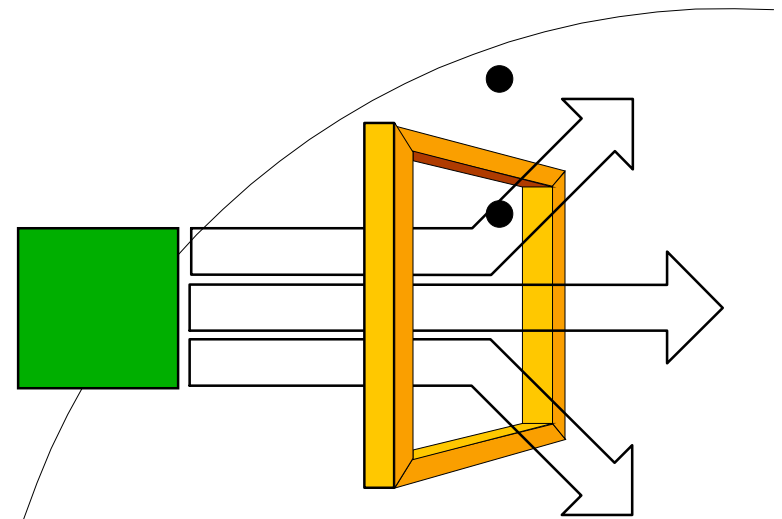


UML'98

Extending UML for Business Process Modeling

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Outline

- The need for integrated business modeling
- Requirements for a competent business modeling technique
- Sources of ideas
- Finding a home within UML
- The extensions
- Application
- Findings

Need for Integrated Business Modeling

- Pace of Business Change is great
- Nearly all systems projects now have element of "BPR"
 - > 70% in consulting practice observations
- This is a "process orientation" where most OO methods are information oriented
 - Class Diagrams
 - Object Life Histories
 - State Diagrams
- Must model beyond the "systems box" to be successful
- Technology leverage essential to effective and efficient business processes
 - Drucker: 1995
 - "the corporation that is now emerging is being designed around a skeleton: information, both the corporation's new integrating system and its articulation"

Requirements for a competent business modeling technique

Based upon the work of Ulrich Frank and colleagues at GMD and subsequently Koblenz Univ.

- Identify stakeholders and their interaction
- Identify external stimuli which trigger business processes
- Express parallel and asynchronous activities
- Distinguish between manual, partly automated or fully automated activities
- Volume of transactions (or stimuli) per unit time
- Responsibilities of organizational units for activities
- Duration of operations
- Resources and costs of operations
- Probabilities that various alternative paths are chosen
- Effects of operations on business objects

