

Business Rules, Decision Management and Smarter Systems

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Agenda

- Why Smarter Systems
- Decisions, decisions, decisions
- A Business Rules Foundation
- Adding Analytic Insight
- Getting to enterprise decision management



Why Smarter Systems?

Days

Timeliness

Real-time

Local
and clear

Objectives

Complex
Trade-Offs

National and simple

Regulations

Complex and global

Every 3-5 Years

Changes to Strategy

Constant

Well-Defined

Decision-Making

Increasingly
Complex

Low

Operational Volume

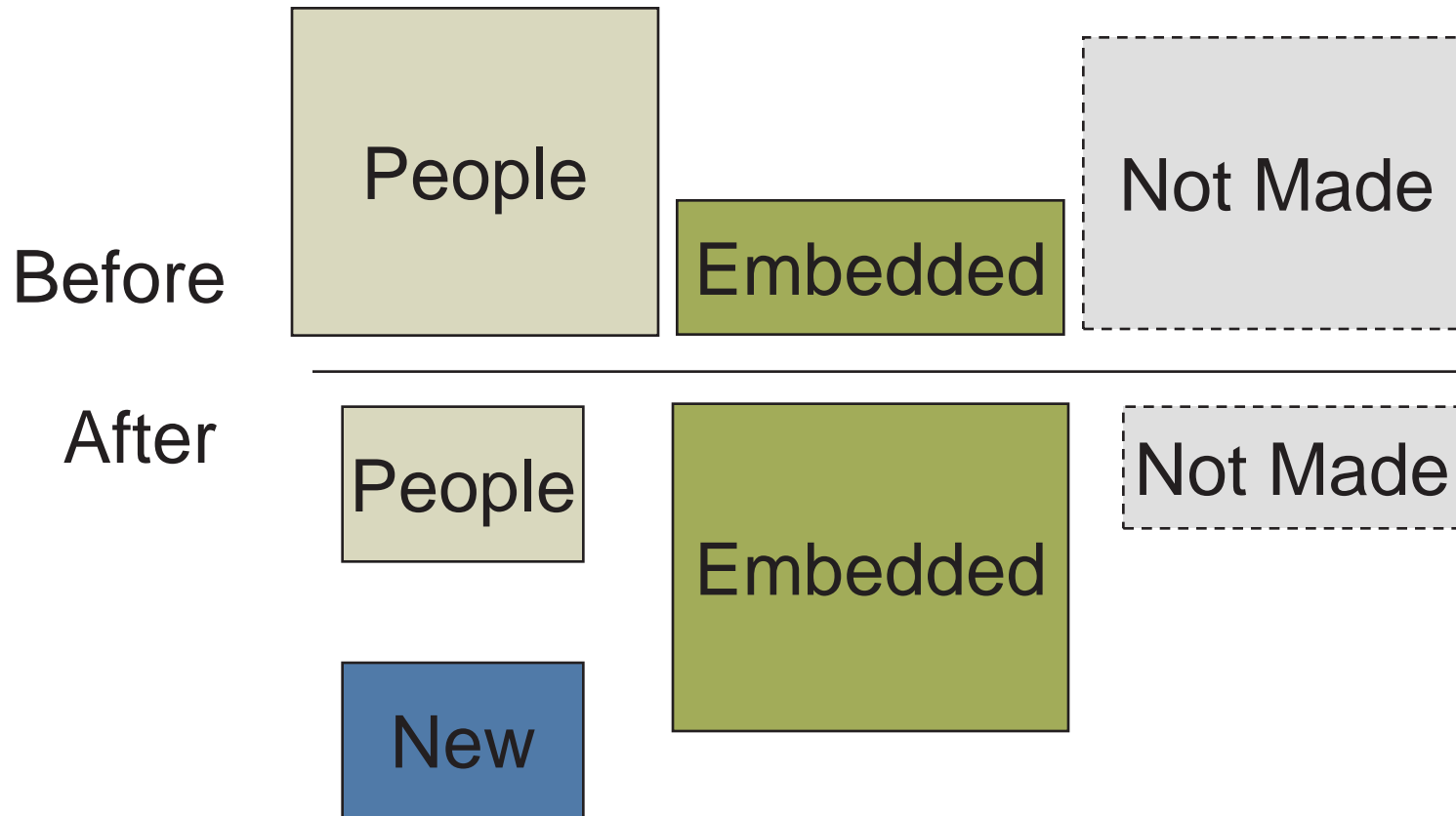
High

So What IS A *Smarter* System

- Operational
- Real-Time
- Rapidly evolving - agile
- Learning
- Customer-Centric
- Extended-Enterprise Ready
- Demonstrably Compliant



