



Working Paper:

**A Framework for
Business Value Analysis (BVA)**

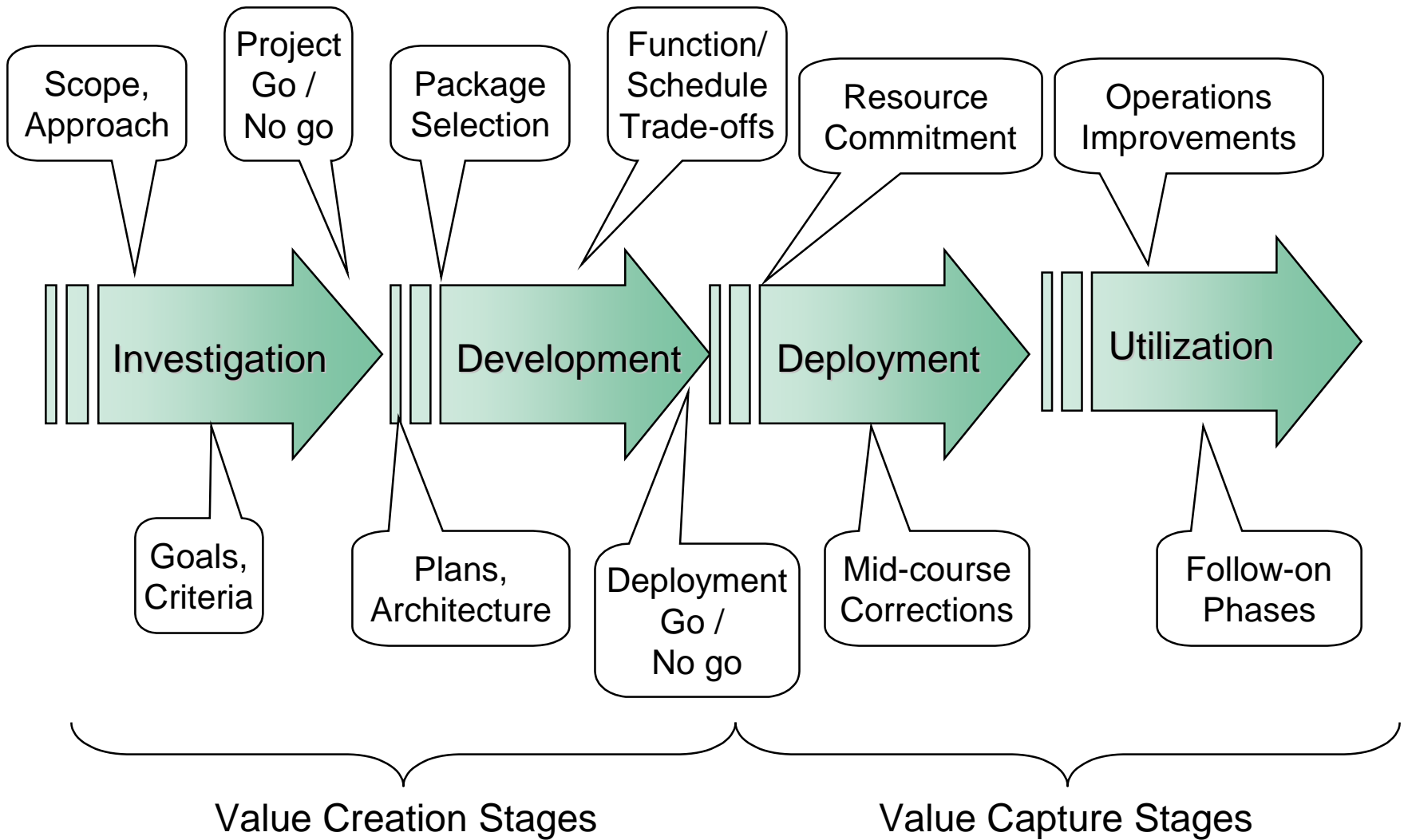
by

Russell Cameron Thomas

- **A holistic, balanced method to help firms create and capture business value...**
 - from large, complex projects
 - in knowledge-intensive businesses
 - in fast changing environments
 - for all stakeholders
 - shareholders, top executives, project managers, front-line employees and managers (computer system users), and, customers / channel partners.
- **Based on the premise that the underlying source of competitive advantage is agility -- the sustainable capability to change**
- **Integrates discounted cash flow with less tangible factors**
 - intellectual capital
 - value of options and opportunities
 - changes in firm business risk
 - changes in competitive position
- **Analyzes outcomes in relation to the enterprise as a whole and it's environment**

- **What is the business value of information systems and associated transformation projects?**
- **How can we define a value if...**
 - benefits are qualitative (perceptions, structures, relationships, etc.)?
 - benefits are indirect?
 - involves intangible assets (tradable and/or owner-specific)?
 - improves flexibility, agility, or responsiveness?
 - it creates opportunities?
 - it reduces risks?
 - benefits can't be isolated easily?
 - depends on the quality of implementation and execution?
 - depends on external business conditions?
- **Are there approaches beyond traditional ROI that fit knowledge-intensive businesses and fast-changing environments ?**

Typical Decisions In A Project Lifecycle



■ The value of a project to an investor is its Net Present Value (NPV)

- NPV = the net stream of cash flows attributable to the project, discounted at the opportunity cost of capital
- Project cash flows are incremental, I.e. the difference between doing and not doing the project.

■ Advantages:

- Clear, consistent decision criteria for all projects
- Same regardless of risk preference of investors
- Quantitative, precise, economically “rational”
- Not as vulnerable to accounting conventions (depreciation, inventory valuation, etc.)
- Factors in both the time value of money and risk
- Relatively simple, widely taught, widely accepted

Assumptions behind Discounted Cash Flow Analysis

- **The only perspective that matters is the capital market investor**
- **Projects are “mini firms” and are interchangeable with whole firms**
- **Capital markets are efficient**
- **Projects are “passively managed” like a stock portfolio**
- **Future cash flows are predictable in a statistical sense**
 - Cash flows are “expected values” -- a probability-weighted average of all possibilities. Probability distributions are normal (bell shaped).
- **Projects and cash flows are independent and additive**
 - a cash flow is a cash flow is a cash flow
 - Firm = net sum of project cash flows, Project = net sum of period cash flows
 - A project is independent of it’s environment, including the firm
- **Project discount rate = opportunity cost of capital**
 - proportional to non-diversifiable risk
- **All risk is accounted for by the discount rate**
- **All factors which could affect the outcome of the project and value to the investors are reflected in the DCF and NPV.**
- **Unknown, intangible, or immeasurable factors are valued at zero**

Realities of Knowledge-Intensive Businesses and Fast-Changing Environments (1)

- **Business value has many dimensions due to multiple stakeholders**
- **Projects are actively managed**
 - project checkpoints, decision options, budget constraints, etc.
 - without active management in deployment and after, business value may not materialize.
- **Projects and cash flows are often interdependent**
 - Some projects don't have benefit streams of their own, but are platforms for other projects
 - A series of cash flows under a budget constraint are dependent on each other
- **Projects can affect the firm's environment and vice versa**
 - by “making the rules” in an emerging competitive marketplace, or by establishing barriers

Realities of Knowledge-Intensive Businesses and Fast-Changing Environments (2)

- **It may not be possible to estimate future cash flows with sufficient confidence**
 - lack of credible cause-effect information
 - inadequate information beyond the planning/forecasting horizon
- **Not all risks are the same. Sources of variation are pluralistic.**
 - Estimation variation vs. process variation vs. “catastrophes” (I.e. assumptions break down)
 - Uncertainty vs. ignorance vs. ambiguity vs. contradiction vs. delusion
- **Not all forms of business value are reflected in DCF due to incompleteness**
- **Many intangible or immeasurable factors may be required for an adequate analysis**
 - e.g. exploratory or “learning” projects

Problems with Discounted Cash Flow (DCF) (1)

■ Time horizon problems

- commitment horizon > payoff horizon > planning horizon (~ forecast horizon)
 - “faith period” = time between end of the planning horizon and end of the payoff horizon.

■ Imperfect data problems

- poor data, missing data
 - poor quality, inaccessible data, lack of history, incommensurate data, double counting
- uncertainty
 - estimation uncertainty, process variation, imprecision,

■ Interdependence problems

- cash flows which are dependent on each other, across time periods or across projects
 - due to contingencies, decision points, options, “platform effects”, constraints, etc.

■ Risk and Opportunity problems

- changes to firm risk (variability) over time
- multiple sources of business risk with different characteristics
- opportunities which lead to other opportunities, and so on
- the value of being able to adapt (agility, flexibility)

■ Indetermination problems

- unknown, indeterminate, or ambiguous cause-and-effect links
- emergent possibilities
- intangibles
- human actors -- role of perceptions, expectations, goals, incentives, penalties, motivation

Problems with Discounted Cash Flow (DCF) (2)

■ Competitive/market environment problems

- vulnerability to competition eroding away any cash flow benefits
 - premium vs. routine capabilities, barriers
- outcomes which increase or decrease market stability
- Game Theory -- momentum, first-mover, signaling, threats, etc.

