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FUNDAMENTALS OF INFORMATION MANAGEMENT

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Part I Fundamentals of Information Management

Part I introduces the organizational context that gives information meaning, and defines the characteristics of information. Examples are used to discuss the information life cycle from the perspectives of both the organization and information technology (IT) functions. Key models used in later chapters are introduced, such as systems models and the entity-relationship model. The relationships among organizations, information systems, and IT are discussed in terms of how each influences information management.

Chapter 1 Organizational Context of Information

Chapter 1 discusses the need for information in organizations and introduces a generic business model that provides the context for information in organizations. The chapter explains how internal and external factors influence the organization’s requirements for information and presents an organizational architecture that is used in later chapters to explore how changes to organizations impact information management.

Chapter 2 Role of Information Systems in Organizations

Chapter 2 discusses the organization as a system and explains the processes needed to provide the organization with the information it needs. The chapter demonstrates how different definitions of an entity reflect business rules, determining how information is managed in the organization. The information life cycle is introduced that is used in later chapters to assess the impact of organizational transformation on the information required by the organization.

Chapter 3 Role of Information Technology in Managing Information

Chapter 3 provides an introduction to IT to collect and store different types of data in a database. The relationship between information systems and IT is explained, demonstrating how IT can support each of the processes in the information life cycle. It explains how IT can influence the characteristics of information and considers the business value of IT. An outline for an information systems and IT plan is presented.

Chapter 4 Role of Business in Information Management

Chapter 4 demonstrates a socio-technical approach to developing an information architecture based on Wilson’s soft systems method. The chapter explains how the information requirements of an organization can be extracted from a range of modelling tools and discusses the use and limitations of models. An enterprise architecture is presented demonstrating the relationship between the organizational architecture, information architecture, information systems architecture, and IT architecture to support each stage of the information life cycle.
CHAPTER 1

ORGANIZATIONAL CONTEXT OF INFORMATION

Scenario 1.1
Organizational Context of Bright Spark

Bright Spark is a UK-based retailer selling light fittings (such as bulbs, lamps, and lampshades) to the general public. The retailer started as a small shop with a staff of three and now, 50 years later, has a chain of 63 stores and two warehouses across Europe. The organization also has a growing customer base in Australia and South America through Internet sales. Over the years the organization has experienced many changes as Bright Spark has been forced to adapt and evolve in order to survive. Sometimes change has been triggered by information technology (IT), such as the introduction of e-business, while other changes have been initiated by management to increase market presence and expand the organization. Bright Spark has changed and grown, transformed from its original shop but still retaining key values. As the organization has transformed, the context within which it collects, uses, and manages information has changed.

Learning Outcomes

The learning outcomes of this chapter are to:

- Identify the components of an organizational architecture.
- Explain the scope of information management in organizations in a changing context.

Introduction

All organizations need information to trigger business processes and form the basis for decisions. This chapter defines what is meant by the term information and explains why information is so important to all organizations. The context in which the organization operates and gives information meaning is explored within a business model. Morphing organizations are then defined. The chapter discusses how organizations evolve over time, changing the way in which they operate and their need for information. An organizational architecture is presented which is used to explore how organizations change and how change affects an organization’s need for information.

1.1 Business Needs for Information

An organization is a social entity within which a series of processes take place in order to achieve a specific purpose (Senior & Swailes, 2010). Information is described as the lifeblood of organizations (Rogerson, 2008) flowing through the business processes and providing a permanent record of the many transactions that take place on a daily basis. All organizations need information to trigger events, make decisions, and communicate actions to enable the organization to achieve its purpose.

Information is intended to be acted upon by the person receiving it (Davenport & Prusak, 1998). It is the sender’s intention that the message being transmitted to the recipient will have meaning to the recipient and that
The information needed by organizations to inform decisions is derived from data. Data and information are different although sometimes the terms are used interchangeably.

**DEFINITION:** The term data generally refers to raw strings of letters and numbers that have been captured in some way. Information is data that have been processed to give the data meaning. An understanding of the units of measure to which the data refers and the context in which the data were collected are needed to add value to data and convert the data into information. Information can be numerical, textual, visual, or audial.

This is a string of data:

\[8, 4, 7, 8, 7, 7\]

If the units of measure are marks out of 10 and the context in which the data were collected was an in-store survey about customer service satisfaction then the information provided by the data is that:

- Two people rate the customer service as being 8 out of 10.
- Three people rate the customer service as being 7 out of 10.
- One person rates the customer service as being 4 out of 10.

Bright Spark can use this information about customer service satisfaction to inform decisions such as do we need to improve customer service in the store?

The amount of information flowing through an organization can become excessive. If a recipient receives too much information they become overloaded, unable to interpret its meaning and unable to act on the information, resulting in information paralysis. Information technology (IT) enables information to be sent quickly and easily from the sender to the recipient(s). As the ease with which information can be sent increases, organizations, and individuals need to take more responsibility for information to avoid information paralysis.

Although IT has become ubiquitous, it must be remembered that organizations can exist without IT, but they cannot exist without information. Information provides the trigger for processes within the business. For example, information received from a customer who wishes to purchase a light fitting from Bright Spark triggers a series of business processes. The customer information triggers business processes to take payment from the customer, add payment to Bright Spark’s accounts, amend the stock records to show that a light fitting has been sold, and processes to arrange for the light fitting sold to be dispatched to the customer.

Information provides the basis for decisions to be taken in the organization. Bright Spark needs information to help inform decisions and ensure the short-term operation and long-term survival of the organization. Organizational decisions include:

- **Operational decisions** that require immediate action, such as do we need to order more stock? This decision will be informed by information relating to current stock levels, typical sales levels in the same time period, expected sales levels, and external factors such as competitors’ pricing strategies.
- **Tactical decisions** relating to the medium term, such as by how much should we reduce the price of products in the end-of-year sale? The decision to reduce prices will be informed by stock levels, sales targets, profit margins, and predicted customer demand.
- **Strategic decisions** relating to the long-term development of the organization, such as should we open a new store? This will be informed by projected sales figures, predicted customer demand, competitor analysis, and expected returns on investment.

Information only has meaning in context (Galliers, 1992). A business model provides the context which gives information meaning to the business.

**1.2 Context of Business Information**

A business model is a way of identifying the main components of a business (Hedman & Kalling, 2003) and structures the context for information in the organization. The following business model analyses the context in which an organization functions. The business model is a useful tool for analysts to use to define the organizational context of business information.
context and identify key terminology used in the business. The model is also used with business owners to reflect on the organization’s mission and assess information requirements.

### 1.2.1 Overview of Business Model

Figure 1.1 presents a generic business model in which to analyse an organization, the organization’s relationship with the environment, and the organization’s information requirements. The model prompts key questions concerning fundamental elements of the organization. Information to compile the model can be derived from interviews and documentation. The business model defines the context of the organization and focuses on the key question *what business are we in?* The model identifies three main intersecting sets of concern: the *organization*, the *market(s)* in which the organization trades, and the *business environment* in which the organization operates. These three sets are influenced by, and must operate within, the overall *business climate*. Analysis of these sets assists in developing an appreciation of the organizational context within which information is needed. The model provides a structure based on set theory to identify the main individuals and organizations with whom the organization needs to communicate and to analyse the information flows to and from the organization.

![Generic Business Model](image)

### 1.2.2 Organization

The organization set of the business defines the boundary separating the organization from the world surrounding the organization and includes the following elements:

{mission, internal structure, geographic structure, business processes, organizational culture, history}

**Mission**

The mission element defines the intention of the organization in relation to other components of the business model such as customers and markets. The mission includes the purpose of the organization (the reason it exists), its values (what is important to the organization), its beliefs (the assumptions about itself and the environment), and a definition of where it operates (de Wit & Meyer, 2010).

Johnson *et al.* (2008) describe the mission as being the premise of the organization that provides the focus of the organization that is used to align components and guide actions and decisions, to enable the mission to be achieved and sustained. The mission provides the overall rationale, the justification for the existence and operation of the organization. The mission focuses on the present context while the vision focuses on the future desired state of the organization. The organization requires information to help communicate, achieve, and measure progress towards achieving its mission.

**Internal Structure**

The formal internal structure considers the way in which the organization arranges people, processes, and resources to achieve the organization’s mission. The formal structure allocates responsibilities for completing, coordinating, and controlling activities (Senior & Swailes, 2010), seeking to identify the optimum grouping of resources and activities. The structure may involve arranging business processes to maximize efficiency or to improve the organization’s ability to respond to the needs of customers and other external influences (such as new technological developments and changes in legal requirements). The internal structure defines the formal paths for communicating information between people and processes.

