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Delivery management: Connecting delivery with business strategy

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Session Track Number: DR-1952

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Realities can stall software-driven innovation

Complexities in software delivery compounded by market pressures

Complex, Multi-platform Systems and Applications

62% of companies have agile projects requiring integration with legacy systems

Increasing Mandates

2010 Spending in U.S. on governance, risk and compliance was **$29.8 billion**

Globally Distributed Software and Product Supply Chains

50% of outsourced projects are expected to under perform

Cost Reduction

70% budget locked in maintenance and **37%** of projects go over budget

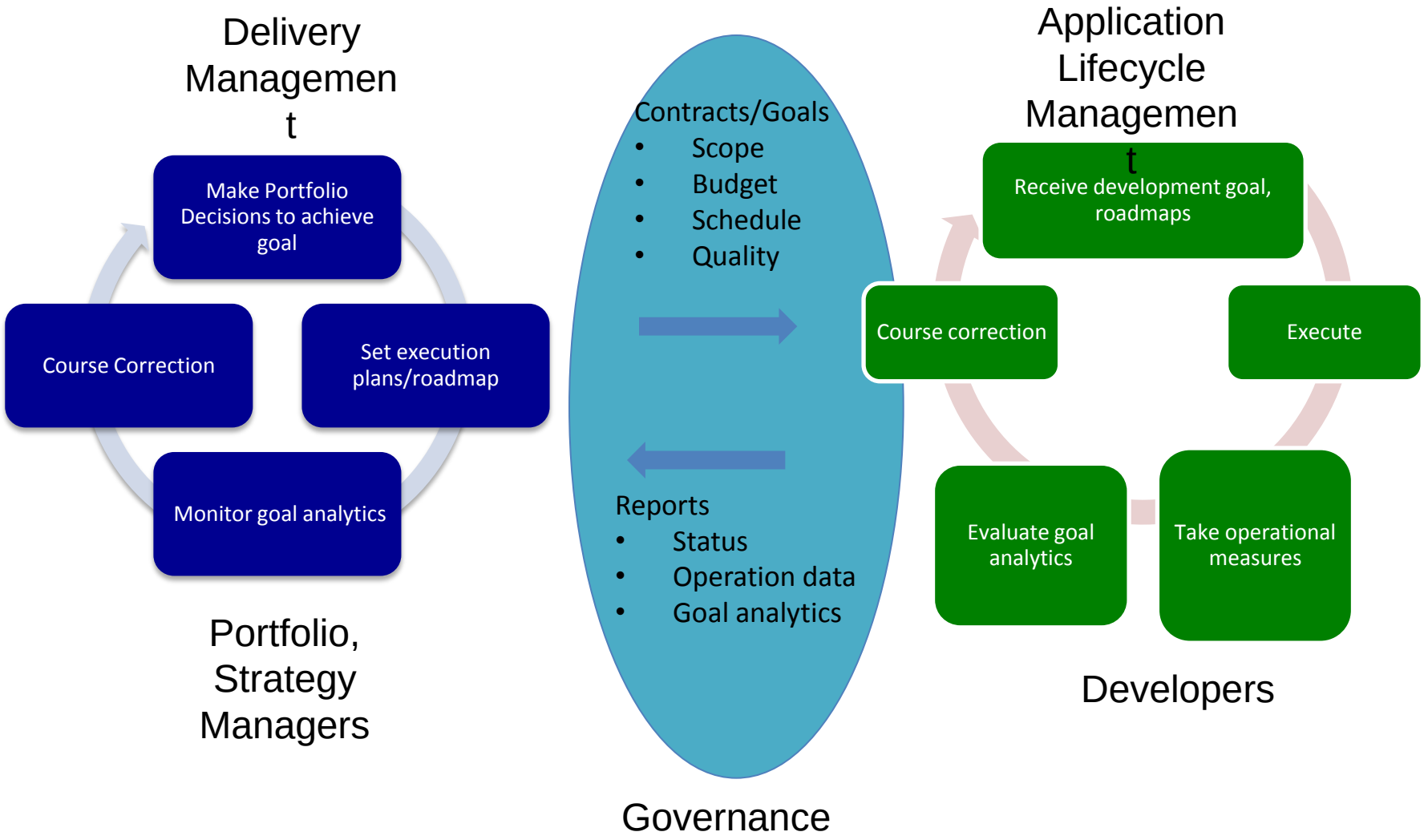
Unpredictability in Software Delivery

62% of projects fail to meet intended schedule

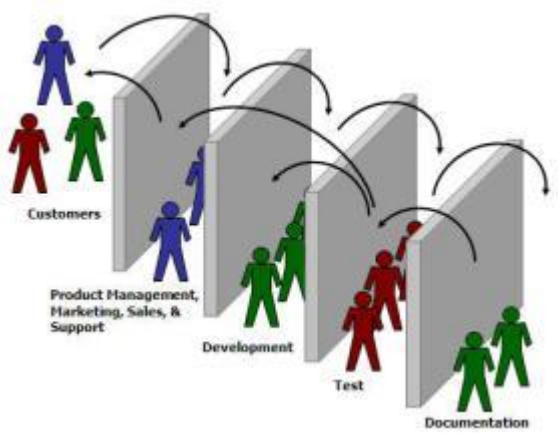
Changing Requirements and Time to Market

30% of project costs are due to rework and poor execution of requirements

Key Idea: Align DM and CLM through instrumented governance



Shifting from managing projects to managing value and change



Engineering Governance ⟷ Economic Governance

Many project management approaches support the "happy path" from a proposal to requirements, onto project scope and delivery, but:

- What happens when the delivery team encounters problems or delays?
- How do you quickly identify delivery issues, and understand their business impact?
- What happens to delivery when customer priorities change?
- How do you adjust to enable successful delivery and also address your customer's priorities?

In addition to these basic hygiene factors, there is an increasing interest in "continuous delivery" - by providing a regular product or application releases, it is possible to make them more reliable, reduce delivery risk and get earlier feedback from customers.

- How do you capture your customer's input?
- How can you use it to inform future development cycles?
- How can you update your customer on progress and roadmaps?

Delivery Management

Coupled portfolio management and team planning

Rational. Focal Point

- Capture, evaluate, and prioritise customer needs
- High-level financial analysis
- Road-mapping and high-level release planning
- High-level status, cost and benefit tracking

