November 2013 subject reports

ITGS

Overall grade boundaries

Higher Level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 10	11 - 22	23 - 34	35 - 46	47 - 58	59 - 70	71 - 100

Standard Level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 9	10 - 21	22 - 33	34 - 45	46 - 57	58 - 69	70 - 100

General comments

Past subject reports from the May 2012 session onwards need to be considered when reading this report. Comments in past reports relating to both internal assessment (Project) and external assessment (SL and HL Paper 1, SL / HL Paper 2 and HL Paper 3) continue to be highly relevant to this session.

In order to fully understand the comments in this report, it is necessary to obtain the following from the school IB coordinator:

- Individual membership to Online Curriculum Center (OCC) which is free for all IB educators
- November 2013 CD-ROM/DVD containing the N13 ITGS examinations and markschemes from the school IB Coordinator.

Higher and standard level project

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 3	4 - 7	8 - 10	11 - 14	15 - 18	19 - 22	23 - 30

Recommendations for IB procedures, instructions and forms

- Project samples must be completely digital and follow the Handbook of Procedures 2014 (Section B3.5 Information technology in a global society: project). Both the 3/CS form (mandatory) and the Teacher Marks Justification Form (recommended, available on the online curriculum center,(OCC)) must be submitted in a digital format and saved in the appropriate locations within the candidate's project folder.

  Link:
  http://ibpublishing.ibo.org/xwiki/bin/view/Handbook2014/B3.5+Information+technology+in+a+global+society%3A+project

- The digital version of the 3/CS form for the specific examination session must be used from the Handbook of Procedures.

- Screencasts are required for all projects and must be submitted in the candidate's Project folder. This is especially important in instances where the moderator may not have access to particular software tools that the candidate used to create their product. This includes all database products, for example, Access and FileMaker Pro are platform dependent.

- Products must be submitted in the Product folder in the original file format as well as in a cross-platform format. For example, a DTP product may be submitted as an Adobe InDesign product, but must also be submitted in PDF format as well.

- No product folder may be left empty. In instances where a templated product cannot be exported from an online website, sufficient evidence from the development of the content, such as versions of the images used, must be provided in the Product folder.

- Some projects arrived after the date of submission. Teachers must leave themselves sufficient time to complete the administrative requirements involved with submitting the Project.

The range and suitability of the work submitted

Most schools are now meeting the requirements for all the components (ie Cover Page, Documentation, Product and Screencast). There were a few schools that did not submit screencasts and these had to be requested. Most cover pages were linked appropriately to

the documentation and to the product.

The Teacher Marks Justification Form is where the teacher explains how they awarded marks was not used by some schools. This is a mechanism to ensure that the moderator can understand the thought processes of the teacher in the awarding of the marks and this helps align the marks between the moderator and the teacher.

In most cases, the ITGS Projects identified a real client and a problem that required an IT solution.

Some schools presented similar projects in the sample (eg: they were all websites, or they were all very similar access databases). It is unlikely that these candidates were focused on the client and their unique problem, but rather on finding a client for whom they could create a particular kind of product. This is not the correct orientation for the ITGS project. In other schools it was clear that candidates enjoyed creating an original IT product that would address their client's problem and as a result produced good work doing so.

Some schools had problems in the development of documentation. In some cases there was no correlation between the candidates' ability to create an IT software solution and quality of the associated documentation.

Candidate performance against each criterion

Criterion A

In most cases the investigation document was acceptable. However, the questions in the consultation interview did not support the main body of text in for this criterion. The questions were not well formulated and did not extract information to adequately explain the candidate's problem, what the inadequacies of the present situation.

Criterion B

Usually superficial - some candidates do not understand what *IT system requirements* are. Weaker candidates tend to not understand what System Interaction, Security requirements and/or Specific Performance Criteria are. Details were often lacking. The relationship between criteria B, D and F was not recognized. In some instances, there were inconsistencies between IT systems identified in this criterion and the tools used to create the product in Criterion E. Specific Performance Criteria were not clearly stated and often were phrases that could not be tested and evaluated. However, most candidates were able to clearly justify their choice of IT solution.

