



THE CCTV Consultants Correspondence Course



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Profile on the author

Douglas Grant

After completing my formal training in the electrical and electronic fields I chose a career in Closed Circuit TV, where I have specialised in the design and sales of CCTV since the early 80's. Although CCTV was breaking new ground at this time and had huge potential, it was surprising to learn at that time within the United States and Europe there was little technical or practical information on CCTV for the Security Industry.

The few text courses available which included the subject matter of CCTV were written in the early years prior to the 1990's and excluded any new technology. The only source of product knowledge as far as I was concerned had to come from manufacturers brochures. Although an important medium for information, manufacturer's brochures have often proven to be less than satisfactory for most people wanting a broader and more effective way to learn.

By the time 2000 had come around I had decided that the digital/networking technologies were going to be integrated into security products and for my part a greater understanding of this new industry was required. I sat for my MCSE certifications and passed. This new awareness gave me the insight into the possibilities of networking large and smaller analogue CCTV systems into a network environment. I have since that time been instrumental in training and supplying large IP network CCTV systems.

This course will be a first of its kind and lead students from the CCTV analogue technology into the IP camera system. I have written various articles on these subjects at: <http://www.cctv.com.au/articles.php>

I sincerely hope this course will help fill the "knowledge gap" for the next generation of CCTV enthusiasts.



I have spent many hours in conversation over the years discussing, both the lack of good training and informative literature available to people wanting to enter the CCTV industry. My wife, during one such conversation insisted it was time to put some attention into just such a program.

As CCTV was my specialty, I decided my first move should be directed to the writing of a training manual which was needed to fill the neglected area of CCTV training; this took over twelve months to develop. The CCTV Consultant has now trained a number of new people in the industry who now have a broader knowledge of CCTV.

The CCTV Consultants Guide is the result of ongoing education which includes a case study designed to help place technical information in a user friendly context.

Douglas M. Grant

MCSE



Desired Learning Outcomes of the Course

As a result of participating in Session 1, students will be able to:

- identify where the industry is at currently in terms of
 - needs;
 - equipment, IP devices; and
 - service, support;
- identify the objectives of an effective CCTV system;
- identify the uses/applications of CCTV;
- identify CCTV configuration and types.

Training Methods

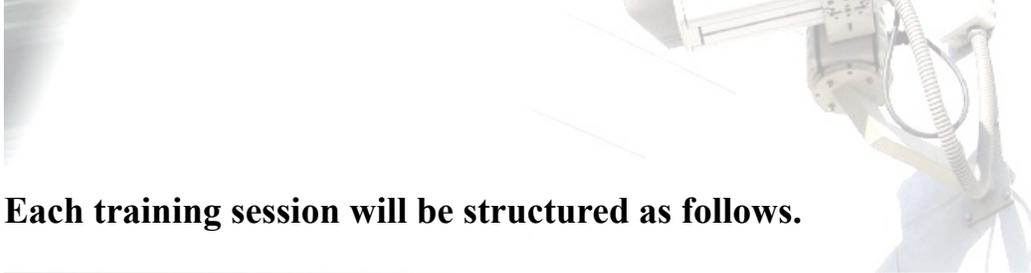
Introduction and commencement of case study

How this Session Links to the Program Objectives

The body of the session is designed to contribute towards achieving the **knowledge** and **attitude** objectives. The case study contributes towards achieving the **skills** and **attitude** objectives.

The structure of the course consists of various sessions, please strive to complete one session per week.

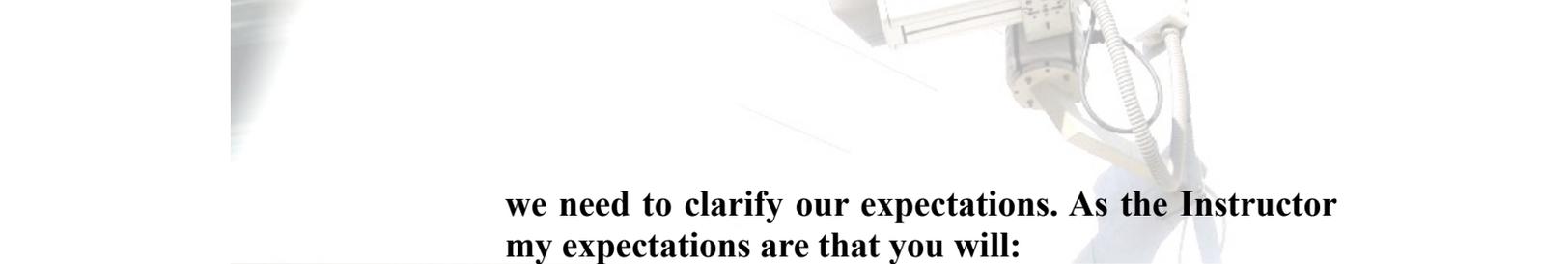
You may work at your own speed.