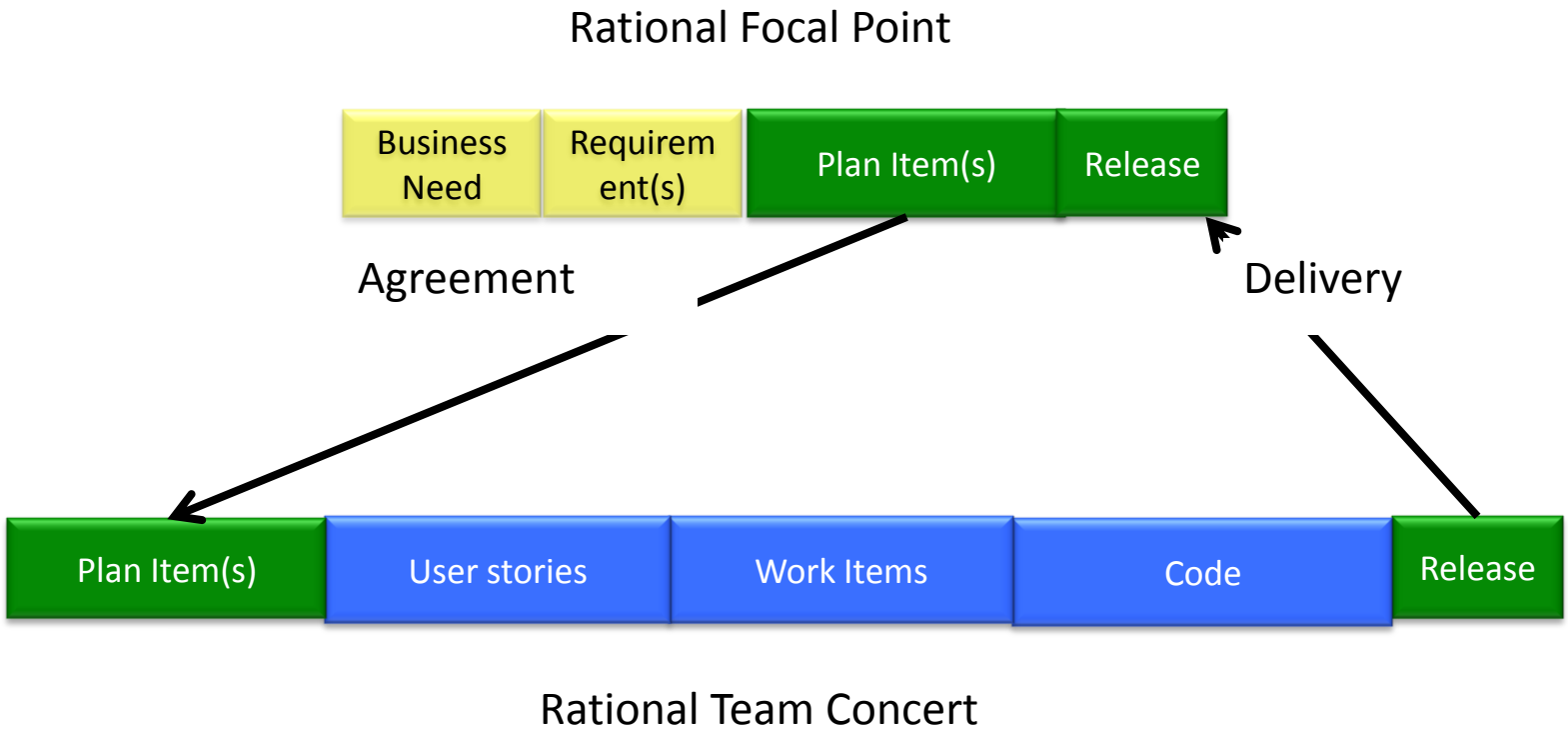
Rational. Requirements Composer

- Elaborate customer needs with process flows, story boards or user interface sketches
- Review and approval of requirements
- Manage change and impact

Rational. Team Concert

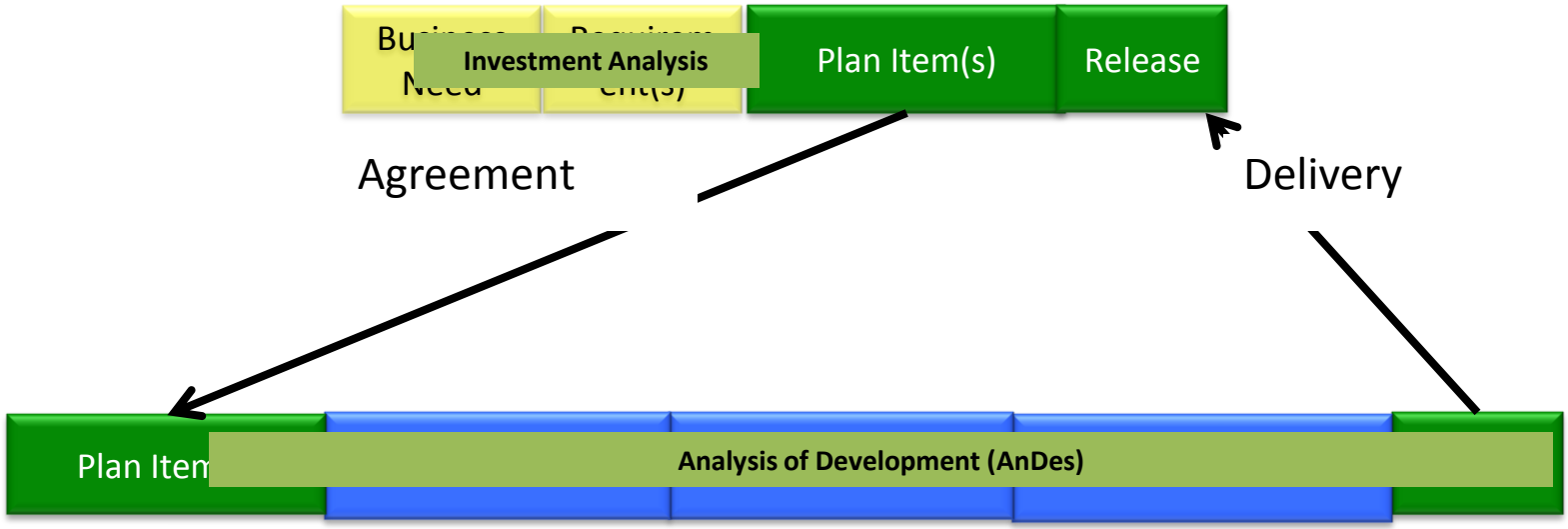
- Development iteration planning
- Task management and work item tracking
- Team collaboration
- Integrated developer IDE

Example lifecycle of project scope items



Example lifecycle of project scope items

Rational Focal Point



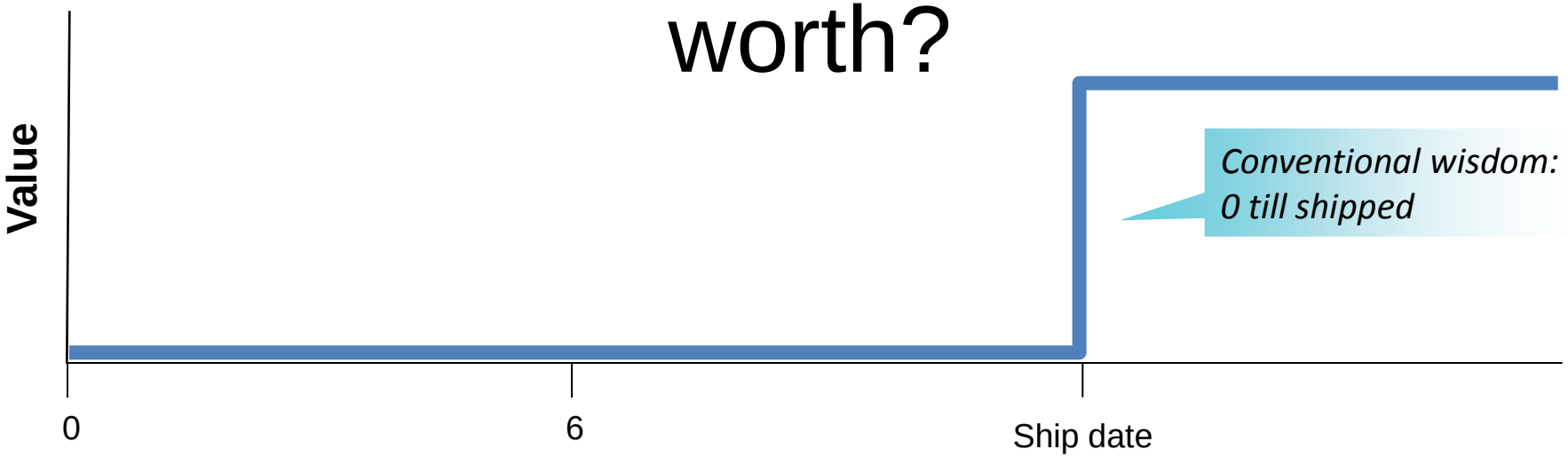
Rational Team Concert

Investment Analysis: Committing to initiating, continuing a development effort is a question of economics

- Need to reason about where to assign constrained resources
- Balance quick wins against long term benefit
- Show return on investment for innovation

Key challenge is conventional wisdom (and FASB rules): Incomplete projects have no value

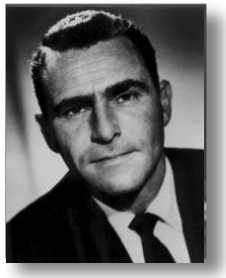
The key question: How much is an incomplete development program worth?