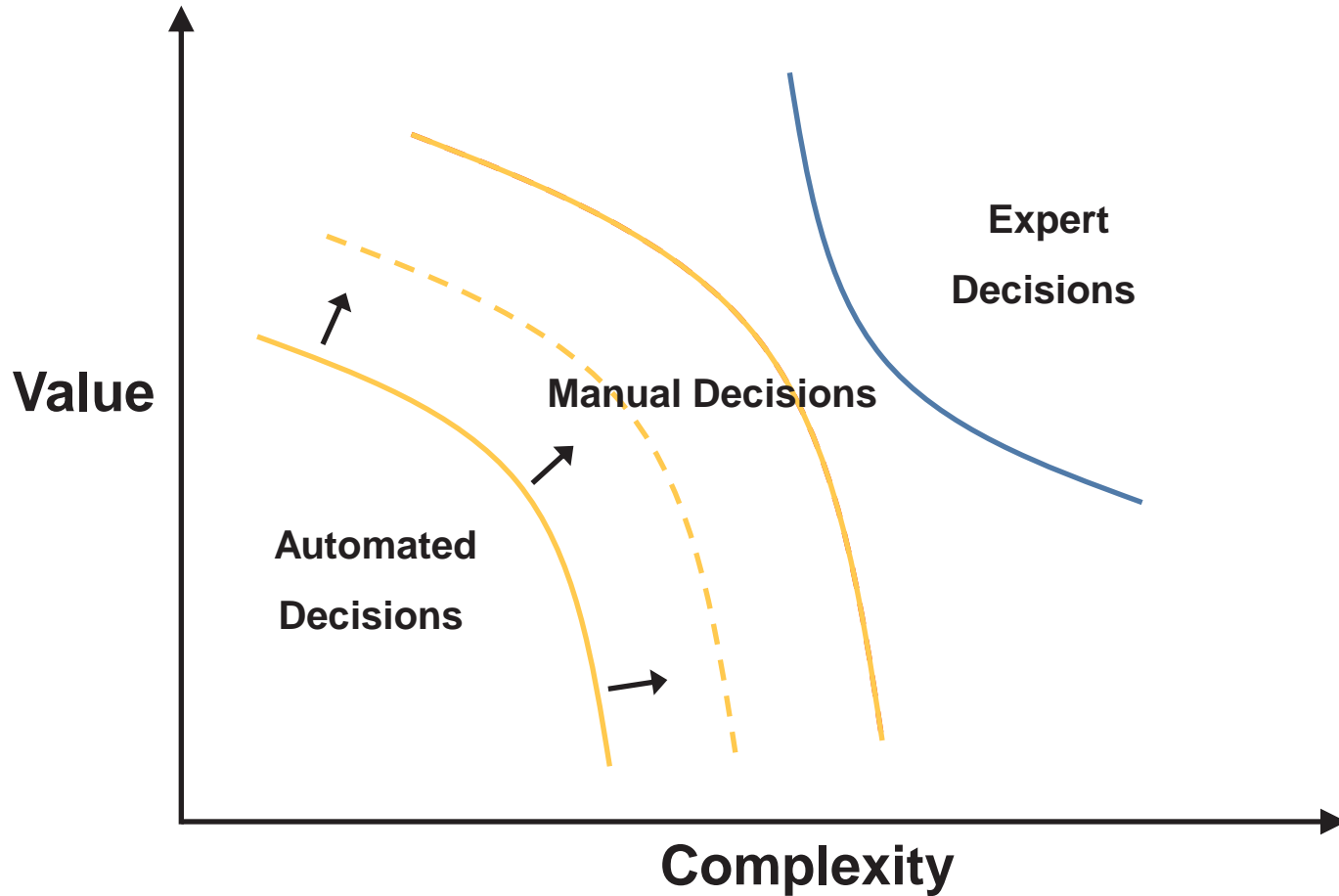
Smarter Systems Make More Decisions



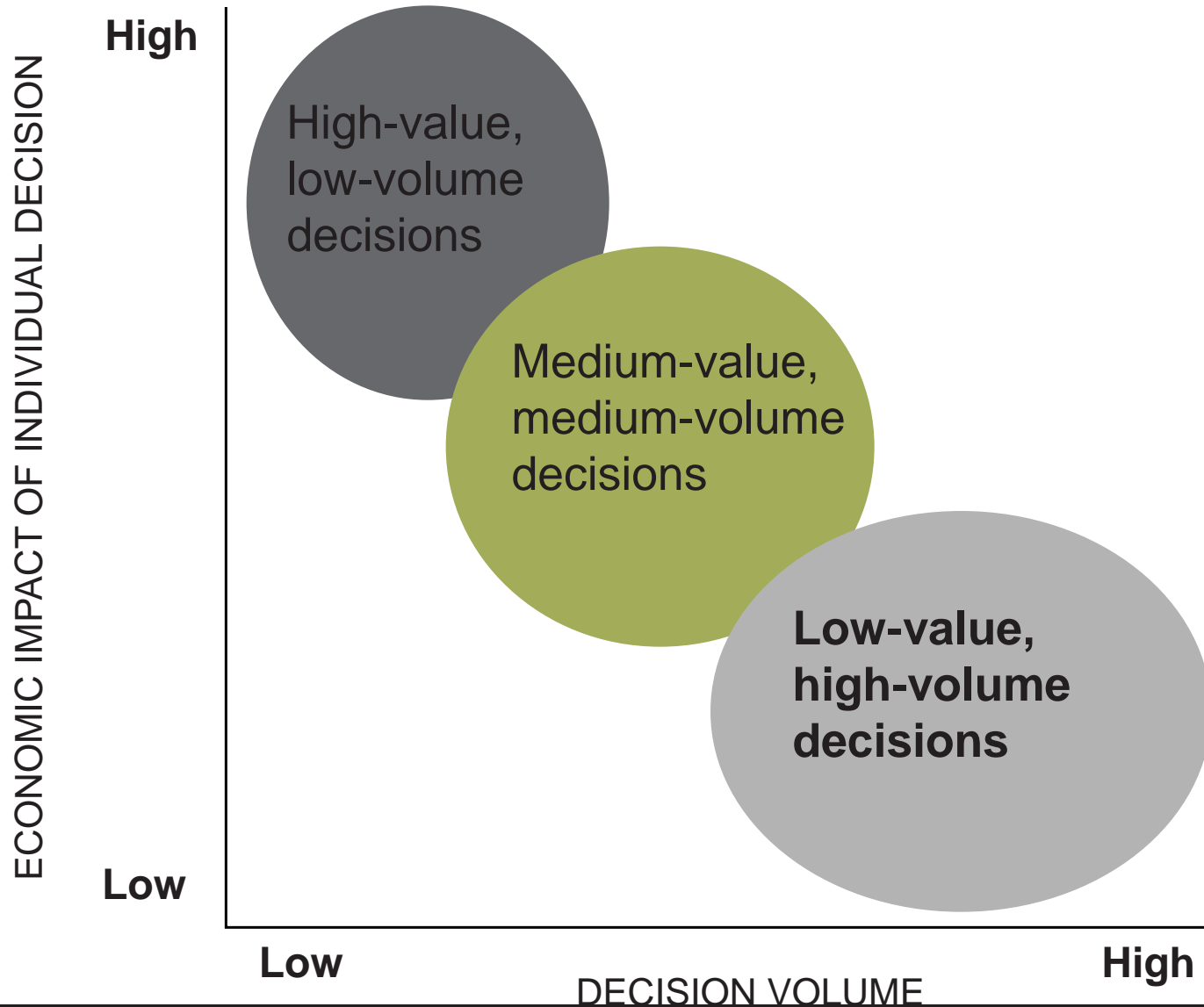
Larger boxes represent more decisions, by volume



