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Rewarding Learning

Candidate Num...

ADVANCED
General Certificate of Education
January 2011

Applied Information and Communication Technology

Assessment Unit A2 7

assessing

Unit 7: Investigating Systems

[A6J11]

A6J11

THURSDAY 13 JANUARY, AFTERNOON

TIME

2 hours.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Answer **all eleven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 100.
Quality of written communication will be assessed in **questions 2, 5, 8 and 10**.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

This paper is accompanied by a Case Study. You must **not** use your own annotated copy of this Case Study.

ADVICE TO CANDIDATES

You are advised to take account of the marks for each part question in allocating the available examination time.

6403

For Examiner's use only			
Question	Marks available	Marks	Remark
1	5		
2	7		
3	6		
4	4		
5	18		
6	12		
7	8		
8	16		
9	10		
10	11		
11	3		
Total	**100**		

1 In the table below, identify with a tick (✓) **five** valid reasons for developing a computer based solution to resolve the problems at SQUEAKY CLEAN.

REASON FOR DEVELOPING A NEW SYSTEM	
Loads of paperwork in use at SQUEAKY CLEAN.	
Harry, the secretary, does not like paperwork.	
A major objective is to provide a good quality service to customers.	
Terry and Fiona would like to extend the range of services that are offered.	
Terry and Fiona would like to take more holidays.	
A new system will improve the standard of cleaning provided.	
Customers find it difficult to renew their contracts.	
The number of clients is growing rapidly.	

[5]

2 Following their decision to employ the services of ABSOLUTE ANSWERS, a project initiation meeting needs to be arranged.

(a) The initial meeting should last for a maximum of one hour. Which of the following delegate lists would achieve the most productive outcome within this time?

_____[1]

DELEGATE LIST 1	DELEGATE LIST 2
Manager of ABSOLUTE ANSWERS Terry Hamilton Caroline Smyth	Terry Hamilton Fiona Duffy Caroline Smyth Harry James Manager of ABSOLUTE ANSWERS Programmer from ABSOLUTE ANSWERS Analyst from ABSOLUTE ANSWERS Two full time cleaners Driver

(b) Provide a detailed justification for your choice.

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_____[6]

3   A trainee analyst has been asked to work alongside James McKenna who is ~~the~~ analyst assigned to the project at SQUEAKY CLEAN.

ABSOLUTE ANSWERS has a predefined list of information which must be availabl~~e~~ completion of the project initiation phase. The trainee has been asked to suggest how th~~e~~ information should be obtained. The senior analyst will either agree or disagree with the suggested fact finding activity.

Complete the following table:

INFORMATION NEEDED	SUGGESTED FACT FINDING ACTIVITY	SENIOR ANALYST'S DECISION	EXPLANATION OF DECISION
Define the Terms of Reference for the project.	Interview Terry, Caroline and Harry individually.	DISAGREE	
Operational requirements.		AGREE	These are the people who carry out the day-to-day activities within the business and as such are most aware of the requirements of a new system and the problems with the existing method of doing things.
Sample documentation.	Ask only the cleaners for samples of the documents they complete.		
Organisation structure.	Ask either Terry or Fiona for an organisation chart.		There should only be one version of this structure which can be confirmed by the owners of the business.
Daily office activities.		AGREE	It is very important that the analysts get some first-hand knowledge of the business.

[6]

4 James has suggested to Terry that SQUEAKY CLEAN would benefit from the introduction of a simple network.

In the table below, identify with a tick (✓) **four** valid reasons for introducing a local area network.

REASONS FOR INTRODUCING A LOCAL AREA NETWORK	
Employees will be able to collaborate.	
Caroline can access client details from home.	
Useful hardware can be easily shared by all staff.	
SQUEAKY CLEAN can buy new machines of a lower specification.	
Centralised backup procedures can be implemented.	
All employees will have internet access.	
SQUEAKY CLEAN will appear more professional.	
Paperwork will be reduced.	

[4]

5 The senior analyst has decided to extend the range of fact finding activities. _____ _____
obtain information from all customers but realises that this will be a time consu____ ____ity.
He has identified the following activities as requirements for the analysis phase o_ ____
at SQUEAKY CLEAN:

Design questionnaire	*Observe Harry*	*Compile analysis report*
Present findings	*Administer customer questionnaire*	*Interview Harry*
Interview Caroline	*Review documents obtained during interviews*	*Analyse questionnaire data*

The activities are not listed in any particular order.

