Development Approach
BUSINESS CASE Work Product Description
IBM Worldwide Services

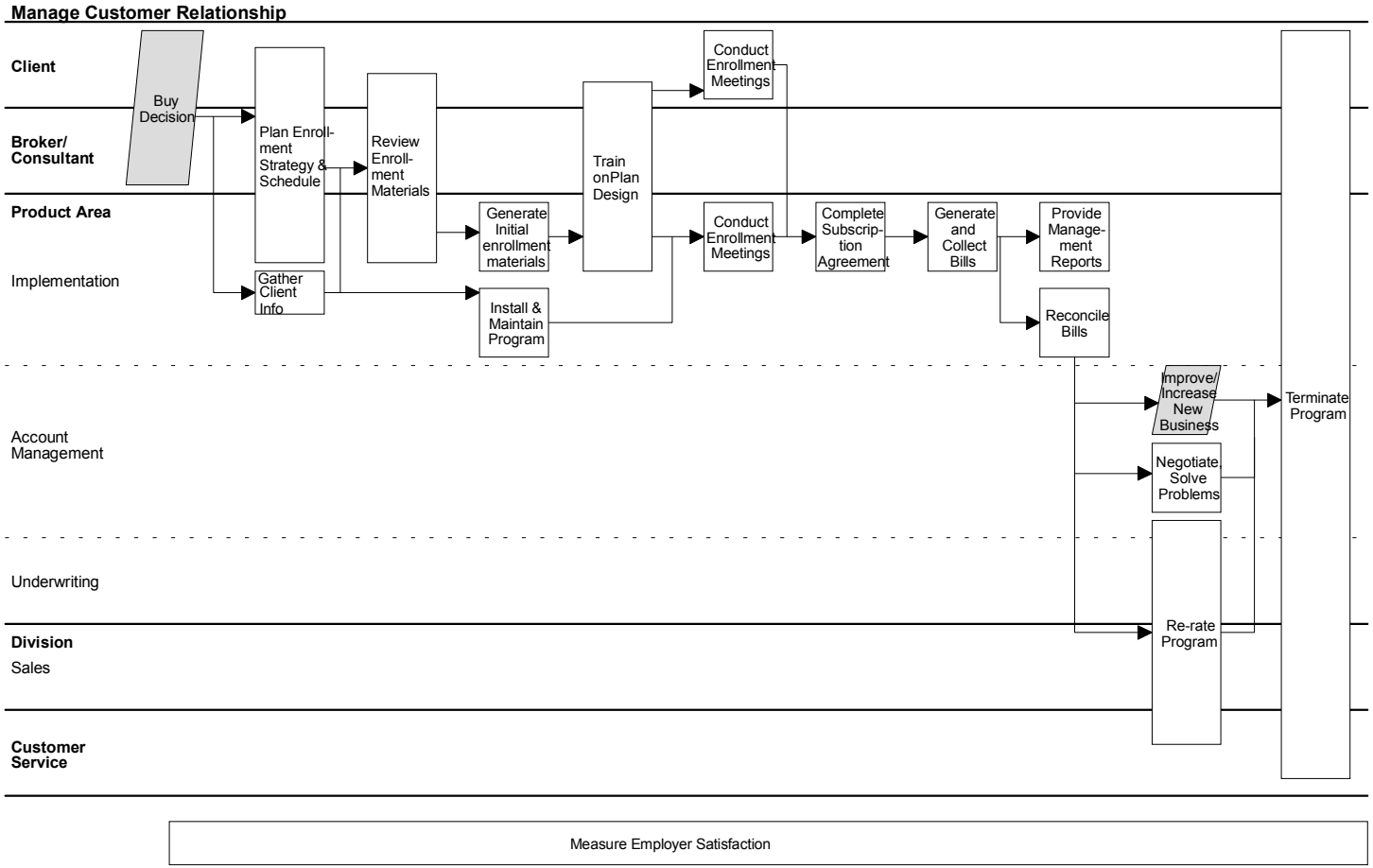
September 21, 1999

PRINCIPLES OF ACTIVITY-BASED COSTING

IBM

Understanding process costs allows the management of product and customer costs

Example

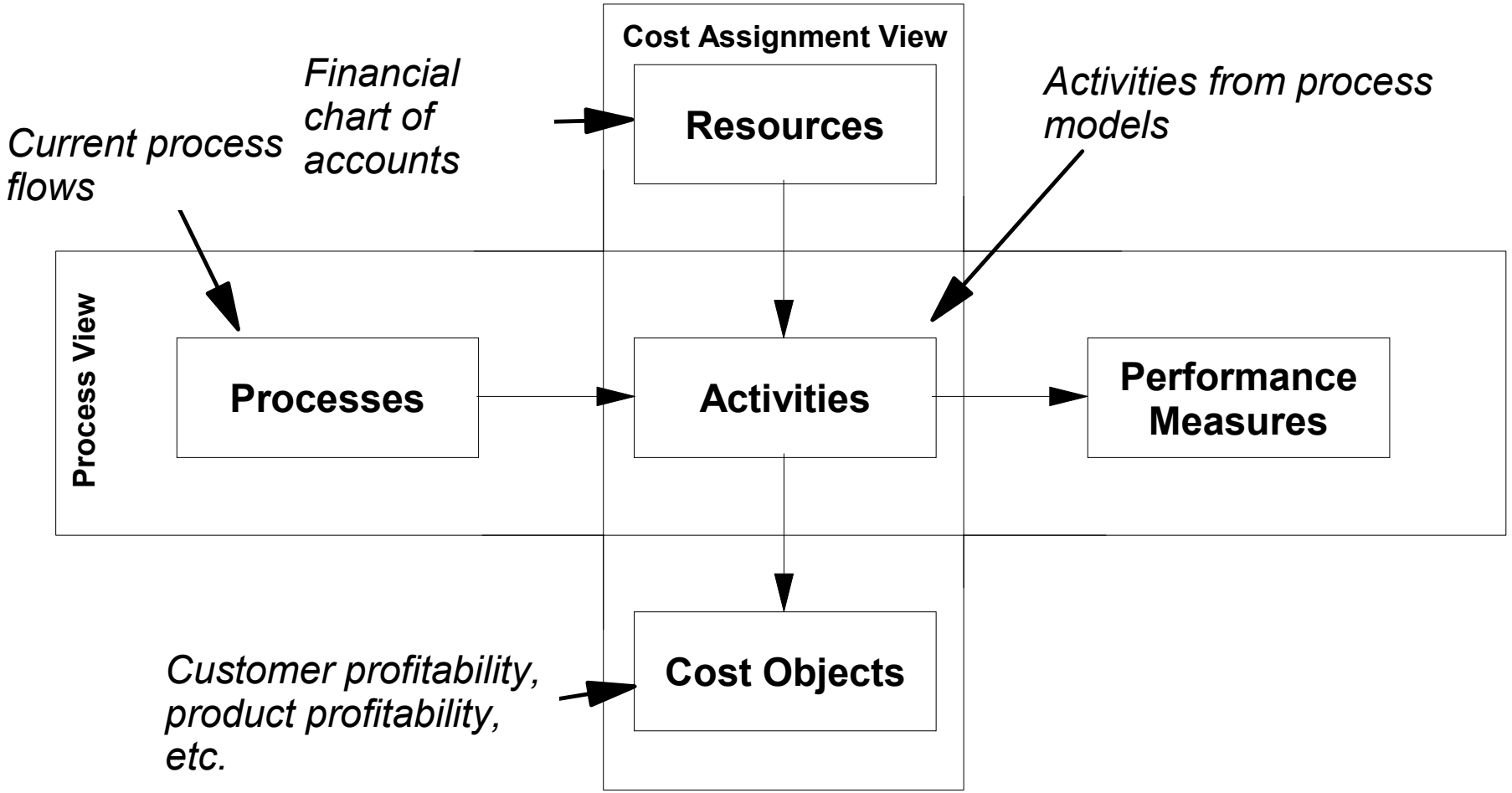


Activity Based Costing (ABC) is a tool that can be used to manage customer, product and other costs

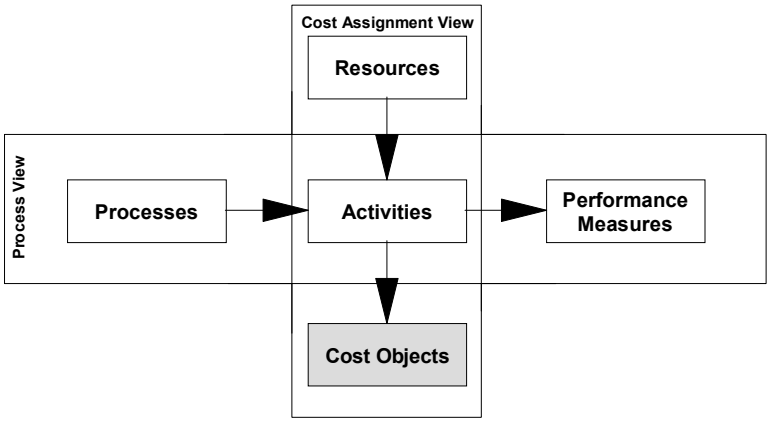
✓ **ABC facilitates reengineering and continuous improvement by:**

- **Identifying the total cost of a process, operation, customer, etc.**
- **Tracking value-added and non-value-added activities**
- **Tracking cycle times**
- **Tracking other measures that are important for your client and their industry**

ABC combines two views of a business to allocate costs to the current processes



The first step in an ABC analysis is to identify the "cost object(s)"

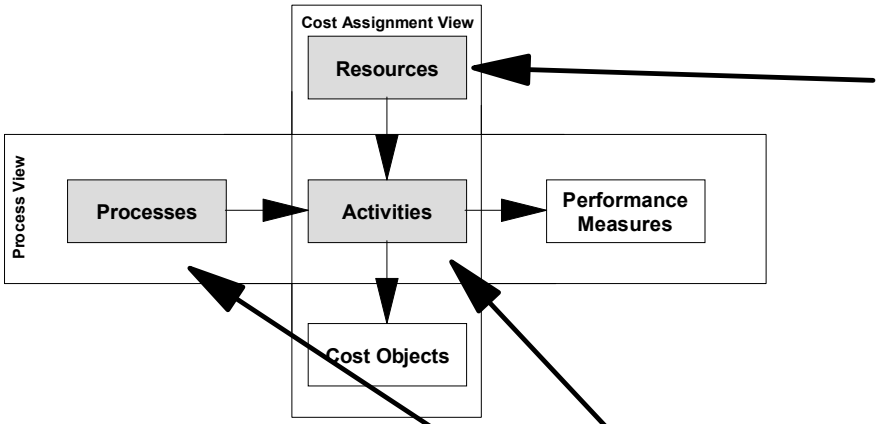


✓ **Determine what the client would benefit from measuring**

- **customer profitability**
- **product profitability**
- **etc.**

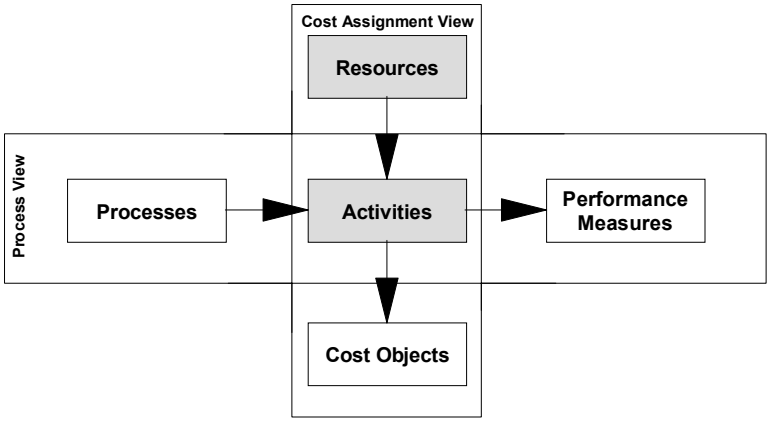
✓ **Define the types of the specific cost objects (e.g., what are the products)**

The next step uses information collected as part of the engagement as inputs to the ABC analysis



