

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**

**Gerard Scallan
SCOREPLUS**

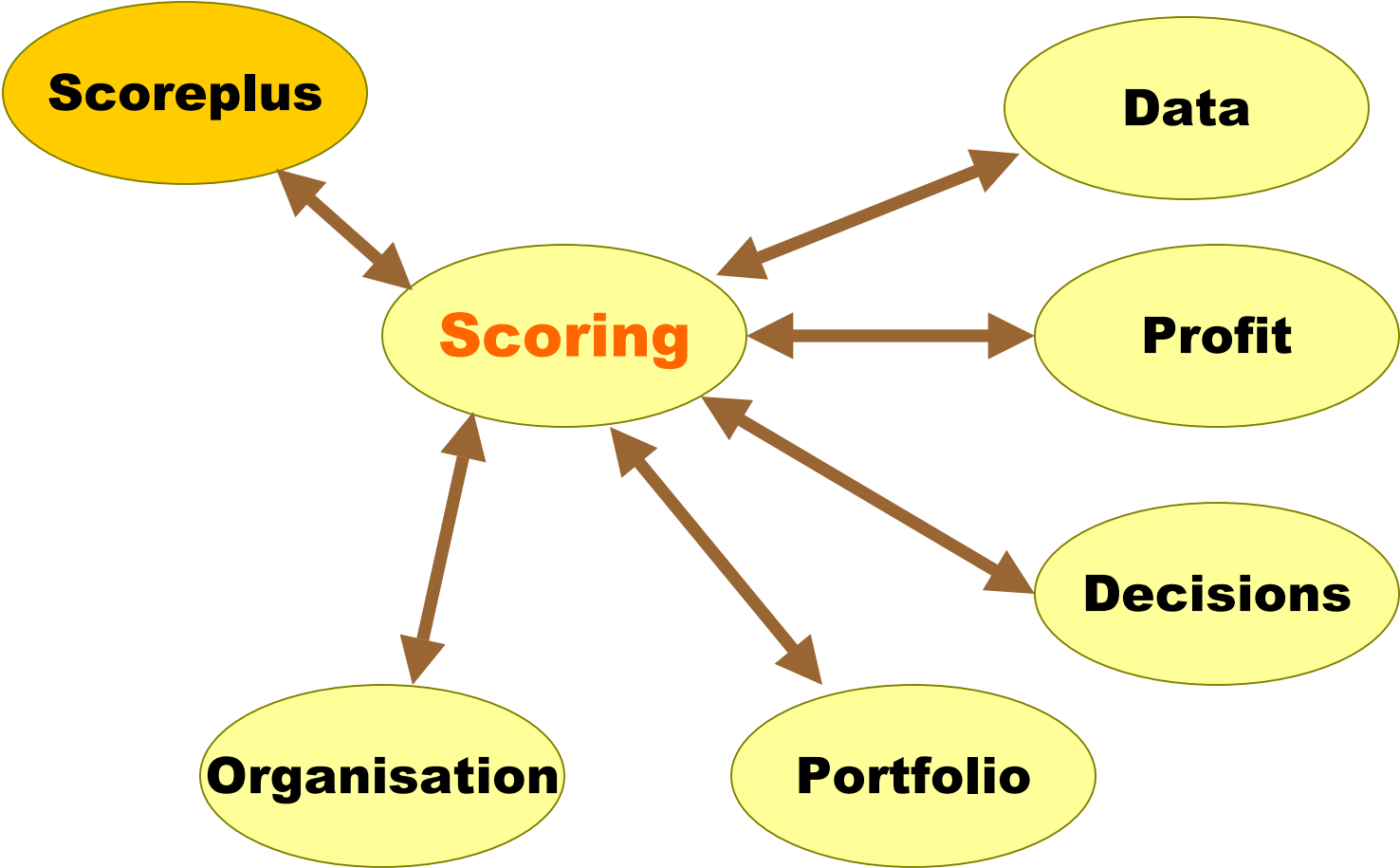
www.scoreplus.com

BBA Retail Credit
Management Update

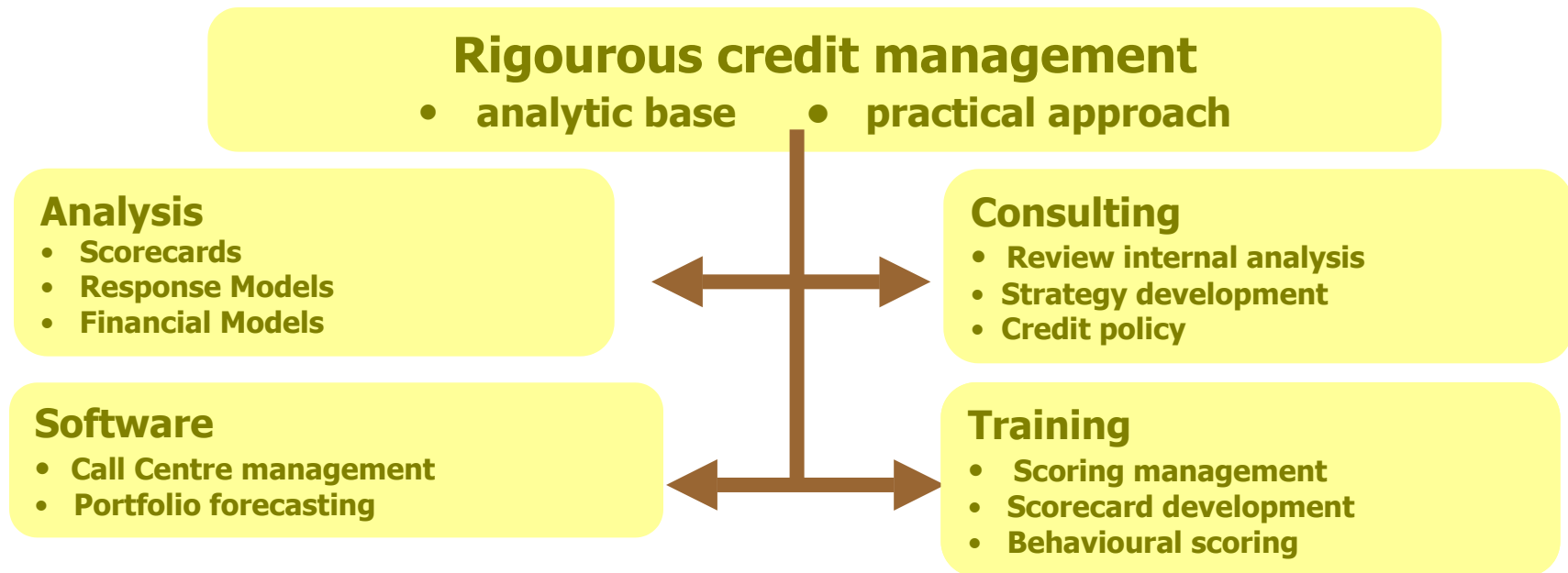


→ data → information → profit

Credit Scoring, Modelling and Data Structure of Presentation



What is Scoreplus?