The GANTT chart shown below includes all of these activities:

6403
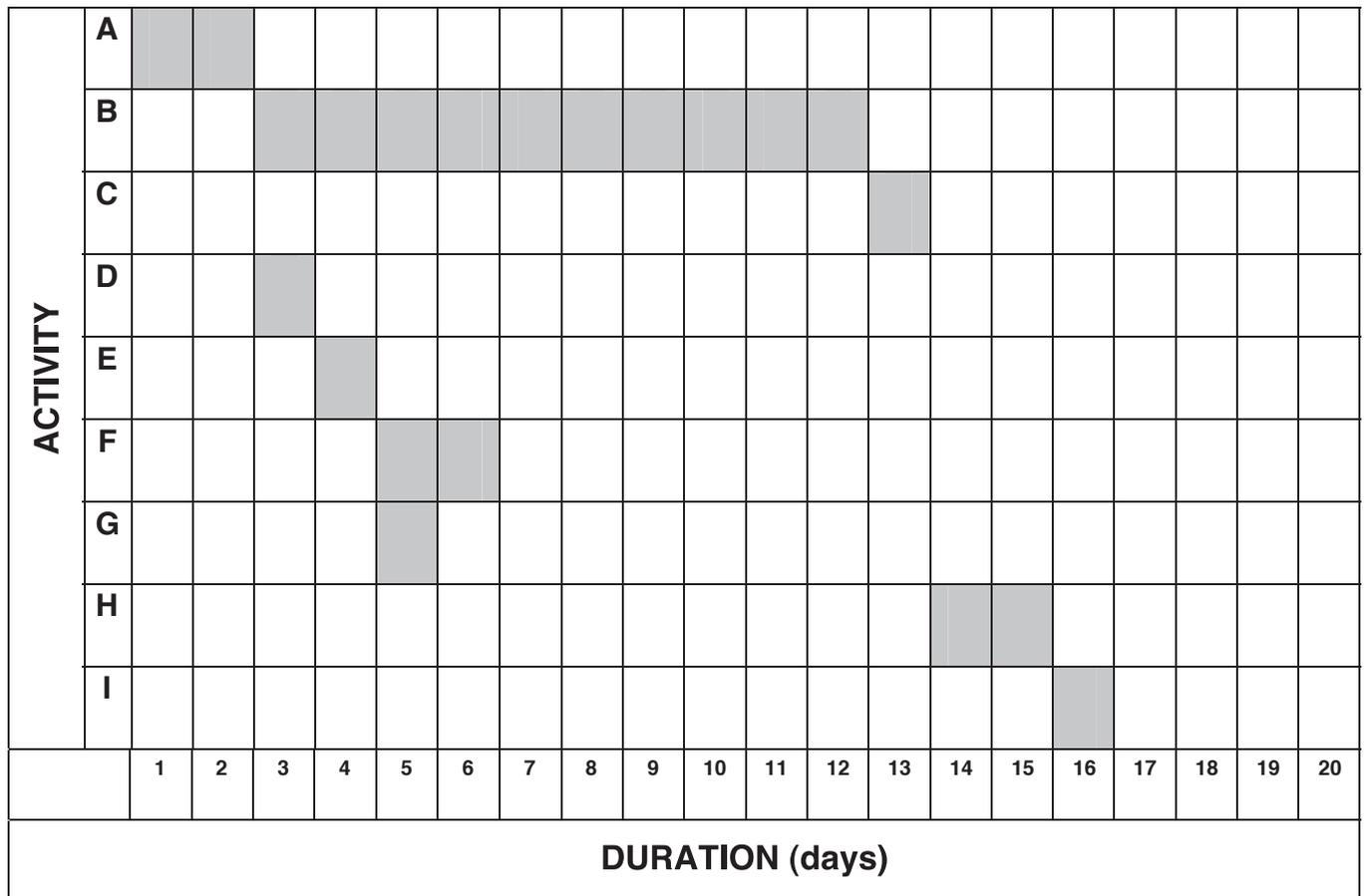
(a) Using the information provided, complete the following table to show the predecessors and descriptions for all activities in the analysis phase.

Activity	Description	Predecessor	Duration (days)
A	Design questionnaire		2
B		A	10
C			1
D			1
E	Interview Harry	–	1
F		E	2
G			1
H	Compile analysis report		2
I	Present findings		1

[11]

(b) What is the shortest time for completion of this project?

