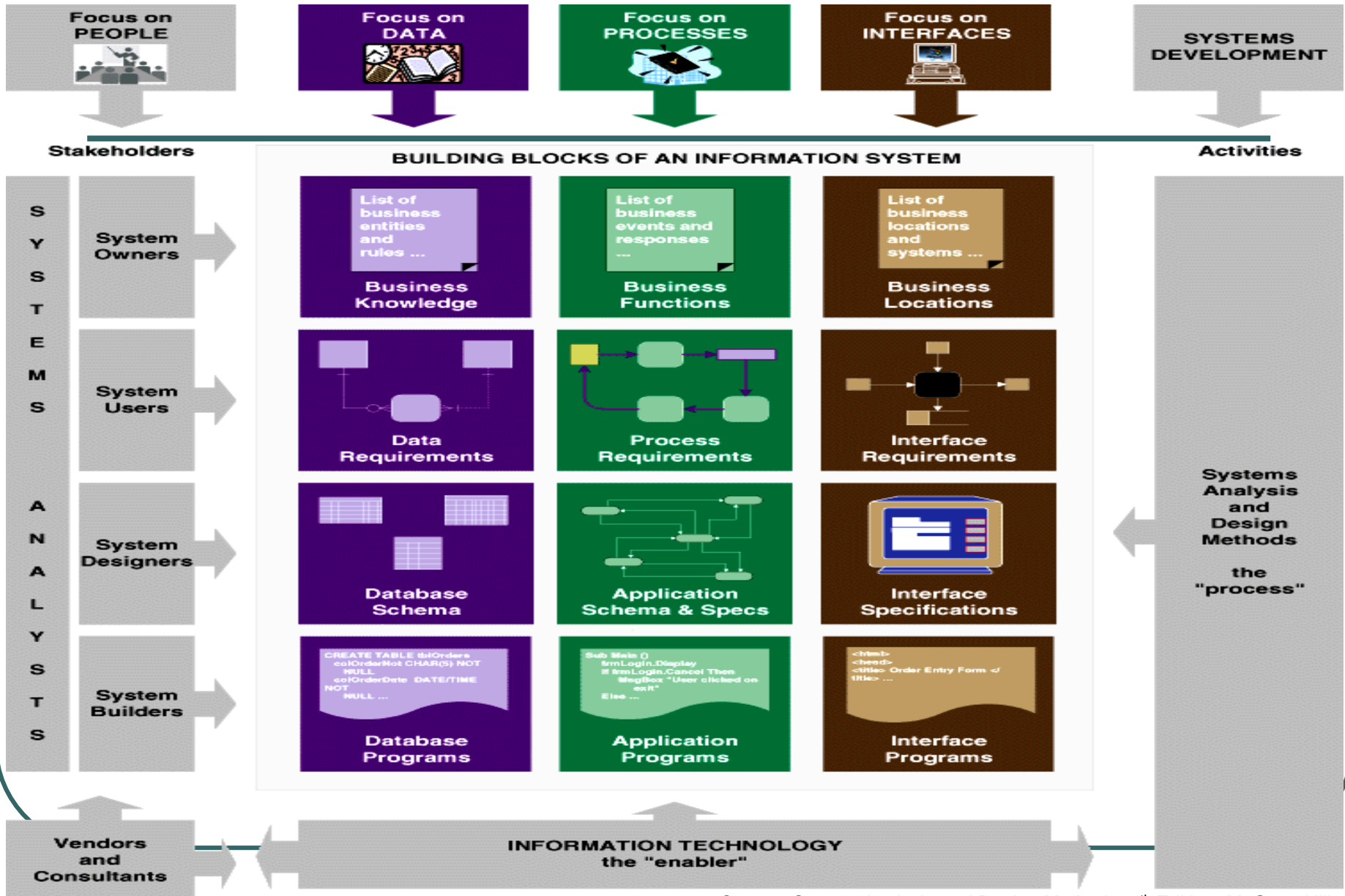


CHAPTER

2

INFORMATION SYSTEM BUILDING BLOCKS

Chapter Map



Data and Information

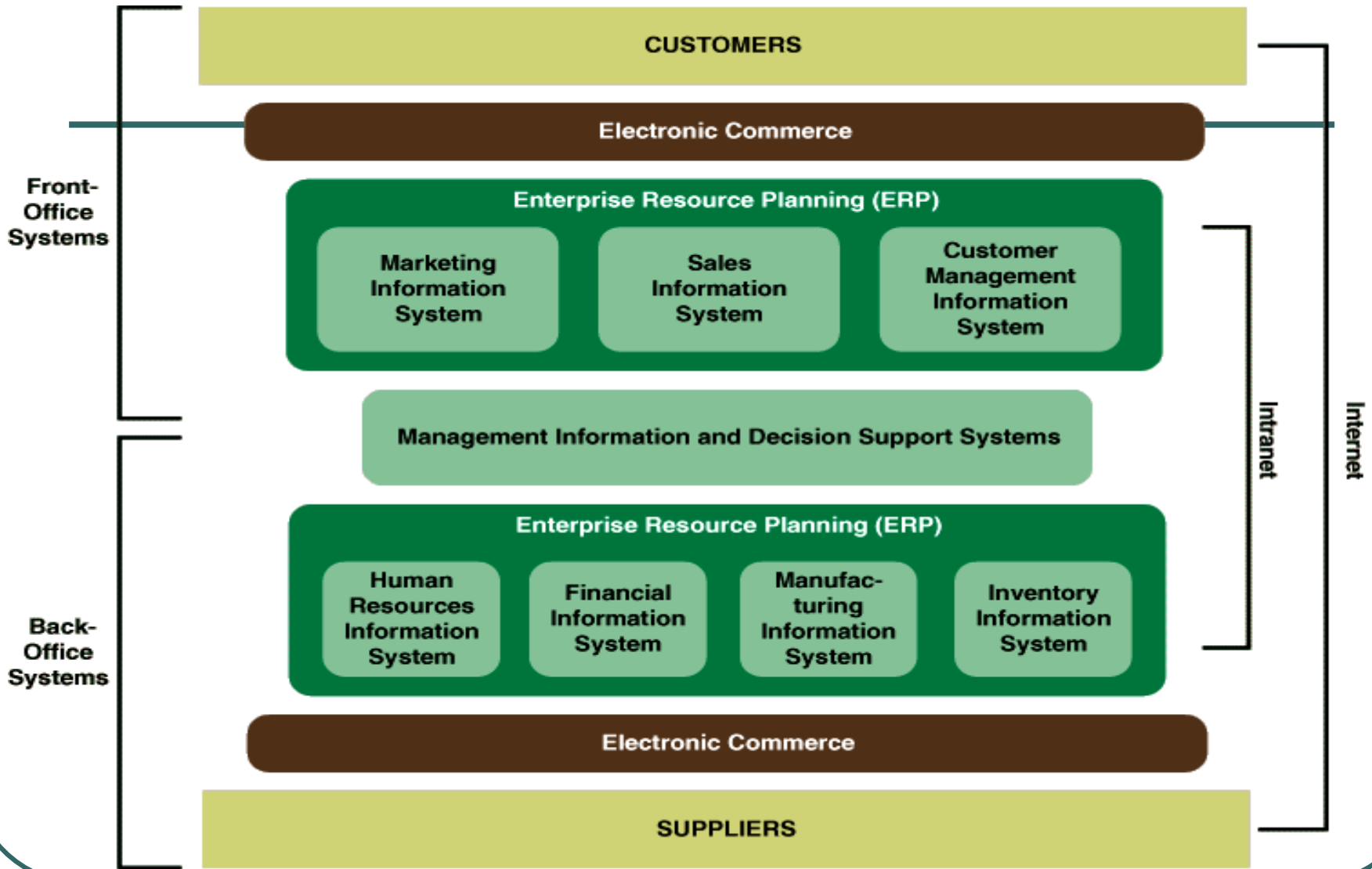
Data are **raw facts** about the organization and its business transactions. Most data items have little meaning and use by themselves.

Information is **data that has been refined and organized** by processing and purposeful intelligence. The latter, purposeful intelligence, is crucial to the definition—People provide the purpose and the intelligence that produces **true** information.

Front- and Back-Office Information Systems

- **Front-office information systems** support **business functions** that **reach out to customers** (or constituents).
 - Marketing
 - Sales
 - Customer management
- **Back-office information systems** support internal **business operations** and **interact with suppliers** (of materials, equipment, supplies, and services).
 - Human resources
 - Financial management
 - Manufacturing
 - Inventory control

A Federation of Information Systems



Classes of Information Systems

- Transaction processing systems
- Management information systems
- Decision support systems and EIS
- Expert systems
- Office automation systems

Transaction Processing

Transaction processing systems are information system applications that **capture and process data** about business transactions.

- Includes **data maintenance**, which provides for custodial updates to stored data.
- **Business process redesign (BPR)** is the study, analysis, and redesign of fundamental business (transaction) processes to reduce costs and/or improve value added to the business.

