



# **MARKSCHEME**

**May 2014**

## **INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY**

**Higher Level and Standard Level**

**Paper 2**

15 pages

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### Using assessment criteria for external assessment

For external assessment, a number of assessment criteria have been identified. Each assessment criterion has level descriptors describing specific levels of achievement, together with an appropriate range of marks. The level descriptors concentrate on positive achievement, although for the lower levels failure to achieve may be included in the description.

Examiners must judge the externally assessed work at SL and at HL against the four criteria (A–D) using the level descriptors.

- The same assessment criteria are provided for SL and HL.
- The aim is to find, for each criterion, the descriptor that conveys most accurately the level attained by the candidate, using the best-fit model. A best-fit approach means that compensation should be made when a piece of work matches different aspects of a criterion at different levels. The mark awarded should be one that most fairly reflects the balance of achievement against the criterion. It is not necessary for every single aspect of a level descriptor to be met for that mark to be awarded.
- When assessing a candidate's work, examiners should read the level descriptors for each criterion until they reach a descriptor that most appropriately describes the level of the work being assessed. If a piece of work seems to fall between two descriptors, both descriptors should be read again and the one that more appropriately describes the candidate's work should be chosen.
- Where there are two or more marks available within a level, examiners should award the upper marks if the candidate's work demonstrates the qualities described to a great extent. Examiners should award the lower marks if the candidate's work demonstrates the qualities described to a lesser extent.
- Only whole numbers should be recorded; partial marks, that is fractions and decimals, are not acceptable.
- Examiners should not think in terms of a pass or fail boundary, but should concentrate on identifying the appropriate descriptor for each assessment criterion.
- The highest level descriptors do not imply faultless performance but should be achievable by a candidate. Examiners should not hesitate to use the extremes if they are appropriate descriptions of the work being assessed.
- A candidate who attains a high level of achievement in relation to one criterion will not necessarily attain high levels of achievement in relation to the other criteria. Similarly, a candidate who attains a low level of achievement for one criterion will not necessarily attain low achievement levels for the other criteria. Examiners should not assume that the overall assessment of the candidates will produce any particular distribution of marks.
- The assessment criteria must be made available to candidates prior to sitting the examination.

**Theme: Business and employment**

**Criterion A — The issue and stakeholder(s)**

**[4 marks]**

**1. (a) Describe *one* social/ethical concern related to the IT system in the article.**

*Example: **Privacy of customer** data stored in the online database could be a concern should an unauthorized user gain access and **use it for fraudulent purposes**.*

*Social/ethical concerns may include the following:*

<b>Examples of concern</b>	<b>Impact/result/consequences/effect/outcome on the shopper/online business/traditional store</b>
Privacy/security of customer’s data	Unauthorized users gaining access to this information and using it for fraudulent purposes <i>eg</i> spreading of viruses, stealing credit card information, identity theft, unwanted spam
Recording of a customer’s location	Could reveal to unauthorized people the whereabouts of online shoppers and send them unwanted advertising, profiling the habits of the customer
Using free in-store Wi-Fi service to access online store which may capture data	Unwanted advertising by store to shoppers
Online store’s combine personal information with purchasing choices and location	Profiling of customer used negatively against them <i>eg</i> unwanted marketing
Lack of security of a mobile phone and apps remaining logged on	Unauthorized transactions
Ethics of using physical stores as “showrooms” and then customers buying online <b>or</b> loss of business/customers for physical stores as a social concern	May result in traditional stores closing down  Loss of jobs
Trustworthiness of online sites	Purchases from fraudulent online stores who do not deliver the goods
Reliability – due to inability to use the device/app/ <b>or</b> reliability of network/device or out of range/slow connection	May result in customers not being able to use the app in store and take advantage of coupons, or to make an informed purchasing decision
Inequality of access – not all apps are available for each region/not all customers can afford/know how to use smart phones	Cannot benefit from making more informed purchasing decisions and may pay higher prices

Integrity of online data – data could be lost/changed/corrupted when stored on the online database	Inaccurate product/customer details, leading to misleading information and incorrect orders
Globalization leading to a loss in the traditional culture of shopping	May result in high streets/shopping malls closing down
People and machines – negative change in human behaviour due to the use of the mobile shopping apps	Lack of face-to-face interaction with others and loss of social skills Time wasting at work – reduced productivity Loss of jobs of shop floor assistants

*continued ...*

Question 1 continued

(b) Describe the relationship of *one* primary stakeholder to the IT system in the article.