Typical hierarchical organizational structures group people and processes by:

- Key function such as purchasing, production, sales, finance, and human resources, to form functional hierarchies in which staff develop specialist skills in business processes. Functional structures can lead to fragmentation and the loss of information as work is passed over the wall to the next function (Anumba *et al.*, 2002). Information needs to be managed to coordinate activities between functions and avoid delays where one function may be waiting for information from another function.
Product or service offered by the organization, such as the bulb department and lamp department in Bright Spark. Product-based structures enable staff to develop expert product knowledge but business processes may be duplicated across departments. Information management is needed to reduce administration costs and satisfy the different information needs of specialist areas in the product structure.

Location-based structures group people and processes to enable an organization to respond to the needs of the local community. Information is needed to coordinate activities between the different geographical locations.

Matrix structures provide an alternative to hierarchical organizational structures superimposing a set of horizontal divisions onto the hierarchical structure (Senior & Swailes, 2010). Matrix structures adopt a flexible project-based structure suited to innovative and problem-solving activities, but the structures can become complex. Information is needed to prioritize competing demands and maintain communication between managers in the structure.

The structure of the organization determines the lines of communication and spans of control between people. The organizational structure therefore affects the way in which information is used and managed in the organization. A number of factors influence the design of organizational structures including the nature of the work to be undertaken, the location of the work, size of the organization, and the degree of power and control to be retained centrally (Senior & Swailes, 2010).

In addition to the formal organizational structure, an informal structure emerges through interactions that are not defined or constrained by the formal structure. An informal structure evolves from the interactions between people in the organization and emerges through friendships and common interests. The informal structure can support, and at times work against, the formal communication paths established in the formal organizational structure. Informal structures can highlight deficiencies in the formal communication channels (Mullins, 2010b) for sharing information. The informal communication flows are powerful information arteries in the organization and should not be neglected in information management policies.

**Geographical Structure**

The organizational structure operates across the geographical structure of the organization, which considers the physical locations around the world where the organization has a presence. Bright Spark has retail stores in the United Kingdom and warehouses elsewhere in Europe, in addition to Internet sales in other countries. The geographical structure defines the boundary of the organization, identifying where information is needed.

Separate buildings in a physical location, and floors within buildings, isolate departments and functions in the organizational structure. The physical location of resources and expertise seeks to improve coordination and communication within specialized activities. Location also promotes the development of cooperative working practices and cultural values within departmental groupings. However, the strengthening of departmental identities through shared values and goals can lead to friction between departments. As staff identify with their department, creating a we group, a separation is identified between those outside the we group. The separation can lead to departmental barriers being formed that hinder the effective flow of information needed in the organization. Dingley et al. (2000) suggest that departments in organizations can adopt the same characteristics as a tribe, possessing a shared culture, maintaining boundaries, engaging in social rituals, adopting a common language, and defending their territory when it is perceived to be under threat. Differences in values, cognition, language, terminology, and behaviour between departments can lead to cultural communication barriers (Dingley et al., 2000) that affect the way in which information is used in the organization.

The increasing use of IT enables individuals to communicate with colleagues, share information, and collaborate in business processes without the need to be physically located in the same place. This has led to the formation of virtual organizations: organizations that are geographically dispersed and electronically linked (Pedersen & Nagengast, 2008) that can adapt to changes in the environment (Lin & Lu, 2005).

**Business Processes**

Traditionally, the organizational structure determines the way in which people, equipment, and business processes are physically located in the geographical structure. The business processes relate to the main activities required in the organization to transform resources into the products and services to sell to customers. The business processes relate to the primary activities of the organization, which can be identified using the value chain model. The value chain model distinguishes between
primary activities directly involved in the development of a product or service, and secondary activities that support the production process (Porter & Millar, 1985). In Bright Spark, primary activities include inbound logistics (receiving light fittings ordered from suppliers), operations (displaying products and providing advice to customers), outbound logistics (packaging and dispatching lighting products to customers), marketing (advertising light fittings and creating special offers), and after-sales service (exchanging faulty lights and providing an installation service). Support activities in Bright Spark include the organizational infrastructure of management, finance and legal services, human resource management, technology development (involving the website), and procurement (negotiating packaging contracts and purchasing shop display equipment), which provide an infrastructure to support the primary activities. Information is needed to trigger business processes, to be input into business processes, to control business processes, and to be delivered as an output from business processes in the value chain, informing organizational decisions.

Organizational Culture

The culture of the organization is the way in which the people in the organization engage in business processes to achieve the organization’s mission. Cultural analysis considers the beliefs and value systems that underpin the philosophy of the organization. Schein (2010) likens the culture of an organization to the personality of an individual, guiding and constraining behaviour. Organizational culture can be evidenced through:

- Artefacts, including physical signs such as the organizational structure, providing a physical representation of cultural values.
- Beliefs and values providing the basis for the organizational strategy.
- Assumptions guiding the decisions and actions of the people in the organization (Schein, 2010).

Culture evolves from the shared history of the members of the organization, providing stability and a sense of identity (Schein, 2010). Brown (1998) suggests that there are three sources of organizational culture: the national culture of the organization’s location, the vision and management styles of the key leaders in the organization, and the nature of the business and the environment in which the organization operates. Mullins (2010b) describes organizational culture as providing a pervasive context for everything that happens in the organization.

The organizational culture provides the context within which data are interpreted, giving information meaning. Table 1.1 lists a number of categories, which Schein (2010) suggests can be used to describe culture,
### Table 1.1 Continued

<table>
<thead>
<tr>
<th>Category for Describing Culture (Schein, 2010)</th>
<th>Impact on Information Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implicit Rules</td>
<td>New members of the organization need to learn the <em>rules</em> of the informal organization. Information management needs to consider any deficiencies in the formal lines of communication that are addressed in the informal structure, and identify how the implicit rules of working in the informal structure contribute to the management of information in the organization.</td>
</tr>
<tr>
<td>Climate</td>
<td>The organizational climate, the <em>feel</em> of the organization, is influenced by factors including the physical use of building space and the interactions between staff. Information management needs to consider the flow of information in the organization including how information is communicated and the opportunities and barriers for communicating information. The emphasis on formal information flows through organizational hierarchies that can overlook the informal channels through which information is shared.</td>
</tr>
<tr>
<td>Embedded Skills</td>
<td>In the formal organizational structure, explicit business procedures are documented and the information needed by the procedures can be identified from documentation. In the informal structure, implicit <em>skills</em> and business practices operate ensuring the effective functioning of the organization; the information needs of these practices must also be identified.</td>
</tr>
<tr>
<td>Mental Models</td>
<td>A mental model is a personal construct through which the world is perceived. Members of the organization evolve <em>shared perceptions</em> defining the way information is used in work practices. Shared mental models need to be understood to ensure that information is presented in a manner consistent with the perceptions of the organization.</td>
</tr>
<tr>
<td>Shared Meanings</td>
<td>The language of a social group creates a <em>sense of unity</em> separating the group from others. Within an organization, different departments attribute different meanings to key terms about which information needs to be managed, such as product, item, and component. Different definitions of information can be the source of many problems in information management.</td>
</tr>
<tr>
<td>Root Metaphors</td>
<td>Root metaphors are <em>shared views</em> of the world characterizing a group. Metaphors can become embedded in physical artefacts, reinforcing a group’s view of the world. Information management needs to understand the view of the world held by members of the organization as the views provide the context within which information will be interpreted and used.</td>
</tr>
<tr>
<td>Formal Rituals</td>
<td>Rituals are the <em>actions</em> taken by a group that are not required by business processes but are needed to maintain the culture of the group. For example, a ritual is the way in which a group celebrates the success of a project or an individual being promoted. Rituals demonstrate the values of the organization that need to be embedded within information management.</td>
</tr>
</tbody>
</table>

*Source*: Based on Schein (2010).

and shows how the categories may impact on information management.