Management Information Systems

A management information system (MIS) is an information system application that provides for **management-oriented reporting**. These reports are usually generated on a predetermined schedule and appear in a prearranged format.

Decision Support Systems

A decision support system (DSS) is an information system application that provides its users with **decision-oriented information** whenever a decision-making situation arises. When applied to executive managers, these systems are sometimes called **executive information systems (EIS)**.

- **A data warehouse** is a **read-only, informational database** that is populated with **detailed, summary, and exception** data and information generated by other transaction and management information systems. The data warehouse can then be accessed by end-users and managers with DSS tools that generate a virtually limitless variety of information in support of unstructured decisions.

Expert Systems

An expert system is a programmed decision-making information system that captures and reproduces the knowledge and expertise of an expert problem solver or decision maker and then simulates the “thinking” or “actions” of that expert.

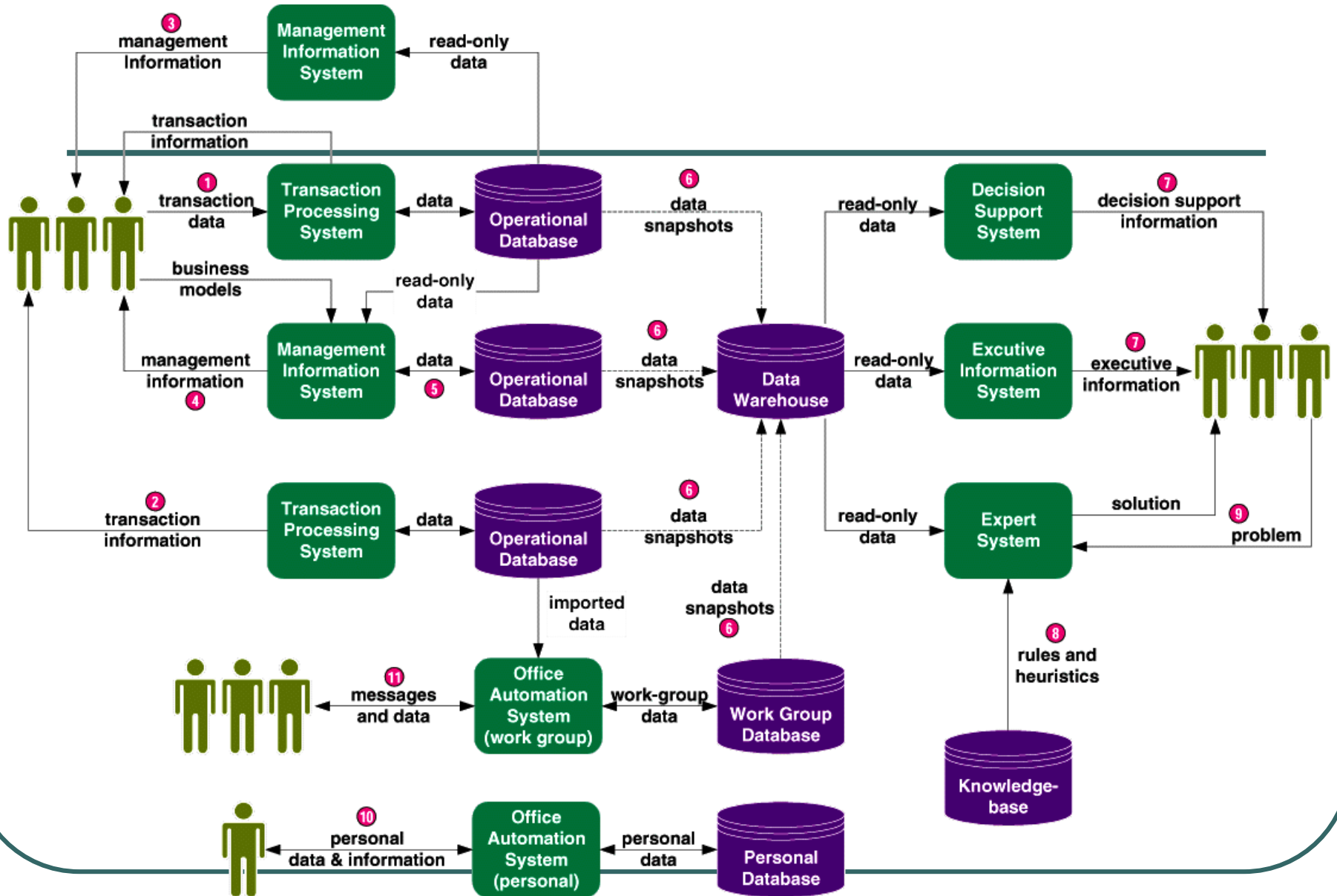
- Expert systems are implemented with **artificial intelligence** technology that captures, stores, and provides access to the reasoning of the experts.