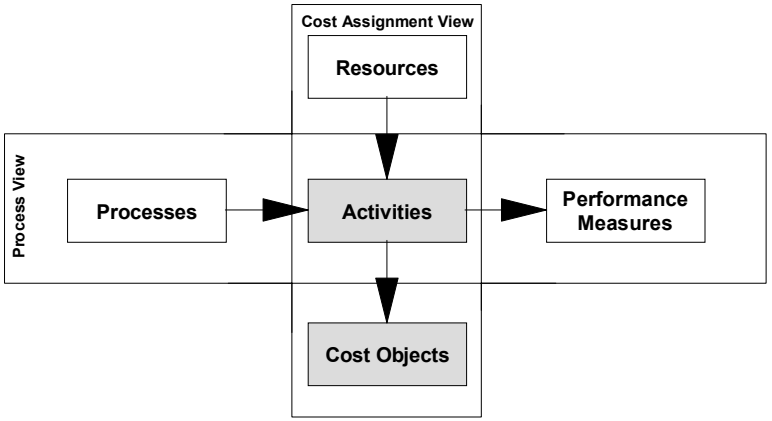
- ✓ Collect the chart of accounts for the business for the last fiscal year (the time frame must cover all cyclical events); these are the "resources"
- ✓ Collect the process flows developed in Module 3; these define the "activities"

Resources are then allocated to activities based on "resource drivers"



- ✓ For each line item in the chart of accounts (resource)
  - determine the activities it affects
  - determine a method to allocate the resource item across the affected activities
  - the allocation criterion is called a resource driver
- ✓ Now all activities have their fully loaded costs

Finally, the activity costs are allocated to the cost object(s) by "activity drivers"

