Here is the text scanned word for word from the provided document, organized using bullet points and avoiding charts and graphs:

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, then, 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 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 systems analysts require a wide range of 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 are required to understand how IT can be applied to business situations and to ensure that the IT delivers real business value.
    - Analysts are continuous problem solvers at both the project and the organizational level, and they put their analytical skills to the test regularly.
    - 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).
    - 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 makes group of people to work together, especially with large scale systems. But in smaller organizations, one person may do several jobs and

play several of roles or may even hire a single man for the development. The team is commonly composed of 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 on the nature of work of all the other team members. Specifically, the analyst has the roles:

- The systems analyst role (primary role) focuses on the IS issues surrounding the system. The work includes:
  - develops ideas and suggestions for ways that IT can support and improve business processes, helps design new business processes supported by IT
  - designs the new information system
  - ensures that all IS standards are maintained.
- The business analyst role focuses on the business issues surrounding the system. The work includes:
  - helps to identify the business value that the system will create
  - develops ideas for improving the business processes
  - helps 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 the requirements from the stakeholders associated with the new system. The work includes:
  - must understand the business well
  - 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:
  - ensures that the new information system conforms to organizational standards
  - helps 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 the system installation. The work includes:
  - ensures that adequate documentation and support are available to users
  - provides user training on the new system
  - develops 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 has 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 a systems or application. 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 & problems.

System Development Life Cycle Stages

- The system life cycle can be divided into eight phases. Although each phase is presented discretely, it is never accomplished as a separate step.

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

SDLC Stage 1: Planning

- A system project will not start for no apparent reasons. 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. After the planning the resulting outcomes are:
  - System request or a brief summary of a business need, and it explains how a system that supports the need will create business value.
  - Feasibility report/study.
- 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.

- This stage includes the preliminary study of proposed information system solution to the end users' problems. Because the development of Information System is a time consuming. The result of planning includes system request and a feasibility study. This study is a preliminary study which investigates the information needs of the users and determines the resource requirement, costs, benefits and feasibility of a proposed project.

System Initiation

- Projects are identified when someone recognizes a business need that can be satisfied through the use of information technology (development of an information system). Project initiation is the point at which an organization creates and assesses the original goals and expectations for a new system. The need for the system should be valid, imagine a small sari-sari store serving an average of 15 people a day adapting automated auditing system. It can be possible, but surely would lead to loss rather than gain.
- The first step in the process is to identify the business value for the system by developing a system request that provides basic information about the proposed system. Next, the analysts perform a feasibility analysis to determine the technical, economic, and organizational feasibility of the system.

Preparing System Request Form

- The first deliverable (outcome) on planning stage is called a system service request, or more known as the system request. It is a standard form that is used for requesting systems development work with the entries below:
  - **System Name:** The proposed name of the Information System. You may use standard names based on the nature of the system like 'Sales and Inventory', 'Auditing', 'Ordering', 'Student Profiling' and add the name of the establishment or organization (client).
  - **System Sponsor:** The person who has the greatest interest on making the system successful. The person who initiated the system (your client). The primary contact person from the client/business side.
  - **Department:** Department/Office of the sponsor. (Change to Position if Department is not applicable)
  - **Phone:** Contact number of the sponsor
  - **E-mail:** Email address of the sponsor
  - **Type of Request:** New System, System Error Correction, System Enhancement
  - **Business Need:** List that describes why the information system should be built and explains to the organization should funs the project.
  - **Functionality:** List of key features of the system discussed on a clear manner.
  - **Expected Value:** List of expected gains after the implementation of the system.

Conducting and Preparing Feasibility Study

- Once the need for the system and its business requirements have been defined, the approval committee may authorize the systems analyst to prepare a more detailed

business case to better understand the proposed information system project. Feasibility guides the organization in determining whether to proceed with the project. Feasibility analysis also identifies the important risks associated with the project that must be managed if the project is approved. As with the system request, each organization has its own process and format for the feasibility analysis, but most include techniques to assess three areas: technical feasibility, economic feasibility, and organizational feasibility.