More and more decisions can be automated



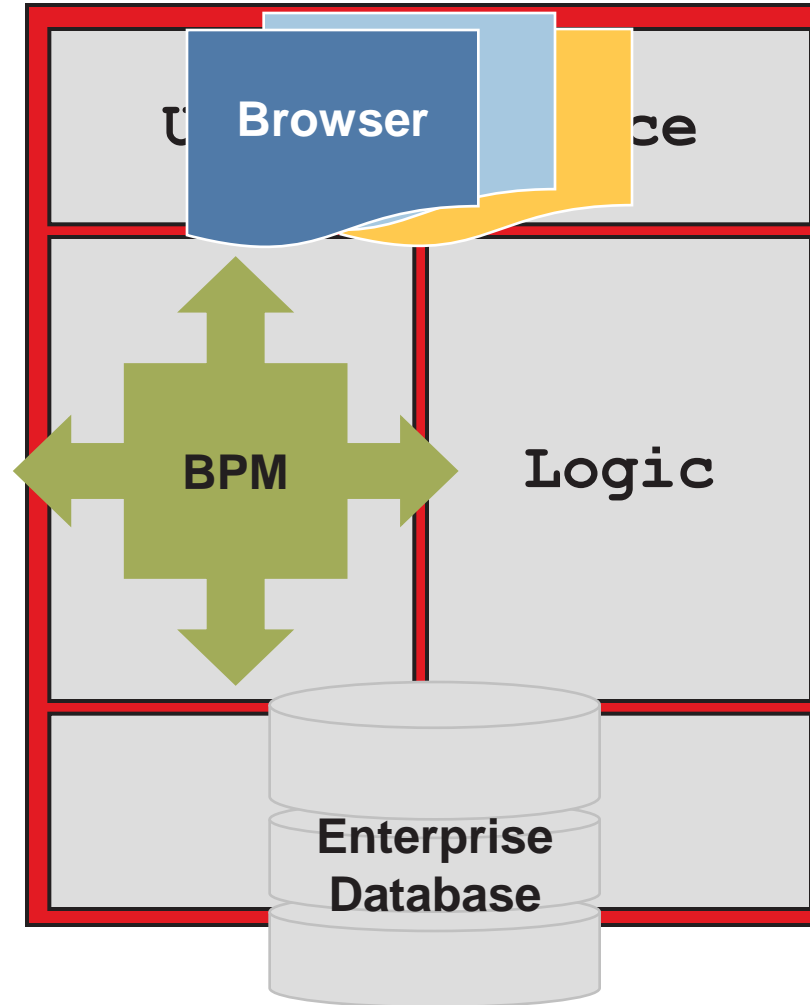
Different kinds of decisions



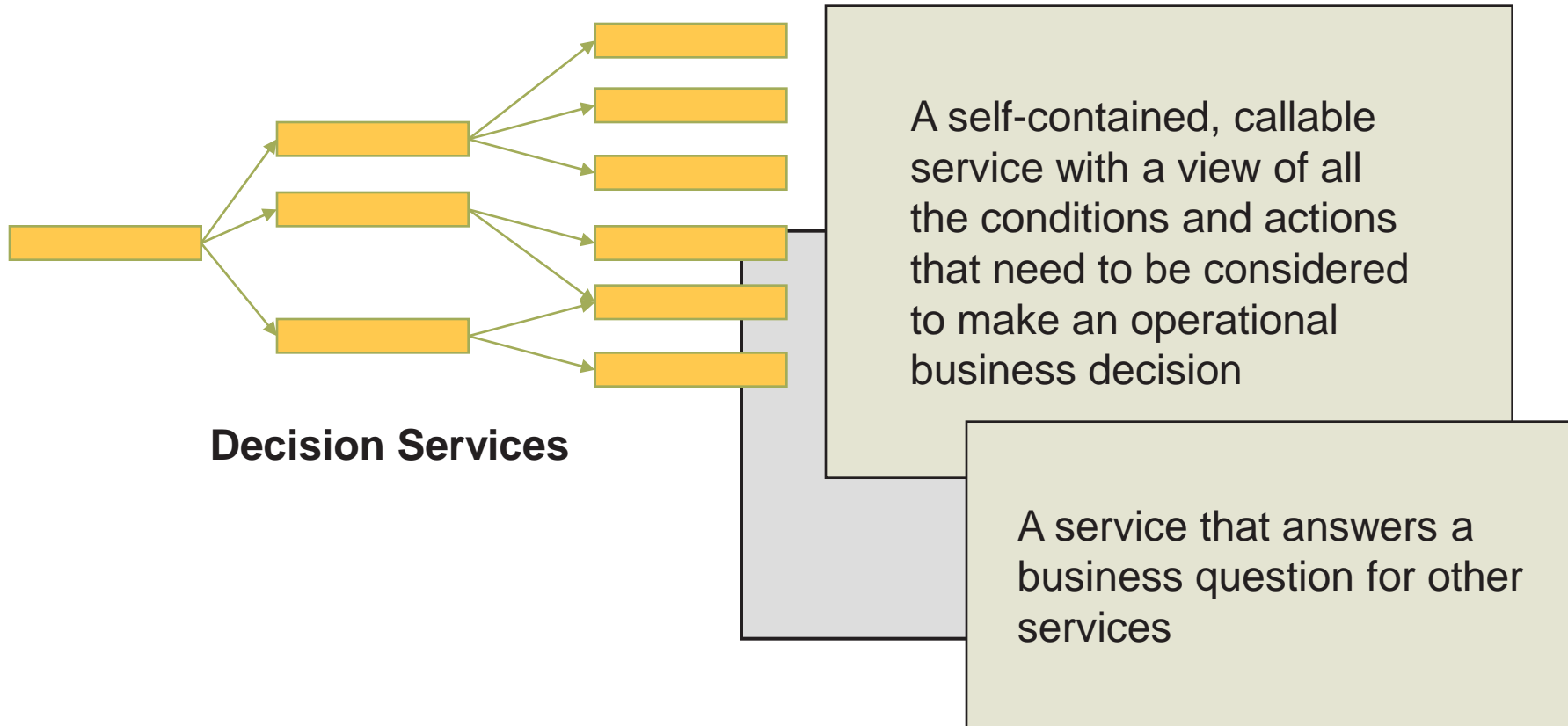
Many Decisions Are Hidden



Applications have evolved



Evolution Completed

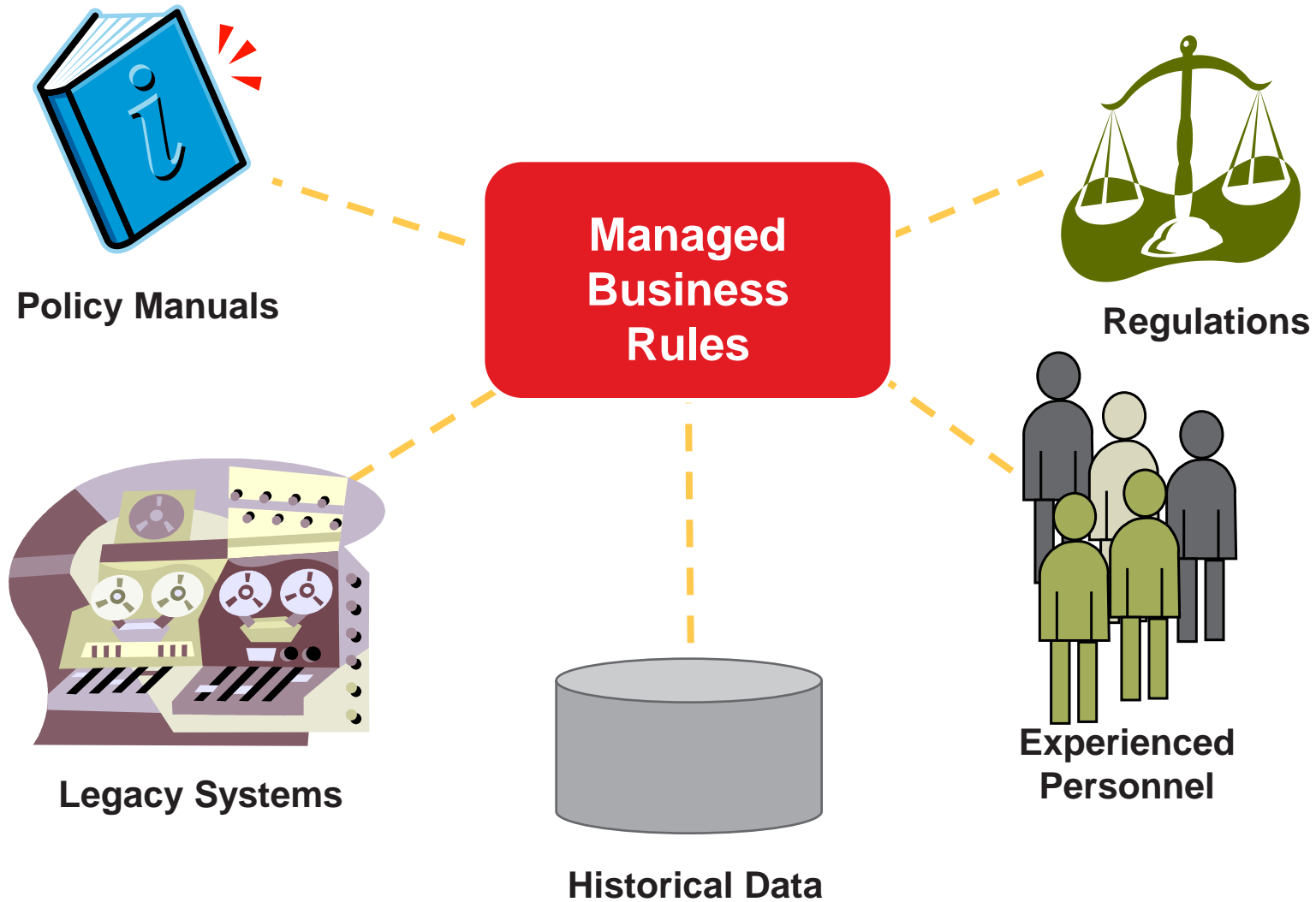




The Basic Process

- Identify Decisions
- Integrate Decision Services
- Automate the decision with business rules
- Empower the business to manage the rules
- Analytically improve the rules
- Add predictive insight
- Optimize and adapt

Business Rules Are Everywhere

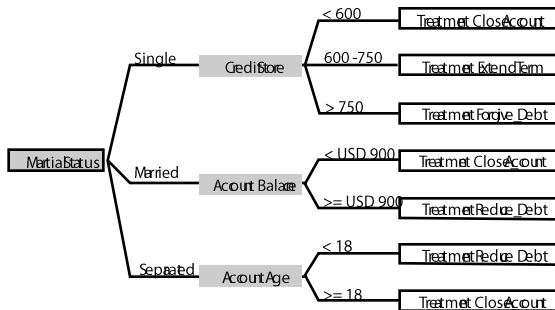


Some Examples

If customer's debt exceeds customer's assets then set the customer's application status to Declined.

If order's purchasedDate is earlier than January 1, 2004 then print ("Your purchase is no longer eligible for return").