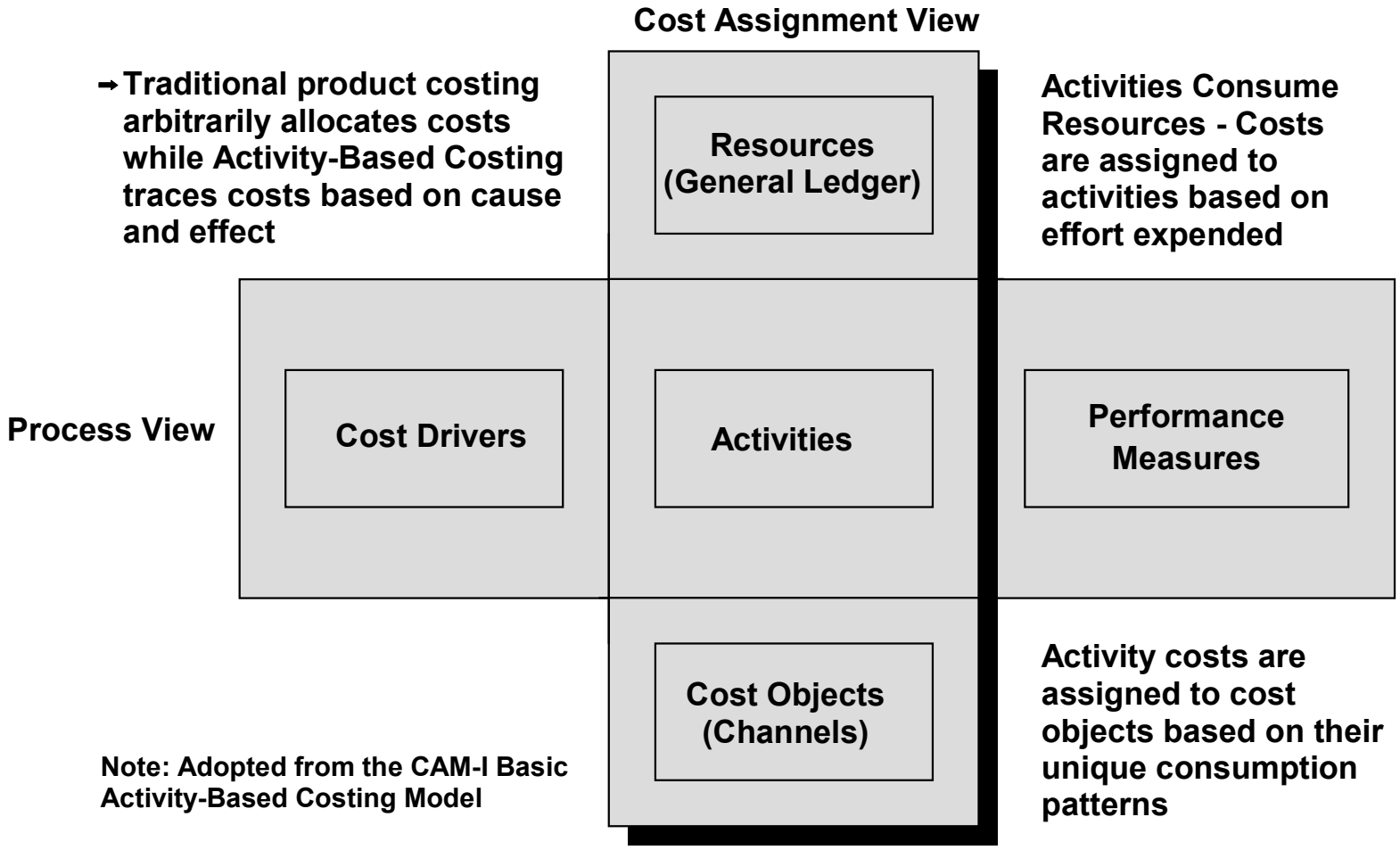


✓ For each activity

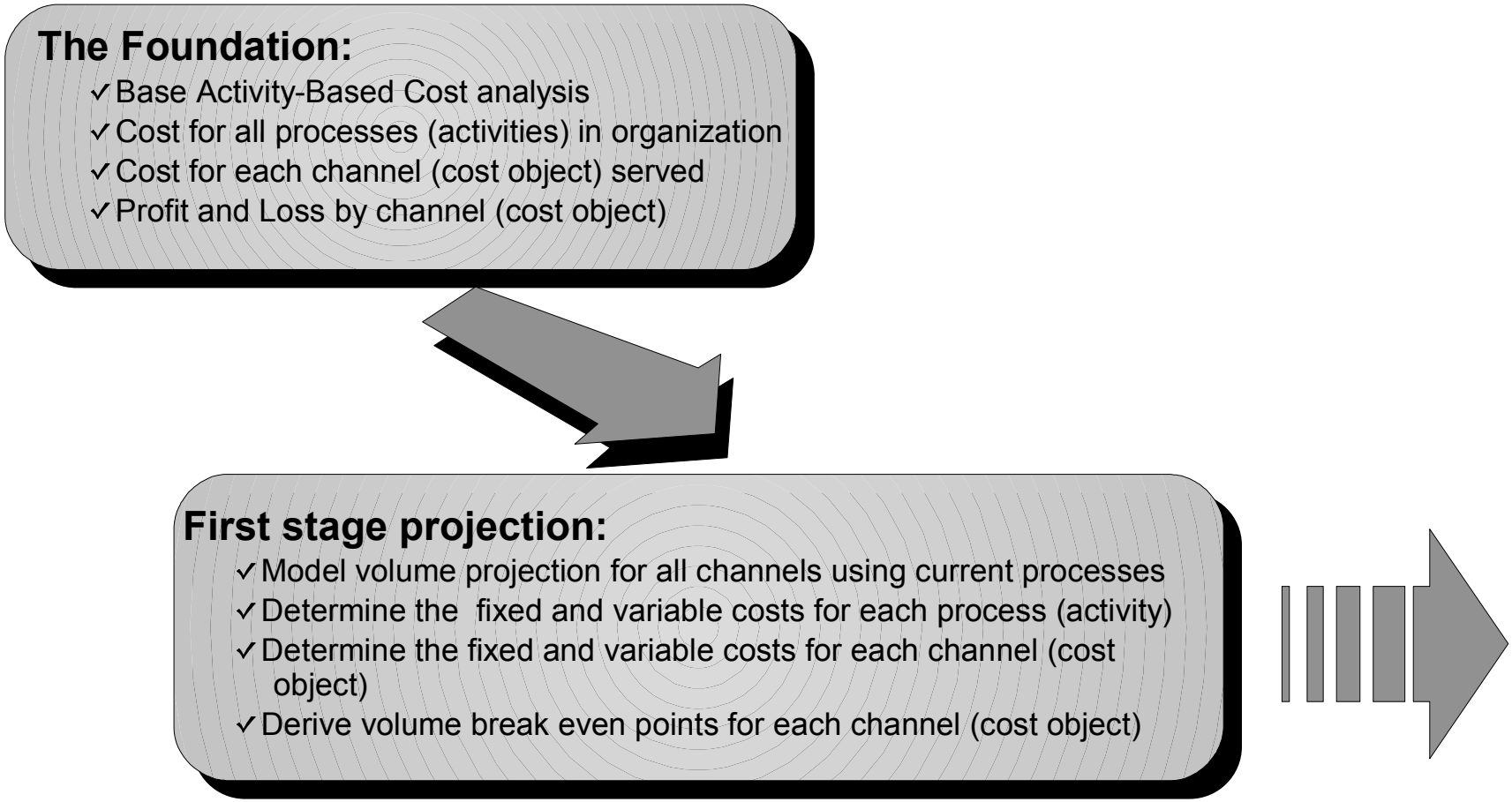
- determine the cost objects it affects
- determine a method to allocate the activity item across the affected cost objects
- the allocation criterion is called an activity driver

✓ Now all cost objects have their fully loaded costs (and/or benefits)

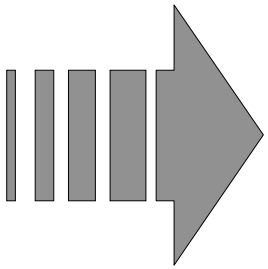
Problem: Determine the cost of delivering banking services through an electronic delivery channel. While it is believed that brick and mortar is a high cost delivery solution, we must understand the costs of the alternatives. Activity-Based Costing is a vehicle for accomplishing this



