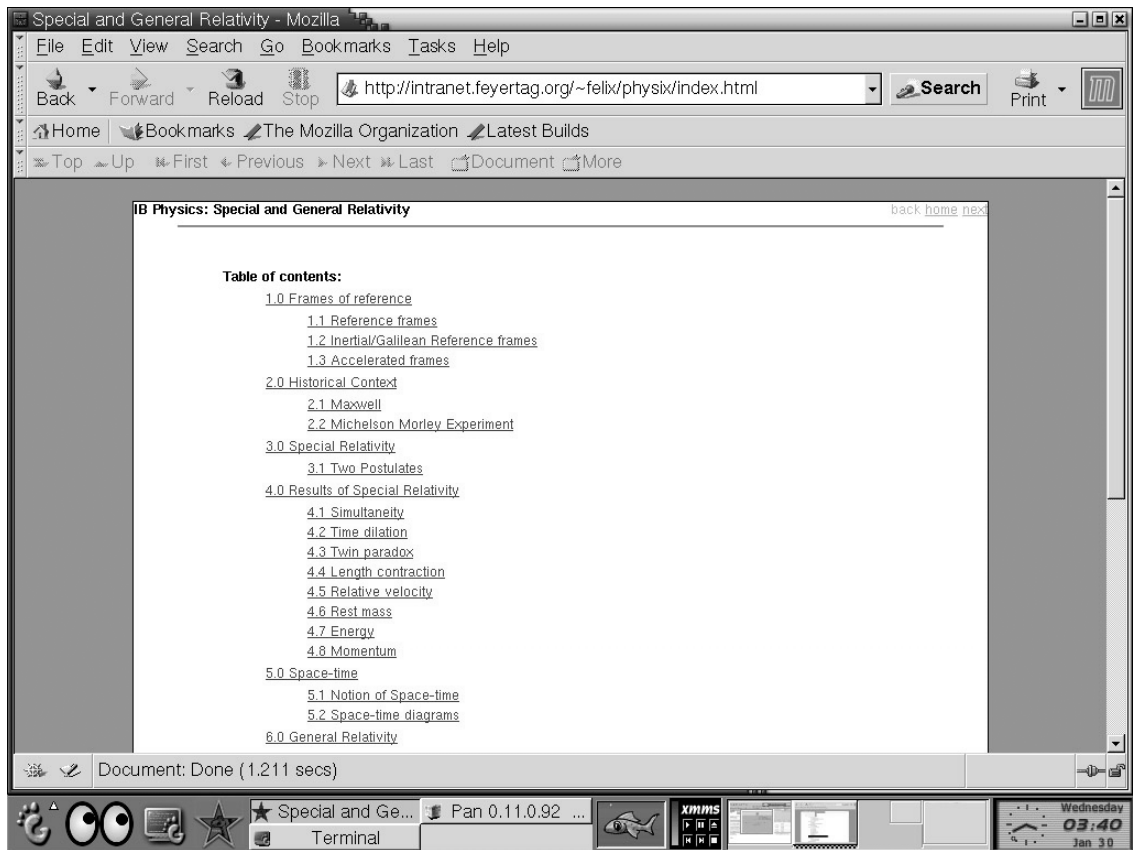
Special and General Relativity - Mozilla Terminal

Tuesday 23:09 Jan 6

Screenshot 3: After



The Index Page:



Assessment Criteria

Criterion	Level	Examiner Comments
G Identifying the Problem within a Social Context	3 (Maximum 3)	The problem is clearly identified and the social context described. The inadequacy of the current situation is presented.
H Analysis and Feasibility Study	4 (Maximum 4)	Two IT approaches are described with a comparison of advantages and disadvantages. The choice of a web site is justified with a brief explanation in the final section of how it will solve the problem.
I Planning the Chosen IT Solution	6 (Maximum 10)	1 mark: The time line is mentioned, but it is not well thought out and lacks detail. 0 marks: There are no diagrams to illustrate the plan. A schematic plan of the page structure would have been useful. 2 marks: The software is fully described. 2 marks: The hardware is fully described. 1 mark: The collection of data is outlined, but it is not described fully.
J Testing and Evaluating the Solution	2 (Maximum 6)	This is a very weak section. The first tester is identified, justified and the consequent refinements explained and illustrated. The second tester is not named, and there is no explanation of why this tester was qualified to test the product. There is no test by an end-user.
K Assessing the Social Significance of the Product	3 (Maximum 3)	An observed social benefit is explained (to the student himself and then projected into sharing through the Internet). A projected benefit to students around the world is also presented.
L The Product	5 (Maximum 6)	2 marks: The product is fully functional. 2 marks: The design is appropriate as a solution to the problem identified in criterion H. 1 mark: The solution is reasonably complex but could have had more page links to allow more flexible routes through the site.
M The Log Book	3 (Maximum 3)	The log book was kept very well; regular, relevant, dated entries made; illustrated frequently with screenshots and rough diagrams. Please note that this report was over the 2,500 word limit. It is not recommended that teachers encourage their students to submit reports of this length.
Total	26/35	

Project Example 2

Boys' Basketball Varsity Statistics

G Identifying the Problem within a Social Context

There is a need in the sports program at an International School for basketball statistics for the boys' varsity basketball team. The coach has expressed that the team would benefit from these statistics because they will help the team and individual players assess their strengths and weaknesses. The team will therefore be able to improve their weaknesses, and build on their strong points. It would be helpful to have speedy and accurate results that display the statistics from each of the games. The coach could then use these results to further enhance practices and game situations. Basketball fans at the school will also benefit from having statistics, because they will be able to follow the basketball season more closely. Currently, there is no such system available, but it is possible to provide the team with statistic charts and graphs using databases, word processors, and spread sheets.

H Analysis and Feasibility Study

There are many possible solutions to the problem that no statistics exist for the boys' varsity basketball team. Three solutions include using an up to date statistic system, video taping games, or having students, like myself, keep the statistics while watching each game.

Even though there are many methods for keeping statistics, some are more high tech and more complicated than others are. For example, many of the more professional sports teams have up to date statistic systems. These are performed electronically, and provide immediate information about a player and his statistic on a scoreboard for the audience to see. This would be useful to help keep the audience involved in players individual achievements. However, this is too expensive for the International School's budget, and therefore would not be a realistic solution to the problem. Video taping the games and watching them closely afterwards to review the statistics, would allow the teams and coaches to actually watch themselves, to see how their plays are carried out throughout the game. However, this would also involve more high tech equipment, and would not provide information quickly. Therefore, it is also not a practical solution to the problem. A more realistic solution for the need of statistics is the method I have chosen to use. I attend each basketball game and keep the statistics on the charts that I make. This will then be entered into an Excel spreadsheet from which charts could be produced analysing the data. Even though this is more tedious work than with an automatic score keeper, it is a much more reasonable approach for the school.

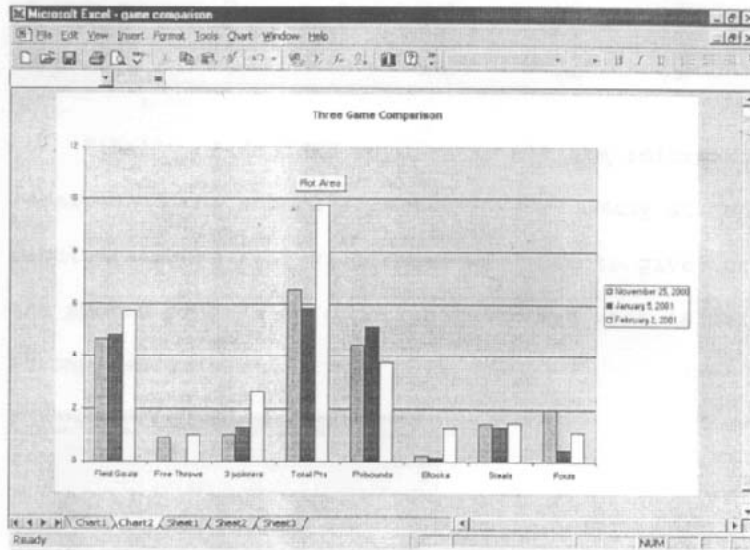
I Planning the Chosen IT Solution

Before choosing a project topic, I spent a lot of time considering many things that needed to be done at the school. After talking to a physical education teacher and coach at the school, I decided that the sports program would benefit from team statistics for the boys' varsity basketball team.

