Chapter 12 Review Questions

1. **What is a DSS?**

The definition of DSS, which has evolved since the 1970s and prevails today, was defined as:

Computer-based systems that help decision makers confront ill-structured problems through direct interaction with data and analysis models

1. **What is the architecture of a DSS, as suggested by Sprague and Carlson? Summarize the attributes of each component.**

* The dialog component links the user to the system, taking any number of styles.
* The data component is either accessed directly by the user or as an input to the model component. Data can come from numerous sources, but it is typically summarized data, rather than transaction data. To get that data, the DBMS for the transaction system can extract the transaction data, summarize it, and make it available to the DSS.
* The model component performs the analysis in a DSS, generally using a mathematical representation of the problem. There are many kinds of models (strategic, tactical, and operational, as well as model-building blocks and subroutines), forming the model base.

1. **What is an institutional DSS? Give an example**

Institutional DSS are often built by decision support groups. They are intended for organizational support on a continuing basis, and they are generally written using a decision support language. An institutional DSS tends to be fairly well defined, it is based on predefined data sources (heavily internal, perhaps with some external data), and it uses well-established models in a prescheduled way. Variations and flexible testing of alternative what-if situations are available, but seldom done during interaction with the ultimate decision maker.

The marketing DSS of Ore-Ida Foods, Inc,. must support three main tasks in the decision-making process: data retrieval (which helps managers find answers to “What has happened?”), market analysis (which addresses “Why did it happen?”), and modeling (which helps managers with “What will happen if ...?”).

1. **Explain how Harrah’s Total Rewards program works**

To better know its customers, Harrah’s encourages them to sign up for its frequent-gambler card, Total Rewards. In return for inserting the card in a gaming machine when they play it, gamblers can receive free hotel rooms, shows, meals, and other giveaways. Up until its Total.

Rewards program began in 1998; Harrah’s only knew how much money each of its 40,000 machines made, not which customers were playing them. Harrah’s also realized it needed to reward its best customers to keep them coming back, but in order to do that it had to find out who they were.

Harrah’s mined its Total Rewards database to uncover patterns and clusters of customers: gender, age, distance from any casino, gaming machines played, and amounts of bets. From this, it can fairly accurately estimate the long-term value of each customer, create different demographic clusters, and create personalized marketing campaigns by offering giveaways appropriate to that customer’s cluster. Over time, Harrah’s compiles a profit-and-loss for each customer to calculate how much “return” it is likely to receive for every “investment” it makes in that customer. It also tracks how each one responds to its direct mail offers, ratcheting up or down its giveaways based on changes in that customer’s expected long-term value. Harrah’s goes to this much trouble to know its customers, because it has found that it is not its “high rollers” who are the most profitable.

1. **What is an ESIS?**

Executive information systems (EIS) are DSS that provides access to summary performance data, use graphics to display and visualize the data in an easy-to-use fashion, and have a minimum of analysis for modeling beyond the capability to “drill down” in summary data to examine components. Executives use EIS for company performance data (sales, production, earnings, budgets, and forecasts), internal communications (personal correspondence, reports, and meetings), and environmental scanning (news on government regulations, competition, financial and economics developments, and scientific subjects).

1. **What are the pitfalls in EIS development identified by Watson?**

* Lack of executive support: Executive support is crucial for EIS because executives must provide the funding and supply the needed continuity because they are the principal users.
* Undefined system objectives: The technology, the convenience, and the power of EIS are impressive, maybe even seductive. But the real underlying objectives and business values of an EIS must be carefully thought through.
* Poorly defined information requirements: Once the objectives of the system are defined, the required information can be identified. This process is complicated because the EIS typically needs nontraditional information sources, such as judgments, opinion, external text-based documents, in addition to traditional financial and operating data.
* Inadequate support staff: The support staff must have technical competence, of course, but perhaps more importantly the understanding of the business and the ability to relate to the varied responsibilities and work patterns of executives. A permanent team must manage the evolution of the system.
* Poorly planned evolution: Highly competent system professionals using the wrong development process will fail with EIS. An EIS is not developed, delivered, and then maintained—it needs to evolve over time under the leadership of a team that includes the executive sponsor, the operating sponsor, executive users, the EIS support staff manager, and IS technical staff.