Each training session will be structured as follows.

- Defining the session's objectives.
 - Start with reading the Tutorial then go on to the Study Session and respond to any and all questions by email.
 - Working through the content.
 - Summarising of the session's main learning points.
 - Working on the case study.
- During the last session there will be a open book written exam and presentation of case study outcomes. The exam answers will be included for your reference.
- The exam is offered as a tool to clarify your understanding and knowledge of the CCTV Industry. The Specification that you will write and publish will show your understanding of the course material and your ability as a CCTV Consultant.

To successfully work together throughout this course



we need to clarify our expectations. As the Instructor my expectations are that you will:

- write down any questions you may have through out the course, as well as any session reports you are having trouble with;
- appreciate the commitment necessary in completing the course by correspondence;
- take notes on the content of each Session as considered necessary.

As students you can expect:

- feedback via e-mail regarding any questions which may arise;

The CCTV Consultants Course has been prepared and provides all the information necessary for this course.

You are welcome to supplement the course with text books which are relevant to the CCTV course.



Overall objectives of the course are:

To increase professionalism within the CCTV industry by:

- raising the level of technical knowledge;
- developing appropriate skills in specifying equipment while designing systems that meet client needs together with:-
- creating an awareness of the need to design and install high quality CCTV systems.

As a result you can be expected to:

- enjoy an excellent reputation for producing high quality work;
- have the technical knowledge and confidence to be able to design and install CCTV systems that meet your client's needs.

This course will be an aid in understanding the following.

- X Cameras
- X Lenses
- X Screens
- X Cabling
- X Control equipment
- X Transmission Devices
- X Tender Process
- X Introduction to Video over IP Networking

This course offers a case study of a department store which includes the industries approved tender process.



Tutorial Session 1 - CCTV General

INTRODUCTION TO SESSION 1

Session Topics

- Responsibility of the Industry to assure a quality job
- Features of CCTV systems
- CCTV system configuration
- Introduction to a Case Study
- Case Study
- Summary of Case Study
- Floor Plan of Stewarts Department Store (Case Study)



CONTENT OF THE TUTORIAL SESSION 1

Responsibility of the industry to assure a quality job

In today's ever increasing crime rate within the public and private sectors, large and small businesses are discovering the necessity to protect their staff and investments with security devices.

The CCTV Security Market is expanding at a rapid rate, which will create a much larger industrial demand on CCTV products. Not to mention a greater need for people with CCTV knowledge. These security installations, may ultimately be the deciding factor of 'business survival' for many people.

Each CCTV system should be designed to cater for the specific needs of the client. It is important to be able to design an up to date security system. This system should offer your client every possible advantage through your knowledge of all CCTV products available.

This course does not offer specific "product knowledge" as the technology used by individual manufacturers can change and does change frequently.

Although I consider the information in this course to be a starting point for you in your travels through CCTV, it does I hope offer you a sound understanding of the principals of CCTV.

Those seeking security products rely on the **expertise** of the people in our industry. Therefore, to avoid costing society money and jobs through lack of understanding, education is vital in the area of "CCTV know-how". This will not only secure our own future but expand future employment as well, due to the people required to fill the demand of this growing market. It will be the people within this industry who are willing to put the time and energy into education, that will change the industry from what it is today to one that is informed and aware.



Features of CCTV systems

A correctly designed and installed CCTV system should produce a clear, crisp picture at the screen. The field of view would have been calculated and represent the subject under surveillance. After successfully completing their training, the operator should feel comfortable switching cameras and recording/playing back necessary events as they occur.