I began by gathering player information, such as their names and numbers, and then I decided which skills I would document. I formatted this information onto a spreadsheet using Microsoft Excel.

Basketball Statistic Sheet									
Date:									
Player	Number	Points from Field Goals	Points from Free Throws	Points from 3 pointers	Total Pts	Rebounds	Blocks	Steals	Fouls
Anderson, V	10								
Bezerril, F	16								
Bezerril, M	15								
Calyn, J	14								
Gijler, N	8								
Jordan, Jacob									
Jordan, Josh	12								
Knickle, M	16								
Malats, J	6								
Whitcher, M	7								

The above screen shot is an example of the chart I used while keeping statistics at the basketball games. I would manually record the data whilst watching the games, and then I typed up the information I received and presented the finished charts to the coach. After attending two games I made comparison graphs, presenting the differences in averages between the two games. These graphs are useful in creating a visual aid to accompany the charts that I have created. They make it easier to quickly compare the games, and see how the team has weakened or improved.

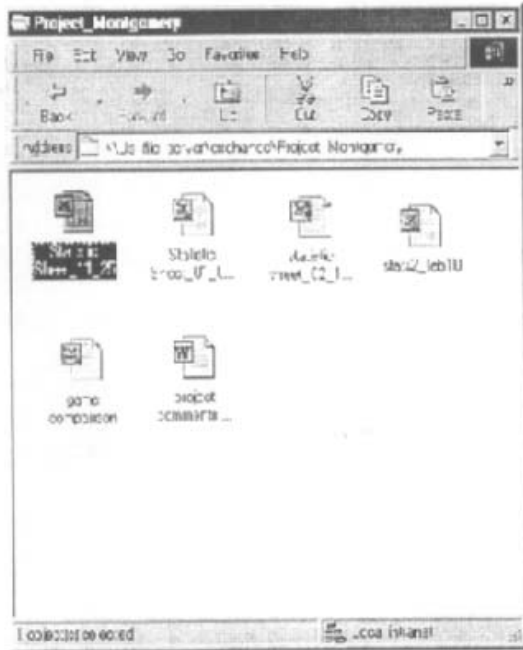


The graph that I have showed above is a three game comparison. Since the graph is easy to read, it is evident to anyone where the team has improved throughout the season. Every time a new game was played, I added that game to the graph, so that it would always show updated game information and comparisons. The coach was also given the graphs so that he has visual aids to share with his team at practices and games.

I used a database application to show the averages of each individual player for all of the games. I calculated the averages of points, rebounds, blocks, fouls and steals. This is primarily used for the coach to see which players are the strongest and in which areas. An example of my database is shown in the screen shot below.

	Player	Number	Games Played	Average Points	Average Rebounds	Average Blocks	Average Fouls	Average Steals
1	Andersson, V	10	2	1.00	1.00	0.00	0.50	1.00
2	Bezerni, F	18	1	1.00	6.00	0.00	1.00	1.00
4	Bezerni, M	15	1	0.00	0.00	0.00	0.00	0.00
5	Colyn, J	14	2	6.50	5.00	0.00	1.00	2.00
6	Gigler, N	8	1	7.00	6.00	0.00	0.00	1.00
7	Jordan, Jacob		2	4.00	8.00	0.50	1.50	2.50
8	Jordan, Josh	12	2	13.50	4.00	0.50	3.50	3.00
9	Knickle, M	16	2	7.50	7.50	0.50	2.50	0.50
10	Malats, J	6	2	7.50	4.00	0.00	0.50	1.00
11	Whicher, M	7	1	18.00	5.00	0.00	1.00	0.00

Finally, I decided to display all the information I received on the school's public server. Many students and faculty members will visit this in order to give outsiders to the sports program an opportunity to see what is being accomplished.



Above I displayed a screen shot of the folder that my project is located in on the school’s server. It is very easy to access, and therefore provides quick information and basketball insight for the students and teachers who are interested.

J Testing and Evaluating the Solution

I was not able to arrive at a final solution to my chosen problem without refining, testing, and then retesting my initial ideas. My original spreadsheet that I produced on Microsoft Excel was a very rough copy. I attended the first boys’ varsity game using this method of keeping statistics and realized that it was very difficult to obtain and record the data on this chart. Therefore, after testing this sheet, I decided to make some changes on my own. The main problem I found at that point was that it was very difficult to keep the statistics on one sheet by myself, without any help from others. I then decided to separate my sheet into two parts on separate pages. One page had a chart that showed the minutes played and points scored, while the other page displayed rebounds, blocks, steals and fouls. This made it possible for each person to concentrate on just one aspect, instead of having to record every detail of the game. While this made it easier, I still found that it was very difficult to keep track of the minutes each team member plays. Since players are substituting in and out all throughout the game, there was not enough time to record this data. The coach informed me that this aspect of the statistics was not necessary for him to have, but that there were other things he would like to have included. Instead of only recording the shots that are made, he also expressed interest in having me document the shots that are attempted. This new method would help him see the percentage of shots that each player and the team as a whole were making. Also, he could evaluate if the majority of his shots and points were originating from three pointers, field goals, or free throws. After he gave me this idea, I went back to Microsoft Excel and made a new spreadsheet displaying all of the new information he inquired about. I created two new spreadsheets, and my final results are displayed below.

Basketball Statistic Sheet- Shots								
								Date: 2/10/01
*Did Not Play								
Player	Number	Field Goals Attempted	Points from Field Goals	Free Throws Attempted	Points from Free Throws	3 Pointers Attempted	Points from 3 pointers	Total Pts

Basketball Statistic Sheet				
				Date: 2/10/01
*Did Not Play				
Player	Rebounds	Blocks	Steals	Fouls

I have only displayed the headers of the two spreadsheets, however the players' names and statistics were added to the appropriate cells underneath each heading.

At the next game, I used my new spreadsheet, and found that it was very possible to gather this new information and I successfully obtained all of the data that the coach asked for. After collecting this data, I was able to present him with the information he really wanted, and I also calculated the percentages for him so that he could share these figures with his team. Very late in my project, I decided to not only share the statistics with the team, but also with the spectators and fans. To do this I created a folder including all the information I have collected that can be accessed on the public school server. This makes it possible for the students and faculty at the school to follow the team's accomplishments and setbacks.

K Assessing the Social Significance of the Product

The topic of keeping statistics for a basketball team has many great effects on various people in our community. Therefore, I chose my project knowing that a large group of people would benefit from my idea. The two main groups in which my efforts effect the individual involved in the sports program and the spectators of the basketball team.

The prime objective of my project was to assist the boys' Varsity basketball team and their coach, by documenting their statistics, with hopes of showing patterns and trends throughout the competitive season. At the beginning of the season when the coach asked me to keep these statistics, he expressed a certain amount of uncertainty regarding the use of such a system. "I had never used statistics to justify any portion of my basketball program. I believed that the players were so inexperienced and played so few times that consistency and repetitions were not true factors." states the coach regarding his thoughts on statistics at the beginning of the season. However, as the project evolved, he began to realize that keeping statistics is in fact a useful tool in coaching high school basketball. The statistics that I provided aided him in re-teaching and reorganizing offensive plays. The players on the team also saw what a difference the statistics were making, because they could individually assess their strengths and weaknesses. This helped them with knowing what their skills were the most necessary to concentrate on during practices. One of the players mentioned that he specifically appreciated seeing the graphs comparing the team's performance in the different games.

"Since the graphs show how we performed against each team, they will help us to know which teams are the toughest for us when it comes time for the final tournament in March," explains Mark, a senior member of the team.

After I had information on a few of the games, I began to display what I had found on the school's server, so that it is available to students and faculty here at the school. This made it possible here for the team's fans to keep track of how the team was performing in each game. It is useful for people who were unable to attend a particular game, or who simply want to know how an individual player is doing throughout the season. By providing this information, the fans are able to become more aware of the team's execution in each game, and can follow the exciting season more closely. Student and basketball fan, Kate Jenkins says "I enjoy being able to check out how my favorite players are doing, and I feel like I know so much more about the team just by being able to look at their statistics."

