Credit Scoring, Modelling and Data Issues

What should scoring do?

RETAIL CREDIT RISK:
an overarching concept for credit professionals

Pinners' Hall - London
19 October 2001

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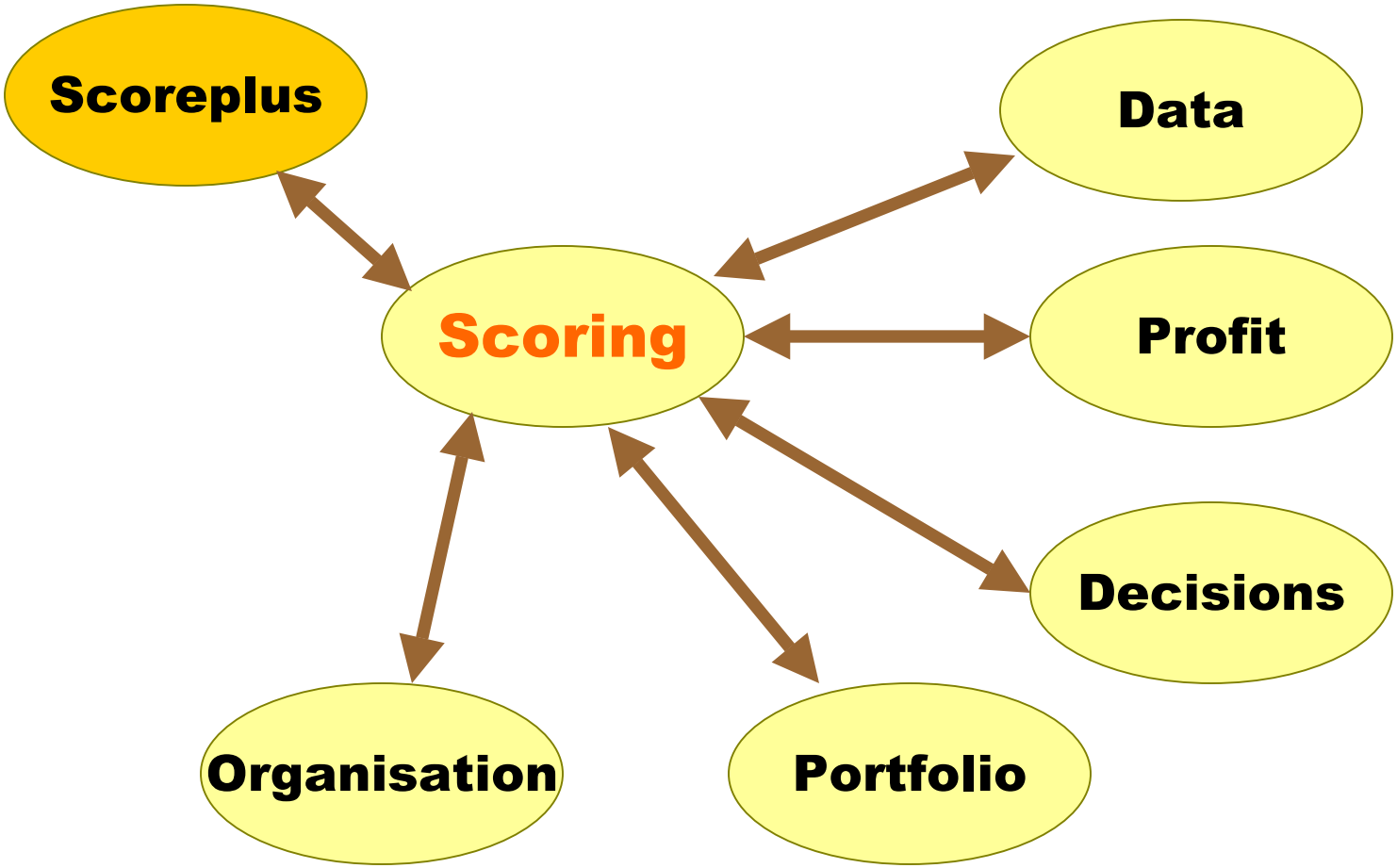
SCOREPLUS

www.scoreplus.com

Score Plus
→ data → information → profit

BBA Retail Credit Management Update

Credit Scoring, Modelling and Data
Structure of Presentation



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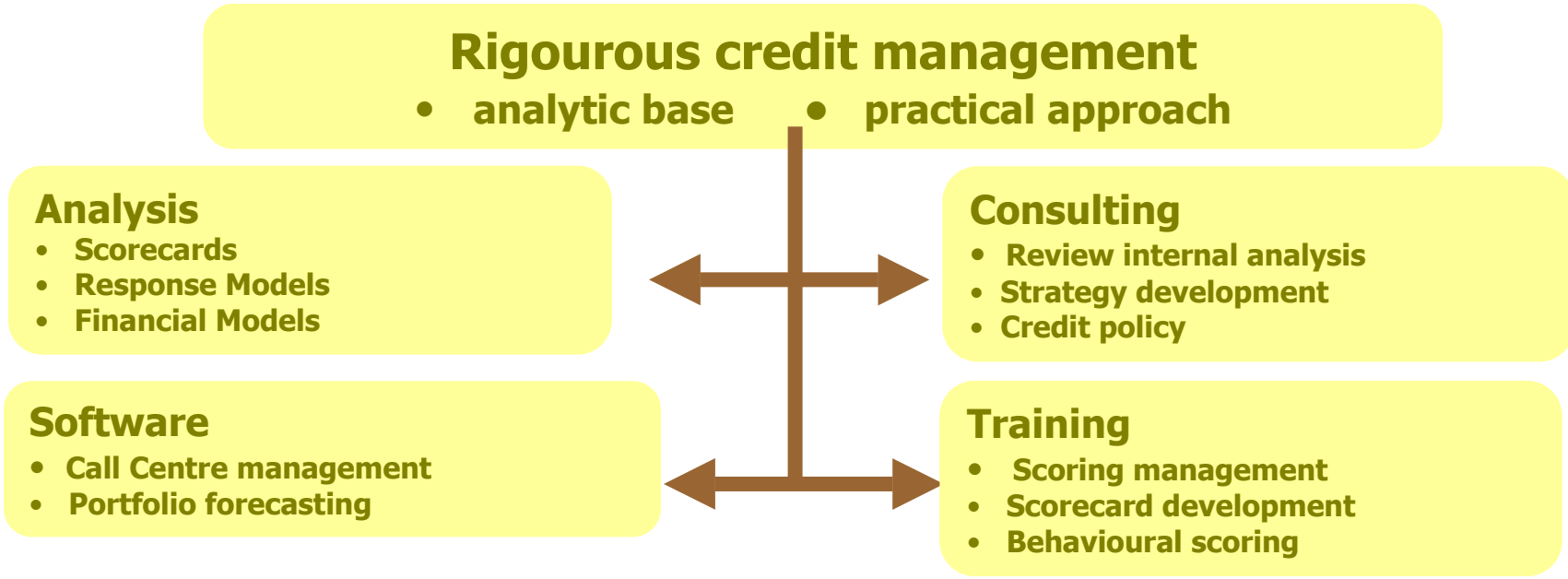
What is Scoreplus?