CCTV system configuration

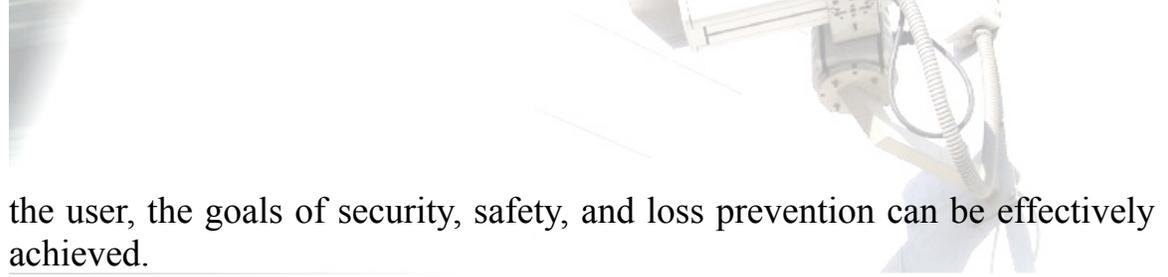
The smaller configurations of CCTV consist of 3-4 cameras, these cameras could be analogue or IP type cameras. If the analogue cameras are required a switcher and a screen would be used. If the client has asked for a network solution and has existing analogue cameras you will have to convert these cameras to accept an IP address. To successfully accomplish this you will require multiple video servers or a single server or DVR with at least 4 inputs.

In a new installation IP cameras would be purchased and connected to the network using an existing data switch, or if the system is going to be on a stand alone subnet you will have to supply the switch.

The larger systems in use today such as Casinos, Transport stations, incorporate a matrix switching system with numerous capabilities, one of which is the ability to call up any camera to numerous screens in the system. When interfaced with alarm and access control equipment the systems capabilities are even further enhanced. Touch screen functions and mimic boards can be used for more efficient and effective control of camera locations.

New systems with network capabilities are usually all IP cameras connected to a larger network with storage capability. These solutions have all the features you would have in a data network including remote access using PC's and PDA devices. The Internet is a common WAN for remote access to images.

The smaller CCTV systems have fewer cameras and are generally hard wired with greater limitations in comparison to the larger systems. Still the majority of CCTV systems designed are smaller systems and if interfaced correctly with peripheral equipment such as control equipment, DVR's, printers and alarm devices, the result will be an effective system. After the appropriate CCTV system has been installed with adequate training given to

A robotic arm is visible in the upper right corner of the page, set against a light, blurred background of a factory or industrial environment. The arm is metallic and has various cables and hoses attached to it.

the user, the goals of security, safety, and loss prevention can be effectively achieved.



INTRODUCTION TO THE CASE STUDY

Objectives of doing a case study

A case study is a simulation. A realistic situation is presented and you are asked to consider a number of pertinent situations. The purpose of this case study will be to give you practice at applying the theory you have learnt.

Each Session will present additional information to be used in the case study which has a number of acceptable designs, and you will be striving to accomplish this by the end of the course. You will be using your experience in the Industry to choose equipment or devices that best suit the solution you decide on. Every year there are new technologies available which produce better or more cost effective solutions. I urge you to consider them all, and after you have explored the possibilities and find yourself using proven, reliable equipment that you are comfortable with, so be it.

Just because it is new technology, it doesn't necessarily mean it's right for your project.



Overview of case study content

The business case study presented in this course is:

Stewarts Department Store.

You will be playing the part of a consultant and must always consider the case study from that perspective. Stewarts Department Store has been having problems recently with stock losses resulting from theft, and have decided to do something about it. They believe a CCTV surveillance system is the answer.

CASE STUDY

Stewarts Department Store

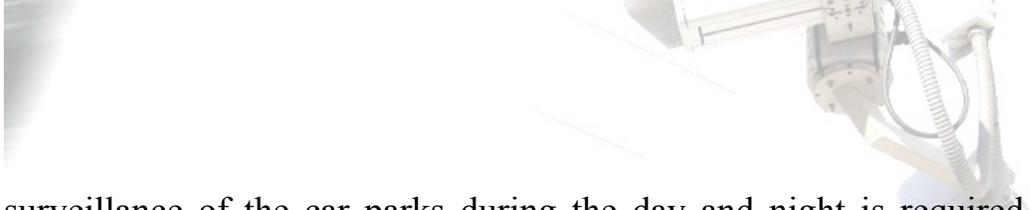
Mr. Jim Thomas, the State Manager of Stewarts Department Store has been given the directive to commission a consulting firm. The consulting firm is to undertake an extensive design and costing of a security system, which will reduce shrinkage, increase productivity, deter shoplifting, aid in the prosecution of shoplifters and the internal theft from staff and managerial personnel.

You have been referred to Stewarts Department Store as a respected consultant. The decision to install the latest CCTV equipment has been suggested as the solution to the ongoing problem.