■ Imperfect reasoning problems

- inadequate and incomplete models, unknown-unknowns
- erroneous belief, bias, distortion, self-fulfilling forecasts
- limits to computation, data gathering, and storage capabilities, understandability
- buried assumptions

■ Management and learning problems

- value of decision options, the ability to control your destiny, and learn from experience
- tendency toward disorder without active management, performance feedback

■ Multiple stakeholder problems

- Not everyone evaluates ROI like a stockholder
 - e.g. computer system end-users ROI relative to their investment of time and energy
- Management can receive value that shareholders cannot not
 - control value = value from the ability to redeploy assets

A Rough DCF Can Support Good Decision-Making

- **Simple “Go-No Go” decisions where the evidence is overwhelming, the acceptance threshold is low, or the rejection threshold is high**
- **Investment funds required are not significant**
- **Stakeholders are willing to agree to assumptions and estimates, accepting them as “reasonable”**
- **Stakeholders are willing to make a decision with less-than-perfect analysis in the interest of moving fast, even if the analysis could be wrong**

Increasing effort and sophistication



- **Make estimates and assumptions for incomplete or complex data**
- **Extrapolate beyond forecasting/planning horizon**
- **Increase the discount rate to factor in uncertainty, risk**
- **Backward reasoning to compensate for missing cause-effect information**
- **Estimate intervals or bounds for imprecise data**
- **Sensitivity analysis to compensate for possibly weak assumptions or estimates**
- **Gather more data to improve estimates, precision, or completeness of data**
- **Scenario Analysis to compensate for an unpredictable future**
- **Modeling and simulation to incorporate complex cause-and-effect**
- **Credibility Testing to limit the analysis if data or models are inadequate**

The Verdict on Discounted Cash Flow -- Necessary but Not Sufficient in Today's Business Environment

- **DCF is valid by itself for evaluating business value as long as specific conditions hold**
 - Relatively simple business structure (i.e. easily decomposable into independent cash flow streams)
 - Relatively simple projects
 - Stable environments
 - Buy-in of other stakeholders is not dependent on the value they receive
- **Even with the “fixes” which extend DCF, it is ultimately too limited for today's complex business environments**
- **DCF must be augmented by including analysis of:**
 - non-quantified factors
 - intangibles
 - impact on business risk, competitive position, etc.
 - value as defined and experienced by other stakeholders

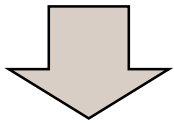
Business Value of Any IT Project is Multidimensional

- Each stakeholder has their own investments, costs, risks, and outcomes.
- Also their own definition of “value”

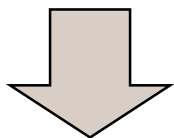
Owners

Shareholder Perspective

Discounted Cash Flow is oriented toward investors

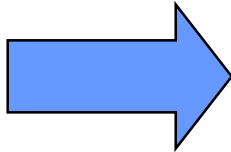


Top Management Perspective

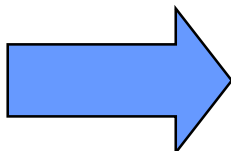


IT Users

Decision-maker Perspective

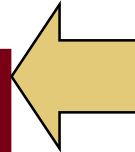


Worker Perspective

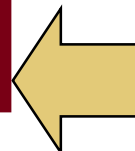


Clients

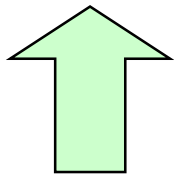
Channel/Supplier Perspective



Customer Perspective



**Outcomes,
Capabilities,
Assets**

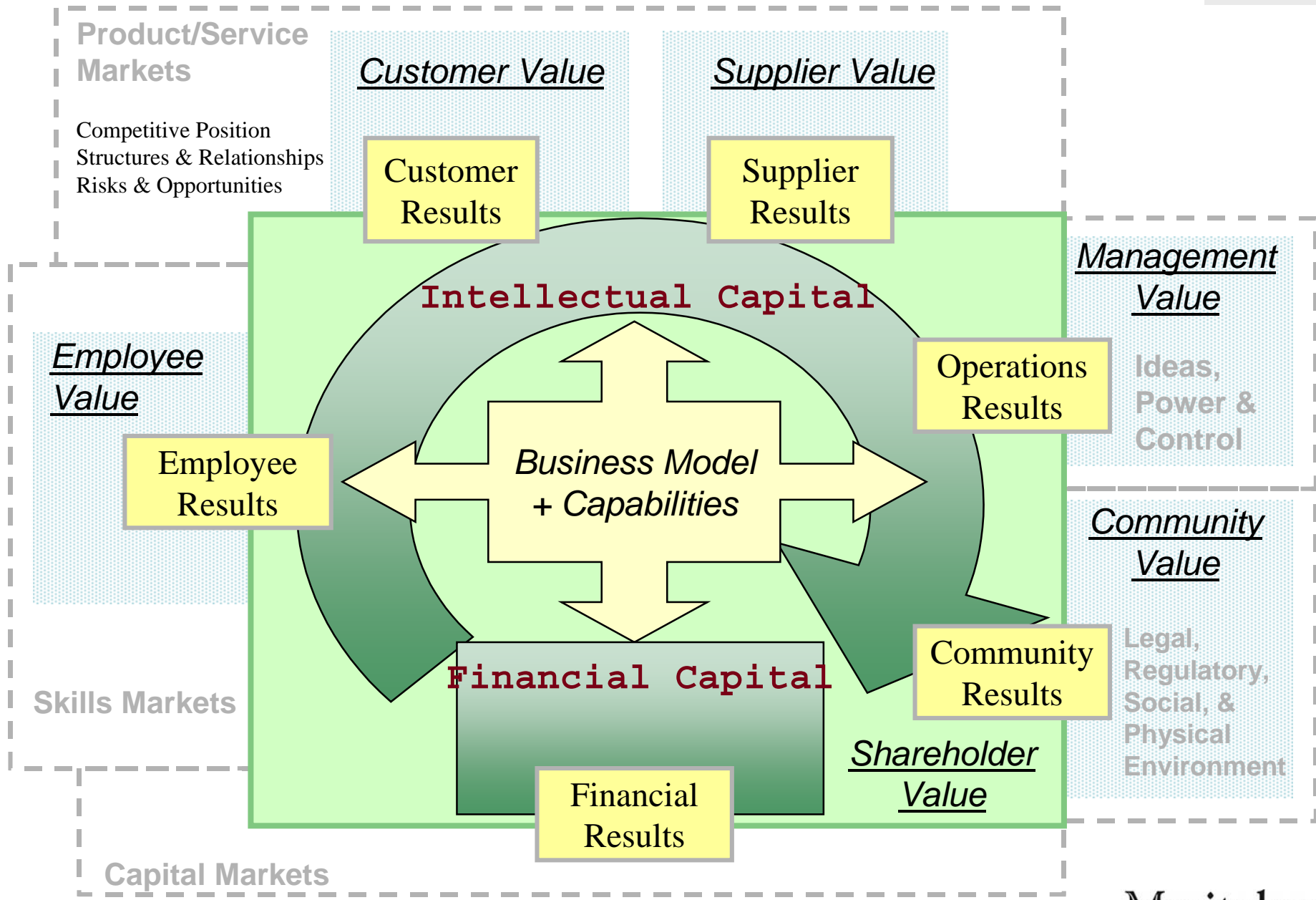


IT Project Manager Perspective

Implementers

Buy-in from stakeholders depends on their perception of the value **they receive** relative to their investment.

Proposed Business Value Analysis Framework





A Survey of Non-DCF Business Value Analysis Methods

■ Definition

- Value is defined by the buyer – or, what someone is willing to pay for it.
- A company would then be valued by the stock market: price per share X total number of shares outstanding = market value.

■ Formula

- Measure of intellectual capital = market value – book value
- The assumption here is that everything which remains after deducting fixed assets must be intangible assets.

■ Benefits

- Simplest method of calculating the value of intangible assets, and reasonable too

■ Drawbacks

- Applied to entire business, not projects
- Stock market is volatile
- There's evidence that book value and market value are often understated
- This raw number is relatively useless in comparing companies

■ Definition

- A ratio which compares the market value of an asset with its replacement cost.
- Developed as a way to predict corporate investment decisions independent of macroeconomic factors such as interest rates.
- Q is a measure of “monopoly rents” – i.e., a company's ability to get unusually high profits because it's got something no one else has.