- Clients
  - Barclays Bank
  - Royal Bank Card Services
  - First USA
  - Stannic Bank
  - Abbey National
  - .....

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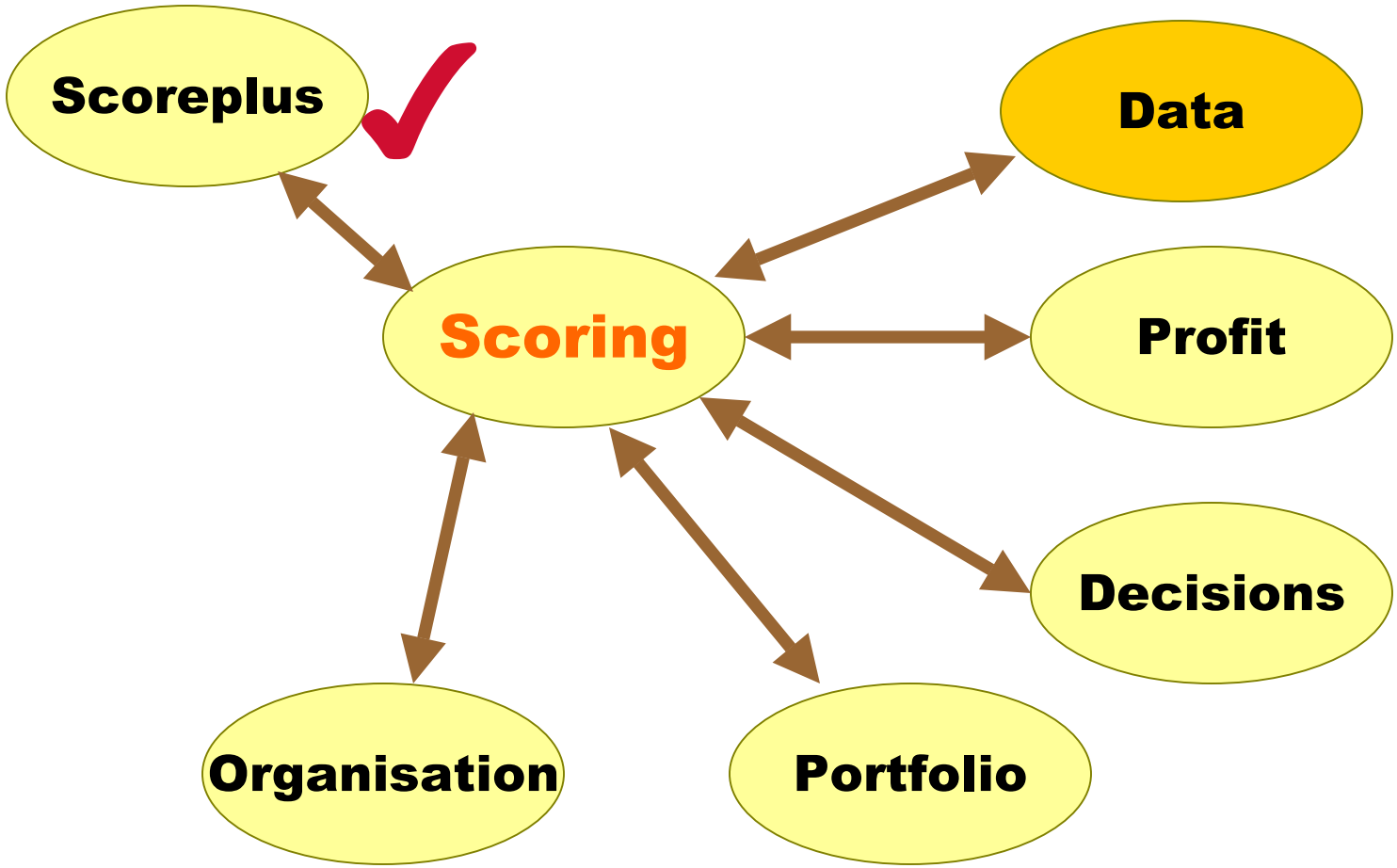