Even though many people have benefited from these statistics, the social significance could have been greater if a larger spectrum of people was reached, and if more people were involved in creating the project. If some of the more advanced applications could have been used, the statistics could have been displayed immediately for the crowd, and even shown to opposing teams, which would have had more of an impact on the sports society. However, considering the small setting and environment of the school, I feel that the method I chose to use helped the school's sports program, and is an application which will continue to be used in years to come.

Appendix

Date: 11/25/00 *against Waterloo St. Johns*

Player	Number	Time	Field Goals (pts)	Free Throws (pts)	3 pointers	Total Pts	Rebounds	Assists	Blocks	Steals	Fouls
Anderson, V		27 min					11				1
Bezerril, F	18	13 min		1		1	1				1
Bezerril, M	15	4 min									
Colyn, J	14	20 min				6	1				1
Gigler, N											
Jordan, Jacob		6 min									
Jordan, Josh	12	17 min				6	1				1
Knickle, M	10	27 min				10					1
Malata, J	6	27 min				9					1
Whitaker, M	7	31 min				9					1
						18					1

Minutes

1st quarter
 Anderson 15:35-15
 Bezerril 10:00-10
 Colyn 2:18-22
 Gigler 1:00-10
 Jordan 7:49-12
 Knickle 7:23-10
 Malata 7:23-10
 Whitaker 7:23-10

2nd quarter
 Anderson 15:35-15
 Bezerril 10:00-10
 Colyn 2:18-22
 Gigler 1:00-10
 Jordan 7:49-12
 Knickle 7:23-10
 Malata 7:23-10
 Whitaker 7:23-10

3rd quarter
 Anderson 15:35-15
 Bezerril 10:00-10
 Colyn 2:18-22
 Gigler 1:00-10
 Jordan 7:49-12
 Knickle 7:23-10
 Malata 7:23-10
 Whitaker 7:23-10

4th quarter
 Anderson 15:35-15
 Bezerril 10:00-10
 Colyn 2:18-22
 Gigler 1:00-10
 Jordan 7:49-12
 Knickle 7:23-10
 Malata 7:23-10
 Whitaker 7:23-10

Letter of Reference from Boys Varsity Basketball Coach

To Whom It May Concern:

Prior to the start of the candidate's project, Game Statistics for the Varsity Boys Basketball Team, I had never used statistics to justify any portion of my basketball program. I believed that the players were so inexperienced and played so few times that consistency and repetition were not true factors. At the beginning of the season I asked the candidate to keep statistics for me as a possible alternative, because other coaches believed wholeheartedly in it. My wish was that the statistics would prove me correct, that there was no true need for such a system. Shortly after the project began, I could see patterns in shooting and rebounding. I began to realize that what I originally supposed was in fact true, but the statistics pointed out other weaknesses and deficiencies. With this information, I was able to re-direct, re-teach, and re-organize the plays used to initiate our offence and to make adjustments in our floor positioning to strengthen our defensive rebounding. The candidate's diligence and persistent efforts to collect the necessary data, to organize it, and then to get it in my hands as rapidly as possible, made the true difference in the result of this project. The charts and graphs representing the foul shots, field goals, three-pointers, rebounds, blocks, steals and fouls told a different story than I originally imagined. Then I asked her to make a few more adjustments by not only recording the shots made, but also the shots attempted, which she did professionally. The added information, along with the other data made for a complete overview of my offense and defense.

After working very closely with the candidate on this project, I have come to the realization that statistics are in fact a valuable tool. They were more important for the team scheme than the individual players, because I still believe that statistics for individual players does not prove much. In fact, the statistics were more of an indication of what we did wrong instead of what we did right. In the end, they were valuable in being able to correct some very necessary components of team play. I truly thank the candidate for all her efforts in this project, and for helping to open the long locked door that now proves that data and statistics are a must.

Sincerely,
 Boys Varsity Basketball Coach

Assessment Criteria

Criterion	Level	Examiner Comments
G Identifying the Problem within a Social Context	3 (Maximum 3)	A full explanation of the social context is given.
H Analysis and Feasibility Study	3 (Maximum 4)	The student justifies the chosen approach with a reference to feasibility but does not explain how it solves the problem.
I Planning the Chosen IT Solution	5 (Maximum 10)	<p>0 marks: The student provides no schedule of events for the planning, implementation and testing of the product.</p> <p>2 marks: The student provides visual evidence of the design and making of the product in the form of screenshots from the product.</p> <p>1 mark: The student mentions software tools but does not note versions, platform and how they are used.</p> <p>0 marks: There is no mention of hardware used.</p> <p>2 marks: There are good examples of the data collected by the student and entered in the spreadsheet and database.</p>
J Testing and Evaluating the Solution	0 (Maximum 6)	The student has chosen to test her own product. Beta testers must be independent and must be qualified.
K Assessing the Social Significance of the Product	3 (Maximum 3)	The student explains in detail both observed and projected social impacts.
L The Product	3 (Maximum 6)	<p>2 marks: The product is fully functional.</p> <p>1 mark: The product is appropriate for the task.</p> <p>0 marks: Although the product is functional and appropriate, it does not constitute a complex or creative approach.</p>
M The Log Book	3 (Maximum 3)	The log book is a good example of what is expected for this project.
Total	20/35	

The Portfolio Extension: Guidance for Teachers

Description

Students must extend one of their portfolio pieces to include primary and secondary research into either a global or a local interaction in the form of a local interview/global interview, for example via chat/e-mail.

The portfolio extension should be 800–1,000 words in length. The word count does not include the cover page, appendix or bibliography.

The questionnaire must be created by the student and approved by the teacher.

The interviewee(s) must be over the age of 18, knowledgeable and directly involved in the issue under investigation.

Students must record the interview(s) in order to produce a transcript or summary. The student can determine the most appropriate format for reporting the interview(s), for example, transcript with questions and answers, summary of responses, quotes.

Where appropriate, students may wish to conduct more than one interview and compare the different perspectives. In this case, full transcripts will not be necessary. The student should provide summaries and quotes to support their findings. These must be included in the appendix together with the questionnaire(s).

Students must include a cover sheet that clearly identifies: portfolio title; issue being addressed; date completed; word count; and candidate name.

The portfolio extension must address the extension criteria N–R. The report must be written using the criteria headings N–P. This method enables students to present their work in a structured and coherent way.

Process

1. Choose one of the three portfolio pieces to be submitted for moderation.
2. Complete the portfolio extension proposal.
3. Decide on the most suitable interviewee(s).
4. Establish contact (via letter) to determine their willingness to be interviewed.
5. Establish the place, date and time of the interview.
6. Design the questionnaire (10–15 open and probing questions).
7. Test the questionnaire with an appropriate person and refine it as necessary.
8. Provide the interviewee(s) with the questions in advance.
9. Confirm the time, date, place and method of recording the information.
10. Complete the interview(s) and record the responses. Obtain a follow-up contact number or e-mail address from the interviewee(s).
11. Transcribe/summarize/quote (or a combination, as appropriate) the interview(s) and make contact with the interviewee(s) to clarify any questionable areas. A transcription header must be included: name of person interviewed; qualification/position; name/address of organization; date/place of interview; and method of recording interview.

12. Follow up the interview(s) with a letter of thanks and offer a copy of the final report.
13. Analyze the data collected.
14. Write a draft with an appendix including the questionnaire and the transcript(s) of the interview(s).
15. Complete a self-check using a checklist based on the assessment criteria.
16. Submit the draft to the teacher for comments.
17. Refine the draft according to the teacher's comments.
18. Write the final report. Include the cover page, bibliography and appendix.

