



Rewarding Learning

ADVANCED  
General Certificate of Education  
January 2014

Centre Number

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| 71 |  |
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Candidate Number

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# Applied Information and Communication Technology

## Assessment Unit A2 7

*assessing*

### Unit 7: Investigating Systems

[A6J11]



TUESDAY 21 JANUARY, MORNING

#### 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 7, 9 and 11**.  
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.

For Examiner's  
use only

| Question     | Marks available | Marks | Remark |
|--------------|-----------------|-------|--------|
| 1            | 9               |       |        |
| 2            | 6               |       |        |
| 3            | 9               |       |        |
| 4            | 7               |       |        |
| 5            | 8               |       |        |
| 6            | 13              |       |        |
| 7            | 6               |       |        |
| 8            | 15              |       |        |
| 9            | 12              |       |        |
| 10           | 9               |       |        |
| 11           | 6               |       |        |
| <b>Total</b> | <b>100</b>      |       |        |



- 1 There are many problems at FIONA'S FASHIONS. Three quotations from page 4 of the case study which highlight some of these problems are given below. For each quotation answer the questions giving **different** responses in each case.

**QUOTATION 1:**

“Doreen .... sometimes totally underestimated the time involved and recorded unrealistic completion dates.”

|                        |  |
|------------------------|--|
| Why is this a problem? |  |
| Impact on Business     |  |
| Possible Solution      |  |

**QUOTATION 2:**

“She (Fiona) tried to create supplier orders based on what she thought was being used by the staff.”

|                        |  |
|------------------------|--|
| Why is this a problem? |  |
| Impact on Business     |  |
| Possible Solution      |  |

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

**QUOTATION 3:**

“... there was often confusion about returns, payments and whether or not the stock item had even been returned or even existed in the first place.”

Why is this a problem?

Impact on Business

Possible Solution

[9]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

2 Fiona has asked the consultancy company Flexible Futures to examine the issues at FIONA’S FASHIONS with a view to developing a computer system. Fiona and Fred, the senior systems analyst, have agreed to meet, to agree a Terms of Reference.

(a) Explain why it is important to have a Terms of Reference.

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[2]

(b) Identify with a tick (✓) **four** items of information that **would not** be included in a Terms of Reference document.

| Items              |  |
|--------------------|--|
| Data Flow Diagrams |  |
| Algorithms         |  |
| Budget             |  |
| Costed Options     |  |
| Time Scales        |  |
| Scope of project   |  |
| Constraints        |  |
| Test Plan          |  |

[4]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

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**(Questions continue overleaf)**

3 Fred wants to explain the stages involved in the development of a system to Fiona and then decide on the most appropriate systems development methodology to use.

(a) Give a brief explanation of what happens at each phase of the Systems Development Lifecycle (SDLC).

| STAGE             | EXPLANATION   |
|-------------------|---|
| initiation        | Fiona will meet with Fred to explain the business opportunity or problem and create a Terms of Reference. |
| analysis          |   |
| design            |   |
| implementation    |   |
| testing           |   |
| review/evaluation |   |
| maintenance       |   |

[6]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

(b) Suggest **three** reasons why Fred might choose to use the DSDM methodology at FIONA’S FASHIONS.

Reason 1

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Reason 2

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Reason 3

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[3]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

4 Fred begins the fact finding process by inspecting the documentation used in FIONA'S FASHIONS.

(a) Give two reasons, with examples, why document inspection should not be the only fact finding technique used.

Reason 1

Four horizontal lines for writing the first reason.

Reason 2

Four horizontal lines for writing the second reason, ending with [4].

(b) An alternative fact finding technique is observation.

(i) Give one advantage of using this technique at FIONA'S FASHIONS.

Two horizontal lines for writing the advantage, ending with [1].

(ii) Identify two problems that could be uncovered by using observation at FIONA'S FASHIONS.

Problem 1

Two horizontal lines for writing the first problem.