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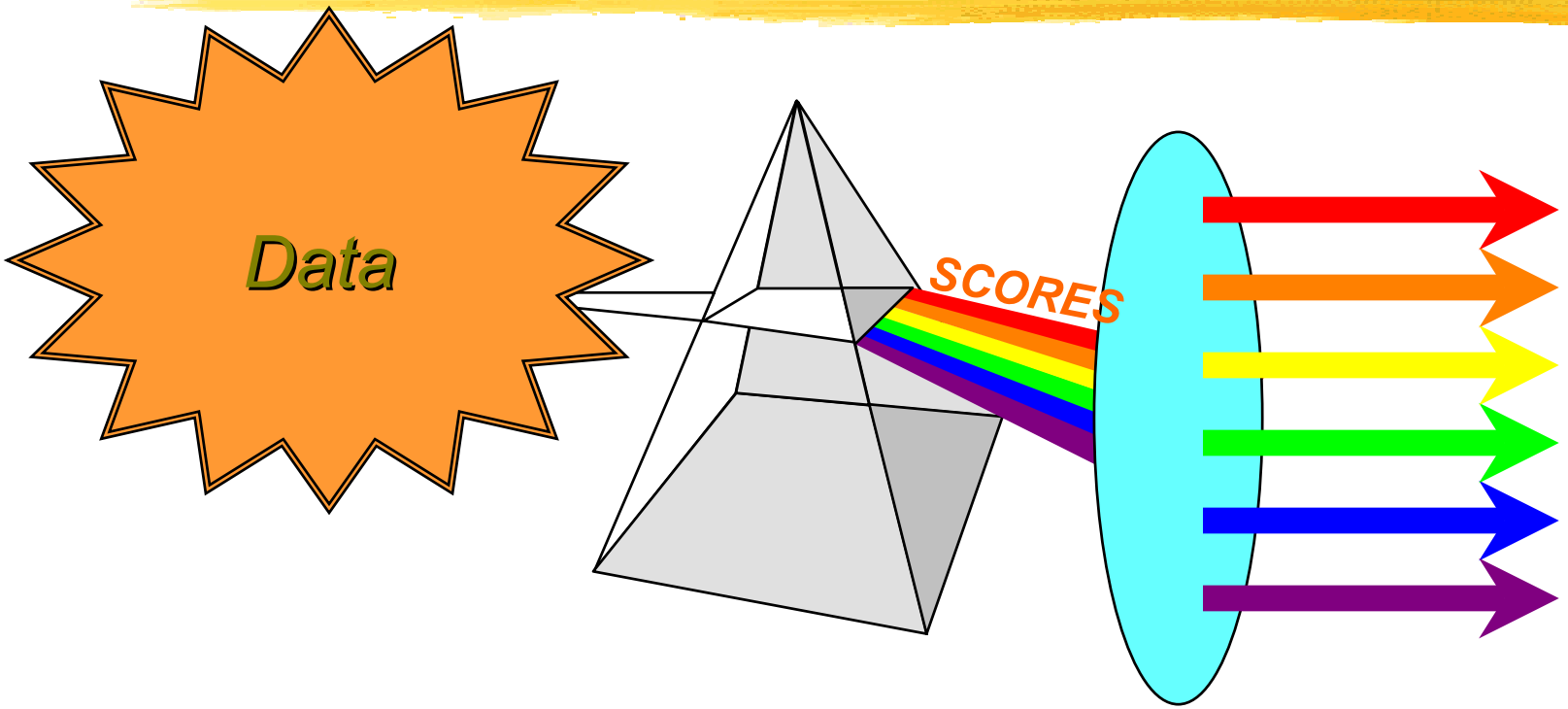
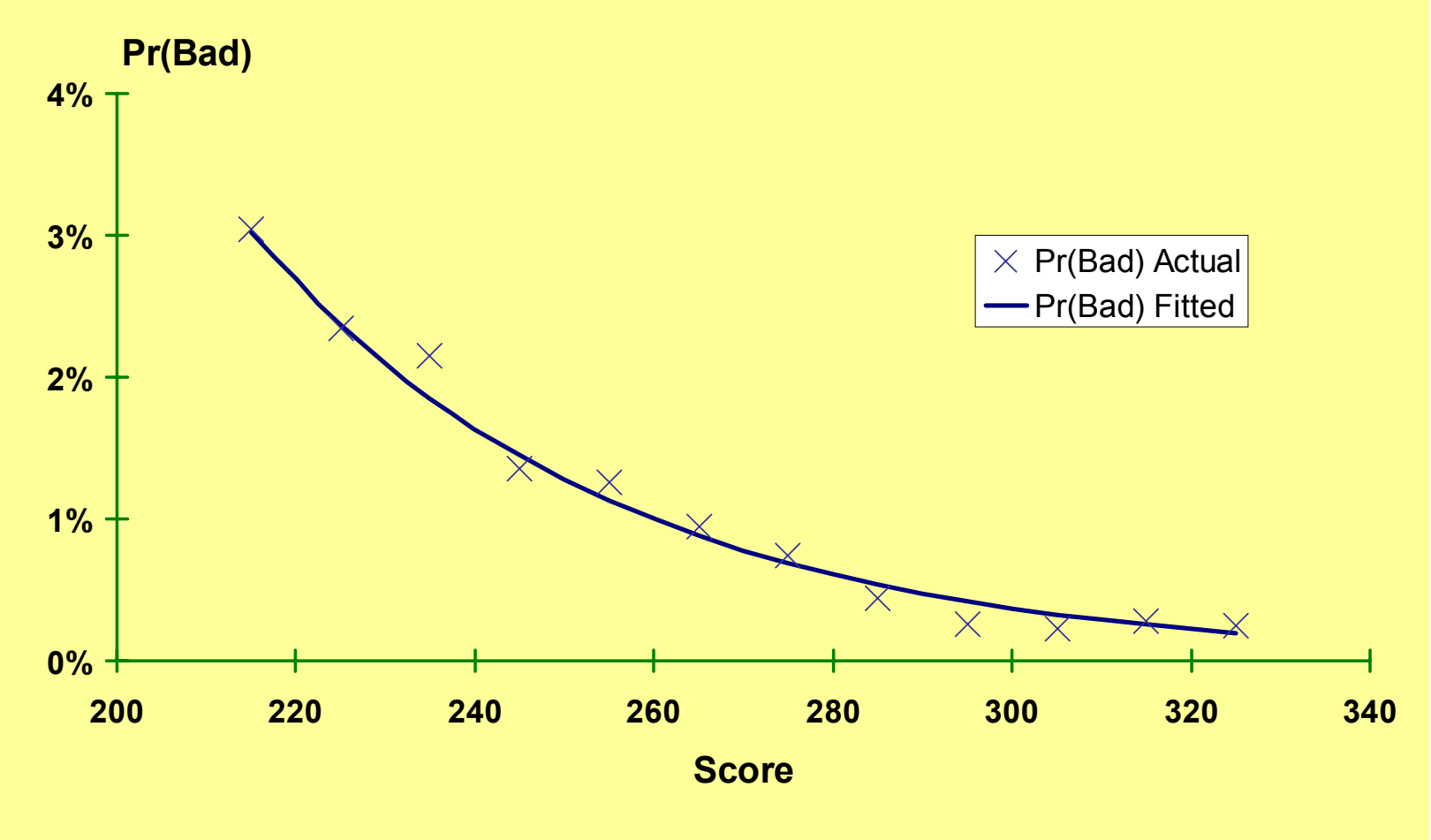
Scores structure data



- Scores do not add new data - they structure existing data
- Focus on one aspect of customer behaviour
  - e.g. risk at account opening, or probability of mailing response
- Give numerical estimate of expected behaviour

Score-Probability relationship



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GIGO: Garbage In - Garbage Out

- Scores can only structure data - not add information
  - scoring can only work if data are adequate to decision
- Quality of data determines value of score
  - corrupted data will lead to less power
- Example: Small business account opening score

Data Source	Discrimination *(Information Value Contribution)*
Application data	23%
Business Account History	37%
Personal Account History	17%
Business Credit Bureau	11%
Personal Credit Bureau	12%
	100%

Do third party data matter?