Who	What	Part of IT system
Shoppers/customers	Gain information about products and make better purchases  Provide private information/financial information	Shopping apps  Online stores
Physical stores, <i>ie</i> retailers with a physical store (negative relationship)	May lose customers from making in-store purchases due to the customer using the shopping apps which directs them to other stores or directs them to buy online	Shopping apps or online stores
Owners/staff of online shopping sites  Accept named site from article – Amazon, Taobao	Set up the online stores with product information <i>eg</i> product, description, price for customers to visit and purchase goods  Create the online customer databases that store shoppers information <i>eg</i> private information, financial information, purchasing history	Online store/website  Online customer database
Providers of online shopping apps	Provide/develop the app which allows shoppers to compare prices of products, gain reviews.	Shopping App <i>eg</i> Amazon Price Check

Marks	Level descriptor
0	The response does not reach a standard described by the descriptors below.
1	Either an appropriate social/ethical concern <b>or</b> the relationship of <b>one</b> primary stakeholder to the IT system in the article is identified.
2	Either an appropriate social/ethical concern <b>or</b> the relationship of <b>one</b> primary stakeholder to the IT system in the article is described <b>or</b> both are identified.
3	Either an appropriate social/ethical concern <b>or</b> the relationship of <b>one</b> primary stakeholder to the IT system in the article is described; the other is identified.
4	Both an appropriate social/ethical concern <b>and</b> the relationship of <b>one</b> primary stakeholder to the IT system in the article are described.

**Criterion B — The IT concepts and processes [6 marks]**

2. (a) Describe, step-by-step, how the IT system works.  
**IT system: Using cell/mobile/smart phones and online databases.**

Step	From the article	Development (DEV)
Setting up (using the phone)	Downloading the app  Shoppers set up an account and provide personal information (line 22)	Set up information includes: the username and password, different examples of personal <i>eg</i> mobile phone number for verification  Downloading the app from the App Store
Connectivity (using the phone)	Customer uses smart phone to access the internet (line 1)	Phone connects to wireless network or mobile broadband (via radio link) (3G, 4G, Wi-Fi)  A client/server is used – phone is client, online shopping site provides server  Data might be encrypted during transmission/decrypted at server  Transmission of data may in different formats <i>eg</i> html, ssl, use of TCP/IP  Use of browsers (Safari, Chrome) to enter the URL of online store from phone
Input data (use of phone)	From image – reference to Scan it, Snap it and Say it	Input is via barcode scan, photo, voice, text, stylus (development of scan it say it snap it) input uses touch screen, phone’s camera or microphone

*continued ...*

Question 2 continued

<p>Step associated with using the online database-processing</p>	<p>Customer uses shopping app with mobile (line 11, 15)</p> <p>Personal information is stored in the online database</p> <p>Customer checks the product online (line 12)</p> <p>Customers check price, find discount coupons and research product reviews online (line 16)</p> <p>Customer uses smart phone to purchases online (line 16).</p> <p>Shopper's location may be picked up from the smart phone (line 24)</p>	<p>Examples of possible developments extending beyond the article:</p> <p>Verification of shopper details to log on to account in online store</p> <p>Server matches photo, barcode, voice, text to product in online store's database</p> <p>Use of tech terms to search the database eg searching fields and matching records</p> <p>Development of how to find discount coupons from online database / development on the steps to find product reviews and details from online database</p> <p>Customer uses shopping cart software to purchase the product</p> <p>Customer enters information required to purchase the product (ie credit card details, name, address)</p> <p>Customer builds a wish list</p> <p>App identifies customer's location via GPS or cell phone towers (triangulation)</p>
<p>Storage</p>	<p>Information is held on in-store online database (line 23)</p>	<p>Online store records customer information in database</p> <p>Online store sends customer tracking number/confirmation</p>
<p>Output</p>		<p>Information about product is sent back to phone</p>



**(b) Explain the relationship between the IT system and the social/ethical concern described in Criterion A.**

<b>Link between the concern and the Shopping Apps or Online Stores</b>	<b>How</b>	<b>Why</b>
Privacy/security would be a concern if	Unauthorized access to online customer information in a database with	Due to poor password protection by staff, or a hacker hacks into the firewall of the web server
	Data is intercepted during transmission	There is inadequate encryption of the connection between the phone and the online server
	Online stores track customer's location using GPS/cell tower/ in-store Wi-Fi service	App has the feature to "Use current location" <b>or</b> Tracking of Wi-Fi/mobile signal
	Online store's use of data unwittingly supplied by customers to develop profiles of customers	From data mining the different databases <i>ie</i> combining personal information with purchasing choices, location of purchase
Security	Lack of security of a mobile phone and apps remaining logged on	If there is no passcode on the phone and no need to log on to an app, once with access to the phone, unauthorized purchases can be made
Ethics of using physical stores as "showrooms" and then buying online <b>or</b> Loss of business/profits for physical stores as a social concern	Physical stores provide facilities for customers who have no intention of purchasing and use the facilities to buy from elsewhere  Using the mobile app/online store to shop online	There are no restrictions on using phones in stores and connectivity to the internet can be found in store <i>eg</i> use of 3G or from stores own Wi-Fi  People choosing to purchase online instead of in the store