If (vehicle's age is between 0 and 8 years)
 and (policyholder's age is between 21 years and 60 years)
 and (policyholder's number of claims does not exceed 3)
 then set policyholder's case to "STANDARD"



Rule:

If:

Consider all of the following conditions:

The total protection needed of theInsured is between - and -

< Select new condition >

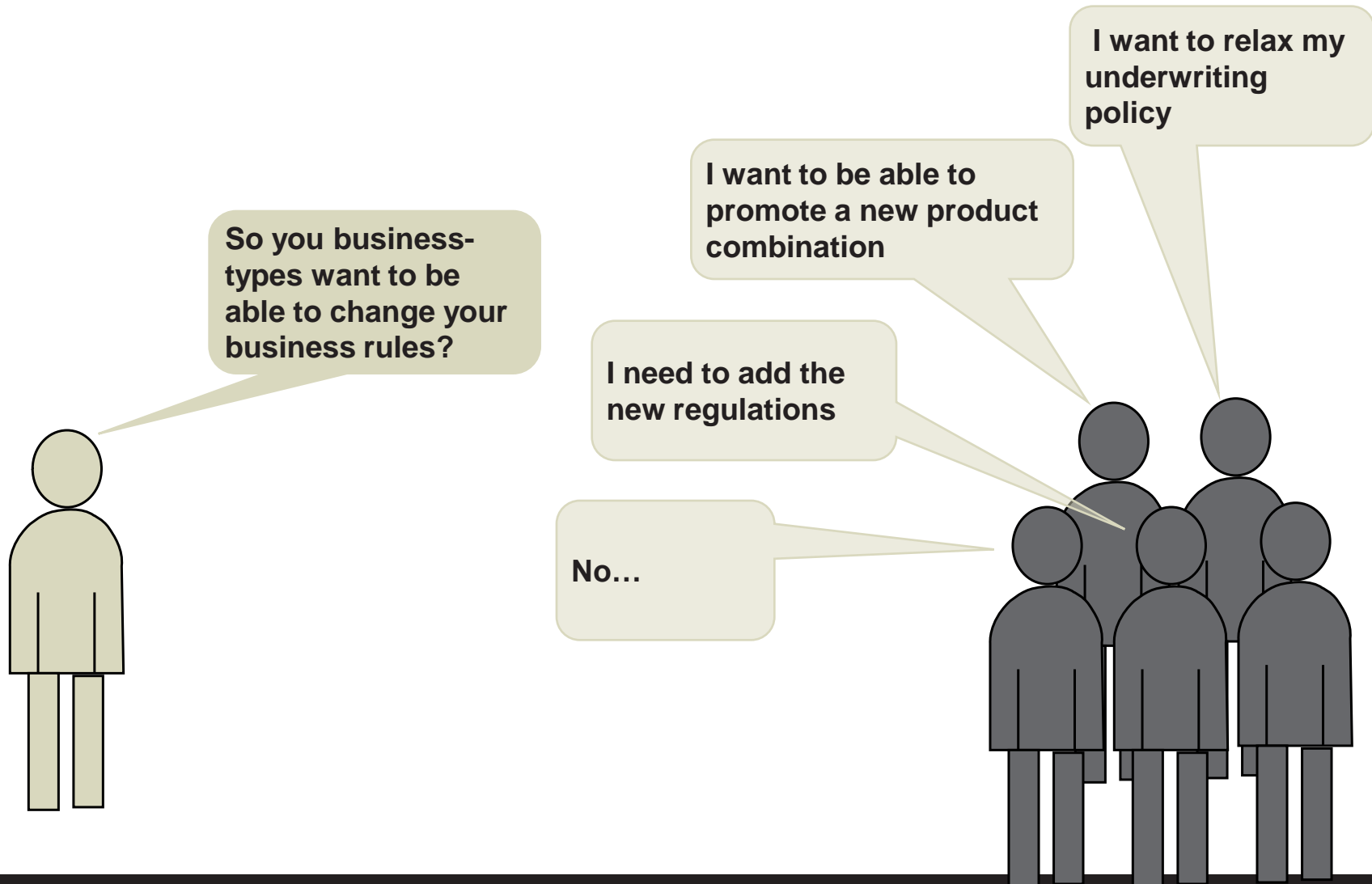
Then:

Set the incentive plan of theInsured to -

< Select new action >

Card TypeCondition	Student Bronze	Student Gold	Student Platinum
IncomeCondition	Income LimiAction	Credit LimiAction	Credit LimiAction
7,500 - 9,999	1,000	1,500	2,000
10,000 - 19,999	1,100	1,600	2,100
20,000 - 29,999	1,200	1,700	2,200
30,000 - 39,999	1,500	2,200	2,700
40,000 - 49,999	2,000	2,500	3,000
50,000 - 59,999	2,500	2,800	3,300
60,000 - 69,999	3,500	3,800	4,000
70,000 - 79,999	4,000	4,500	4,800
80,000 - 89,999	4,500	4,700	5,200
90,000 - 99,999	5,000	5,200	5,700

Empower the Business to Manage the Rules





Which Would Your Users Understand?

```
public class Application {
    private Customer customers[];
    private Customer goldCustomers[];
    ...
    public void checkOrder() {
        for (int i = 0; i < numCustomers; i++) {
            Customer aCustomer = customers[i];
            if (aCustomer.checkIfGold()) {
                numGoldCustomers++;
                goldCustomers[numGoldCustomers] = aCustomer;
                if (aCustomer.getCurrentOrder().getAmount() > 100000)
                    aCustomer.setSpecialDiscount (0.05);
            }
        }
    }
}
```

If customer is GoldCustomer
and Home_Equity_Loan_Value is more than \$100,000
then college_loan_discount = 0.5%

College Loan Discounts

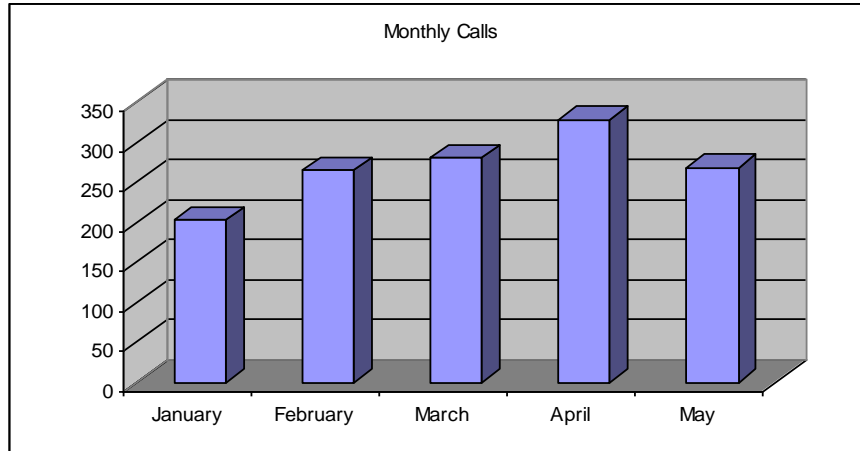
Current Discount = %

Eligibility

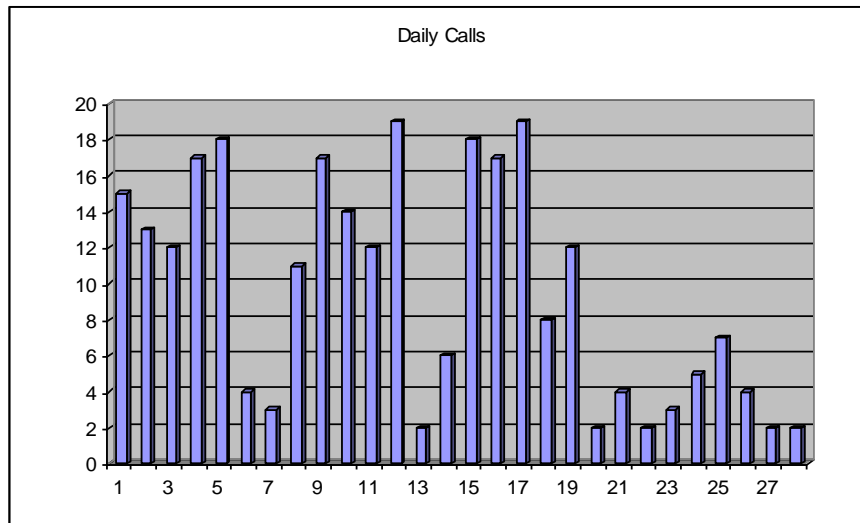
↓ and

Home Equity Loan ↓

Analytics \leftrightarrow Graphs

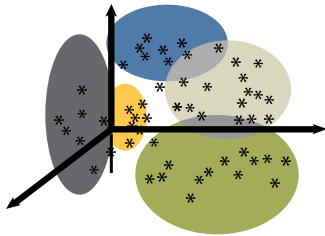


- Even graphics require interpretation
- Not everyone can see the patterns
- And code does not “see” at all



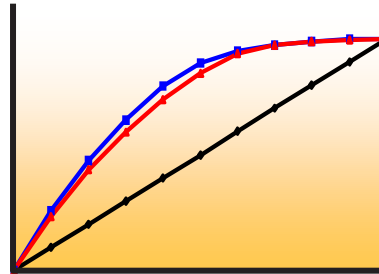
More Sophisticated Analytics Improve Results

Descriptive Analytics



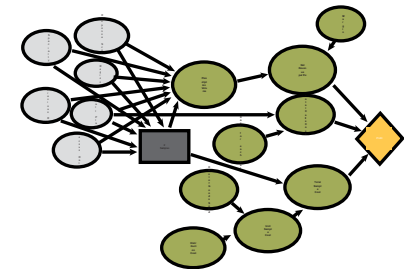
How do I use data to learn about my customers? Who are my best/worst customers?