Office Automation Systems

Office automation (OA) systems support the wide range of business **office activities** that provide for improved work flow and communications between workers, regardless of whether or not those workers are located in the same office.

- **Personal information systems** are those designed to meet the needs of a **single user**. They are designed to boost an individual's productivity.
- **Work group information systems** are those designed to meet the needs of a **work group**. They are designed to boost the group's productivity.

Information Systems Applications



Information Systems Architecture

Information systems architecture provides a unifying **framework** into which various people with different perspectives can organize and view the fundamental building blocks of information systems.

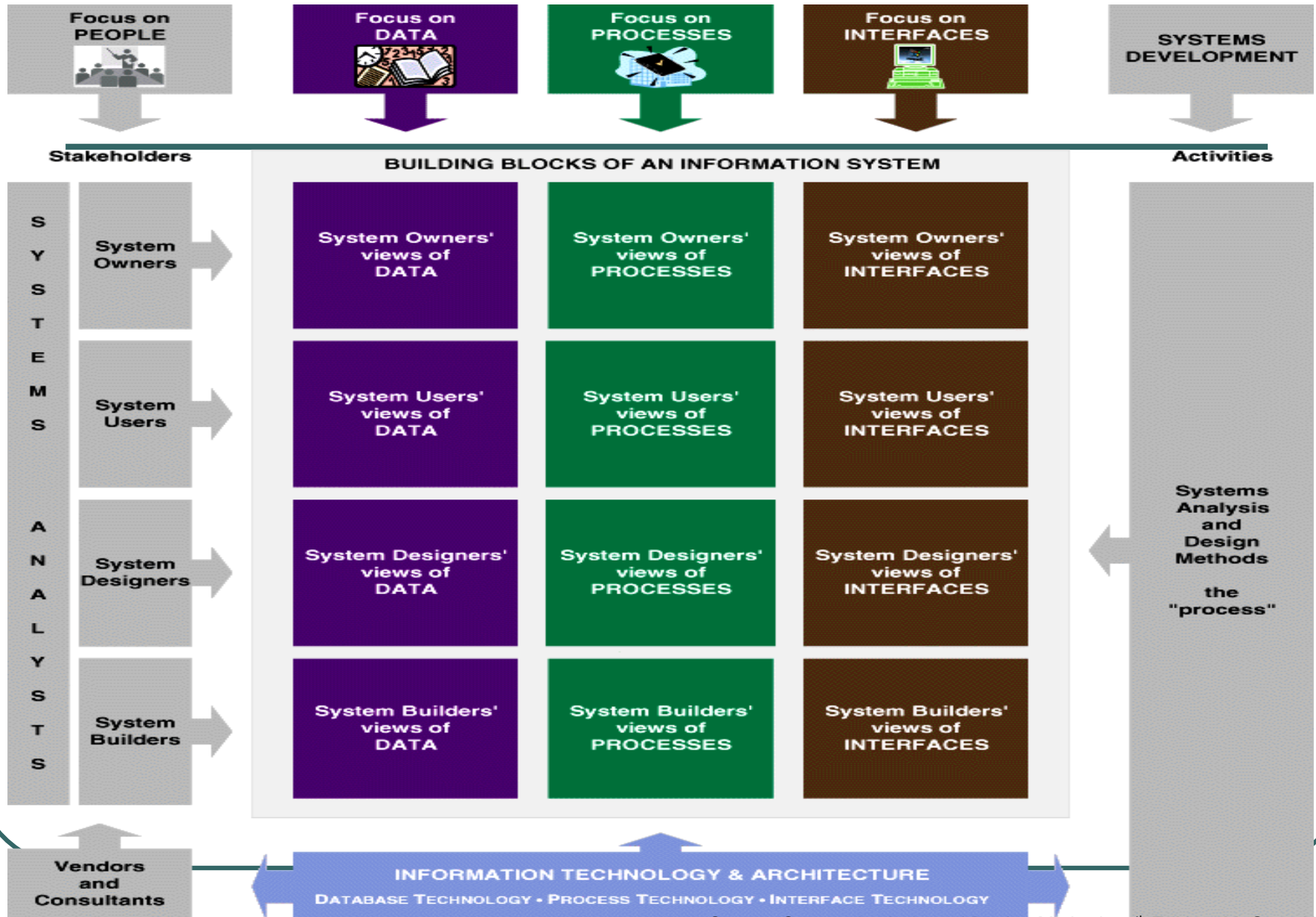
Perspectives or Stakeholders

- **System owners** pay for the system to be built and maintained.