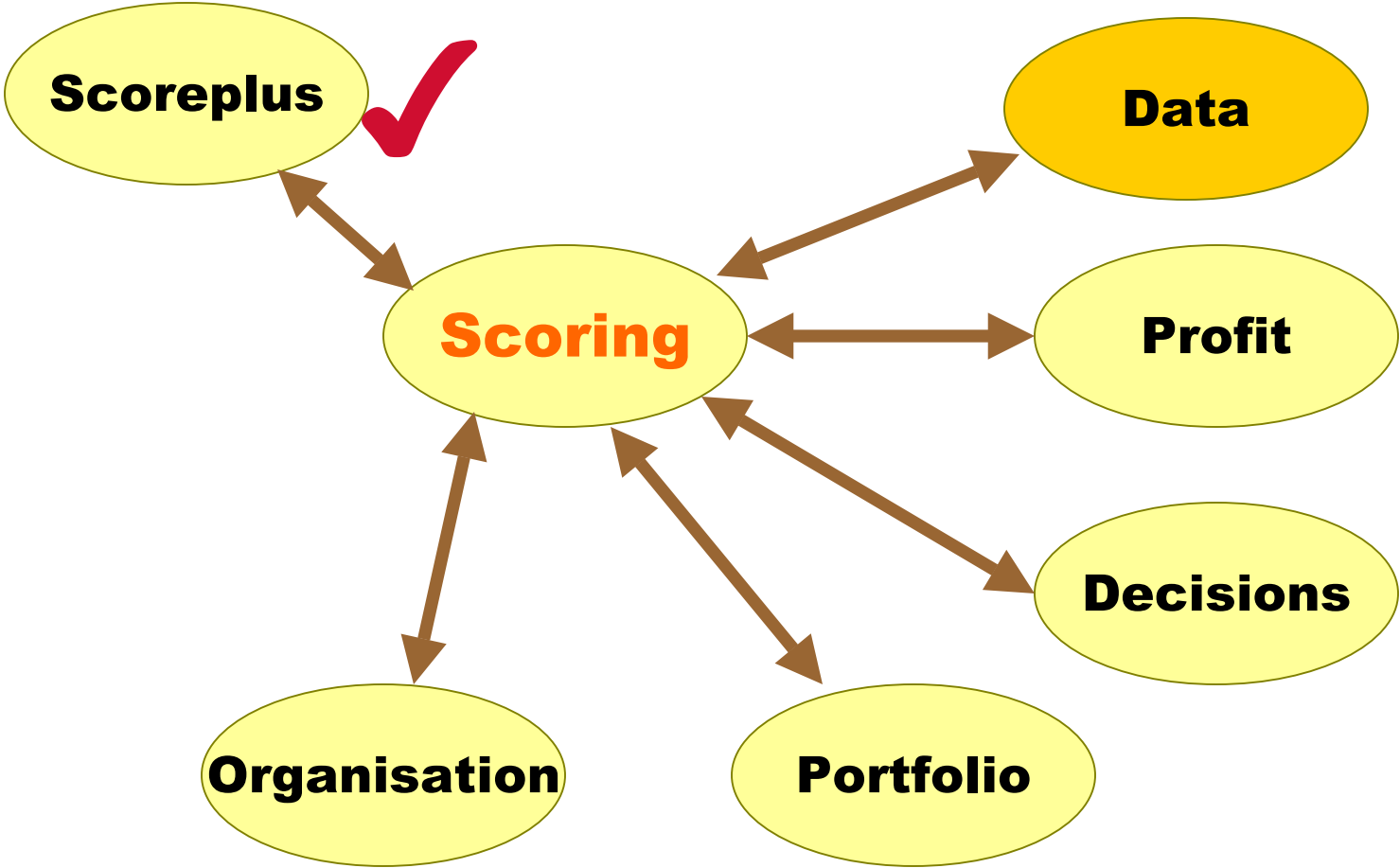
■ Clients

- Barclays Bank
- Royal Bank Card Services
- First USA

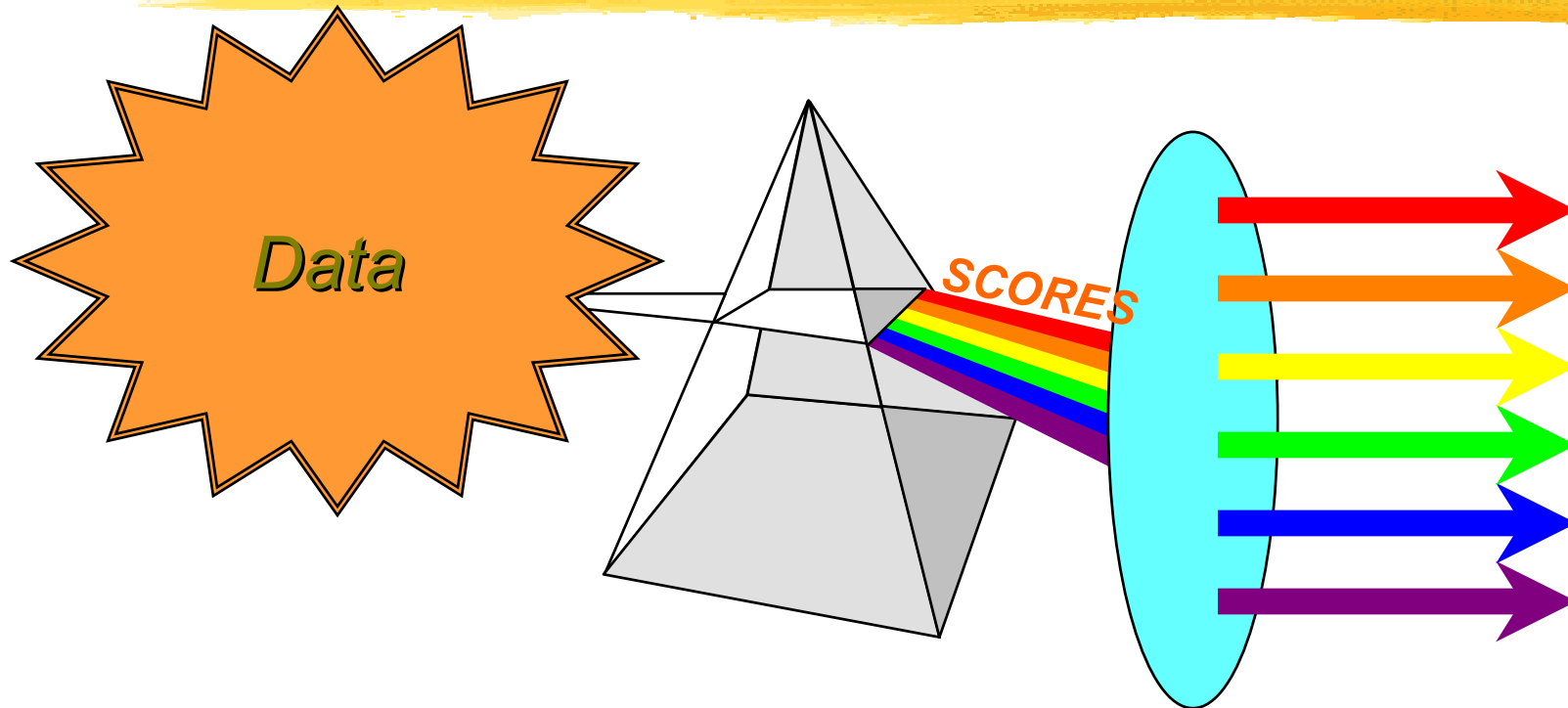