- The conventional wisdom:
  - Fails to acknowledge value of work already done
  - Provides no opportunity for ongoing value management
- Can only discuss cost, not value

If all unshipped efforts are worthless, there is no way to compare investments

Another approach: Things are worth what someone might pay for them

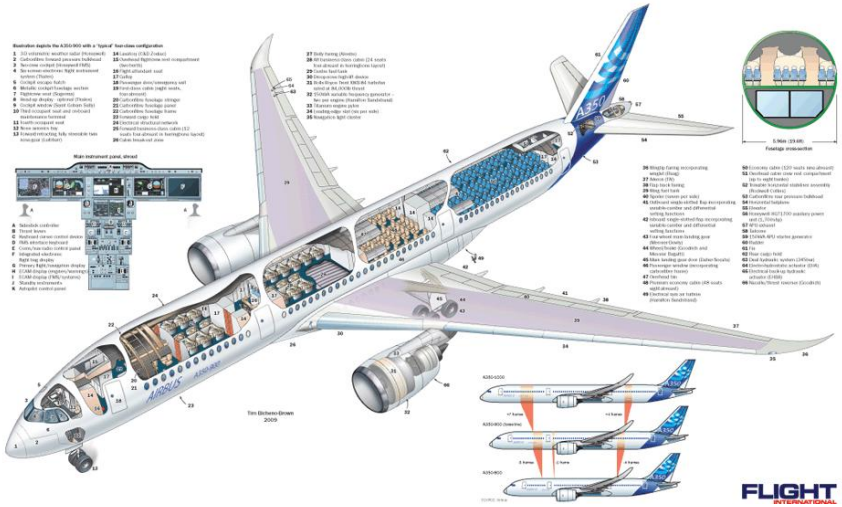


- Imagine (if you will) you could sell your incomplete development program
- The buyer would spend money now to obtain the option to invest in completing the program to receive its benefits
- How would one reason about the fair price?
  - The buyer, ***reasoning like an investor***, to compute return on investment needs
    - Probability of the cost to complete
    - Probability of the benefit to be received

The economists call this "*incomplete market reasoning*"

For example

- For how much would Airbus sell the A350 program?
- Certainly not zero!
- The buyer would get the right to spend the rest of the money to get the future benefits



What concepts are needed?

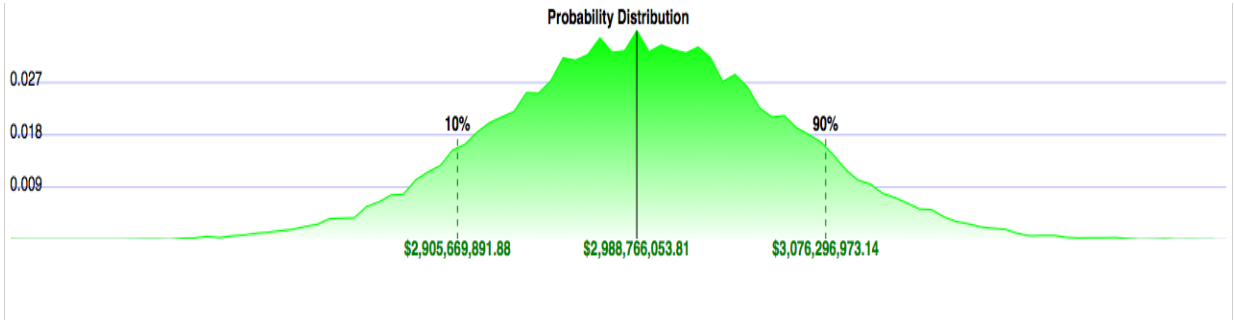
- For expected costs and value:
  - Must deal with the time value of money – Net Present Value (NPV)
- For the risk to be undertaken:
  - Must deal with uncertainty in costs and benefits – Random variables from statistics

The cost and benefit streams are provided by each stakeholder

- Stakeholders might include
  - Business analyst
  - Product manager
  - Development manager
  - Operations manager
  - Service manager
  - ….
- By quarter, each stakeholder provides the actuals and updated estimates for their stream
  - High, low, expected values
  - Reasoning for the input
- Finance provides cost of money and other indirect costs, if needed.

The NPV itself is a distribution found by applying Monte Carlo simulation to the summations

- The mean of the distribution is its fair value and
- The standard deviation is a measure of its risk.



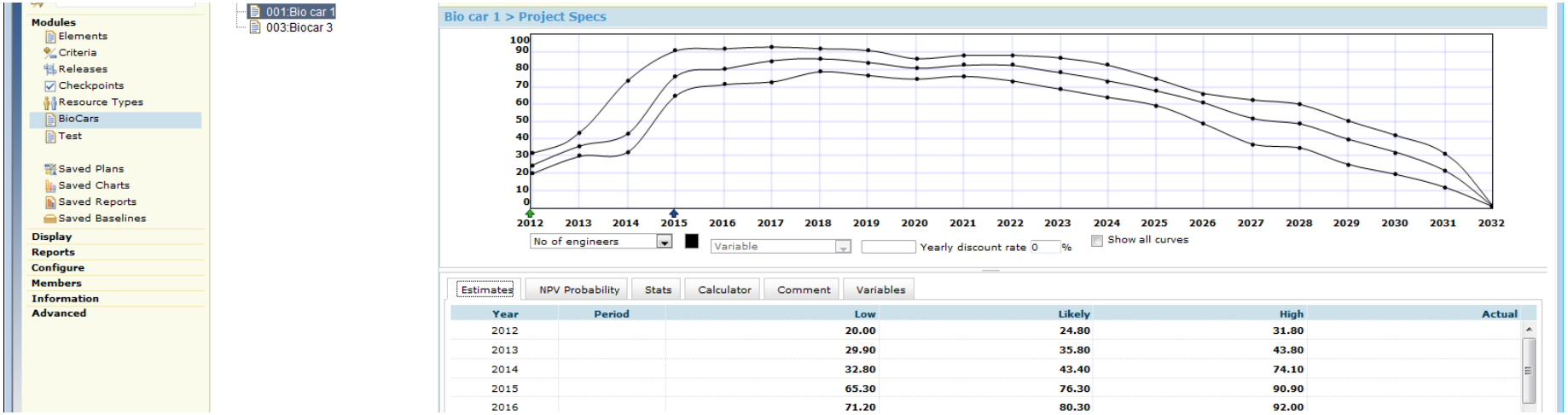
Investment analyzer features:

- Can build
  - Simple initial business cases with less confidence
  - More elaborate, faithful business cases when warranted
- Wide range of financial measures: RoI, IRR, payback
  - Expression language available to extend
- Reusable templates
- Include actuals as they become available
  - Can compare actuals against forecasts for accountability, process improvement
- Capture organizations business logic for calculating costs and benefits
- Capture snapshots in for trending
- Both monetary and non-monetary benefits

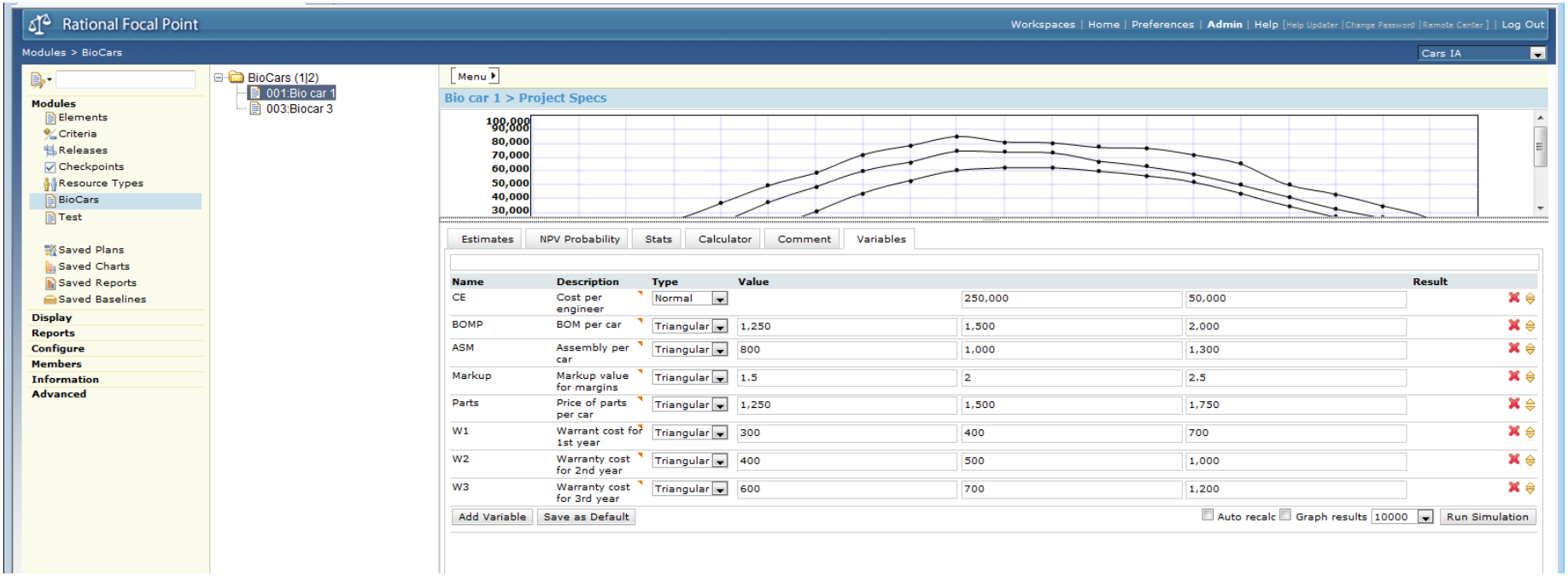
Investment analysis allows for uncertainty