**History**

Culture is informed by the history of the organization. The history of the organization considers how the organization has evolved and the current state of business transformation. Bright Spark has a strong history that explains how the retailer has grown from small beginnings by trajectory growth; other organizations may have experienced strategies of diversification, acquisition, downsizing, or dissolution of mergers. The history of the organization has led to the current status and has left an imprint on the organization influencing structure, processes, culture, and information needs. Scenario 1.2 presents a brief history of Bright Spark.
Scenario 1.2

History of Bright Spark

Larry Hughes completed an apprenticeship as an electrician but did not wish to spend his life working for someone else. As he was growing up, he helped out at the local market at weekends and during the holidays so after he completed his apprenticeship he opened his own market stall selling small electrical components. In 1961 he opened the first Bright Spark shop employing two people: Mrs Lewis was responsible for managing the accounts and John Edwards served customers. Larry designed and fitted the shop himself. The main counter included a fitting so that light bulbs could be tested and customers could see how lampshades would look when lights were switched on. Larry also organized the buying of stock. A key success factor for the shop was that Larry provided customers with technical advice and occasionally completed electrical work for customers.

When Larry opened his second shop he wanted to replicate the same level of customer service. Larry employed a manager, shop assistant, and bookkeeper and Larry tried to divide his time between the shops. As more shops opened, the structure of Bright Spark needed to change to coordinate activities. Larry realized that he needed to give managers some flexibility to manage their stores in their own way as the store managers were in a better position to understand the specific needs of their customers. Larry remained in charge of selecting stock and ensured that additional functions of logistics, human resources, and IT were managed to support the retail shops. As more shops opened, area managers were appointed to assist in meeting the changing needs of customers throughout the United Kingdom.

1.2.3 Market

The market set of the business model considers the target audience(s) for the organization's products and services. McDonald and Dunbar (2012) emphasize that markets should be defined from the customer's perspective, rather than the organization's perspective, as the range of products or services that the customer perceives as satisfying the same need.

Three levels can be defined in a market including the:

- Totally available market of the needs that can be satisfied by all alternative products and services.
- Potentially available market, focusing on potential uses of the organization's and competitors' portfolio of products and services.
- Realistically available market of the need which can be satisfied by the organization's portfolio (McDonald & Dunbar, 2012).

The scope of the potentially available market is increased by e-business, which enables organizations to trade in global markets with an online international presence. Although IT enables global transactions to be easily coordinated, global trading has existed for hundreds of years (Lipsey & Chrystal, 2011). The market set of the business model considers the elements:

{customers, consumers, channels}

Customers and Consumers

The market set of the business model distinguishes between customers who buy the product or service directly from the organization, and consumers who use the product or service purchased. Organizations need to communicate and exchange different information with customers and consumers. In retail, the customer and consumer may be the same organization or individual; however, it is important to recognize when and how these roles differ. For example, Match Lighting is a lighting manufacturer who supplies lighting products to Bright Spark. Bright Spark is therefore a customer of Match Lighting. People who purchase Match Lighting's products from a Bright Spark shop are a customer of Bright Spark and a consumer of Match Lighting.

Organizations serve the needs of different types of customers. Lynch (2006) suggests that the main categories of customers include:

- Domestic customers: Individuals make a purchase for themselves or their family. Demand for the product or service is a primary demand that is not dependent on the demand for a product later in the supply chain.
- Large commercial customers: Organizations make a purchase for use in their business but the purchase is dependent on demand for their own products and services, which may be in a different market.
- Small commercial customers: Organizations make a purchase for use in their business, and demand is derived from demand in other markets.
- Large service customers: Organizations sell products direct to domestic customers for immediate consumption.
- Public service customers: Public sector organizations use the products to provide a service direct to domestic customers for immediate consumption.
- Not-for-profit customers: Purchases made for use in the delivery of a product or service to domestic customers within a clearly focused value system.
Different customers have different requirements for the products and services offered by an organization. Market segmentation is based on the premise that groups of customers can be defined that require a similar marketing approach (Jenkins & McDonald, 1997). There is an underlying assumption that market segments objectively exist; however, Jenkins and McDonald (1997) propose that the definition of market segments needs to consider the organizational structure and its capabilities in terms of how the organization makes sense of the marketplace.

Market segments are defined by identifying a collection of variables for categorizing customers with similar needs (McDonald & Dunbar, 2012). For example, Chelsom et al. (2005) suggest that variables may include:

- Geographic features such as region and population density.
- Demographic features such as age, family size, income, education, and occupation.
- Psychographic features such as social class and personality.
- Behavioural aspects such as loyalty, use, and awareness of the organization’s offerings.

An understanding of customers and market segmentation requires a range of information to be managed relating to customer profiles and the frequency of product purchase (McDonald & Dunbar, 2012). Customer profiling categorizes customers using variables to identify the primary characteristics of customers who are profitable or have potential for profitable growth in the future. This enables organizations to focus their marketing activities and use resources efficiently.

Channels

The market sector of the business model also considers the channels that the organization uses to transfer products and services to customers and consumers in the marketplace. This includes, for example, selling direct to customers, wholesalers, or intermediaries. The use of the Internet as a channel and the use of IT to coordinate information between channels are discussed in Chapter 10.

1.2.4 Business Environment

The business environment is the main source of inputs to the organization over which the organization has some influence. The business environment includes suppliers of equipment and raw materials, as well as other organizations within the industry (or industries) in which the organization trades, who can affect the business processes and decisions of the organization. The business environment includes:

- Markets: The marketplace. This includes, for example, selling direct to customers, wholesalers, or intermediaries. The use of the Internet as a channel and the use of IT to coordinate information between channels are discussed in Chapter 10.

Industries

An industry is a category of business activity in which the organization and its suppliers operate in the business environment. The specific industry or industries with which an organization is associated will influence the information needs of the organization. For example, information will need to be collected and retained to demonstrate Bright Spark’s adherence to industry standards on issues relating to quality and safety of electrical products. The North American Industry Classification System (NAICS, 2007) defines 20 main industry categories, including construction, manufacturing, and information. Industries are defined within each category, such as industrial building construction, fruit and vegetable canning and news syndicates. NAICS is used to collect and publish statistics relating to the American economy. Similar systems are used in the United Kingdom, the United Kingdom Standard Industrial Classification of Economic Activities (SIC, 2007), and in Europe, the Eurostat System (2008).

Suppliers

Suppliers are organizations that provide products and services to the organization, including the direct raw materials that the organization needs to create its outputs, as well as resources such as equipment, staff, and consumables. The supply chain focuses on the activities that cross the boundary between the organization and its supplier’s organization from initial procurement (including determining need for resources and identifying potential suppliers) through to ordering, receiving, and paying for resources supplied (Wagner et al., 2003). Match Lighting is one of Bright Spark’s main suppliers. A regular, reliable supply of quality resources is essential to Bright Spark and this requires accurate and timely information to be exchanged between the trading partners.

Strategic Alliances

A strategic alliance may exist between two or more organizations that have formally agreed to cooperate in some way for mutual benefit. Chen et al. (2008) suggest that motivations for forming a strategic alliance may be:

- Resource-oriented: Seeking the acquisition of, or access to, resources, knowledge, skills, and marketing channels.
- Cost-oriented: Seeking efficiency savings through sharing the costs of research and development.
- Strategy-oriented: Tactics to increase market share or shorten time to market to extend barriers to competition.
Learning-oriented: Sharing information to support research and development and business growth.

The cooperation can take many forms, such as subcontracting and licensing agreements, joint ventures, acquisitions, and mergers (Johnson et al., 2008). Strategic alliances rely on the exchange of information between organizations creating additional requirements and challenges for information management. Information is also needed to help organizations select potential partners. Chen et al. (2008) suggest that information is needed in relation to:

- Corporate compatibility including size, resources, strategy, culture, and working practices.
- Technology capability including skills and expertise.
- Resources such as equipment, knowledge, and investment in research and development.
- Financial conditions such as profitability and growth potential.

Some of this information can be identified through the comparison of business and information models for each organization.

### Link 1.1

Example of Strategic Alliance

#### Parent Company

An organization may be owned by another organization, called a parent company. Information will be exchanged between the organization and the parent company. The parent organization may limit the autonomy of the organization, imposing restrictions on the actions and decisions the organization can take without prior agreement of the parent organization. The level of autonomy permitted will affect the information requirements of managers at different levels in the organization. Levels of autonomy will also influence the business rules that direct organizational processes and the way in which information is used. Information management needs to be aligned with the requirements of the parent company (where it exists) to ensure that information can be effectively shared and communicated within a common frame of reference. Table 1.1 introduced the importance of shared meaning of information within the organization. A framework of shared meaning needs to be extended to incorporate the views of the parent company.