Frequently Asked Questions: The Portfolio Extension

- **How many people should be interviewed?**

Students are encouraged to interview more than one person. Interviewees should represent alternative viewpoints.
- **Is the report written under criteria headings?**

Yes. The report must be written under the criteria headings N–P.
- **What methods can be used in the interview process?**

Some suggestions include personal interview, e-mail, online chat, telephone, fax or a combination of these.
- **What methods can be used to report the results of the interview?**

A hard copy of the transcript must be included in the appendix. This could be a full transcript with questions and answers, or a summary of responses or quotes.
- **Should the teacher comment on drafts?**

The teacher is encouraged to comment on one draft but should not heavily annotate or edit it.
- **Should the teacher write comments on the finished piece?**

Teachers are encouraged to justify their marks in pencil in order to facilitate the moderation process.
- **Is there a penalty for exceeding the word limit?**

If the work is obviously greater than the word limit, the external moderation will be based on the first 1,000 words.
- **How is the portfolio piece selected?**

The portfolio extension must be chosen from one of the three pieces submitted for external moderation.
- **What criteria should be used to justify the choice of interviewee?**

The interviewee must be over 18 and well qualified in the chosen area.
- **What types of questions are suitable to ask the interviewee?**

Questions should be well structured, open questions rather than closed, allowing the interviewee to expand on the responses.
- **How many questions should be asked in an interview?**

The suggested number is between 10 and 15.
- **Are citations expected within the report?**

To gain full marks the student should cite evidence from the portfolio research and interview transcript(s) using a recognized referencing method.
- **Is it necessary for students to record the interview using video or audiotape recorders?**

This is not a requirement, but may be useful when producing the transcript. However, the interviewee should be asked for permission before any recording is made.

Portfolio Extension Example

Portfolio Extension

Title

Workers' use and abuse of company e-mail

News Item

Kelly, Maura. Your Boss May Be Monitoring Your E-mail. 12/8/99.

Salon Technology.

http://www.salon.com/tech/feature/1999/12/08/email_monitoring>

Report

Criterion N: Discussion and Analysis of the Interview

Monitoring of e-mail and online activity of employees by employers, according to the research, is becoming more common and easier to do than ever before. It is also clear that this practice is controversial and has no comparable legal precedents on which to gauge its legality. It would appear that companies are left to decide for themselves to what extent they will control their employee use of these tools and devise their own justifications and policies.

Interviews were conducted with both employees and managers at firms that practise e-mail monitoring and firms that do not. An attempt was made by the interviewer to consult both employees and employers with varying opinions on the subject.

Reasons provided by employers for actively monitoring varied depending on the type of business. JD, the employer of a large financial consulting firm, responsible for sensitive data and large amounts of money, justify their monitoring policy as a means to earn the trust and respect of their clients in much the same way as a bank would advertise the latest technology for their vaults. There seemed to be less concern for the wasting of company time although the reduction of this as a result of the policy was a welcome side effect.

Reasons provided by employers for not monitoring employees were based on not wishing to create an environment of distrust and a belief that the data involved was not as crucial.

Although there was concern for time wasting, it was not felt important enough to jeopardize the working atmosphere that had taken years to establish.

Employees at a firm that practices extreme monitoring are aware of the policy as well as the consequences they face if they do not comply. However, there seemed to be varying degrees of understanding as to why the policy was enacted.

Employees at a firm that does not exercise monitoring vary greatly in their understanding of the firm's expectations as well as the reasons why there is no policy. There is also concern among employees that the lack of monitoring could result in hurting the business and encouraging time wasting.

Criterion O: Reflection on the Interview

The initial research indicated that employees generally were against the idea of monitoring e-mail and online activity and view it as an invasion of their privacy. The research provided a bleak picture of employers watching over their employees' every move, creating a Big Brother atmosphere.

However, the interviews conducted do not necessarily bear out these findings. Rather, they indicate that employers are not merely concerned with keeping their employees busy but are genuinely interested in the welfare of the company and atmosphere in the workplace.

An important observation made is that when the risks to the business are high, employers will go to great lengths to protect the data and integrity of the business. However, when the risks to the business are simply wasting time and monitoring would damage the atmosphere, employers are more reluctant to impose it.

In both cases, educating the employees as to the reasons monitoring is done (or not done) is essential to maintain good employee–employer relations. Including employees in the decision of whether to monitor also empowers employees in the decision making process and makes it much easier for them to buy into the idea and even support it.

Criterion P: Projection of Broader Implications from the Interview and Portfolio Research

The issue of monitoring employee online activity at work is controversial and many sided. There is very effective technology available to monitor employee online activity at work and research shows that it is being used.

Employers have an obligation to clients and shareholders that the product or service provided is produced as efficiently as possible. Employers are ultimately responsible for what happens in their firms, including the actions of their employees. Employees interpret the covert monitoring of their actions at work to be an invasion of their privacy.

Employers who choose to monitor their employees are advised to follow these rules:

- 1.) Make certain that all employees are aware that they are being monitored and why.
- 2.) The firm's Acceptable Use Policy should be written, visible at all times and that consequences are clear.
- 3.) Make certain that all monitoring is compliant with local and international law.
- 4.) Involve, as much as possible, employees in the decision process to monitor.

Ultimately, the monitoring of employee online activity can be seen as a necessary evil in many cases. As long as employees are made aware of what is being monitored, where it is stored and for how long – employees have no recourse. When employers involve employees in the decision making process concerning monitoring, it can go a long way to maintain if not improve the work environment and build trust and loyalty among employees.

Word count: 800

Appendix

COMPANY THAT MONITORS EMPLOYEES' EMAIL

Employer Questionnaire

1. What is your name and what position do you hold in the company?
2. Does your company monitor employees' email?
3. What were the reasons for introducing email monitoring in your company?
4. Who was consulted when this decision was taken?
5. What method of email monitoring does your company utilize?
6. Are the employees aware of the fact that their email is monitored?
7. How is the information collected and stored and who has access to it?
8. What policy documents relevant to email usage exist within the company and how are they made available to your employees?
9. How does your company enforce these policies?
10. How have these policies been received by your employees?
11. What are the consequences if an employee is found to be in breach of these policies?
12. How has email monitoring been received by your employees?
13. What are the advantages of email monitoring for your company?
14. Have you encountered any problems with the introduction of email monitoring?
15. If so, how have you addressed them?
16. On reflection was the introduction of email monitoring a positive step for your company?
17. Considering recent news coverage, available software products and your own experience would you recommend employee email monitoring to other companies?

name of the person interviewed: *JD*

qualification/position: *managing director*

name/address of organization: *ELCO Financial Consulting in Vienna, Austria*

date/place of interview: *15th October 2003/ELCO offices*

Transcript of interview with employer who monitors email

1. What is your name and what position do you hold in the company?
My name is JD and I am currently the managing director of ELCO Financial Consulting in Vienna, Austria.
2. Does your company monitor employees' email?
Yes.
3. What were the reasons for introducing email monitoring in your company?
Our company is responsible for the collection and maintaining the financial records (history and projections) of numerous clients, many of whom are relying on our data integrity, privacy and anonymity standards. The risk of these data being leaked, either unintentionally or not, is very high given the company's reliance on e-mail for our transactions and communications with clients and other institutions. Our company's very existence and survival in this competitive market relies heavily on a profile and reputation of high security and data integrity. Our company is also very concerned with the risk of computer espionage and attack in the form of Viruses, Trojan Horses and Worms that are so easily passed as attachments to e-mails.
4. Who was consulted when this decision was taken?
This decision was discussed between the Board of Directors, the Technology Support Staff and I.
5. What method of email monitoring does your company utilize?
Our company employs a stealth-like software that both forwards questionable e-mails as well as saves keystrokes. E-mails are randomly investigated and employees who draw unnecessary attention to themselves are subject to greater scrutiny. The company also has an extensive firewall installed that strips all attachments from incoming mail, opens and scans them for viruses. Employees are immediately notified of suspect e-mails and attachments received.
6. Are the employees aware of the fact that their email is monitored?
Absolutely. All employees are made aware of the policy, in writing, and have signed an Acceptable User Agreement which is legally binding.
7. How is the information collected and stored and who has access to it?
In accordance with local and international law, all data is saved on secure servers and kept only as long as needed. All employees have the right to view data stored from their machines.