_____[1]

(c) Terry is concerned about the length of time being spent on the analysis phase. She is keen to get the new system up and running as quickly as possible. She has asked the senior analyst to outline some changes that could be made to the plan. Identify **two** possible changes and discuss the outcomes.

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_____[6]

6 James is keen to involve the newly appointed junior analyst in the development of the data models. Following on from the context diagram, the analysts will now examine the main processes in detail.

(a) What is the name of the next diagram that they will create?

_____

_____[1]

(b) What component will appear on this diagram that does not appear on a context diagram?

_____

_____[1]

(c) Suggest two problems that the analysts could encounter at this stage if the context diagram has not been properly created.

Problem 1

_____

_____[1]

Problem 2

_____

_____[1]

(d) When reviewing the first attempt at the diagram, James notices a few mistakes. Complete the following table to show the necessary corrections.

COMPONENT	CORRECTION
suppliers	
contracts	
Send order to supplier	
b Accounts process	
Manage Administration at SQUEAKY CLEAN	

[8]

10
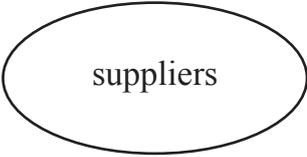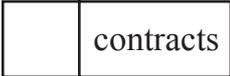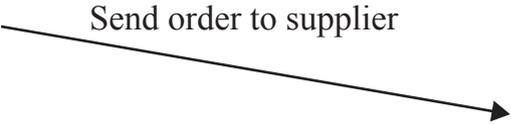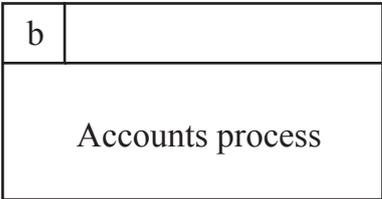
7 On completion of the investigation activities, the junior analyst has identified the following requirements for the new system at SQUEAKY CLEAN.

She now needs to categorise them into inputs, outputs, files and processes. Complete the following table by inserting a tick (✓) indicating the category to which each item belongs:

	CATEGORIES			
REQUIREMENTS	**INPUT**	**OUTPUT**	**FILE**	**PROCESS**
Client details				
Job enquiry form				
Staff				
Weekly task schedule				
Produce supplier order				
Create task schedule				
Client contracts				
Clients				

[8]

8 The analysts at ABSOLUTE ANSWERS typically use a TOP DOWN approach to data analysis. For this reason, they will start by looking in detail at some of the requirements of the new system.

A sample Task Schedule is shown below:

Squeaky Clean

Task Schedule: 24ᵗʰ January 2011

Day	Start Time	Hours	Client Details	Completed
Mon.	09:30	2	Elaine Frank, 22 Willow Lane, 07944 4231390	
Mon.	12:00	1	Maria Parkfield, The Manse, 09823 1345679	
Mon.	2:30	2	John Phillips, 29 Long Acre, 09865 234990	

Staff Name: Eleanor Smith

Signature: _____   **Date:** _____

These forms must be signed and returned to the Secretary by 4:30pm on Friday.

Page 1 of 5

**(a)** List 5 pieces of data from the above document that should be stored within a database.

1. _____   2. _____   3. _____

4. _____   5. _____   [5]

(b) Which items on the Task Schedule could be generated automatically by the database?

_____

_____

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_____[2]

The analysts have decided to create a JOB table to store details of the scheduled jobs. The structure of this part of the database is shown below.

```
    ┌──────────┐
    │  CLIENT  │
    └────┬─────┘
         │
      requests
        /\
    ┌──────────┐
    │   JOB    │
    └──────────┘
```
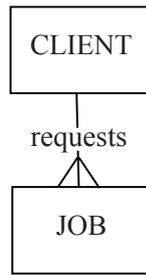
(c) (i) In addition to the pieces of data already listed, the analysts have decided to add Client No to the CLIENT table and Job Ref to the JOB table. Explain the purpose of these fields.

_____

_____[1]

(ii) A relationship must exist between these two tables. Explain how this relationship will be established. You should use database terminology in your answer.

_____

_____

_____

_____[2]

The junior analyst has put together the following sample data file to demonstrate the contents of the JOB table.