- Easy inputs of future costs and benefits: three values:
  - L, the lowest monetary value you believe could occur (no chance of a lower value)
  - E, the most likely or expected monetary value
  - H, the highest monetary value you believe could occur (no chance of a higher value)
- Can support direct or calculated input

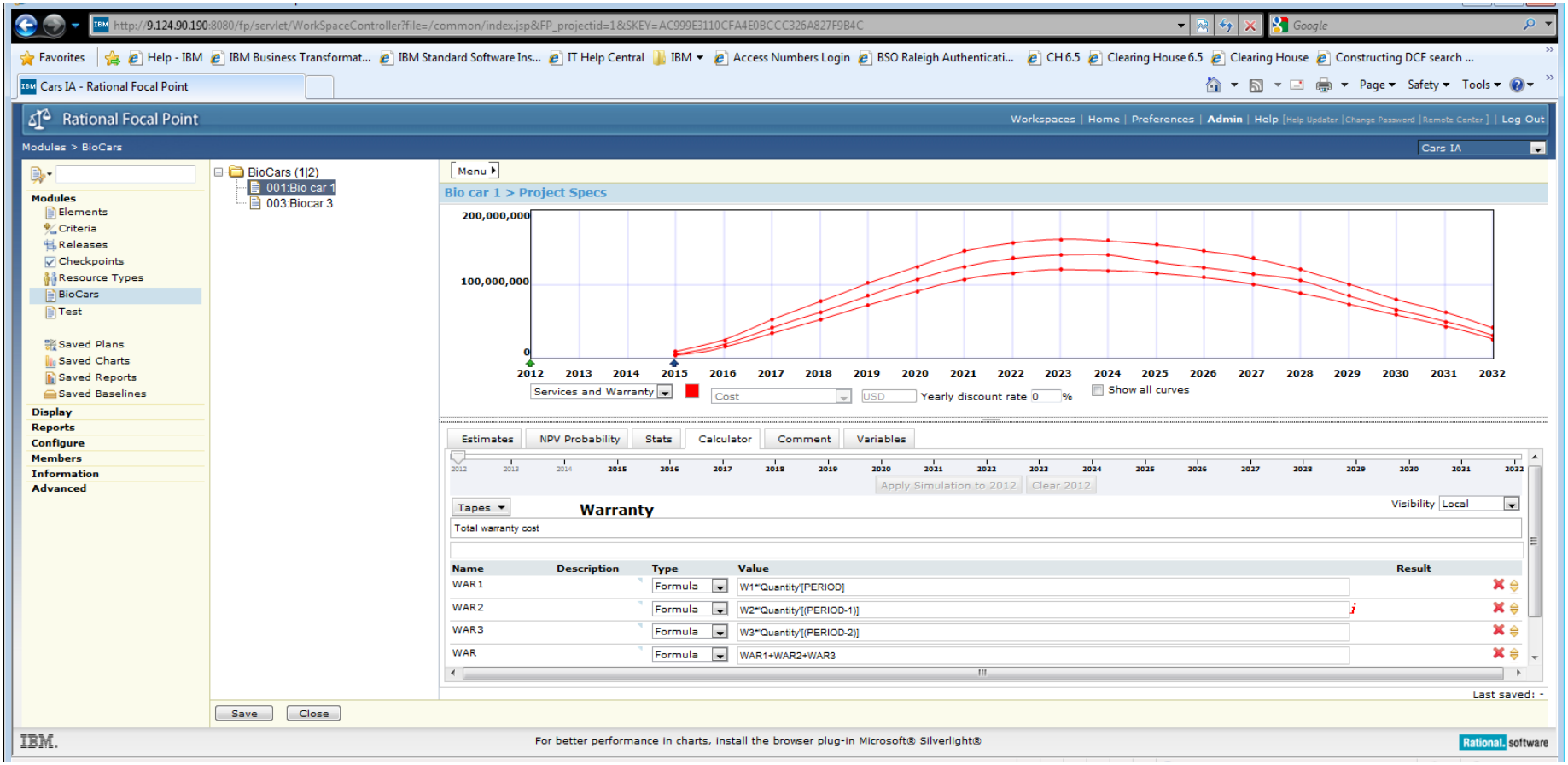
Direct input screen



Variables specification

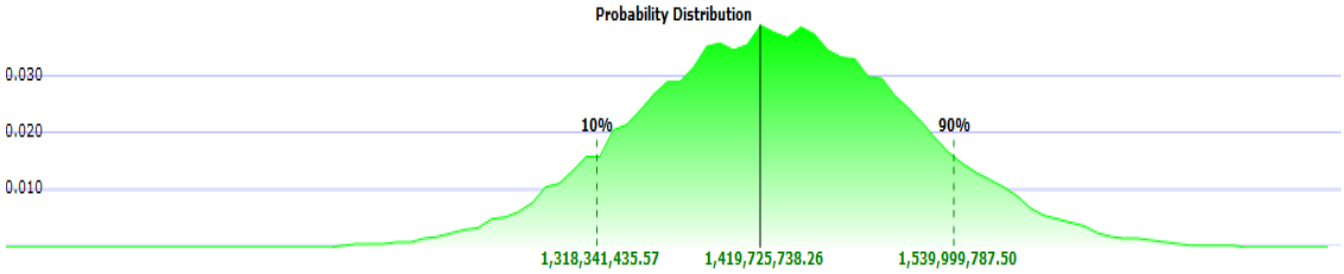


Calculated Input



Investment analysis summary

- Take an investment perspective
- Identify , forecast, calculate cost and benefit streams
- Accounts for uncertainties, financial risk
- Forecast financial returns
  - NPV
  - RoI
  - ….



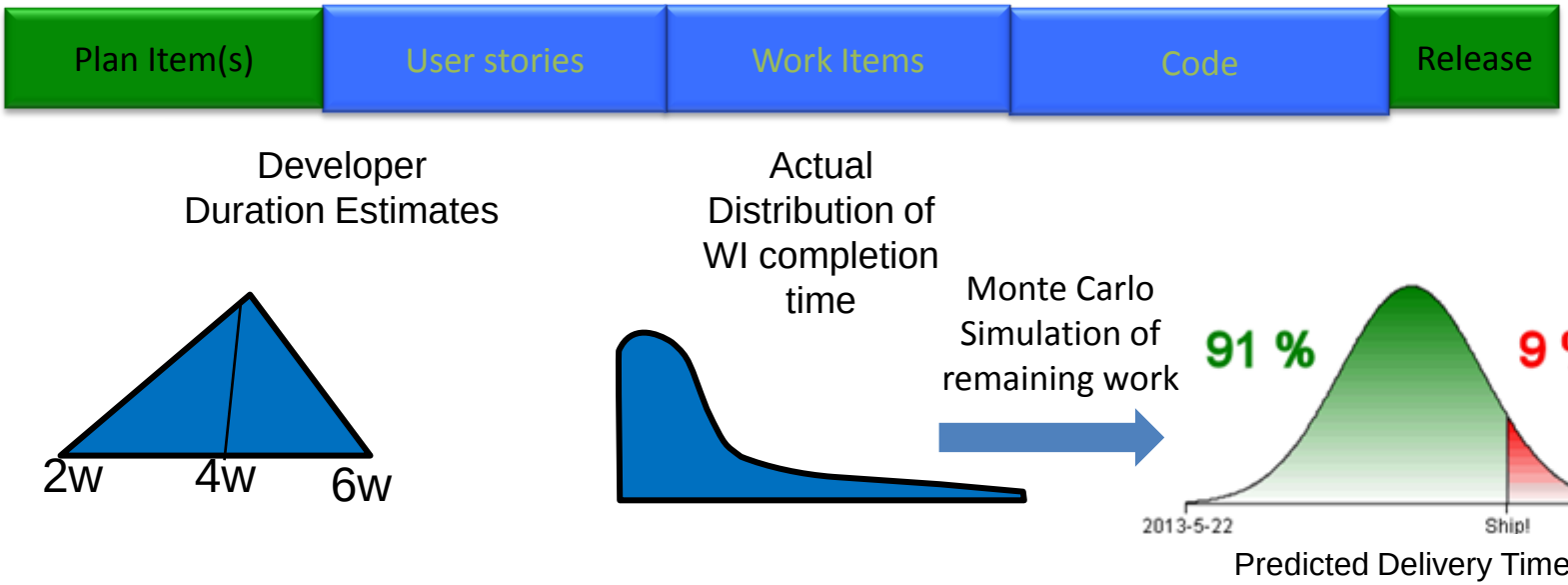
Introducing ANDES: Detecting and Remediating Threats to On-time Software and Systems Delivery

