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A THEORETICAL APPROACH TO AUTOMATION – SCOPE, CHALLENGES AND OPPORTUNITIES

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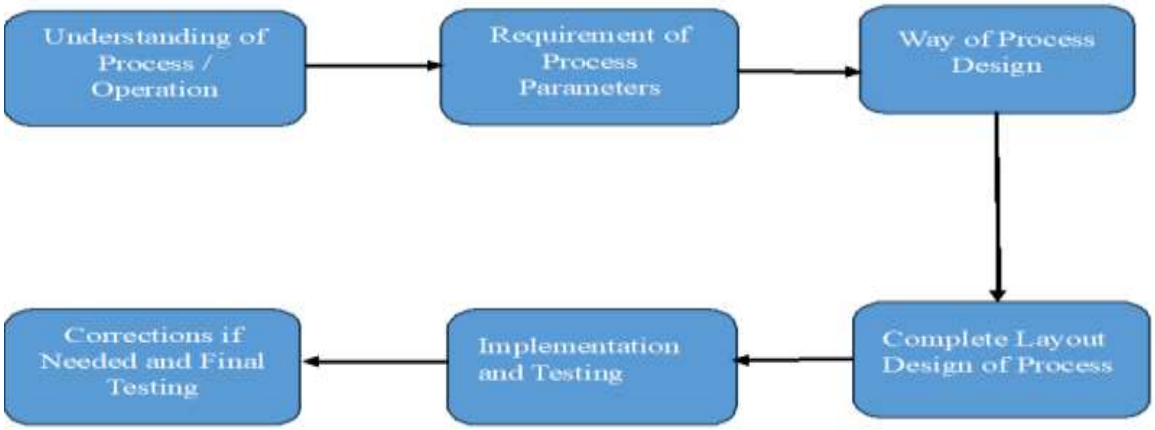
Abstract
Automation is defined as a technology that operates various processes without human assistance or with less human assistance. The aspects of automation implementation in any area are quality improvement, safe environment, time-saving, increased speed of operations, increased production rate, accuracy in work, error reduction, consistency in process, efficiency, smooth handling of complex processes, cost reduction, etc. Now, automation is a part of every area, including healthcare, manufacturing, industrial automation, education, sales and marketing departments, accounts handling, customer service help desk, etc. The purpose of writing a paper is to present a theoretical approach regarding automation, system design ideas, types of automation, their benefits, various applications, challenges with automation, and opportunities.

Keywords
Automation, Types of automation, Benefits of automation, challenges in automation, opportunities.

Introduction

Nowadays automation plays a crucial role in various sectors of work, customer satisfaction concerning all parameters is one of the most important aspects of choosing automation in multiple areas. With the advancement in automation, daily life becomes so much easier, one can have lots of solutions to solve problems in a simple way but on the other side there is a need for some challenges like awareness of the process, experienced user, skill to handle the process, working strategy maker, knowledge about the things, etc. In this paper, an attempt is made to cover what automation is and the basic details related to automation.

I. System Design Process



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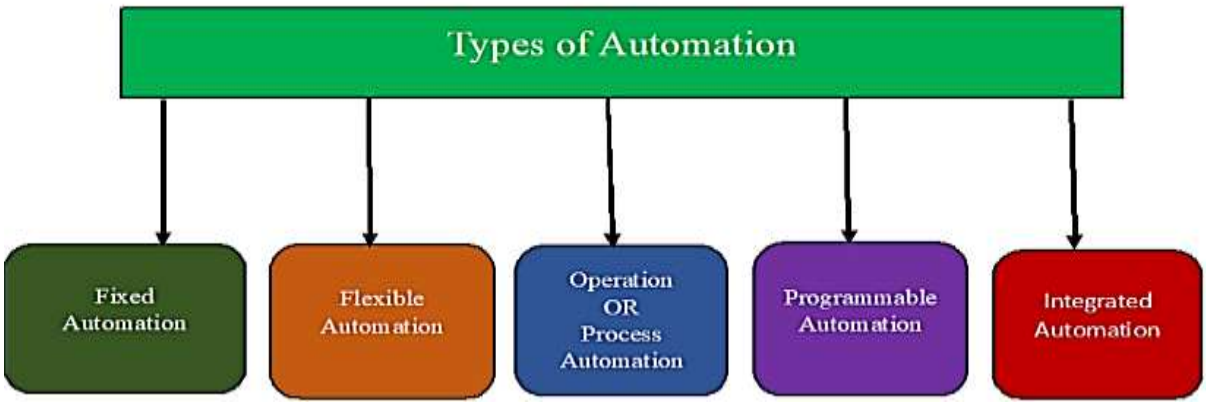
II. Types of Automation



Fixed Automation—The sequence of operations or processes is already decided and constant in fixed automation. The installation cost to build a setup for such type of automation is very high. It is useful to provide or produce consistency in the product production process. Changes in the production process are difficult to make once the process design is done.

