

Learning Resource

How Information Supports Decision Making

Now that you have been introduced to the basics of data, how it can be stored, and the importance of data quality, let's look at how data transformed into information supports organizational decision making. In their simplest form, information systems are all about getting the right information in the most usable format to the right people, at the right time and place. Advances in integrated software applications, the internet, and better data management practices provide businesses with better tools to support that goal.

A key competitive advantage of an organization is the ability to react to changes quickly. Being able to make the right decision to address a potential threat or seize an opportunity could make the difference in whether or not the company stays in business or continues to increase profits. The key to making good decisions is having the relevant information readily available in the form that is needed. There are three basic levels of decision making in an organization: operational, managerial, and strategic as illustrated below.



Let's look at the process of creating an invoice. An invoice contains several pieces of data, such as customer name, number, address, shipping method, items ordered, and quantities. This data is required at an operational level to update inventories, handle logistics, add to accounts receivable, and so forth. At the mid-level of our pyramid, the management level, the data from each individual invoice are not as important as the cumulative information that many invoices can provide. For example, sales have increased 25% on product A,

orders for product B are shipping consistently behind schedule, and shipping costs with shipper X are increasing more than with other shippers. With this information on trends or patterns, management can investigate further and make decisions on production schedules, supplier relationships, or preferred shipping vendors.

At the senior or executive level of an organization, the company leadership is less concerned than middle management about the trends or patterns—their concerns are strategic. Senior management looks at information, both from within the organization and external. For example, suppose a key component needed in the manufacturing process is petroleum-based. Rising oil prices, coupled with industry forecasts that prices will continue to rise, call for addressing this situation at a strategic level. Senior management might consider whether a price increase can be justified, how much of an increase the market can bear, or whether there are alternatives that would not degrade the product.

A primary advantage of an information system is its ability to support and improve decision making throughout the organization by turning data into useful information. However, the system is just a tool and does not replace the human factor; people are still required to make the choices involved in the decisions. Individuals at all levels of the organization can use the information provided by the system as they make their decisions. In the invoice example above, the creation and use of the invoice data could all be done by hand, using paper invoices. However, the use of a system to capture, store, and share that information throughout the organization significantly increases the efficiency and effectiveness of the process and makes the information immediately and readily available to those who need it to make their decisions.

We can see that information moves through the organization and is viewed for different purposes by different levels within the organization. However, the data are captured at the operational level (transaction-processing systems) and made available in appropriate forms (summary of product, customer, geographic distribution differences, and so on) at the various managerial levels.

It is important to note that information can flow both up and down the levels within an organization. Information that is useful for monitoring ("How are we doing?") typically flows from the operational level upward. Control information ("Is business going as planned?") typically flows from the top level downward. For example, a senior manager notes that sales figures are declining. She queries down through the organization to find more information to control the declining sales. From mid-level management, she may learn that only the Midwest region is experiencing a decline. From the operational level, she may learn that the sales force in that region has had significant turnover and that 40 percent of its sales representatives have fewer than six months of experience.

More specifically, let's look at some examples of possible types of information and decisions different levels of the organization based on information from an invoice processing system based on the graphic above.

Level	Types of Information	Area of Focus or Concern	Decision Example	Supporting Information from the IT System
Strategic	Overall sales figures	Amount of increase in market share. Monitor sales volume vs. projected sales.	Decide to discontinue under-performing products.	The system could produce a report of products where the sales volume is not meeting the projected volume.
Strategic	Overall Sales Figures	Determine manufacturing capacity requirements and resource utilization. Identify increasing costs of raw materials due to increased oil prices.	Decide whether to reduce production of products that use significant petroleum-based ingredients.	The system could provide a report on products that include more than 10% petroleum-based ingredients.

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Managerial	Monthly Invoices	<p>Plan monthly production schedule.</p> <p>Schedule employees.</p> <p>Plan maintenance schedules.</p> <p>Manage inventory.</p>	<p>Decide to increase production schedule to meet increased demands on certain products.</p>	<p>The system would provide product sales volume information to indicate high-demand products.</p>
Managerial	Monthly Invoices	<p>Impact on monthly payroll; overtime hours worked.</p>	<p>Decide to increase number of employees in certain departments to reduce excessive overtime.</p>	<p>The system could provide a report indicating where sales exceeded projected demand by 15%.</p>

Level	Types of Information	Area of Focus or Concern	Decision Example	Supporting Information from the IT System
Operational	Invoice Data	Update inventory, schedule production. Coordinate shipping.	Decide to negotiate shipping rates with most-used shippers.	The system could produce a report of the volume of shipping done with each shipping vendor and their shipping rates.

To provide a more personal example, think about the information you can gain from your online bank account system. The system can show your current balance, total of deposits, total of withdrawals, pending payments (if you use online bill paying), etc. Then based on information the system provides, you can make more informed decisions about your budgeting and spending. If the system showed information that last month your total withdrawals at ATM machines had increased significantly, on average you were hitting the ATM machine 3 or 4 times each week, and the withdrawals averaged \$50 per withdrawal, you could decide to limit yourself to once-a-week ATM withdrawals of no more than \$100. Further analysis of your spending habits could show a significant amount of money being spent daily on eating lunch out. You could then decide to pack your lunch two days a week. This shows how you could make fact-based decisions supported by information from the banking information system.

Keep in mind that information technology is simply a tool. Knowing how to use the tool correctly is instrumental to overall effectiveness. The key to using IT successfully is knowing what data an information system contains and how the data can be converted into useful information to support decision making at each level in the organization. This helps organizations achieve their business strategy and maintain or increase its competitive advantage.

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