1. **Describe three kinds of knowledge representation**
2. Case-based reasoning (CBR): Expert systems using this approach draw inferences by comparing a current problem (or case) to hundreds or thousands of similar past cases. CBR is best used when the situation involves too many nuances and variations to be generalized into rules.
3. Neural networks: Neural networks are a type of decision-making system organized like the human brain—neural networks contain links (called synapses) and nodes that fire signals between each other. Neural networks are more intelligent than the other forms of knowledge representation discussed here because they can learn.
4. Rules-based systems: The most common form of knowledge representation, the rules these systems are based on are obtained from experts drawing on their own expertise, experience, common sense, ways of doing business, regulations, and laws to state the rules. Rules generally present this knowledge in the form of if-then statements, the number of rules determining the complexity of the system. Rules are appropriate when knowledge can be generalized into specific statements.
5. **What does the Authorizer’s Assistant do and how does it do it?**

Authorizer’s Assistant is American Express’ expert system that approves credit at the point of sale, attempting to minimize credit losses and catch fraud. Whenever an AmEx card is run through a point-of-sale device, the transaction goes into AmEx’s credit authorization system (CAS). Authorizer’s Assistant has been added to CAS, authorizing credit by looking at whether cardholders are creditworthy, whether they have been paying their bills, and whether a particular purchase is within their normal spending patterns. It also assesses whether the request for credit could be a potential fraud.

The Authorizer’s Assistant is a rules-based expert system, and the type of credit charge and the number of charges per day drive authorization decisions. Interviewing authorizers with various levels of expertise generated the rules, and the developers coding Authorizer’s Assistant had to develop expertise in credit and fraud as well as in the analysis of cardholder charge patterns.

1. **What is agent-based modeling?**

Agent-based modeling is a simulation technology for studying “emergent behavior” – that is, behavior (such as a traffic jam) that emerges from the decisions of a large number of individual individuals (drivers). The simulation contains computer-generated agents, each making decisions typical of the decisions an individual would make in the real world. Thus, if modeling a day at a theme park, the agent representing a family of four would make different decisions than the agent representing teenagers on a date. The confluence of a huge number of individual behaviors underlies understanding the mysteries of why businesses, markets, consumers, and other complex systems behave as they do. In modeling the behavior of highly complex systems via individual agents, agent-based systems often arrive at counterintuitive results. Use of this decision-making technology may help predict the formerly unpredictable.

1. **What is real-time enterprise?**

Real-time enterprises are organizations that can know how they are doing at the moment, rather than having to wait days, weeks, or months, as has been the case. Through IT, organizations have been able to see the status of operations more and more toward real time. The Internet is giving companies a way to disseminate closer-to-real-time information about events, such as a large customer order or cancellation, a supply chain disruption, weather or governmental disruption, important news, and so forth.

1. **In what four ways does an enterprise nervous system differ from many past systems?**
2. It is message based: Applications, devices, and people efficiently and effectively communicate with each other via messages.

1. It is event driven: When an event occurs, that event is recorded and made available.

1. It uses a publish and subscribe approach: The information about the event is “published” to an electronic address and any system, person, or device authorized to see that information can “subscribe” to that address’s information feed, which is automatically updated whenever a new event occurs. This approach is a way to inform hundreds, thousands, millions of people or systems of an event in real time, in a format customized to their system or device.
2. It uses common data formats: The formats used in disparate systems are reduced to common denominators that can be understood by other systems and hence shared.
3. **What is a smart tag and how might it be used?**

Smart tags are communicating objects, they can be as small as a match head, and they are implanted on a wafer surrounded by a coil of wire that serves as the tag’s antenna. The antenna allows a tag to be polled by a reader that passes within a certain distance. The tag can be passive (read only) or active (send out signals), and can carry far more information than bar codes by carrying the history of an item, not just ID code and price. Smart tags could transform industries because one day they will talk to one another – object-to-object communication – which will change how work is handled.