- ANDES is an analytics solution that provides early, actionable insight into issues that are putting on-time delivery at risk by:
  - Assessing the evolving likelihood of on-time product delivery and amount of risk remaining
  - Diagnosing common development issues that are adversely affecting the likelihood of on-time delivery using *patterns* in development data
  - Providing actionable insight into what caused the issues, and next steps to take towards resolution
  - Enabling “what-if” analysis to explore the most likely outcomes of different solutions to issues
- ANDES makes predictions and diagnoses based on data you already have (in Rational Team Concert)
  - Work items
  - Iteration/milestone plans
  - Business case
  - Etc.
- ANDES uses modern analytic methods to combine expert opinion with project data to make outcome predications

The goal: On time delivery of agile efforts

- The impact of missing a scheduled delivery results in
  - Higher costs:
    - Additional develop time may mean blow budgets
    - Technical debt – Rushing the code out the door may mean cutting corners on quality resulting in after delivery costs
    - Wasted stakeholder efforts: marketing, sale, support, operation, …
  - Less benefits
    - Revenue
      - Missing market window, especially of software embedded in larger product
      - Missed contractual commitments
      - Missed operational commitments
- Yet, interesting, economically valuable software has uncertainties that make schedule commitments hard to meet

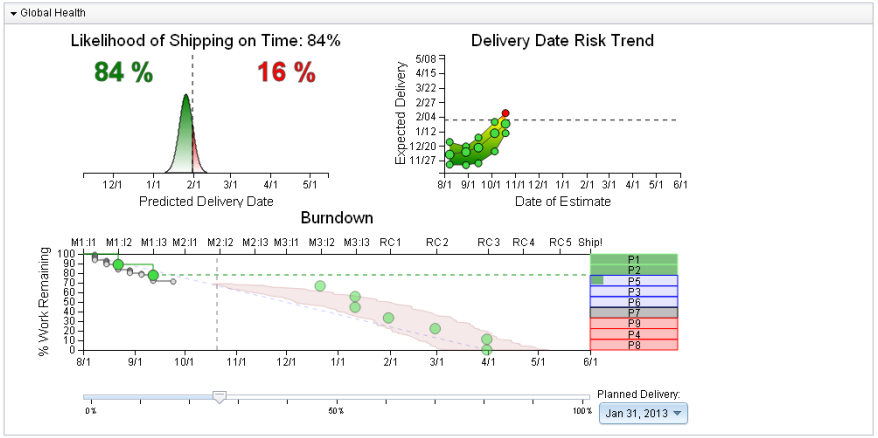
ANDES is a Monte Carlo simulation to lifecycle of project scope items