- Example 1 - Customer Level Behavioural Score
- Bank account history available -> powerful discrimination
- Bad rate without 3rd party data: 5.50%
- Bad rate with 3rd party data: 5.38% (2% loss reduction)
- Conclusion: - marginal use on these customers

- Example 2 - Mail Order New Customer Score
- Little information on applications -> heavily dependent on CRA
- Bad rate without 3rd party data: 14.0%
- Bad rate with 3rd party data: 12.8% (9% loss reduction)
- Conclusion: - major impact
- - restrictions reinforce value of existing customer info
- - restrictions raise barriers to entry into market

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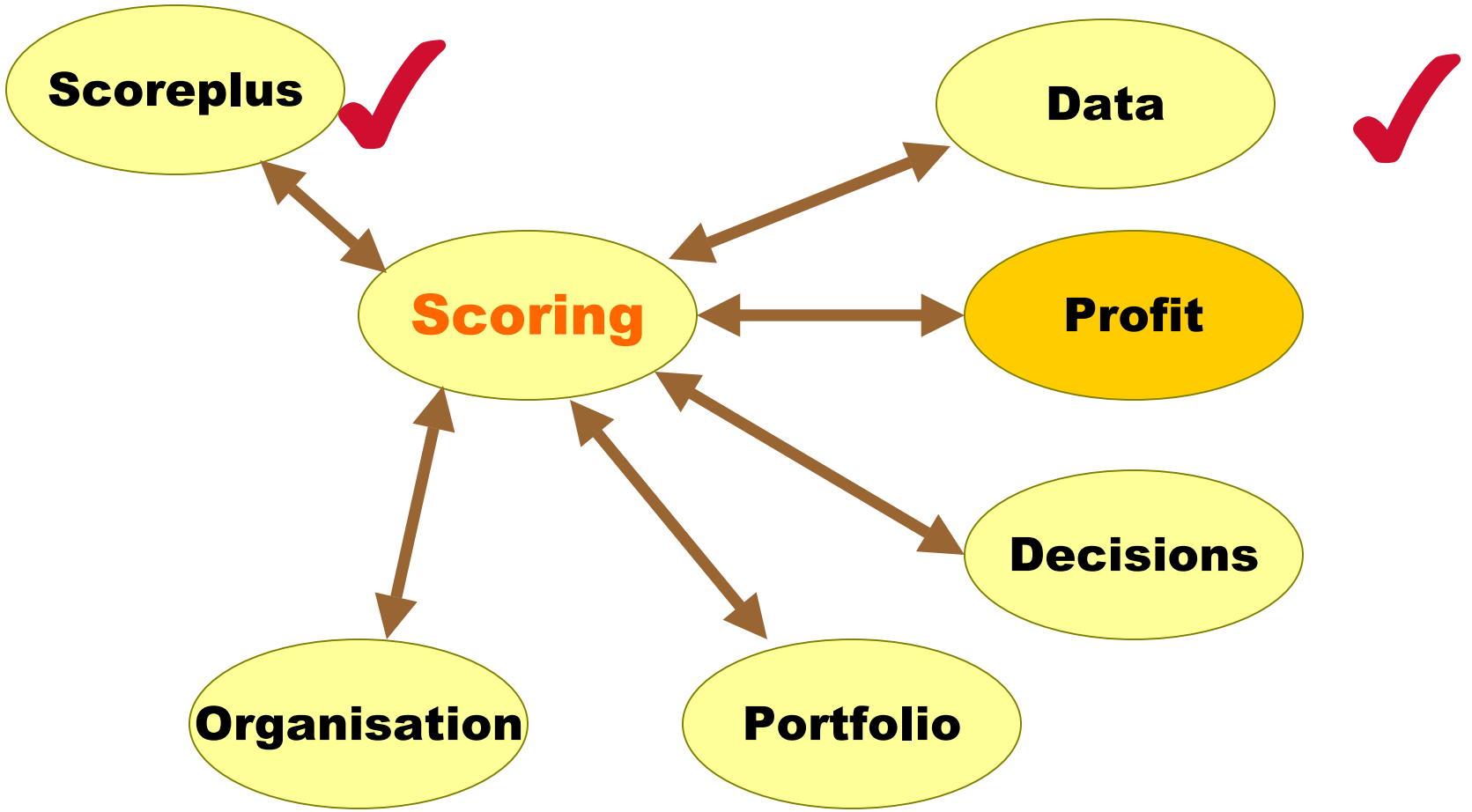

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Scoring and Profit: Credit card example

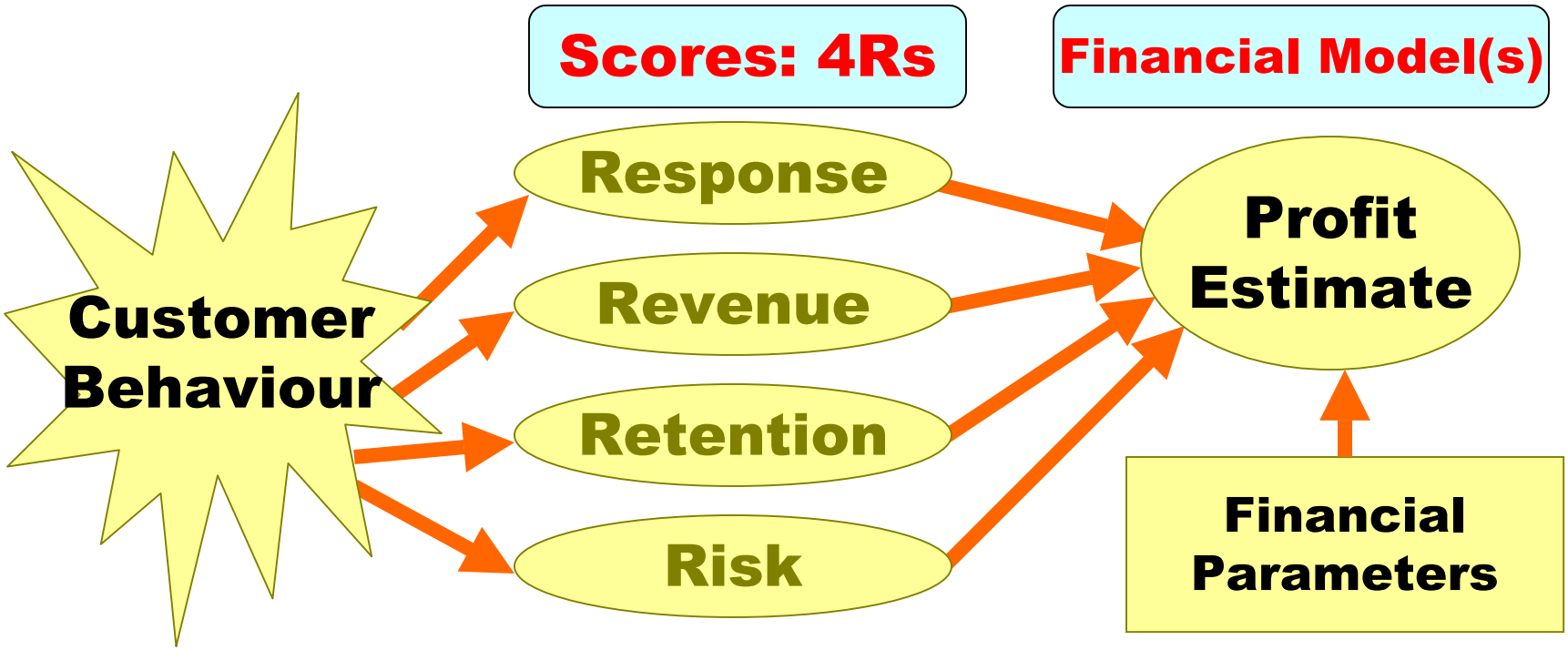
- Total portfolio profit: £100m
  - Top 6%: +£100m
  - Next 24%: +£ 50m
  - Bottom 70%: - £ 50m
- Profit profile:
  - revolver
  - balance transfer
  - high balance
  - credit insurance
  - delinquent
  - BUT NOT CREDIT LOSS