#### Trade Unions

Workers in many industries have established trade unions (also known as labour unions) to establish collective bargaining power. This power is used to develop agreements with the management of organizations on issues regarding pay, employment benefits, working conditions, and human resource policies such as recruitment and promotion. Information management is needed to support negotiation, communication, and implementation of such agreements.

#### Professional Institutions

Characteristics of a profession include specialist knowledge and skills gained through training, high standards of behaviour, and adherence to ethical codes of practice (Professions Australia, 1997). Membership of a professional body is restricted to practitioners who demonstrate the required specialist knowledge and training, and agree to comply with codes of conduct (Bott, 2005). Professions cannot exist without clearly defined ethical guidelines (Presidents & Fellows of Harvard College, 2009) and are governed by a professional body. Professional bodies seek to establish and promote high standards of conduct within a community of professionals. Examples of professional bodies include the British Computer Society, South African Institution of Professional Accountants, American Advertising Federation, and Fédération Internationale de l'Automobile (the world governing body for motor sport).

A professional body differs from a regulatory body. Professionals are members of a professional body, a regulatory body does not have members as it has a legal mandate with the primary purpose of protecting the public (Quality Research International, 2009). Professional bodies have an important role in facilitating interaction between professionals, enabling agreed meanings to be derived and shared to shape and redefine practice, and to monitor compliance in accordance with agreed standards (Greenwood et al., 2002) within the culture of the profession. The influence of the professional body will impact on organizational processes and the information required. In addition, information will need to be collected, managed, and presented on demand to demonstrate that the organization is complying with the requirements of the professional body. The specific requirements of the professional bodies and relevant regulatory bodies with which an organization may be associated need to be considered when developing an information management strategy.

#### 1.2.5 Products and Services

The products and services produced as outputs from the organization are made available to customers in the market:

{product portfolio, services}
Product Portfolio

An organization may offer a range of tangible products to one or more potential markets of customers. Different products provided by the organization may be aimed at different customer segments. For example, Bright Spark has identified regional differences in relation to sales of its products; different products are in higher demand in different stores. Customer segments may differ in terms of profitability, degree of competition, and stage of growth of the market (Lynch, 2006). Organizations providing products to customers provide an indirect benefit to the customer; the benefits to the customer are derived from their consumption or use of the product.

Services

Services are less tangible than products but offer a direct benefit to the customer. Unlike products, services cannot be stored to be sold at a later time (Mullins, 2010b). Macdonald (1994) suggests that products and services differ in terms of:

- Timing of consumption, as services are consumed at the point of delivery.
- Scheduling of production and delivery, which are separated for products but may be undertaken at the same time in the provision of a service.
- Role of the customer in the production process as the customer is directly involved in the production of a service.
- Liability as deficient products can be replaced but the provision of a deficient service at the time of consumption cannot be directly replaced.
- Transportation as products are transported to the point of sale and services are transported to the point of delivery.
- Quality measures as products may be more objectively evaluated against agreed criteria than the perceived quality of a service with which a customer may not be satisfied.

The information needs of products and services therefore differ.

1.2.6 Competition

The organization experiences competition from the providers of products and services against which its outputs must compete and includes:

{competitors, direct substitutes, indirect substitutes}

Competitors

Competitors are organizations that are targeting the same markets and customer groups as the organization. Johnson et al. (2008) suggest that organizations need information about the basis of the competition, the intensity of the competition, and how competition can be influenced. Information is needed about the products and services offered by competitors and the percentage share of the market held. This information is needed to inform corporate strategy, product development, marketing campaigns, and pricing initiatives.

Direct Substitutes

A direct substitute satisfies the need of a consumer in the same way as the need is satisfied by the organization. Rival organizations offer products or services that provide the same function, differentiated by price, perceived quality, or branding.

Indirect Substitutes

An indirect substitute satisfies the need of a consumer in a different way from how the need is satisfied by the organization. It is an alternative rather than a direct replacement for the product or service. For example, candles are an indirect substitute for electrical lighting products therefore Amy’s Candles (an independent store) is an indirect substitute for the lighting products of Bright Spark.

Johnson et al. (2008) differentiate between two further forms of substitute; substitution of need and generic substitution. Substitution of need occurs when the need for a product or service becomes redundant due to new developments in technology. Generic substitution arises when different types of products are in competition within a larger market, for example, holiday companies and furniture retailers compete for the available income of households (Johnson et al., 2008).

Product cannibalization occurs when a new product is launched and gains sales by diverting sales from an existing product (Srinivasan et al., 2005). Product cannibalization can result from the introduction of multipacks of the same product, multipacks of complimentary products (for example, computer and printer), indirect substitutes, and product variants (such as new colours launched within the same brand). Organizations need to capture and manage information about the product, services, and organizations with which it competes for customers.

1.2.7 Resources

Resources are the materials, skills, and equipment taken as inputs from the business environment into the organization to enable the organization to engage in its core business and provide the products and services to the market. Resources include:

{finance, people, technology, skills, raw materials, assets, information}
**Finance**

A wealth of financial information needs to be managed in the organization with high degrees of accuracy, integrity, security, and adherence to relevant legislation. The sources of finance need to be identified and monitored, particularly in relation to any specific conditions about how money can be used or the nature of the return expected by an investor.

**People**

People are the most important asset in any organization (Mayo, 2006), providing the capability and creativity for an organization to be formed, sustained, and developed. The electrical expertise of Bright Spark's founder differentiated the first shop from competitors in the market. Specialist knowledge is core to a profession. Quinn et al. (1996) suggest that specialist knowledge forms the intellectual capital of an organization and includes:

- Cognitive knowledge (know-what) that forms the basic knowledge of the profession.
- Advanced skills (know-how), the ability to apply knowledge within the standards required by the profession.
- Systems understanding (know-why), a deep knowledge of the interrelationships between concepts which enables professionals to develop insight from their experience.
- Self-motivated creativity (care-why) that refers to the ability of highly motivated staff to outperform their peers.

The terms human capital and intellectual capital refer to the skills and knowledge within an organization which, if supported by appropriate organizational structure, culture, and systems can support the development of core competencies and innovation (Coakes & Bradburn, 2005). Within the business model it is necessary to identify the range of people and professions that comprise the human resources in the organization. Information management then must identify the information that people in the organization need in their work to support knowledge management activities.

**Technology**

Most organizations will use technological resources to create, manage and distribute their products and services. The use of the word ‘technology’ is not restricted to IT and considers the use of:

- Heavy machinery such as that used in production lines and on construction sites.
- Diagnostic equipment such as heart monitors in hospitals, temperature monitors used in catering, and on-board diagnostics used in motor vehicles.
- Specialist tools such as stethoscopes, chefs’ knives, artists’ brushes, and power tools.

Information needs to be managed about each type of technology, such as calibration parameters, maintenance schedules, and depreciation rates. In addition, many types of technology provide data on production rates, error detection, and quality indicators. These data need to be effectively captured and communicated within the organization for use in appropriate business processes and to inform decision-making.

**Skills**

A skill is an ability to perform a task. Skills may be measured in terms of the performance of the task or the deliverable achieved from the task. Some tasks require skills in the speed and accuracy of motor movement, other tasks require skills in content abilities (such as verbal, mathematics, and spatial abilities) and domain knowledge (Ackerman, 2007).

Employees have two types of skills to offer organizations: subject skills, which are specific to an area of work, and transferable skills (such as communication skills and team working), which can be used in a range of activities crossing professions and organizations during a career (Cox & King, 2006). The business model identifies the range of skills needed by the organization to define and conduct the business processes needed to support the development of products and services. Information needs to be managed about the skill base of the organization and the further development of staff skills to support the growth of both the organization and its employees.

**Raw Materials**

The organization takes raw materials from suppliers in the business environment to transform through a series of business processes thus creating the products and services offered in the marketplace. The term raw materials includes both the direct ingredients needed to create the product or service, and the indirect materials needed for support activities such as marketing and distribution. Information is needed to coordinate regular communication between business processes and suppliers in the business environment to ensure a timely supply of materials.

