Here is the complete text extracted from the provided document, organized sequentially:

SYSTEM DEVELOPMENT AND SYSTEM ANALYST

In business and technology, systems development refers to the process of examining, confirming a business situation with the intent of improving it through developing and applying new or updated procedures and technologies. Systems development can generally be thought of as having two major components: Systems analysis and Systems design.

- **System analysis** is the process of gathering and interpreting facts, diagnosing problems, and using the information to recommend improvements to the system. This is the job of the systems analyst.
- **System design** is the process of planning a new business system or one to replace or complement an existing system. But before this planning can be done, we must thoroughly understand the old system and determine how computers can best be used to make its operation more effective.

In technical terms, systems development is the process of defining, designing, testing, and implementing a new software application or program. It could include the internal development of customized systems, the creation of database systems, or the acquisition of third-party developed software.

The systems analyst plays a major role in the information systems development process. The systems analyst works closely with all project team members so that the team develops the right system in an efficient way. Systems analysts must understand how to apply technology to solve business problems. In addition, being a systems analyst requires a wide range of skills:

- **Technical skills:** Analysts must have the technical skills to understand the organization's existing technical environment, the new system's technology foundation, and the way in which both can be fit into an integrated technical solution.
- **Business skills:** Required to understand how IT can be applied to business situations and to ensure that the IT delivers real business value.
- **Problem-solving skills:** Analysts are continuous problem solvers at both the project and the organizational level, and they put their analytical skills to the test regularly.
- **Communication skills:** Often, analysts need to communicate effectively, one-on-one with users and business managers (who often have little experience with technology) and with programmers (who often have more technical expertise than the analyst does).

- **Interpersonal ethics:** Analyst must be fair and honest with other project team members, managers, and system users. Analysts often deal with confidential information or information that, if shared with others, could cause harm.

SYSTEM ANALYST ROLES

Developing systems usually causes a group of people to work together, especially with large-scale systems. But in smaller organizations, one person may do several jobs and play several roles or may even hire a single person for the development. The team is commonly

composed of a programmer/coder, layout designer, database designer, and the analyst that serves as the team leader. The analyst will pilot the team and must at least have basic knowledge of the nature of work of all the other team members. Specifically, the analyst has the following roles:

- **The systems analyst role (primary role):** Focuses on the IS issues surrounding the system. The work includes:
  - Developing ideas and suggestions for ways that IT can support and improve business processes.
  - Helping design new business processes supported by IT.
  - Designing the new information system.
  - Ensuring that all IS standards are maintained.
- **The business analyst role:** Focuses on the business issues surrounding the system. The work includes:
  - Helping to identify the business value that the system will create.
  - Developing ideas for improving business processes.
  - Helping design new business processes and policies.
  - Must have business training and experience, plus knowledge of analysis and design.
- **The requirements analyst role:** Focuses on eliciting requirements from the stakeholders associated with the new system. The work includes:
  - Must understand the business well.
  - Being excellent communicators.
  - Highly skilled in an array of requirements elicitation techniques.
- **The infrastructure analyst role:** Focuses on technical issues surrounding the ways the system will interact with the organization's technical infrastructure (hardware, software, networks, and databases). The work includes:
  - Ensuring that the new information system conforms to organizational standards.
  - Helping to identify infrastructure changes that will be needed to support the system.
  - Must have significant training and experience in networking, database administration, and various hardware and software products.
- **The change management analyst role:** Focuses on the people and management issues surrounding system installation. The work includes:
  - Ensuring that adequate documentation and support are available to users.
  - Providing user training on the new system.
  - Developing strategies to overcome resistance to change.
  - Must have significant training and experience in organizational behavior and specific expertise in change management.
- **The project manager role:** Ensures that the project is completed on time and within budget and that the system delivers the expected value to the organization.
  - Often a seasoned systems analyst.
  - Must have acquired specialized project management knowledge and skills.
  - Sometimes assumes the analyst role.

The roles and the names used to describe them may vary from organization to organization. In addition, there is no single typical career path through these professional roles.

SYSTEM DEVELOPMENT LIFE CYCLE (SDLC)

System Development Life Cycle or SDLC is a process followed for a software project, either systems or applications. It consists of a detailed plan describing how to confirm, develop, maintain, replace, and enhance specific software.
The life cycle defines a methodology for improving the quality of software and the overall development process. A candidate system is approached after the analyst has a deep understanding of user needs and problems.

SDLC Stages:

1. **Planning**
2. **Analysis**
3. **Design**
4. **Development**
5. **Testing**
6. **Implementation**
7. **Running and Maintenance**
8. **Review**

SDLC STAGE 1: PLANNING

The planning phase is the fundamental process of understanding why an information system should be built and determining how the project team will go about building it.
A system project will not start for no apparent reason. It must have been initiated by someone (we will generally call him the user). Based on the user's requests, the System Analyst (SA) will check the background of the problems to see if it is possible to solve them. After the study, the SA will produce a feasibility report. This report will describe the scope of the new system and contains estimates of the time, costs, and benefits that would result from the system.

Outcomes of Planning:

- **System request:** A brief summary of a business need, explaining how a system that supports the need will create business value.
- **Feasibility report/study:** Investigates the information needs of users and determines resource requirements, costs, benefits, and feasibility.

System Initiation

Projects are identified when someone recognizes a business need that can be satisfied through the use of information technology. Project initiation is the point at which an organization creates and assesses the original goals and expectations for a new system.