High Profit ≠ Low Risk

Why is profit modelling difficult?

- **Profit depends on conflicting types of behaviour**
  - Activity (Level of Turnover)
  - Borrower/Transactor
  - Risk
- **Trade-off depends on financial parameters**
  - Interest rates and funding cost
  - Product structure - e.g. late fees, utilisation incentives
  - Operating costs - e.g. collections costs
  - Credit insurance income and costs
- **Profit depends on accounting conventions**
  - Allocation of overheads
  - Timely identification of provision
  - Need different conventions for different purposes

How to model profit … the 4Rs



- Scoring models to estimate key dimensions of customer behaviour
- Financial model to trade-off the 4Rs
- Time dimension

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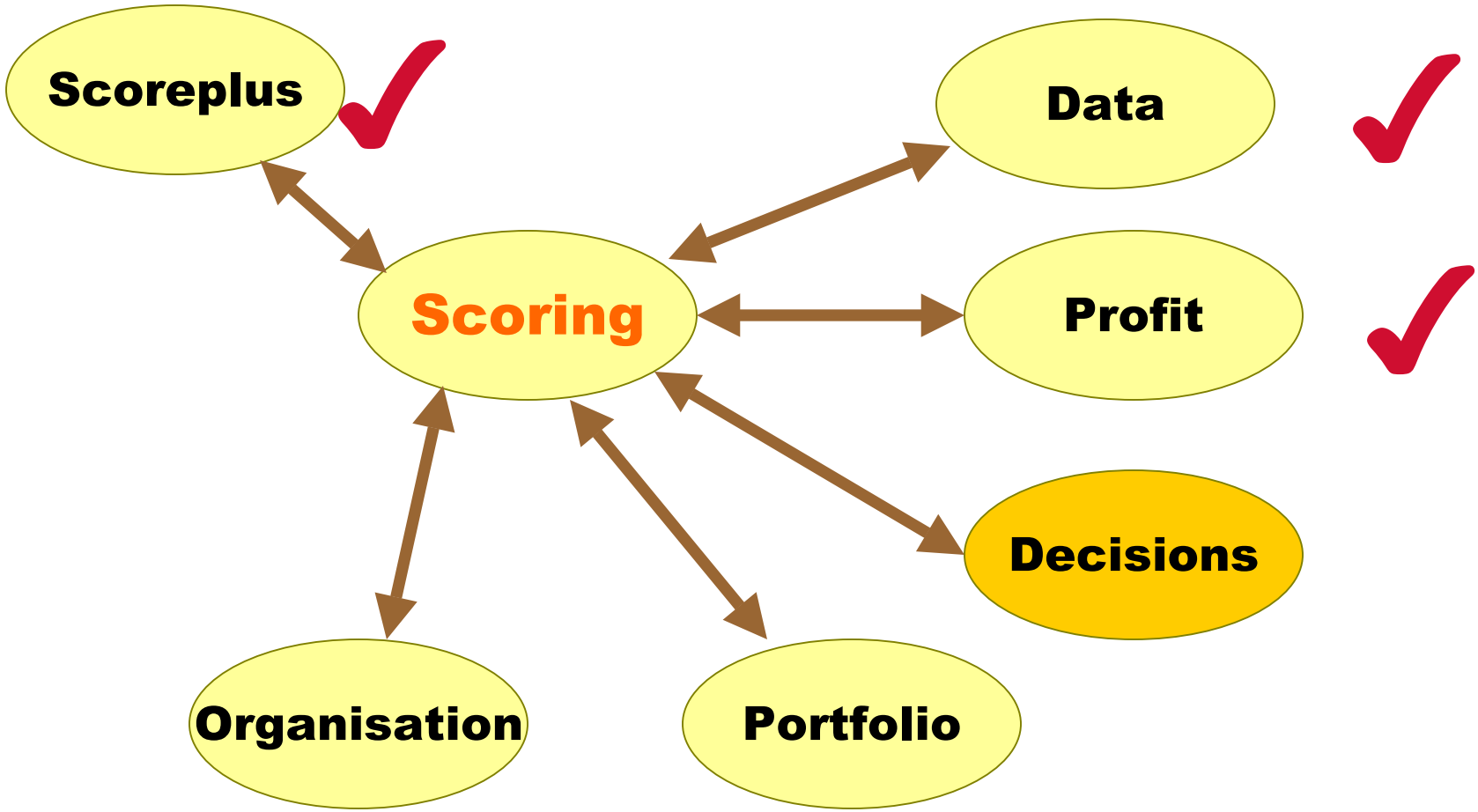