**Assets**

Assets are used to transform the raw materials into the products and services offered by the organization. Fixed assets are tangible and intangible items owned by the organization that are not regularly offered for sale (Chelsom et al., 2005) within the portfolio of products and services presented to customers in the market. Tangible assets in Bright Spark include land, buildings,
equipment (including warehousing equipment, packaging equipment, IT, and transport vehicles), and fixtures (including office furniture and shop displays). Although an organization may have physical buildings, it is an abstract concept, and virtual organizations can exist without occupying a physical building (Senior & Swailes, 2010). Intangible assets include intellectual capital (such as patents and trademarks), the human capital of knowledge and expertise of staff, and the goodwill developed through the organization’s reputation. Current assets can be converted into cash to pay liabilities within 12 months and include cash, debtors, and stocks of raw materials (Chelsom et al., 2005). Information is needed relating to the nature of each asset to calculate depreciation. This includes the original cost of the asset and its expected life span before replacement (Chelsom et al., 2005).

Information

Quality information is an essential business resource (Hannula & Pirttimäki, 2005) providing the basis for business processes and decisions affecting all areas of the business model. Hannula and Pirttimäki (2005) categorize business information in terms of the:

- Source of the information, whether the information comes from an external source (such as its suppliers) or whether the information is generated internally within the organization.
- Subject of the information, whether the information refers to something external to the organization (such as the percentage share of the market the organization currently holds) or whether the information refers to something internal within the organization (such as the range of new products being developed).
- Type of information, whether the information is quantitative (objectively measurable, such as physical measurements of bulb wattage) or qualitative (subjective, such as the aesthetic quality of a lighting design).

Scenario 1.3 shows how these categories can be used to map the current types of information in the organization and to identify further information needed to improve decision-making.

### Scenario 1.3

#### Business Information Cube in Bright Spark

Bright Spark is reviewing its product portfolio. One of the manufacturers has increased its prices and Bright Spark needs to decide whether to keep stocking lampshades from this manufacturer. The information collected to help Larry Hughes make a decision has been categorized using the business information cube in Table 1.2.

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>Subject of Information</th>
<th>Type of Information</th>
<th>Information Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>Internal</td>
<td>Quantitative</td>
<td>Selling price of lampshade to customers. Number of lampshades sold in the last six months.</td>
</tr>
<tr>
<td>Internal</td>
<td>Internal</td>
<td>Qualitative</td>
<td>The extent to which the lampshade complements or completes the product range offered to customers.</td>
</tr>
<tr>
<td>Internal</td>
<td>External</td>
<td>Quantitative</td>
<td>Number of competitors stocking the same product.</td>
</tr>
<tr>
<td>Internal</td>
<td>External</td>
<td>Qualitative</td>
<td>Need information about the anticipated demand for the product based on sales trends.</td>
</tr>
<tr>
<td>External</td>
<td>Internal</td>
<td>Quantitative</td>
<td>Not required.</td>
</tr>
<tr>
<td>External</td>
<td>Internal</td>
<td>Qualitative</td>
<td>Not required.</td>
</tr>
<tr>
<td>External</td>
<td>External</td>
<td>Quantitative</td>
<td>Purchase price of lampshade from manufacturer.</td>
</tr>
<tr>
<td>External</td>
<td>External</td>
<td>Qualitative</td>
<td>Need information about expected new products to be launched.</td>
</tr>
</tbody>
</table>

Table 1.2 Categorizing Information to Inform Product Portfolio Decision

Table 1.2 highlights some types of information that Bright Spark currently has and would like to have in order to inform the decision about whether to continue stocking a particular lampshade. This helps Bright Spark identify the information to be collected to help support the decision.
Organizational Context of Information

A further column could be added to Table 1.2 to distinguish between formal and informal sources of information. Formal sources of information include that derived from organized reporting structures, externally such as annual reports, and internally such as weekly sales meetings. Informal information is derived from unauthorized sources, externally such as salesmen from different organizations commenting on sales trends during lunch at a trade event; internally such as gossip shared between colleagues passing in the corridor.

### 1.2.8 Core Business

An organization may engage in a range of activities, offering a diverse portfolio of products and services in a number of markets. The core business focuses on the main type of business pursued by the organization and considers the organization’s:

- {purpose, strategy, core competencies}

**Purpose**

The core purpose of the organization can be considered to be a subset of the mission statement, the fundamental reason for the organization to exist. Over time an organization may diversify the product portfolio to meet customer needs in new markets, but the core of what the organization does provides the basis for the organizational strategy.

Johnson et al. (2008) suggest that the purpose of the organization has four main influences:

- **Corporate governance:** Who the organization aims to serve, how it provides the services, and who is the arbiter of these decisions.
- **Stakeholders:** Who the organization serves and the power they have to influence the purpose of the organization.
- **Corporate social responsibility:** Who the organization should serve directed by ethical concerns.
- **Cultural context:** Prioritization of who the organization serves driven by cultural values.

Information about the purpose of the organization needs to be clearly communicated to provide a focus for the implementation of the organizational strategy.

**Strategy**

Organizational strategy provides direction to the organization outlining how the organization seeks to engage in the core business to achieve the defined mission in different markets (Johnson et al., 2008). The strategy provides the overall context, constraining and guiding all formal activity in the organization. The alignment of activities in the organization with the organizational strategy may be explicit, for example, through the use of balanced scorecards, or implicit in the actions and directions of business leaders. The information management strategy needs to be aligned with the organizational strategy to ensure information is available to use, and is used, to support the business processes and decisions needed to action the organization’s strategy.

### 1.2.9 Business Climate

Core competencies are situated at the centre of the business model, in the intersection of the organization, market, and business environment. An organization will have many skills that can be used to provide a range of products and services to the market. Core competencies focus on the skills, knowledge, and expertise at which the organization excels and which can be leveraged to provide a competitive advantage in the market against its competitors. Competencies may arise from (Johnson et al., 2008):

- Cost efficiency, achieved through economies of scale, supply chain management, efficient processes, and experience.
- Value-added features of the product or service derived through expert staff, customer service processes, and timely communication of information. For example, the electrical expertise available in Bright Spark adds value to the sales process.
- Managing links between processes in the organization.
- Robustness of the competence, achieved through the organization’s ownership of the competence and the degree to which the competence is difficult to transfer to other organizations.

Information needs to be managed to strengthen and support the core competencies of the organization.
Fundamentals of Information Management

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**Legislation**

All organizations are required to adhere to a range of legal policies that constrain activities in the organization, the market, and business environment. Legislation relates to the way in which employees are treated; the way in which products and services are created, marketed, and sold; and the environmental impact of the organization. Information is needed to ensure that business processes adhere to current legislation and that, where necessary, information is available to provide evidence of adherence to legislation. Where an organization trades in more than one country, adherence to the legislation of those countries is also necessary. As changes to legislation come into force, organizations need to capture information relating to the new legislation and adapt business processes as required by the legislation.

**Economy**

The economic system of the country or countries in which the organization trades can significantly impact the organization. Harbury and Lipsey (1993) identify the following features with which to examine an economy:

- **Resources**: The availability of physical resources of an economy including land (minerals and energy sources), labour (size and distribution of the human population providing human resources), and capital (tangible assets such as factories and intangible assets such as human capital).
- **Production**: The types of production in an economy such as: primary production (the harvesting of natural resources); secondary production (manufacturing and construction of finished goods); and tertiary production (services to support producers, such as finance, or to provide entertainment, such as hospitality).
- **Foreign trade**: The balance of payments documents the payments made and received for imported and exported goods and services, and the earnings from investments. It is affected by exchange rate of currencies.
- **Economic growth**: Employment indicators measure the production capacity of the economy. The gross national product (GNP) and gross domestic product (GDP) measure the output value of goods and services produced. GDP measures the output values within the boundary of the national economy and GNP includes the value of outputs in foreign countries. For example, the GNP would include Bright Spark’s sales in South America but these sales would not be included in the GDP.
- **Money and banking**: The outputs of the economy are affected by pricing. Inflation is the level with which prices are increasing. Interest rates indicate the cost of borrowing money for organizations needing to invest in, for example, equipment.

- **Government**: The degree to which governments directly or indirectly influence resource allocation through government expenditure and nationalization. These economic indicators affect demand for the organization’s products and services, and the costs incurred in producing them. Information about these indicators is needed in the organization to support strategic decisions.

**Culture**

The organization, market, and business environment operate within national and international cultures. Awareness of cultural differences is needed as organizations, such as Bright Spark, increasingly engage in international trade. Differences in cultural values and codes of behaviour need to be considered in terms of how a customer’s perception of the product or service offered by the organization may be influenced. Cultural differences relating to, for instance, differences in conversational style between nationalities can affect the way in which trading takes place. An understanding of other cultures can help to appreciate the different views adopted within negotiations (Senior & Swailes, 2010), providing the context for information to be interpreted and to be given meaning. Information management needs to recognize the different ways in which information may be perceived, gathered, used, and interpreted within different national cultures.

