Using Backup and Restore Automation from Disaster in University Information Systems

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Abstract—For information system users in university, especially for those who work daily and frequently which deals with storing data in the computer, the computer should be aware of sudden “disaster”, such as virus, due to system failure. When “disaster” happens, it can hide or even lose the data or files in the computer. Backup is needed to prevent the loss of data when the computer is attacked by “disaster”. It is highly recommended for organizations even individuals to do data backups on a regular basis. It is important in order to avoid the loss of important data when the disaster hits. While restore is to bring back the system to a certain point before. This paper proposes an application to automate the process of backup and restore called “SIPINTAR” which ensures that the data is stored properly and safely. The results are useful for helping individuals and organizations to protect their computers from system failure or other “disaster”.

Keywords—Information Systems; Back up; Restore; Disaster.

I. INTRODUCTION

Institutions such as universities from different types (small, medium and large) consider information as one of the most important assets that need to be secured against expanding number of dangers [1]. Online learning method (e-learning) is a method which enables the teacher to conduct learning activities wherever and whenever. It has many functions and purposes so that the teacher can get a lot of information to be used in teaching and learning process. Data is important, therefore data storage and its protection is a serious issue which should be considered [2]. In conducting e-learning, the teacher also can do operations such as grading, making schedules, announcements about certain rules or about classes, students and teacher data, etc. Most institutions now have more prominent attention to different sorts of business intrusions [3], [4] and they move forward to get ready for congruity of organizations, ensuring businesses are resilient and deploying a fast recovery after an emergency [3], [5].

Data and information on value, scheduling and teaching and learning process is very important, it needs a reliable backup application. Their ultimate objectives are to satisfy stakeholders’ needs in addition to keeping in business for as long as they can [3]. Information can be imitated naturally and accurately to numerous areas. Numerous replication calculations duplicate information esteem from the source information thing to its reproductions [6]. Data backup is a necessary requirement for every organization [1]. The first step in understanding disaster recovery is to define and measure it [7].

II. THEORY

A. Backup and Restore

A disaster recovery plan is similar to an insurance policy that provides comprehensive protection from natural disasters, such as earthquakes, surges, sea tempests, and tornadoes. Disaster recovery plans over the years that are typically used by organizations that have computers and data for daily business operations. Recovery planning process is expensive, an alternative is to backup data from your computer and store it in an alternative location [8]. A disaster is anything that can cause a disruption in the normal operation of a business [9], [10]. Nowadays, more people use computers to store important documents, and a variety of other small information that may need to be maintained for a long time. Doing backup data computers is important to keep the document in the long term as well as short term.

B. Information Systems E-Learning

E-learning can be defined as a learning process created by interaction with digitally delivered content, network-based services and tutoring support E-learning is any technologically mediated learning using computers whether from a distance or in face to face classroom setting, it is a shift from traditional education or training to ICT-based personalized, flexible, individual, self-organized, collaborative learning based on a community of learners, teachers, facilitators, experts [11]. The software was designed and coded to operate within a unique environment of databases, operating systems and hardware. Most of the hardware used proprietary applications programming interface to interface with the learning system [12]. Information System (I.S) is basically concerned with data processing into some information. IS works in every system, which provides information for the managerial activities in university. A framework to change over information from inside and outside sources into data and impart that data in an proper shape, to chiefs at all levels in all capacities to empower them to settle on convenient and compelling choices for arranging, coordinating and controlling...
the exercises for which they are capable. Others, however, give it more limited scope. They see it as a IS e-learning collecting and analyzing data and producing reports. Its purpose is to help managers to solve structured problems [13], [14].

C. Disaster

The term disaster or catastrophe owes its starting point to the French word "Desastre" which is a mix of two words "des" meaning terrible and "aster" which means star. In this way the term alludes to 'Awful or Evil star'. The disaster is an event of natural or manmade causes that leads to sudden disruption of normalcy within society, causing injury to life and property, to such an degree that typical social and financial instruments accessible are deficient to reestablish commonality. Debacle is a cataclysmic interruption of life in a general public caused by nature or a man made circumstance [15].

III. METHOD RESEARCH

This research consist of two stages following with 8 steps, there are: (1) Preliminary study I, (a) Observations, (b) Literature review, (c) Identification of requirement, (d) Design Information system of backup and restore with SDLC Water fall and (2) Preliminary study II, (d) Observation of real system (e) Testing information system backup and restore for disaster using any conditions (f) Analysis, (g) Conclusions and recommendations. The flowchart of the research is illustrated schematically in Figure. 1.

![Fig.1. Flowchart of Research](image1)

Software engineering research is intended to help improve the practice of software development, so research planning should make provisions for the transition. Software engineering research includes, but is not limited to, experimental research. [13], [18].