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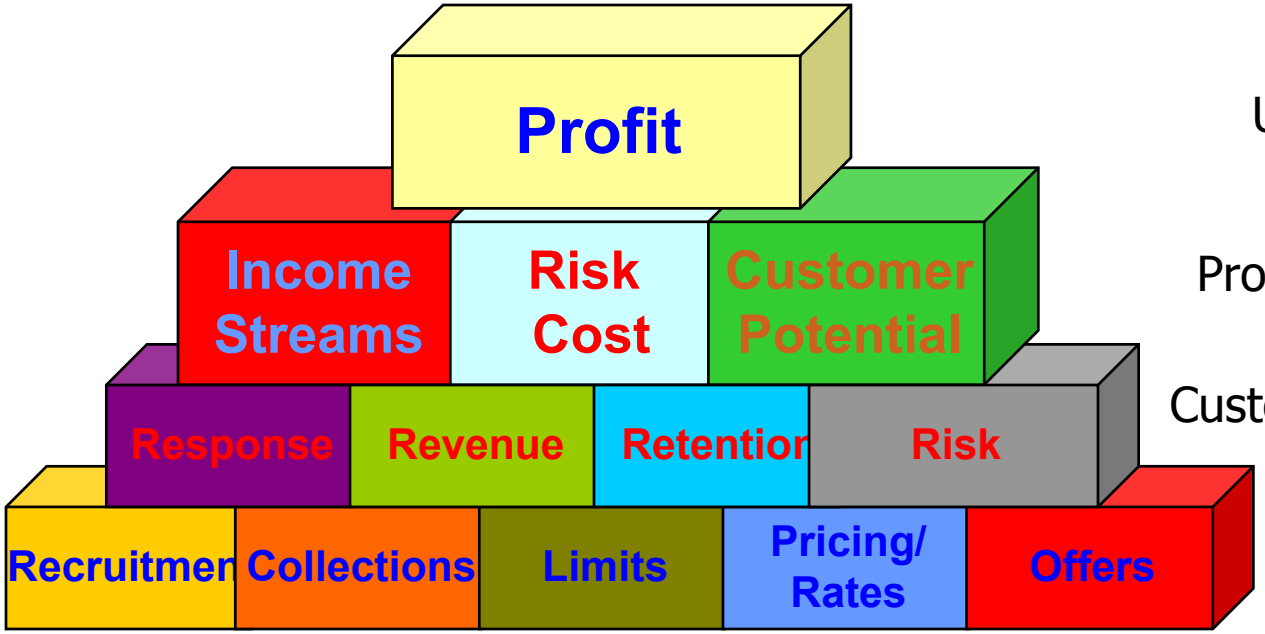
Profit Pyramid: can't see the top from the ground



- Goal is to select lender actions to maximise (long-term) profit
- Linkage between lender actions and profit is complex
- Need to assess customer potential under different actions

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Solution: Action-specific scores

- Model 1: → collection action: Score 1

- Model 1: → collection action: Score 2

- Model 3: → collection action: Score 3

- Model 4: → collection action: Score 4

Build four score models to test outcomes

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Who-to-call example

Account	Probability of Payment With a Collection Call	Probability of Payment With no Collection Call
No. 1	20%	18%
No. 2	25%	5%
No. 3	30%	15%

vs

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Decision making: Action-specific scores

- Scores estimate customer behaviour
  - GIVEN LENDER ACTION
- Actions vary change customer treatment
  - collections action
  - lower interest rate
  - credit limit
- Estimate potential profit under different actions
  - FOR EACH INDIVIDUAL CUSTOMER
- Take action which maximises value of customer

Adapt treatment for each individual

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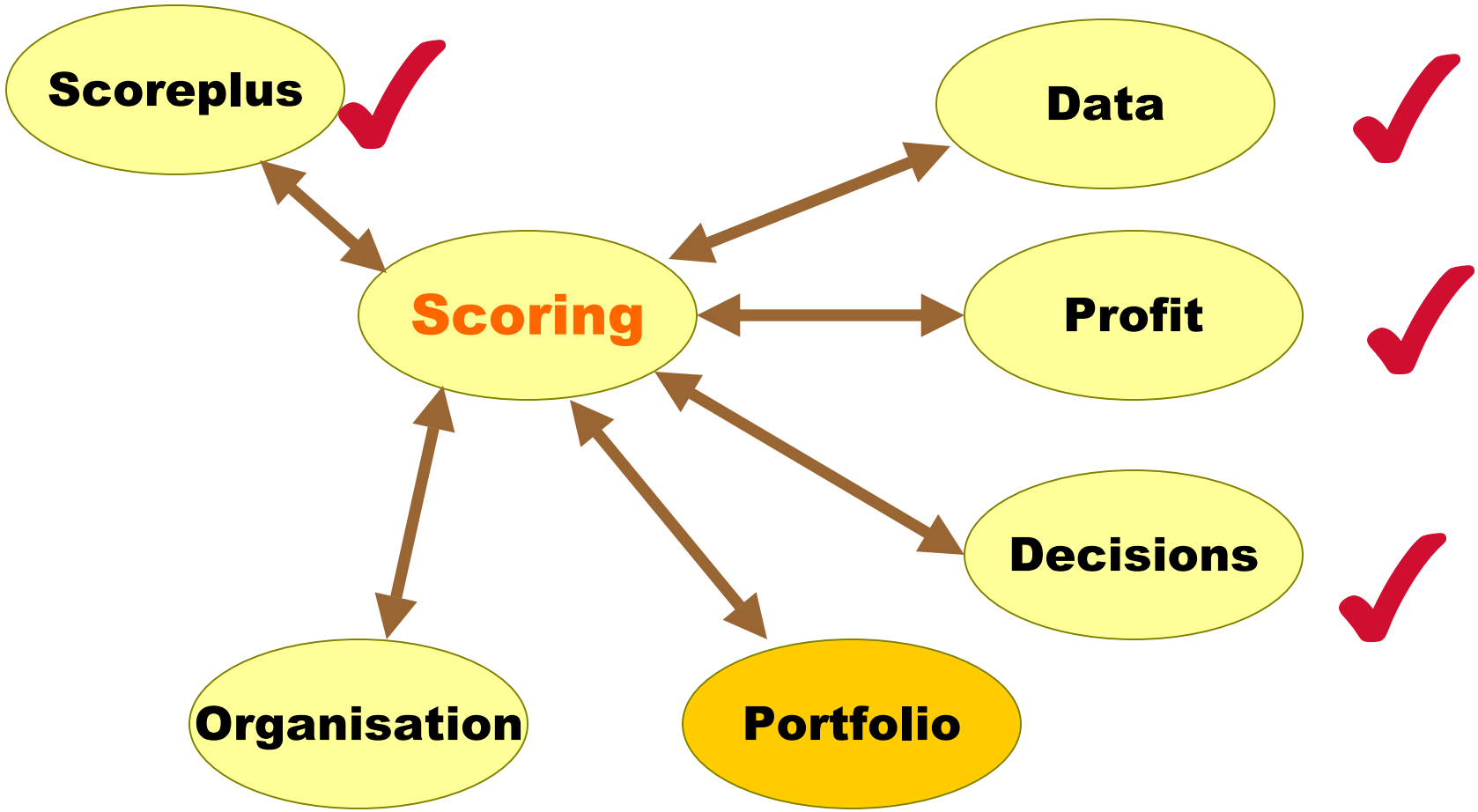