Criterion C

In this session this criterion was much better than in previous sessions. However, there is still room for improvement. The product schedule must show all phases of development. This was often not the case. Many candidates submitted a "a slightly modified clone" of the exemplars in the TSM with very general comments like "interview with the client" or "worked on the project" instead of personalizing it and saying "table of products was created and records with

data about the cakes and ingredients entered". The entries must be specific to the client, problem and product and not generic entries that could apply to any IT product of a similar type.

Criterion D

Candidates need to research the correct way to show the overall structure and the internal design for the kind of product that they are developing. Some candidates mistakenly include printouts of finished product. In general they are missing explanations of the designs included. All resources that will be used in the making of the product must be listed. Techniques should include the complex techniques that will be highlighted in Criterion E and also any other appropriate techniques that were used in the making of the product. Testing should address those aspects of the product that ensure that the specific performance criteria identified in Criterion B have been tested. The client's signature is required for Criterion D as indicated on Forms.zip.

Criterion E

In many cases, candidates did not include screenshots to illustrate appropriate points in the development process and why that technique was used. Instead, they just mentioned something like "with xxx technique I did this" and then showed the finished screen. Therefore, the reason(s) why the technique was used was not mentioned. In other cases candidates provided screenshots and some description of the techniques that they used. Candidates tended to describe rather than explain or justify the use of the techniques.

Wherever code is included as a technique, the code must be documented and also a screenshot must be included to show the effect of the code.

Screenshots must be large enough to be legible. Also arrows, circles and other markings need to be used to show the particular aspect of the screenshot being referred to in the text.

Screencasts are required and must be no longer than 5 minutes in length. They must demonstrate that the product is fully functional and also explain the techniques highlighted in Criterion E. Please note, all marks for Criterion E are based on the written documentation.

Criterion F

The evaluation was adequate in most cases, but it was often restricted by the quality of the feedback provided by the client and/or end user. The feedback should address three aspects of the project:

- The effectiveness of the process of development and consultation with the client throughout the process.
- To what extent each of the specific performance criteria in Criterion B were met.
- Recommendations for future development of the product. These should not include modifications that were necessary in the current product.

Criterion G

Most products worked. Also, most candidates used correct folder names and file names, the project cover pages worked and files and folders were correctly included in the CD-ROM/DVD. However, the contents of websites were often not well organized in the Product folder. Some candidates need more advice in this area. Products must be fully functional.

Recommendations and guidance for the teaching of future candidates

- Teachers must not give the examples found in the Teacher Support Material (TSM) on the OCC to the candidates as a starting point for their Project. When this happens, candidates tend to use them as a template and then adapt them for their own Project. The teacher should look at several examples with the candidates and not give them out as a recipe.

- Originality must be encouraged, even when writing the documentation. They could write the documentation in their own style using the Forms provided (which are simply containers to prevent candidates spending considerable amounts of time designing forms and to give moderators a standard format to moderate, that will save them time and lead to greater consistency in moderating).

- Candidates in a class should not be guided to produce the same kind of products and find clients with problems that can be “matched” to the particular product. Candidates need to identify a client who has a problem which can be solved with an IT solution and then determine the most appropriate IT solution.

- Candidates must be warned to keep the projects within the word limit - several candidates went over the word limit and self-penalised themselves. When this happens candidates are only awarded marks on the documentation up to the word limit of 2000 words, usually losing marks for the last criteria as the word count is over the limit.

- Teachers need to provide appropriate feedback after each criterion before the candidate proceeds to the next stage. Teacher feedback on the first draft is allowed.

- Teachers need to be familiar with the following information regarding the ITGS Project and engage in additional professional development regarding the ITGS Project wherever possible.

Information sources for the project:

- *ITGS Guide* (pages 56-72)
- *Teacher Support Material* (Internal Assessment)
- Forms.zip templates
- *Guidance on the appropriateness and complexity of an IT solution for the project*
- OCC *ITGS Project FAQs*
- *ITGS Subject Reports* for M12, N12, M13 and N13 session
- *Handbook for Procedures for the Diploma Programme (updated yearly)*
- Relevant information in the *Coordinator Notes (published quarterly)*

Additional professional development for the project:

- ITGS OCC discussion forum
- ITGS online workshops (cat 1, cat 2)
- ITGS face-to-face workshop (cat 1 & 2, cat 3)
- Candidates need to be cautioned that the exemplars in the Teacher Support Material (TSM) are not to be used as templates. Candidates must adhere to Academic Honesty Regulations and the ITGS Project must be their own work.