Stannic Bank
Abbey National

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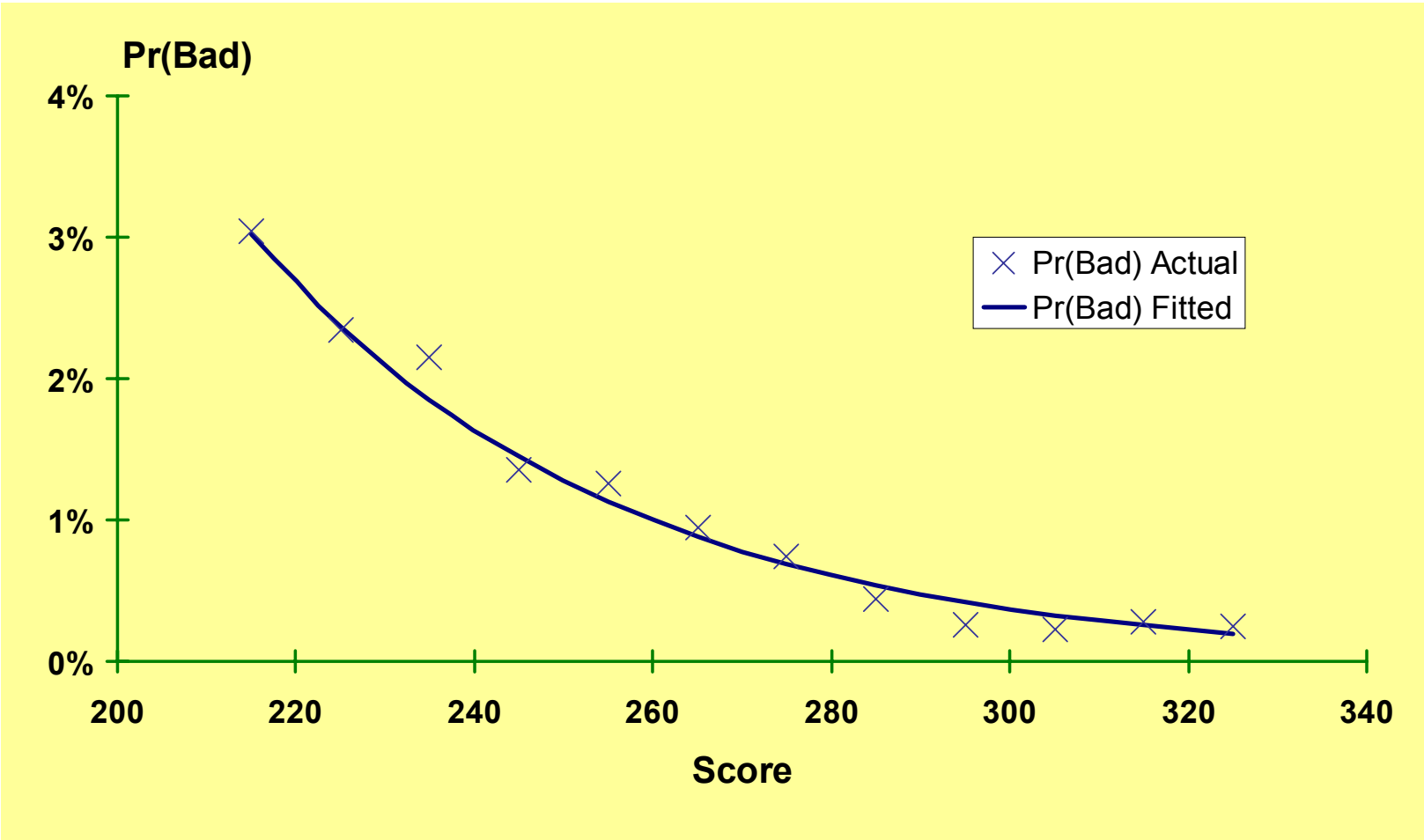