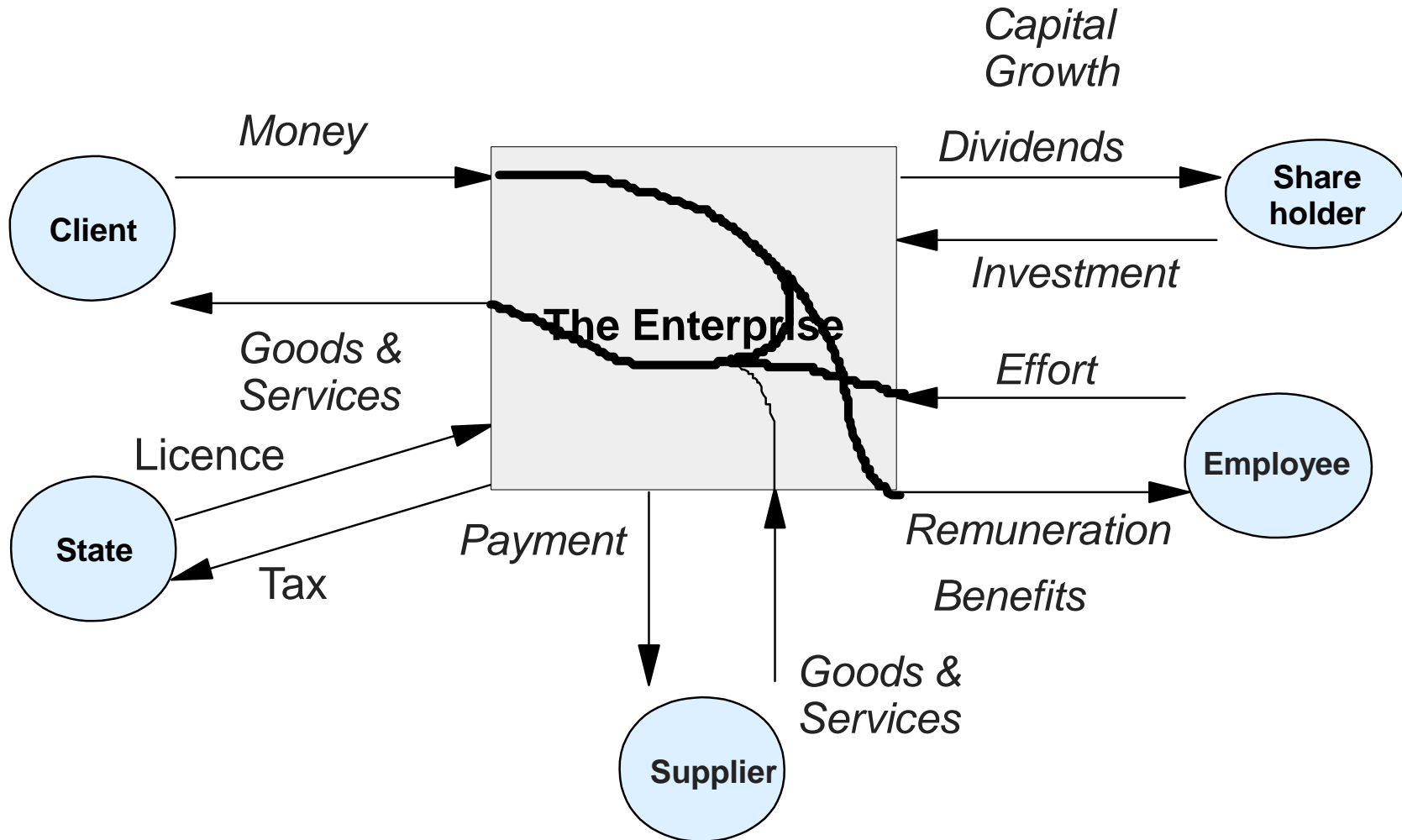
Sources of ideas

- Previous work on integrating Memo and Martin/Odell OOA method
 - Stakeholder models
 - Value chain identification (ala Porter)
 - Business process models (ala GMD)
 - Integration to Odell event models
- Design mapping to layered architecture based upon MVC (Smalltalk/Xerox PARC)
- Classical BPR principles (Hammer, Champey, Davenport)
- David Taylor (Enterprise Engines) convergent engineering approach