8. What policy documents relevant to email usage exist within the company and how are they made available to your employees?
The E-mail Acceptable Use Policy is attached to all employee contracts and signed along with the contracts. It is published in all working languages of the company and is to be displayed in the area of all computers in the building.
9. How does your company enforce these policies?
As mentioned in my earlier response, e-mail keystrokes are randomly checked for questionable content. If an employee is thought to be in breach of the AUP, he/she receives a written warning and is informed that their activity will be closely scrutinized for a period of several weeks or until the company is convinced they are compliant. After two warnings, an employee is put on formal report and any further incidence will result in their termination of employment.
10. How have these policies been received by your employees?
All employees engaged after the policy was enacted were made aware of the policy prior to signing their contract. Employees already working here prior to the policy were concerned about invasion of privacy. The company's governing body consulted our attorneys and made sure our policy was compliant with local and international law. To my knowledge, no employee left the company as a result of the policy as our exit interviews would bear out.
11. What are the consequences if an employee is found to be in breach of these policies?
As I just said, employees who are found to have compromised company security will be warned and could be asked to leave.
12. How has email monitoring been received by your employees?
I think our employees were surprised at first but have grown to appreciate the serious nature of the policy and how their actions can impact on themselves, their colleagues and ultimately the company.
13. What are the advantages of email monitoring for your company?
Most importantly, our reputation with our current and potential clients is highly respected as serious and one of high integrity. Our AUP is public knowledge and we are proud to inform our clients of it. Another unintentional result has been that employees are far less likely to write personal e-mail during their time at work and productivity has noticeably increased. Employees are far less apt to encourage friends to e-mail them at work. Finally, the incidence of viruses resulting in technological downtime and data loss has been significantly reduced.
14. Have you encountered any problems with the introduction of email monitoring?
At first, it was difficult for current employees. However, once they were convinced that our policy was compliant with the law, they were less concerned.
15. If so, how have you addressed them?
We conducted an informal survey of other companies and found that most of them had similar policies. Once our employees were aware of this, their concern was significantly reduced.

16. On reflection was the introduction of email monitoring a positive step for your company?

Absolutely. The benefits to the company are overwhelmingly superior to the problems associated with the introduction of the policy.

17. Considering recent news coverage, available software products and your own experience would you recommend employee email monitoring to other companies?

I think it has a great deal to do with the nature of the business. Our company's responsibility to its clients was really the deciding factor in implementing such a controversial policy. Other businesses may not be able to justify such a decision with their employees.

COMPANY THAT MONITORS EMPLOYEES' EMAIL

Employee Questionnaire

1. What are your names and what positions do you hold in the company?
2. What were the reasons for introducing email monitoring in your company?
3. How was email monitoring introduced to the employees?
4. What method of email monitoring does your company utilize?
5. How do you feel about the use of email monitoring?
6. Do you know what information is collected, how it is stored and who has access to it?
7. What rights do you have to verify information stored about your email use?
8. What policy documents relevant to email usage exist within the company and how are they made available to employees?
9. How does your company enforce these policies?
10. What are the consequences if an employee is found to be in breach of these policies?
11. What are the advantages of email monitoring for your company?
12. Have you encountered any problems with the introduction of email monitoring?
13. If so, how have they been addressed?
14. On reflection was the introduction of email monitoring a positive step for your company?
15. Considering recent news coverage, available software products and your own experience would you recommend employee email monitoring to other companies?

name of the person interviewed: *RP*

qualification/position: *manager*

name/address of organization: *ELCO Financial Consulting in Vienna, Austria*

date/place of interview: *15th October 2003/ELCO offices*

Transcript of interview with happy employee whose email is monitored

1. What are your names and what positions do you hold in the company?
RP, manager, ELCO Financial Consulting, Vienna, Austria.
2. What were the reasons for introducing email monitoring in your company?
I don't know.
3. How was email monitoring introduced to the employees?
I wasn't there when it was introduced.
4. What method of email monitoring does your company utilize?
I don't know.
5. How do you feel about the use of email monitoring?
OK.
6. Do you know what information is collected, how it is stored and who has access to it?
Everything, I guess. Recipient, content, date of emails I send and sender, content and date of the ones I get. The information is kept by human resources. I think just the HR Manager has access.
7. What rights do you have to verify information stored about your email use?
I don't know.
8. What policy documents relevant to email usage exist within the company and how are they made available to employees?
I had copies of the policies and had to sign my acceptance of them when I joined the company.
9. How does your company enforce these policies?
I know checks are carried out from time to time and people have been disciplined.
10. What are the consequences if an employee is found to be in breach of these policies?
They are warned in the first instance but if they persist in misuse or have done something really bad they can be dismissed and have been.
11. What are the advantages of email monitoring for your company?
Protection of company interests and the information it holds.
12. Have you encountered any problems with the introduction of email monitoring?
Protection of employees.

13. If so, how have they been addressed?

Employees don't spend employer's time doing other stuff like Friends United.

14. On reflection was the introduction of email monitoring a positive step for your company?

Human Resources would say so.

15. Considering recent news coverage, available software products and your own experience would you recommend employee email monitoring to other companies?

I guess, yes.

name of the person interviewed: *TW*

qualification/position: *PA to financial consultant*

name/address of organization: *ELCO Financial Consulting in Vienna, Austria*

date/place of interview: *15th October 2003/ELCO offices*

Transcript of interview with unhappy employee whose email is monitored

1. What are your names and what positions do you hold in the company?
TW, PA to financial consultant, Financial Company.
2. What were the reasons for introducing email monitoring in your company?
*Expectations from clients of discretion and security.
The board wanted to make sure we were doing company business all the time.*
3. How was email monitoring introduced to the employees?
As a fait accompli.
4. What method of email monitoring does your company utilize?
I don't know.
5. How do you feel about the use of email monitoring?
I don't like the invasion of my privacy with this Big brother stuff. It's like the bosses don't trust us.
6. Do you know what information is collected, how it is stored and who has access to it?
No.
7. What rights do you have to verify information stored about your email use?
None I know of.
8. What policy documents relevant to email usage exist within the company and how are they made available to employees?
The acceptable use of email policy is sent out with the contract and offer of employment, signing it is a condition of employment.
9. How does your company enforce these policies?
One of the HR people trawls through other people's emails all day.
10. What are the consequences if an employee is found to be in breach of these policies?
They're dead meat.
11. What are the advantages of email monitoring for your company?
They say efficiency and protection of employees.
12. Have you encountered any problems with the introduction of email monitoring?
Not personally.

13. If so, how have they been addressed?

N/A.

14. On reflection was the introduction of email monitoring a positive step for your company?

No.

15. Considering recent news coverage, available software products and your own experience would you recommend employee email monitoring to other companies?

Sure, if you want to alienate your work force and make people feel they are suspected of slacking.

COMPANY THAT DOES NOT MONITOR EMPLOYEES' EMAIL

Employer Questionnaire

What is your name and what position do you hold in the company?

Does your company monitor employees' email?

1. What were the reasons for not introducing email monitoring in your company?
2. Who was consulted when this decision was taken?
3. What methods of email monitoring had your company considered?
4. What policy documents relevant to email usage exist within your company and how are they made available to your employees?
5. How does your company enforce these policies?
6. What are the consequences if an employee is found to be in breach of these policies?
7. How have these policies been received by your employees?
8. What are the advantages of these policies for your company?
9. Have you encountered any problems with not monitoring email in your company?
10. If so, how have you addressed them?
11. On reflection was the decision not to monitor email a positive step for your company?
12. Considering recent news coverage, available software products and your own experience would your company consider employee email monitoring in the future?

name of the person interviewed: *LP*

qualification/position: *managing director*

name/address of organization: *Voyage Travel (travel agency) in Vienna, Austria*

date/place of interview: *22nd October 2003/Voyage Travel's offices*

Transcript of interview with employer who does not monitor employees' email

1. What is your name and what position do you hold in the company?
My name is LP and I am currently the managing director of Voyage Travel.
2. Does your company monitor employees' email?
No.
3. What were the reasons for not introducing email monitoring in your company?
We are a small business with a loyal clientele and number of employees who have been with the company for a number of years. We did not wish to create an atmosphere of mistrust and risk employees leaving and taking their regular clients with them.
4. Who was consulted when this decision was taken?
I met with all the employees in a staff meeting and we discussed the need for e-mail safety and data security. We also discussed the use of company e-mail for personal use. I gauged the response of the employees from these discussions and based my decision on that.
5. What methods of email monitoring had your company considered?
I considered several products that monitor keystrokes as well as random e-mail screening for key-words. I also investigated the use of filters that would not allow the use of anonymous web-based e-mail systems such as hotmail.
6. What policy documents relevant to email usage exist within your company and how are they made available to your employees?
In an open memo to employees, I have expressed my concerns about data security and wasting time at work. My staff appreciates my concerns and we have an understanding that is collegial and comfortable.
7. How does your company enforce these policies?
We have an understanding. If I have a concern, I will speak to the employee personally. This is usually enough to solve the problem.
8. What are the consequences if an employee is found to be in breach of these policies?
There is no formal policy and all cases of concern are handled on a case by case basis.
9. How have these policies been received by your employees?
The employees were very happy that I openly discussed my concerns and respect the decision not to use e-mail monitoring.