Predictive Modeling



How are those customers likely to behave in the future?
How do they react to the myriad ways I can “touch” them?

Decision Optimization

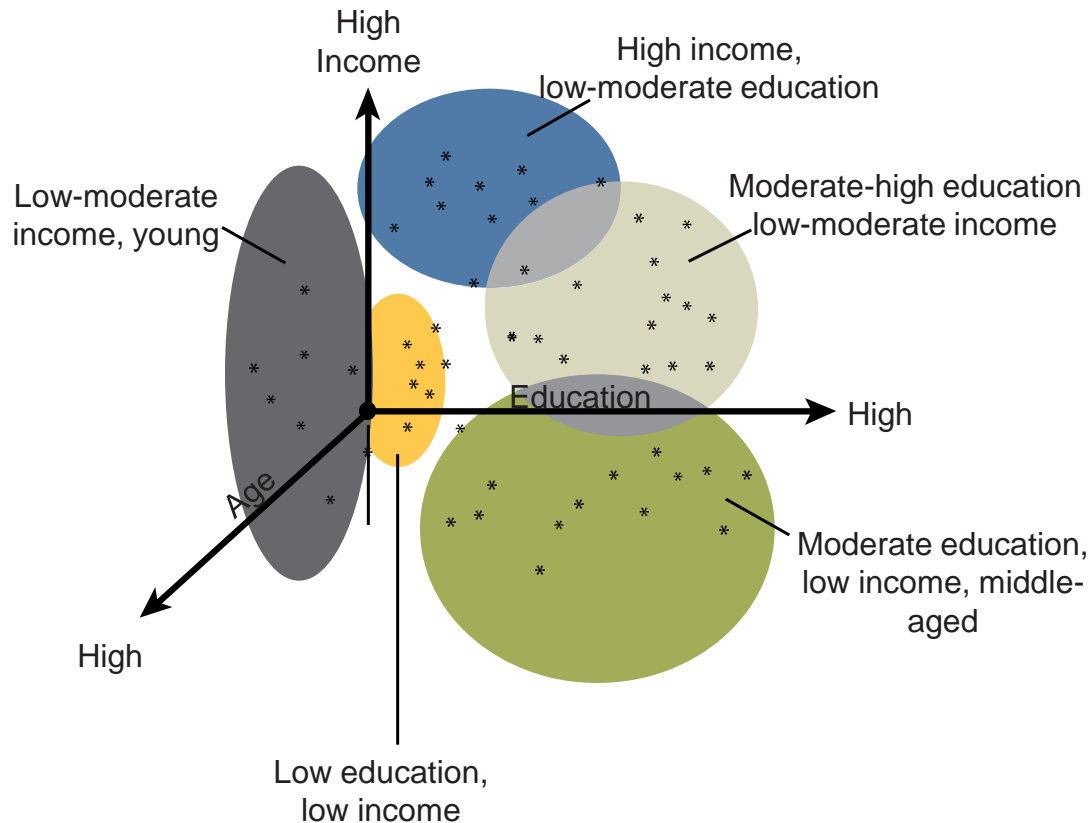


How do I leverage that knowledge to extract maximum value from my marketing investments?

Knowledge - Description

Action - Prescription

Descriptive Analytics - Improve Rules



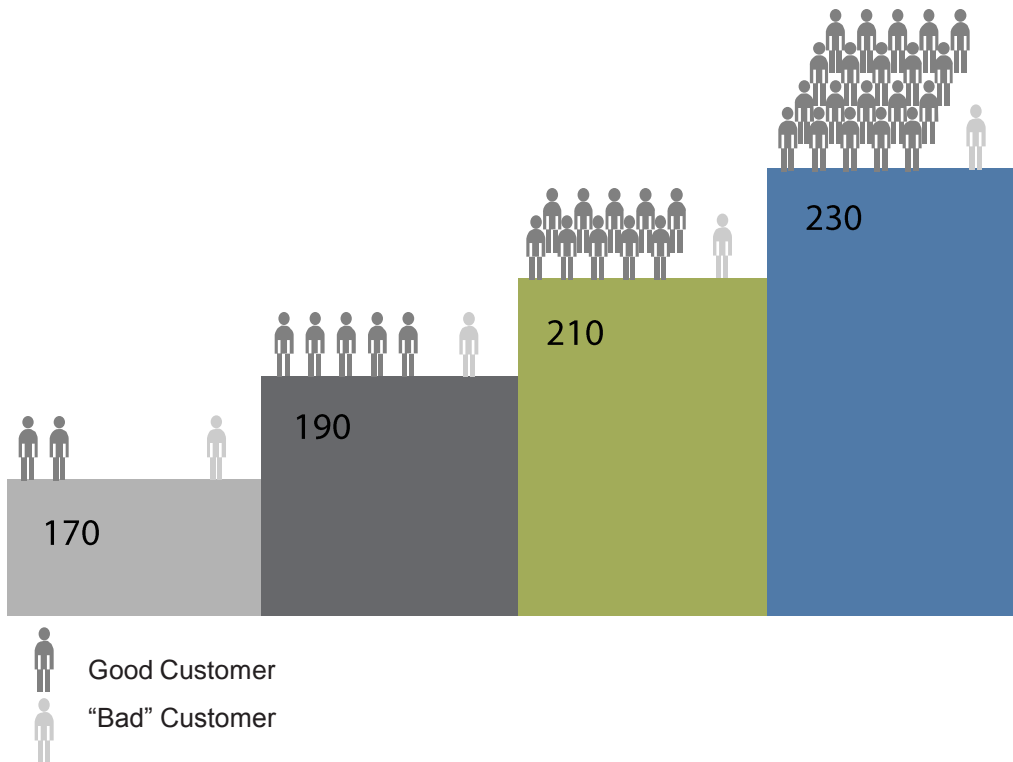
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Use: Find the relationships between customers

Example: Sort customers into groups with different buying profiles.

Operation: Analysis is generally done offline, but the results can be used in automated decisions – such as offering a given product to a specific customer