■ Formula

- $Q = \text{Market Value} / \text{the replacement cost of fixed assets.}$
- Replacement Costs = reported value of company assets + back accumulated depreciation + account for inflation

■ Benefits

- Most revealing when like companies are compared over a period of several years.

■ Drawbacks

- Applied to entire business, not projects

Early Attempt #3 Calculated Intangible Value

■ Definition

- Assumes that the market value of a company reflects both tangible and intangible assets.
- Determine assets which create extra value (adapt a method used to evaluate brand equity)
- Brands confer economic benefits resulting in a higher return on assets than unbranded competitors.
- Calculate the premium and you infer the value of the brand.
- Value of Intangible Assets = company's ability to outperform an average competitor with similar tangible assets

■ Formula

- Calculate average pretax earnings for 3 years
- Get average year-end tangible assets for 3 years
- Divide earnings by assets to get the ROA
- Find the industry's average ROA for the same 3 years
- Calculate excess return
 - Industry average ROA X company's average tangible assets
 - Subtract that from this company's pretax earnings
- Calculate the premium attributable to intangible assets
 - 3 year average income tax rate X excess return
 - Subtract the result from the excess return to get an after-tax number
- Calculate the NPV of the premium

■ Benefits

- Permits company-to-company comparisons using audited financial data
- A measure of a company's ability to use its intangible assets to outperform other companies in its industry
- Good indicator
 - A rising CIV can help show that a business is generating the capacity to produce future cash flows
 - A falling CIV might indicate that a business is spending too much on tangible assets and not enough on research or brand-building

■ Drawbacks

- Applied to entire business, not projects

- Total Cost Ownership
- Real Options
- Return on Management
- Target Modeling
- Process Modeling
- Dynamic Models

- Complex Adaptive Models

Perspective

Total IT spending

Individual investment decisions

Total IT systems and processes

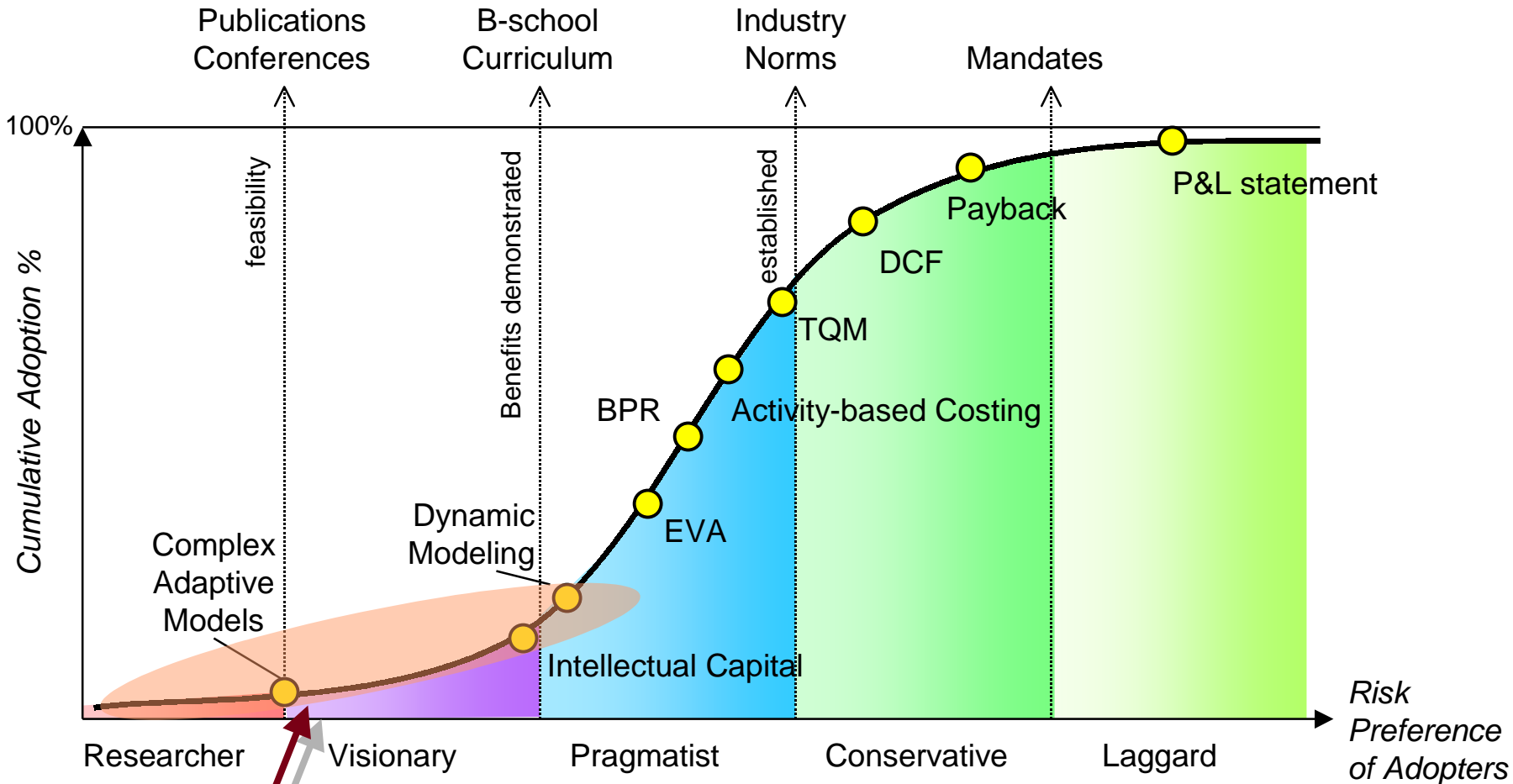
Overall business model

Individual processes

Quantitative: levels, rates of change,
feedback loops, nonlinearities

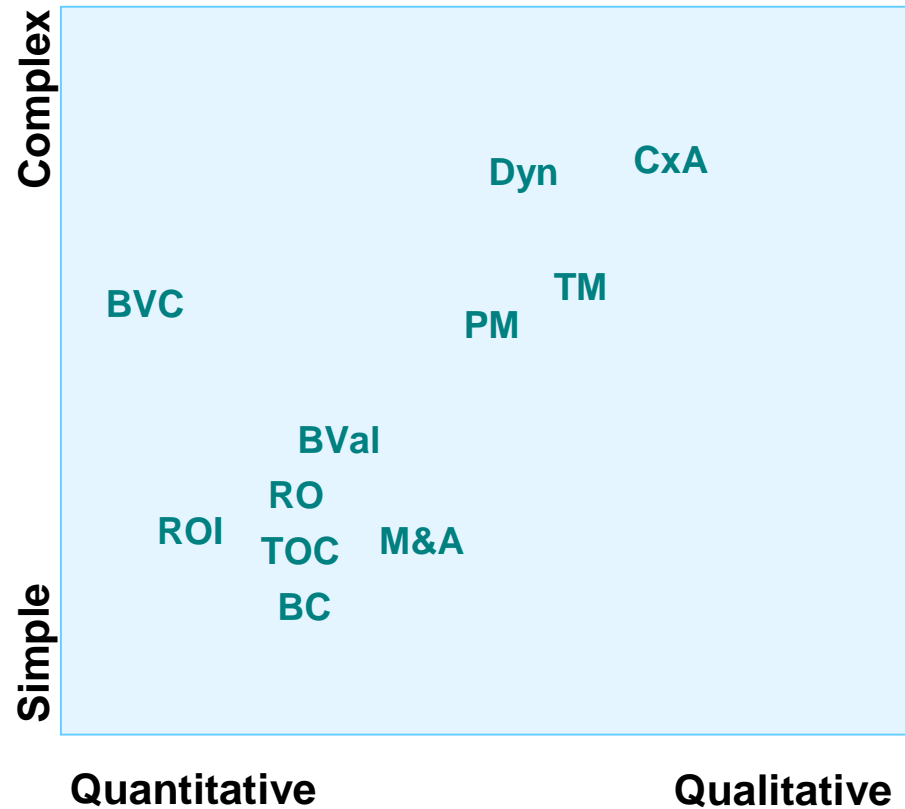
Emergent behavior,
information-domain behavior

Adoption of Business Value Analysis Methodologies



The most interesting BVA methodologies are just now emerging

- ROI/BE Methods
- Business Cases
- Total Cost Ownership
- Real Options
- Bus Value Computing
- Business Valuation
- M&A Analysis
- Target Modeling
- Process Modeling
- Dynamic Models
- Complex Adaptive



Dynamic vs. Static

- ROI/BE Methods
- Business Cases
- Total Cost Ownership
- Real Options
- Bus Value Computing
- Business Valuation
- M&A Analysis
- Target Modeling
- Process Modeling
- Dynamic Models
- Complex Adaptive