10. What are the advantages of these policies for your company?

The working environment is very positive and there is a tremendous mutual respect between employees and employer. I have emphasized the team aspect of this company and I encourage individualism among my staff.

11. Have you encountered any problems with not monitoring email in your company?

By not employing appropriate firewalls, we have jeopardized our client data in the past.

12. If so, how have you addressed them?

Out of necessity for data integrity, I had a firewall and filtering software installed that checks incoming mail attachments for harmful viruses. However, the staff was aware of this and know that it is only for data safety.

13. On reflection was the decision not to monitor email a positive step for your company?

Absolutely. The benefit to the working atmosphere far outweighs the need to monitor what my employees are doing with their e-mail. My staff is happy, work together and respect my concerns.

14. Considering recent news coverage, available software products and your own experience would your company consider employee email monitoring in the future?

No. I am not concerned, given the low-grade data we are dealing with and the fine staff I currently employ.

COMPANY THAT DOES NOT MONITOR EMPLOYEES' EMAIL

Employee Questionnaire

1. What are your names and what positions do you hold in the company?
2. Has the subject of email monitoring been discussed in your company?
3. How do you feel about the company's decision not to monitor email?
4. What policy documents relevant to email usage exist within the company and how are they made available to employees?
5. How does your company enforce these policies?
6. What are the consequences if an employee is found to be in breach of these policies?
7. What are the advantages for employees of not monitoring email?
8. What are the disadvantages for employees of not monitoring email?
9. Have you encountered any problems with email abuse in your company?
10. If so, how have they been addressed?
11. On reflection do you think email monitoring would have been a positive step for your company?
12. Considering recent news coverage, available software products and your own experience would you recommend employee email monitoring to other companies?

name of the person interviewed: *RK*

qualification/position: *travel agent*

name/address of organization: *Voyage Travel (travel agency) in Vienna, Austria*

date/place of interview: *22nd October 2003/Voyage Travel's offices*

Transcript of interview with happy employee whose email is not monitored

1. What are your names and what positions do you hold in the company?
My name is RK and I am a travel agent working for Voyage Travel.
2. Has the subject of email monitoring been discussed in your company?
Yes. Our boss held a meeting with all employees and shared with us her concerns about e-mail and data security at work.
3. How do you feel about the company's decision not to monitor email?
I was very relieved that our boss chose not to monitor our e-mail at work. I was very appreciative of her frank and open discussion with us regarding such issues as wasting time and inviting viruses. I was able to openly discuss that what can often appear as private e-mail, not related to work is in fact the time of friendly exchanges that help to develop good, working relationships with carriers, hotels and other travel agents. Brutal monitoring or filtering programs may make these types of exchanges impossible and breed an atmosphere of distrust in the company. If an employee is not pulling their weight, it will surely be evident in other areas besides their e-mail. As for data security, although losing or corrupting data as a result of viruses is inconvenient, the data can be restored easily from our tape back-up and need not be coveted like gold at Fort Knox.
4. What policy documents relevant to email usage exist within the company and how are they made available to employees?
Our boss sent a memoir to each of us outlining the same fears she had shared at the meeting. She also provided a list of very helpful do's and don'ts to follow and has trusted us to abide by them.
5. How does your company enforce these policies?
These 'policies' (if you can call them that) are entirely self-enforced, using an honor system.
6. What are the consequences if an employee is found to be in breach of these policies?
The boss would most likely have a word with the employee and make clear to them that their actions were not just hurting the employee but also reflecting badly on the rest of the staff and the business. We have been working together a long time and know each other well. If there were ever a breach of this so-called policy, it would surely be accidental.
7. What are the advantages for employees of not monitoring email?
The work environment is improved with the element of trust and staff feels both empowered and respected as employees. The team aspect is also important as we are all in this business together. Doing something that would hurt the company is also hurting your friend and colleague.

8. What are the disadvantages for employees of not monitoring email?
There is always the risk of inviting viruses that can cause problems on the computer systems. There is also the potential of time wasting and not getting work done. This however corrects itself as if one person does not do a job another staff member will have to and this can breed friction. It is self correcting.

9. Have you encountered any problems with email abuse in your company?
I have had to cover for a colleague who was caught up in personal e-mail exchanges and therefore not able to take care of her clients. The result was that her clients began asking for me instead of her on their return visits to the agency. If we were to move toward a commission scheme of pay supplement, this would hurt her and be valuable pressure on her to cease. As it turned out, the embarrassment was enough to make her stop.

10. If so, how have they been addressed?
As I said, it corrected itself. I also mentioned it to her over lunch and she was embarrassed and stopped.

11. On reflection do you think email monitoring would have been a positive step for your company?
Absolutely not. It would have created a mistrusting atmosphere in the agency and a Big Brother mentality. It would have been a very bad move.

12. Considering recent news coverage, available software products and your own experience would you recommend employee email monitoring to other companies?
Perhaps it is appropriate for companies that are working with highly sensitive data or large amounts of money. However if these problems can be solved with common understandings and trust, the benefits to the work environment far outweigh the risks of not monitoring.

name of the person interviewed: *NP*

qualification/position: *HR manager*

name/address of organization: *Voyage Travel (travel agency) in Vienna, Austria*

date/place of interview: *22nd October 2003/Voyage Travel's offices*

Transcript of interview with unhappy employee whose email is not monitored

1. What are your names and what positions do you hold in the company?
NP, HR manager, Voyage Travel.
2. Has the subject of email monitoring been discussed in your company?
Yes.
3. How do you feel about the company's decision not to monitor email?
Disappointed.
4. What policy documents relevant to email usage exist within the company and how are they made available to employees?
Employees have to sign that they have read and agreed to the company acceptable use policy as a condition of employment.
5. How does your company enforce these policies?
No.
6. What are the consequences if an employee is found to be in breach of these policies?
If we could catch them (a big if) it would depend on the infringement, anything from a verbal warning recorded on the employee's file, to dismissal if they were doing something really gross or criminal.
7. What are the advantages for employees of not monitoring email?
They get away with wasting company time emailing their mates. I guess they could be getting or passing on commercially sensitive information. But that would be really dumb.
8. What are the disadvantages for employees of not monitoring email?
We can't protect them against allegations of mis-selling or other breaches of codes of practice.
9. Have you encountered any problems with email abuse in your company?
No. Ignorance is bliss.
10. If so, how have they been addressed?
N/A
11. On reflection do you think email monitoring would have been a positive step for your company?
Sure. Our competitors do it. We could be wasting money on employees not doing company work or even be hemorrhaging information to our competitors.
12. Considering recent news coverage, available software products and your own experience would you recommend employee email monitoring to other companies?
I recommended it to this company.