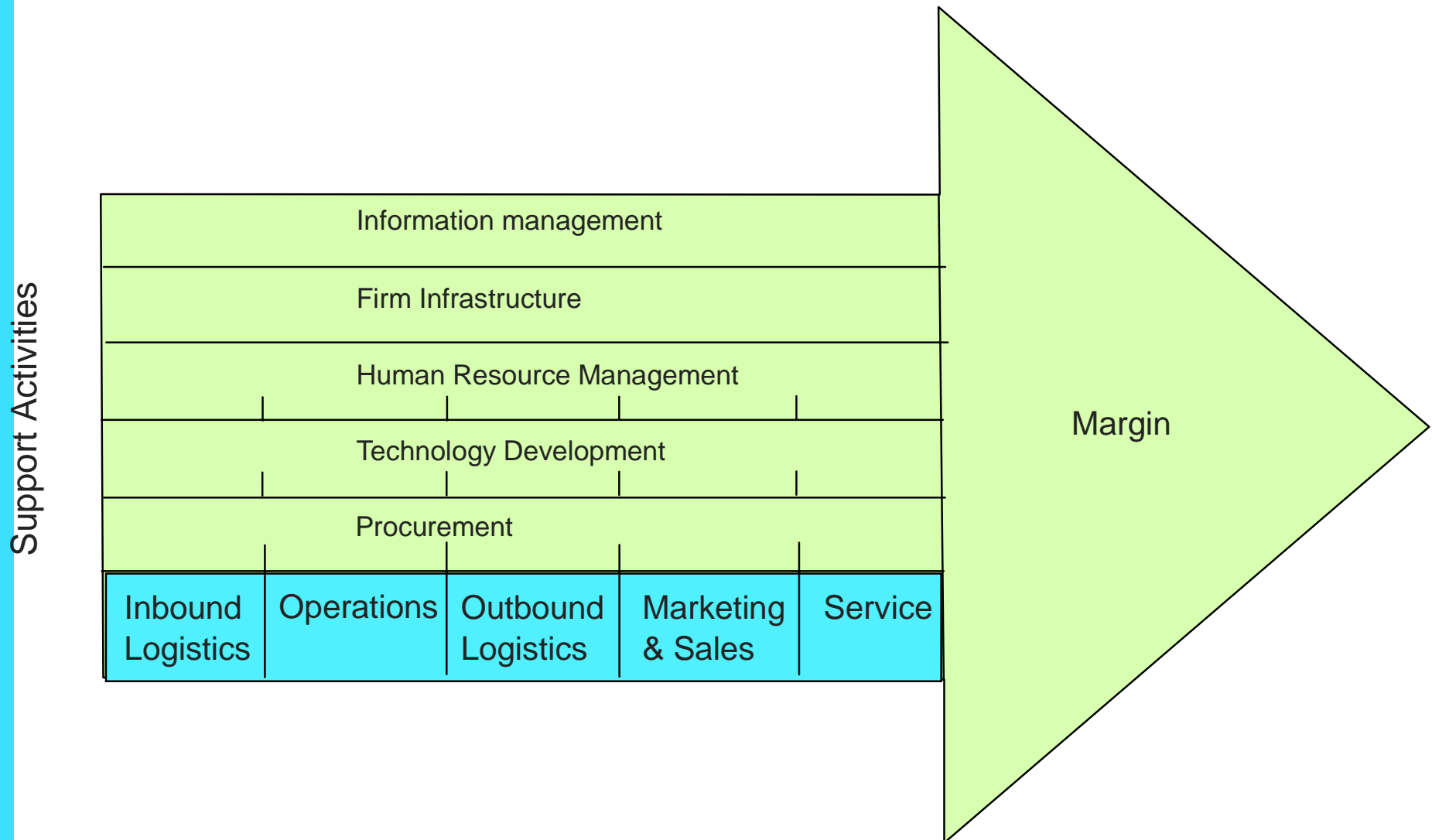
Approach

- Stakeholder model identifies scope, value chains and sources of stimuli
- Business process model per value chain
- Current and desired views for comparison
- Identifying manual, computerised and supported activities
- Comparing duration and costs
- Mapping operations to geographic locations
- Elimination of non-value-adding activities
- Parallel and asynchronous activities with due respect for dependencies
- High user involvement in facilitated sessions