Scores structure data



- 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



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

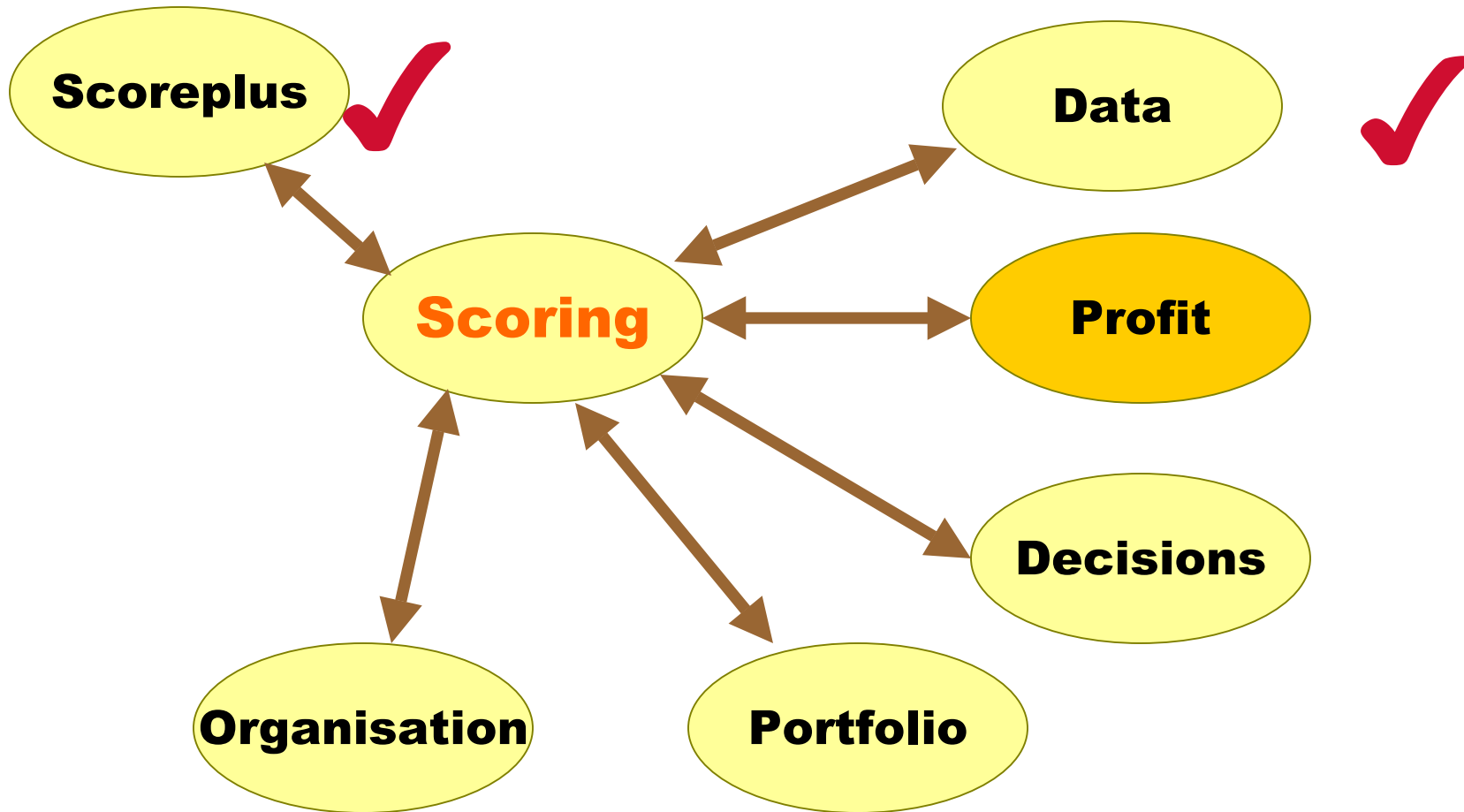
Data Source	Discrimination (Information Value Contribution)
Application data	23%
Business Account History	37%
Personal Account History	17%
Business Credit Bureau	11%
Personal Credit Bureau	12%
	100%

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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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 \neq Low Risk

Why is profit modelling difficult?

■ Profit depends on conflicting types of behaviour

- Activity (Level of Turnover)
- Borrower/Transactor
- Risk

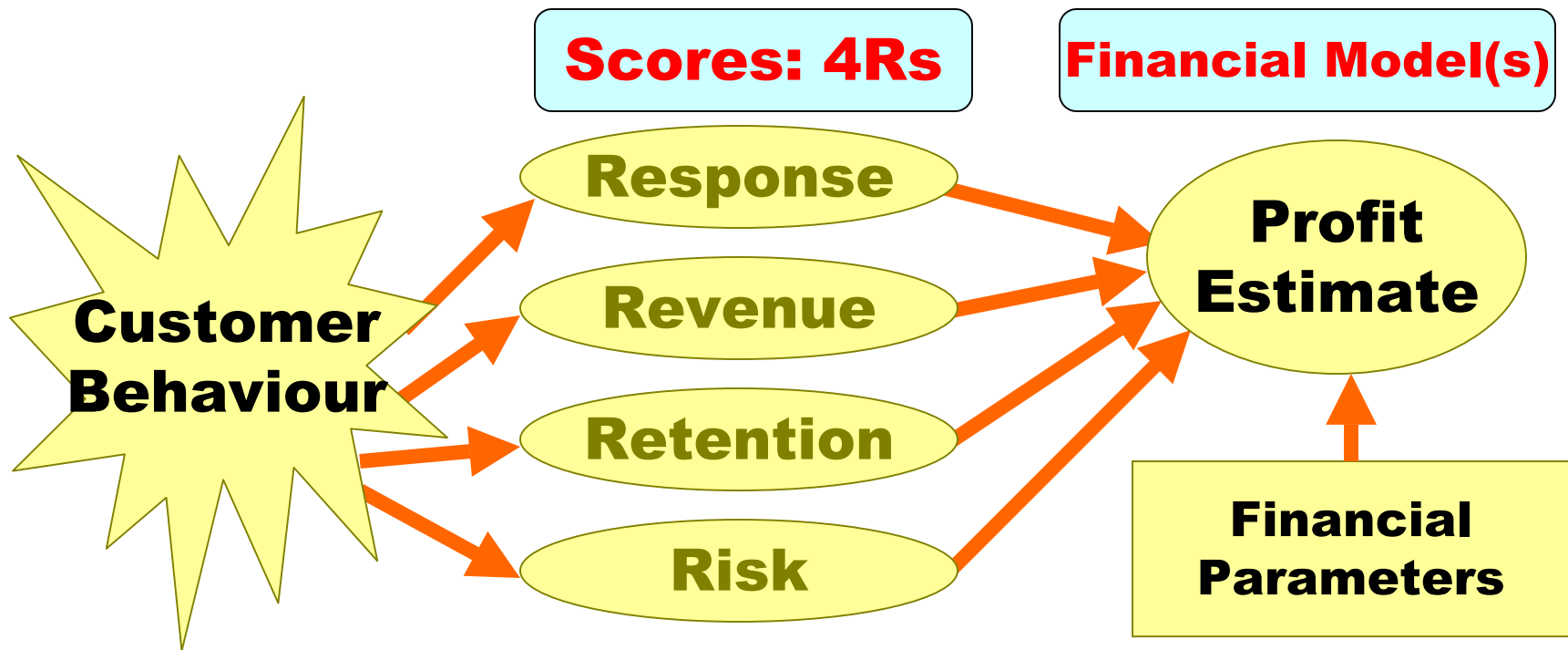
■ Trade-off depends on financial parameters