- **System users** use the system to perform or support the work to be completed.
- **System designers** design the system to meet the users' requirements.
- **System builders** construct, test, and deliver the system into operation.
- **Systems analysts** facilitate the development of information systems and computer applications by bridging the communications gap that exists between nontechnical system owners and users and technical system designers and builders.
- **IT vendors and consultants** sell hardware, software, and services to businesses for incorporation into their information systems.

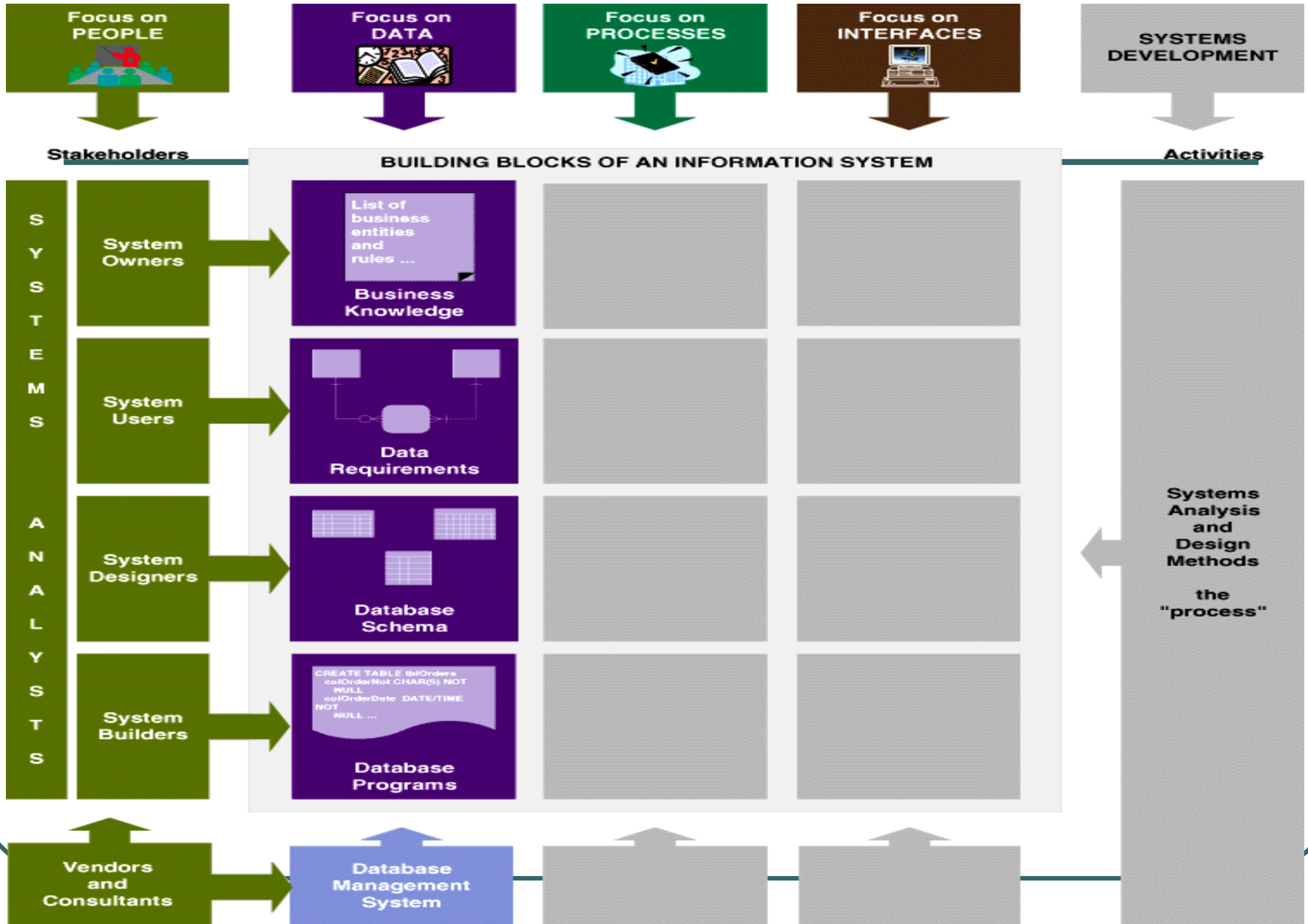
Focuses for Information Systems

- **Data**—the raw material used to create useful information.
- **Processes**—the activities (including management) that carry out the mission of the business.
- **Interfaces**—how the system interfaces with its users and other information systems.