Problem 2

Two horizontal lines for writing the second problem, ending with [2].

Table with columns: Examiner Only, Marks, Remark.



5 Based on his fact finding investigations, Fred has listed items of data he needs to categorise before he starts the data modelling process.

Identify with a tick (✓) the correct category for each item listed.

| Item                 | CATEGORIES |        |         |      |
|----------------------|------------|--------|---------|------|
|                      | Data Flow  | Entity | Process | File |
| staff                |            |        |         |      |
| manage payroll       |            |        |         |      |
| staff payslip        |            |        |         |      |
| manage stock         |            |        |         |      |
| van driver           |            |        |         |      |
| telephone notebook   |            |        |         |      |
| invoice details      |            |        |         |      |
| delivery description |            |        |         |      |

[8]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

6 (a) (i) Fred has drawn a context diagram. Explain why this is important in the analysis phase of the project.

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[2]

(ii) Fred has also drawn a level-1 Data Flow Diagram (DFD). Explain the purpose of this diagram.

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[2]

(iii) Identify who should be involved in the review of these DFDs with Fred.

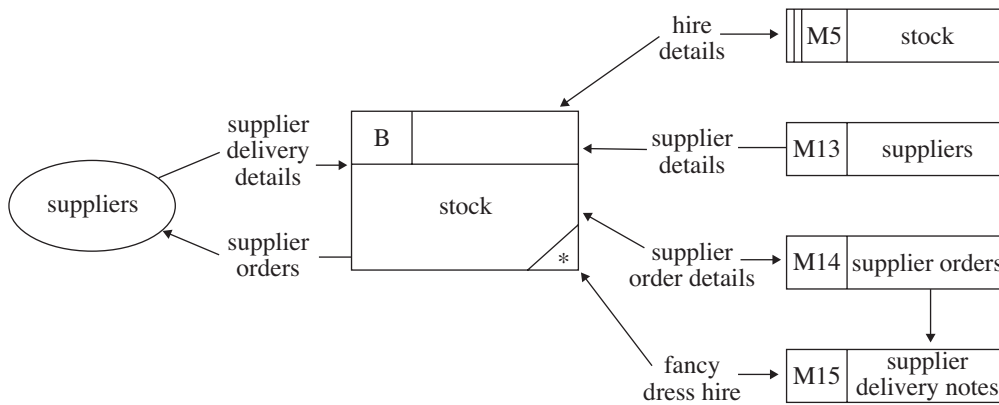
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[1]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

(b) A trainee analyst at Flexible Futures has attempted a partial level-1 DFD.



Examine this diagram and list the errors it contains in the spaces below.

- (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
- (iii) \_\_\_\_\_
- (iv) \_\_\_\_\_
- (v) \_\_\_\_\_
- (vi) \_\_\_\_\_
- (vii) \_\_\_\_\_
- (viii) \_\_\_\_\_

[8]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

- 7 Fiona has tried to improve the manual system by introducing notebooks and handwritten lists of suppliers and stock. Examples of the supplier and stock lists are shown below.

### SUPPLIER LIST

ZipsandBits 028 90567222 [www.zipsandbits.com](http://www.zipsandbits.com) Moved – see below.

The Satin Mill, MillBrook Industrial Estate,  
Carrickfergus BT40 8T4.

Bobbins (threads and lace), Dorset, England.  
[www.bobbins.com](http://www.bobbins.com) 066 27727272

Bright Buttons, Cathedral Quarter, Belfast, BT6 7EW

The Satin Mill, MillBrook Industrial Estate,  
Carrickfergus BT40 8T4.

ZipsandBits Unit 56, Riverside Industrial Estate.

