Careers in Information Systems

Information Systems Job Boards

The field of information systems is expanding and there are career opportunities in business, government, non-profit organizations, and education. A major in information systems provides you with a wide range of career opportunities. Career choices range from very technical positions in network administration or programming to more communication-oriented employment in training or help desk support. A few of the possibilities are described below:

Network Administration

Network administrators are responsible for the technical support of an organization's network infrastructure. This profession includes such tasks as designing the network structure, establishing and maintaining servers, designing cabling, validating users, providing security, and ensuring the ongoing day-to-day operations of the network.

Network Support Personnel

Networks come in many variations and network systems and data communications analysts analyze, design, test, and evaluate systems such as local area networks (LAN), wide area networks (WAN), Internet, Intranets, and other data communications systems. These analysts perform network modeling, analysis and planning; they also may research related products and make necessary hardware and software recommendations. Telecommunications specialists focus on the interaction between computer and communications equipment.

Systems Analysts

Systems analysts identify opportunities for improvement in business processes and design computer and systems related solutions. Those in this profession help their clients

define technology-related needs and design a system that is most appropriate for them. They help an organization realize the maximum benefit from its investment in equipment, personnel, and business processes. This may include planning and developing new computer systems or devising ways to apply existing systems' resources to additional operations. Systems analysts are projected by the U.S. Department of Labor to be one of the top three growth occupations from the years 2000-2010.

Consultants

Many companies, such as Accenture, Deloitte-Touché, IBM and Unisys, provide advice to their clients that are attempting to use information technology more effectively. These companies hire information systems majors to serve as consultants for their clients. Consultants act as systems analysts, programmers, database administrators, and troubleshooters for their clients. Consultants work on short and long-term projects frequently reengineering processes or instituting continuous quality improvement methods.

Computer Programmers

Computer programmers design, write, test, and maintain the detailed instructions, called programs that computers must follow to perform their functions. Many technical innovations in programming—advanced computing technologies and sophisticated new languages and programming tools—have redefined the role of a programmer and elevated much of the programming work done today.

Database Support Personnel

With the Internet and electronic business creating tremendous volumes of data, there is growing need to be able to store, manage, and extract data effectively. Database administrators work with database management systems software and determine ways to organize and store data. They set up computer databases and test and coordinate changes. It is the responsibility of a database administrator to ensure performance, security, accuracy and integrity of the organization's database. A data analyst works with database administrators, systems analysts and programmers to identify the best method of storing data for an organization. A data analyst is usually responsible for designing the underlying data structures for an organization. With the volume of sensitive data generated every second growing rapidly, data integrity, backup, and keeping databases secure have become an increasingly important aspect for organizations. Some organizations have created a special position, a data security specialist to handle the increasingly difficult job of maintaining data security.

Computer Support Specialists

Computer support specialists provide technical assistance, support, and advice to customers and other users. This group includes technical support specialists and help- desk technicians. These troubleshooters interpret problems and provide technical support for hardware, software, and systems. They answer phone calls; analyze problems using automated diagnostic programs, and resolve recurrent difficulties. Support specialists may work either within a company that uses computer systems or directly for a computer hardware or software vendor. Increasingly, these specialists work for help- desk or support services firms, where they provide computer support on a contract basis to clients. Computer support specialists and systems administrators are projected by the

U.S. Department of Labor to be among the fastest growing occupations over the year 2000-2010 periods.

Web/Internet Support Specialists

The growth of the Internet and expansion of the World Wide Web, the graphical portion of the Internet, have generated a variety of occupations related to design, development, and maintenance of Web sites and their servers. For example, webmasters are responsible for all technical aspects of a website, including performance issues such as speed of access, and for approving site content. Internet developers or web developers, also called web designers, are responsible for day-to-day site design and creation.

Training

Ubiquitous information systems have created a growing need for education about the most effective use of the technology. Training personnel are needed to help users on a one-to-one basis, in small groups and in large classroom formats.