- 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

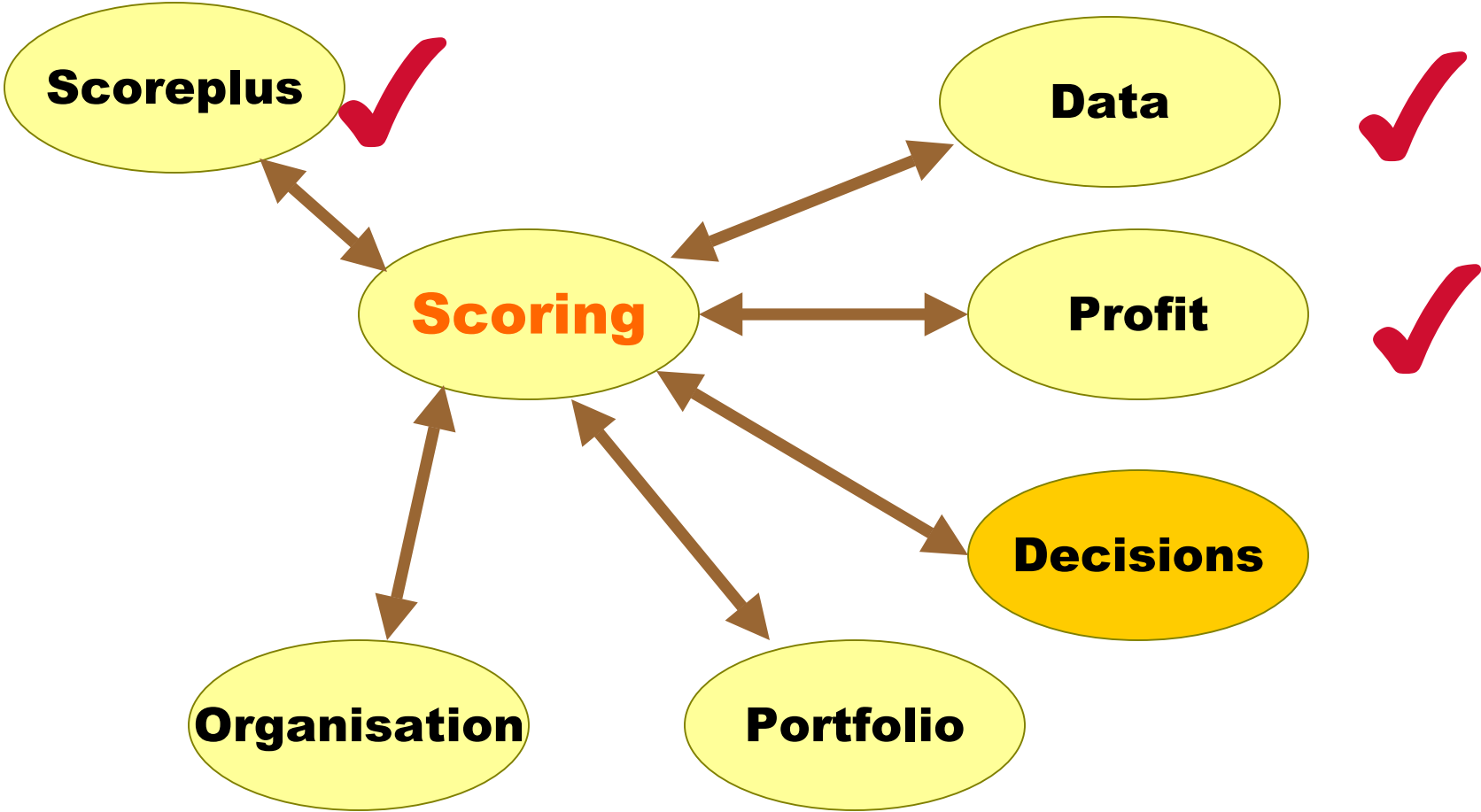
- Allocation of overheads
- Timely identification of provision
- Need different conventions for different purposes