Predictive Analytics – Add Insight



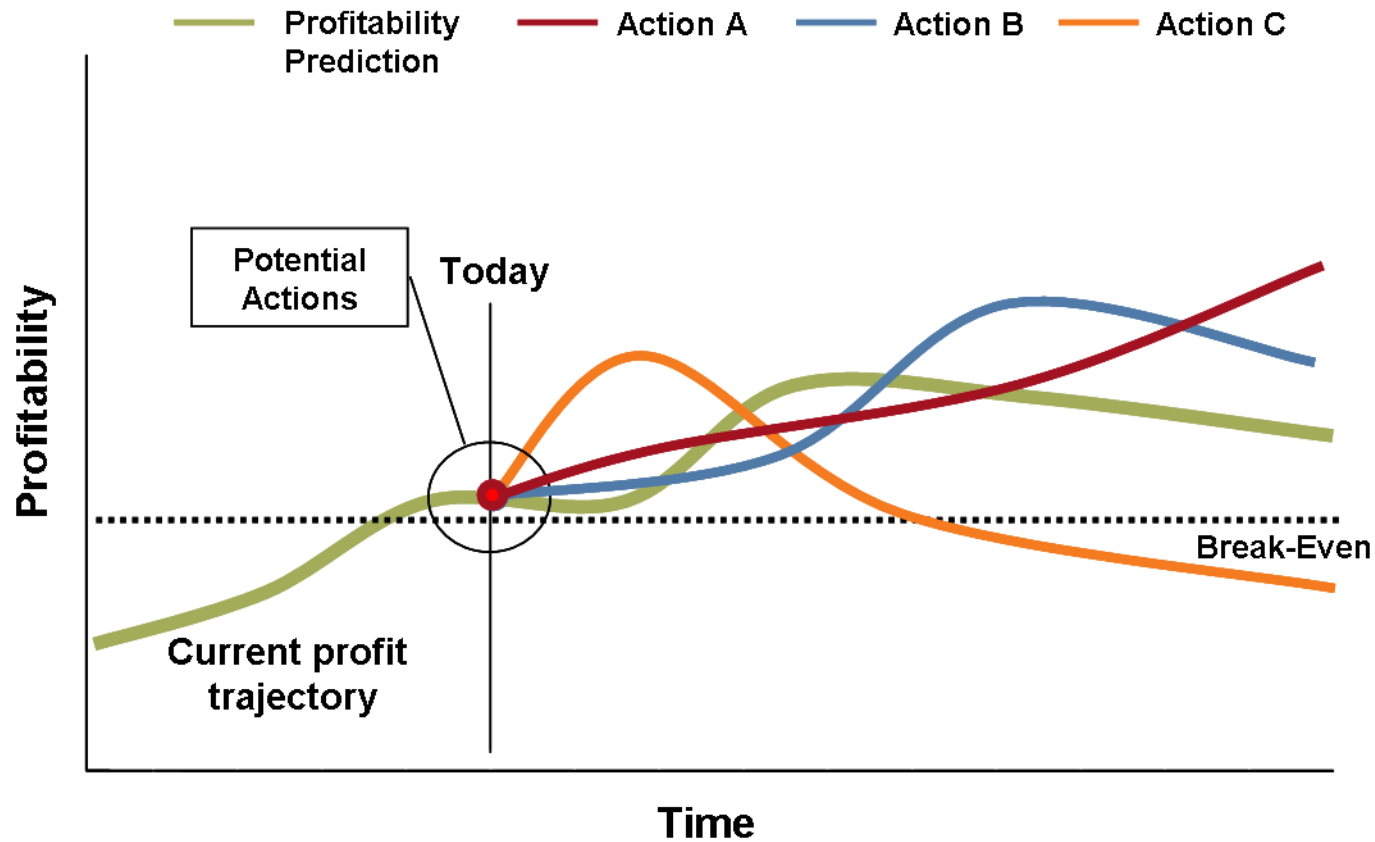
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Use: Identify the odds that a customer will take a specified action

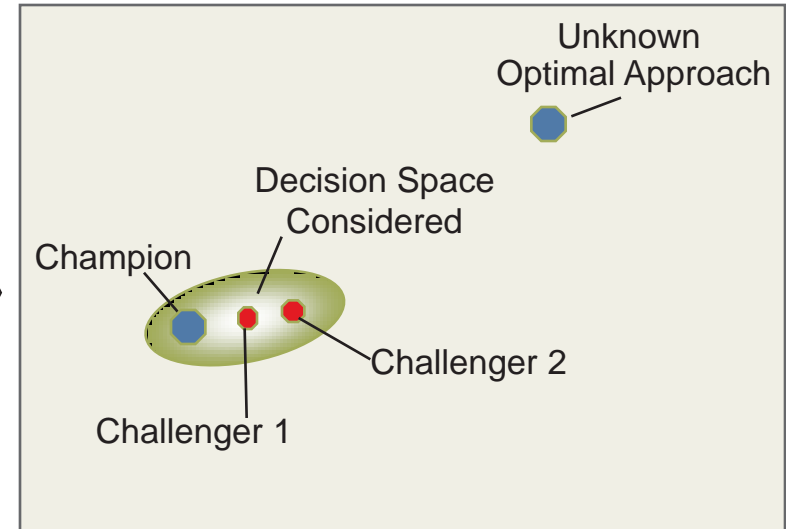
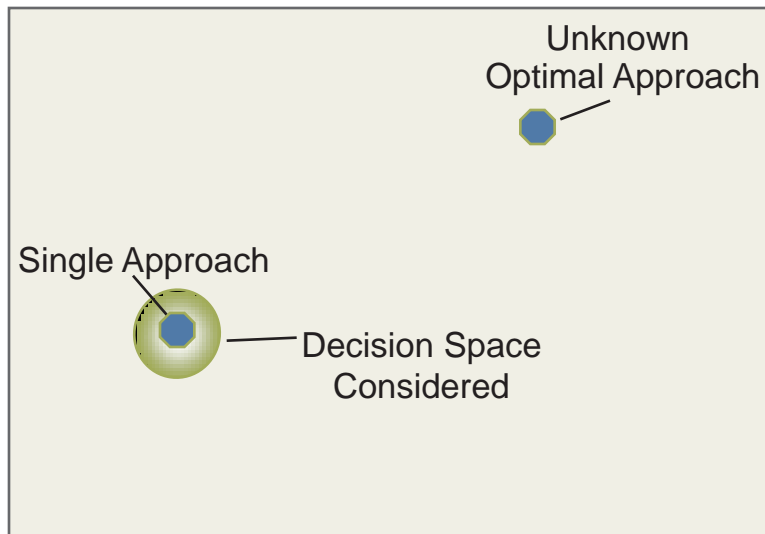
Example: Will the customer pay me back on time? Will the customer respond to this offer?

Operation: Models are called by a business rules engine to “score” an individual or transaction, often in real time

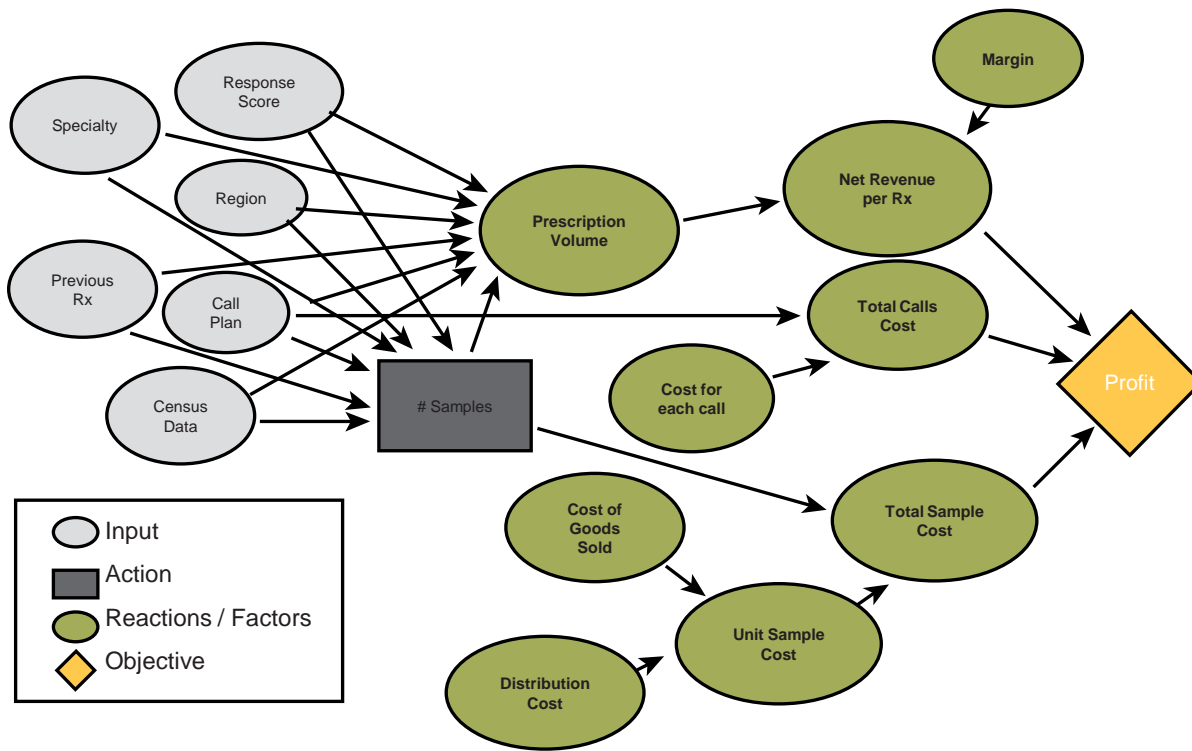
Impact May Take Time to Play Out



What Is Champion/Challenger Anyway?