Job Ref	Date	Start	Hours	Client Details	Staff Details
001	24/01/11	09:30	2	Elaine Frank, 22 Willow Lane, 07944 4231390	Eleanor Smith 09876 444231
002	24/01/11	12:00	1	Maria Parkfield, The Manse, 09823 1345679	Eleanor Smith 09876 444231
003	24/01/11	14:30	2	John Phillips, 29 Long Acre, 09865 234990	Eleanor Smith 09876 444232
101	31/01/11	09:30	2	Elaine Frank, 22 Willow Lane, 07944 4231390	Eleanor Smith 09876 444231
102	31/01/11	12:30	1	Maria Parkfield, The Manse, 09823 1345679	Eleanor Smith 09876 444231
103	31/01/11	14:30	2	Eamonn Cassidy, 790 Forge Road 07856 444321	Eleanor Smith 09876 444231
107	02/02/11	09:00	2	Fred Black, 20 Fairy Lane, 09876 444213	Janice Friel 02876 453212
108	02/02/11	09:30	3	James Franklin	Maria Lancer 09875 345123
109	02/02/11	14:00	2	Maria Parkfield, Manse Road, 09823 1345679	Jenny Peoples 09875 345907
110	02/02/11	14:00	3	Silvio Rosario, 29 Parklands 07654 345908	Maria Lancer 09875 345123

(d) Analyse the sample data on the opposite page and explain the problems that the senior analyst has identified with this structure. Provide specific examples and suggest a solution.

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_____ [6]

9 The analysts and programmers who are employed by ABSOLUTE ANSWERS work very closely together. They follow an in-house procedure which calls for certain documentation to be completed at defined stages of the project.

(a) Complete the following table to show when each document is produced, who produces it and for whom it is produced.

DOCUMENT	PHASE	PRODUCED BY	PRODUCED FOR
User Guide		Analyst or Programmer	Users
Feasibility Study	Initiation or Investigation		
Test Log	Implementation		
Context Diagram			

[8]

(b) Give two reasons why documentation is so important within the system development lifecycle.

Reason 1

_____

_____[1]

Reason 2

_____

_____[1]

10 The database will also have an INVOICE table, the proposed structure of which is shown below:

Field Name	Data Type/ Size	Required?	Comments	Sample Data
Invoice No	Auto number	Yes	Primary key	0041
Invoice Date	Date/Time	Yes	Short date format	12/12/2010
Client No	Text, 4	Yes	Foreign key – links to CLIENT table	C002

A series of test data has been tried out on the new system and the following records have been rejected from the system.

(a) For each record, in the table below, explain why it has been rejected.

Invoice No	Invoice Date	Client No	Reason for rejection
10022	03/03/2011	C199	
1OO23	28/11/2010	C001	
10256	23/12/2010	C999	
11230	12/23/2010	C190	
1002A	03/03/2010	C199	

[5]

(b) Within their initial documentation, ABSOLUTE ANSWERS stated that the final system will be completely error free. When asked to justify this, James explained that the system is constantly tested during the system development lifecycle.

Discuss the various types of testing that the system will undergo and give examples of specific features that could be tested at each stage. Your answer should also make reference to the people involved and the relevant phase of the system lifecycle.

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_____[6]

11 Terry is concerned about whether the new system will be a success once it is implemented. Give **three** reasons for the system not being a success for SQUEAKY CLEAN.

Reason 1

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_____[1]

Reason 2

_____

_____[1]

Reason 3

_____

_____[1]

THIS IS THE END OF THE QUESTION PAPER

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ADVANCED
General Certificate of Education
January 2011

Applied Information and Communication Technology

Case Study
Assessment Unit A2 7

assessing

Unit 7: Investigating Systems

[A6J11]

THURSDAY 13 JANUARY, AFTERNOON

You must use **this** clean copy of the Case Study in the examination and not your own annotated copy.

Squeaky Clean

Squeaky Clean is a thriving company formed three years ago by two solicitors, Terry ~~and Fiona Duffy. Tired of juggling the needs of their young families with busy profession~~ lives, they realised that there was a definite market for cleaning services. Both had previously considered getting some domestic help at home, but found difficulty in getting help at the right time and at the right price.

Aware that for many people, the cost of getting domestic help would be well outside the normal family budget, Terry and Fiona considered carefully how this kind of service could be made accessible to the public. It took quite a while to work everything out but with professional advice and their own legal knowledge, Terry and Fiona started a domestic cleaning company, "Squeaky Clean". They agreed financial terms and conditions and Terry initially decided to manage the company on a full time basis while Fiona would currently retain her legal career. As well as being co-owner of the company, she would have responsibility for dealing with all contracts generated in the business as she is an expert in this particular aspect of the law.