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http://www.salon.com/tech/feature/1999/12/08/email_monitoring

Records of Interviews

Any quoted resources from portfolio piece

Policy document

Assessment Criteria

Criterion	Level	Examiner Comments
N Discussion and Analysis of the Interview	2 (Maximum 3)	The interviews have been well discussed with extensive reference to comments made during the interviews. While an attempt at analysis has been made in the early paragraphs further analysis is required at the end in order to gain full marks
O Reflection on the Interview	2 (Maximum 4)	There is some reflection of ideas between the interview and the portfolio research with generalized supporting examples. More depth is required. Specific examples should have been used in order to compare and contrast the differing opinions. No new relationships were established.
P Projection of Broader Implications from the Interview and Portfolio Research	2 (Maximum 4)	Some attempt has been made to project implications but there are no specific supporting examples cited from the interviews or the portfolio.
Q Interview Process		
Appropriateness of the choice of the interviewee	1 (Maximum 1)	Six appropriate interviewees have been selected. They represent different stakeholders with contrasting views.
Appropriateness of the interview questions	3 (Maximum 3)	Good open-ended questions intended to elicit the required range of responses. Follow-up included where appropriate.
Comprehensive record of the interview(s)	3 (Maximum 3)	A full record of all interviews has been included.
R Quality of Communication	2 (Maximum 2)	The writing is clear and logical.
Total	15/20	

General Comments

A well-written piece of work that lacked depth in places and would have benefited from using the full 1,000 words.

Only one of the comments from the interviewees is attributed.

A policy is referred to in the bibliography but not referred to in the report or included in the appendix.

Studying an Area of Impact: An Example

What follows is a concrete example of how to study an area of impact using the integrated approach to teaching ITGS described in the “Syllabus Details” section of the ITGS guide. The example is based on section 3.3, health.

Section 3.3 Health

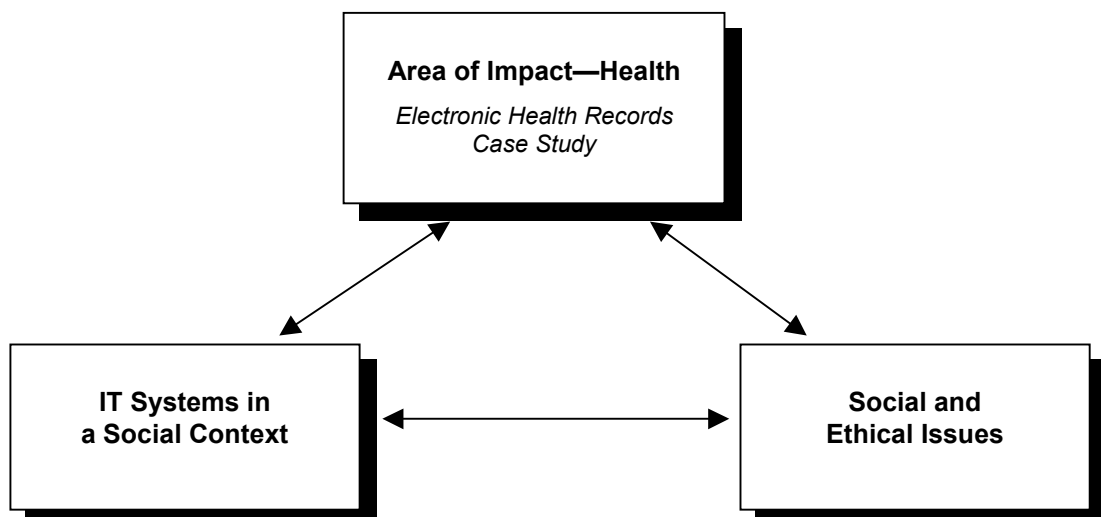
Suggested Health Topics

- Online health information, for example, information about diseases and treatments
- Online counselling, for example, chat with a psychologist
- Telemedicine, for example, remote surgery, fast communication, sending X-rays electronically
- Electronic health records (EHR)
- Use of virtual reality to train surgeons
- Robotics, for example, hip replacement surgery

Case Study: Electronic Health Records (EHR)

Step 1: Identifying a Topic

The case study begins by identifying a particular topic (EHR) in the area of impact, health, in section 3.3 of the syllabus.



A manual (paper) filing system has many disadvantages.

- Information may be in different locations, for example, with the doctor, hospital, physiotherapists, and it is difficult to get a full picture of a patient's health.
- Diagnosis often relies on a patient giving his medical history, which may not be completely accurate.
- Tests may be repeated unnecessarily.
- Lack of information about allergies, current medication or other complications may lead to incorrect prescribing.
- It is hard or impossible to gather research data and statistics.

In order to overcome these disadvantages an electronic health records system could be used.

Step 2: Social and Ethical Issues

The case study systematically reviews the social and ethical issues presented in section 1 of the syllabus and applies them to the particular example of EHR.

1.1	Reliability means data must be reproducible, ie yield similar results each time it is used on similar samples. Reliability = correctness + robustness. Correctness is the ability of software products to perform their exact tasks, as defined by their specifications. Robustness is the ability of software systems to react appropriately to abnormal conditions (Meyer 1997).
1.2	Integrity (data integrity) means that data has not been altered or destroyed in an unauthorized manner. A system does what is expected of it. Data validation is the process of ensuring that data entered into the EHR conforms to pre-determined constraints, for example, data type, numeric range, precision (IT-14-9-2).
1.3	Security is the combination of availability, confidentiality, integrity, and accountability (CEN 13608-1, 2000). Availability is the property of being accessible and useable on demand by an authorized entity (ISO 7498-2), ie the system must be available when required.
1.4	Privacy and anonymity. Privacy is the freedom from intrusion into the private life or affairs of an individual when that intrusion results from undue or illegal gathering and use of data about that individual (ISO/IEC 2382-8). Confidentiality is the property that information is not made available or disclosed to unauthorized individuals, entities, or processes (ISO 7498-2). Authorization is the granting of rights, which includes the granting of access based on access rights. (ISO 7498-2).
1.5	Authenticity (authentication) is the process of reliably identifying security subjects by securely associating an identifier and its authenticator (ISO 7498-2).
1.6	Intellectual property is not applicable to this example.
1.7	Equality of access considers whether some groups of people will be disadvantaged in relation to access to the health network.
1.8	Control (access control) ensures that the resources of a data processing system can be accessed only by authorized people in authorized ways (ISO/IEC 2382-8). Consent must be obtained from the patient and access controls must reflect the consent given.

1.9	Globalization and cultural diversity. Globalization means that health records will have no geographical boundaries.
1.10	Policies and standards. Policies are enforceable measures intended to promote appropriate use, for example, government laws such as the Privacy Amendment Act, December 2001 in Australia, and also national health privacy codes. Such laws must include possible penalties. Standards are technical rules that enable compatibility and therefore facilitate communication or interoperability between different IT systems. Such standards will be necessary for the transfer of health data between different networks within and between countries.
1.11	People and machines includes consideration of who designs the technology and controls its pace of introduction. It considers the advantages of using machines for certain jobs and the advantages and concerns of introducing machines into the workplace.

Step 3: Discussion of Social and Ethical Issues

In a detailed way the case study sets out the advantages and concerns of using electronic health records, using the methodologies for analysing social impact and ethical considerations in the “Syllabus Details” section of the ITGS guide. The discussion is free-flowing and covers the social and ethical issues of section 1 of the syllabus though not necessarily in the order in which they are laid out in the ITGS guide.

HealthConnect is an Australian initiative to develop a **voluntary** national health information network based on computerized health records. This case study is based on information obtained from the work of HealthConnect.