Analytics To Optimize And Adapt



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Use: Design a ruleset that will deliver the right decisions to reach goals

Example: Identify how much money to spend on each marketing channel to maximise sales in a given timeframe and budget

Operation: Decision models are used offline to develop rules, which can then be deployed to operate in real time



The Approach

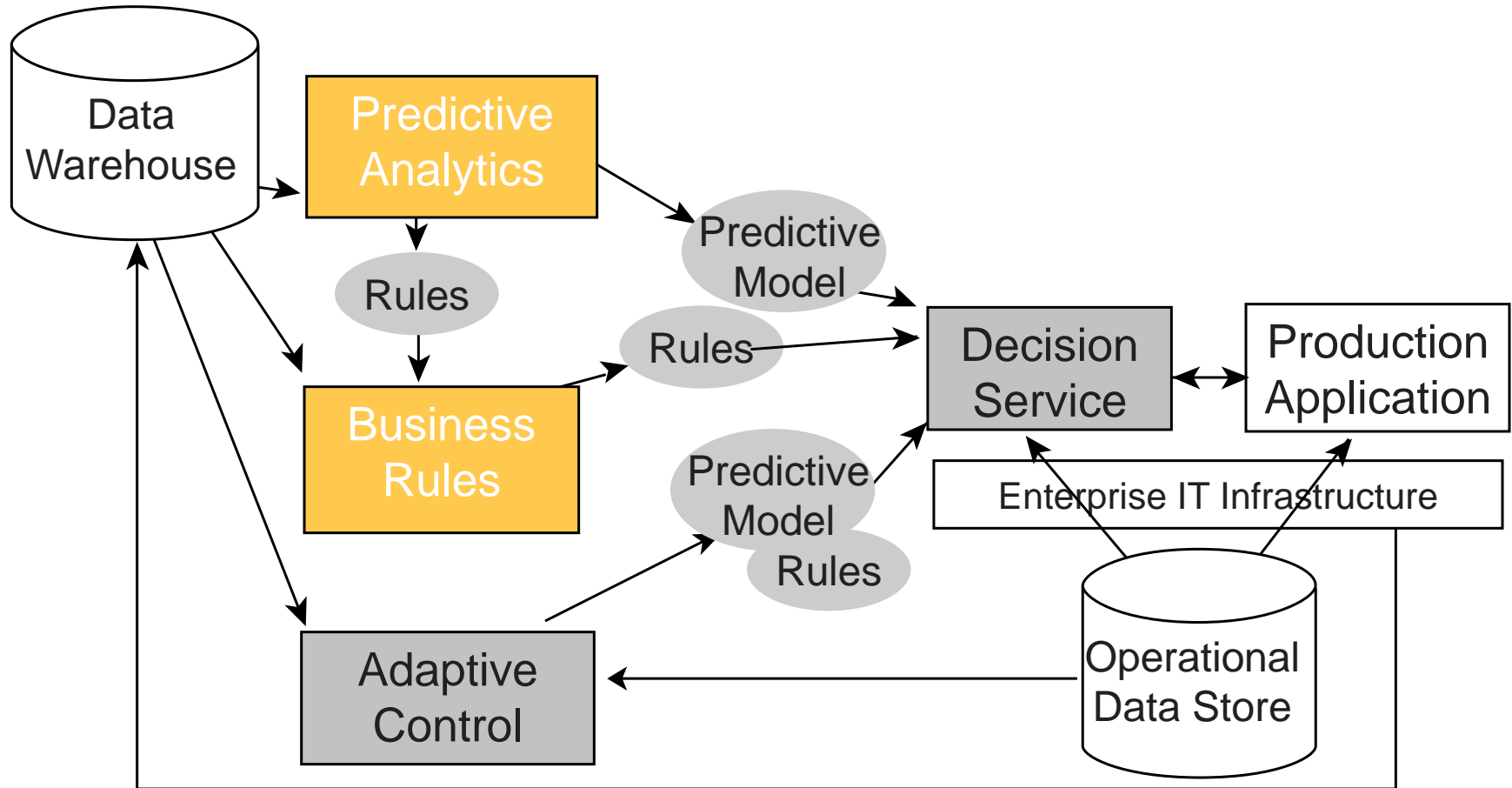
ENTERPRISE DECISION MANAGEMENT

is an approach for automating and improving high-volume operational decisions.

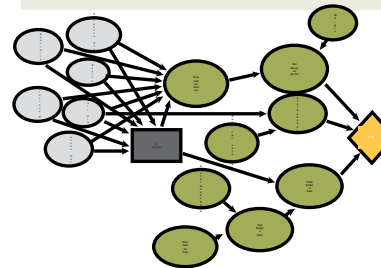
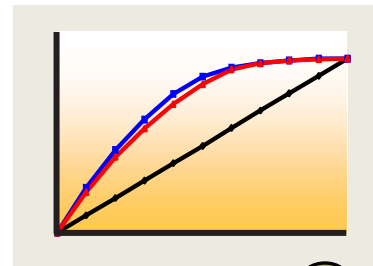
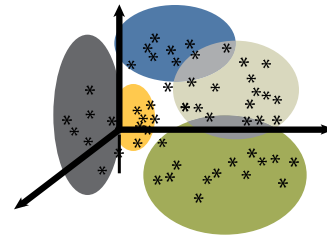
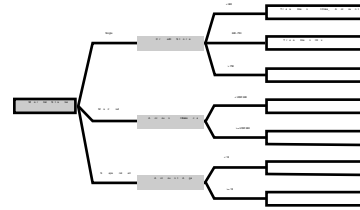
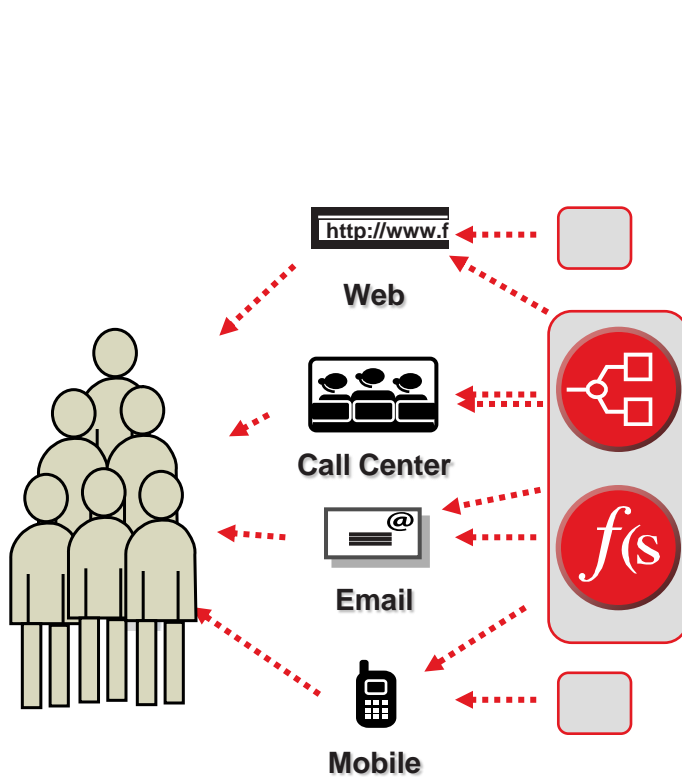
Focusing on *operational decisions*, it develops *decision services* using *business rules* to automate those decisions, adds analytic insight to these services using *predictive analytics* and allows for the ongoing improvement of decision-making through *adaptive control and optimization*.