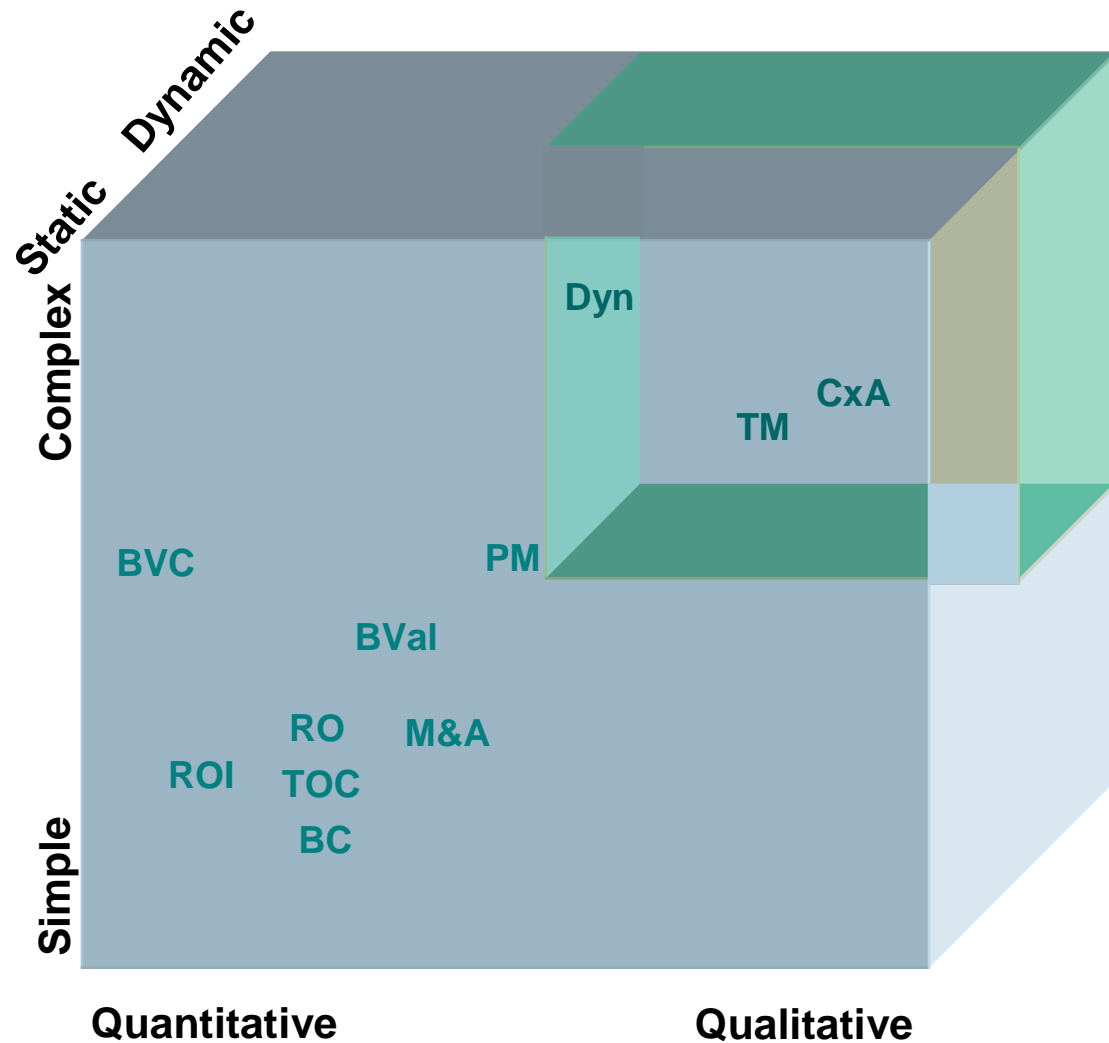
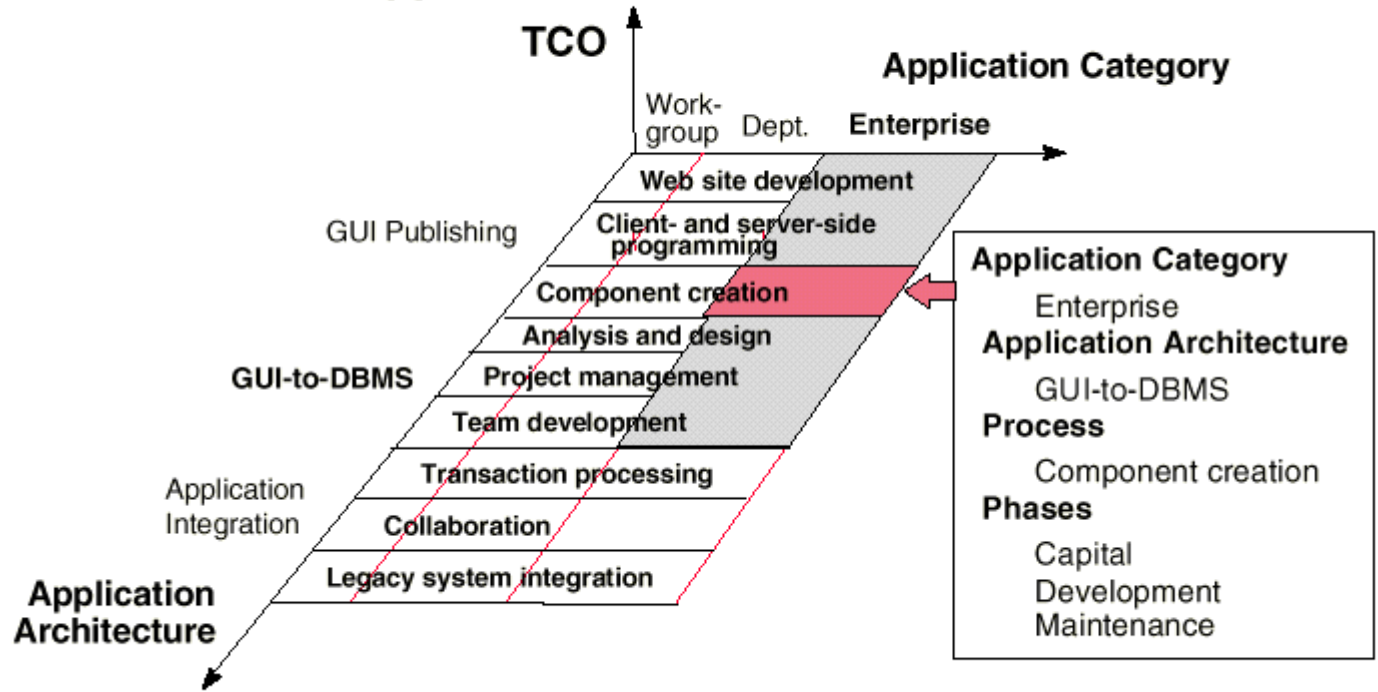
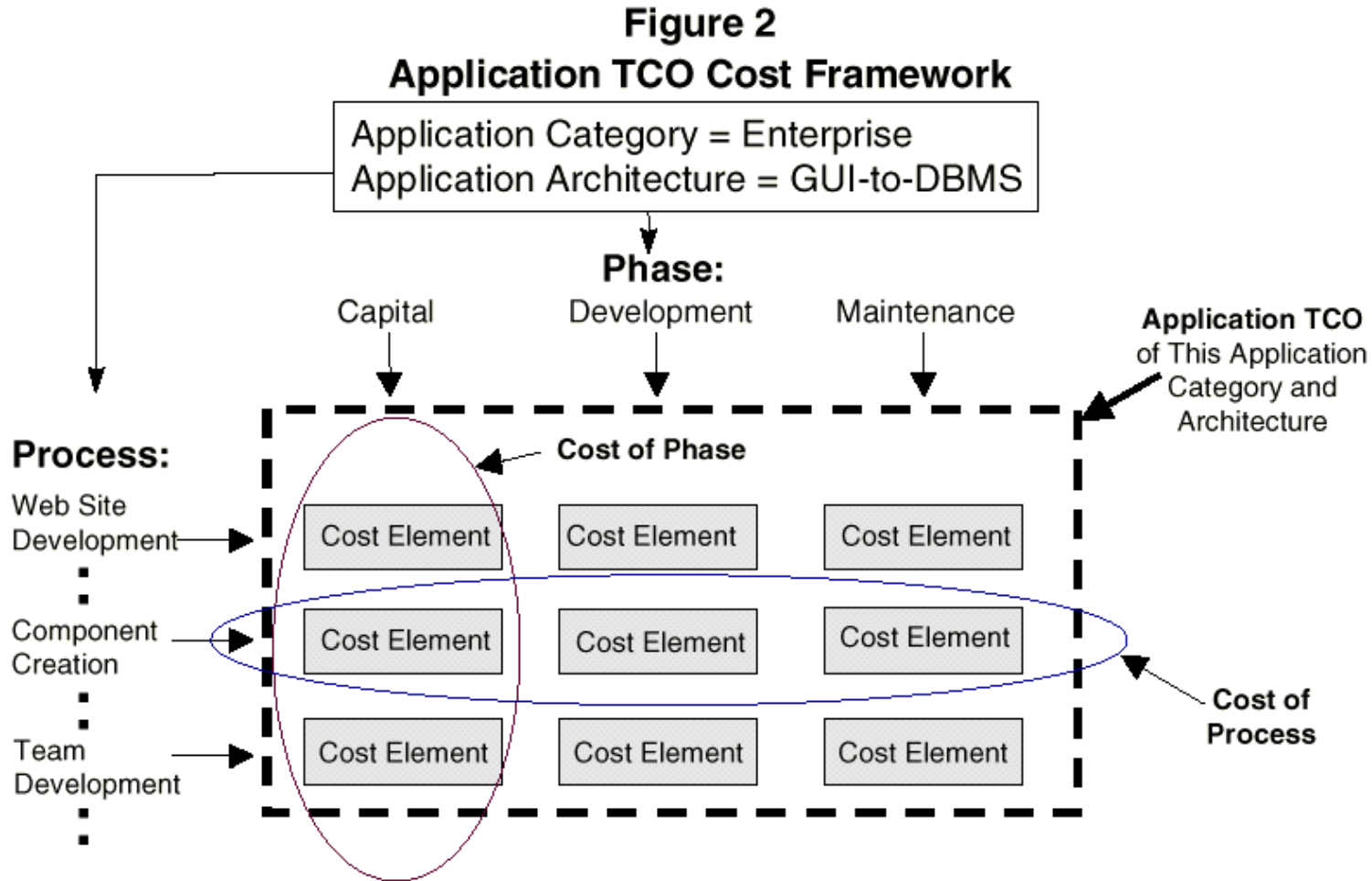