Squeaky Clean is fully committed to delivering an excellent service to the public. All staff are fully vetted; they are fully trained and must comply with all company rules regarding the conduct of their work. Apart from the directors, Terry and Fiona, Squeaky Clean currently employs a manager, a secretary and 20 full time staff including a driver. The company retains a bank of part time staff who can be called on if necessary. The company also owns a van for transporting equipment to particular jobs. Sometimes industrial cleaning machines are required and the van is used to deliver these to the premises on the night before and to collect them on the day after a scheduled job.

A major objective for Terry and Fiona was to provide a good value quality service. Research into the provision of domestic cleaning services in the area, found little evidence of any kind of reasonable service. They did find advertisements for individuals charging over £20 an hour for very basic cleaning with no guarantee of any kind of quality control. However, there was no company at that time providing what they thought they could offer.

Terry and Fiona realised that they had to come up with a range of options that would attract potential customers and create loyalty to the company. They decided to offer a range of contract options that would have different associated discounts. All services carry a minimum time of one hour. It would not be cost effective to place a member of staff at a location for any less time since travel time and transport must also be considered. These options include the following:

Option 1   **"One off service"** Specific customer requirements are costed on an hourly basis based on a minimum time allocation of one hour with one cleaner present.

Option 2   **"Four week contract"** Specific customer requirements are costed on an hourly basis based on a minimum time allocation of one hour each week over a four week period. The first week is charged at the full rate and then a discount of 5% is applied to the following three weeks.

Option 3   **"Twelve week (three month) contract"** Specific customer requirements costed
            on an hourly basis based on a minimum time allocation of one hour each over
            a twelve week period. The first week is charged at the full rate and then a
            of 5% is applied to the following three weeks. For the remaining eight weeks,
            discount of 7% is applied.

Option 4   **"Twenty six week (six month) contract"** Specific customer requirements are
            costed on an hourly basis based on a minimum time allocation of one hour each
            week over a twenty six week period. The first week is charged at the full rate and
            then a discount of 5% is applied to the following three weeks. For the next eight
            weeks, a discount of 7% is applied. For the remaining fourteen weeks, a discount of
            10% is applied.

Option 5   **"Fifty two week (one year) contract"** Specific customer requirements are costed
            on an hourly basis based on a minimum time allocation of one hour each week over
            a fifty two week period. The first week is charged at the full rate and then a discount
            of 5% is applied to the following three weeks. For the next eight weeks a discount of
            7% is applied. For the next fourteen weeks, a discount of 10% is applied and for the
            remaining twenty six weeks, a discount of 12% is applied.

All contracts must be renewed on expiry before any further service can be provided.

Terry oversees the overall day to day running of the company. The secretary deals with all
enquiries relating to new clients. He is required to get the new client to complete a "job enquiry"
form. This form requests the client contact details and allows the client to select particular
services that the company provides. This is mainly done by ticking boxes but there is space on
the form for the client to add additional information regarding requirements. Terry and Fiona
sometimes review these forms and get new ideas for extending their range of services.

The secretary provides limited information to the client and then passes the "job enquiry" forms
to the manager Caroline Smyth. Caroline visits every new client and assesses the job. This
is a very time consuming activity and because of the growing number of clients, Caroline is
sometimes not able to visit for up to two weeks. Some clients are unhappy with the delay and do
not proceed with the enquiry and so potential customers are lost.

Caroline defines the exact client requirements, recording them on a "client requirement" form and
then costs the range of options available. Caroline prepares a "costing summary" form which is
sent out to the client for consideration. She passes copies of all forms to Harry who sorts them in
date order and files them. When the client provides a response to the costing, whether by calling
in to the office or by telephone, Caroline will get the "client contract" drawn up. All contracts
must be copied and posted to Fiona for approval before being sent out to the client. Fiona calls
into the office once a week to indicate approval and sign new contracts.

Once approved, the contract is sent to the client and should be signed and returned before
any service can be supplied. Once the signed contract has been returned, they must be filed.
The secretary, Harry James, is responsible for this. These procedures also apply to renewal of
contracts. The whole process is very labour intensive and time consuming. It depends on Harry

getting everything done on time and because of the volume of work he has to do, this happens. Clients are not pleased when they have to contact the office to see what is the delay.

Sometimes because of other commitments, Fiona cannot visit the office and there can be a two week delay. Harry is aware that an increasing number of customers have said they will not be back. Renewal customers are particularly dissatisfied as they feel they have shown commitment to the company.