Higher and standard level paper one

Candidates need to become familiar with the overall structure of the Paper 1 questions. For each question they must allow approximately 30-35 minutes to organize and write their response. Paper 1 requires concise focussed responses.

In this session, there were three questions that were common to both papers:

HL Q1 and SL Q1 – Mobile Wallet

HL Q2 and SL Q2 – DRM (Digital Rights Management) Cloud movies

HL Q3 and SL Q3 – Senior Care goes hi-tech with virtual doctor visits

Higher and standard level paper one

HL Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 8	9 - 16	17 - 26	27 - 35	36 - 43	44 - 52	53 - 80

SL Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 6	7 - 13	14 - 20	21 - 27	28 - 33	34 - 40	41 - 60

The areas of the programme and examination which appeared difficult for the candidates

Candidates did not reach the upper marks on part (b) questions nor the upper markbands on part (c) questions.

In part (c), candidates are expected to provide a structured response that:

- Addresses the command term used in the question
- Makes explicit reference to the scenario
- Uses ITGS terminology (IT terminology and terminology relating to social and ethical issues)
- Applies their knowledge relating to the specific scenario and provide examples wherever possible.

- Provide a balanced argument
- Show evidence of analysis/evaluation, judgment, opinion based on the argument presented.

Very few candidates reached the 7-8 markband. It seems that most candidates simply read the first part of the question and immediately begin to write.

HL Paper 1 candidates only

Most candidates were completely unprepared to write about DRM, database validation and verification, limitations of Gantt charts, advantages of IT support provided by outsourced companies, fuzzy logic, and effectiveness of voice recognition systems in future models of IT systems.

Other areas that proved difficult to a significant number of candidates were definitions of ITGS terms such as RFID and intellectual property – most candidates had only a partial idea of what those meant. Also, not many candidates were successful when attempting to explain policies that protect users' rights – most of the candidates went off-course and developed answers about companies rights instead.

SL Paper 1 candidates only

All parts of Strand 1 and Strand 2 and Strand 3.1-3.9 must be studied for SL Paper 1. There were gaps in knowledge as cited in the comments relating to SL Paper 1 questions 1 - 5. The questions that emerge are:

- What information has been collected by the candidates throughout the study of ITGS?
- How is that information recorded for later review?
- What methods are used to review this information before the examination?

SL Paper 1 candidates experienced difficulties with the concepts relating to DRM in question 2 and the product development life cycle (PDLC) in question 5. PDLC comes from Strand 3.9 Project management. This section of the ITGS guide is used for developing the Project and is also a taught topic.

The areas of the programme and examination in which candidates appeared well prepared

Questions where candidates have common familiarity with the technology were answered well. These include mobile/cell phones in Question 1 accessing movies from online services or by streaming in Question 2 and video conferencing in Question 3.

Most candidates well prepared to:

- identify pieces of information collected by a store when a bill is paid and
- identify input devices required for a videoconference,
- explain a reason why encryption is used

- explain technical issues that would need to be addressed to set up a videoconferencing system
- evaluate the options between downloading or streaming and between purchasing a commercial database package or developing its own database.

The strengths and weaknesses of the candidates in the treatment of individual questions

SECTION A

HL Q1 and SL Q1 – Mobile Wallet

Most candidates were able to achieve full marks on parts (a)(i), (b)(i), and (b)(ii). They achieved partial marks on parts (a)(ii), (a)(iii), and (c).

(a)(ii) Most candidates knew the meaning of the acronym RFID, but they were unable to present a characteristic of RFID.

(a)(iii) Most candidates were able to present one characteristic of encryption, but not many could present a second characteristic in order to achieve 2 marks.

(c) The development of the extended response (c) was usually adequate. Most candidates described how the use of encryption and pin codes were effective in providing appropriate security during purchases. However, not many went beyond that point or just present superficial suggestions, such as the use of biometrics.

HL Q2 and SL Q2 – DRM (Digital Rights Management) Cloud movies

Most candidates were able to achieve full marks in (a)(ii) where they identified two other media that use DRM and (a)(iii) where they defined the term *intellectual property*. Candidates achieved partial marks in (c) and they could not answer could not answer (a)(i) and (b).