How to model profit ... the 4Rs

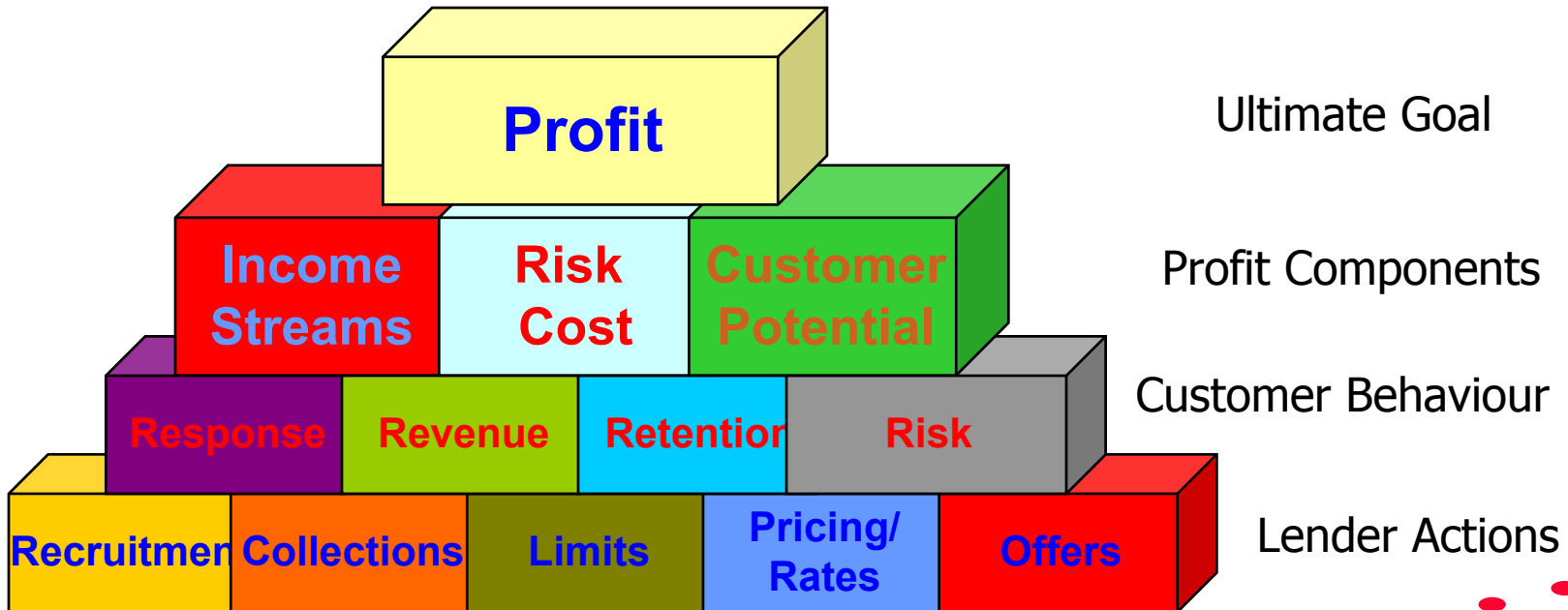


- Scoring models to estimate key dimensions of customer behaviour
- Financial model to trade-off the 4Rs
- Time dimension

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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

Solution: Action-specific scores

- Model 1: collection action:  Score 1  No action
- 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