Examples of their use:

* To capture new information: A disk drive can have a checklist on the tag that ensures that each step is completed before the next one begins, uncovering more sources of production errors than in the past.
* As theft-prevention devices: When an item with a tag is illegally taken offsite, it can automatically be disabled, preventing it from being usable.
* In safe-guarding location: People entering an area can wear an RFID wristband, or it can send out a warning when people with Alzheimer’s disease are beyond the bounds of their facility or are near dangerous areas.
* As “silent commerce”: “Fresh” fish will be able to tell you if they are really fresh, because their smart tag can tell you whether they have been frozen at any time since being caught. Variable pricing could become more of the norm. Cars can carry smart tags, and drivers are charged variable prices for where they drive in the city and when—encouraging or discouraging driving at different places at different times (an example of real-time traffic control).

1. **Describe the four parts of an OODA loop. What is the goal of OODA-loop thinking?**

The OODA loop consists of four actions:

1. Observe where the challenger’s plane is

2. Orient himself and size up his own vulnerabilities and opportunities

3. Decide which maneuver to take

4. Act to perform it before the challenger could go through the same four steps.

The goal is to operate inside a challenger’s loop, that is, take the four steps faster.

1. **Describe the three OODA loops at Western Digital**

* The Shop-Floor OODA Loop: The shop floor supervisors in the factories, who manage closest to real time, operate on the tightest OODA loop. They receive a page or a flashing light on their dashboard when one of their variances is violated. The time from alert to action is often minutes, rather than the former hours or days. Sometimes, they can diagnose and resolve the problem using their dashboard because the dashboards can be used to initiate actions.
* The Factory OODA Loop: The production managers, who oversee multiple production lines, operate on an OODA loop that is not as tight as the shop floor OODA loop. They too receive alerts, but a more important use of their dashboard is in their daily production meeting, where they assess yesterday’s performance and discuss ways to improve operations. The “yesterday problems” already handled by the shop floor supervisors, though, have been filtered out. So the production managers only see the unresolved issues, which reduce their information overload and quickens their OODA loop. As a result, their daily production meetings have dropped from 5 hours to 1.5 hours. These meetings involve 15 people, so the dashboard system provides them significant time savings in these meetings alone. The system has also reduced micromanagement; there is no longer haggling about who has the right data because they all see the same data. The production managers also use their dashboard in a learning mode, performing “health checks” of the operational aspects of the factory to see what is and is not functioning well. Western Digital has learned that the shorter the OODA loop, the more frequent the health check needs to be.
* The Corporate OODA Loop: Corporate executives receive alerts on their dashboards, and they find they can uncover root causes faster because of the dashboards. But they mainly use their dashboards to perform health checks – for the enterprise as a whole. Their OODA loop is not as tight as the factory loop but their decisions often affect the factories. Many decisions require consultation with others, so people routinely send screen shots or references to screens to others, so that they can all be looking at the same data when discussing an issue.

1. **Explain the potential dark-side aspects of a real-time enterprise**

Object-to-object communication could compromise privacy, since “at what point does an object’s ability to track, record, and communicate with other objects invade an individual’s rights?” There’s no cut-and-dried answer; it can depend on the circumstances and time. It’s a political issue, not a technical issue, and many CEOs are going to face this question in the future. The answers lie in CEOs understanding the context of the use of smart tags, and the sensitivities that can arise in those contexts, and manage those social environments.

Also, in the era of speed, a situation can become very bad very fast – much faster than in a slower economy – so speed must be balanced with caution. People in a high-speed environment need “deep visibility” into the workings of their environment, and must be constantly watching for signals that something bad is likely to happen.