The financial assessment started with a solid foundation by creating an accurate model of the cost of doing business

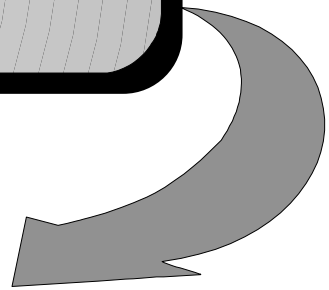


Then the future processes could be modeled and the cost of market exit alternatives could be estimated



Second stage projection:

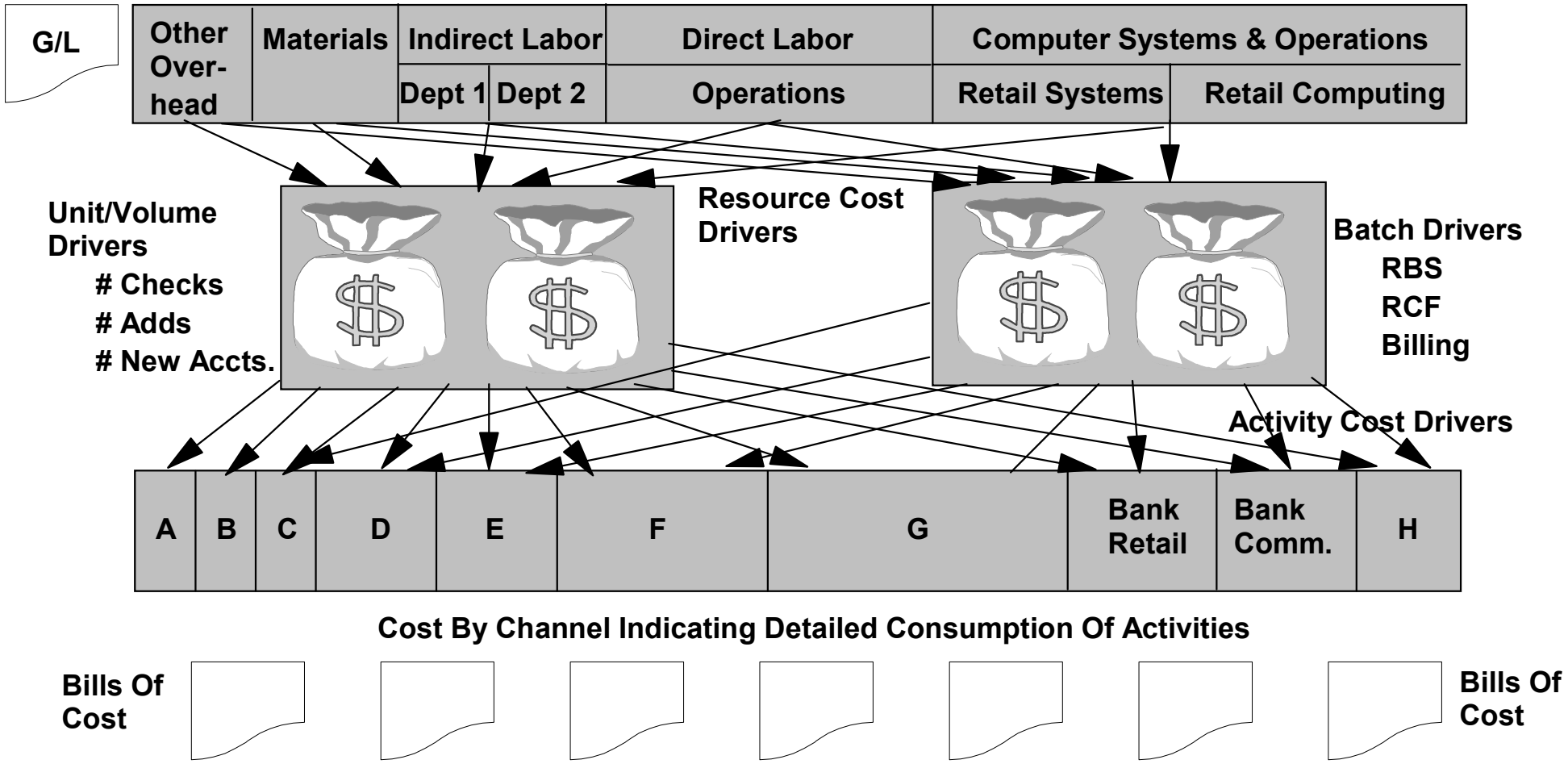
- ✓ Determine the cost of future processes
- ✓ Project the cost of each channel and develop a profit and loss statement
- ✓ Model volume growth to determine the ability of the new processes to handle growth