**Quiz 1.1**

Business Model

**Link 1.2**

Checklist for Developing a Business Model

**1.3 Morphing Organizations**

Morphing is a verb meaning to gradually change from one image to another. Over time Bright Spark has morphed through a series of phases to change the face that it presents to its customers. A face is the surface image presented for external view. The face of an organization presents a surface image of the organization to be viewed externally. The face of Bright Spark has transformed from personal service provided at a counter, through to personal service provided via Internet technology. The
organizational face covers the underlying structures and systems which maintain the image of the face, in the same way that a clock face covers the inner working of the oscillating wheel, gears, and springs that move the hands around the clock face. Beneath the face lies a network of interacting components that are continually adjusting in response to internal and external triggers in order to achieve the organization’s objectives.

Peters and Waterman Jr. (2004) proposed that this network of components comprise dynamic interactions between the components of structure, strategy, systems (including formal and informal procedures), style of management, and culture, skills, staff (including morale, attitude, behaviour, training, and appraisal), and shared values. These internal components change in response to triggers from the external environment (such as the introduction of new legislation or the development of technology) or internal changes (such as the appointment of new managers). The interrelationships between components mean that a change in one component is likely to initiate a series of changes rippling through the organization. Changes to the underlying organization may be reflected in changes to the face of the organization. The morphing organization gradually changes its external image in response to adjustments in the relationships between its internal components while retaining key features which provide its identity.

**DEFINITION: A morphing organization is an organization that gradually changes the external image it presents to the world while retaining its own identity.**

The following sections examine the triggers driving organizational transformation, the phases of transformation, and the dimensions of the morphing organization that may be affected by transformation.

### 1.3.1 Triggers of Organizational Transformation

Organizational transformation can be triggered by internal or external information (Senior & Swailes, 2010). External triggers for change may come from the business climate, which is influenced by a range of factors, identified using PEST analysis (Johnson et al., 2008), also referred to as PESTEL analysis (Mullins, 2010b). The factors include:

- **Political:** National and international priorities and policies can limit or facilitate trade, such as import quotas. Political triggers such as a government’s decision to increase fuel duty may affect the ability of an organization to compete internationally (Senior & Swailes, 2010). This could lead to Bright Spark opening or closing stores to reduce transportation costs.

- **Economic:** Financial indicators such as inflation, interest rates, currency rates, and unemployment affect the demand for the organization’s products and the organization’s ability to compete in the marketplace. For example, Bright Spark may be unable to compete on price in certain countries due to exchange rates so will need to change the basis of competition.

- **Sociocultural:** Sociocultural triggers such as changes in demographics and standards of living will affect demand for particular types of products. For example, concerns for the environment increase demand for lighting products that are energy efficient and are manufactured from sustainable materials.

- **Technological:** Speed, frequency, and uptake of development of new technologies relating to, for example, production techniques, materials, and IT trigger change in organizations. For example, the development of low-energy light bulbs has triggered changes in Bright Spark such as the need to source different light bulbs from new suppliers.

- **Environmental:** Issues that affect the natural environment such as energy consumption and waste disposal may require the organization to change production processes.

- **Legal:** Legislation such as employment law, health and safety regulations, and the data protection act trigger changes to business processes.

Senior and Swailes (2010) suggest that internal triggers for change include changes of: leadership, structure, strategy, power (of unions or departments), processes, and equipment. Information triggers change and the resulting transformation changes the future information needs of the organization as the architecture of the organization changes.

### 1.3.2 Stages of Organizational Transformation

Organizational transformation is essential for survival, enabling organizations to adapt to changes in the business environment and become realigned internally and externally (Bryson, 2011). Dixon et al. (2010) identify three stages in organizational transformation:

- **Break with the past:** This involves introducing the need to change from the existing organizational architecture.

- **Exploitation and deployment:** Developing the dynamic capabilities to redesign and reconfigure the organization to support organizational survival.

- **Exploration and innovation:** Engaging in organizational learning, promoting creativity and innovation to
create sustained competitive advantage in the long term.

These stages operate in cycles as an organization continually adapts to survive in its changing environment.

The retailer Bright Spark has transformed through a number of morphing phases. Bright Spark started out as a small shop with a counter. A few products were displayed on the ceiling and behind the counter, but the main stock was held in a stockroom, which was only accessible to staff. Customers came into the shop and asked the sales assistant for the product they were looking for. The sales assistant listened to the needs of the customer and used her knowledge to identify the products that would meet the customer’s requirements.

**Phase 1: From Counter Service to Self-Service**

Bright Spark moved the counter to the side of the shop and put more products on display in the shop. Customers were allowed to take items directly from the display shelves and take the items to a cashier to pay for them. Bright Spark moved from counter service to self-service.

**Phase 2: From Self-Service to Internet Service**

In 1998, Bright Spark recognized the opportunity offered by the Internet, which triggered the next phase of organizational transformation. Bright Spark created a website to use as a new marketing channel to encourage potential customers to visit the stores. A product catalogue was later added to the website, which increased the functionality of the website enabling customers to buy products online. The Internet provides Bright Spark with a virtual store that customers can access from any location where they can connect to the Internet. The main activities of selecting products, putting products into a basket, and paying for them at the checkout of the store are replicated online.

**Phase 3: From Internet Service to Internet Collaboration**

In phase 2 Bright Spark focused on the changes needed in the organization to replicate standardized business processes in an online trading environment. In phase 3, Bright Spark seeks to add greater value to the standardized processes by facilitating more engagement with customers and suppliers. From a customer perspective, this means a return to the more personalized service that Bright Spark provided through counter service in the original stores. Customers can enter into a dialogue with sales assistants online to discuss their needs and receive expert knowledge on the lighting options available. Bright Spark’s suppliers can also discuss the development of new product ideas with Bright Spark and negotiate order quantities online.

The following section identifies the areas of Bright Spark that were affected at each phase of the organization’s transformation.

### 1.4 Dimensions of Organizational Transformation

Cox *et al.* (2006) identify dimensions that can be used to analyse the way in which an organization transforms. The dimensions shown in Figure 1.2 are used in the following sections to discuss the internal changes that occurred within Bright Spark as it moved through transformations from: counter service to self-service; self-service to Internet service; Internet service to collaboration. The morphing dimensions illustrate how information is affected when organizations undergo such transformations.

![Morphing Dimensions](image)

**1.4.1 Transforming from Counter Service to Self-Service (Phase 1)**

As Bright Spark moved from providing counter service to allowing customers to serve themselves, the infrastructure of the store was first changed by the introduction of new shelving units and checkouts. Security was affected as previously the sales counter acted as a physical barrier separating the customer from the stock held behind the counter and in the stockroom. Self-service required customers to be given direct access to the shelves where products were displayed. As customers took the products from the shelves, the price of each product had to be more clearly displayed so the data about products had to be changed. Self-service was a different way of shopping and the shopping practices were changed both for customers and staff. As customer service changed, the processes of sales, purchasing, and payment changed with more autonomy being given to the customer. Bright Spark had to trust customers; trust that customers would pay
for the products taken from the shelves before leaving the store. This new way of shopping dramatically affected the people employed by the stores. The role of the sales assistant was redefined and the skills assistants needed changed. Previously sales assistants developed specialist knowledge of the products to help them advise customers of the different products available. Self-service reduced the personal interaction between customers and sales assistants, requiring sales assistants to have a broader but less specialized knowledge of products in the store. These changes are summarized in Figure 1.3.

When Bright Spark sought to replicate the self-service shopping experience online, a technical infrastructure was developed providing a technical interface to interact with customers. The absence of direct physical contact with the products to be purchased meant that further consideration had to be given to the data that needed to be presented to the customer about the product for sale, and the terms and conditions of the purchasing transaction. Attention also had to be given to the data to be captured from the customer in making the purchase.