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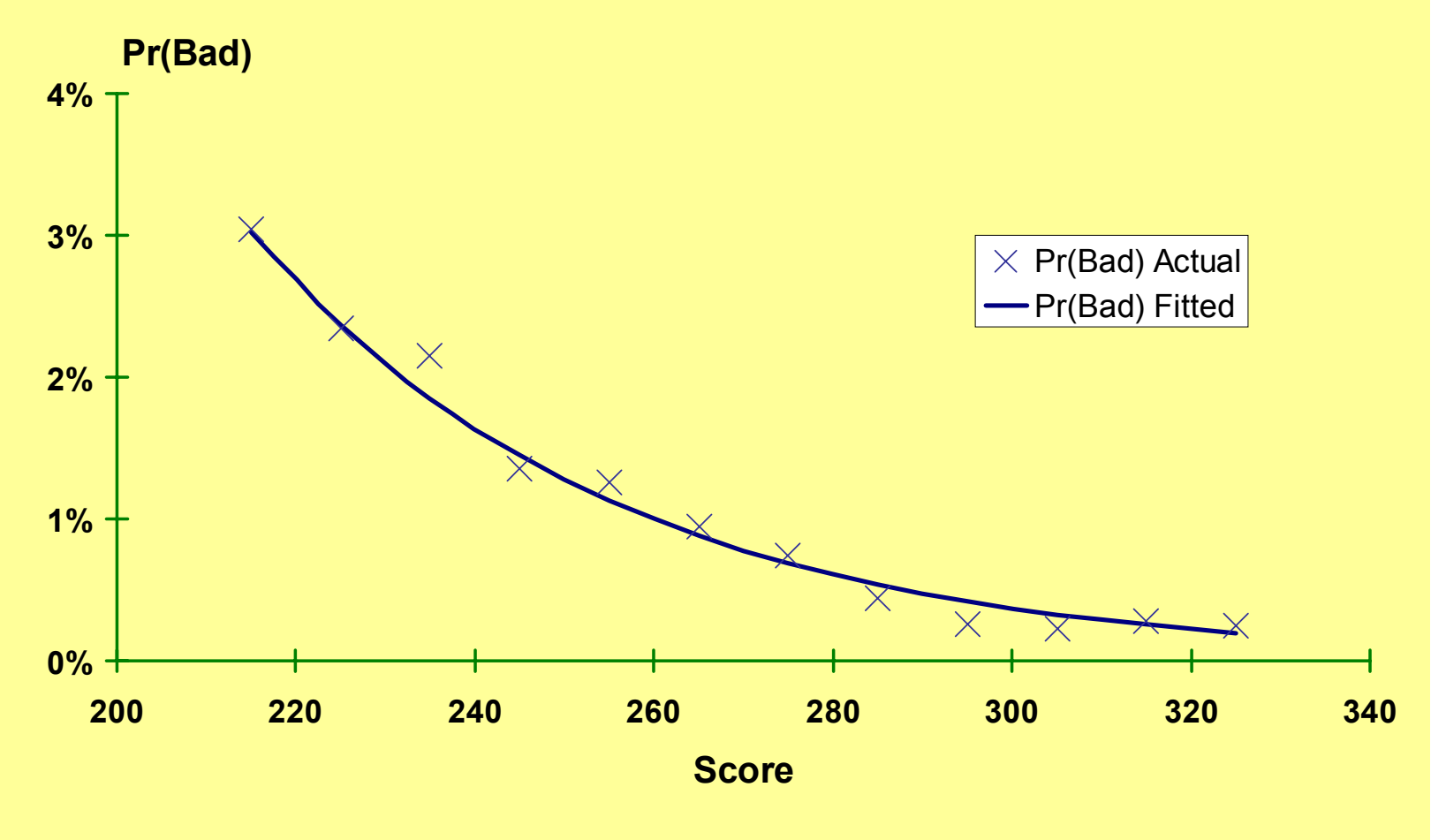
Score-Probability relationship



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Scores and Capital Adequacy

	Balance	Pr(Bad) *(from Score)*	Expected Loss	Value at Risk (97.5% level)
Smith	£5,000	5%	£250	£2,386
Jones	£15,000	2%	£300	£4,416
Scallan	£8,000	1%	£80	£1,640
….				
Portfolio	**£28,000**	**2.3%**	**£630**	**£8,442**

- Scores translate into expected loss
- Variability of estimates help estimate Value at Risk
- Does not (currently) handle correlation between cases
- Does not look at systemic risk