*continued ...*

Question 2 continued

Trustworthiness of information accessed by customer	Reviews can be made by anybody and posted online and from product comparison sites	Lack of authentication of users who submit reviews of products  Lack of regular updating of product information.
Reliability would be a concern if	Errors could occur when customer inputs information	Small keys on the phones onscreen keyboard could be mistyped by user
	The network/device is out of range/connection slow, website down at peak time	The online store has not purchased adequate bandwidth for the usage  There are not enough cell towers to give full coverage to this location  Too many users on the free in-store Wi-Fi
Inequality of access	Not all customers have access to the product information and online stores	Digital divide – ie older generation are not familiar with newer technologies  Apps may not be available for each region or for each phone operating system  Not all customers can afford mobile technologies or know how to use smart phones
Globalization leading to a loss in the traditional culture of shopping	Less consumers visiting physical stores as they are shopping online	Stores cannot survive – if they do not make sales as they have to pay all of the overheads and staffing costs but do not earn revenue
People and machines – negative change in human behaviour due to the use of the mobile shopping apps	Lack of face-to-face interaction and social skills  Time wasting at work – reduced productivity  Loss of jobs of shop floor assistants	There are no restrictions in store or no policies on use of the technology
Integrity of online data	Data could be lost/ changed/ corrupted when stored on the online database giving inaccurate product/customer details, misleading information and incorrect orders	Poor website security eg poorly configures firewall, hacking or weak access control

*Candidates are expected to make reference to relevant stakeholders, information technologies, data and processes. Candidates will be expected to refer to “how the IT system works” using appropriate IT terminology.*

Marks	Level descriptor
0	The response does not reach a standard described by the descriptors below.
1–2	<p>There is little or no understanding of the step-by-step process of how the IT system works and does not go beyond the information in the article.</p> <p>The major components of the IT system are identified using minimal technical IT terminology.</p>
3–4	<p>There is a description of the step-by-step process of how the IT system works that goes beyond the information in the article.</p> <p>Most of the major components of the IT system are identified using some technical IT terminology.</p> <p>The relationship between the IT system referred to in the article and the concern presented in Criterion A is identified, with some use of ITGS terminology.</p>
5–6	<p>There is a detailed description of the step-by-step process that shows a clear understanding of how the IT system works that goes beyond the information in the article.</p> <p>The major components of the IT system are identified using appropriate technical IT terminology.</p> <p>The relationship between the IT system referred to in the article and the concern presented in Criterion A is explained using appropriate ITGS terminology.</p>

**Criterion C — The impact of the social/ethical issue(s) on stakeholders****[8 marks]****3. Evaluate the impact of the social/ethical issues on the relevant stakeholders.***Positive Impact to customers may include the following:*

- greater choice of products – online stores can have larger inventory because overhead costs are lower
- access to information about products – including prices, reviews, comparison of products to make more informed purchase decisions
- can take advantage of special offers, coupons *etc* – lower costs to customer.
- global access rather than just local
- convenience/efficiency / flexible – can shop anytime and anywhere – shopping in downtime/commute time
- less time-consuming.

*Negative impacts to customer may include the following:*

- too many choices to make an intelligent decision
- personal details (*eg* home address) could become accessible to unauthorized persons if data is not secured at the server/during transmission – this information could be misused/changed
- customer's whereabouts can be tracked – owners may feel that they are under surveillance
- items can be hard to return – resulting in possible shipping costs, time wasted packing and sending the item
- fraud – bogus online stores or shops, fake websites
- unacceptable goods – goods do not match the online advertiser's description
- shipping problems – unexpected costs, goods take too long to arrive or never arrive
- unwanted offers – customer might inadvertently accept an unwanted offer *ie* buying in a hurry
- malware – unscrupulous sites adding malware to your smart phone.
- reliability of device/network/app
- equality of access – not everyone (customer) has a smart phone with internet connection
- less social interaction – impact on culture as less approaching of staff.

*Negative impact on online store may include the following:*

- increase in sales – much wider customer base
- collection of information about customers, such as browsing and buying histories – useful in marketing.