IV. RESULT AND ANALYSIS

Educational institutions depend upon on-demand data systems, from student records, schedules of subject, announcements to professional research and content, to administrative applications and much more. Most conventional backup methods are outdated and limited in its scope of data protection, as it does not meet the requirements of educational that may have offices in multiple departments and campuses with vital information. Disaster recovery for these institutions implies protection of localized data pertaining to records, exams, and etc.

The development of a IS requires several phases, which have a relation on the activities. The activities include analysis, design, coding & testing, implementation and maintenance that sometimes referred to as phases. On the phase have elements that provide the framework for manage the project. Waterfall approach was SDLC first model to be utilized broadly in Software Engineering to guarantee achievement of the venture. In "The Waterfall" approach, the whole process of software development is divided into separate phases. Waterfall SDLC demonstrate is a successive programming improvement process in which advance is viewed as streaming progressively downwards (like a waterfall) through a rundown of stages that must be executed keeping in mind the end goal to effectively construct a PC programming. Initially, the Waterfall demonstration was proposed by Winston W. Royce in 1970 to describe a possible software engineering practice [19], [20].

Software requirements are establishes the expectations for software functionality and identifies which system requirements the software affects. Requirements
analysis includes determining interaction needed with other applications and databases, performance requirements, user interface requirements, and so on [21]. Requirement of information systems is user both individuals and organizations protected by a system failure or other disaster, which is expected to reduce the cost in the event of damage to files or data on the client computer and can also duplicate data into separate media. Data from such duplication will be used to restore the data in case of damage or loss of data. In analyzing the proposed system for this application is the user can perform backup and restore automatically, at which time the backup files and folders can be setup in the coveted drive. Utilize case is speaks to a noteworthy bit of framework usefulness and on-screen character is a man or framework that gets advantage from and is outer to the subject [22], [23]. Actor in this case is user both individual and institutions, use case are backup, configuration and restore, which user can backup and restore, with configuration whenever, wherever drive of PCs.

Analysis phases are phase to understand and to keep in all the detail of business needs and the processing requirements of the new system. Instruments and procedure for investigation is UML. The Unified Modeling Language (UML) is generally accepted as the de facto standard modeling notation for the analysis and design of the object that oriented on software frameworks [13], [24]. UML is an institutionalized broadly useful displaying dialect in the field of software engineering and programming building. The standard is managed and was created by the object management group [19], [25].

In this case we only show use case diagram. Use cases help us to understand and clarify the user’s requirement for interactions with the system and reveal it most or all the functional requirements of the new system. [19], [26].

Architectural design are determines the software framework of a system to meet the specific requirements. This outline characterizes the real segments and the connection of those segments, yet it doesn’t characterize the structure of every part. The outer interfaces and apparatuses utilized as a part of the venture can be dictated by the creator. Point by point outline are looks at the product segments characterized in the structural plan stage and creates a determination for how each part is executed [21]. Detailed Design included are designer data location source (folder name, set copy and description), temp data (file name, folder type, level), temp delete (file name, folder type, level), and data location destination (destination). Type Data are character and numeric, with length 1 until 200.

Coding is implements the detailed design specification [21]. Coding phases are receiving the design of the system documents, the work done is divided in to modules/units and actual coding is started. Since, in this stage the code is created so it is the fundamental concentration for the designer. This is the longest period of the programming advancement life cycle. For this situation, programming dialect with Microsoft Visual Fox Pro. Visual FoxPro began as an individual from the class of dialects normally alluded to as "xBase" dialects, which have linguistic structure in view of the dBase programming dialect.

Stages Testing: After the code is produced it is tried against the necessities to ensure that the item is really settled the necessities tended to and accumulated it amid the prerequisites stage. During this phase all types of functional testing like unit testing, integration testing, system testing, acceptance testing are done as well as non-functional testing are also done. Testing are determines whether the software meets the specified requirements and finds any errors present in the code [21]. Any software development process is divided into several logical stages that allow a software development company to organize its work efficiently in order to build a software product of the required functionality within a specific time frame and budget. All software projects go through the phases of requirements gathering, business analysis, system design, implementation, and quality assurance testing [27], [28]. In black-box, or functional testing, test conditions are developed on the basis of the program or system’s functionality; that is, the tester requires information about the input data and observed output, but does not know how the program or system works. The tester focuses on testing the program’s functionality against the specification. With discovery testing, the analyzer sees the program as a black box and is totally unconcerned with the inner structure of the program or framework [29].

In figure 3 displays is where the backup progress shown in red running. Automatically incremental backup process will take place every minute.
on university computer. Can make changes to what is back up at any time through an easy to use program that runs on your computer.

The backup system will keep copies of old versions of files it has backed up. So can make a change to a file and wanted to revert to the version of the file as it was the previous week for example. Can restore files at any time without the assistance of technical support staff. Restoring files is accomplished through an easy to use point-and-click interface provided by SIPINTAR program installed on university computer.

REFERENCES