(a)(i) It was clear most candidates were completely unprepared to write about DRM. They simply did not know what it is.

(b) Most candidates did not read carefully and consequently went off course and developed answers about companies rights instead of users rights.

(c) The development of the extended response (c) was usually competent, which means a significant number of candidates reached the 5-6 markband. Streaming vs. downloading proved to be a topic well known and understood by most candidates, so it was not hard for them to come up with balanced analysis, conclusions and judgments.

HL Q3 and SL Q3 – Senior Care goes hi-tech with virtual doctor visits

Most candidates were able to achieve full marks in (a)(i) where they identified two input devices for videoconferencing, and achieved partial marks in (b) and (c). Candidates could not answer (a)(ii).

(a)(ii) Many candidates confused validation with verification, and vice-versa. Other candidates wrote about how important it was to use validation and verification, but did not describe what they meant. Another group of candidates went completely off course and/or demonstrated complete lack of knowledge of these two terms. A small percentage of candidates knew exactly what the terms meant and provided proficient responses.

(b) Candidates were usually able to identify technical issues necessary to be addressed for an effective video conferencing system. However, they had difficulties to explain these same issues.

(c) The development of the extended response was usually competently developed. Candidates were able to produce a response with knowledge and understanding about the advantages and disadvantages of the nursing home purchasing commercial software in comparison to developing the database themselves. The analysis was usually balanced.

SL Paper 1 only (Q4 and Q5)

SL Q4 – Developing a website

(a)(i) Most candidates were able to provide the formula. The question requires a formula and not part of a formula. Therefore, *=(D2-C2)* is accepted and *D2-C2* is not. The same applies to (a)(ii) where an absolute cell reference, a formula is required.

(a)(iii) Absolute cell reference and the reasons for using it were not understood well. This concept is best addressed with hands-on use of spreadsheets.

(a)(iv) Likewise, problems that can emerge when two different persons enter data into a spreadsheet requires candidates to apply their knowledge from collaborations where they have accessed common documents (ie spreadsheets) or from scenarios that they have discussed in class.

(b) The question requires an explanation of why a website needs to be tested by a technical expert, the client and end users. Candidates rarely achieved full marks even though the question is an immediate consequence of their study of Strand 3.9 and the practical work on their Project. Candidates do not understand how to “explain with reasons”.

(c) Again the response is an immediate consequence of understanding the process (reasons for the various assessment criteria) used to develop the Project. Candidates did not reach the upper levels of the markband due to lack of organization and understanding in their responses. It points out that candidates need to understand why and how the client needs to be involved in all stages of Project development.

SL Q5 – Using GPS to monitor vehicle movements

(a)(i) Even though the diagram is typical for this type of scenario, candidates did not seem to understand that the location and possible purpose of the secure servers in the diagram and had difficulties in (a)(ii) identifying the steps used by the GPS system to locate the position of the vehicle. It is important to understand the IT system(s) used in a scenario before proceeding to questions relating to other parts of the ITGS Triangle.

(b) Most candidates experienced difficulty in both explaining why only using data collected from GPS systems to predict traffic flow may not be suitable and (b)(ii) why civil liberties groups may be concerned about the use of this data by governments and authorities. Candidates often did not consider that it is the location of the person's car that is known and not necessarily the location of the person who owns the car. The car could be driven by a different person.

(c) Some reasonable responses for whether GPS systems should be introduced into all vehicles, but rarely a balanced response leading to a conclusion.

HL Paper 1 only (Section B – Q4 and Q5, Section C – Q6 and Q7)

HL Question 4 – Project Management

Most candidates were able to achieve full marks in (a)(ii) and (a)(iii) and achieved partial marks on the remaining questions.

(a)(i) Most candidates either knew that the methodology illustrated was waterfall or were able to identify a characteristic of the methodology, but not very many knew both methodologies.

(b) Most candidates demonstrated some knowledge about Gantt charts, but lack of knowledge about their limitations. They focused usually on identifying reasons why the specific Gantt chart shown in the illustration was not appropriate for the development of the advertising video.

(c) -The development of the extended response was usually basic. This was disappointing. By the number of times, Gantt and PERT charts have been present in exams, it was expected that the candidates would have a much better knowledge about them. The responses were usually superficial, missing several characteristics of those charts, and at times not even differentiating one from the other.