Information System Building Blocks



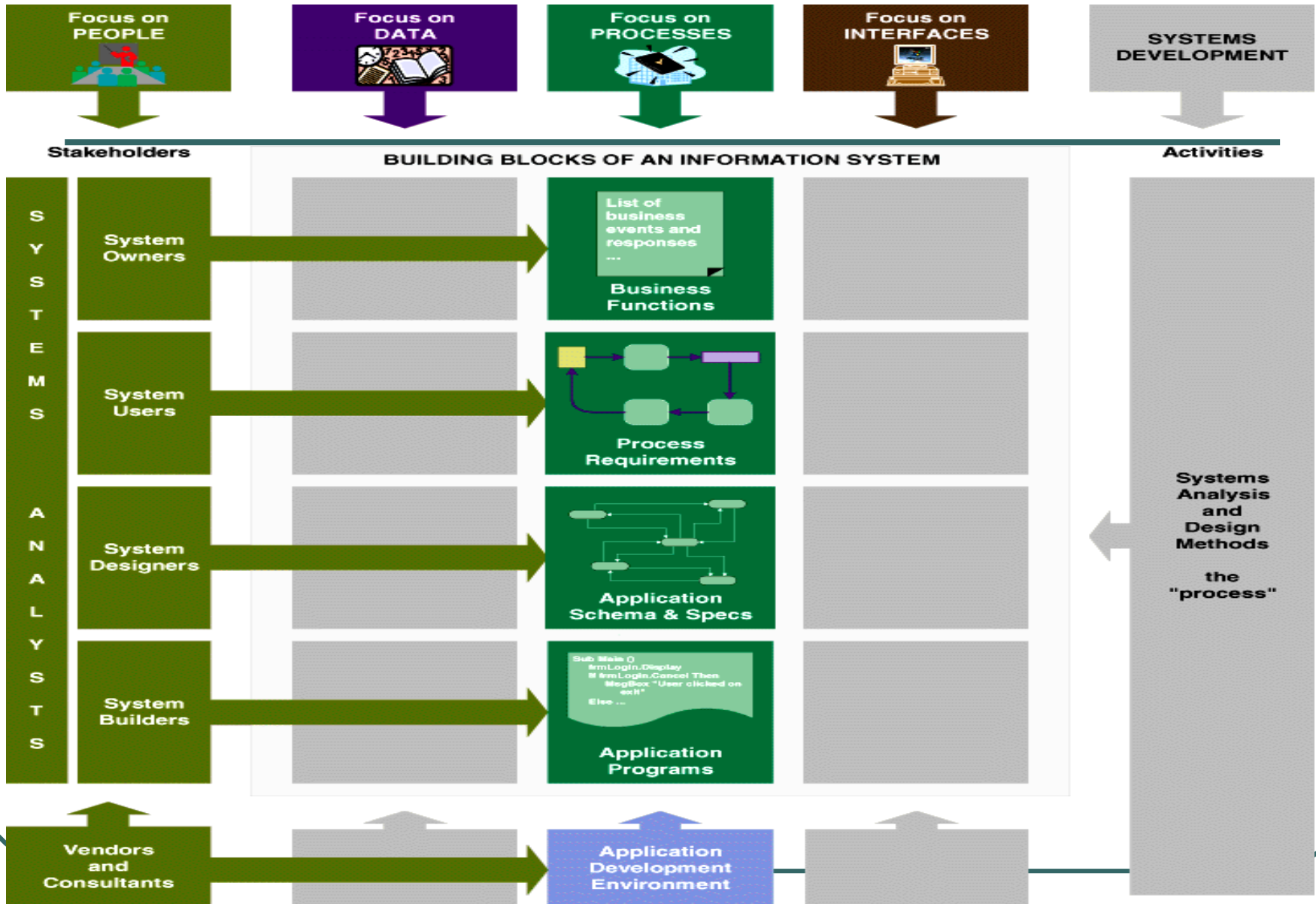
The DATA Focus



The DATA Focus

- System **owners'** perspective
 - **Business knowledge** is the insight that is gained from timely, accurate, and relevant information. (Recall that information is a product of raw data.)
- System **users'** perspective
 - **Data requirements** are a representation of users' data in terms of entities, attributes, relationships, and rules. Data requirements should be expressed in a format that is independent of the technology that can or will be used to store the data.
- System **designers'** perspective
 - **Database schema**
- System **builders'** perspective
 - **Database management system**

The PROCESS Focus



The PROCESS Focus

- System **owners'** perspective
 - **Business functions** are **ongoing activities** that support the business. Functions can be decomposed into other subfunctions and eventually into processes that do specific tasks.
 - A **cross-functional information system** supports **relevant business processes** from several business functions without regard to traditional organizational boundaries (**barriers**) such as divisions, departments, centers, and offices.