Mr. Thomas interviewed you for the job and was impressed to the point of commissioning you to design and cost the entire CCTV system.

He has a budget of \$85,000 to spend this year.

Since there have been reports of assaults after hours which occurred on the way to vehicles left in the Stewarts Department Stores parking areas,



surveillance of the car parks during the day and night is required as staff come and go from their respective shifts. For this reason alone, Mr. Thomas feels that not only does he want the Manager's office to have control during day shifts, he also wants the night shift store person in the warehouse to have the ability to view some of the cameras as well. It may even be necessary for the gatehouse guards to have the same control for their shift.

Stewarts Department Stores are a national chain with 30 stores in total. Mr. Thomas has been told security systems can do "all things". One of these "things" is the ability to network all the existing stores together so as to screen every store from Head Office.

Mr. Thomas does not want a system that has to be controlled by a rocket scientist. He wants user friendly equipment that will not become obsolete by the time it is commissioned. Furthermore, if he is going to spend \$85,000.00 on a CCTV system, he wants to be able to review a recorded tape and be able to identify the persons involved.

You were told the cash office was "held up" at gun point and a substantial amount of money stolen.

If your design proposal is approved by Head Office, you probably will be chosen as consultant for the new store's CCTV system. To achieve success it is important to fulfil your new client's needs and also come close to his budget.

Mr. Thomas has definite ideas about what he would like to view in the store. He has suspicions that some of the check-out staff are taking money from the till and wants a clear recording of how and when they are doing it. He also suspects some of the check-out staff have some type of scam organised with their friends, but Mr. Thomas is not sure what it is.

There is the never ending problem with shop-lifting to be addressed. The store would like to make an example of their sincerity towards the prosecution of shop-lifters but to date have no recorded proof of it happening. Mr. Thomas said all six aisles have empty packaging left stuffed behind the displayed merchandise at the end of each day.

The store has been held up recently in the cash office on pay day. A lot of money was taken at gun point. The police need a recorded image to aid in



their investigations.

The loading area is suspected of being responsible for the greatest losses in merchandise. Cases of cigarettes go missing before they are displayed on the shelves.

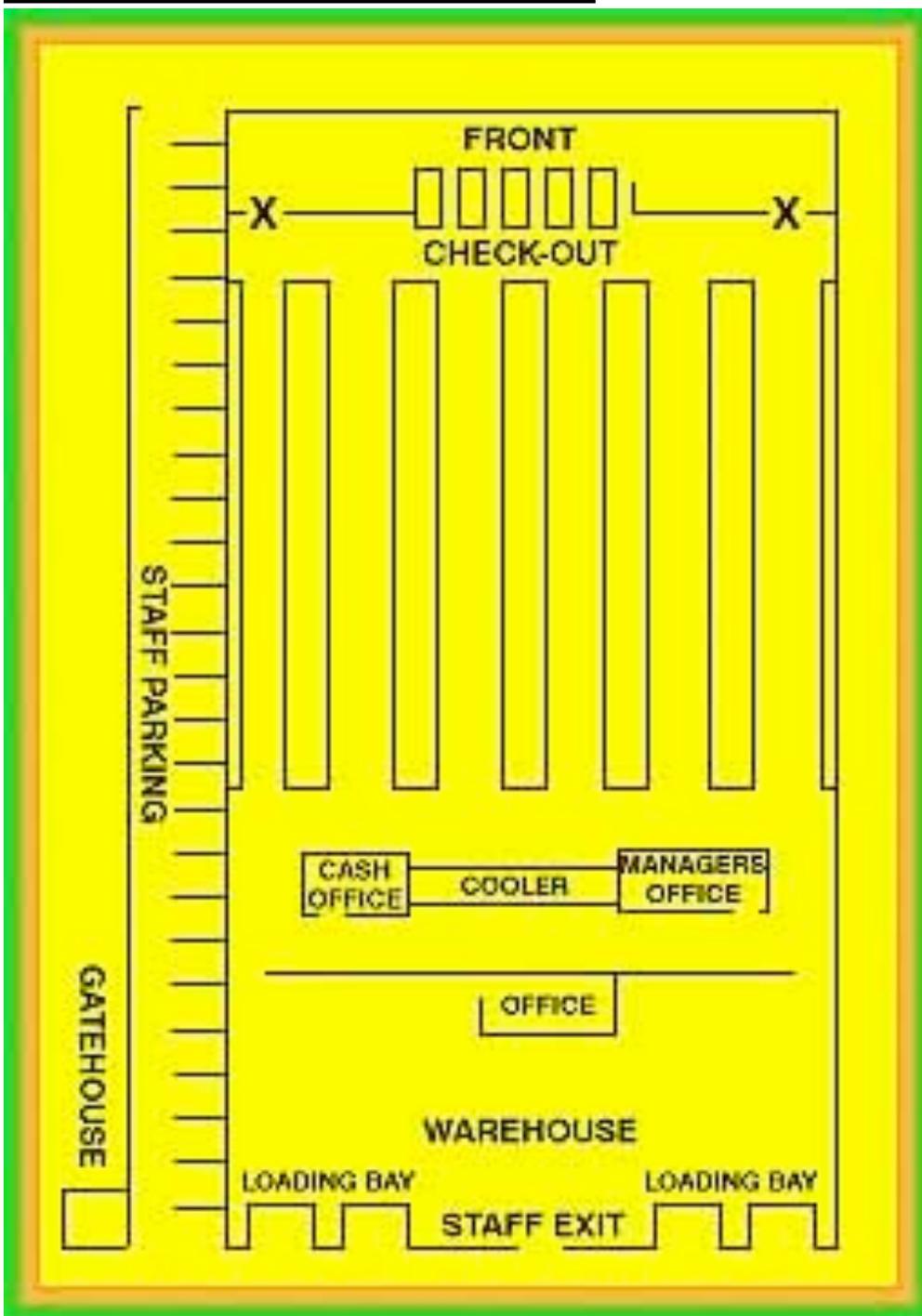
The car park area is a large area that services both client and staff, with the staff parking at one end closest to the store. (See floor plan). It is the third time one of the staff have been robbed as they leave from their shift. One of the female staff was assaulted by an attacker. Fortunately the attacker was frightened off by another staff member.