Technical Sales and Support

Computer hardware, software and networking vendors such as IBM, Unisys, Hewlett-Packard, Oracle, Microsoft, and Sun Microsystems required competent sales and support personnel. Many vendors prefer to hire personnel who understand the technology and are comfortable selling to technical professionals. This is a high-paying career option for those people who combine good communication skills, technical knowledge, with the ability to speak comfortably and easily with others.

Information Technology Concepts

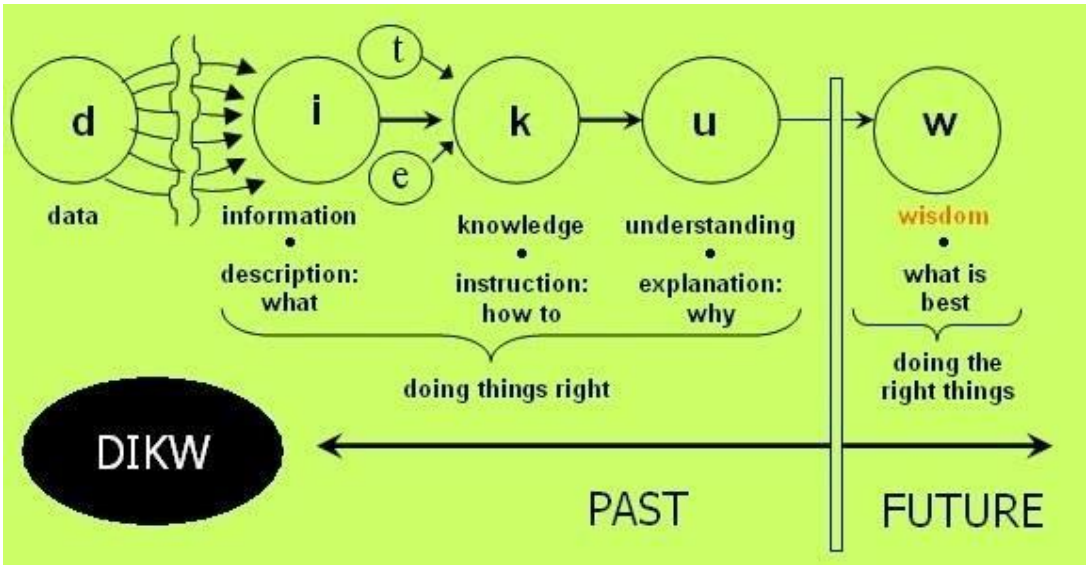
Introduction

The first two components of information systems, hardware and software, by themselves do not make a computer useful. Imagine if you turned on a computer, started the word processor, but could not save a document. Imagine if you opened a music player but there was no music to play. Imagine opening a web browser but there were no web pages. Without data, hardware and software are not very useful! Data is the third component of an information system.

The Data, Information, Knowledge, Wisdom

Ever heard of the DIKW pyramid? It stands for the Data / Information / Knowledge / Wisdom pyramid. Sometimes it is also referenced as “DIKW Hierarchy”, “Wisdom Hierarchy”, “Knowledge Hierarchy”, “Information Hierarchy” or “Knowledge Pyramid”.

Although it is uncertain when and by whom those relationships were first presented, the ubiquity of the notion of a hierarchy is embedded in the use of the acronym DIKW as a shorthand representation for the data-to-information-to-knowledge-to-wisdom transformation.



We frequently hear the words Data, Information and Knowledge used as if they are the same thing. You hear people talking about the Internet as a "vast network of human knowledge" or that they'll "e-mail through the data." By defining what we mean by data, information and knowledge – and how they interact with one another – it should be much easier.

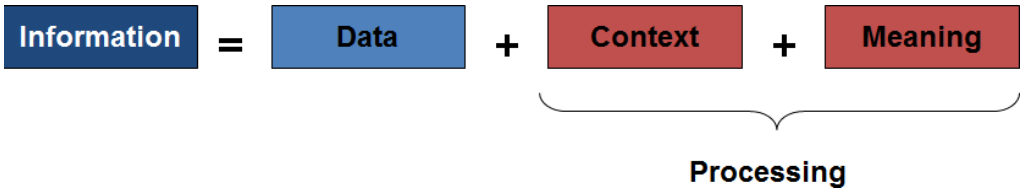
- **Data** is the term, that may be new to beginners, but it is very interesting and simple to understand. It can be anything like name of a person or a place or a number etc. Data is the name given to basic facts and entities such as names and numbers. The main examples of data are weights, prices, costs, numbers of items sold, employee names, product names, addresses, tax codes, registration marks etc.
- **Data** is the raw material that can be processed by any computing machine. Data can be represented in the form of: Numbers and words which can be stored in **computer**'s language.