- **Technical Feasibility:** This is concerned with specifying equipment and software that will successfully satisfy the user requirement. The technical needs of the system may vary considerably, but might include:
  - The facility to produce outputs in a given time.
  - Response time under certain conditions.
  - Ability to process a certain volume of transaction at a particular speed.
  - Facility to communicate data to distant location.
  - Out of all types of feasibility, technical feasibility generally is the most difficult to determine.
- **Economic Feasibility:** Economic analysis is the most frequently used technique for evaluating the effectiveness of a proposed system. Sometimes known as cost/benefit analysis; (but may also be in different approach) the procedure is to determine the benefits and savings that are expected from a proposed system and compare them with costs. If benefits outweigh costs, a decision is taken to design and implement the system. Below are the most common measures used as tools on economic feasibility:
  - **Cash Flow Analysis and Measures:** IT projects commonly involve an initial investment that produces a stream of benefits over time, along with some ongoing support costs. Therefore, the value of the project must be measured over time. Cash flows, both inflows and outflows, are estimated over some future period.
  - **Return on Investment:** The return on investment (ROI) is a calculation that measures the average rate of return earned on the money invested in the project. ROI is a simple calculation that divides the project's net benefits (total benefits total costs) by the total costs. A high ROI suggests that the project's benefits far outweigh the project's cost, although exactly what constitutes a "high" ROI is unclear. ROI is commonly used in practice; however, it is hard to interpret and should not be used as the only measure of a project's worth.
  - **Cost Benefit Analysis:** A cost benefit analysis (also known as a benefit cost analysis) is a process by which organizations can analyze decisions, systems or projects, or determine a value for intangibles. The model is built by identifying the benefits of an action as well as the associated costs, and subtracting the costs from benefits. When completed, a cost benefit analysis will yield concrete results that can be used to develop reasonable conclusions around the feasibility and/or advisability of a decision or situation.
- **Operation Feasibility:** It is mainly related to human organizational and political aspects. The points to be considered are:
  - What organizational structures are disturbed?
  - What new skills will be required? Do the existing staff members have these skills?
  - If not, can they be trained in due course of time?

- Generally, project will not be rejected simply because of operational infeasibility but such considerations are likely to critically affect the nature and scope of the eventual recommendations. This feasibility study is carried out by a small group of people who are familiar with information system techniques, who understand the parts of the business that are relevant to the project and are skilled in system analysis and design process.

- In the conduct of the feasibility study, some more interrelated types of feasibility that can be considered are the following:
  - **Social Feasibility:** Social feasibility is a determination of whether a proposed project will be acceptable to the people or not. This determination typically examines the probability of the project being accepted by the group directly affected by the proposed system change.
  - **Management Feasibility:** It is a determination of whether a proposed project will be acceptable to management. If management does not accept a project or gives a negligible support to it, the analyst will tend to view the project as a non-feasible one.
  - **Legal Feasibility:** Legal feasibility is a determination of whether a proposed project infringes on known Acts, statutes, as well as any pending legislation. Although in some instances the project might appear sound, on closer investigation it may be found to infringe on several legal areas.
  - **Time Feasibility:** Time feasibility is a determination of whether a proposed project can be implemented fully within a stipulated time frame. If a project takes too much time it is likely to be rejected.

SDLC Stage 2: Analysis

- Based on the feasibility report, the SA will carry out a requirement analysis. The SA will use techniques like interviewing, observation, questionnaires and/or reading of manuals to find out from the user the new system's requirements. What the SA has gathered will be documented using tools like Data Flow Diagrams and/or Run Charts. There will normally be a presentation by the SA to the user to verify the findings.
- Once the findings have been confirmed to be accurate, the SA will design a system that will meet the user's requirements. The SA will produce the system specification, which includes:
  - The data/information flow
  - The file storage organization
  - The systems requirements

SDLC Stage 3: Design

- Based on the system specification, the SA or the Senior Programmer will then produce the program specification for each of the programs (if there is more than one program). The SA or the Senior Programmer will have to ensure that all program specifications adhere to the system specification and standards. They will also have to ensure that a test schedule is prepared for each program.
- Typically, the program specification consists of:
  - Program/module description and objectives

- Input file(s) specification
- Output file(s) specification
- Processing requirement

- The programmer will take the program specification and use a method agreed upon to design the program before coding it. Common methods are Jackson Structured Programming, Pseudocode and Flowchart.