Mr. Thomas would like to be alerted if there is a robbery via SMS and have images emailed to his private email address. He wants a real time connection he can access when he is abroad or at home. The consultant will advise him of the various bandwidths available from the local Telcos and set up the Internet access for him at the store.

You will advise him of storage and the devices required for 30 days using motion detection.

STEWARTS DEPARTMENT STORE

Floor Plan





Study Session 1 - CCTV General

Surveillance and Security

Surveillance:

furnaces, boilers, underwater, nuclear power stations, dams, tunnels, x-ray laboratories, cranes

Centralized control:

roads, railways, toll stations, parking areas, Bus ways.

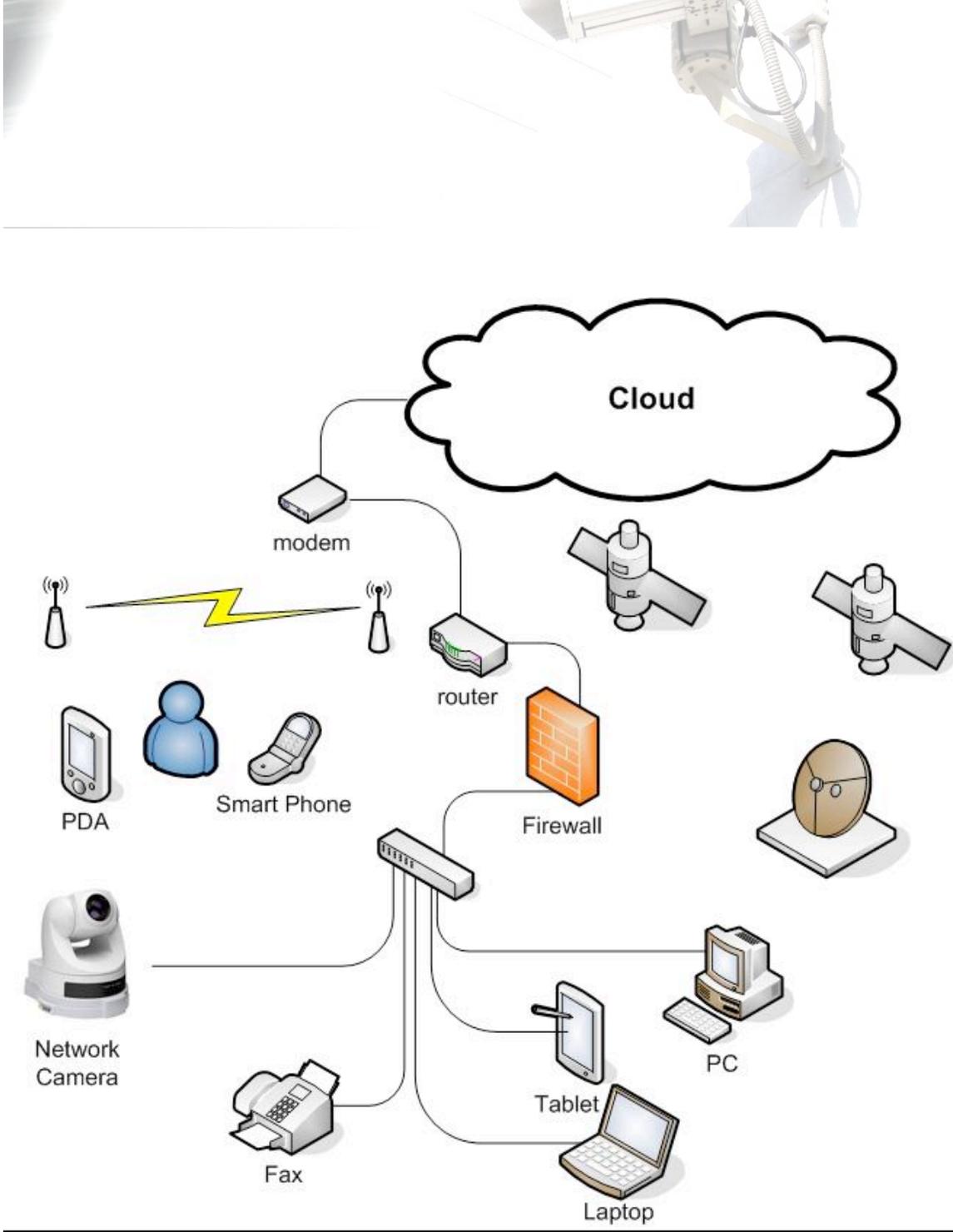
Security

banks, stores, buildings, railway stations, factories, theatres, parks, casinos

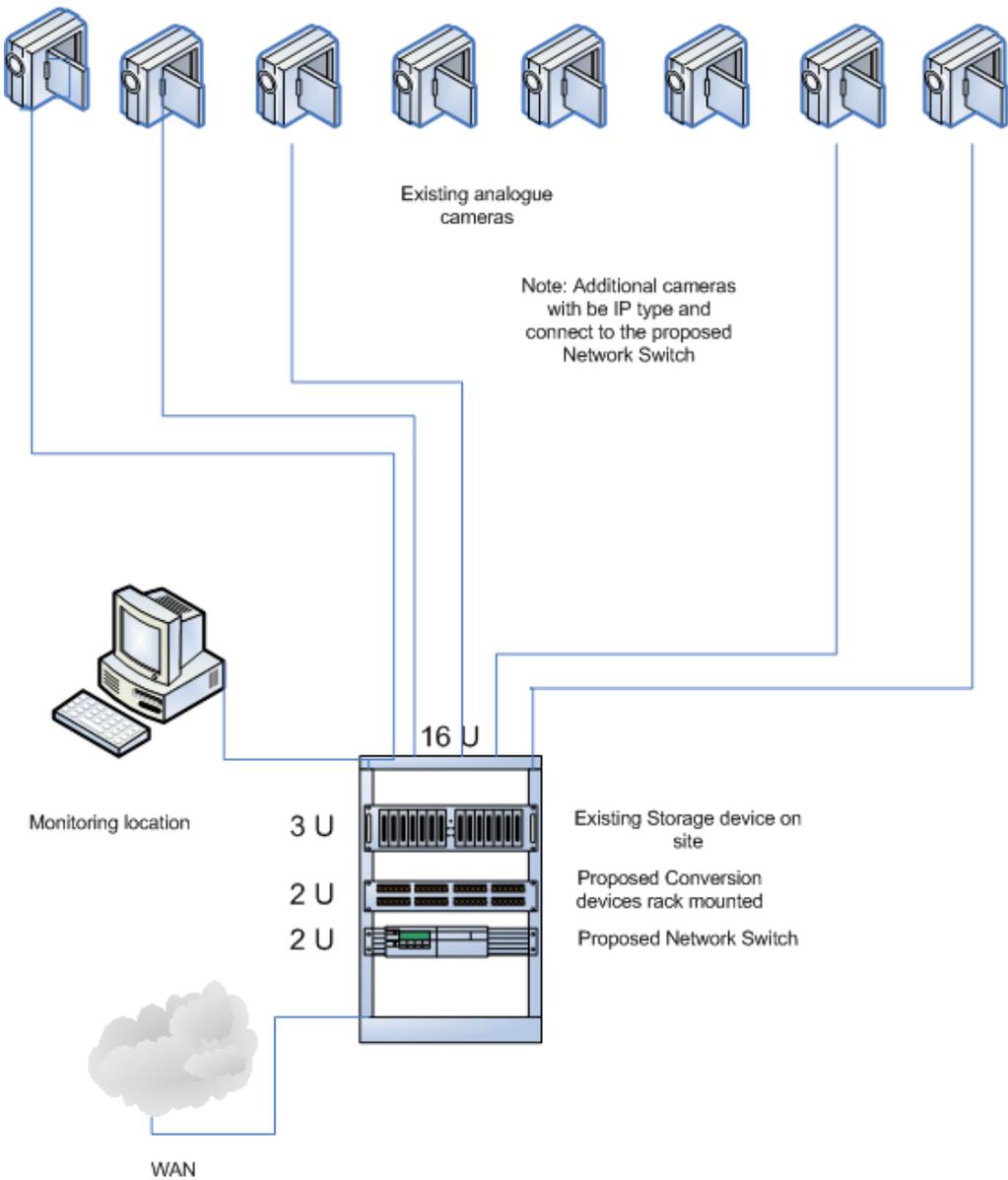
Medical:

hospitals, clinics, first-aid centres, pharmacies.

A small network with CCTV and remote access



Monitoring Video Wall used for Larger CCTV Systems



INTRODUCTION TO THE CASE STUDY



Objectives of doing a case study

A case study is a simulation. A realistic situation is presented and you are asked to consider a number of pertinent questions. The purpose is to give you practice at applying the theory you learn each session to a set of business problems.

How a case study will be completed by the students

Each session the case study will present additional information about the situation, followed by questions to lead to the desired answer. This case study has one ideal answer and we will be striving to reach that answer by the end of the course.

Overview of the case study content

The business situation presented in the course case study is Stewards Department Store. You will be playing the part of a consultant and you are to always consider the case study from that perspective. Stewards Department Store has been having problems lately with stock losses and stealing and have decided to do something about it. They believe a CCTV surveillance system is the answer.

How the case study will be run

After each Tutorial session, spend time working on the case study.

Our role as the instructor in the case study

I will give out additional information, if required, to clarify the task and questions each session. If you have questions, you are to e mail the instructor.



Your role in the case study

You will be playing the role of a Consultant. To effectively involve yourself, I suggest you create a company name for your new consulting business.

i.e.: John Smiths CCTV Security Consulting.

End result of the case study

Each session: After working on the case study, you will present me with an evaluation of what you believe is being asked for. You may also want to suggest to me what you would offer at this point in the case study.

Last session: The final presentation of the case study will form part of the total grade for the course. Again, you will be expected to write a short paper in representation of your presentation. I will play the role of Mr. Thomas and you will play the part of the consultant presenting your proposed solutions to his business security problems. The format of the presentation will be up to you.

Here are some ideas: Draw the floor plan of Stewards Department Store. Indicate the camera positions. Explain how the CCTV surveillance system will solve the various problems Mr. Thomas is facing. Explain how each piece of equipment was chosen and why. In a similar way, present the plan of the control room and remote sites as well as the system specs. It is an opportunity to be creative and put your thinking caps on not only to come up with a workable solution to the case study but also to make an interesting presentation of it.

Refer to the: **CCTV** Documentation Sheets.

These sheets are to be used throughout the course.



CASE STUDY – SESSION 1

Stewards Department Store

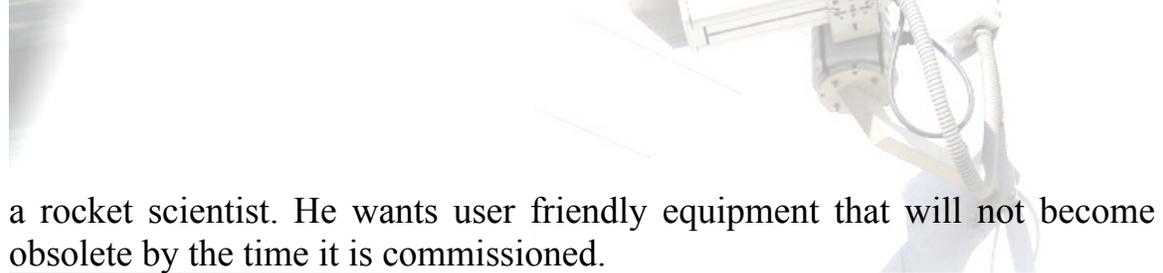
You have been referred to Stewards Department Store as a respected consultant. The store has suffered great losses due to theft. The decision to install the latest CCTV equipment has been suggested to be the solution to the ongoing problem. You have been called in to assist.