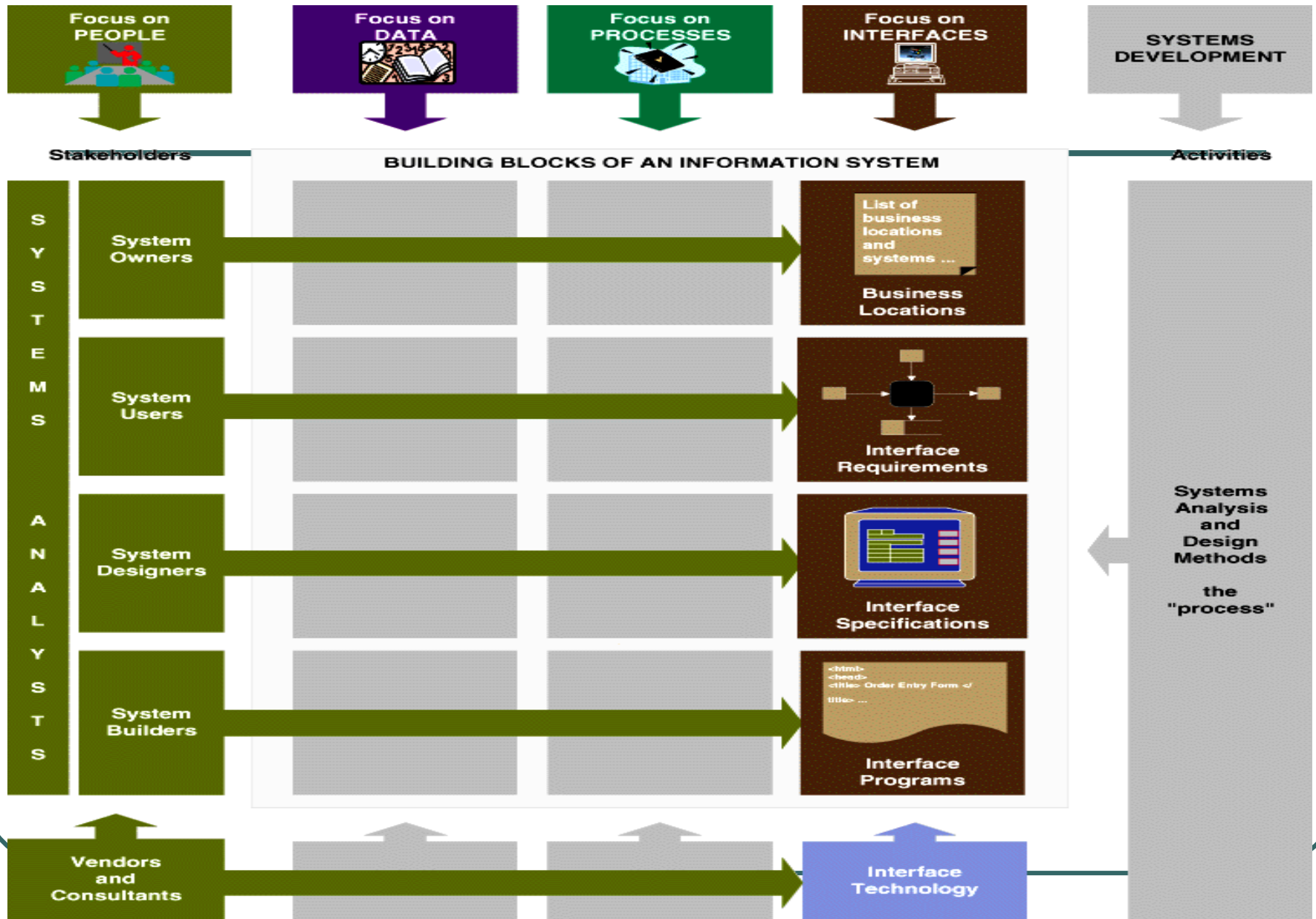
The PROCESS Focus (continued)

- System **users'** perspectives
 - **Business processes** are activities that respond to **business events**. Business processes are the “work” performed by the system.
 - **Process requirements** are a representation of the users' business processes in terms of **activities**, data flows, or work flow.
 - A **policy** is a **set of rules** that govern a business process.
 - A **procedure** is a step-by-step set of **instructions** and logic for accomplishing a business process.