In stores, security focused on the products for sale. Online, security focuses on information, including information about transactions, with the aim to maintain security for customers. Previously, trust lay with Bright Spark that customers would not take products from the store without paying for the products. Online, trust lies with customers that the information provided by the online store is accurate (for example, if the website states that a product is in stock, the product really is in stock) and the transactions will be honoured as agreed (for example, that the correct product will be delivered on time). For the customer, the practice of shopping online adopts a similar approach to self-service. For organizations, practices such as order fulfilment have had to change considerably. Almost all back-office processes are affected by the introduction of Internet sales, including stock control, packing, distribution, and finance. As processes change, the people employed have had to adapt to online procedural working; the use of the Internet changed the skills that people needed. Internet service can be impersonal and the skills needed for online communication are different from those of sales assistant in a physical store. These changes are summarized in Figure 1.4.

Figure 1.3 Organizational Transformation: Counter Service to Self-Service

1.4.2 Transforming from Self-Service to Internet Service (Phase 2)

When Bright Spark sought to replicate the self-service shopping experience online, a technical infrastructure was developed providing a technical interface to interact with customers. The absence of direct physical contact with the products to be purchased meant that further consideration had to be given to the data that needed to be presented to the customer about the product for sale, and the terms and conditions of the purchasing transaction. Attention also had to be given to the data to be captured from the customer in making the purchase.

In stores, security focused on the products for sale. Online, security focuses on information, including information about transactions, with the aim to maintain security for customers. Previously, trust lay with Bright Spark that customers would not take products from the store without paying for the products. Online, trust lies with customers that the information provided by the online store is accurate (for example, if the website states that a product is in stock, the product really is in stock) and the transactions will be honoured as agreed (for example, that the correct product will be delivered on time). For the customer, the practice of shopping online adopts a similar approach to self-service. For organizations, practices such as order fulfilment have had to change considerably. Almost all back-office processes are affected by the introduction of Internet sales, including stock control, packing, distribution, and finance. As processes change, the people employed have had to adapt to online procedural working; the use of the Internet changed the skills that people needed. Internet service can be impersonal and the skills needed for online communication are different from those of sales assistant in a physical store. These changes are summarized in Figure 1.4.

Figure 1.4 Organizational Transformation: Self-Service to Internet Service

1.4.3 Transforming from Internet Service to Internet Collaboration (Phase 3)

Figure 1.5 summarizes the transformation from replicating self-service processes online to engaging in collaboration online with customers, suppliers, and business partners. Bright Spark uses a collaborative Internet-based system to place orders with its main supplier, Match Lighting. Collaborative systems require issues of computer system compatibility to be addressed to provide the infrastructure for the online communication. However, the data issues that need to be addressed are also extremely significant to ensure that data can be accessed and understood. The data issues relate to both technical compatibility and business semantics within the supply chain. While in Internet service security focuses on restricting access, in collaborative systems the emphasis is on facilitating authorized access to data. As organizations seek to share data, both parties have to trust that the data are accurate and will not be misused. Sharing data requires a change in practices to share the data and a change in processes to act on the data exchanged. Working with trading partners affects the people in both organizations who are required to work together, develop skills in online communication, and develop trusting relationships.
require additional information or additional types of information to be captured. For example, opening a new store will require Bright Spark to capture information about the stock levels in the store. Bright Spark already captures information about stock levels in other stores, therefore the new store will increase the volume of information to be managed. If the new store is to operate in a different market, additional information will need to be captured about the customer preferences and trading restrictions in the new market. If changes are made to the organizational structure, the way in which information flows through the organization will also change. Changes to the technological infrastructure may require changes to the way in which information is captured, stored, and used in the organization.

- **Security**: Changes to the organizational infrastructure may introduce additional risks to the organizational resources. Information may be needed to monitor aspects of security, such as the unauthorized entry into buildings. The changes may introduce new physical or electronic threats to information security. For example, information may be at risk of loss during a theft in a store or at risk from unauthorized modification of an electronic file.

- **Trust**: Changes to the infrastructure or business processes may affect the nature of trust in the organization. For example, in online transactions customers trust that the information provided is correct. As unreliable information can quickly erode trust, the importance of accurate information becomes more important.

- **Data**: Changes to business processes may require additional data to be captured. Changes to the infrastructure may increase the points in the organization where data are captured. This increases the risk that data may be captured incorrectly or inconsistently, affecting the quality of the information in the organization.

- **Processes**: Business processes are initiated by information and involve the processing of information. Changes to the way the organization operates may therefore change the information required to initiate processes. Changes may also be required to the way in which information is processed or presented to support decisions taken in the organization.

- **People**: Changes to the staff required in the organization may require changes to the type and format of information. For example, the creation of a new post, such as area manager, will require information to be created about the sales and trends.
in a specific regional area. The appointment of a new person to an existing role may require the existing information to be presented in a different way. For example, some area managers may prefer graphical information about sales trends rather than detailed numerical information.

- **Skills:** Information is needed about the skill base in the organization. Changes to business processes may require different skills to be acquired in the organization. Skills are also needed to manage information effectively in the organization. For example, changes to the technological infrastructure may require new technical skills to be developed.

- **Practices:** As business processes, infrastructures, people, and skills change, the way in which organizational processes are conducted may change. Changes to business practices may require additional information to be available, or may change the requirements relating to when and where information is needed, or how the information is accessed and used.

These dimensions of change are discussed further within the organizational architecture.

### 1.6 Organizational Architecture

Architecture refers to the process and result of designing a structure which establishes boundaries for the suggested use of space (Gerstein, 1992). In designing a building architecture, the architect will consider, for example, purpose, aesthetics, light, materials, and land usage. In the same way that walls in a building delineate space for certain activities to take place (such as kitchen, bathroom, and bedroom), the architecture of an organization delineates space for business processes to take place (such as production, marketing, and stock control). While a building architect considers physical space, the organizational architect considers both physical and virtual space. Bright Spark has physical stores and warehouses, a virtual store to support Internet sales, and conceptual boundaries separating business functions. The organizational architecture creates behavioural space, which provides opportunities and constraints for action (Gerstein, 1992).

The business model provides the context for the organizational architecture and identifies the external stakeholders, which may provide opportunities and constraints for achieving the organization's vision. The organizational architecture is a holistic representation of the formal and informal elements of an organization and the interactions between them, shown in Figure 1.6.

The formal elements of the organization architecture include:

- **Strategy:** The current direction being taken by the organization to achieve its desired position in defined markets.
- **Processes:** The main activities required to transform resources to products and services offered by the organization.
- **Systems:** The integration of business processes required to achieve the aims of the organization's strategy, including the information systems required to provide the information needed to support the business processes.
- **People:** The job roles defined within the organizational structure.
- **Technology:** The equipment required to undertake the business processes, including the IT required to support the implementation of information systems.
- **Security:** The actions taken to minimize and detect risks to the organization's assets and resources

These formal elements are organized within the organizational infrastructure and operate within the organizational culture. For example, Bright Spark possesses a range of resources, including people, finance, stock, and equipment. The organizational structure incorporates resources together, in a meaningful way, to support the mission of the organization and defines hierarchical paths for communicating information. Data are needed about each of the elements in the formal structure and are needed to integrate the elements to support the performance of the organization.

Bright Spark needs to undertake a range of business processes to achieve the organization's mission. The business processes need to be planned and logically structured before being allocated to staff in the organizational structure. The organizational structure enables the processes to be coordinated and controlled. There is a difference between process and practice; process relates to defined routines of what should happen in the organization and practice refers to what actually happens in the organization, building on the knowledge and experience of the people involved. Business processes and working practices are situated within the organizational culture, influenced by history, management styles, and leadership styles. Business processes, practices, and the artefacts used within them are components of a human activity system (Engeström, 2001) where activity emerges within the situational context (Cox et al., 2006).

Beneath the formal organizational architecture are the informal elements of:

- **Vision:** The future state which the organization aspires to achieve.
Trust: The degree of belief that the practices of the organization are conducted with honesty, fairness, and transparency.

The organizational architecture structures the interactions between these elements, providing the context within which information is interpreted and used in the organization. Different models can be used to analyse, represent, and communicate elements of the organizational architecture that constructs the behavioural space within which organizational activity takes place.

Saucer and Willcocks (2004) emphasize that defining the organizational architecture is not a one-off task (like designing a building); it is a continuous process of adjustment to meet the changing needs of the business environment. The organizational architecture provides the bounded space to facilitate and constrain business activity but does not define the business activity (in the same way that an architect may provide space with the recommendation that the space is used as a bedroom but the residents use the space as an office, games room, or storage room). Most organizational architectures have emerged from a series of transformations over a period of time. The organizational architecture provides the structure, shape, and form within which information is needed to inform and record business activity.

