## Chapter 6.1 Recoverable Operation Problem and Model

*Introduction:*

In this chapter, we discuss the possible problem and how DBMS help solve these problems and start from where, and discuss how to deal with these malfunctions.

*At first, we mainly discuss ‘System Malfunction’ or ‘Crash’, and the design of Logging and Recovery is used to recover these kind of errors. Also we will introduce the Buffer Management Model, it is the fundamental of the DBMS Recovery.* Also in the next chapter, we still need this model for several transactions to access the Database.

### Chapter 6.1.1 Malfunction Model

When the database has been visited or updated, there would has a lot of problems. The problem’s range from the wrong input error data from Keyboard to Explosion which happened in the room where the Disk stored.

*Wrong Data Input*

Some wrong data input would not be detected. What we need to do is to write the constraint and trigger to find out the wrong data input.

Medium Malfunction

* *Partial Malfunction* - one or several bytes malfunction in the disk, and normally *Parity Check* can be used to check this issue.
* *Disk Head Malfunction* - the whole Disk can not be accessed. Then there have one or two methods to solve:
* Using *RAID model, then lost Disk can be recovered*.
* *Maintain one Backup*, which is to say that there would have one copy on tape or disk. *Create Backup periodically*, just completely or incremental, stored in safety distance far from Database.
* We can not use the Backup method, but to *save the redundancy copy online*. These copy can be distributed on several points. Later, we will discuss how to maintain the database consistency.

Disaster Malfunction

System Malfunction

### Chapter 6.1.2 Further Discussion about Transaction

### Chapter 6.1.3 Right Execution about Transaction

### Chapter 6.1.4 Primitive Operation about Transaction