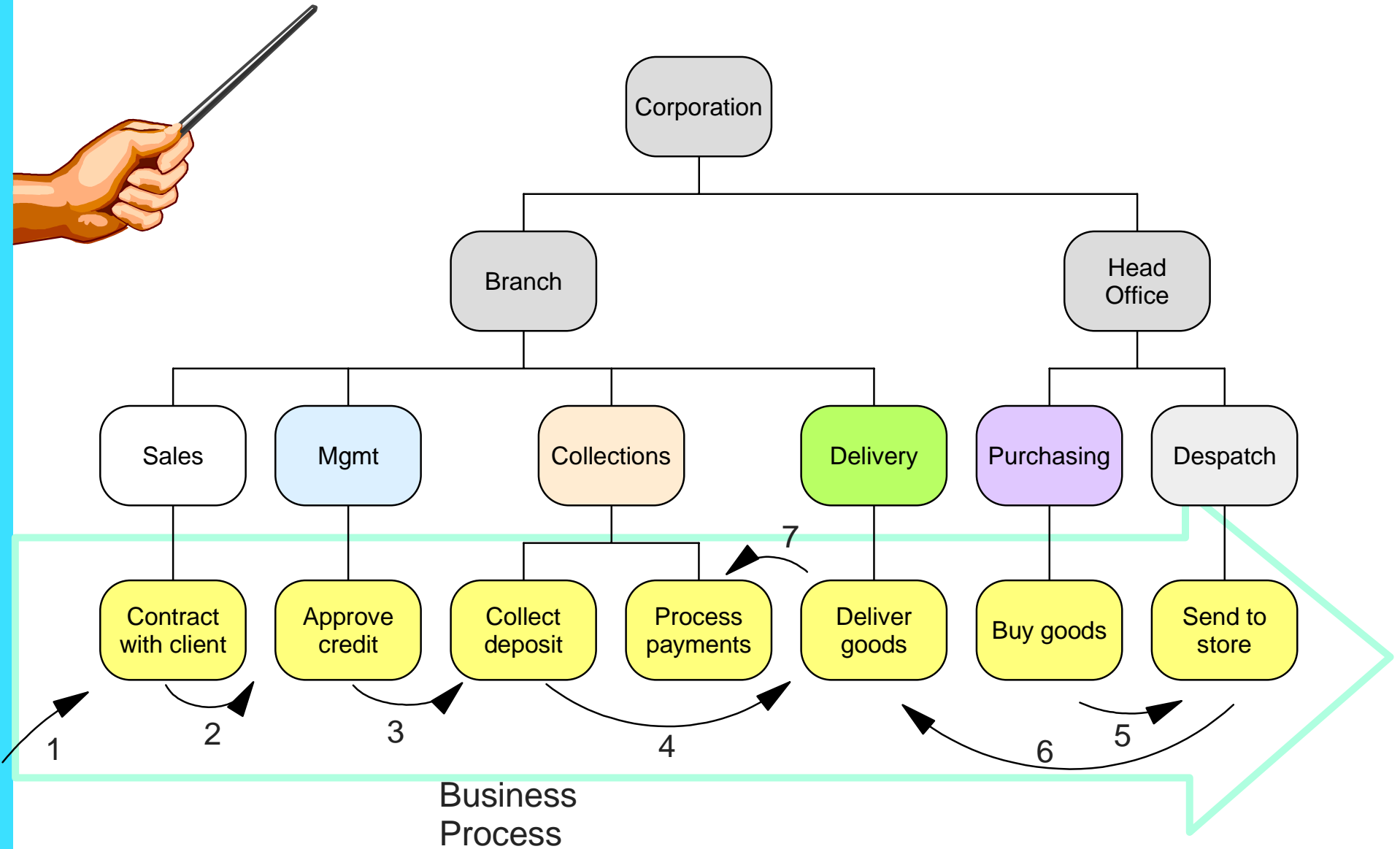
Stakeholder Perspective



Porter Value Chain model



Value Chain cuts across functional boundaries



Finding a home within UML

- We rejected
 - Sequence diagrams - not easy to use in JAD sessions, no parallel and asynchronous activity. More appropriate at "design" level due to detail
 - Collaboration diagrams - similar to above
 - State diagrams - single object type. Business processes affect many types of objects
- We chose activity diagrams
 - Sense of flow and dependencies
 - Show parallel and asynchronous activity easily, also synchronisation where required
 - Swim lanes allow geographic or organizational topology to be added
 - Represent processes requiring multiple state changes across various domain objects
 - Closest to event models used previously
- Contrary to UML advice to use these "for internal design"
 - Supported by Fowler and Scott in UML Distilled

The extensions

- Use UML stereotype mechanism

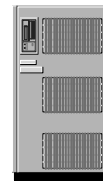
- Text

- <<manual>>
- <<supported>>
- <<automated>>

- Diagram Properties

- Volume per unit time
- Current experienced duration (best, average, worst)
- Current cost per invocation
- Desired target duration and cost