1.7 Scope of Information in Organizations

Information and the need for information management existed before the proliferation of IT in organizations, however, technology has created a new awareness of information management. Information is needed for an organization to make and communicate decisions, take action, and assess the effectiveness of actions. The information the organization needs can be generated internally within the organization or can be derived from external sources. The business model provides a structure within which to identify the key sources and subjects of information needed by the organization. The business model provides the organizational context for information management.

The context within which organizations operate is continually changing. Organizations need information about their external environment for two main reasons. First, organizations need information as feedback on performance to determine whether changes are needed in order to attain the organization's goals. Second, organizations need information on how the context in which they operate is changing in order to be able to respond to opportunities and threats. Information about changes
in the external environment may trigger internal changes in the organization which may affect components of the formal structure (including strategy, processes, systems, security, technology, people, infrastructure, and culture) and informal structure (including vision, practices, human activity systems, socio-technical aspects, skills, architecture, and values). Changes to these components will change the information needed by the organization. Information management is needed to support the current information needs of the organization and to provide the flexibility to support future changes to the organization.

**Summary**

Data are strings of characters that have been captured in some way. Information is derived from an understanding of what the characters represent and the context in which the characters were collected. Information is needed to trigger business processes, record transactions, and inform decision-making at all levels in an organization.

The business model is a tool to analyze the context in which an organization trades. An organization needs to continually adapt to changes in the trading environment. Internal and external opportunities and pressures drive organizational transformation. A morphing organization changes the way it interacts with external parties. The organizational architecture comprises a series of interacting components in the formal and informal structures of the organization. Changes to the formal and informal structures of the organization require changes to be made to one or more components in the organizational architecture. The organizational architecture provides the context within which information is used in the organization. Changes to the organizational architecture therefore change the information needs of the organization.

**Reviewing Scenario 1.1**

*How has the organizational context changed?*

In its 50-year history, Bright Spark has evolved from one small shop to a chain of stores. It now also sells its products internationally using e-business systems. The changes to the context in which Bright Spark collects, uses, and manages information can be explored using the business model in Figure 1.1. For example:

- **Organization:** The internal structure, geographic structure, processes, and culture of Bright Spark have changed as the organization has grown and moved into e-business.
- **Core business:** The purpose of Bright Spark has remained the same and the core competencies are embedded in the specialist knowledge of the staff. The strategy of the organization has evolved in response to fierce competition from major stores.

- **Resources:** The range of skills and technology required by Bright Spark has increased over time. The opening of new stores has increased the volume of information that needs to be managed about Bright Spark’s resources.
- **Products and services:** The type of products sold by Bright Spark has remained the same, though the range of products has changed to reflect market trends.
- **Market:** The Internet has provided an additional channel for Bright Spark to sell its products and opened up new markets for the organization. Information about the different needs and expectations of different customer groups needs to be regularly maintained.
- **Competition:** As Bright Spark has moved into new international markets, the range of competitors it needs to be aware of has increased. This has required the organization to continually assess the basis on which it is able to compete.
- **Business Environment:** Bright Spark remains a lighting specialist within the home furnishings industry. The retailer purchases lighting solutions from a number of manufacturers such as Match Lighting.
- **Business Climate:** Bright Spark must keep up to date with relevant legislation relating to electrical lighting in the countries in which it trades. Bright Spark must also monitor information on economic and social issues that may affect the organization. For example, a combination of factors, such as an increase in home design television programmes and a poor economic climate, has encouraged homeowners to update the lighting in their homes. Bright Spark has therefore seen an increase in sales of lamps and sculptural light fittings.

*How has the organization changed and how has this affected the information the organization needs?*

The dimensions shown in Figure 1.2 provide a structure within which to analyze the transformation that Bright Spark has experienced.

- **Infrastructure:** The infrastructure of the organization has transformed at a number of levels including:
  - Geographically, through the opening of stores and warehouses.
  - Organizationally, in terms of the structure needed to monitor, control, and coordinate operations at multiple locations.
• Technologically, to manage information and communication across locations and to enable e-business processes.

The opening of new stores increases the volume of information to be managed in Bright Spark and changes the structures in which information is communicated. The introduction of e-business changes the way information is captured, communicated, and used.

○ Security: The physical security of products and resources has changed in response to advances in security technology (such as surveillance cameras and monitored alarms) and the demands of insurance companies (such as specification of locks). The security of information has evolved from the storage and transmission of information between stores and in e-business. The communication of information across a geographically dispersed organization and in e-business systems introduces risks relating to the loss or corruption of information.

○ Trust: The owner of Bright Spark initially trusted a small number of staff to provide expert knowledge to customers. Larry now has to trust staff in all stores in the chain to adopt and reflect the cultural values of the organization. Online customers have to trust that the information provided by Bright Spark is accurate and that the organization will deliver products as agreed. Customers also have to trust that Bright Spark will keep personal information secure and ensure that personal information is not misused.

○ Data: The volume of data in Bright Spark has increased as the opening of each store widens the business context within which the organization operates. This requires more data to be maintained relating to customers, sales, products, and employees. More information is also needed about competitors in different customer markets and international trading regulations. As the number of places where data are captured has increased, policies and controls are needed to ensure that data are entered accurately and consistently throughout the organization.

○ Processes: The growth of Bright Spark has led to the formalization of business processes to ensure that customers experience consistent levels of service through the chain of stores and to facilitate communication of information throughout the growing organization. The introduction of e-business requires information to be managed to integrate the processing of online transactions with existing business systems, enabling orders and enquiries received via e-business systems to be actioned.

○ People: Bright Spark has sought to retain its key value of personalized service through the appointment of experienced staff. New roles, such as store and area managers, have been introduced into the organizational structure as the retailer has grown. Bright Spark is required to maintain information about staff it employs.

○ Skills: In the first shop, Bright Spark needed staff with sales and accounting skills. As the retailer has grown, it has needed a wider range of skills including, marketing, IT, and logistics. The organization manages information about the skills of its staff in order to assist in identifying any additional training requirements.

○ Practices: The fundamental working practice of selling lighting products to customers in the store has remained relatively unchanged. The main changes in the store relate to the actions and equipment used to capture information at the point of sale. However, the back-end processes relating to ordering, finance, stock control, and distribution have changed extensively through the formalization of processes needed to capture, store, and use information from across the chain of stores.

Exercise 1.1

1. List four reasons why information is needed in organizations.
2. What is meant by information paralysis?
3. Is IT necessary to manage information in an organization?
4. What two things are needed to add value to data and convert data into information?
5. What is the key question that the business model answers?
6. What is the purpose of the business model?
7. What is the role of the formal organizational structure in information management?
8. Identify the four roles of information in relation to business processes.
9. How do group norms affect the requirements for information?
10. What is a meant by a root metaphor?
11. Give two examples of features which may be used to categorize information about customers.
12. If an organization wanted to capture demographic information about its customers, give two examples of data that the organization would need to collect from customers.
13 What is strategic alliance?
14 What is the difference between a direct and indirect substitute?
15 What information is needed to calculate the depreciation of assets?
16 What information can be derived from the factors identified using PEST analysis?
17 List the areas that are analysed in morphing organizations.
18 What are the three categories of information in the business information cube?
19 Information is reported at the weekly staff meeting. Is this an example of formal or informal information? Why?
20 How does an organizational architecture differ from an organizational structure?

Activities 1.1

Apply the following steps to create a business model of Bright Spark.

1 Replace the following labels from Figure 1.1:
   - Organization: What is the name of the organization?
   - Market: What is the collective name for the field in which the organization's customers are located?
   - Business Environment: What is the name of the industry in which the organization trades?
2 Prepare a list of:
   - Products and services the organization offers to customers.
   - Resources the organization needs to provide the products and services. Provide examples of sources of finance, equipment, skills, assets, and information.
   - Competitors who provide the same or similar products and services to the organization’s customers.

Discussion Questions 1.1

1 What are the possible motivations for a strategic alliance?
2 How important is the organization’s culture in managing information?
3 Why is the source of information considered in information management?
4 What information will Bright Spark need to inform the decision of whether to open a store in Australia?
5 Why do organizations need to change?
6 How does organizational transformation affect information management?
7 Consider the analogy that information is the lifeblood of an organization. To what extent do you agree with this analogy? Can you suggest an alternative analogy?
8 How do the components in the formal structure of the organizational architecture relate to the components in the informal structure of the architecture?
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