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

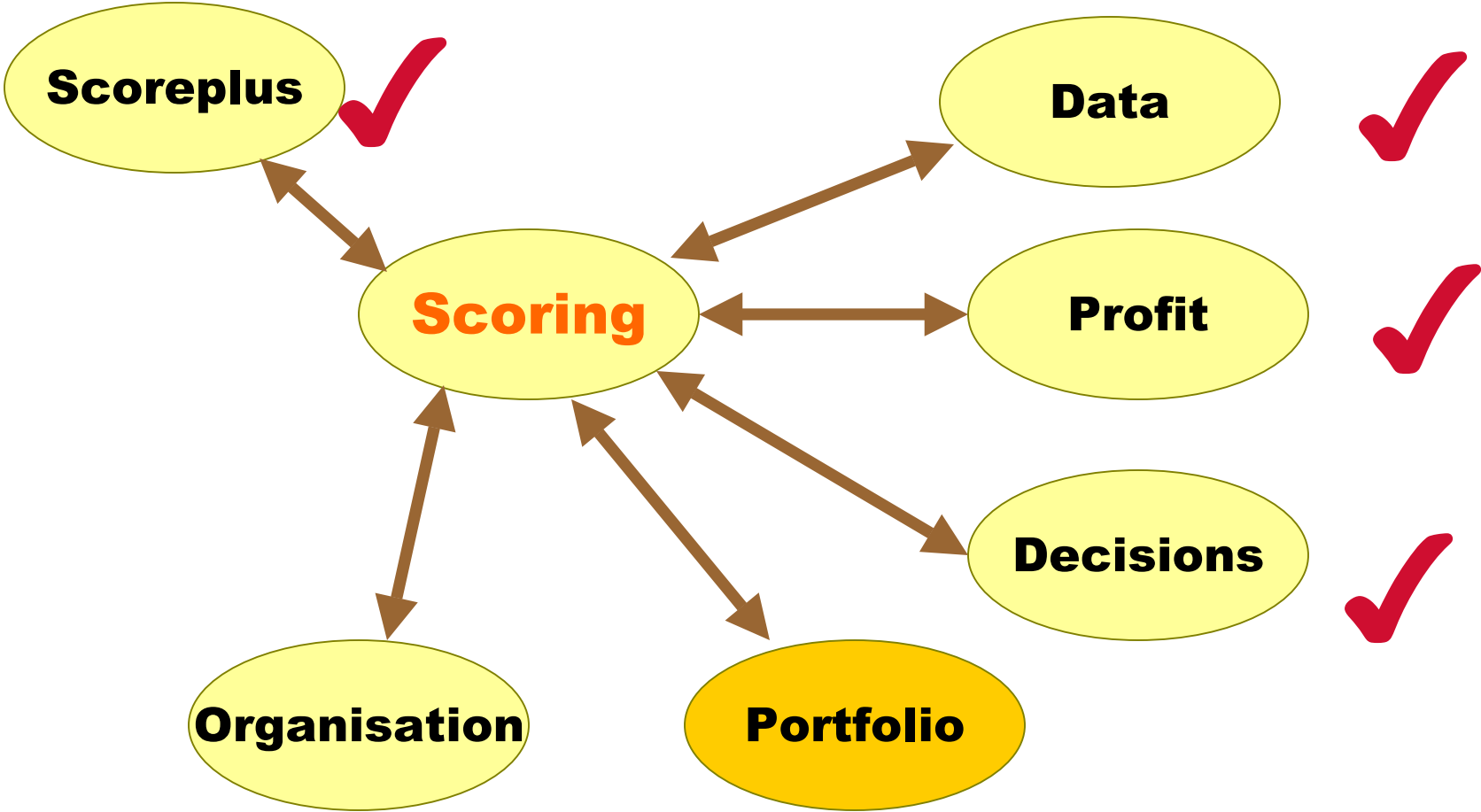


Decision making: Action-specific scores

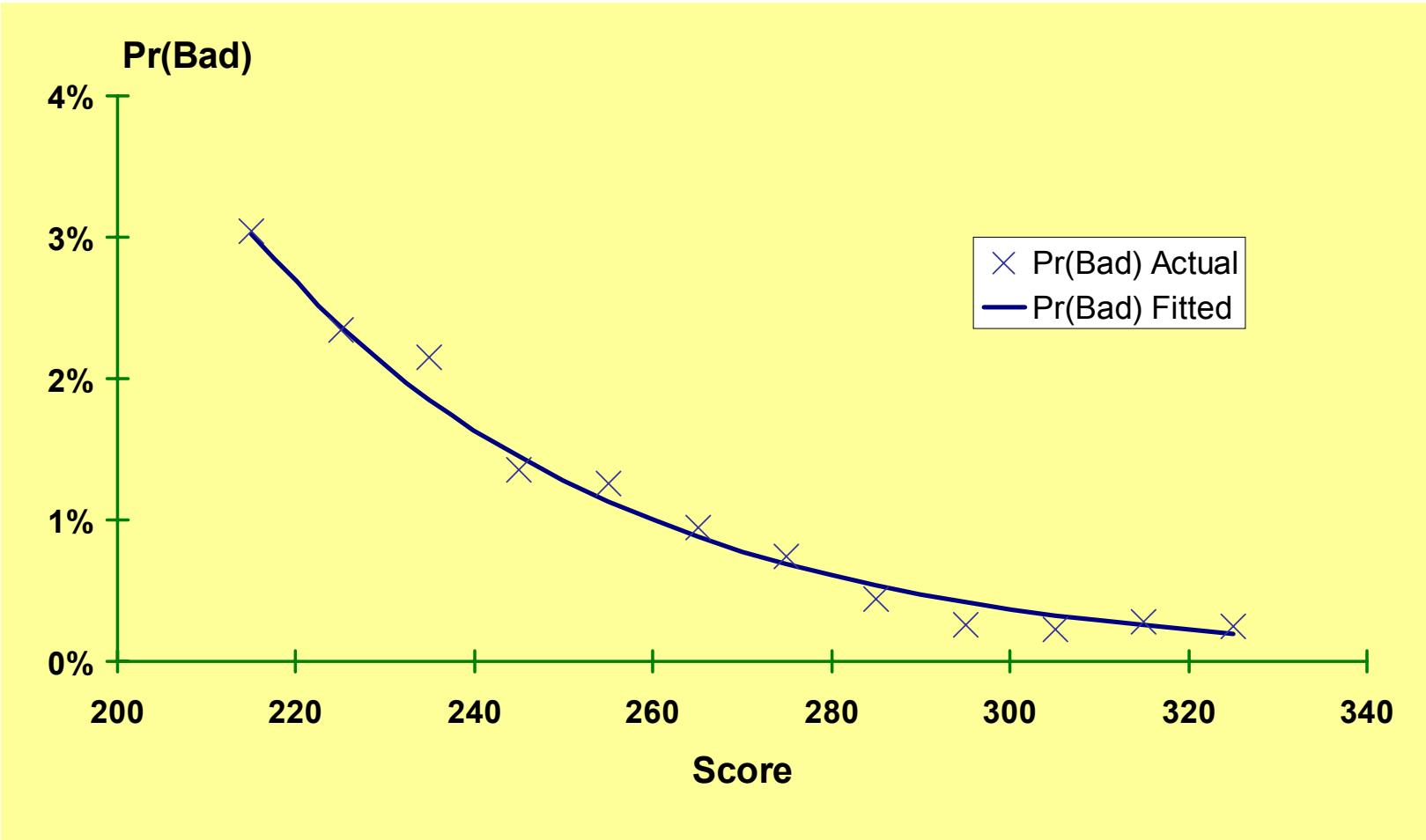
- Scores estimate customer behaviour
 - GIVEN LENDER ACTION
- Actions vary change customer treatment
 - collections action
 - lower interest rate
 - credit limit
- Estimate potential profit under different actions
 - FOR EACH INDIVIDUAL CUSTOMER
- Take action which maximises value of customer

Adapt treatment for each individual

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Score-Probability relationship

