



EMBA Program  
MB-511

# **Data Science for Managerial Decisions (MB 511)**

## **A Short Course in Data Science using Python**

**Instructor**  
**Anant Prakash Awasthi**

# Data Science for Managerial Decisions (MB 511)

## Program Overview

- Introduction to Data Science
- Information Technology An Overview
- Applications of Data Science in various fields
- MIS and Control Systems
- Data Collection and Data Pre-Processing
- Building Information Systems
- Support Systems for Management Decisions



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# MIS and Control Systems

- Introduction to MIS and Control Systems
- Design and Implementation of MIS
- Control Systems in Action
- Challenges and Future Trends



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# MIS and Control Systems

## Introduction to Control Systems



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### Definition

- In the context of business management, a control system refers to a set of **processes, tools, and mechanisms** put in place to **regulate, monitor, and influence the activities** and **performance** of an organization. The primary goal of a control system is to **ensure that the organization's objectives are achieved efficiently and effectively**. It involves the establishment of **standards**, **measurement of actual performance**, **comparison of performance against standards**, and the **implementation of corrective actions** as necessary.

### Key components

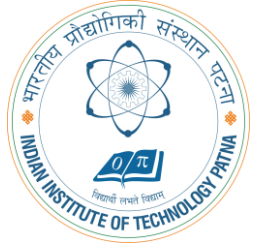
- A business management control system consists of essential components: **standards, setting performance benchmarks; measurement, collecting data** through metrics and KPIs; **comparison, analyzing actual performance against established standards; feedback**, utilizing **reporting systems** and loops for continuous improvement; corrective actions, adjusting operations based on identified deviations; and adaptability, ensuring flexibility and scalability to accommodate changing business dynamics. These components collectively enable proactive management, efficient decision-making, and the achievement of organizational objectives.

# MIS and Control Systems

## Designing Control Systems

Designing a control system involves a systematic process to regulate and optimize organizational performance. Key steps are outlined below:

- **Define Objectives:** Clearly articulate organizational goals to align control mechanisms with strategic objectives.
- **Establish Standards:** Set performance standards and benchmarks, defining expected outcomes in various areas.
- **Select Metrics:** Identify key performance indicators (KPIs) for measuring actual performance against standards.
- **Data Collection:** Implement systems for collecting relevant data through regular monitoring and reporting.
- **Deviation Analysis:** Regularly compare actual performance with standards, conducting root cause analysis for deviations.
- **Feedback Mechanisms:** Create effective communication channels to provide timely feedback on performance.
- **Corrective Actions:** Develop protocols for adjusting strategies and operations based on performance analysis.
- **Adaptability:** Design the control system to be flexible and scalable, capable of evolving with changing business dynamics.
- **Ethical Considerations:** Ensure that control mechanisms comply with ethical standards and legal requirements.
- **Continuous Improvement:** Establish feedback loops for ongoing evaluation and improvement of the control system.



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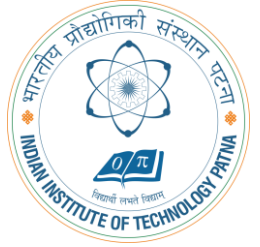
# MIS and Control Systems

## Designing Control Systems – Best Practices

Designing an effective control system in business management involves **implementing best practices** to ensure it **aligns with organizational objectives, promotes efficiency, and facilitates continuous improvement.**

By incorporating best practices, organizations can design and implement control systems that not only monitor performance but also contribute to **strategic success, employee engagement, and continuous organizational improvement.**

- **Clear Objectives and Standards:** Define precise organizational objectives and establish clear performance standards.
- **Strategic Alignment:** Ensure that the control system is closely aligned with the overall strategic goals of the organization.
- **Selecting Appropriate Metrics:** Choose relevant Key Performance Indicators (KPIs) that directly reflect organizational performance and goals.
- **Real-time Monitoring:** Implement real-time monitoring tools for prompt identification of deviations and immediate corrective actions.
- **Regular Reporting:** Establish regular reporting mechanisms to keep stakeholders informed and promote transparency.

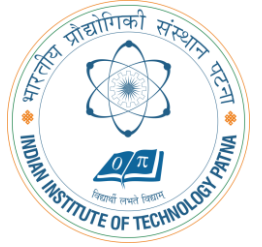


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## Designing Control Systems – Best Practices

- **Data Accuracy and Quality:** Ensure data accuracy and quality through rigorous validation processes and data governance.
- **Employee Involvement:** Involve employees in the control process, fostering a sense of ownership and responsibility for performance outcomes.
- **Balanced Approach:** Utilize a balanced mix of feedforward, concurrent, and feedback controls for comprehensive management.
- **Adaptability and Flexibility:** Design control systems that can adapt to changing business environments and requirements.
- **Continuous Improvement:** Foster a culture of continuous improvement by using feedback loops to make incremental adjustments.