### STOCK LIST

Buttons: Large Blue 12 10 8 7  
Small Rose 10 8 6 4 14

Blue Embroidery Thread

Four 30 cm zips from Zips & Bits, telephone 028  
90567333

6 metres of Lace from Mr Bobbins

30 metres of ivory silk from the satin mill

20 small heart buttons from Bright Buttons Cost £5  
24th October 2013

40 metres of white silk

Wine red satin (60 m)

Silk 50 metres

Examiner Only

Marks Remark





(a) Part of the proposed database design is shown below.

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

**Database Design**



Modify the design to include a new table called REQUIREMENTS and any additional relationships. [4]

(b) (i) Indicate with a tick (✓) which data items would be stored in the ORDER table.

| DATA ITEMS        |  |
|-------------------|--|
| Unit              |  |
| Quantity Used     |  |
| Order Description |  |
| Cost Per Unit     |  |
| Customer No       |  |
| Order Type        |  |
| Customer Name     |  |
| Stock No          |  |
| Order Number      |  |

[4]

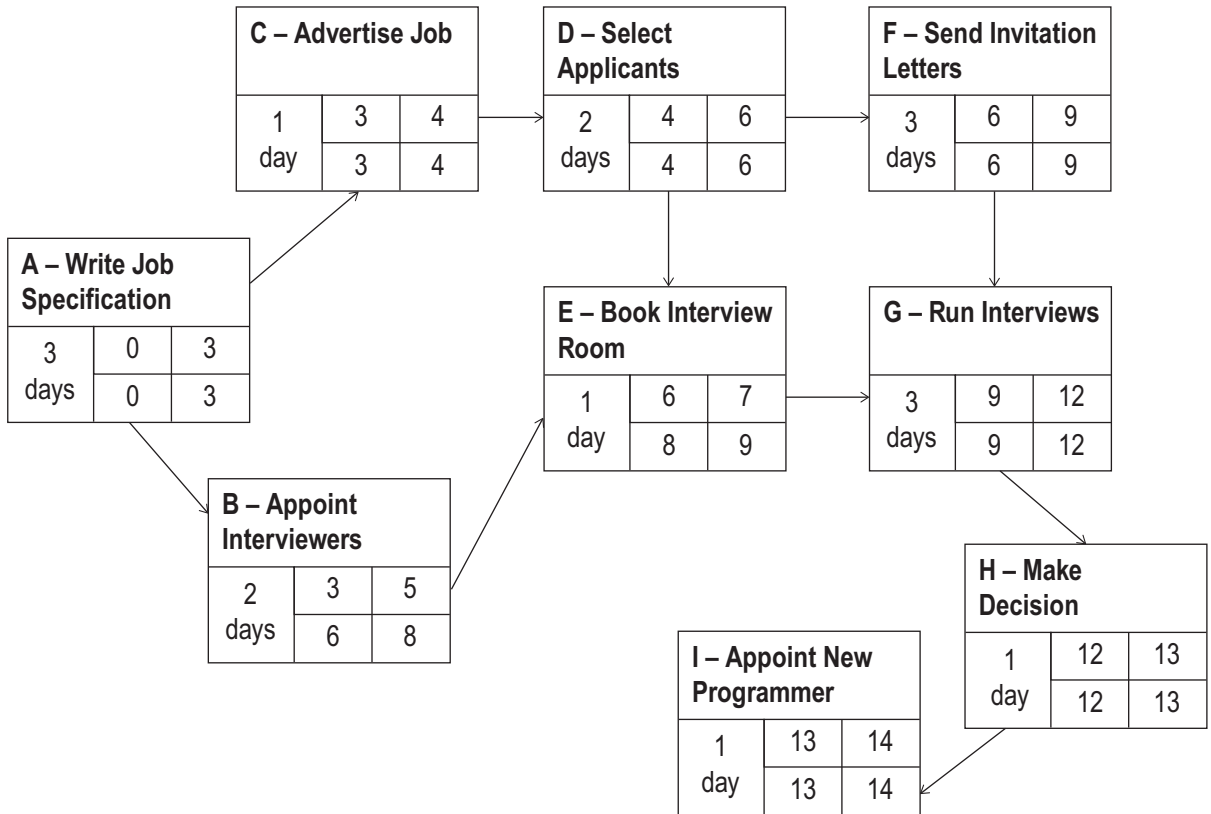




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**(Questions continue overleaf)**



(b) Fred has drawn a network diagram for the recruitment process.