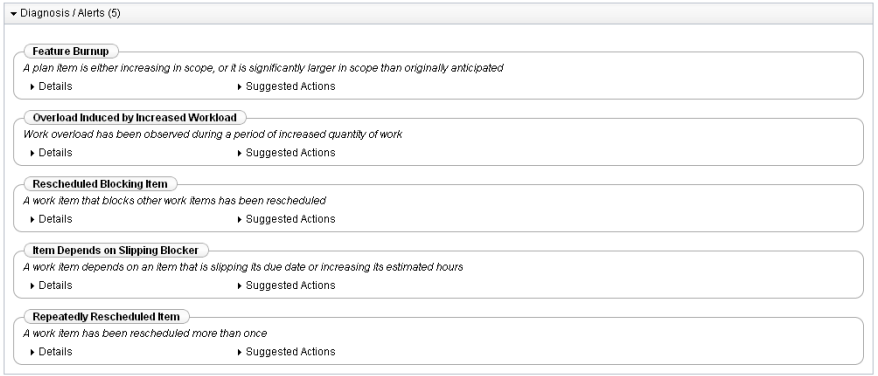


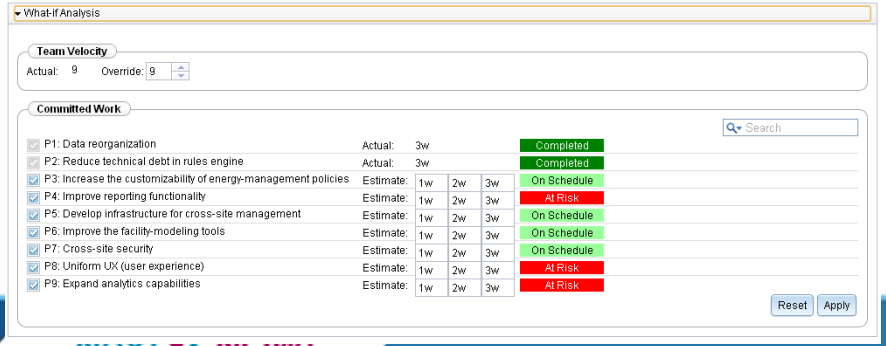
Uncertainty is reduced as

- Higher risk work is completed
- Plan items are scoped as work items

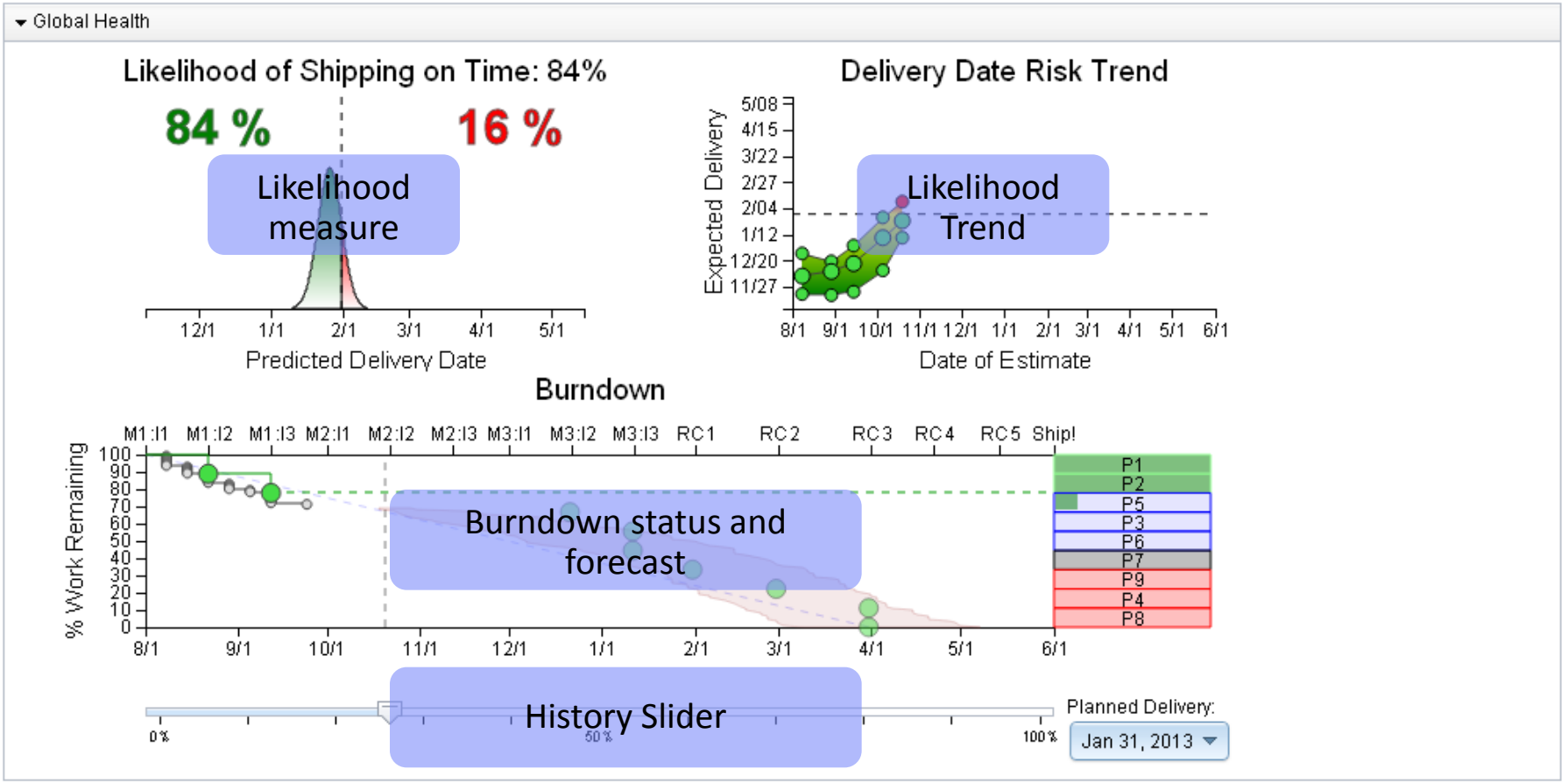
The Andes Solution



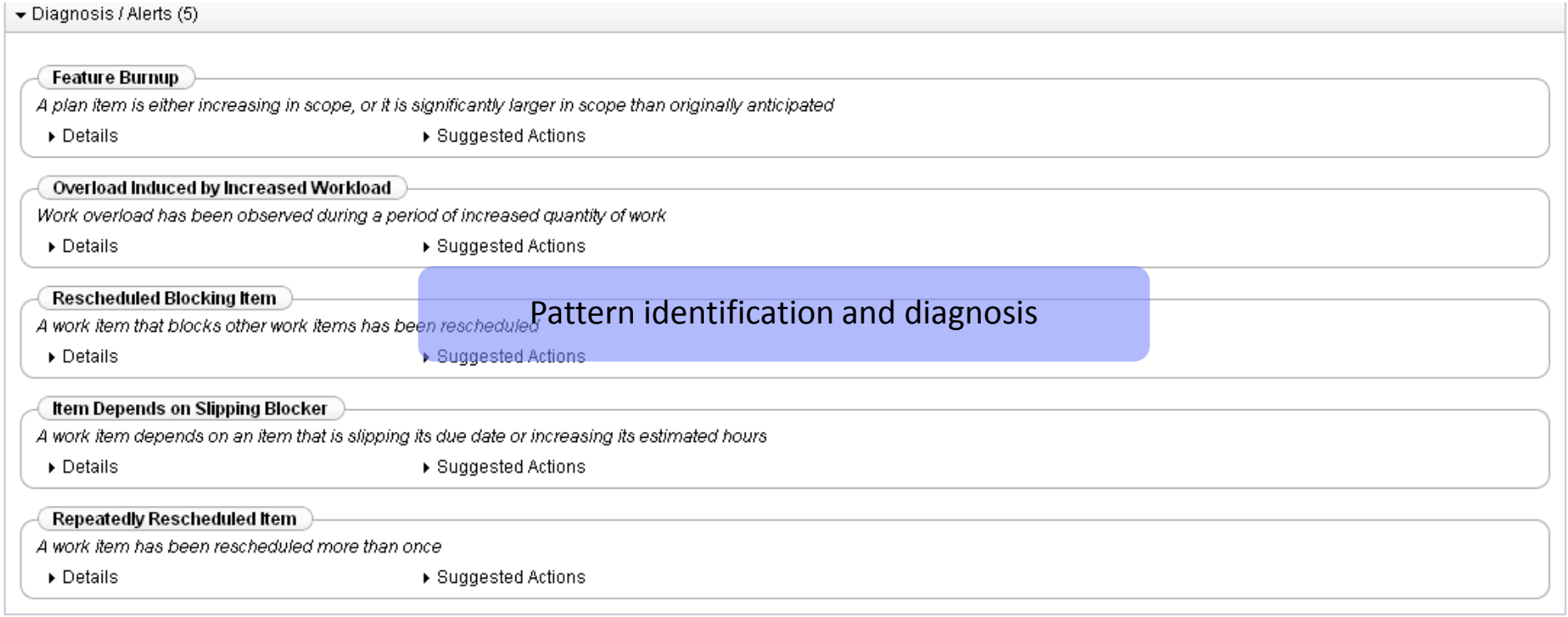




The Andes Solution

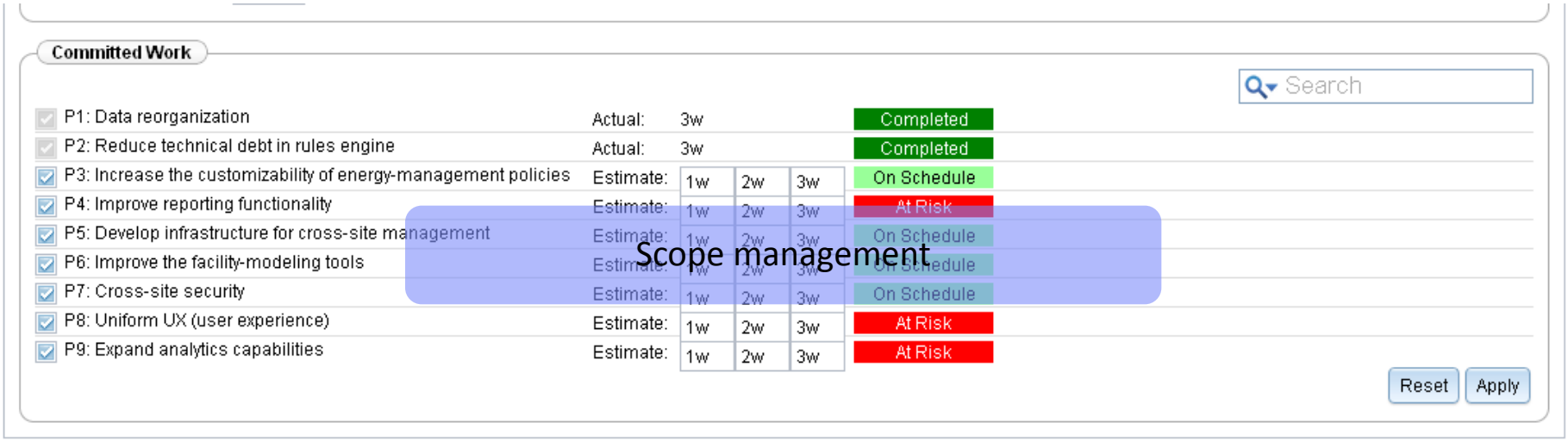


The Andes Solution



Pattern identification and diagnosis

The Andes Solution

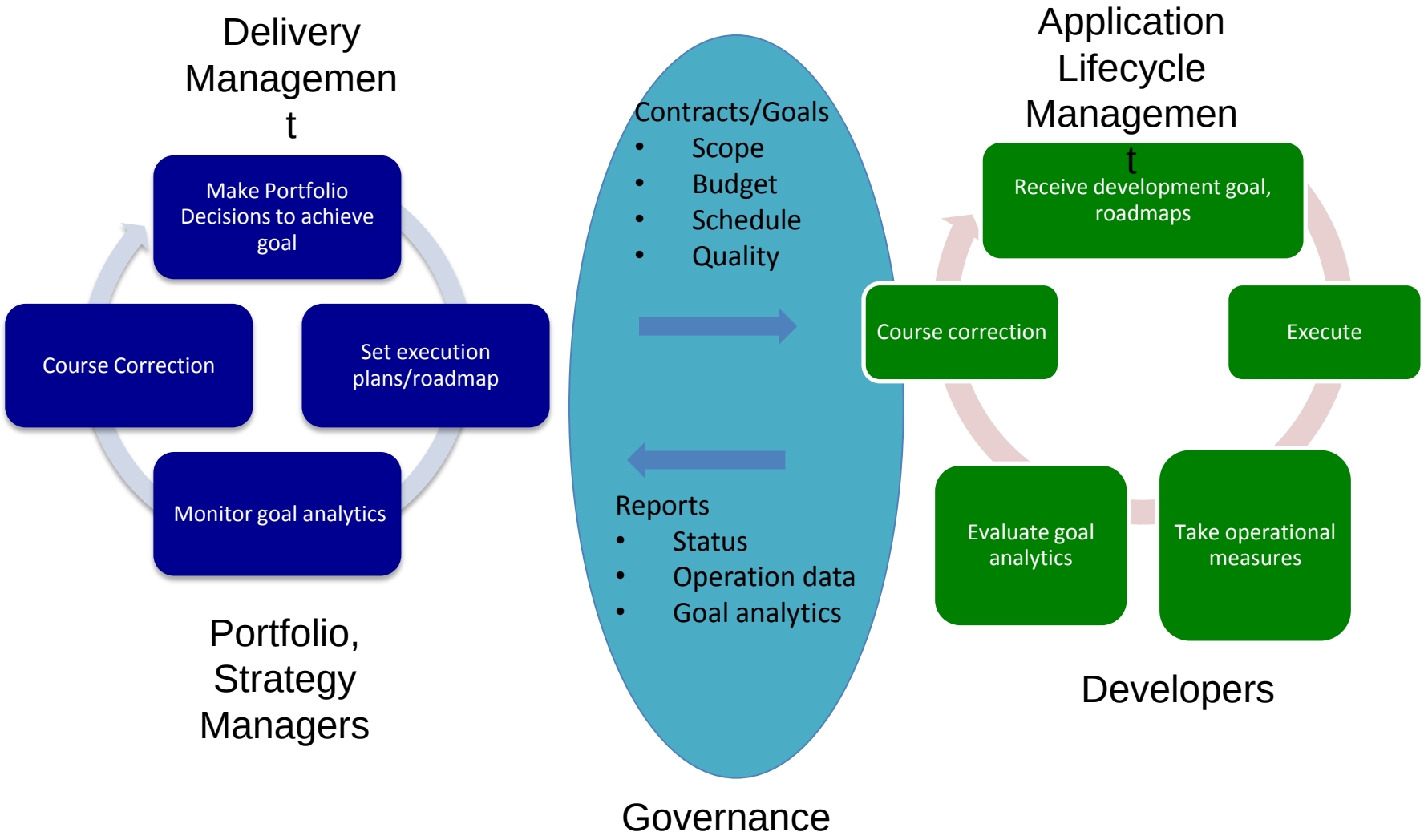


Scope management

Wrapping up AnDes

- ANDES introduces an analytic method for predicting likelihood of making project commitments
  - First instance is scope management
  - Later instances might include quality and budget management