- **Data**... data is raw. It simply exists and has no significance beyond its existence (in and of itself). It can exist in any form, usable or not. It does not have meaning of itself. In computer parlance, a spreadsheet generally starts out by holding data.
- **Data** is/are the facts of the World. For example, take yourself. You may be 5ft tall, have brown hair and blue eyes. All of this is "data". You have brown hair whether this is written down somewhere or not.
- **Data** – the discrete, objective facts about events – is the essential raw material needed for the creation of information; however, it cannot be used to make decisions because it has no meaning. It lacks meaning because it has no inherent structure; no established relationships between entities.

In many ways, data can be thought of as a **description of the World**. We can perceive this data with our senses, and then the brain can process this. Human beings have used data as long as we've existed to form knowledge of the world.

Until we started using information, all we could use was data directly. If you wanted to know how tall I was, you would have to come and look at me. Our knowledge was limited by our direct experiences.

Data becomes **information** when we add meaning. We add meaning by providing a **context** to the data. The context identifies the purpose, and circumstance, that surround the gathering of data; it removes ambiguity. We can remove ambiguity in a variety of ways: categorizing, calculating, condensing, etc. Information is helpful because it allows us to answer the "who", "what", "where", "when", and "how many" questions.



While information is necessary for good decision-making; alone it is insufficient. The reason is that information is simply a message: it has a sender and a receiver; and it is ultimately the receiver, not the sender, who decides whether the message is informative (and thus becomes information). A message full of unconnected observations may be considered to be information by the sender, but judged to be noise by the receiver. Since information is meant to change the way the receiver *perceives* something (to have an impact on his/her judgment and behavior), the message must be tailored to the knowledge and experience level of the user.

- **Information**: Information is data that has been converted into a more useful or intelligible form. It is the set of data that has been organized for direct utilization of mankind, as **information** helps human beings in their decision making process. Examples are: Time Table, Merit List, Report card, Headed tables, printed documents, pay slips, receipts, reports etc. The information is obtained by assembling items of data into a meaningful form. For example, marks obtained by students and their roll numbers form data, the report card/sheet is the .information. Other forms of information are pay-slips, schedules, reports, worksheet, bar charts, invoices and account returns etc. It may be noted that information may further be processed and/or

manipulated to form knowledge. Information containing wisdom is known as knowledge.

- **Information**... information is data that has been given meaning by way of relational connection. This "meaning" can be useful, but does not have to be. In computer parlance, a relational database makes information from the data stored within it.
- **Information** is a collection of facts organized so that they have additional value beyond the value of the individual facts. For example, sales managers might find that knowing the total monthly sales suits their purpose more (i.e., is more valuable) than knowing the number of sales for each sales representative.

Information allows us to expand our knowledge beyond the range of our senses. We can **capture data in information**, and then move it about so that other people can access it at different times.

In short, information helps us decide what to do, not how to do it. The "how" requires knowledge.

Here is a simple analogy for you. If I take a picture of you, the photograph is **information.** But what you look like is **data.** I can move the photo of you around; send it to other people via e-mail etc. However, I'm not actually moving *you* around – or *what you look like*. I'm simply allowing other people who can't directly see you from where they are to know what you look like. If I lose or destroy the photo, this doesn't change how you look.
When people confuse data with information, they can make critical mistakes. **Data is always correct** (I can't be 29 years old and 62 years old at the same time) but **information can be wrong** (there could be two files on me, one saying I was born in 1981, and one saying I was born in 1948).
Information **captures data at a single point**. The data changes over time. The mistake people make is thinking that the information they are looking at is always an accurate reflection of the data.
By understanding the differences between these, you can better understand how to make better decisions based on the accurate facts.