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## Designing Control Systems – Best Practices

- **Ethical Considerations:** Ensure that control practices adhere to ethical standards and comply with legal requirements.
- **Clear Communication Channels:** Establish clear communication channels for disseminating control-related information to relevant stakeholders.
- **Risk Management:** Integrate risk management practices to identify and mitigate potential risks in a proactive manner.
- **Employee Training:** Provide comprehensive training to employees on control processes and systems to enhance effectiveness.
- **Regular Audits:** Conduct regular audits to assess the effectiveness of the control system and identify areas for improvement.



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# MIS and Control Systems

## Control Systems – Types

Management control systems are tools and processes that organizations use to **guide, monitor, and evaluate** their activities to ensure that they align with organizational goals. There are various types of control systems in management, each serving a specific purpose.

Organizations often use a combination of these control systems to create a comprehensive approach to managing and optimizing their operations. The selection of control systems depends on the nature of the organization, its goals, and the specific challenges it faces.

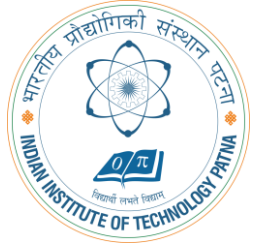
- Feedforward Control System
- Operational Control System
- Concurrent Control System
- Behavioral Control System
- Feedback Control System
- Cybernetic Control System
- Financial Control System
- Cultural Control System
- Strategic Control System
- Market Control System



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## Control Systems – Types



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### Feedforward Control:

- **Purpose:** Anticipates and prevents problems before they occur.
- **Implementation:** Establishes controls in advance based on forecasts and planning.
- **Example:** Pre-employment background checks to prevent potential issues.

### Concurrent Control:

- **Purpose:** Monitors activities as they occur to ensure adherence to standards.
- **Implementation:** Involves real-time monitoring and adjustment during ongoing processes.
- **Example:** Supervisors overseeing production lines to ensure quality standards are maintained.

### Feedback Control:

- **Purpose:** Assesses performance after the fact and makes adjustments based on results.
- **Implementation:** Involves reviewing outcomes and taking corrective actions.
- **Example:** Financial audits conducted after the close of a fiscal year to identify and rectify discrepancies.

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## Control Systems – Types



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### Financial Control:

- **Purpose:** Focuses on financial aspects, such as budgets, expenses, and revenue.
- **Implementation:** Involves budgetary controls, financial reporting, and variance analysis.
- **Example:** Monthly financial reviews to ensure spending aligns with budgetary constraints.

### Strategic Control:

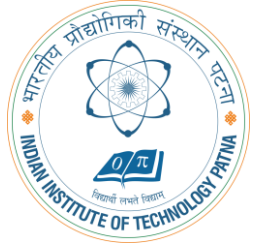
- **Purpose:** Evaluates the alignment of activities with the organization's long-term strategy.
- **Implementation:** Involves assessing performance in relation to strategic objectives.
- **Example:** Regularly reviewing and adjusting business strategies based on market trends.

### Operational Control:

- **Purpose:** Focuses on day-to-day activities to ensure efficiency and effectiveness.
- **Implementation:** Involves setting operational standards and monitoring processes.
- **Example:** Quality control checks on production lines to maintain product standards.

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## Control Systems – Types



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### Behavioral Control:

- **Purpose:** Regulates employee behavior and performance through policies and guidelines.
- **Implementation:** Involves setting expectations and providing incentives or consequences.
- **Example:** Employee performance appraisals and incentive programs.

### Cybernetic Control:

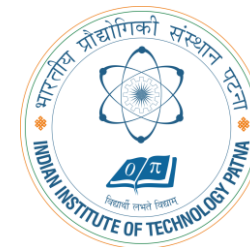
- **Purpose:** Uses feedback mechanisms to maintain stability and correct deviations.
- **Implementation:** Involves comparing actual performance to standards and making adjustments.
- **Example:** A thermostat maintaining a set temperature in a room through feedback loops.

### Cultural Control:

- **Purpose:** Influences behavior through organizational culture, values, and norms.
- **Implementation:** Involves fostering a culture that aligns with desired behaviors.
- **Example:** Companies promoting a culture of innovation to drive creativity among employees.

### Market Control:

- **Purpose:** Relies on competition and market forces to regulate performance.
- **Implementation:** Involves market-driven mechanisms, such as customer feedback and competitive analysis.
- **Example:** Adjusting product prices based on market demand and competition.



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**Have a question?**

**Feel Free to Reach out at**

- **+91-88846-92929** (WhatsApp)
- **anant.awasthi@outlook.com** (E-Mail)