Advantages	Concerns
<p>Reliability</p> <ul style="list-style-type: none"> Hardware and software can be designed to be correct and robust. 	<p>Reliability</p> <ul style="list-style-type: none"> What about hardware failures, software bugs, viruses? <p><i>Implications: Could health records be incorrect? Could health records be lost? Could this be life-threatening?</i></p>
<p>Accessibility</p> <ul style="list-style-type: none"> Fast access to personal health history—more efficient health care could be life-saving in an emergency. The risk of inappropriate treatment is avoided, ie it is not reliant on a patient’s memory. EHR can incorporate medical alerts, for example, allergies to drugs, pre-existing conditions. EHR can share information among health care workers, for example, doctor, pathologist. 	<p>Accessibility</p> <ul style="list-style-type: none"> Could health records be inaccessible due to software or hardware failure? <p>Security</p> <ul style="list-style-type: none"> How secure is the network? Is it secure at collection? Is it secure at storage (hardware theft)? Is it secure during exchange (hackers)? Could it be inaccessible due to software or hardware failure? <p><i>Implications: data could be altered or deleted by an unauthorized person; lives could be threatened in an emergency.</i></p>

Advantages	Concerns
	<p>Equality of Access</p> <ul style="list-style-type: none"> The disabled, elderly, non-English speaking people or those in remote or rural areas may not have Internet access or may lack the skills necessary to access the health network. The structure does not account for non-medical remedies, for example, herbal medicines, acupuncture. <p><i>Implications: some people become disadvantaged and cannot benefit from the health network.</i></p>
<p>(Access) Control</p> <ul style="list-style-type: none"> Measures can be taken so that only authorized individuals have access, for example, firewalls, passwords, audit trails. 	<p><i>Implications: how safe are these methods? Who checks that no unauthorized access has occurred?</i></p>
<p>Availability</p> <ul style="list-style-type: none"> Global access, for example, when holidaying overseas <p>Authorization</p> <ul style="list-style-type: none"> Hardware and software, for example, levels of password access, can be used to provide access rights to authorized users. 	<p>Privacy</p> <ul style="list-style-type: none"> Who has access: is it just health care workers? Does the patient know what information is collected? Does the patient know who has access? Does the patient know how it will be used? Is information used only for the agreed purpose, ie in a health care context? Is only the necessary information collected? <p><i>Implications: if a third party, for example, an insurance agency or prospective employer found out a person was HIV positive the individual may not be sold insurance or hired for a job.</i></p> <p><i>When should information be disclosed, for example, imminent threat to a person's health (partner has HIV) or public safety (school bus driver is treated for substance abuse) or mandatory reporting, ie need to consider breach of confidentiality versus public risk?</i></p> <p><i>Confidentiality is priceless. If it is breached, it cannot be returned—compare with a stolen visa card where the victim can be compensated.</i></p>

Advantages	Concerns
	<p>Policies</p> <ul style="list-style-type: none"> • What policies are in place for complaints if patients believe their privacy has been infringed? • What penalties are in place to deter and punish offenders? <p><i>If health records are sent overseas, does that country have the same security measures and confidentiality policies?</i></p>
<p>Globalization and Cultural Diversity</p> <ul style="list-style-type: none"> • Health records will have no geographical boundaries. 	<p>Globalization and Cultural Diversity</p> <p><i>Implications: different privacy laws in different countries could result in disputes. Legal issues may arise with health care workers operating in different countries.</i></p>
<p>Control</p> <ul style="list-style-type: none"> • Controls can limit amount of information accessed and keep some information private, for example, physiotherapist does not need to see mental health report. 	<p>Control</p> <ul style="list-style-type: none"> • Can patients access their own information? <p><i>Implications: could access result in legal action against a health worker depending on the information?</i></p> <ul style="list-style-type: none"> • Can a patient control who has access to their information?
<p>Integrity</p> <ul style="list-style-type: none"> • Data validation can help ensure data integrity. 	<p>Integrity</p> <ul style="list-style-type: none"> • Users must not be able to alter or destroy data in an unauthorized manner. • Can patients change wrong information? • Could there be errors in data entry? <p><i>Implications: could health records be mixed up or given to the wrong person? Could this result in a breach of privacy?</i></p>
<p>Authenticity</p> <ul style="list-style-type: none"> • Records can easily be edited, updated, copied. 	<p>Authenticity</p> <ul style="list-style-type: none"> • Electronic information is easy to steal and copy as there may be no sign of “breaking and entering” and nothing is “missing”. • If changes are made to health records it is essential to be able to identify the author as an authorized person. <p><i>If records are illegally modified, this could result in incorrect information leading to discrimination against the individual. Drug users could authorize themselves to write their own medical records.</i></p>

Advantages	Concerns
<p>Research</p> <ul style="list-style-type: none"> • Research data and statistics can be gathered for a community, for example, history of diseases, side effects, treatment effectiveness. • The diagnosis could be linked to information about best treatments. 	<p>Research and Privacy</p> <ul style="list-style-type: none"> • How is a person identified for research (medicare number)? Can research results be linked back to an individual? <p><i>Implications: data collected on minority groups could be used against them. Large quantities of data on an individual from different sources could result in an electronic dossier.</i></p>
<p>Policies</p> <ul style="list-style-type: none"> • Laws, for example, Australian Privacy Amendment Act, December 2001, and national health privacy codes can help ensure privacy. <p>Standards</p> <ul style="list-style-type: none"> • Health records can be shared within and between countries 	<p>Policies</p> <ul style="list-style-type: none"> • Laws may be different in different countries.
<p>People and Machines</p> <ul style="list-style-type: none"> • Machines can make life easier for people as they can aid efficiency and take over dull work, for example, searching health files. • Machines have more stamina, memory, accuracy, speed. 	<p>People and Machines</p> <ul style="list-style-type: none"> • Hardware, software and networking will need to be purchased. • Health workers will need time and training. <p><i>Implications: Who will fund this?</i></p> <ul style="list-style-type: none"> • Health workers will need fast access. <p><i>Implications: There is a need for a friendly user interface.</i></p> <ul style="list-style-type: none"> • Health workers will spend more time using computers. <p><i>Implications: Will health workers' workloads increase? Will ergonomic issues result from extra time spent at work stations? Will time at the computer be taken from time spent talking to the patient?</i></p>

Step 4: How Can Privacy Be Protected?

Because privacy is such a central social and ethical issue related to this topic the case study concludes with a review of legal considerations related to privacy. Finally, there is a discussion of the IT systems (section 2 of the syllabus) that could be used to ensure privacy.

Policies and Laws

- Laws, for example, Australian *Privacy Amendment Act* December 2001 with penalties for misuse/unauthorized use
- Additional legislation pertaining to electronic health records
- National Health Privacy Code
- Independent body to oversee access issues
- Clear lines of accountability and responsibility for organizations
- Accurate information about EHR given to patients
- Training for staff so policies and responsibilities are clear

Hardware and Software Security Measures

- Locks on computer rooms, physical locks on hardware
- Computers not left unattended on public counter
- Printouts shredded, old disks destroyed, audit trails
- Data not stored on shared laptop and not taken home on laptop or disk
- Secure archives
- Levels of access, for example, different passwords for different aspects of the system
- Protecting servers and databases from unauthorized access, for example, firewalls
- Authenticating identity of sender and receiver
- Protection of integrity of message
- Ensuring senders cannot deny they sent a message
- Data deleted when no longer needed
- Consent by patient could include signature, PIN, password, digital signature
- Safety during transmission from transmission errors or hackers, for example, encryption

PKI (public key integrity) is the combination of policy, procedures and technology that offers the services of authentication, integrity, confidentiality and digital signature (ISO 2001) and reduces the risk of unauthorized access. PKI uses public key cryptography and digital signatures (see [www.encryption.ppt](#)).

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How to Reference Sources

The following guidance is based on the Harvard author–date system. It is offered only as an example: the IBO permits any accepted convention for citing and acknowledging sources.

Body Text

Use brackets or parentheses to set off a reference in the text. Give the author’s last name, if it is not part of the text, and the date of publication.

A full reference should appear in the bibliography at the end of the piece of work.

Footnotes

Footnotes provide related information that does not belong in the text. There should be as few of these as possible and they should be identified with a superscript number¹ and placed at the bottom of the same page.

Bibliography

The bibliography, or list of references you have used, should appear at the end of the piece of work.

List sources alphabetically by the last names of authors or editors. If there is no author or editor, list sources by titles and put them in order by date.

Books: Author’s last name and first name or initial if name is unknown. Date. Title (in italics). Place of publication. Publisher’s name.

Articles in journals: Author. Date. Title of the article (in quotation marks). Name of the journal (in italics). Volume number, first and last pages.

Information from the Internet: Author’s name if possible. Title (in italics). Date site was visited. URL (address for the home page). Heading as listed on the web page (if there is one).

CD-Roms: Title and version. Publisher. Year.

Unpublished personal interviews and personal research such as questionnaires: Author (last name, first name). Type of source. Pertinent identifying information. Date. Availability.