HL Question 5 - Managing the IT support at OBI International

Most candidates were able to achieve full marks in part (a)(i) and achieve partial marks on the remaining questions.

(a) Candidates were usually able to correctly identify the one or two requirements in part (a)(i), but then would go off course in the remaining part of the question.

(b) In a similar manner, candidates were usually able to correctly identify one or at most two policies, but then would go off-course in the remaining part of the answer or were unable to provide explanations for the policies identified.

(c) The development of the extended response in part (c) was usually adequate. Candidates were usually able to present some advantages and disadvantages to the solutions of an in-house IT department and to outsource its IT department, but those answers were mostly descriptive and the analysis was usually unbalanced.

HL Question 6 - Driverless trains?

Most candidates were able to achieve full marks in (a)(i) and achieved partial marks on the remaining questions.

(a)(ii) Most candidates were able to identify characteristics that make the robotic train an expert system, but the description of the characteristics was usually incomplete.

(b) Most candidates provided some characteristics the training simulator should have, but usually they missed important features and/or there was just a partial explanation of such characteristics.

(c) The development of the extended response was usually adequate. The majority of the candidates mentioned the fact that a human driver would be able to take over the system in case it presented some sort of failure and/or in emergencies, as well as the cost issue. However, most responses lacked depth and missed important considerations of possible solutions.

HL Question 7 - Robotic Vacuums

Most candidates were able to achieve full marks in (a)(i)and (b)(ii). They achieved partial marks on the remaining questions.

(a)(ii) Most candidates were able to identify one characteristic of a microprocessor, but could not identify a second one or add additional information about the first characteristic.

(a)(iii) The same comment from above applies to this question regarding fuzzy logic.

(b)(i) Reasons were usually identified, but no clear explanation was provided.

(c) The development of the extended response was usually basic. Most candidates explained characteristics of voice recognition systems and several of them presented examples of voice recognition in other IT systems (such as smart phones), but failed to provide valid arguments for or against the use of voice recognition in future models of the 'Samba'.

Recommendations for the teaching of future candidates

- The teaching of ITGS has to be balanced in the different areas of the syllabus in order to properly cover the ITGS triangle - there cannot be an emphasis in just one area. All areas must be covered and candidates must learn to develop their answers in depth with well-supported arguments.

- Teaching command terms is essential for success - far too many candidates respond to the questions with very superficial answers. If candidates are given a chance to practice with mock tests and are given the proper feedback about their response to the command terms, their potential for success will greatly increase.

- The preparation of candidates for the requirements of the exam is critical to their success. Paper 1 requires consider and focussed responses. It may be prudent for candidates to spend a minute or two before they start writing to make a rough plan of what they want to day to ensure they stay focussed on the question. It should also help to ensure they can provide balance in any analyses.

Higher and standard level paper two

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 2	3 - 5	6 - 8	9 - 11	12 - 15	16 - 18	19 - 26

General comments

Paper 2 is a unique examination paper in that the questions do not change for each session, but the article that is to be analysed and evaluated does. Therefore Paper 2 needs to be prepared for in a different way to the other papers. This can be done by learning to use a template as a starting point to analyse the article and then write responses based on the analysis.

The article used for this paper had a number of characteristics different from previous articles that provided different challenges to writing responses:

- It was substantially shorter than previous articles.
- The IT system was not specialised and is commonly used by candidates.
- The focus of the article was mainly about one issue, privacy, and other issues raised where usually connected to this main one.
- The article contained a discussion of various impacts which could be used in Criterion C or act as a prompt.

The concept of Privacy used in assessing the responses was not a strict definition as the data on the social networking sites is not actually private, and is not hacked into. Candidates often seemed to expect the data to be private even though it is in the public domain on open social-networking sites and easily accessible by anyone. Hence Privacy, for the purpose of the markscheme, was accepted as being ‘inappropriate access’ and ‘use without permission’ of personal data. This is a similar to the usage of the word in the following situation: if someone looked at an open computer screen and read part of an email in an office as they walked past or had a discussion with their colleague, they could be accused of breaching privacy even though it is the fault of the colleague for leaving a sensitive email open to view.