- Icons



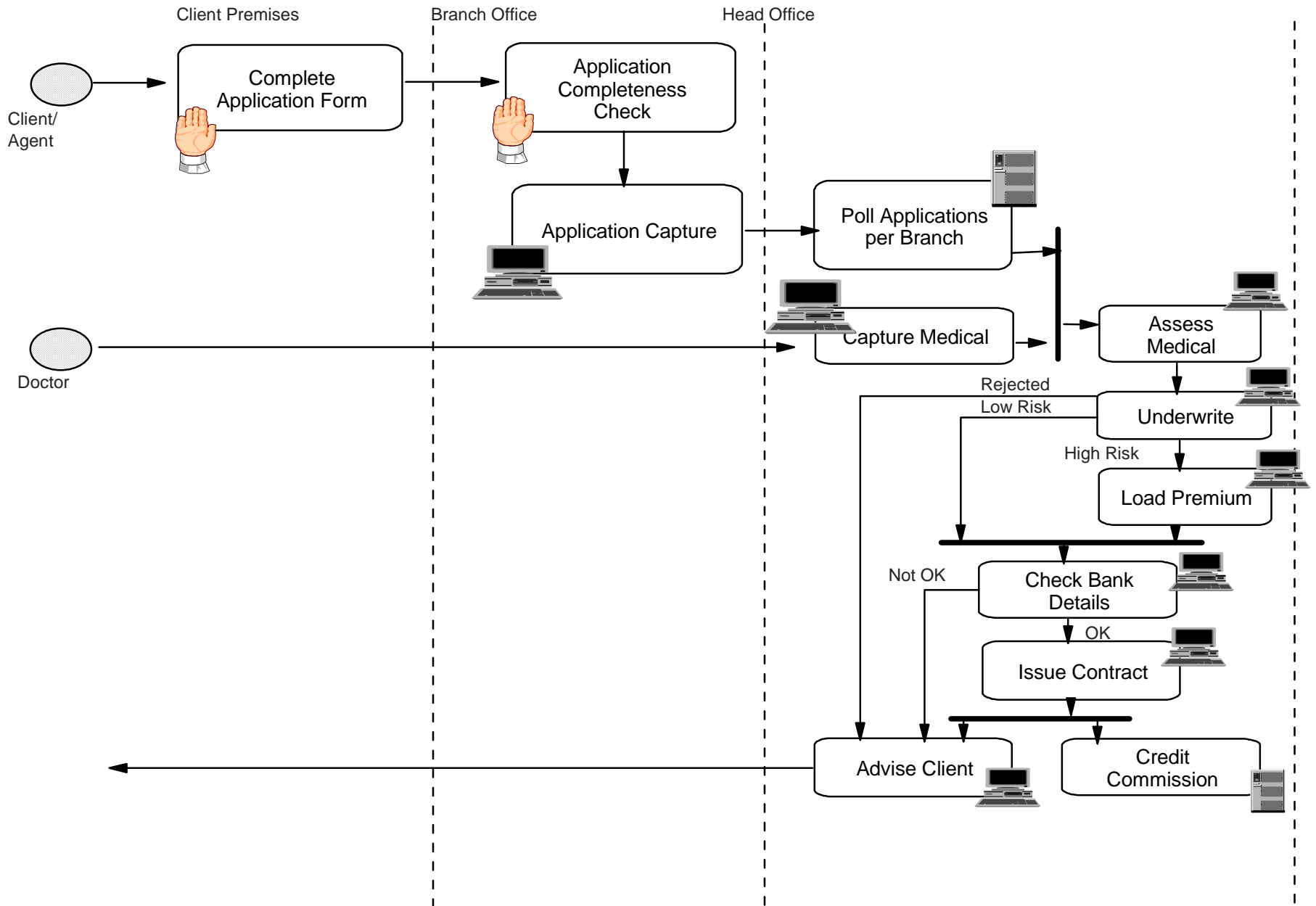
Properties per Activity

- Minimum, average and maximum duration (current, target)
- Lead time before commencement
- Organizational responsibility
- Resources consumed
 - type, unit of measure and consumption (min max avg)
- Number of servers
- Geographic location(s)
- Cost of performing the activity once (current, target)
- For triggers emerging from an activity, state for each path and probability that it is followed

Analyses permitted

- Determining duration of overall process
 - CPM techniques
 - PERT techniques can determine likelihood of various times
- Cost of performing the process
- Resources consumed
- Queuing effects can be examined
- Can look at an average overall or individual scenario
- Various alternative scenarios easily compared

