



UNDERSTANDING PREDICTIVE VS. NON-PREDICTIVE ENVIRONMENTS

Navigating Decision-Making in Uncertain Contexts

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AGENDA

INTRODUCTION

INSTRUCTIVE QUOTES

DEFINITIONS & KEY CHARACTERISTICS

PREDICTIVE ENVIRONMENTS

NON-PREDICTIVE ENVIRONMENTS

MANAGING ENVIRONMENTS

SUMMARY & TAKEAWAYS



INTRODUCTION


Purpose of presentation:

- To introduce environmental predictability and its impact on decision-making across domains, including project management.

Importance of understanding different types of environments:

- Organizations operate in both stable and volatile conditions. Understanding the nature of the environment helps tailor strategies and courses of action.

Relevance to strategy, operations, policy, and project management:

- The environment dictates how strategy is formulated, how operations are conducted, how policy is written, and how project management is performed.
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INSTRUCTIVE QUOTES

“It ain’t what you don’t know that gets you into trouble. It’s what you know for sure that just ain’t so.”

~ Mark Twain (author)

“There are known knowns; there are things we know we know. We also know there are known unknowns; that is to say, we know there are some things we do not know. But there are also unknown unknowns—the ones we don't know we don't know.”

~ Donald Rumsfeld (former US Secretary of Defense)

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DEFINING ENVIRONMENTS

First Principle:

Environments are neutral. What qualifies them as predictive or non-predictive is the way people interpret the environmental conditions.

Predictive Environment:

A setting where future outcomes can be **forecasted** with high accuracy due to stable variables and historical data. The future is (mostly) known.

Non-Predictive Environment:

A setting characterized by uncertainty, ambiguity, and rapid change, where **forecasting** is unreliable. The future is (mostly) unknown.

Key Distinction:

Predictability is about confidence in future outcomes, not just availability of data.

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KEY CHARACTERISTICS

Feature	Predictive	Non-Predictive
Data Availability	High	Limited or Unstructured
Change Rate	Low	High
Complexity	Low to Medium	High
Decision Style	Analytical	Intuitive/Adaptive
Risk Type	Known risks	Unknown/Unknowable risks
Skill to Luck Ratio	95/5	5/95
Planning Horizon	Long-term	Short-term or iterative

PREDICTIVE ENVIRONMENTS

EXAMPLES OF PREDICTIVE ENVIRONMENTS

Manufacturing: Processes are standardized, inputs are controlled, and outputs are consistent.

Retail Forecasting: Historical sales data and seasonal trends provide reliable patterns.

Weather (Short-Term): Based on satellite data, atmospheric models, and historical weather patterns.

Finance (Stable Markets): Historical returns, volatility, and correlations are used in risk models and portfolio optimization.

Traffic Flow Modeling: Traffic patterns follow consistent daily and weekly rhythms.

Energy Demand Forecasting: Energy usage follows predictable patterns based on time of day, season, and weather.

Hospital Resources Planning: Patient admission rates and treatment durations can be forecasted using historical data.

Insurance Risk Assessment: Actuarial models use large datasets to estimate risk probabilities.

Project Management: Deliverables are known, budget is known, schedule is known, team is known.

DECISION MAKING IN PREDICTIVE ENVIRONMENTS

- In predictive settings, decision-making is analytical, logical, and deterministic.
- Actors have most or all information and act on it.
- Cause and effect is expected. A leads to B leads to C.
- Events proceed in linear fashion.

Approach: Data-driven, model-based, optimization-focused

Tools: Forecasting models, simulations, key performance indicators (KPIs) (i.e., regression analysis, machine learning, Monte Carlo simulations)

Example: Inventory management using demand forecasting

Benefits: Efficiency, cost control, minimizing risk, scalability, solo work

NON-PREDICTIVE ENVIRONMENTS

EXAMPLES ON NON-PREDICTIVE ENVIRONMENTS

Startups: Market needs, customer behavior, and product-market fit are unknown and constantly evolving.

Public Health Emergencies: Novel diseases (e.g., COVID-19) emerge with limited data and unpredictable spread.

Geopolitical Conflicts: Complex interdependencies, human behavior, and sudden escalations.

Technological Disruption: New technologies can rapidly change industries, often in unexpected ways.

Natural Disasters: Earthquakes, wildfires, and tsunamis can occur with little to no warning.

Social Movements and Protests: Driven by complex social dynamics, emotions, and tipping points.

Innovation and R&D: Outcomes of research are uncertain, and breakthroughs are often serendipitous.

Cybersecurity Threats: Attack vectors evolve rapidly, and threat actors are adaptive and hidden.

DECISION MAKING IN NON-PREDICTIVE ENVIRONMENTS

- Non-predictive environments demand adaptability
- Actors often act without full information and adjust as new information emerges
- The link between cause and effect is absent. A leads to Z leads to rabbits.
- Events occur in non-linear fashion

Approach: Experimentation, iteration, creativity, and learning

Tools: Scenario planning, red teaming, agile frameworks, design thinking

Example: Crisis response teams adjusting to new information

Benefits: Flexibility, resilience, innovation, teamwork

MANAGING ENVIRONMENTS

TRANSITIONING BETWEEN ENVIRONMENTS


When Predictive Fails:

- Black swan events (i.e., small probability, high impact events)
- Model overfitting (i.e., machine learning model learns its own training data)
- Crisis
- Disruption

Signals of Unpredictability:

- Volatile inputs
- Conflicting expert opinions

Strategy: Build hybrid systems that combine data with human judgement

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IMPLICATIONS FOR POLICY, OPERATIONS, AND PROJECT MANAGEMENT

Policy: Must be adaptable, evidence-based, iterative

Operations: Need for contingency planning, cross-functional teams, build systems that are both efficient and resilient

Project Management:

- Think through the project's assumptions and ensure the list is exhaustive
- Emphasize risk planning when building the integrated project plan and monitor risks closely during the execution of the project

Leadership: Encourage a culture of learning and experimentation

IMPLICATIONS FOR EMPLOYEES IN STATE GOVERNMENT

Current state: Challenging and unpredictable fiscal environment impacting all state agencies. Programmatic cuts are expected in 2026. Some state employees may lose their jobs due to deprioritized programs and activities to save money.

Preparation: Expect unknown and unexpected events to show up. Have a plan B and a plan C.

Safety adjustment: Don't think of your state job as stable and secure until retirement. View it as a springboard to something better.

Ego work: Don't think that your job is too important to be eliminated. We are all replaceable.

Control: Focus on what you can control (e.g., skills development, education, expanding professional network)

Silver lining: Look for silver linings and accumulate lessons as you move through a non-predictive environment.

SUMMARY, TAKEAWAYS, AND QUESTIONS

Predictive Environments: Favor data, models, planning, and efficiency

Non-Predictive Environments: Require adaptability, creativity, and resilience

Key Insight: The best leaders, teams, and organizations can operate effectively in both environments

Questions:

- How does your organization handle unpredictability?
- What tools have you found most useful in uncertain environments?



THANK YOU

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