Examine the network diagram above and place the word TRUE or FALSE into the space opposite each statement.

| STATEMENT   | TRUE/<br>FALSE |
|---|----------------|
| The total project duration is 13 days.  |                |
| Activity E is dependent on activity B and D.  |                |
| The float available in activity E is 1 day.   |                |
| The critical path is given by the activities A, C, D, F, G, H and I.                      |                |
| If activity B is delayed by 3 days the project could still be on time.                    |                |
| According to the plan Fred will book the interview room before he selects the candidates. |                |

[6]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

10 Fred will test the database design using a test data file including both ‘clean’ data and data which contains errors. He examines the data dictionary for the STOCK table, shown below.

| Field           | Data Type | Example                  | Comment                             |
|-----------------|-----------|--------------------------|-------------------------------------|
| StockNo         | Text, 7   | STK6778                  | Primary Key.                        |
| SupplierID      | Text, 6   | SP0002                   | Foreign key to SUPPLIER Table.      |
| UnitCost        | Currency  | £22.99                   | Must be equal to or greater than 0. |
| Unit            | Text, 10  | metres                   | None.                               |
| Description     | Text, 40  | Lighthouse Cotton Fabric | None.                               |
| QuantityInStock | Number    | 45                       | Must be equal to or greater than 0. |

(a) Complete the table below describing data that will definitely raise an error in each field.

| Field           | Test ID | Test data that will raise an error       |
|-----------------|---------|--|
| StockNo         | 1       |  |
|                 | 2       |  |
|                 | 3       |  |
| SupplierID      | 4       | No Supplier ID entered.                  |
|                 | 5       |  |
| UnitCost        | 6       |  |
| Unit            | 7       |  |
| Description     | 8       | Description has more than 40 characters. |
| QuantityInStock | 9       | QuantityInStock less than zero.          |
|                 | 10      |  |

[7]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |

**(b)** Give **two** reasons why the database is tested with data containing errors.

Reason 1

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Reason 2

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[2]

| Examiner Only |        |
|---------------|--------|
| Marks         | Remark |
|               |        |





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Communication Technology**

**Case Study**  
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*assessing*

**Unit 7: Investigating Systems**

**[A6J11]**

**TUESDAY 21 JANUARY, MORNING**

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## FIONA'S FASHIONS

Fiona Fulton opened her business **Fiona's Fashions** in September 2006. Fiona had an exceptional talent for dressmaking and for many years worked from her own work room at home. She did alterations, made all sorts of costumes and outfits, wedding dresses, bridesmaid dresses and a range of household items including curtains and soft furnishings. She had a great way of understanding exactly what a customer wanted and went to extraordinary lengths to deliver quality products. Fiona had no need to advertise for business as her reputation made her very well-known and people came from everywhere to get work done.

Fiona loved her work. In fact she really did not look upon it as work. She rarely turned anyone away and often did not charge people at all. She frequently took on much more work than she could realistically handle. The truth of the matter was that Fiona was not very good at the business end of things.

Fiona made the decision to move into proper premises as a result of advice from her husband Frank. Frank owned and managed a garage and had a real flair for business. Their daughter, Frances, also saw great opportunities for development and persuaded her mother to listen. Frank and Frances both knew that Fiona was working too hard for the amount of profit that was being made. They realised that Fiona needed help to cope with the sheer volume of work that was coming in. They also realised that there were many strands to the business that were growing and developing.

