**Chapter 13 - Review Questions**

**4. Explain how the main components of the BI architecture interact to form a system.**

* BI covers a range of technologies and applications to manage the entire data life cycle from acquisition to storage, transformation, integration, analysis, monitoring, presentation, and archiving. BI functionality ranges from simple data gathering and extraction to very complex data analysis and presentation applications. There is no single BI architecture; instead, it ranges from highly integrated applications from a single vendor to a loosely integrated, multivendor environment. However, there are some general types of functionality that all BI implementations share. Like any critical business IT infrastructure, the BI architecture is composed of data, people, processes, technology, and the management of such components.

**6. What is a data warehouse, and what are its main characteristics?**

* A data warehouse is an integrated, subject-oriented, time-variant and non-volatile database that provides support for decision-making. The data warehouse is usually a read-only database optimized for data analysis and query processing. Typically, data are extracted from various sources and are then transformed and integrated—in other words, passed through a data filter—before being loaded into the data warehouse. Users access the data warehouse via front-end tools and/or end-user application software to extract the data in usable form.

The main characteristics of a data warehouse are:

1. The data warehouse is **subject-oriented**, this means that the data collected must be “business” oriented and therefore sorted by topic.
2. The data warehouse consists of **integrated data**, i.e. preliminary “cleaning” of the data is necessary to ensure rationalization and standardization.
3. The data of the data warehouse are **non-volatile**, which means that a datum entered into the warehouse remains there permanently and cannot be suppressed.
4. The data of the data warehouse is **time-variant** and must be historized, i.e. dated.

**15. Briefly discuss the decision support architectural styles and their evolution. What major technologies influenced this evolution?**

* + Several decision support database architectural styles are available. These architectures provide advanced decision support features, and some are capable of providing access to multidimensional data analysis. The DSS development and evolution can be traced in 3 stages:

1. Stage 1 – The DSS are based, at least in general terms, on the reporting systems of the 1980’s. These reporting systems required direct access to the operational data through a menu interface to yield predefined report structures.
2. Stage 2 – DSS improved decision support by supplying lightly summarized data extracted from the operational database. These summarized data were usually stored in the RDBMS and were accessed through SQL statements via a query tool. At this stage, the DSS began to grow some *ad hoc* query capabilities.
3. Stage 3 – DSS made use of increasingly sophisticated data extraction and analysis tools. The major technologies that helped spawn this development include more capable microprocessors, parallel processing, relational database technologies, and client/server systems.

**16. What is OLAP, and what are its main characteristics?**

* + OLAP stands for On-Line Analytical Processing and uses multidimensional data analysis techniques. OLAP yields an advanced data analysis environment that provides the framework for decision making, business modeling, and operations research activities. Its four main characteristics are:
  1. Multidimensional data analysis techniques.
  2. Advanced database support.
  3. Easy to use end user interfaces.
  4. Support for client/server architecture.

**Chapter 13 – Problems**

**2. Ms. Victoria Ephanor manages a small product distribution company. Because the business is growing fast, Ms. Ephanor recognizes that it is time to manage the vast information pool to help guide the accelerating growth. Ms. Ephanor, who is familiar with spreadsheet software, currently employs a small sales force of four people. She asks you to develop a data warehouse application prototype that will enable her to study sales figures by year, region, salesperson, and product. (This prototype is to be used as the basis for a future data warehouse database.) Using the data supplied in the Ch13\_P2.xls file, complete the following seven problems:**

1. Using Problem 2e as your base, add a second pivot table (see Figure P13.2E) to show the sales by salesperson and by region. The end user must be able to specify sales for a given year or for all years and for a given product or for all products.
   * See attached table.