Third stage projection:

- ✓ Project the impact of exiting different channels (cost objects)
- ✓ Model cost structure without specific channels included
- ✓ Project break-even and contributions to scale economies

"Activity Based Costing" achieves improved accuracy in developing channel costs by understanding their unique cost drivers and consumption of activities. The results become input to channel based P&L's



The type of data collection required included the consumption of resources by activity

Department 340 Resource vs. Activity
Illustrative Example

	Process Claims	Pay By Check	Add Vendors	Daily Proof
Salary & Benefi	86258	20646	92633	32510
Occupancy	3303	871	7006	1441
Postage	9272	43733	0	432
Telephone	5388	337	13279	620
Supplies	990	27412	2099	0
...				

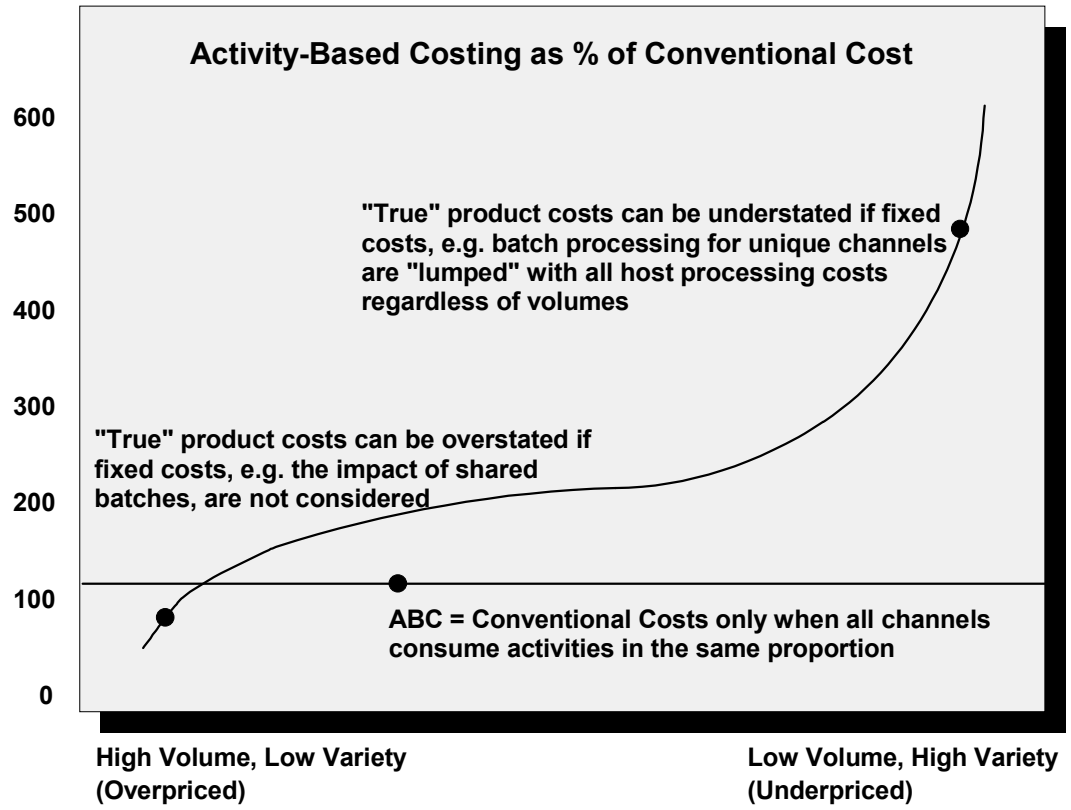
As well as the consumption of activities by channel

Department 340 Activity vs. Channel
Illustrative Example

	Retail Bank	Comm. Bank	User B	Etc...
Process Claims	827	43	3006	0
Pay By Check	37921	1996	101192	
Handle Complai	10958	2874	9497	
Add Vendors	1139	60	4389	
Daily Proof	10	10	10	
...				

"Activity-Based Costing" was selected to model channel costs because conventional costing approaches generally apply resources (labor, systems, interoffice, etc.) directly to channels.