The PROCESS Focus (continued)

- System **designers'** perspectives
 - An **application schema** is a **model** that communicates **how** selected business processes are, or will be, implemented using the software and hardware.
 - **Software specifications** represent the **technical design** of business processes to be automated or supported by computer programs to be written by system builders.
- System **builders'** perspectives
 - **Application programs** are **language-based, machine-readable representations** of what a software process is supposed to do, or how a software process is supposed to accomplish its task.
 - **Prototyping** is a **technique for quickly building a functioning**, but incomplete model of the information system using rapid application development tools.

The INTERFACE Focus



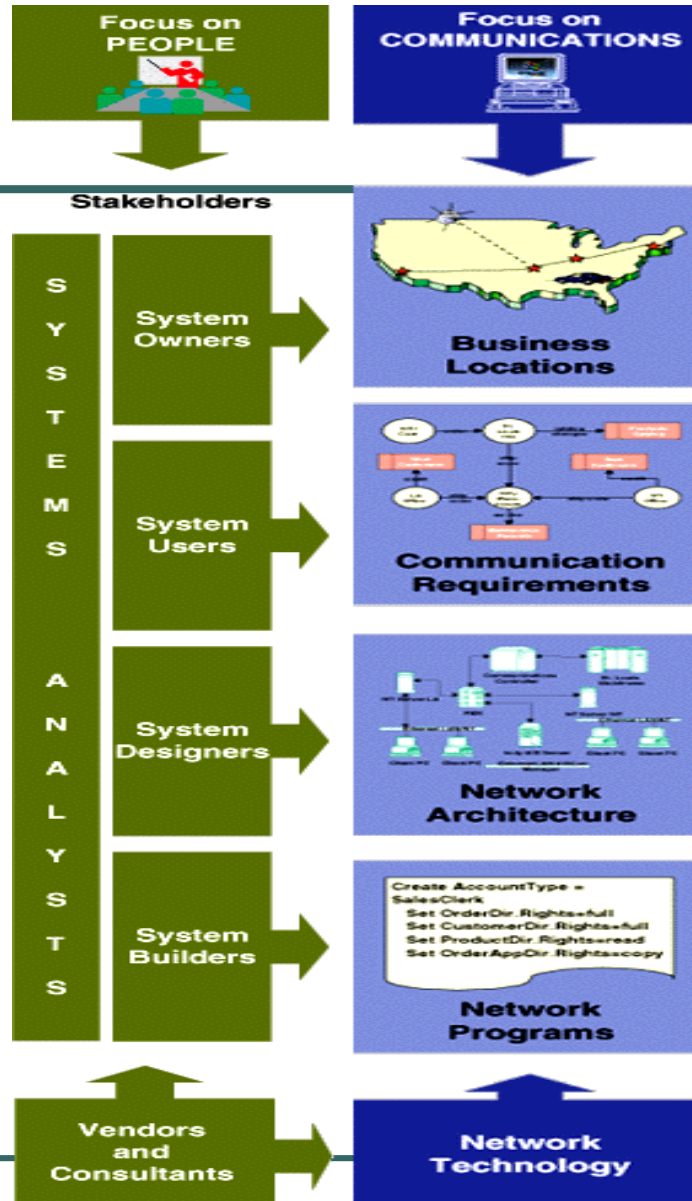
The INTERFACE Focus

-
- System owners' perspective
 - System users' perspectives
 - **Interface requirements** are a representation of the **users' inputs and outputs**.
 - System designers' perspective
 - **User dialogues** describe how the user moves from window-to-window, interacting with the application programs to perform useful work.
 - System builders' perspective
 - **Middleware** is a layer of **utility software** that sits in between application software and systems software to transparently integrate differing technologies so that they can interoperate.

Information System Building Blocks



A COMMUNICATIONS Focus in IS



Summary

- **Data Vs. Information.**
- **Role of information technology in information systems.**
- **Front- and Back-office information systems.**
- **Five classes of information system applications (transaction processing, management information, decision support, expert, and office automation systems) and how they interoperate.**
- **Name three focuses for information systems.**
 - **DATA**
 - **PROCESS**
 - **INTERFACE**