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Using Data to Inform Decisions

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Definition

Using data to inform decisions:

By applying the information, you collect through reports, dashboards, logs, or systems, you can guide actions and solve problems.

Moving from "what happened" to "what should we do next," using facts instead of assumptions.

What other definitions or attributes do people have?

Data Driven verse Data Informed

- **Data-Driven**

    Decisions are made solely base don data.

- **Data-Informed:**

    Data is a key input, but decisions also consider context, experience, and stakeholder input.

Expertise and judgment still matter. Data supports, not replaces, decision-making.

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Key Elements

- **Data Collection** – Gathering relevant data from internal systems, external sources, or research.

- **Analysis & Interpretation** – Applying statistical, analytical, or visualization techniques to extract insights.

- **Decision-Making** – Using those insights to choose actions that align with goals, solve problems, or optimize outcomes.

- **Feedback Loop** – Monitoring results and refining decisions based on new data.

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Why does it matter

- Reduces bias and guesswork

- Improves accuracy and accountability

- Enables proactive and predictive strategies

- Supports transparency and stakeholder trust

- Improves troubleshooting and root cause analysis

What other reasons have people realized?

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Analytics Maturity Model

Level	Definition	Example	Purpose
Descriptive Analytics *What happened?*	Summarizes past data to show trends, patterns, or outcomes	Monthly system uptime reports, user activity logs, or sales dashboards	Helps understand historical performance or behavior
Diagnostic Analytics *Why did it happen?*	Explores data to find the root causes of events or issues	Investigating why a server went down by analyzing error logs and usage spikes	Helps explain anomalies or failures by drilling into the data
Predictive Analytics *What is likely to happen?*	Uses historical data and statistical models to forecast future outcomes	Estimating future traffic loads based on past usage patterns	Helps anticipate problems or opportunities before they occur
Prescriptive Analytics *What to do about it?*	Suggests actions or decisions based on predictions and goals	Recommending optimal server configurations to prevent downtime	Helps choose the best course of action using data-driven insights

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Analogy

- **Descriptive:** The dashboard shows the engine light is on.

- **Diagnostic:** You check the engine and find a loose wire.

- **Predictive:** Based on past issues, you expect the wire might fail again soon.

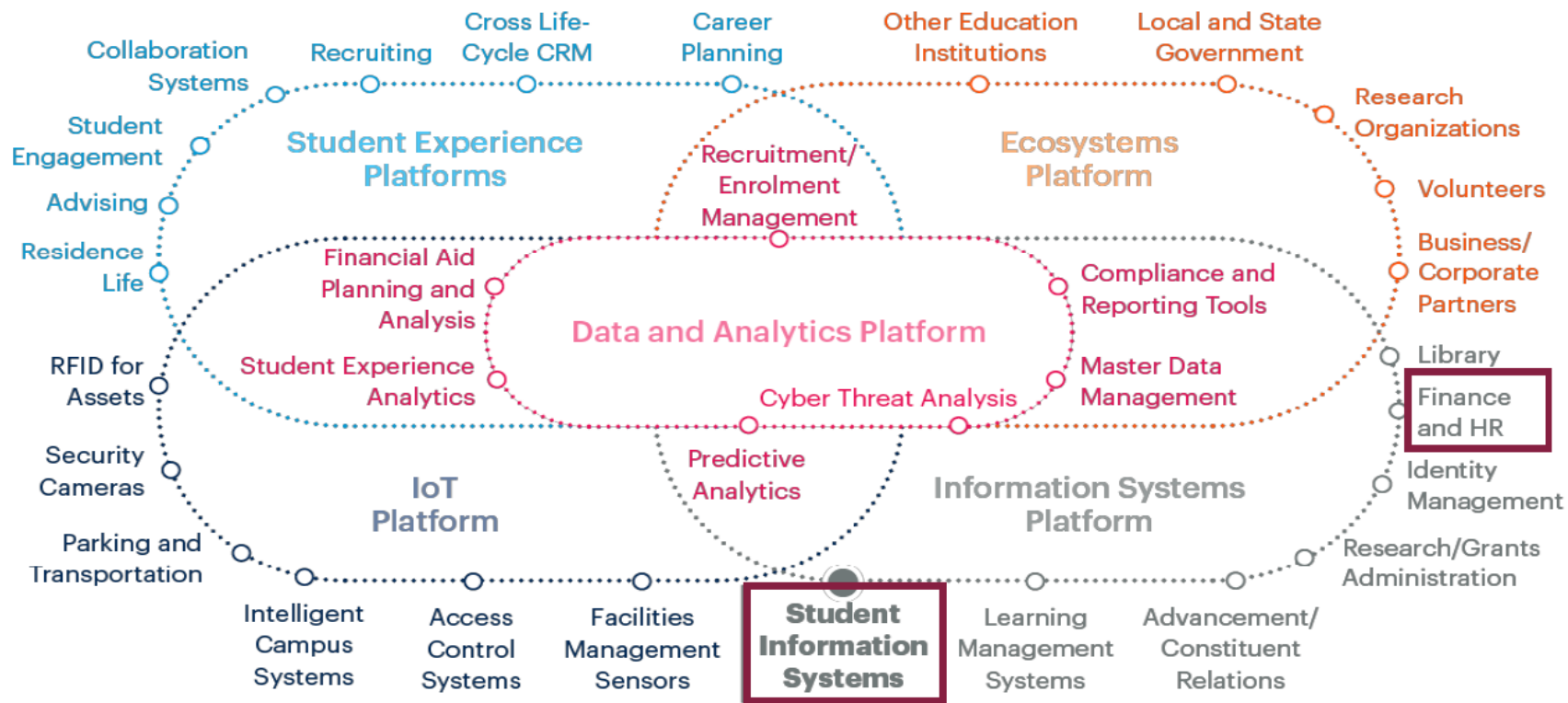- **Prescriptive:** You decide to replace the wire and schedule regular checks.

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Common Pitfalls to Avoid

- **Data existence:** The data needs to exist prior to making decisions from it

- **Confirmation bias:** Only looking for data that supports a preferred outcome

- **Overreliance on averages:** Missing outliers or trends

- **Ignoring data quality:** Making decisions on incomplete or inaccurate data

The Many Data Domains in Higher Ed

Source: Gartner

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Types of Decisions Data Can Support

- **Operational:** "Should we rerun this job or investigate the error?"

- **Tactical:** "Which process is causing delays in deployment?"

- **Strategic:** "Is our current infrastructure scaling effectively?"

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University Examples

- Finance / Research expenses and revenue comparison

- When and where to build new buildings or renovate for housing, classrooms and offices. Where to build sidewalks

- When to replace equipment

- What personal skills and when to hire based on existing and new programs

- What vendors to buy from and how much should we buy

- **What examples do others have?**

Other Examples

- Toyota Maintenance Marketing

- Manufacturer Managing Inventory across Distributors / Retail / Customer

- K12 Tracking Progress and Lowering Dropout Rates

- Call Center Data Management Growth

- Drug Prescriptions Written Verse Filled

Discussion

Questions and Comments

Data Analysis Groups Support (DAGS)

- Community of Practice
- Aim - open community of education and support for all aspects of data analysis (creating to consuming)
- Monthly Meeting
- An open invitation to anyone

  - Listen / Learn

  - Questions

  - Share and get feedback

https://analytics.vt.edu/

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