This can lead to incorrect pricing and/or focusing on the wrong customers and processes



- ✓ **Customers with high sales volumes are not necessarily highly profitable. Profitability depends on whether and how much the net revenues recover customer-specific costs**
- ✓ **Once true costs are known through ABC, customers can be migrated toward higher profitability by better managing their service costs, reducing their services, and/or negotiating prices.**

Though Activity-Based Costing does not require accounting precision, it does require rigorous application to assure defensible identification of the cost of reengineering opportunities

- ✓ **Applying resources from the General Ledger and selecting resource drivers**
  - The time periods selected for the General Ledger and the activities must be the same and represent the environment being analyzed
  - Focus on "allocated" costs to assign them appropriately to activities
  - Given their high cost in service industries, it is critical to understand the nature of systems development and computing costs
    - Analysis could point to the need for an I/T engagement or a Systems & Programming based BT engagement
    - Arbitrarily negotiating reductions in allocations is probably inappropriate
  - The name of the G/L account may not represent the true nature of the expense
  - Granularity is more important to the analysis than it initially may be to the client executive
  - Assigning resources from the G/L to activities is non-trivial and rigor and accuracy are crucial
    - Activities and organizational structure will probably not be consistent nor granular enough
    - Assigning resources is best done via available MIS data
    - Surveys and sampling are good tools but if used, the data on consumption of resources has to be reconciled with the expenses data
    - Complete MIS data will probably not be available and time and resource may not be available to get it via survey. Use interviewing but validate and revalidate the data
    - "Find George!"
  - Remember, the bottom line is the bottom line, **AND** "they" may not like it, but Activity-Based Costing distributes available truth

Understanding the General Ledger will be required as the true makeup of the accounts is probably not obvious

The distributions made in the Systems and Programming area are based on the following...

✓ ***Systems and Programming***

- Overall costs are based on summary data provided by the Controller of the Electronic Banking Group. This data was based on projected annual charges as follows:
  - Retail Computer Facility charges - $525,000
  - Retail Banking System charges - $400,000

- Retail Computer Facility charges of $525,000 were apportioned as follows:
  - $312,000 to the back end systems (IBM). These were distributed by channel based on actual usage percentages from reports supplied by Systems & Programming. Percentages based on actual charges for the IBM system processing time represented about 1/3rd of the total back end systems costs. These percentages were used to distribute the total back end costs. The results were validated by Systems & Programming.
  - $213,000 to the front end systems (Tandem and InternalNet)
  - InternalNet charges ($115,871) were calculated and distributed based on data from Bank H and Bank C detailed billing reports (TelecomNet Usage and Access charges were apportioned based on the distribution of kilosegments, connect hours and port charges)
  - The remainder of the front end charges were considered Tandem charges ($97,129). These were distributed based on the number of accounts except that for Bank G, the number of accounts was multiplied by 2 based on findings from Systems & Programming indicating that "West Coast" users are at least twice as active as those in the rest of the country. (Note that this increases Bank G costs by approximately $15,000 per quarter with current state volumes and decreases costs across the remainder of the channels by an equal amount)

In addition, the distributions of Retail Banking System charges are based on the following...

- Retail Banking System charges of $400,000 were apportioned based on input from Systems & Programming as follows:
  - 30% to supporting existing channels in the development of solutions of TR's and MR's. This was allocated to channels as follows: 3 shares in support of Bank G, 1 share in support of each of the other channels (Bank Retail and Commercial are considered a single channel)
  - 50% in support of developing new products for existing channels. This was allocated to channels as follows: 15% each to Bank Retail, Bank Commercial, User F; 10% each to Bank G, Bank E, User A; 6.25% each to Bank C, Bank B, Bank H Group, and Bank D
  - 20% to "New Products and Proposals of which half goes to selling to new FI's, and half to User B product innovations

The success of Activity-Based Costing is based on understanding the processes that support the cost objects (products, customers, delivery channels, etc.) and the unique consumption of activities by those cost objects

- ✓ **Understanding activity costs is very exciting as it shows what the true costs are vs. what they are thought to be**
  - Are dollars for business development being spent on expanding the business or fixing problems?
    - Does the misalignment of mission and expense give an indication that the processes are broken?
    - Does activity expense indicate that customer expectations are not being met?
    - Is there duplication of activities and therefore expenses?
  - How much is being invested in new systems development vs. maintenance?
    - Is the sheer size of the investment in Systems Development and Computing a shock, as in, "You have how many people doing what?"
    - Is there a disconnect between the operations function and the supporting systems function?
    - Are expenses aligned with the CSF's?
    - Systems based costs are difficult to assign to operations activities. This may (or may not) be necessary
    - Are the delivery of services to a common customer set supported by an integrated technology structure? Does a difference in the infrastructure investment level indicate differing levels of commitment?
  - Analysis of operational activity costs will show the 80/20 rule holds true
    - But, granularity may still be required to identify potential snakes in future states
    - Aggregation of processes is appropriate and may be very important to identify and resolve common problems, but, consider doing it AFTER determining costs on a more granular basis. It is easy to aggregate and difficult to dis-aggregate
    - There are several methods to assign activity costs to cost objects. Activity driver analysis is crucial

It may be important to understand life cycle issues and relate them to activity consumption in order to put the period cost analysis into proper perspective

Key findings in each of the three main business areas revealed the following...

- ✓ **Systems Development and Computing costs were 150% of revenue**
  - Fixed costs are very high for computing services and are projected to be very high for development in the vision state. This indicates the need for:
    - Significant volume growth to absorb costs and/or
    - A detailed review of development costs and computing charges and allocation methods
- ✓ **Business Development costs were 45% of revenue but expenses were primarily devoted to problem management rather than marketing and business development**
  - Volume growth will require investing in volume growth activities
- ✓ **Operations costs were 150% of revenue and because they are generally highly variable, need process improvement focusing on containing costs for:**
  - Adding new customers
  - Payment processing
    - An analysis of key cost components for processing checks and outsourcing alternatives
    - Process improvements in handling electronic payment problems as problem resolution of these payments is more costly than check problem resolution
  - Problem management
    - Claims and complaints (as a proxy for inquiries)
    - Problems caused by funds being insufficient to cover payments

A number of reports detail high cost activities, unit costs of activities, channel profit and loss, and channel unit costs or breakeven. These reports can...