SDLC Stage 4: Development

- When the design is completed, the development stage begins, which is to convert the design into workable solutions (programs or modules)
- The development stage can be divided into two main activities:
  - File creation
  - Application program creation
- Detailed documentation on the files and program used in the system are also done at this stage. These include:
  - Input and output specifications
  - Data dictionary
  - Operating instruction

SDLC Stage 5: Testing

- Throughout the development, and as a separate stage after development is completed, testing and debugging will be necessary. Tests will be carried out according to the schedule prepared by the SA or Senior Programmer. During the process of testing, changes can be made in any of the previous stages to rectify any errors or problems discovered.
- At this stage, the documents generated are:
  - Test log
  - Test plan
  - Test data
  - Test results

SDLC Stage 6: Implementation

- After adequate testing, implementation of the system takes place. The stage includes the installation of the hardware before the system is handed over to the user. It covers:
  - User training
  - Data conversion
  - Control procedures for the changeover
- The System Analyst will be responsible for the implementation plan which covers in detail the time frame for each of the activities mentioned above, and the duties and responsibilities of each of the personnel involved.
- The 4 implementation methods:
  - Direct changeover

- Parallel changeover
- Pilot changeover
- Phased/Gradual changeover

SDLC Stage 7: Running and Maintenance

- This is the stage where the system becomes functional in a live environment and is expected to be able to cope with any of the situations it is built to handle.
- Live usage gives rise to maintenance requests. Errors may be detected which might have slipped through the testing stage. There may be changes in the user requirements or discovery of requirements which have not been included in the first place due to a misunderstanding between the user and the System Analyst.

SDLC Stage 8: Review

- Once the "dust" has settled, i.e. the system has been used for a sufficient length of time and emergencies have been coped with, an evaluation review should be carried out. The review should be carried out by a person who has not been involved in the design and development stages so as to ensure that the review will be carried out objectively. The content of the review will include:
  - Objectives met
  - Cost
  - Performance
  - Standards
  - Recommendations
- After the review, maintenance may be carried out to enhance the system or it may be decided that part or the whole of the system needs to be re-designed, and hence re-developed. If redesigning needs to be done, the initial study will come in again, thus calling into play the entire System Life Cycle once more.
- The overall process covers:
  - The concept of a system.
  - The various stages of the system life cycle.
  - The activities at each stage.
  - The people involved at each stage.
  - Documentation used in each stage.

Data, Information and Information Systems

- Information is defined as knowledge obtained from investigation, study, or instruction. Good and correct information is essential for effective operation and decision making at all levels in businesses.
- On the other hand, a system is a collection of related elements and components that are linked and organized for a common purpose.
- Basing on the two terminologies, you can make an analogy of how important an information system is. It is a systematic grouping of several technologies used to manage, process and present data and information.

- The existence of a system is driven by a need to answer a problem and/ or achieve specific objective/s.
- Every time a transaction is done, data are taken from a particular party, kept in a database/data storage. These data are processed to become information to answer questions and solve problems.
- An information system is defined as the software that helps organize and analyze data to be interpreted, transformed, arranged, and managed as information. So, the purpose of an information system is to turn raw data into useful information that can be used for decision making in an organization.

Components of an Information System

- Information systems are made up of different components that work together to provide value to an organization. While information systems may differ in how they are used within an organization, they usually contain the following components:
  - **Hardware:** Information systems use computer hardware, such as processors, monitors, keyboard and printers. Traditional systems use paper-based resources such as logbooks and filing cabinets.
  - **Software:** These include programs and applications used to process and transform data.
  - **Database:** Information systems requires a database that keeps all the data. It can be a traditional device or a modern form: online and cloud.
  - **Network:** These includes technologies or techniques used to linked and integrate all components.
  - **Procedures:** These are set of steps on how the data are transformed to information.
  - **Users:** Sometimes called peopleware, users are the last component of an information system. Includes the developers, testers, maintenance managers and operators.