*continued ...*

*Question 3 continued*

*Positive impact on online store may include the following:*

- need to provide a way to return items – might have to pay shipping costs
- something must be done with the returned item – repackaged, reused, repurposed.
- initial investment cost to set up IT infrastructure for the store
- IT personal should be hired to maintain database/website
- online store has to setup warehouse of goods at strategic locations to deliver the goods on time, cost involved in setting up warehouse
- if the online server fails, customers will not be able to purchase.

*Positive impact on physical store may include the following:*

- some stores may also offer an online store (*ie* need to keep less inventory on hand, customers can order online and pick up in the store)
- traditional stores can offer greater variety of products with a web presence.

*Negative impact on physical store disadvantages may include the following:*

- decrease in sales – customers buying elsewhere
- decrease in profits – traditional stores need to maintain inventory, hire salespeople *etc*
- closing of store – due to loss of business and high overheads
- loss of jobs (*ie* fewer salespeople, fewer people in inventory of goods).

Marks	Level descriptor
0	The response does not reach a standard described by the descriptors below.
1–2	The impact of the social/ethical issues on stakeholders is described but not evaluated. Material is either copied directly from the article or implicit references are made to it.
3–5	The impact of the social/ethical issues on stakeholders is partially analysed, with some evaluative comment. Explicit references to the information in the article are partially developed in the response. There is some use of appropriate ITGS terminology.
6–8	The impact of the social/ethical issues on stakeholders is fully analysed and evaluated. Explicit, well-developed references to information in the article are made appropriately throughout the response. There is use of appropriate ITGS terminology.

**Criterion D — A solution to a problem arising from the article**

**[8 marks]**

**4. Evaluate *one* possible solution that addresses at least *one* problem identified in Criterion C.**

*Solutions to problems of security/privacy:*

- customer data is encrypted during transmission and on the central server of the online store
- restricted access to information stored on central server of the online store *ie* employees can only view necessary information
- authentication for employees of online store who have permission to access the database
- customer can turn off GPS tracking at will
- detailed privacy policy for the online store
- details of how to secure the online store server *eg* firewall, anti-malware software.

*Solutions to problems related to returning items:*

- allowing customers to return (or pick up) items at a physical location instead of sending them back can benefit retailers (*eg* item purchased online can be picked up and returned at their local store)
- online retailer can send shipping labels for returning the item with the purchase, retailer also assumes shipping costs
- customers need to check shipping and return policies before buying.

*Solutions to problems of unacceptable goods, unwanted offers, fraud:*

- buy apps from a closed app store such as Apple's app store or the retailer itself
- make sure online site is secure, *eg* uses SSL on the login page
- use strong passwords for accessing online stores and change them often
- use of additional authentication *eg* biometrics, authentication dongle/app creating one off pass codes
- research online store to determine that it is reputable, use comparison shopping sites or a site-rating browser add-on
- document as many specifications for the item as possible and maintain a paper trail *eg* delivery charges, warranties *etc.*

*continued ...*

*Question 4 continued*

*Solutions to problems of online purchases rather than purchases in traditional stores:*

- stores can enable customers to purchase in-store goods via an app that interacts with the store’s POS system
- connect with in-store customers via a mobile device to create a personalized experience for the customer that influences behaviour and boosts spending, app connects customer to a salesperson
- retailers can adjust prices to match those offered online
- retailers can offer unique products that are not available online
- retailers can create an online store to offer more products without having to keep them in inventory in the store
- create an “experience” in the retail store that cannot be duplicated online, *eg* coffee shops in bookstores, events such as book signings or fashion shows
- create a digital experience in the store, *eg* tablets that demonstrate make-up or provide information on products in the store. Allow customers to do their research while in the store
- non technical solution of “Save the High St” campaign or equivalent.

*Solution to problem of lack of social interaction in stores:*

- retraining of staff and development of staff to use and interact with the shopping apps.

Marks	Level descriptor
0	The response does not reach a standard described by the descriptors below.
1–2	<b>One</b> feasible solution to at least <b>one</b> problem is proposed and described. No evaluative comment is offered. Material is either copied directly from the article or implicit references are made to it.
3–5	<b>One</b> appropriate solution to at least <b>one</b> problem is proposed and partially evaluated. The response contains explicit references to information in the article that are partially developed. There is some use of appropriate ITGS terminology.
6–8	<b>One</b> appropriate solution to at least <b>one</b> problem is proposed and fully evaluated, addressing both its strengths and potential weaknesses. Areas for future development may also be identified. Explicit, fully developed references to the information in the article are made appropriately throughout the response. There is use of appropriate ITGS terminology.