Knowledge is the data (facts), information, and skills acquired through experience or education. The hallmark of knowledge is *judgment*: the ability to make decisions or come to sensible conclusions. Knowledge comprises not only the ability to *choose* the appropriate course of action, but also the skills to *execute* it.

The key ingredient – *perspective* – allows us to understand the relative importance of each piece of information. It also allows us to see the *connections* between the bits of information, understand the *consequences* each piece of information has on a potential decision, and *compare* the current situation to past situations. By comparing situations and recognizing patterns, we don't have to build a solution to a problem from scratch.

Data: 4, 2 *(without context, these value are meaningless)*

Information: Temperature 4°C, Dew Point 2°C *(context adds meaning)*

Knowledge: A temperature of 4°C and a dew point of 2°C, together with a rain, means that there is a chance of icing *(connection established)*. This icing can adversely affect the performance of my aircraft *(consequences identified)*. This is the same conditions that led to an accident last year *(comparison made)*. I should deice my aircraft *(action taken, risk mitigated)*.

The Value of Information

The value of information is directly linked to how it helps decision makers achieve their organization's goals. Valuable information can help people and their organizations perform tasks more efficiently and effectively. Consider a market forecast that predicts a high demand for a new product. If you use this information to develop the new product and your company makes an additional profit of $10,000, the value of this information to the company is $10,000 minus the cost of the information. Valuable information can also help managers decide whether to invest in additional information systems and technology. A new computerized ordering system might cost $30,000, but generate an additional $50,000 in sales. The *value added* by the new system is the additional revenue from the increased sales of $20,000. Most corporations have cost reduction as a primary goal. Using information systems, some manufacturing companies have slashed inventory costs by millions of dollars. Other companies have increased inventory levels to increase profits. Wal-Mart, for example, uses information about certain regions of the country and specific situations to increase needed inventory levels of certain products and improve overall profitability. The giant retail store used valuable information about the needs of people in the path of Hurricane Ivan when it hit Florida. The store stocked strawberry Pop-Tarts and other food items that didn't need refrigeration or food preparation to serve people in the area and to increase its profits.

The Characteristics of Valuable Information

The value of information depends on their usefulness in the decision making process. To be valuable to managers and decision makers, information should have the characteristics described below. These characteristics make the information more valuable to an organization.

Accurate: Accurate information is error free. Errors could be occurred due to different reasons. If there is some problem in the knowledge required for the process, output (information) may have errors. At the same time, if input (data) contains some errors, the output will not be accurate. This is known as garbage in garbage out (GIGO). Inaccurate information is not error free.

Complete: Complete information contains all the important facts to make clear decisions. For example, an investment report may present all possible benefits and profits without details of cost that will be required**.**

Economical: Information should also be relatively economical. Decision makers must always balance the value of information with the cost of producing it. For example, if collecting the data takes lots of resources and time, it is not economical.

Flexible: Flexible information can be used for a variety of purposes. For example, Information on how much inventory is on hand for a particular part can be for – a sales representative to determine the sales plan- a production manager to identify possible constraints for the production- a financial executive to calculate the current assets figures of inventory

Reliable: Reliability of information describes the correctness of the information. If there are any problems with respect to correctness of data, it will definitely affect the reliability of information. For example, if the reliability of data collection method is poor, it will directly affect the information that will be produced. For example, prediction of prices based on rumors (not past variance information), is not reliable**.**

Relevant: The relevance of information is determined based on the usefulness of information with respect to the decision making process. For example (E.g.), a drop in timber prices cannot be used to predict the price fluctuation in computers.

Simple: Simplicity in the representation of information is also a very useful feature utilized to improve the usability of information in the decision making process. Too many information could affect the simplicity in the presentation. Therefore it is better to provide interactive customization to determine simplicity. Providing too many information is known as information overloading.

Timeliness: Decisions should be made at the right time to achieve effectiveness. Timely information refers to providing information at the right time. For example, if you can get to know today's weather forecast before you leave home, you can decide whether to bring an umbrella or not.

Depending on the type of data you need, some characteristics become more valuable than others.