Flexible Automation—Flexible automation overcomes the drawback of change adoption. This type of automation provides two facilities, which include reconfiguration and reprogramming.

Process (Operation) Automation—Process automation uses technology to make complex processes work automatically. Its advantages include error reduction, Time Savings, Time management, and production efficiency. Process automation uses software and technologies to complete the objectives of the business process.

Programmable Automation—Programmable automation provides or produces a product in batches. Programs control the sequence of operations or processes of the designed system. In this automation, computer-controlled devices monitor and control the operations of machinery or equipment used in a system.

Integrated Automation –It uses software and machines to perform a task or process with minimum inputs.

III. Applications of Automation

Various applications involve the concept of automation. Now, automation is an essential part of every working platform. Some main areas of the automation field are mentioned below.

(1)Industrial automation
(2)Agriculture
(3)Artificial Intelligence
(4)Robotics field
(5)Automotive industries
(6) Business Automation

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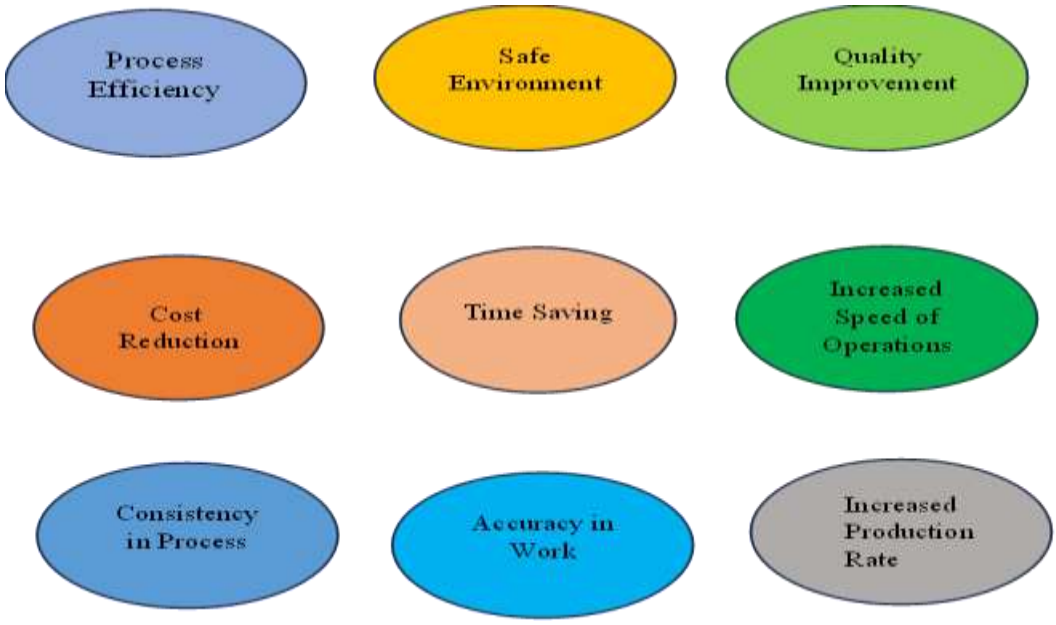
IV. Benefits of Automation



V. Challenges with Automation

The automation design of any system has various challenges on various platforms. e.g. manufacturing, installation, working environment, running process, production, etc. Some of them are listed below.

- To design an automation system for any task, the installation cost, manufacturing, and purchasing of various things require a huge investment.
- As a point of economic expenditure, the Maintenance cost of the system is also one of the parameters.
- From a technical point of view the proper data related to the application to be designed and skilled labour, employees have to be considered.
- Selection of particular equipment and tools according to process needs is also an important parameter of an automation system.
- Proper and effective communication among all process parameters as well as concern groups of working is also desirable.
- Adoption of new changes as per requirement or need of process.
- Fulfilment of various expectations of users.
- Total Dependency on automation creates a problem if the system is uncertainly failing. It will interrupt the working sector process.
- Fulfilment of resources requirement.

VI. Opportunities

Nowadays automation is a part of every sector. It makes the tasks or processes of day-to-day life easier. The complex processes can be handled easily with the use of automation. Some areas are mentioned below where one can easily find an opportunity.

- Automation Training
- Manufacturing Plants process
- E-commerce
- Social media platform
- Account sections
- Customer help support
- Healthcare sections

- Industrial automation
- Stock marketing automation
- Business automation
- Office automation
- Payment bill automation

VII. Outcome of an Automation

- Low-cost operations using various automation is possible.
- Smooth Handling, controlling, and changes with various processes are possible.
- Automatic control over the process is possible.
- Process consistency and a safe environment are the main objectives of automation are also possible.
- Complex processes are also run smoothly.

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