Caroline also prepares "task schedules" for the cleaners. All cleaners must collect their "task schedules" for the following week on a Friday afternoon before 6pm. Every job has an associated task schedule. The cleaner must sign the "task schedule", indicating that the work has been completed and return it to the office before 4.30pm on the following Friday. This signed document is used by Harry to record that the work has been done so that invoice information can be generated. It is also used to calculate wages for the part time staff as they are paid by the hour rather than at the weekly full time rate. Sometimes staff members forget to sign the task schedule. If Harry is not available to check the schedules on Friday afternoons, payment authorisation for part time staff who have not signed the forms is not allowed. This has caused a lot of problems as there will be a delay of one week in payment to the staff. The staff believe that this is unacceptable.

The van driver is also given a weekly "task schedule". He is responsible for checking the equipment before he delivers it and checking it after he collects it. Any damage must be recorded on a "damage report" form which is left in the office for Caroline who will decide if any action must be taken. This might include interviewing the staff involved or perhaps charging the client a breakage fee if the damage is their fault. This does not happen very often but if a client is considered responsible for damages, Caroline creates a "damages demand" which is sent to the client. A "damages payment" is expected within two weeks otherwise the normal demand procedures will follow.

The company provides all cleaning material and equipment for the services they provide. Cleaners are supplied with their cleaning kit comprising a whole range of cleaning products and portable cleaning gear. They must request replacement products and cleaning gear on a "cleaning kit request" form when they submit their signed task schedule forms on a Friday. Replacement supplies are available for collection the following Friday and each cleaner is required to sign a "cleaning kit receipt" so that a record is kept of their stock usage. Harry is responsible for managing this process and must file the "cleaning kit request forms" and the "cleaning kit receipts" for audit purposes.

Caroline reviews the "cleaning kit request" forms before Wednesday of each week. She is responsible for authorising replacement items for the cleaning staff. She monitors this very closely and will check the validity of the request by looking at the "task schedules" for the cleaner concerned.

Harry is required to maintain stock items for the cleaning staff. He tries to check the stock at least once a fortnight. Harry must complete "stock request" forms for low stock items. These must be approved by Caroline before Harry creates "stock orders" for the suppliers. He has to issue these, ensure that the subsequent deliveries are accurate and the stock updated, record the supplier invoices and then make sure that the suppliers are paid. Sometimes stock items are not available

for staff simply because Harry has not been able to complete the whole stock ord~~er pro~~cedure within the required timescale. This is problematic for the cleaners who either try to p~~urchase~~ materials themselves or ask the client. Some clients have complained to Caroline that t~~hey are not~~ getting the full service they agreed in their contracts.

Invoices for Option 1 clients are created on the Monday following the completion of the work. All other clients are invoiced monthly. Invoices are posted out to clients and payment is expected within one week. Clients may pay by cash in person or credit or debit card over the phone. The company has discontinued the practice of payment by cheque in line with most other organisations. There is a considerable amount of work involved in generating the invoices. As Harry is responsible for answering the phone, dealing with clients as well as a whole range of other tasks, he finds it hard to get suitable uninterrupted time to do this. Some days, he either comes in very early in the morning or stays on later at night. He is very worried and under pressure at present as he realises that he is at least two weeks behind in creating the invoices.

Harry is also responsible for regularly checking that payment has been received for all invoices. With a growing number of clients, it is becoming impossible to keep up with this. He is also required to issue first, second and final "reminders" to clients. If a client fails to pay within two weeks of a final reminder, Harry is required to advise the manager who issues a "discontinuation of service" notice to the client. This notice also advises clients of the legal consequences of non payment. Terry and Fiona are sent copies of all discontinuation notices and deal with the legal aspects themselves.

Harry has on occasion not recorded client payments. This has resulted in clients being sent out reminders.

The business is very successful but the administrative processes are becoming totally unmanageable. The amount of paper generated is impossible to manage effectively. Caroline has proposed the appointment of at least two new staff to assist with all the work that must be done.

She believes that Harry could be a great help to her in the assessment and costing of new jobs if he could be released from some of his office duties.

She is also of the opinion that they could make good use of better computer facilities. At present, Caroline and Harry have standalone PCs and they have to share a printer. They have no Internet access and they have no means of sharing any data easily. They use basic application software and have no formal training at all.

Caroline is concerned at the growing number of clients who want an instant response to their requests and who are dissatisfied with the time it takes to generate the responses they receive. She is very aware that clients are not happy with the invoicing system. She is concerned that any bad publicity arising out of poor administration could affect new business. Clients might well look elsewhere for services.

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