- Automate for speed and consistency
- Improve targeting, relevance and results
- Increase customer profitability
- Grow and strengthen customer relationships
- Reduce fraud and risk

Putting The Pieces Together

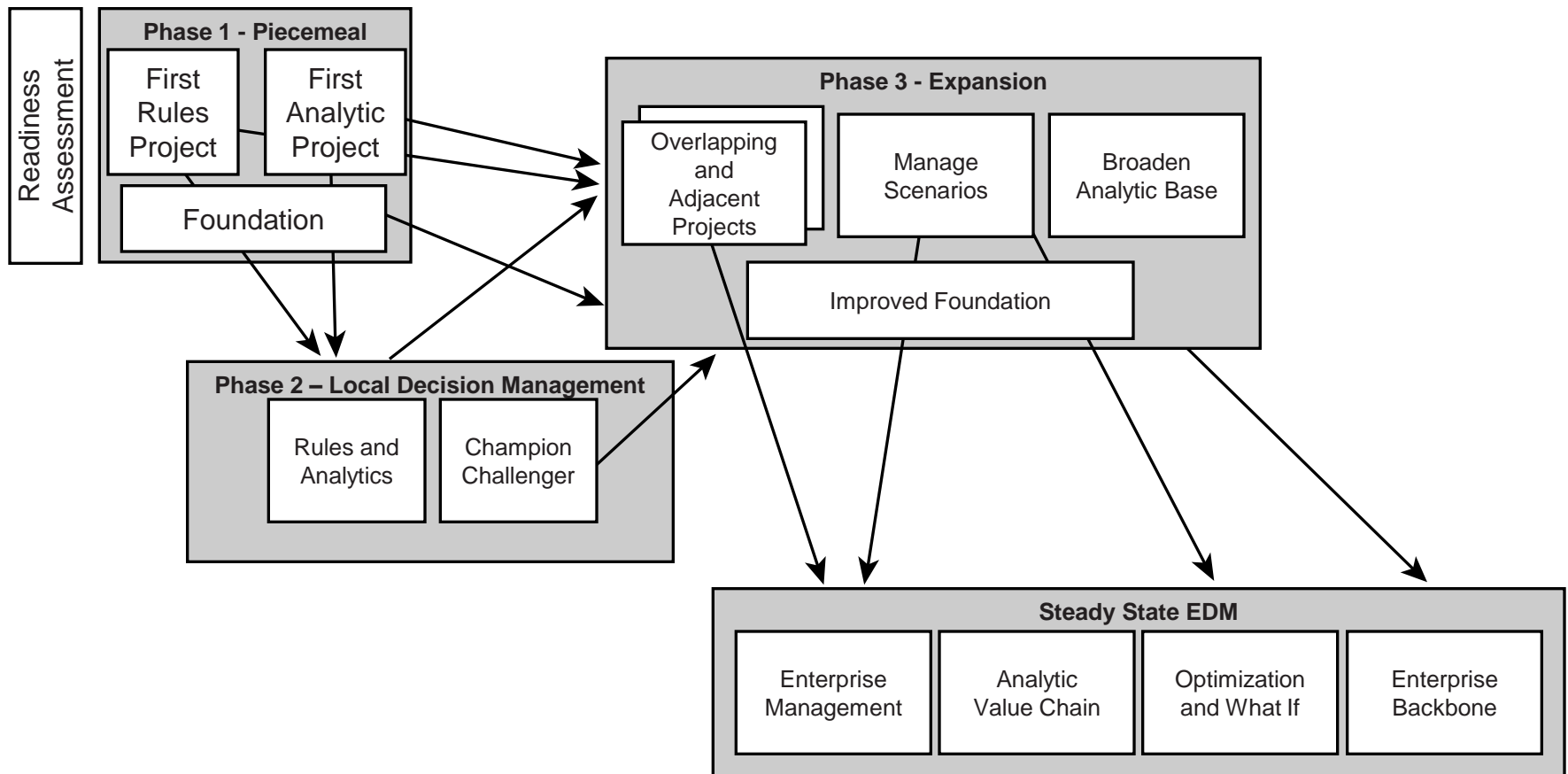


The Evolution Of A Retention Offer



- Automate Decision
- Apply rules
- Segment customers
- Predict risk, value
- Optimize decision

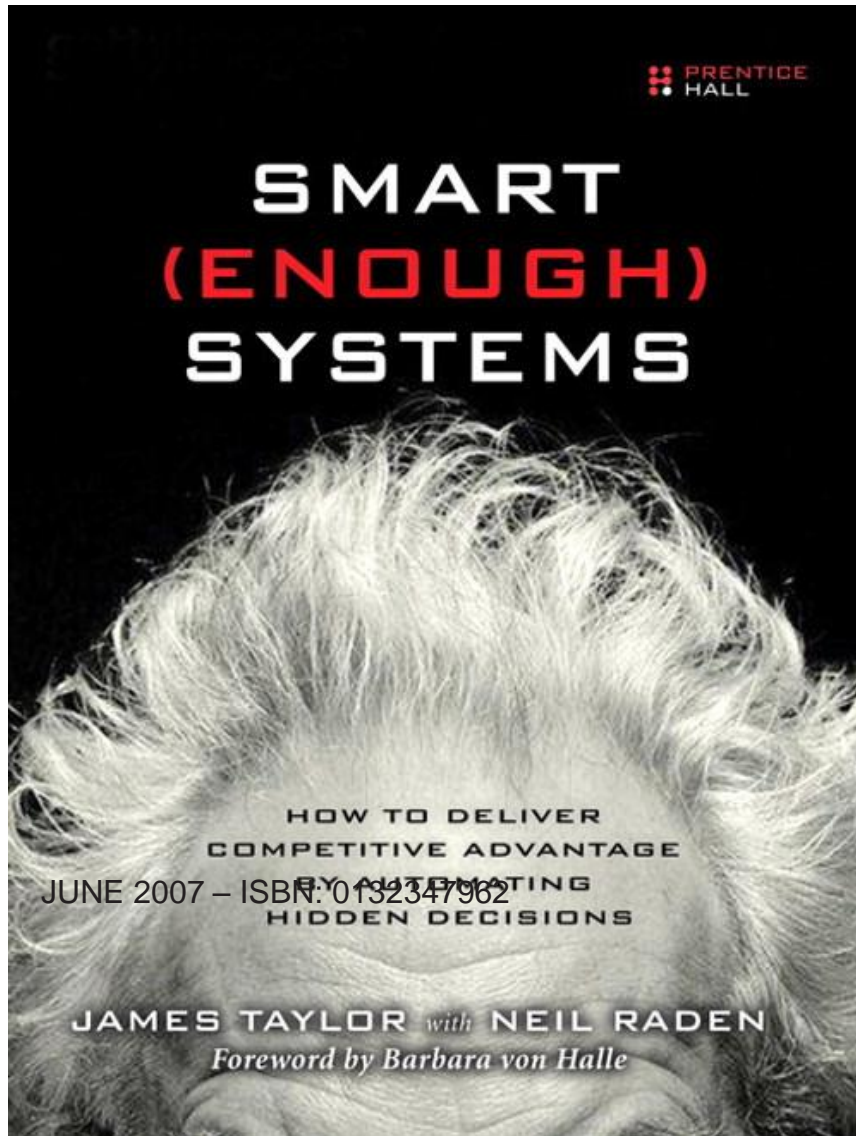
An overview of traversing the steps in EDM



Action Plan

- Identify your decisions
 - Decisions that matter to customers
 - Hidden decisions
 - Transactional decisions
- Consider
 - Who takes them now
 - What drives changes in them
 - What the context is for them
- Adopt Business Rules
 - Approach and technology
 - Management and governance
 - Change the relationship between business and IT
- Investigate Data Mining and Predictive Analytics
 - Data Mining for rules
 - Predictive reporting
 - Executable analytics
- Build Adaptive Control into your applications

Smart (Enough) Systems – The Book



The book is full of insightful examples of problems solved by applying Enterprise Decision Management across various industries and outlines a practical and incremental method for implementing the technology.

- How key business trends impact the decision-making process
- Why organizations need systems smart enough to cope with these trends
- How decision automation can make their systems smart enough
- How to translate decisions into a corporate asset and competitive advantage
- The ROI and business impact of better decisions and smarter systems
- The core concepts and technologies needed and how they work together



Thank You

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