Characteristics of an Information System

- Based on the definition of a system, one must bear the following characteristics: organization, interaction, interdependence, integration and a central objective.
  - **Organization:** It implies structure and order. It is the arrangement of components that helps to achieve objectives. In the design of a business system, for example, the hierarchical relationships starting with the president on top and leading downward to the blue-collar workers represents the organization structure. Such an arrangement portrays a system subsystem relationship, defines the authority structure, specifies the formal flow of communication and formalizes the chain of command. Likewise, a computer system is designed around an input device, a central processing unit, an output device and one or more storage units. When linked together they work as a whole system for producing information.
  - **Interaction:** It refers to the manner in which each component functions with other components of the system. In an organization, for example, purchasing must interact with production, advertising with sales and payroll with personnel. In a computer system, the central processing unit must interact with the input device to solve a problem. In turn, the main memory holds programs and data that the arithmetic unit uses for

computation. The interrelationship between these components enables the computer to perform.

- **Interdependence:** It means that parts of the organization or computer system depend on one another. They are coordinated and linked together according to a plan. This interdependence is crucial in systems work. An Integrated information system is designed to serve the needs of authorized users (department heads, managers, etc.) for quick access and retrieval via remote terminals.
- **Integration:** It refers to the holism of systems. Synthesis follows analysis to achieve the central objective of the organization. Integration is concerned with how a system is tied together. It is more than sharing a physical part or location. It means that parts of the system work together within the system even though each part performs a unique function. Successful integration will typically produce a synergistic effect and greater total impact than if each component works separately.
- **Central Objective:** The last characteristic of a system is its central objective. Objectives may be real or stated. Although a stated objective may be the real objective, it is not uncommon for an organization to state one objective and operate to achieve another.

Categories of Information

- There are three categories of information related to managerial levels and the decision managers make.
  - **Strategic Information:** Relates to long-range planning policies that are of direct interest to upper management. Information such as population growth, trends in financial investment and human resources changes would be of interest to top company officials who are responsible for developing policies and determining long-range goals.
  - **Managerial Information:** Of direct use to middle management and department heads for implementation and control. This information is of use in short- and intermediate-range planning that is months rather than years. It is maintained with the aid of management Information systems (MIS).
  - **Operational Information:** Short-term, daily information used to operate departments and enforce the day-to-day rules and regulations of the business.

Types of Information System

- Information systems are categorized based on their various management levels. The highest layer is the Executive Information Systems, then Decision Support Systems for senior managers, Management Information Systems for middle managers and lastly the Transaction Processing Systems for workers.
  - **Executive Information Systems (EIS):** This system is designed to address unstructured decision-making at the strategic level of an organization. The systems at strategic level help senior managers in long-term planning. It employs advanced graphics and communications software for creating a generalized computing and communications environment. Sometimes tagged as Executive Support Systems (ESS) and a parallel system to Decision Support Systems.
    - Examples: In a retail business, it will have the Accounting module, Human resource,

Marketing module, sales module, Supply chain management module, Quality control module and the customer relationship module. Banks use this system to assess mortgage loans, this system collect information from the customers, assess their credit based on the information supplied to the system, this is then used to determine the output based on defined criteria programmed in the system.

- **Management Information Systems (MIS):** This system is designed to serve the functions of planning, controlling and decision-making at the management level of an organization. The system at management level support monitoring, controlling and decision-making activities of middle level managers. MIS is an information system that generates accurate, timely and organized information so managers and other users can make decisions, solve problems, supervise activities, and track progress. Because it generates reports on a regular basis, a management information system sometimes is called a Management Reporting System (MRS). Management information systems often are integrated with transaction processing systems.
  - Example: An Inventory module that notifies the purchasing department of items it needs to reorder.
- **Decision Support System (DSS):** Differ from MIS in mainly having more analytical power and more user-friendly capabilities. DSS combine data and analytical/modeling tools to support semi-structured/unstructured decision-making. Using spreadsheet software, you can complete simple modeling tasks or what-if scenarios.
- **Transaction Processing Systems (TPS):** This system is designed to serve the operational level of an organization. TPS record and process the daily routine transactions of the organization like, accounting, payroll, order processing, etc. A Transaction Processing System (TPS) is an information system that captures and processes data generated during an organization's day-to-day transactions. A transaction is a business activity such as a deposit, payment, order or reservation.
  - Sample: The system or module used by clerical staff in performing the activities associated with transaction processing, which include recording a business activity such as a student's registration, a customer's order, an employee's timecard or a client's payment.