Decision Support Systems (DSS)

Evolution of DSS
The Advent of DASD/DBMS
PC/4GL Technology
Operational Data vs DSS Data

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DSS – The Evolution

- The origin of DSS processing hark back to the very early days of computers and information systems [1, p.2]
- Evolution of information processing consisted of early 1960's up to 1980 [1, p.2]
- In the early 1960's, the world of computation consisted of creating individual applications that were run using master files [1, p.2]
- The master files were housed on magnetic tape, which were good for storing a large volume of data cheaply, but the drawback was that they had to be accessed sequentially [1, p.2]

DSS – The Advent of DASD

- The 1970's saw the advent of disk storage, or direct access storage device (DASD) [1, p.4]
- Data could be accessed directly on DASD
- There is no need to go through records 1, 2, 3, … n to get to record n + 1
- Once the address of record n + 1 was known, it was a simple matter to go to record n + 1 directly
- With DASD came a new type of system software known as a database management system (DBMS)
- And with the DBMS came the notion of a "database" [1, p.4]

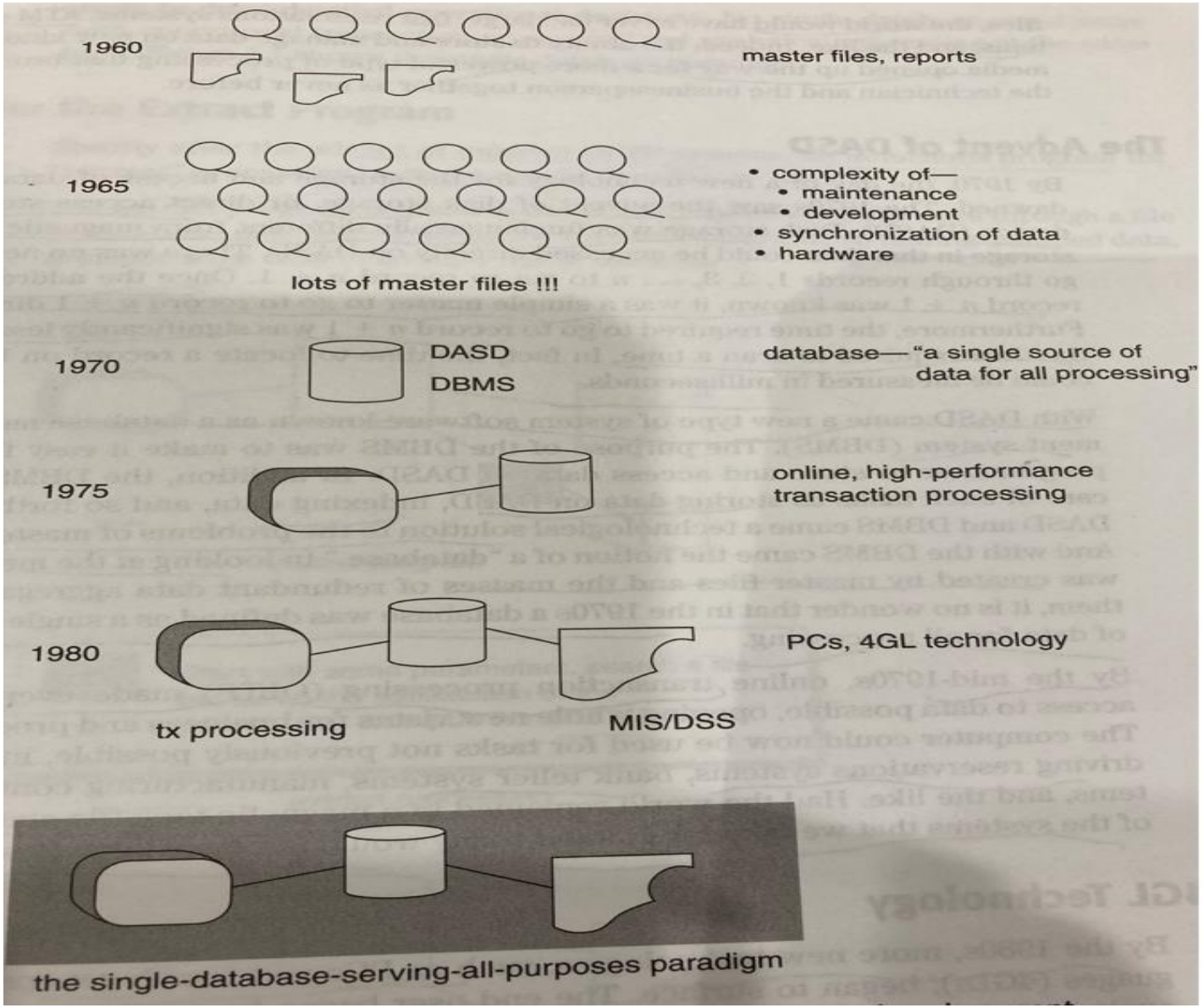
DSS – Online Transaction Processing

- By the mid-1970's, online transaction processing (OLTP) made even faster access to data possible [1, p.4]
- This opened a whole new vistas for business and processing [1, p.4]
- The computer could now be used for
  - Driving reservations systems
  - Bank teller systems
  - Manufacturing control systems

DSS – PC/4GL Technology

- By the mid-1980's, more new technologies, such as PC's and fourth-generation language (4GLs), began to surface [1, p.4]
- With PC's and 4GL technology came the notion that more could be done with data than simply processing online transactions [1, p.4]
- Previously, data and technology were used exclusively to drive detailed operational decisions [1, p.5]
- No single database could serve both operational transaction processing and analytical processing at the same time [1, p.5]

DSS – Evolutionary Stages [1]



DSS – Enter the Extract Program

- Shortly after the advent of massive OLTP system, an innocuous program for “extract” processing began to appear [1, p.5]
- Extract processing is done for performance and control
- The extract program became popular, for at least two reasons [1, p.6]
  - Extract processing can move data out of the way of high-performance online processing, there is no conflict in terms of performance when the data needs to be analyzed en masse
  - When data is moved out of the operational, transaction-processing domain with an extract program, a shift in control of the data occurs. The end user then owns the data once he or she takes control of it.
