CHAPTER 1
INTRODUCTION

1.0 Introduction

Information and technology are two main elements in today's information systems. Information gathers our ideas and organizes to an appropriate ways of accessing it. Technology presents a suitable and appropriate platform from which users can use to access and assemble information together. Advanced information technology is effective in terms of utilizing information. There are many advanced and newly created technologies in computer environment but more recent technologies such as groupware hold greater promise. To be qualified as groupware, the technology must possess one of the following characteristics: it fosters collaboration and coordination between people, it fosters the sharing of information, and it enables the communication between groups of people. (Burns 1995)

Groupware is a generic term for network-based software designed to facilitate group activities such as discussions, debates or team projects. It is a class of computer software aimed at helping individuals work together more productively. Groupware applications which sometimes known as collaborative or multi-user applications are more complex than software designed for a single user. It is an enabling technology that addresses the vast areas of collaboration through digital media to bring substantial improvement and transformation to organisations. Groupware build upon the latest advances in information technology, utilising and building upon local and
wide area networking as well as all recent advances in software and hardware
technologies to achieve both communication and collaboration goals.

Groupware helps people work together. Groupware combines elements of Web
pages, electronic bulletin boards, discussion lists as well as systems for workflow
and business process re-engineering (BPR) to create a shared hypermedia
environment in which multiple users can read and edit each other's files
synchronously or asynchronously. Technologies that support collaboration are in
greater demand today than ever before, and in recognition of that fact, vendors are
integrating collaboration technologies into their products.

Figure 1.0 illustrates the four main categories of information technologies, which are
used to build groupware: multimedia interfaces, communication and information
sharing technologies, object-oriented technologies and artificial intelligence.
Multimedia interfaces involve intelligent interfaces such as icon-based interface,
Virtual Reality Modeling Language (VRML) that clearly define a multiple media and
modes to facilitate human-computer interaction. It involves techniques for building
multimedia interfaces that interpret and generate multiple media such as spoken and
written natural language, graphic, maps and animation. Object-oriented technologies
involve the use of programming languages such as Java or C++ to facilitate and
enhance groupware systems for better use. Artificial intelligence that linked with
groupware is focusing on creating computer systems that can engage on behaviors
that humans consider intelligent. Communication and information sharing involves
sharing of information among users for better and organized use of information. The
communication and information sharing technology are the main focus of this thesis.
1.1 Problem Statement

Every school or even in higher institution of learning, assignments are categorized as a necessity to evaluate students' performance. In a traditional way of completing assignments, students have to write appropriate format using writing and editing tools. Traditional way means that students do their work individually. In a proposed approach, students write assignments based on the format already stated on the screen, communicate and share their problem and solution with other students. The
proposed application is implemented to accommodate collaboration and information sharing between students and instructors and vice-versa and at the same time increases the communication and knowledge sharing between students and instructors. Hence, time is not wasted and students are allocating the extra time for learning, studying or even leisuring.

Lecturers need to change the way of thinking and creating new questions for assignment in such a way that students are able to understand the concept. Every section needs descriptions for students to understand and able to make full use of the application. Using computer and Internet are new ways of learning to some students. For example, new application should have an online tutorial or online help to assist students with their work. Moreover, students should familiarize themselves with the new interface and new environment of study using computers and Internet.

In a whitepaper titled *Collaborative Education with TeamWave Workplace*¹, there is suggestion that educators should pay special attention to the types of student interaction that used in their classroom. The writer has categorized three main types of interaction that occur, which can be clearly seen in the diagram below:

1. **Student-student.** This is inter-learner interaction, which is between student and other students, alone or in-group settings with or without the real-time presence of an instructor.

2. **Student-material.** This is a defining characteristic of education and without it there cannot be education, since it is the process of intellectually interacting with

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¹ 1989, Editorial of American journal of Distance Education
content that results in changes in the student's understanding. They are one-way communications between subject experts, intended to help distant learners in their study of the subject. No other professional teaching expertise is provided, and learning is largely self-directed.

3. **Student-lecturer/instructor.** This type of interaction is regarded as essential by many educators and highly desirable by many students. In this interaction, instructors attempt to stimulate or at least maintain the student's interest in what is to be taught, to motivate the student to learn, to enhance and maintain the student's interest, including self-direction and self-motivation.

![Image of interactions in virtual classroom](image)

*Figure 1.1 Interactions in virtual classroom*
1.2 Research Goals

The thesis focuses on the asynchronous collaborative information sharing in education environment focusing on case study of completing an assignment. Students are required to complete the assigned assignment by phases and able to discuss any arising issues with other students and lecturers via the application. Thus the goals of this research are:

i. **To support asynchronous mode of interactions.**

   Electronic mail enables users to leave messages for one or more person at any time and the person received can read the message any time he or she wants and at any place where connection is available.

ii. **Collaborative Information Sharing.**

   To provide a shared working environment whereby students can share their knowledge and gain new information. Students can post and share their topics in a discussion room or reply and post new topics for others students to response.

1.3 *Significance of the research*

This thesis offer great benefits to the students as well as instructors. The targeted audiences of this project are instructors involved in the learning module, students who are under the instructor's supervision and also for individual users who are keen to learn on new technologies.
1.4 Methodology

The course of action taken in carrying out this thesis is as explained in Figure 1.2 below.

Figure 1.2 Overall Thesis Process
The problem statement is viewed from two literature reviews, which are literature review on applications that support asynchronous mode of interactions and literature review on the existing asynchronous information sharing systems.

Another perspective being analyzed is the suitable tool for the implementation purposes. Lotus Notes and integration to the World Wide Web are analyzed to suit the application that supports asynchronous collaborative information sharing applications.

The design and implementation part in where the coding and testing being conducted. The final part of the overall thesis process is the conclusion of the overall study of the thesis.

1.5 Thesis Organization

Chapter 2: Literature Review on applications to support asynchronous mode of interactions.

In this chapter, the discussion involves discussing applications to supports asynchronous mode of interactions. Applications involve include electronic mail, newsgroup and mailing lists, workflow systems, hypertext, group calendars, collaborative writing systems and bulletin boards.
Chapter 3: Literature Review on existing asynchronous information sharing systems

In this chapter, the discussion revolves on the topic of existing asynchronous information sharing applications for the purpose of implementing the case study. Different types of asynchronous information sharing applications are discussed and analyzed which are TeamRoom, Learning Space and BSCW Shared Workspace.

Chapter 4: Analysis and Design

Chapter 4 focuses on the analysis and design of the application. Discussion on functional requirements, non-functional requirements, design architecture and user interface are presented.

Chapter 5: Implementation

This chapter highlights the implementation aspect of this thesis.

Chapter 6: Testing

Chapter 6 looks into the usability testing of the ACIS application.
Chapter 7: Conclusion

Chapter 7 concludes the overall presentation of the thesis. The topics highlighted in the final chapter include the system strength and its limitations, future enhancements of the system and personal objectives learnt throughout the thesis.