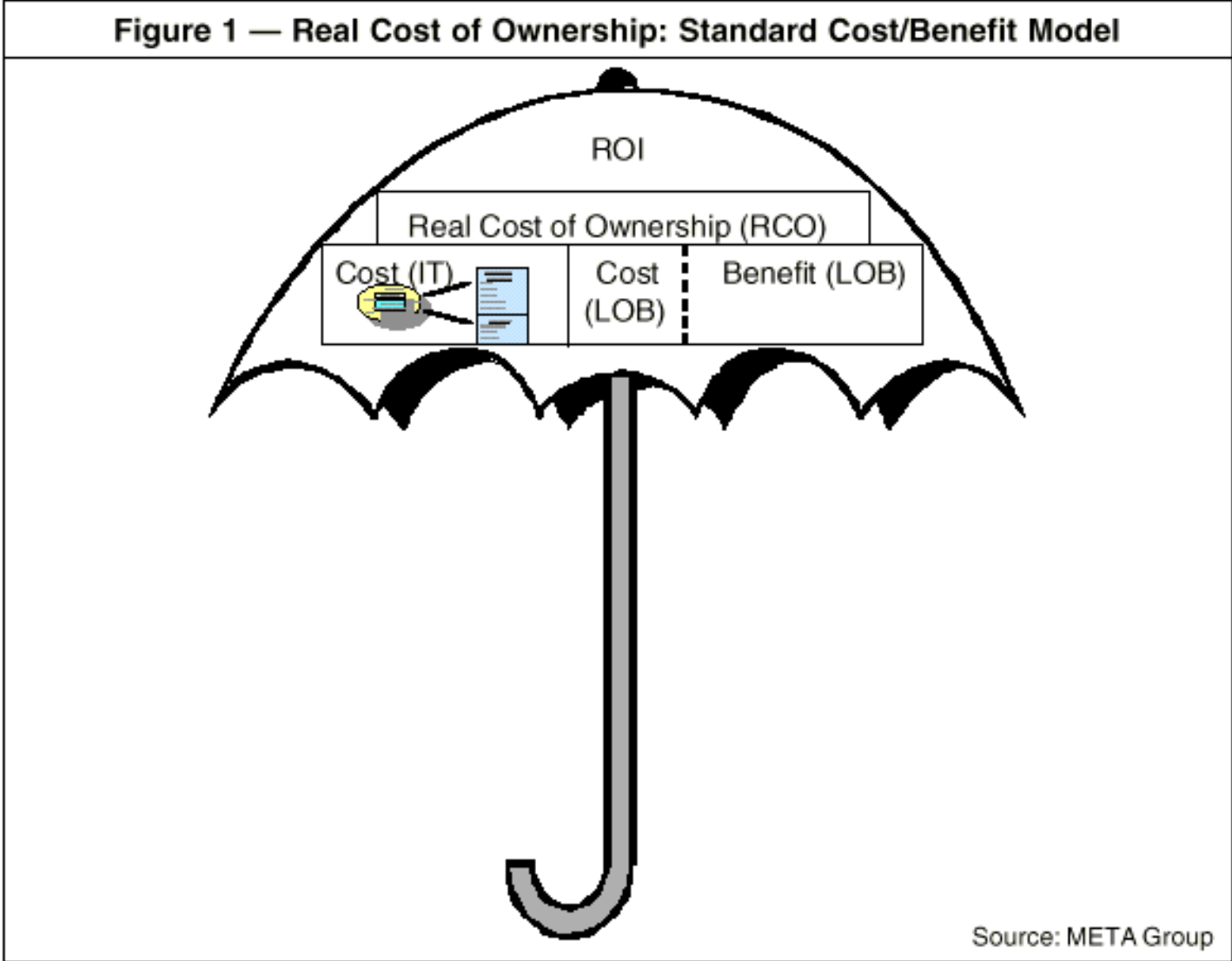
Figure 1
Application TCO Model: Level 2



Source: GartnerGroup



Source: GartnerGroup





Business Value Analysis Applied to Customer Relationship Management

- **The goal of sales & marketing processes is effective relationships, not just process efficiency.**
 - Value creation is a collaboration between vendors and customers
- **Results come from the “total system”**
 - total system = buying/usage processes + relationships + vendor CM processes
- **Potential to affect costs and revenues**
 - implies high performance leverage and risk.
- **Compensation and metrics are crucial factors.**
- **High autonomy of sales/service people and organizations.**
- **Many different organizations touch the customer, not just sales and service people**
- **Changes become visible to customers and competitors.**
- **Flexible, dynamic processes rather than fixed configuration.**

1. **Process-driven customer value management**
2. **Performance management and metrics**
3. **Systematic relationship management**
4. **Collaboration, internal and external**
5. **Agility**
6. **Innovation**
7. **ROI of Investments in Customer Information**
8. **Increasing complexity of sales and marketing models**
9. **Revenue management**
10. **Capturing the “Voice of the Customer”**
11. **Privacy, Confidentiality, and Security**

- Traditional approaches to ROI (i.e. Discounted Cash Flow) fall short
- Indirect cause-effect is a major obstacle to ROI analysis.
- Only when the investment is directly tied to a new revenue source is it relatively safe to attribute revenue increases directly to customer management systems.
 - E.g. a new channel, a new market, a new product line
- Relating operating performance metrics to shareholder value is hard.
- Very complex environment
 - many different market segments, channels, contact points, customer purchase decision processes, types of information, types of people, etc.
 - Revenue drivers, cost drivers, risk drivers, opportunity drivers, quality/satisfaction drivers, relationship drivers, etc.
 - links between these elements changes quickly.
- Infrastructure can be a waste (i.e. no benefit) but it can also be a drain (i.e. a detriment).
- E-business makes things even more complex!!
 - Communities
 - Auctions, Exchanges
 - “Freeware” models
 - Virtual organizations
 - Customer power
 - Globalization

Typical
“Inside
looking out”

■ Simple Δ Analysis -- Traditional ROI and Business Case Analysis

- Project oriented
- Goal = justify investment (and professional services!)
- Appeals to CFO

■ Baseline Performance and Δ Analysis

- Process-oriented
- Performance Metrics tied to business strategy
- “As-Is” model, to be compared to a “To-Be”
- Appeals to Quality Dept., Training Dept.