  - Extract processing was soon found every where.

Operational Data vs. DSS Data [1]

Primitive Data/ Operational Data	Derived Data/ DSS Data
application oriented	subject-oriented
detailed	summarized, otherwise refined
accurate, as of the moment of access	represents values over time, snapshots
current value data	often historical data
serves the clerical community	serves the managerial community
can be updated	is not updated
run repetitively	run heuristically
performance sensitive	performance relaxed
accessed a unit at a time	accessed a set at a time
transaction driven	analysis driven
high availability	relaxed availability
small amount of data used in a process	large amount of data used in a process
supports day-to-day operations	supports managerial needs
high probability of access	low, modest probability of access

Operational vs DSS - Difference

- Primitive data is detailed data used to run the day-to-day operations of the company. Derived data has been summarized or otherwise calculated to meet the needs of the management of the company
- Primitive data can be updated. Derived data can be recalculated but cannot be directly updated
- Primitive data is primarily current-value data. Derived data is often historical data
- Primitive data is operated on by repetitive procedures. Derived data is operated on by heuristic, nonrepetitive programs and procedures
- Operational data is primitive DSS data is derived
- Primitive data supports the clerical function. Derived data supports the managerial functions [1, p.15-16]

Data Integration in the Architected Environment

- The integration of data occurs across the architecture
- As data passes from the operational to the data warehouse environment, it is integrated
- There is no point in brining data over from the operational environment into the data warehouse environment without integrating it
- If the data arrives at the data warehouse in an unintegrated state, it cannot be used to support a corporate view of data
- And a corporate view of data is one of the essences of the architected environment [1, p.19]

User of the Architected Environment

- The data-warehouse user – also called the DSS analyst – is a businessperson first and foremost, and a technician second [1, p.19]
- The primary job of the DSS analyst is to define and discover information used in corporate decision-making
- The DSS analyst operates in a mode of discovery
- Only on seeing a report or seeing a screen can the DSS analyst begin to explore the possibilities for DSS [1, p.19]

References

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