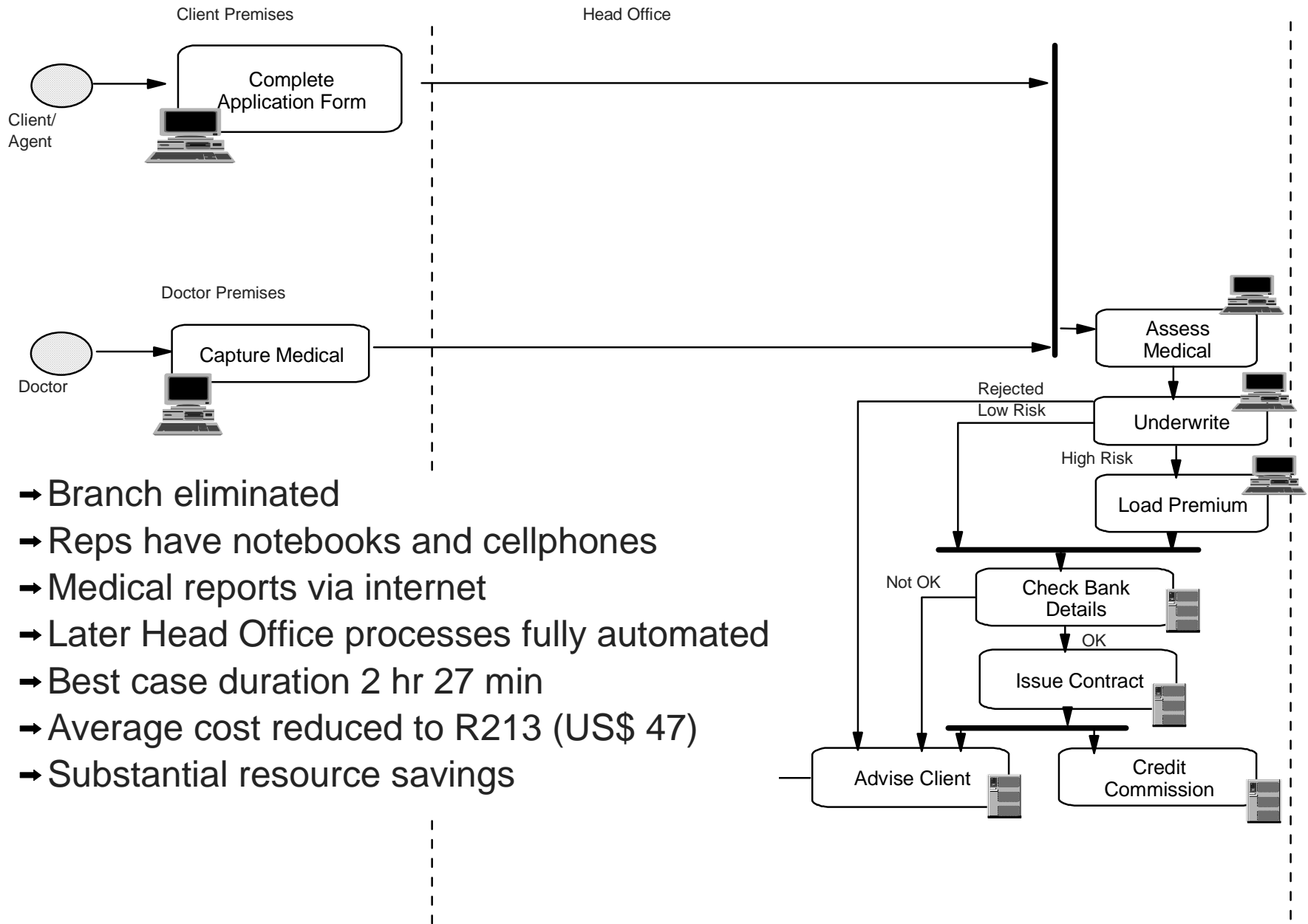
An Assurance Application



Current Process Analysis

- Best case duration 3 days 38 mins
- Average duration 3 days 1 hr 12 mins
- Average cost R326 (about US\$ 72)
- Longest delay: waiting for medical report
- No major savings by speeding up head office processes
- Fully automated functions much cheaper than computer supported ones
 - Automation will save costs
- Head office Underwriting is under staffed

Reengineered process



Findings & Further Work

- Earlier approach has proven useful in many contexts
- Wide UML acceptance and growing CASE support should allow widespread, easier use
- Tools and training equip analysts and business people to examine business operations in rich and multidimensional ways
- Assists organizations in becoming more efficient and effective in better serving customers and other stakeholders
- Hope to extend work into providing **quality measures** for outputs of business processes
- Caution: quantitative side is only one of many facets for consideration. Also:
 - ▶ Human, political, legal, ethical issues