Mr. Jim Thomas, the State Manager of Stewards Department Stores in Brisbane, Australia has been given the directive to commission a consulting firm to undertake an extensive design and costings of a security system which will reduce shrinkage, increase productivity, deter shoplifting, aid in the prosecution of shoplifters and the internal theft from staff as well as managerial personnel.

Since there have been reports of muggings after hours which occurred on the way to vehicles parked in the parking areas, surveillance of the car parks during the day and night time is required, as staff come and go from their respective shifts. For this reason alone Mr. Thomas feels that not only does he want the Manager's office to have control during day shifts, he also wants the night shift store person in the warehouse to have the ability to view some of the cameras as well. It may even be necessary for the gatehouse guards to have the same control for their shift.

Stewards Department Stores are a national chain with 30 stores in total. Mr. Thomas has been told security systems can do all things. One of these things is the ability to network all the existing stores together so as to screen every store from Head Office in Melbourne. If this is possible he wants to know if his CCTV system will have this feature.

By the way, Mr. Thomas does not want a system that has to be controlled by



a rocket scientist. He wants user friendly equipment that will not become obsolete by the time it is commissioned.

He was also given a budget of \$85,000. You were also told the cash office was held up by gun point and a substantial amount of money was stolen.

Luckily, you found this information out before Mr. Thomas interviewed you for the job. In fact, Mr. Thomas was impressed to the point of commissioning you to design and cost the entire CCTV system. If the findings are approved by Head Office, you could find yourself consultant and project manager for the new store's CCTV system. Now you must find a way to fulfill your new client's needs and come close to his budget.

More information...

Mr. Thomas has certain ideas he would like to see in the store. He knows some of the check-out staff are taking money from the till and wants a clear recording of how and when they are doing it. He suspects some of the check-out staff have something going on with their friends, but Mr. Thomas is not sure what it is.

There is always the problem with shop-lifting. The store would like to make an example of their sincerity towards prosecution of shop-lifters but to date have no proof of it happening. Mr. Thomas said all six aisles have empty packaging left stuffed behind the displayed merchandise at the end of each day.

The store has been held up recently in the cash office on pay day. A lot of money was taken at gun point. The police need some identification to help their investigations.

The loading area is suspected of being responsible for the greatest losses in merchandise. Cases of cigarettes go missing before they are displayed on the shelves. The car park area is a large area with staff parking at one end closest to the store. It is the third time one of the staff have been robbed as they leave from their shift. One of the female staff was assaulted by an attacker. Fortunately he was frightened off by another staff member.



Remember to write down any questions you may have on the course as you go along and at the end of each session send them back with your conclusions.

As a result of studying this session students will respond to:

- 1) Identify where the industry is currently at in terms of needs, equipment and service. (*Example of students' response*).
 - I believe the industries' needs are all about obtaining quality equipment from knowledgeable people in the industry who know their product and have the means of offering quick reliable service.
 - 2) Identify the objectives of an effective CCTV system.
 - 3) Identify the uses / applications of CCTV.
 - 4) Configure a four camera system using four different designs.
 - 5) List client's objectives and what you believe a well designed CCTV system will achieve.
 - 6) Determine locations which best need camera surveillance as per the client's objectives.
-
- 7) List particular problems associated with each camera location.

END SESSION 1



Preview of Session 2

Next session we will be studying cameras. This is one of the most important component of a well designed CCTV system. We will be learning about the types, construction and properties of CCTV cameras.

Desired Learning Outcomes

As a result of studying this session, students can be expected to:

- demonstrate a knowledge of the different types of illumination;
- demonstrate a knowledge of the types, construction and properties of CCTV cameras;
- demonstrate a knowledge of camera specifications;
- identify how this knowledge will benefit their clients;
- determine the quantity, locations, types and operating characteristics of cameras needed to meet the needs of a specific application. (Case study).

Thank you for your participation and hard work on the first session.

Go over the sessions as many times as you feel you need to.