- Part of the Rational/Research joint program
- ANDES is architected to fit into Rational jazz framework.

Key Idea: Align DM and CLM through instrumented governance

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“I used to think collaboration was a hippie word leftover from the 1960’s…now I define it as survival”

Innovate 2011 speaker

To compute the value of the program:

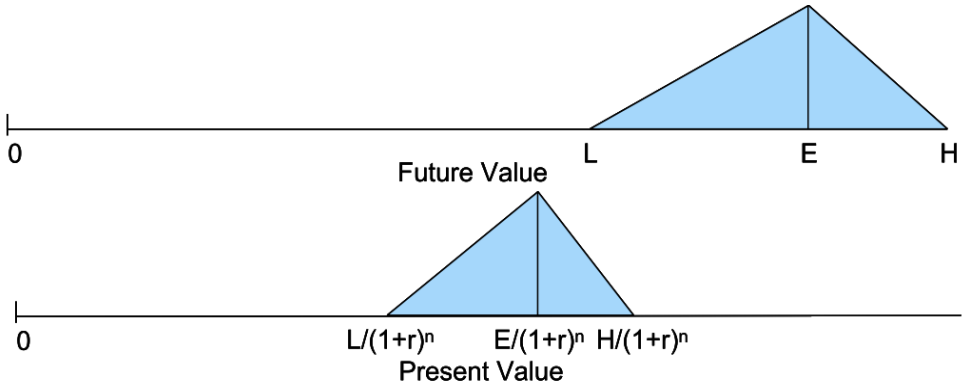
Apply the Net Present Value formula

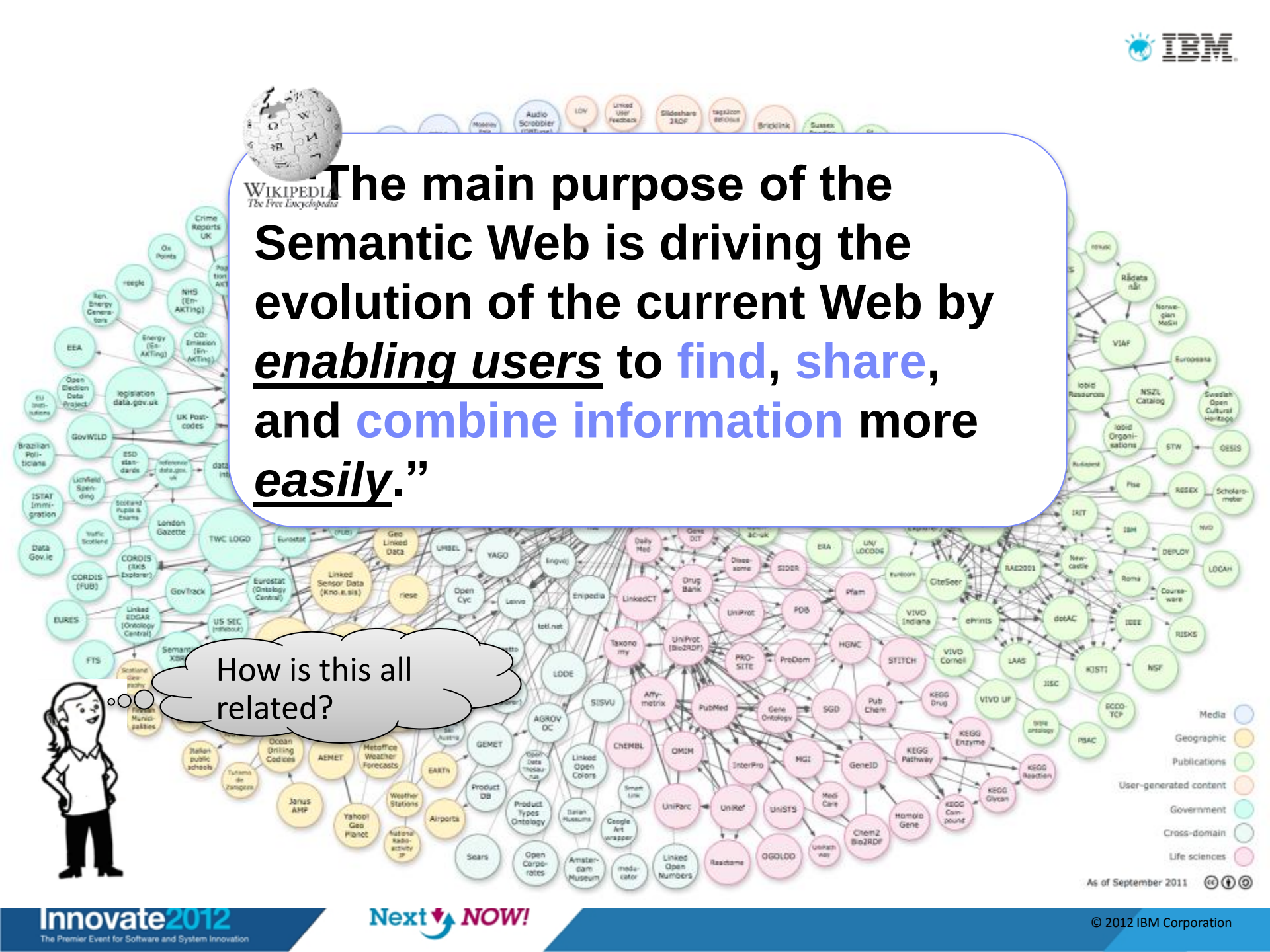
$$NPV(SSD) = \sum_{i=t_D}^{t_E} \frac{B_i}{(1+r_B)^i} - \sum_{j=t_t}^{t_D} \frac{D_j}{(1+r_D)^j} - \sum_{k=t_D}^{t_E} \frac{M_k}{(1+r_M)^k}$$

With:

1. B_i = *Benefits future values*
2. D_j = *Development expenses future value*
3. M_k = *Maintenance, after delivery expenses future values*
4. t_t = *Today, the current period*
5. t_D = *Delivery period*
6. t_E = *End of life period*
7. *The* r_B, r_M, r_D *are discount rates accounting for the time value of money.*

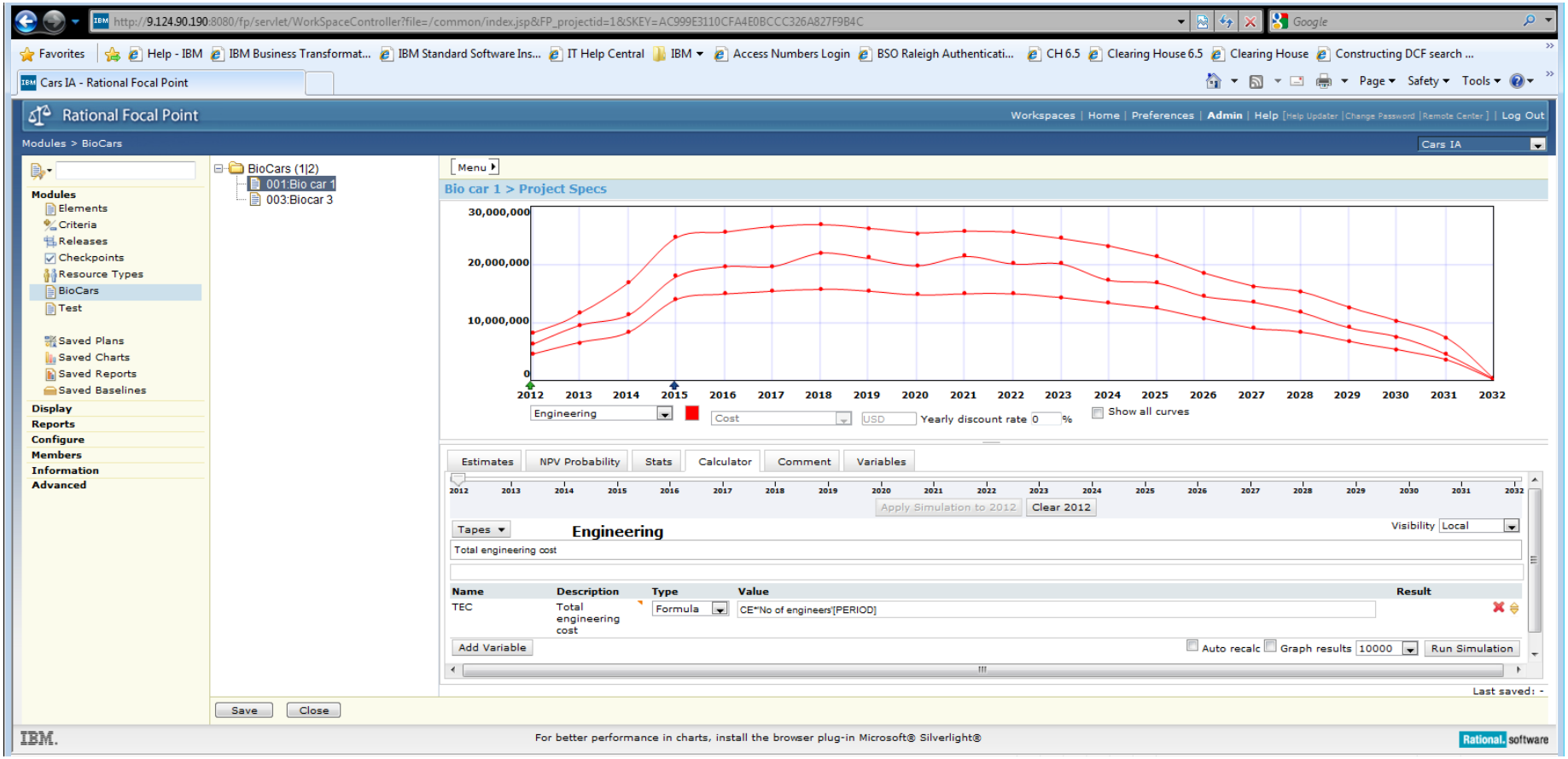
Using triangular distributions as the future values





Failure happens all the time. It happens every day in practice. What makes you better is how you react to it.

-Mia Hamm, FIFA World Player of the Year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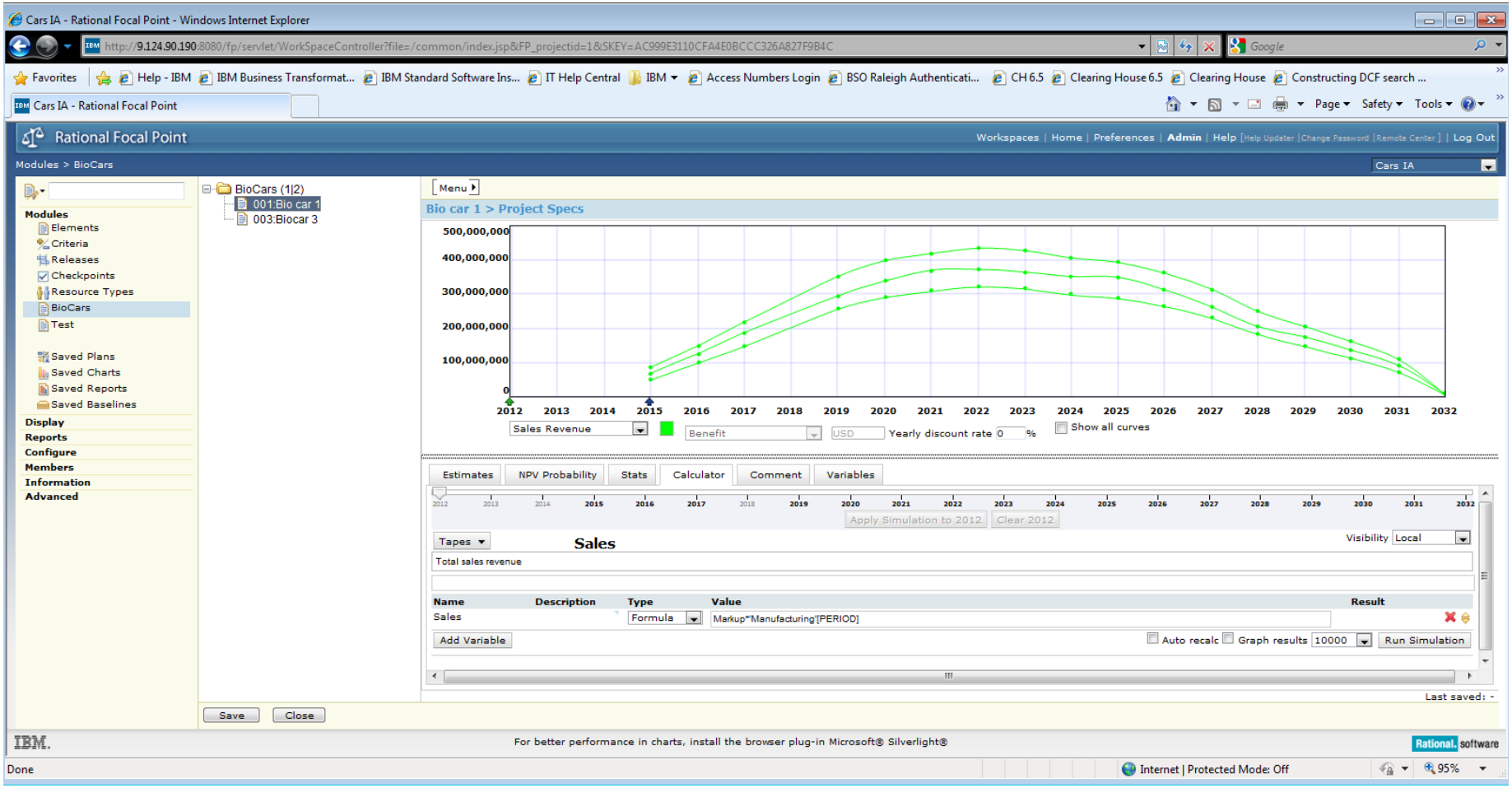
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NPV Probability
Stats
Calculator
Comment
Variables
Apply Simulation to 2012
Clear 2012
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