Preparing System Request Form

The first deliverable (outcome) on the planning stage is called a system service request, or more known as the system request. It is a standard form used for requesting systems

development work with the entries below:

- **System Name:** The proposed name of the Information System.
- **System Sponsor:** The person who initiated the system and has the greatest interest in making it successful.
- **Department/Position:** Department or position of the sponsor.
- **Phone:** Contact number of the sponsor.
- **E-mail:** Email address of the sponsor.
- **Type of Request:** New System, System Error Correction, or System Enhancement.
- **Business Need:** List describing why the information system should be built.
- **Functionality:** List of key features of the system.
- **Expected Value:** List of expected gains after system implementation.

Conducting and Preparing Feasibility Study

Feasibility analysis helps determine whether to proceed with the project and identifies risks. Most organizations assess three core areas:

1. **Technical Feasibility:** Concerned with specifying equipment and software that will successfully satisfy user requirements (output time, response time, transaction volume, data communication). Generally the most difficult to determine.
2. **Economic Feasibility:** Also known as cost/benefit analysis. Compares expected benefits and savings with costs.
   - *Cash Flow Analysis and Measures:* Measures inflows and outflows over some future period.
   - *Return on Investment (ROI):* Measures the average rate of return earned on money invested. Formula: $\text{ROI} = (\text{Total Benefits} - \text{Total Costs}) / \text{Total Costs}$.
3. **Operational Feasibility:** Related to human, organizational, and political aspects (disturbed structures, required skills, training availability).

Interrelated Types of Feasibility:

- **Social Feasibility:** Determination of whether a proposed project will be acceptable to people.
- **Management Feasibility:** Determination of whether a proposed project will be acceptable to management.
- **Legal Feasibility:** Determination of whether a proposed project infringes on known Acts, statutes, or pending legislation.
- **Time Feasibility:** Determination of whether a proposed project can be implemented fully within a stipulated time frame.

SDLC STAGE 2: ANALYSIS

Based on the feasibility report, the SA will carry out a requirement analysis using techniques like **interviewing, observation, questionnaires, and/or reading manuals**. Gathered data is documented using tools like **Data Flow Diagrams and/or Run Charts**, followed by a verification presentation to the user.
Once confirmed, the SA produces the **system specification**, which includes:

- The data/information flow
- The file storage organization
- The system requirements

SDLC STAGE 3: DESIGN

Based on the system specification, the SA or Senior Programmer produces the **program specification** ensuring adherence to standards and test schedules. Typically consists of:

- Program/module description and objectives
- Input file(s) specification
- Output file(s) specification
- Processing requirement

Common design methods used before coding include **Jackson Structured Programming, Pseudocode, and Flowchart**.

SDLC STAGE 4: DEVELOPMENT

Converts the design into workable solutions (programs or modules). Divided into two main activities:

1. **File creation**
2. **Application program creation**

Detailed documentation includes **Input and output specifications, Data dictionary, and Operating instructions**.

SDLC STAGE 5: TESTING

Testing and debugging are carried out according to the SA's schedule. Changes can be made to any previous stage to rectify errors. Generated documents include:

- **Test log**
- **Test plan**
- **Test data**
- **Test results**

SDLC STAGE 6: IMPLEMENTATION

Includes hardware installation, user handover, and covers:

- User training
- Data conversion
- Control procedures for the changeover

The 4 Implementation Methods:

1. Direct changeover
2. Parallel changeover
3. Pilot changeover
4. Phased/Gradual changeover

SDLC STAGE 7: RUNNING AND MAINTENANCE

The system becomes functional in a live environment. Live usage gives rise to maintenance requests due to undiscovered errors, requirement changes, or misunderstandings.

SDLC STAGE 8: REVIEW

An evaluation review is carried out by a neutral person after sufficient usage. Content includes:

- Objectives met
- Cost
- Performance
- Standards
- Recommendations

DATA, INFORMATION, AND INFORMATION SYSTEMS

- **Information:** Knowledge obtained from investigation, study, or instruction.
- **System:** A collection of related elements and components linked and organized for a common purpose.
- **Information System (IS):** Software that helps organize, analyze, and transform raw data into useful information for decision-making.

Components of an Information System:

1. **Hardware:** Processors, monitors, keyboards, printers, or traditional paper resources.
2. **Software:** Programs and applications used to process data.
3. **Database:** Online, cloud, or traditional device data storage.
4. **Network:** Technologies linking all components.
5. **Procedures:** Steps on how data is transformed.
6. **Users (Peopleware):** Developers, testers, maintenance managers, and operators.

Characteristics of a System:

- **Organization:** Structure and order (e.g., hierarchical chain of command).
- **Interaction:** How each component functions with other components.
- **Interdependence:** Parts of the system depend on one another.
- **Integration:** Holism of systems; parts work together to produce a synergistic effect.
- **Central Objective:** Real or stated goals driving the system.

CATEGORIES OF INFORMATION & TYPES OF INFORMATION SYSTEMS

1. **Strategic Information (Upper Management):** Long-range planning policies (population growth, financial investment trends). Supported by **Executive Information Systems (EIS) / Executive Support Systems (ESS)**.
2. **Managerial Information (Middle Management):** Short- and intermediate-range planning for implementation and control. Supported by **Management Information Systems (MIS)** (also called Management Reporting Systems).
3. **Operational Information (Workers):** Short-term, daily operational data. Supported by **Transaction Processing Systems (TPS)**.
4. **Decision Support Systems (DSS):** Combine data and analytical/modeling tools

(spreadsheets, what-if scenarios) to support semi-structured/unstructured decision-making for senior managers.