Because of the sheer diversity of her work, Fiona could not keep on top of all of the issues that arose. For example, Fiona had an excellent stock of fancy dress costumes that were available for hire. People were always on the phone looking for particular items. However no one really knew every item that was available or what sizes there were. Fiona had to look right through the stock every time there was an enquiry. Indeed no one really checked on the items that were hired out and sometimes items were not returned at all. The charging system was supposed to relate to the number of days a costume was hired for but this system was seldom implemented properly.

The wedding aspect of the business was also a real growth area with enormous potential. Frances could see that properly managed, this could be an incredible success. Currently it was quite pressured.

The household requests were steady but tended to be time-consuming as Fiona insisted on going to a customer's house to take measurements herself. Although absolutely right about this, it was impossible for Fiona to do everything and inevitably, things got behind.

Alterations were a major part of the business but customers sometimes came to collect items and they were not ready because Fiona had overlooked them.

Frank had watched Fiona's situation for a while before putting together a business plan. As a first step he got her to agree to have three other people work with her at home. Fiona only allowed this because she was getting to the stage where she was having great difficulty in getting everything done. The design work on costumes and dresses was very time-consuming and sometimes took much longer than she had anticipated. Fiona did not want to let people down but the alterations began to get further and further down the list of things to do. She agreed that her three co-workers could definitely handle the alterations as well as some carefully directed work on the costumes.

Wedding orders she insisted on doing herself as she considered the event to be so important that no one else could be trusted to do the work.

Fiona was more than a little haphazard when recording anything. The problem was that when the business was small, she remembered most things and barely wrote anything down. While this might have been alright in the beginning, it was not long before it became a real problem. Some customers were not getting work done on time because dates were not noted, wrong alterations were being made because requirements were not written down accurately and in one dreadful event, a wedding dress had to be remade altogether because the wrong measurements had been applied. A great deal of time was being spent with customers who had genuine grievances. Fiona acknowledged these problems and again on Frank's advice began a system of notebooks, one for each area of the business.

Unfortunately, her ability to remember to write things into the notebooks was just as bad as her ability to remember them at all. At best the details recorded in the notebooks were basic.

She had hard-backed notebooks for 'Alterations', 'Fancy Dress', 'Household' and 'Weddings' as well as an additional notebook that she called 'Miscellaneous' and a notebook called 'Telephone'. The books were all ruled out in columns that were headed, 'Date', 'Customer Name', 'Address', 'Telephone Number', 'Requirements' and 'Completion Date'.

Sometimes people rang Fiona to enquire about getting work done, the cost, the timescale or to see if something was ready. Frank explained to Fiona that if these enquiries were recorded then anyone could answer the phone and a response could be made when the proper information was gathered if it was not readily available.

The decision to move to new premises was based on the fact that the business had really taken off. Fiona had far more work than she could manage and was in a position to employ her daughter Frances as the shop manager, as well as a secretary, Doreen Greer and a total of ten employees and a part time cleaner. She also started delivering costumes and wedding items using a driver, David Magee, whom Frank recommended. Frank also gave her the use of a specially adapted van.

As manager, Frances considered that it should now be possible to maintain the notebook system properly. Frances thought that she would be able to allocate work to the employees in a more efficient manner. She hoped that she would be able to concentrate her efforts on managing the accounts and stock issues that were currently problematic as well as implementing new plans that she had in mind for the business.

Frances required all employees to complete a signed weekly time sheet that identified the hours worked and the nature of the work completed. She thought that as well as providing payroll information, that this might also provide a useful cross-check for work done. However all of the staff including the cleaner and David found this a complete waste of time. It was always half completed in a hurry and although it was filed away, Frances did not always use it in the way it was intended.

In terms of accounting, customers sometimes paid by cash when items were collected. They should have been presented with a pre-prepared itemised bill and issued with a receipt. However because Frances and Doreen were so busy, this sometimes had to be done when a customer arrived. This was a real nuisance for customers who were often in quite a hurry.