■ Customer Lifecycle Analysis

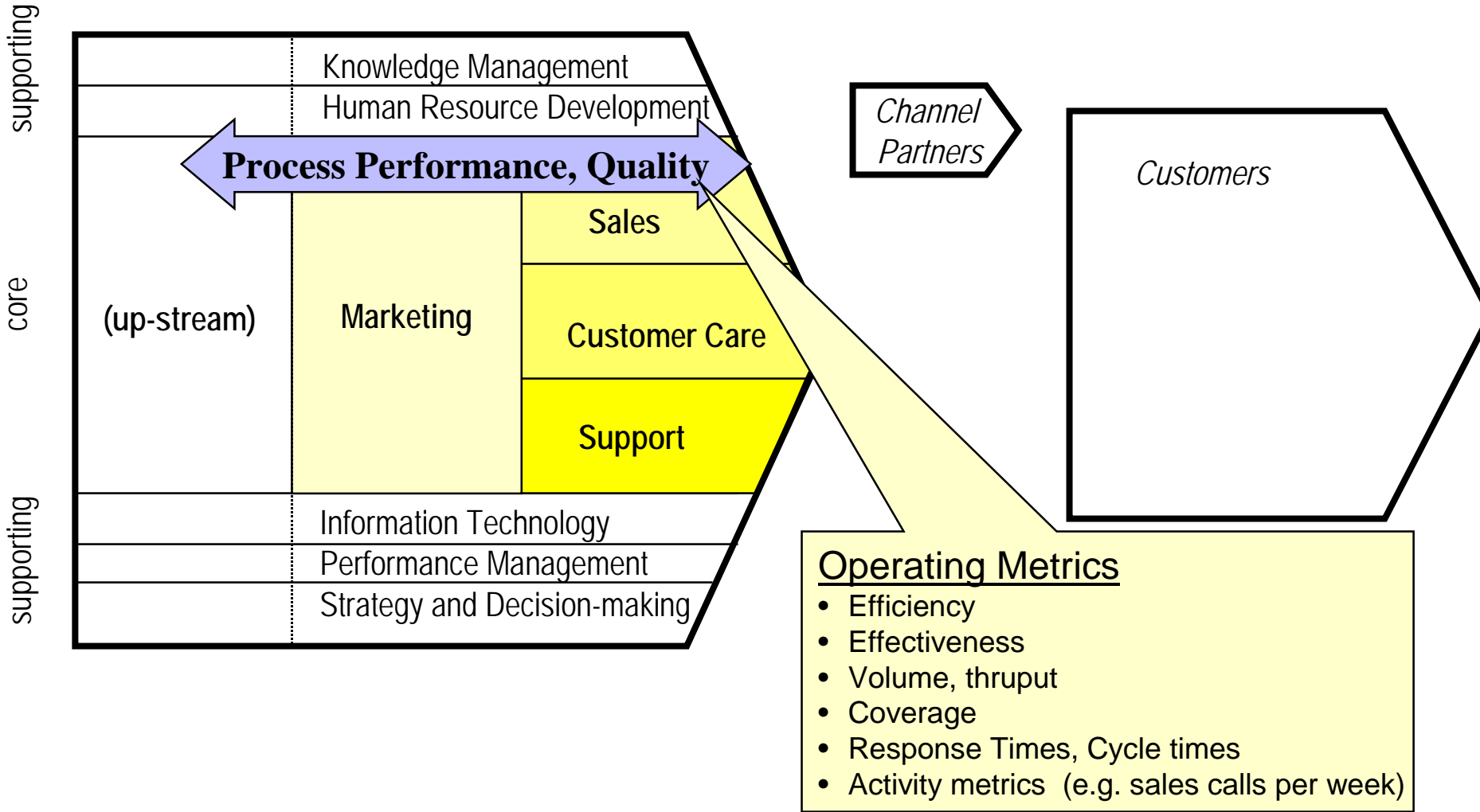
- Business-oriented
- Closed-loop linear models, e.g.
 - “Lifetime Value” (LTV), incl. acquisition, promotion, retention, defection, etc.
 - “One-to-One”
- Appeals to VP of Marketing

Leading
Edge
“Outside
looking in”

- **Define a balanced portfolio of metrics across five perspectives:**
 1. Process perspective – workflows, information flows, transactions, etc.
 2. Perceptual perspective – awareness, preference, mental categories and positions, etc.
 3. Structural perspective – competitive structure, partner relationships, channels, etc.
 4. Financial perspective – costs, investments, revenues, risks
 5. Knowledge perspective – human resources, training, documentation, decision-making
- **Create models using these metrics to tie business capabilities to performance under various scenarios.**
- **Use these models to evaluate alternate theories on driving revenue, market share, customer loyalty, new market development, and profitability.**

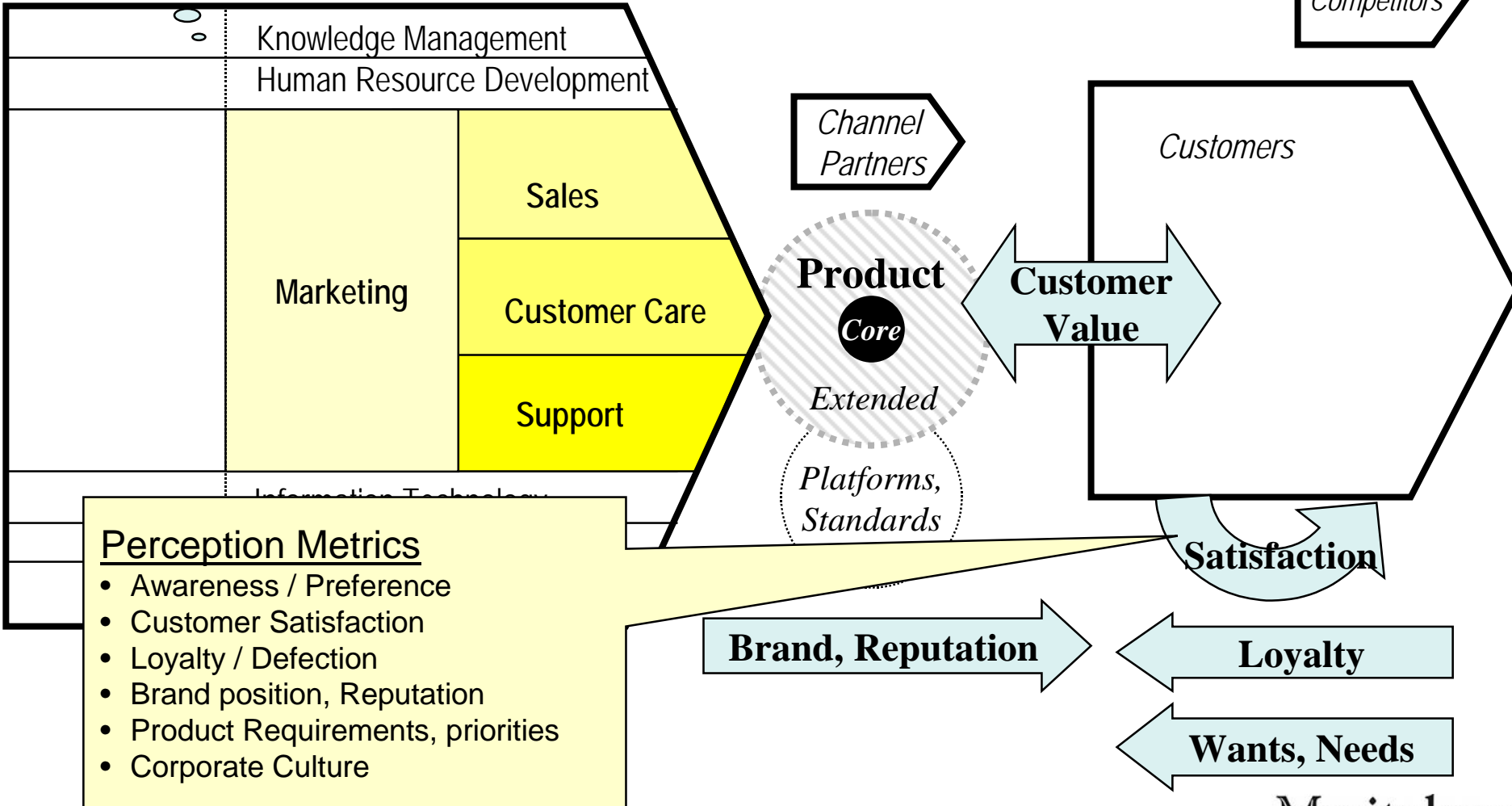
Perspectives on CRM Business Value:

1. Process Perspective -- Core, Supporting Processes



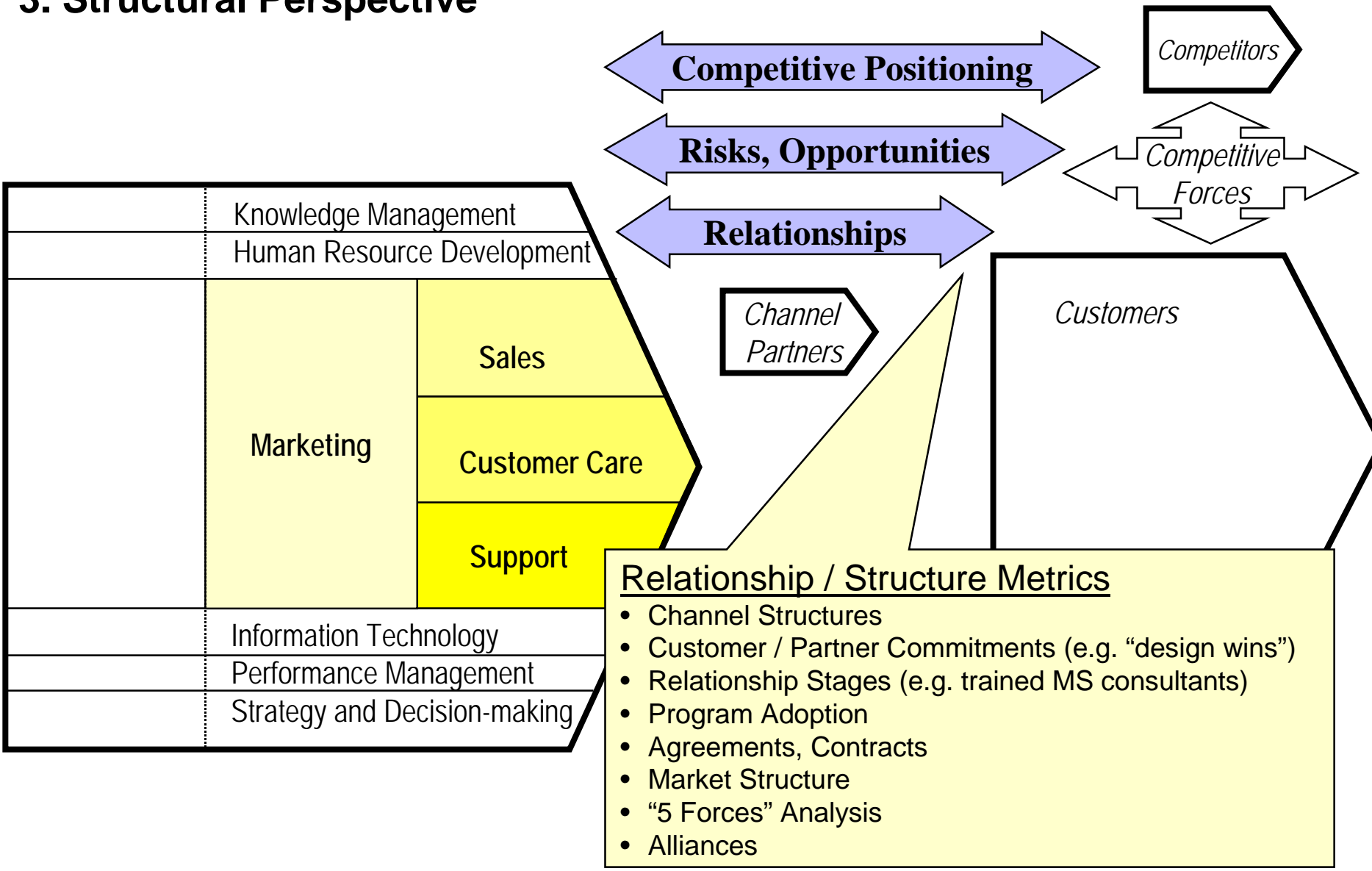
Perspectives on CRM Business Value:

2. Perceptual Perspective – Categories, Awareness, Preferences, Requirements



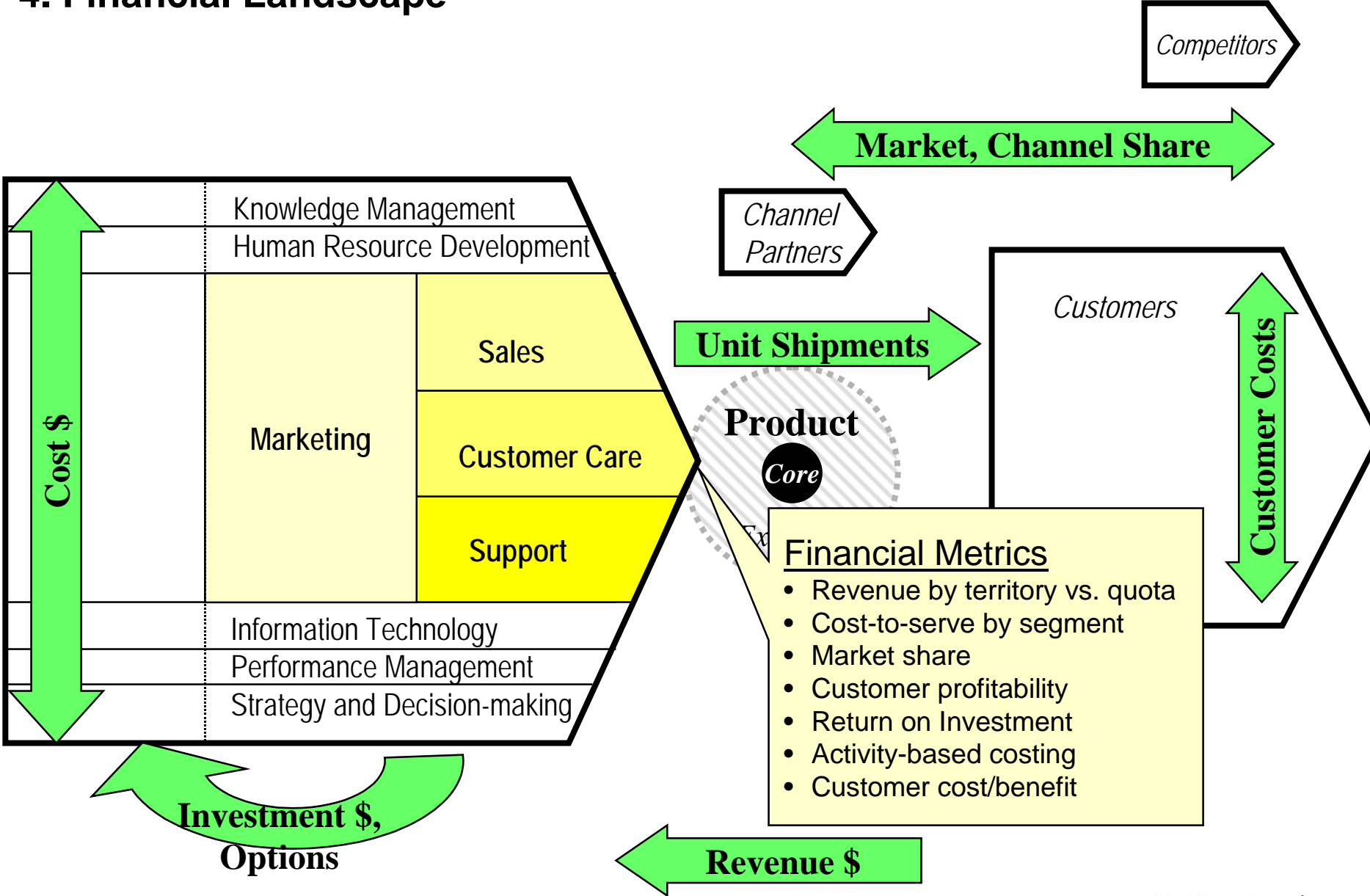
Perspectives on CRM Business Value:

3. Structural Perspective



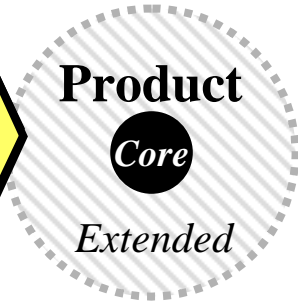
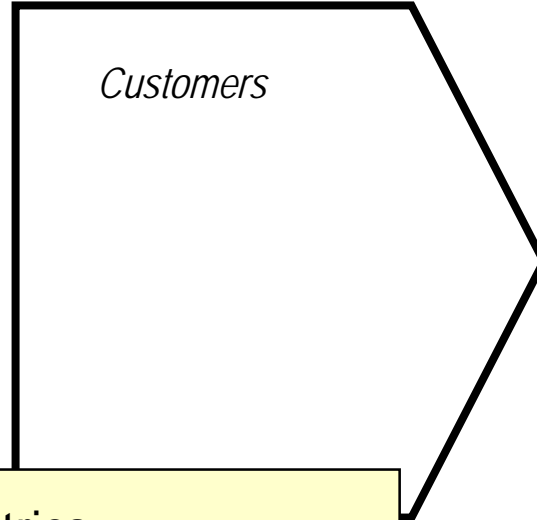
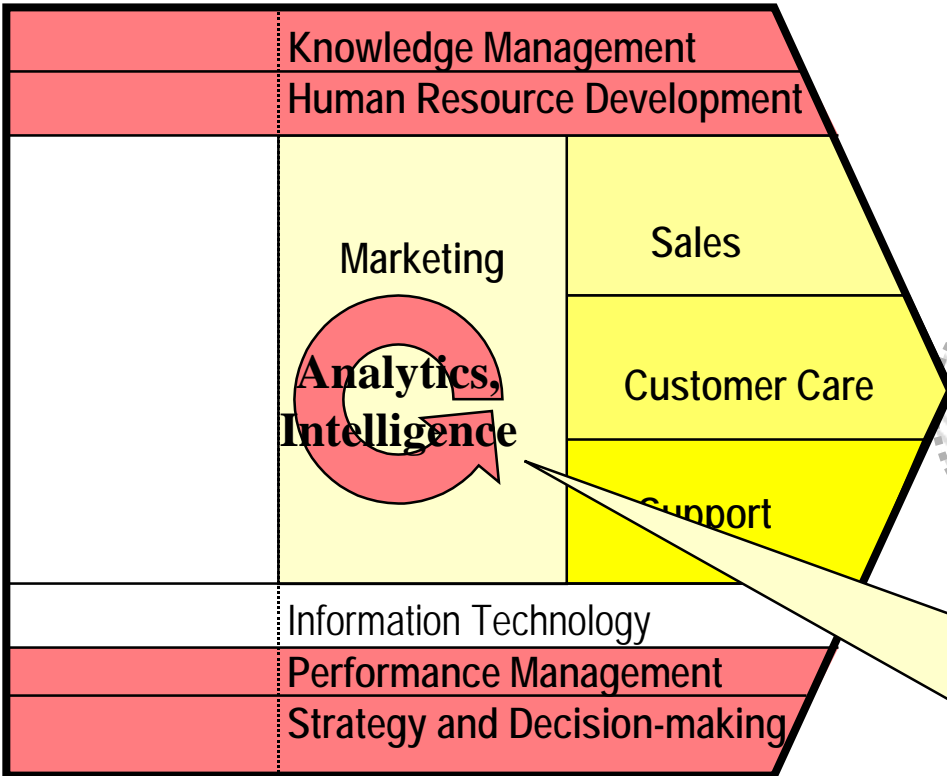
Perspectives on CRM Business Value:

4. Financial Landscape



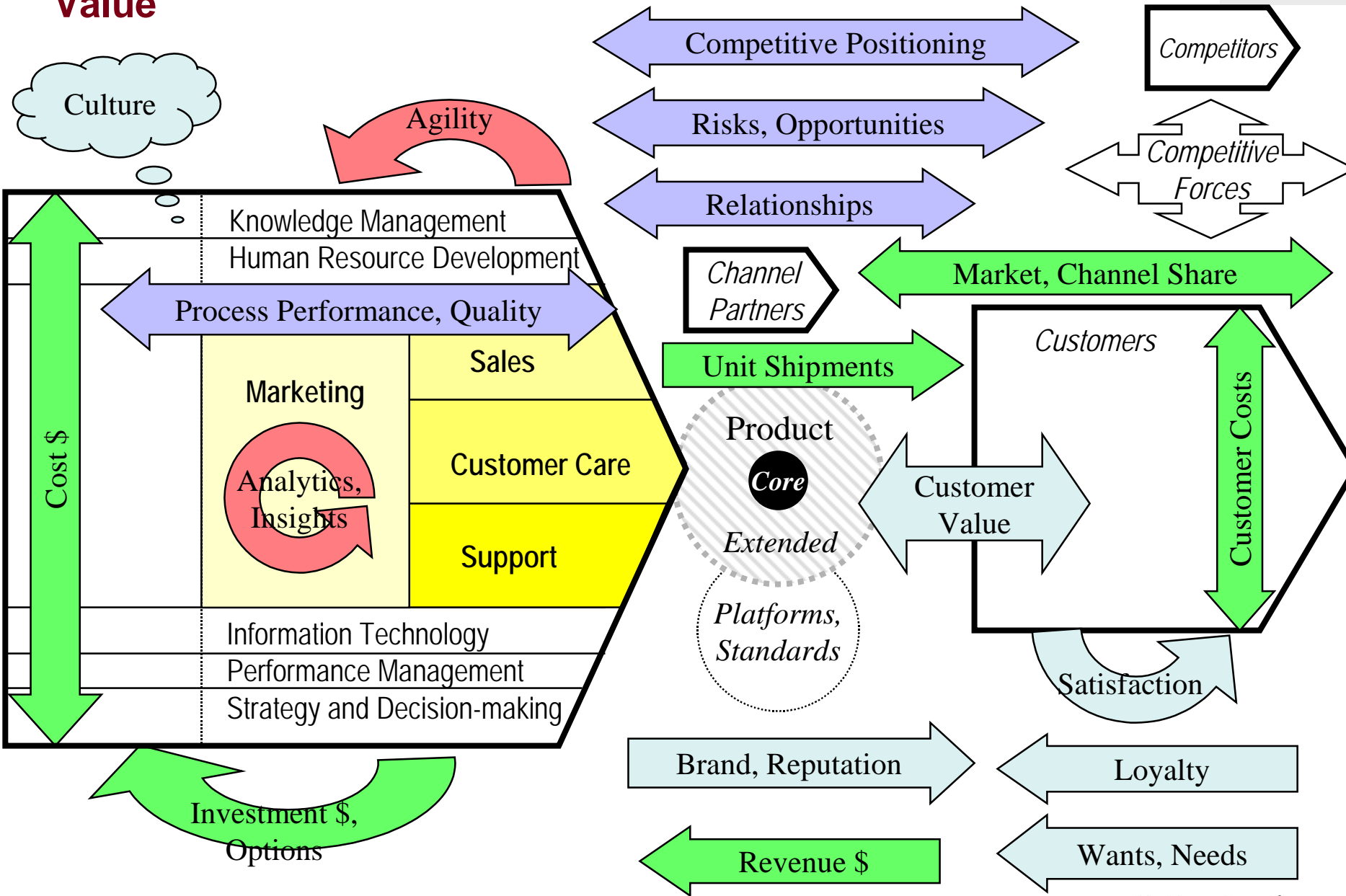
Perspectives on CRM Business Value:

5. Knowledge Landscape



- Knowledge Metrics**
- Market Intelligence effectiveness
 - Competitive Intelligence effectiveness
 - Training, Learning metrics
 - Content use / re-use metrics
 - Systematic responsiveness
 - Forecast accuracy

Perspectives on Customer Relationship Management Business Value



Typical
“Inside
looking out”

■ Sales activities and marketing programs drive revenue

- Focus first on internal activities and processes, organization, channels, marketing programs, etc. Then...
- Trace to external effects (e.g. customer purchase decisions), as an open loop.
- Benefits are usually defined in terms of activities, such as:
 - Freeing up selling time
 - Increasing frequency or volume of activities (e.g. sales calls)
 - Improving targeting or conversion rates

Leading
Edge
“Outside
looking in”

■ Customer needs or buying patterns drive revenue

- CM processes and services designed to optimize customer profitability (segments, one-to-one)
- Much more analytic (operational and financial metrics, closed loop)
- Revenue management and retention modeling

Emerging
“Complex
system”

■ The “ecology” of relationships drive revenue

- Selling chains = channel and customer relationships
- Value creation is a collaboration between buyers and sellers
- Focuses attention on dynamics, evolution, responsiveness, agility
- eBusiness models (communities, auctions, “freeware”, etc.)



Conclusions

Conclusions: What Managers Need from Business Value Analysis

- Clear definitions of “value” and how that relates to decisions which need to be made, for all stakeholders’ perspectives
 - Analysis of the tangible, quantitative outcomes of the project, but with credibility testing to avoid unfounded conclusions
 - Clear, logical analysis of non-quantified and intangible factors
 - A compelling vision which provides the logic and significance for non-quantified and intangible factors
 - A roadmap that helps firms navigate the transformation from “here” to “there”
 - Metrics and analysis to manage projects during and after deployment to capture value, control risks, and capitalize on opportunities.
- *Make it as simple as possible, automated, real-time, widely accessible, actionable, and usable by people on the front line*
- *Must lead to BETTER business results!!!*

Conclusions: How Managers Benefit From Business Value Analysis

- **Better Project Investment Decisions and Project Management**
 - Decision-making -- justification, stakeholder support, investment decision-making
 - Planning -- influencing scope, degree of change, phase sequence, deliverables, etc.
 - Execution -- keeping it on track, focusing, making trade-off decisions
 - Value Capture -- harvesting past investments
- **More Effective and Empowering Performance Management**
 - Link between performance measures (before, after) and project investments
 - Balanced scorecard, with links to shareholder value
 - Embedding performance measures in systems, more real-time
 - Devolution of decision-making to the lowest levels, to the front-line
- **Better Design and Valuation of Mergers/Acquisitions/Alliances**
 - Value creation, esp. intangibles
 - Value capture
 - Role of supporting infrastructure
- **e-Business Design and Transformation**
 - eBusiness start-ups and value chain transformation design
 - Virtual teams and organizations, alliances
 - New business models for knowledge-driven organizations (e.g. consulting)