There was a difference between English and Spanish speaking candidates. The tendency was for English speakers to focus more on the technical and IT system aspects which suited parts of criteria A, B and D. The Spanish speakers focused more on the social and ethical issues in their responses which suited parts of criteria A and C. Both approaches are needed to obtain the higher marks.

The areas of the programme and examination which appeared difficult for the candidates

Even though there was evidence that many candidates had learnt how to write structured responses, especially to Criterion C and Criterion D, there were a significant number who had clearly not planned these responses. Criterion A and Criterion B seemed to be rushed, even by better candidates; and clearly most candidates had not returned to Criterion A to ensure consistency with responses in later criteria. The aim of the paper is that 15 minutes are provided for candidates to plan their response. This involves working through each criterion before the response is written into the answer booklet.

Some of the questions also indicated weaknesses in the preparation of responses for certain questions. Question 2(a) was one example of this. The IT system was essentially a simple one and a significant number of candidates did not seem to be able to divide into a set of steps the process of setting up an account on a social-networking site, logging on to the account, searching for a particular person, and then accessing and viewing the information depending on the various settings. Possibly the system was too familiar to the candidates and they did not appreciate the depth of knowledge that was required to be presented and did not include steps they carried out subconsciously.

Another problem is that many candidates did not know how to write a conclusion for Criterion C and/or D. Usually they were a summary of the previous material or a general comment that was not substantiated.

The strengths and weaknesses of the candidates in the treatment of individual questions

Criterion A (Question 1)

Part A

Most candidates were able to identify a social/ethical concern. Most candidates were able to describe why it was a concern, but the description often omitted to include the context of the article, e.g. ‘privacy concern because the information may be used against them’.

Part B

Most candidates correctly identified a stakeholder but not all were able to describe the relationship of the stakeholders with the IT system. The response needs to identify the stakeholder, what the stakeholder is using the IT system for and how it is being used in the context of the article.

Criterion B (Question 2)

Part A

A disappointing number of candidates did not give a clear description of the complete step-by-step process to show how the IT system works. Although the IT system is widely used by candidates often they were not able to go beyond the information given in the article and use technical terminology to achieve high marks.

Part B

The candidates usually repeated the argument in 1(a) and too many omitted to pinpoint the flaw or weakness of the IT system and its use (which could include lack of policies) that enabled the information to be accessed and used inappropriately.

Criterion C (Question 3)

In Criterion C many candidates stopped half way when responding; this failed to provide a balanced set of impacts and a conclusion. A high mark response usually requires candidates to provide a number of impacts for at least two key stakeholders. Merely identifying the impacts will not gain the higher marks.

Candidates need to also display their analytical and evaluation skills by pointing out relationships and links between impacts and making evaluation comments, for example; Information about a candidate's drinking habits on a Facebook page can have negative impact on his/her application for entrance to a university as he/she may be rejected because of a bad reputation, but at the same time it is a positive for the admissions officer who does not need to waste time and effort on the candidate's application. However the Admissions Officer cannot be certain that the information on the page is a true genuine reflection of the candidate's character.

Criterion D (Question 4)

Most candidates were able to give a solution to one of the problems found in Criterion C (Question 3). However, only a few of them could thoroughly evaluate this solution in a balanced way providing a conclusion that argued the extent to which the solution overall was effective in solving the problem. Conclusions should include future recommendations if possible. The exact problem and its impact need to be described at the beginning and specifically addressed throughout the response, especially in the conclusion, for example:

'The implementation of the detailed polices discussed above would prevent the misuse of candidate's information on social networking services by admissions officers to assess their university application as it is used without their permission. But as discussed above there is no guarantee that the admissions officer's view of the candidate would not be impacted negatively by just viewing the material even if not specifically used in the review of the application. Therefore as discussed above the candidate will need to be careful about what they put on their SNS pages and the privacy settings they use, and the universities need be more open about their use of such information.'

Recommendations and guidance for the teaching of future candidates

- When teaching for Paper 2 using previous examination papers, analyzing candidate responses or using a news article (the original or adapted) the most benefit will be gained if a template is used to analyse it and to structure the responses.
- Sections of the paper can be used for practice to hone the skills during the course. For example, IT systems could be looked at with a view to identifying the steps in how they function.