For bigger orders, such as costume hire, weddings and household items, Fiona created invoices and sent copies out to customers. If payment was not received within two weeks, a reminder was issued. If another two weeks or more elapsed, then a final reminder was issued. Customer payments came in the form of card payments, sometimes cash and on the odd occasion, cheques. Frances intended to phase out the use of cheques in keeping with a lot of other businesses.

When payments were made receipts were supposed to be issued. In principle, this should have been a good system but in practice it was cumbersome and often inaccurate as a result of the original poorly recorded details and poor pricing.

Costing work was very difficult and Frances was very concerned that the business would lose money if something was not done about it.

Doreen was supposed to record all enquiries and provide all responses. She was also required to record details for all of the other books as well. Unfortunately this was not as easy as Frances had thought at first. Doreen had no real knowledge of how long it took to do things and sometimes totally underestimated the time involved and recorded unrealistic completion dates. If the phone was busy she would make brief notes and try to enter the details in the correct notebook later. Unfortunately, this did not always happen. Both Doreen and Frances found themselves recording details of long standing customers over and over again as each entry was regarded as something completely new. They both acknowledged the unnecessary duplication of information.

In addition, Fiona frequently changed entries in the books herself without telling Doreen and this was a source of great annoyance. Fiona also insisted on entering the wedding information herself. As before, the details she provided were minimal and on some occasions inaccurate.

With the increase in customer orders, stock was becoming an issue as well. There was no real system for reordering. Fiona had been so used to estimating requirements for herself that she thought this would still work. Frances tried to make a list of stock items and compile a list of suppliers. She tried to create supplier orders based on what she thought was being used by the staff. This was always done at the last minute and an additional problem for customers was that they might have to wait because the right zips or thread, buttons, material or whatever else was not available.

The control of the costume hire was clearly a major issue. There was no inventory of the stock and no real control over the return of items. Every time Fiona had a good idea for a costume, she might make a new item or adjust something that had not quite worked out for a customer and add it to the rails. She did not see anything wrong with this since as far as she was concerned she was merely increasing availability for hire customers.

When hire orders were taken and the delivery date was due, Doreen would issue David with customer address details and a brief description of the content of the delivery. He had to get customers to sign for the items delivered and then return the signed delivery dockets to Doreen who filed them away. When the items were returned, the dockets should have been marked off but again this was not a very efficient system and there was often confusion about returns, payments and whether or not the stock item had been returned or even existed in the first place. Customers should have been invoiced by Frances based on the records maintained.

Frances also had great ideas for developing the business, employing more staff and perhaps opening a separate costume hire outlet and a dedicated wedding boutique. She felt that since Fiona was so totally committed to this aspect of the business that she would really enjoy just doing this sort of work. This would clearly relieve some of the other issues that were arising. Frances also realised the potential for using the internet, in particular for the costume hire and wedding aspects of the business.

She also wanted to introduce some special services for customers including:

- **Fix It at Five**

This offer would be available every day to the first five customers to arrive at 5pm. They did not have to ring or wait. Repairs and simple alterations that could be done within an hour would be accommodated. Normal prices would be applied. This service was very attractive to busy people who could call on their way home from work and get something done very quickly.

- **Fix It Friday**

This offer would be available on the last Friday of every month and customers would get a percentage discount on the total price depending on what time they arrived. For example a customer arriving before midday would only pay 50% of the cost. A customer arriving between 12 and 3pm would pay 70% of the total cost and a customer arriving between 3pm and 5pm would pay 90% of the total cost.

- **Five Family and Friends**

This offer would be extended to five people from a bride's family or her friends who wished to have specially designed outfits for her wedding. Discounts of up to 30% would be made depending on the order placed.

Frances was becoming increasingly alarmed at the growing problems in the business. She was disappointed at the fact that all of the good ideas and development work were being overshadowed by these issues. She found herself constantly fixing things. She realised that she herself had difficulty in prioritising procedures and recognised that she might need some help.