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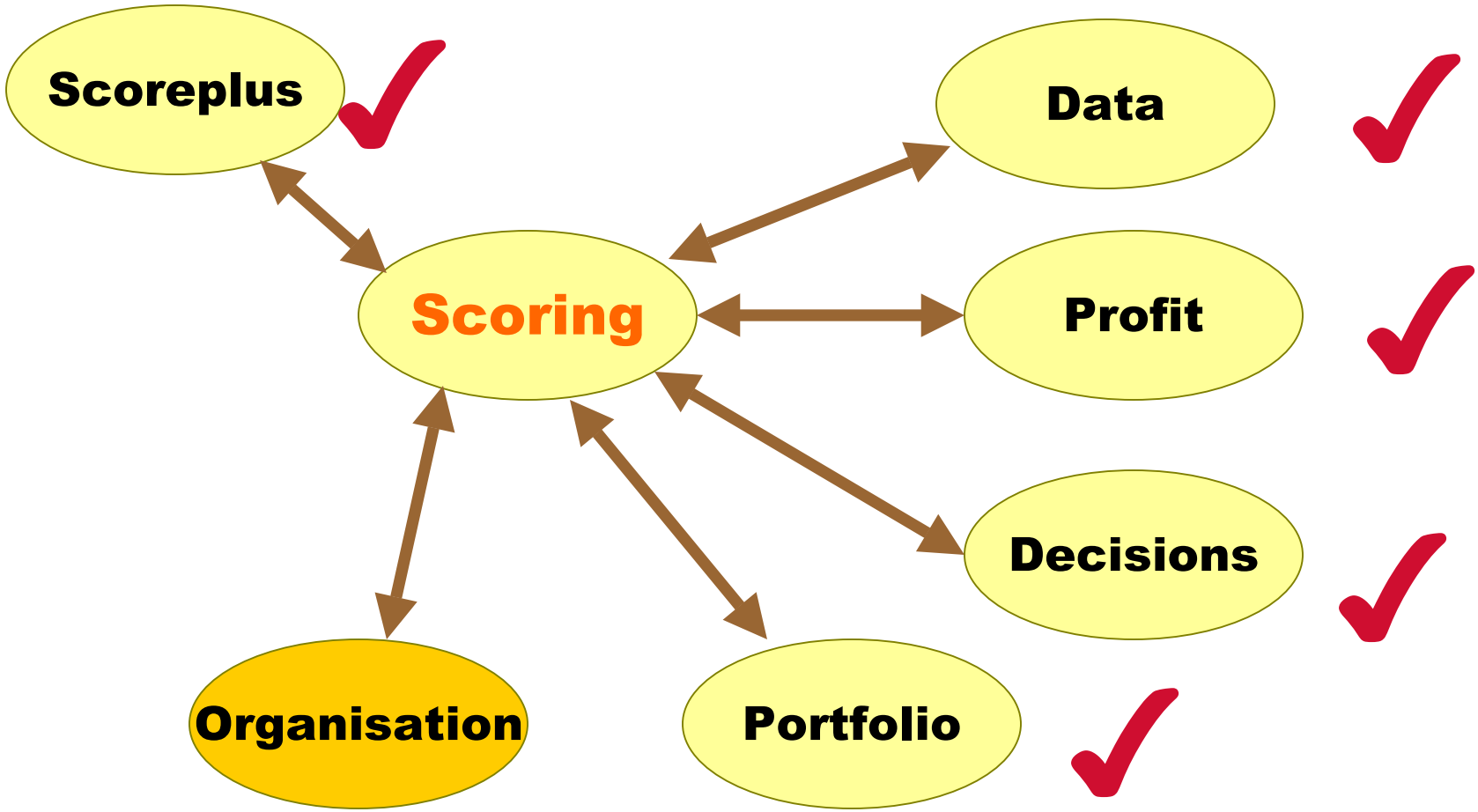

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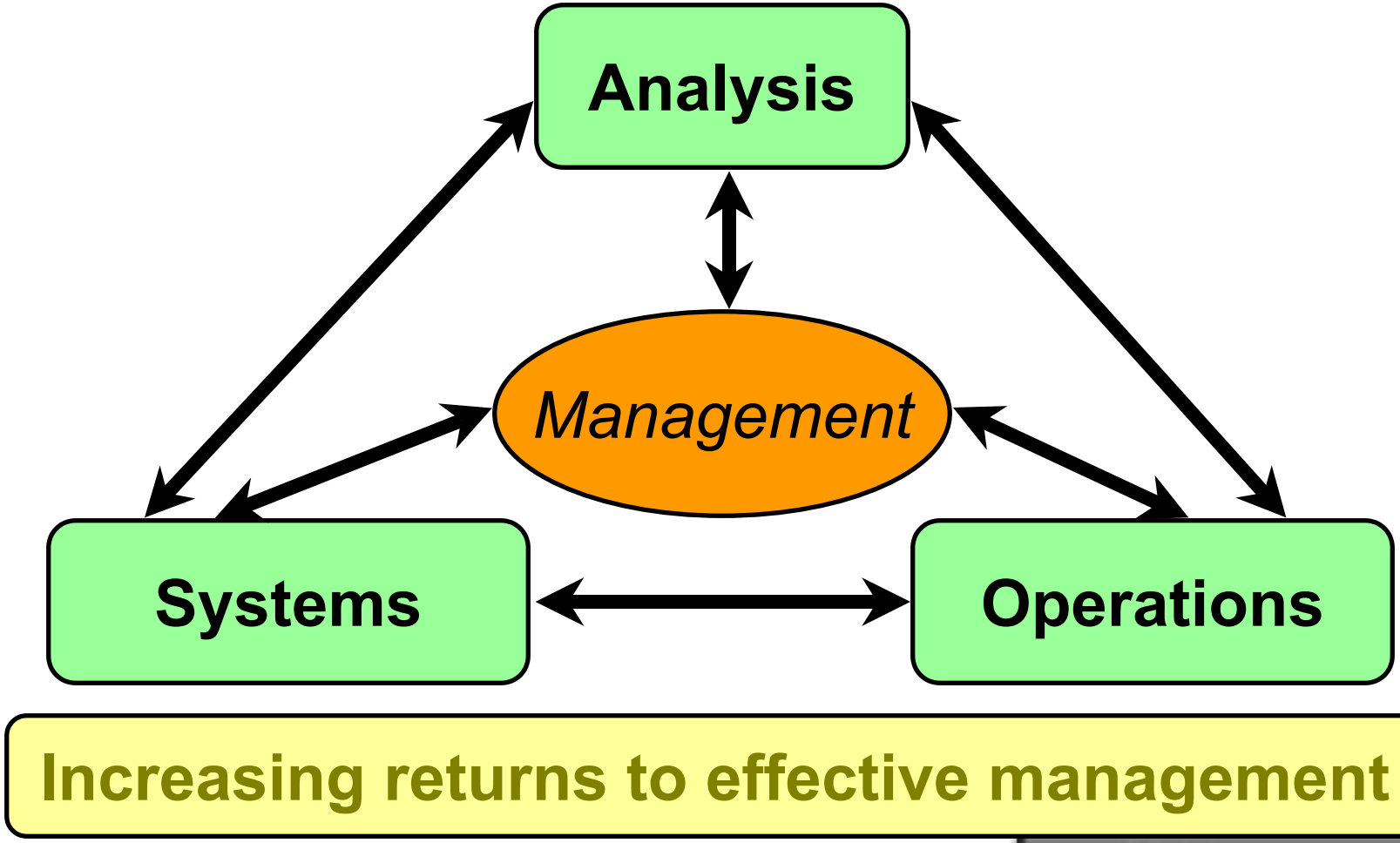
Information culture:
… the competitive difference



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