Activity Based Cost Model
High Cost Activities

	Activity Cost	Percent Of Total
Host Processing	312000	14.5
Systems Development	200000	9.3
Add New Customers	175832	8.2
Pay Bills - Check	163642	7.6
Add New Vendors	133498	6.2
Systems Maintenance	120000	5.6
Network Processing	115871	5.4
Process Claims	114030	5.3
Process Transactions	97129	4.5
Marketing Support	80000	3.7
Management/Mktg	68750	3.2
Complaint Processing	60954	2.8
Complaint Processing	50796	2.4
Other	456588	21.3

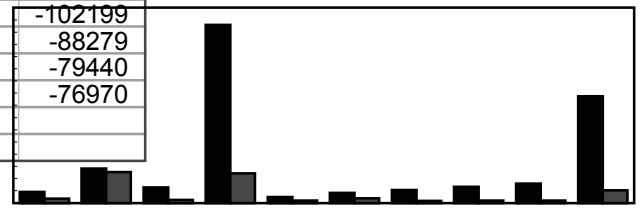
Activity Based Cost Model
Operations Activity Costs

	Total Activity Cost	Number Of Units
Add Customers I	9920.68	60
Add Customers II	11852.38	1139
Add Customers III	175832.09	4389
Add Vendors	133498	21396
Pay Bills Automated	9999	71260
Pay Bills Lockbox	14935	144595
Pay Bills Check	163642	374179
Payment Problems I	20710	456
Payment Problems II	1820	4088
Payment Problems III	1092	2000
Payment Problems IV	4366	9417
Process Claims	114030	80619
Cancel Accounts	16932	5890

Base Case Activity Based Cost Model
Total Costs, Revenues, P&L By Channel

	Number Of Custome	tal Costs	Profit (Loss)
Own Retail Channel	5720	285823	-155151
Own Wholesale Cha	958	135591	-14787
High Volume Ext	9497	601619	-482052
Medium Volume Ext	124	90436	-73118
Wholesale Channel	15131	375404	-233475
Wholesale Channel	3654	151388	-82867
Wholesale Channel	2275	121537	-102199
Wholesale Channel	1538	102413	-88279
Wholesale Channel	1140	90133	-79440
Wholesale Channel	200	87418	-76970
Other Mktg. Costs		111824	
Other Mgmt. Costs		25504	

Base Case Activity Based Cost Model
Customer Unit Costs, Revenues, P&L By Channel
January - March, 1992



	Own Re	Own Wl	High Vo	Medium	Wholes	Wholes	Wholes	Wholes	Wholes	Wholes
Cost	44.72	141.54	63.35	729.32	24.81	41.43	53.42	66.59	79.06	437.09
Aver	17.6	126.1	12.59	120.97	9.38	18.75	8.5	9.19	9.38	52.26

- ✓ **Help client understand the costs of activities and cost objects**
- ✓ **Identify processes that could benefit from reengineering**
- ✓ **Identify whether we are meeting existing customer requirements**
- ✓ **Identify potential mis-alignments with business context**

- ✓ **Identify overlap in functions across units**
- ✓ **Identify how systems development resources are being invested**
- ✓ **Identify how computing resources are being invested**

A channel based P&L was constructed using channel costs and revenues. This was followed by development of channel based "pro formas" based on a limited set of assumptions based on modified volumes and processes

Bill Of Costs + Revenue By Channel = Channel P&L + Assumptions

=

Alternative P&L's by Channel

With the base case developed, a "vision state" was created to show the potential impact of process improvements and volume increases to answer the question , "How good can this business be?". First, models were developed for alternative volume scenarios without reengineering

✓ **Model 1 - Current volume and current process state**

- A picture of the existing channel costs based on their consumption of activities; a baseline

✓ **Model 2 - Near term volume state projection with current processes**

- Projected channel costs based on limited volume growth provided a second point on a curve to begin to understand scale economies. Using the existing process state isolated the impact to changes in volume

✓ **Model 3 - Future volume projection moving to "steady state" with current processes**

- "Steady state" projected costs at a future point in time to provide another point on a curve to understand scale economies. A "steady state" scenario presented a "best possible light" scenario with respect to volumes. Limited future growth reduced high cost activities such as establishing customers other processes typically associated with new customers and helped answer the question, "Can this business ever be profitable without reengineering?".

Modeling volume alternatives with current processes showed the potential for scale economies and isolated the impact to changes in volume

The potential impact for cost improvement, as a result of re-engineered ("vision state") processes, must be estimated to model future channel costs at various volume levels. The objective was to answer the question , "Can this business ever be good?"

✓ **Model 4 - Current volume and "vision state" (re-engineered) processes**

- A picture of the channel costs based on their consumption of activities with "visioned" processes; a baseline showing the potential impact of process improvements at current volumes.

✓ **Model 5 - Near term volume state projection with "visioned" processes**

- Projected channel costs based on limited volume growth provided a second point on a curve to begin to understand the potential impact of re-engineered processes on scale economies.

✓ **Model 6 - "Vision state"; future volumes and reengineering processes**

- Setting "stretch" though reachable goals, helps determine if this business, under any set of conditions warrants investment or is a candidate for divestiture.

The development of scale economy curves requires estimating "leverage" factors. The ratio of fixed to variable costs for each activity must be estimated. Fully fixed costs will not grow relative to volume growth and the factor will be 0.0. Fully variable costs will grow directly as a function of volume, factor will be 1.0. Most activities/processes have both fixed and variable components.

The potential cost improvements of process changes in Operations would result from the following...

✓ **Establish (Setup) User B Customers**

- This has already been reduced by 50% as a result of:
  - Elimination of the need for **data entry** on applications. The past procedure of manual data entry has been replaced by uploading application data from User B to a PC and then to the Tandem system so that re-keying is unnecessary
  - Significant reductions in **verification** of on-line applications. The past procedure included verifying all applications concurrently with requests for voided checks and signed applications. The current procedure is to await the return of the required documents to avoid verifying applications in cases where customers do not return the paperwork
- No additional impact from "New Product X" has been estimated

✓ **Paying By Check**

- There is an anticipated reduction of 10 percentage points in the **number of payments by check** (60% - 50%) with an equivalent **growth in EFT payments**

✓ **Adding Vendors**

- It is anticipated that **customers will add their own vendors** from existing data base which currently contains 60% of the vendors used, therefore this would drop 60%

Additional potential cost improvements of process changes in Operations would result from...