Higher level paper three

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 4	5 - 8	9 - 12	13 - 15	16 - 19	20 - 22	23 - 30

The levels of knowledge, understanding and skill demonstrated

As in previous years, the responses from lower ability candidates lacked any meaningful analyses and evaluations that were substantiated appropriately.

Some candidates demonstrated sound or even advanced technical knowledge. Fewer seemed to understand the social and ethical arguments related to privacy and could analyse them from the point of view of all stakeholders. Very few could do both and present them together in a well-structured answer. In general, most of the Spanish papers seemed to approach Q2, Q3, and Q4 from a humanistic angle whereas more of the English papers focused on the technical side and added the other strand(s) where they could.

There seemed to be a disconnect between the three strands which is perhaps a result of the way the subject is being taught in some schools.

The areas of the programme and examination which appeared difficult for the candidates

The misinterpretation of the questions and lack of depth in the answering continues to be a problem, specifically in extended response questions. This was particularly evident in Q4, as will be explained in more detail later.

Most candidates were clearly able to understand the case study and carry out a minimum of individual research, but sometimes were not able to refer to it or use it to support their arguments effectively.

The strengths and weaknesses of the candidates in the treatment of individual questions

Question 1

The way the question was written made it possible for candidates to refer to errors at the client, taxi, network, satellite, or office. The markscheme allows for all of these possibilities to make it fair for all candidates. The most popular answers were about loss of signal from the satellite due to surroundings, weather and map data being out of date.

A large number of candidates identified a situation in which GPS wouldn't work but had more difficulties describing the situation properly for the second point. A number of candidates were

not 100% aware of how GPS worked which was surprising given that it was one of the main technologies of the case study.

Question 2

The question was well worded and should have been understood by nearly all candidates, however many candidates described the process of reserving a taxi without focusing on the decision about which taxi to send. Those candidates who performed well on this question mostly talked about time and distance being the principal factors and very few identified that many other variables could be taken into consideration or pointed out any of the basic technology behind this.

Question 3

Candidates seemed to be familiar with this concept but some had difficulty in expressing the ways of keeping data safe, the rights of the customers etc. The majority of Spanish papers explained some of the social and ethical reasons why data might should be kept private. Fewer English candidates took this approach and instead focused on the type of data stored and the agreement from the customer. Few candidates made full and correct use of ITGS terms in their answers.

Candidates seemed to focus on whether it was moral / correct rather than under what conditions it was legal to store and share data. In many cases the analysis was unbalanced.

Question 4

The wording of this question confused some candidates who mistook the word “Evaluate” for a command term. Possibly as a result some of the lower ability candidates got confused and evaluated a series of systems they had investigated then recommended one, instead of discussing the criteria. Other candidates suggested features that they had seen or heard about in other taxi systems as being criteria for the selection. Both approaches were accepted if they met the marking criteria for this question, but few responses achieved this.

Surprisingly, quite a few scripts which answered this question well were not able to enter the top markband because they had no evidence of research (despite this requirement being clearly stated in the question).

There were some exceptional answers that got this correct and used their research as a starting point for the analysis of each criterion.

Since Project Management and IT Systems in Organisations are topics in the ITGS course, it is hoped that future candidates will be more aware of the various criteria involved in the selection of a new product, apart from the simple functional characteristics and requirements.

Recommendations and guidance for the teaching of future candidates

- It is recommended that in future, schools continue (or perhaps start) to integrate the 3 strands of the course. Some guidance for this may be useful via the OCC, possibly in the form of a discussion of the different ways to link technology, social and ethical topics and examples together, and then answer questions using this framework.

- Variety in the candidates' research is recommended as in some cases whole classes of candidates quoted the same examples verbatim without any of the individual insights that extra personal research can allow.

- Schools should consider collaborative research for the case study, especially Q4 topic areas. This approach is particularly advised in cases where schools do not have locally available examples and resources.

- Candidates would benefit from instruction on how to express their ideas in a clear and simple way that is easily understood and interpreted by the examiner. Handwriting clarity was an issue for many candidates and they should be provided with opportunities to write long handwritten answers under pressure, because on many occasions the scanned answer papers were difficult to read.

- This version of the paper (since May 2012) is 15 mins longer than previous paper, so candidates are expected to plan their responses. This should ensure they meet the requirements of the paper.