Frances decided that Fiona's Fashions needed some sort of a computer system and professional help. She sat down with Fiona and Frank and between them they agreed to employ the services of the computer consultants Flexible Futures.





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When payments were made receipts were supposed to be issued. In principle, this should have been a good system but in practice it was cumbersome and often inaccurate as a result of the original poorly recorded details and poor pricing.

Costing work was very difficult and Frances was very concerned that the business would lose money if something was not done about it.

Doreen was supposed to record all enquiries and provide all responses. She was also required to record details for all of the other books as well. Unfortunately this was not as easy as Frances had thought at first. Doreen had no real knowledge of how long it took to do things and sometimes totally underestimated the time involved and recorded unrealistic completion dates. If the phone was busy she would make brief notes and try to enter the details in the correct notebook later. Unfortunately, this did not always happen. Both Doreen and Frances found themselves recording details of long standing customers over and over again as each entry was regarded as something completely new. They both acknowledged the unnecessary duplication of information.

In addition, Fiona frequently changed entries in the books herself without telling Doreen and this was a source of great annoyance. Fiona also insisted on entering the wedding information herself. As before, the details she provided were minimal and on some occasions inaccurate.

With the increase in customer orders, stock was becoming an issue as well. There was no real system for reordering. Fiona had been so used to estimating requirements for herself that she thought this would still work. Frances tried to make a list of stock items and compile a list of suppliers. She tried to create supplier orders based on what she thought was being used by the staff. This was always done at the last minute and an additional problem for customers was that they might have to wait because the right zips or thread, buttons, material or whatever else was not available.

The control of the costume hire was clearly a major issue. There was no inventory of the stock and no real control over the return of items. Every time Fiona had a good idea for a costume, she might make a new item or adjust something that had not quite worked out for a customer and add it to the rails. She did not see anything wrong with this since as far as she was concerned she was merely increasing availability for hire customers.

When hire orders were taken and the delivery date was due, Doreen would issue David with customer address details and a brief description of the content of the delivery. He had to get customers to sign for the items delivered and then return the signed delivery dockets to Doreen who filed them away. When the items were returned, the dockets should have been marked off but again this was not a very efficient system and there was often confusion about returns, payments and whether or not the stock item had been returned or even existed in the first place. Customers should have been invoiced by Frances based on the records maintained.

Frances also had great ideas for developing the business, employing more staff and perhaps opening a separate costume hire outlet and a dedicated wedding boutique. She felt that since Fiona was so totally committed to this aspect of the business that she would really enjoy just doing this sort of work. This would clearly relieve some of the other issues that were arising. Frances also realised the potential for using the internet, in particular for the costume hire and wedding aspects of the business.

She also wanted to introduce some special services for customers including:

- **Fix It at Five**

This offer would be available every day to the first five customers to arrive at 5pm. They did not have to ring or wait. Repairs and simple alterations that could be done within an hour would be accommodated. Normal prices would be applied. This service was very attractive to busy people who could call on their way home from work and get something done very quickly.

- **Fix It Friday**

This offer would be available on the last Friday of every month and customers would get a percentage discount on the total price depending on what time they arrived. For example a customer arriving before midday would only pay 50% of the cost. A customer arriving between 12 and 3pm would pay 70% of the total cost and a customer arriving between 3pm and 5pm would pay 90% of the total cost.

- **Five Family and Friends**

This offer would be extended to five people from a bride's family or her friends who wished to have specially designed outfits for her wedding. Discounts of up to 30% would be made depending on the order placed.

Frances was becoming increasingly alarmed at the growing problems in the business. She was disappointed at the fact that all of the good ideas and development work were being overshadowed by these issues. She found herself constantly fixing things. She realised that she herself had difficulty in prioritising procedures and recognised that she might need some help.

Frances decided that Fiona's Fashions needed some sort of a computer system and professional help. She sat down with Fiona and Frank and between them they agreed to employ the services of the computer consultants Flexible Futures.





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