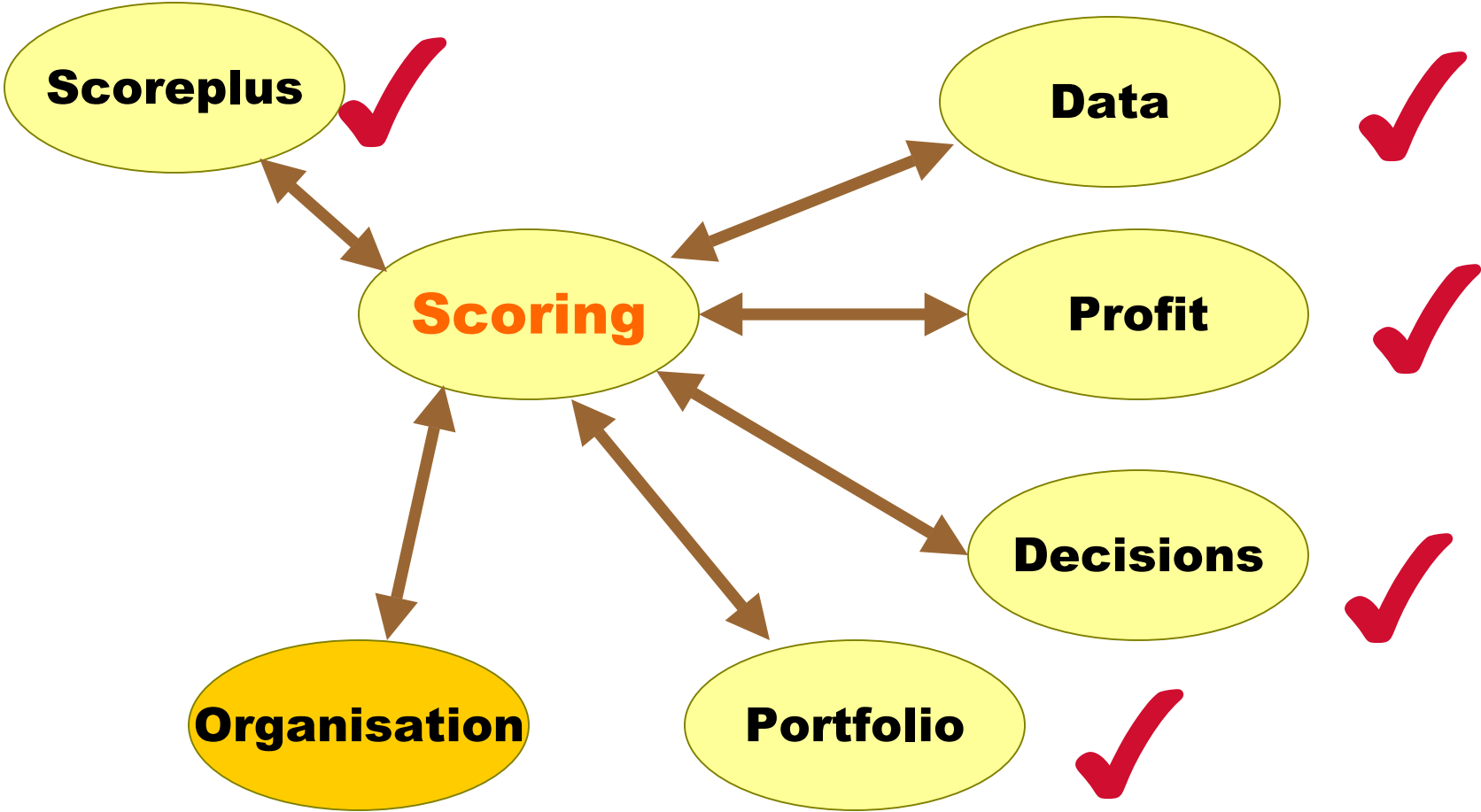


Scores and Capital Adequacy

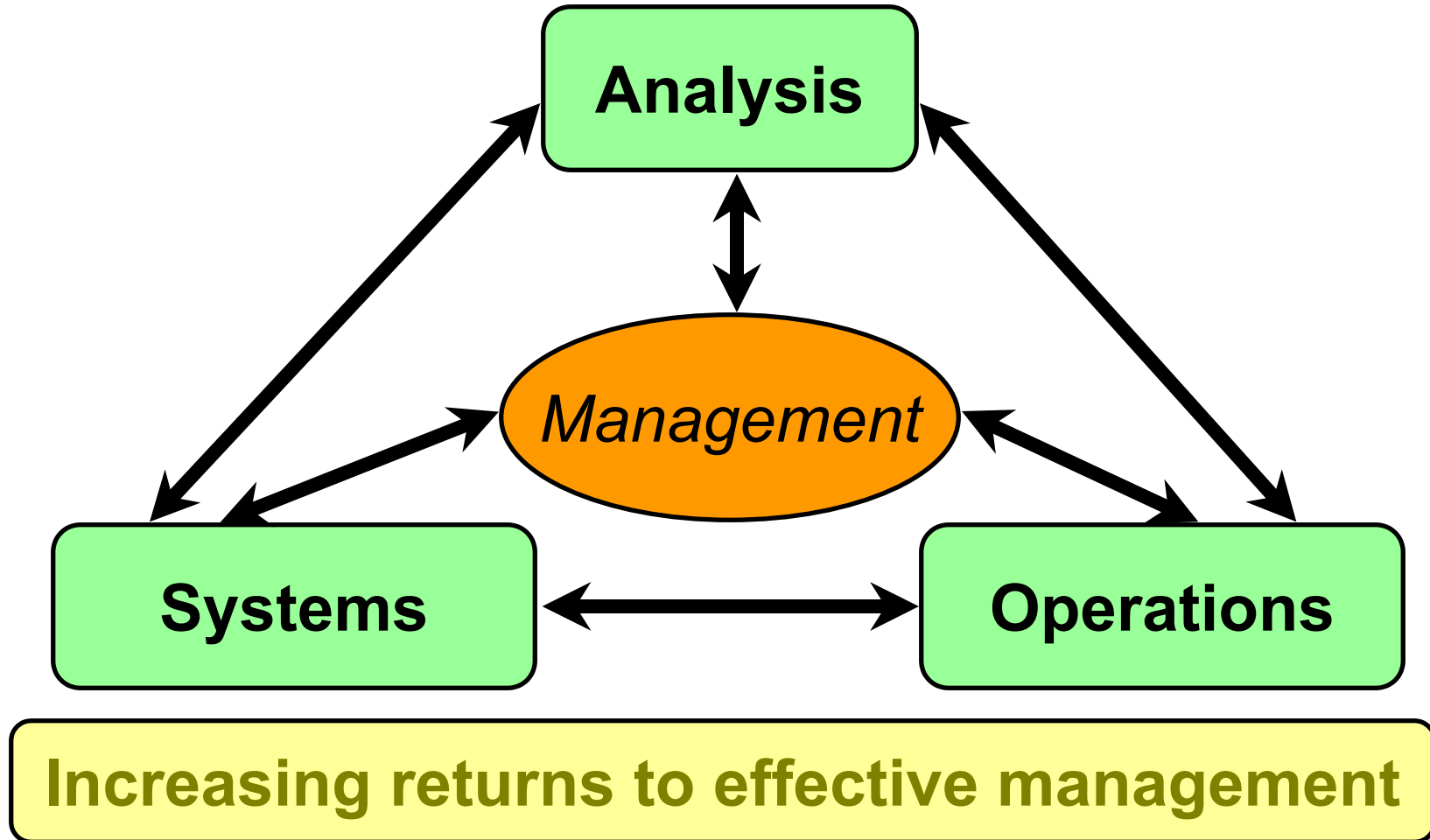
	Balance	Pr(Bad) <i>(from Score)</i>	Expected Loss	Value at Risk <i>(97.5% level)</i>
Smith	£5,000	5%	£250	£2,386
Jones	£15,000	2%	£300	£4,416
Scallan	£8,000	1%	£80	£1,640
....				
Portfolio	£28,000	2.3%	£630	£8,442

- 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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Information culture: ... the competitive difference



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