✓ Claims (Complaints) Processing

- This would drop 60% based on...
  - "Claims posted in > 5 days " - 18% to 10%

    Reduced cycle time on checks 1 day
    Set customer expectations based on history
    Increased EFT payments
    Improved vendor relations with problem and/or high volume vendors based on tracking

  - "Customer did not allocate 5 business days" - 17% to 5%

    Set correct expectations with customer - Payment status screen
    Increased EFT payments
    Improved merchant history to update status screen
    Personal interaction with problem customers based on tracking

  - "Posted in 5 business days" - 15% to 5%

    Same as > 5 business days plus
    Set customer expectations
    Provide guarantee

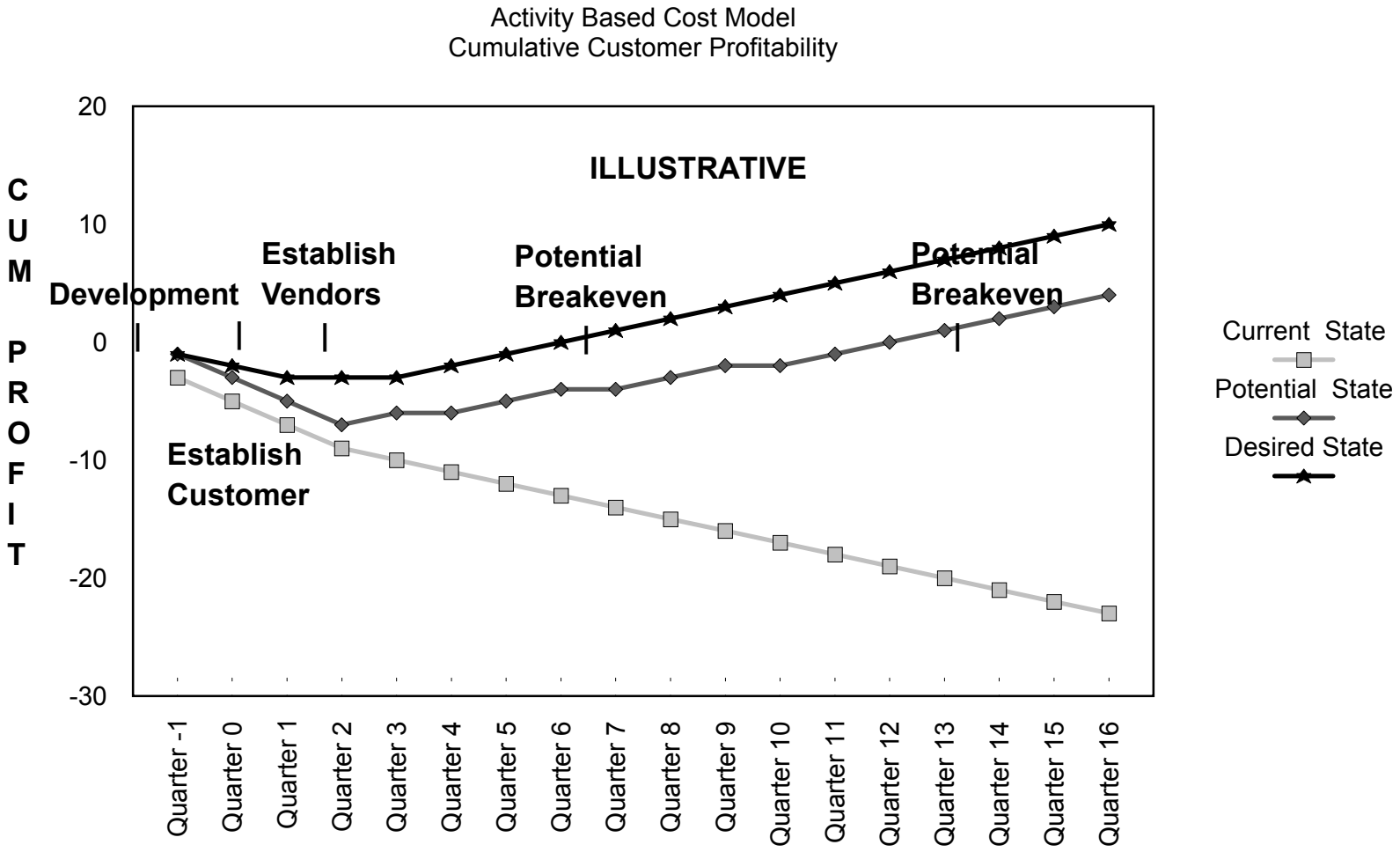
  - "Check not received" - 11% to 3%

    R&I follows up with vendor within predictable timeframes based on merchant history and updates customers (and information screens)
    Fix printer problem and use check mailer
    Reduced returned checks due to mis-stuffs , metering, etc.

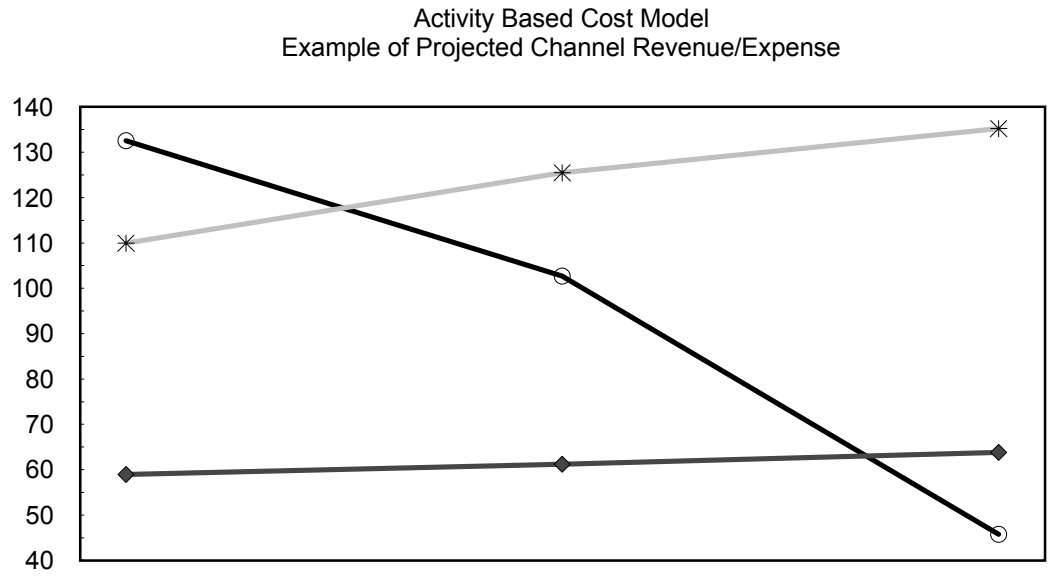
In addition to process improvements, to model anticipated benefits from economies of scale, the ratio of fixed to variable costs for each activity must be estimated

- ✓ **In the YE '92 growth state, factors are assigned to estimate relative fixed to variable ratios**
  - Fixed costs will not grow relative to volume growth - Factor = 0.0
  - Variable costs will grow directly as a function of volume - Factor = 1.0
- ✓ **For example:**
  - Back end processing has **high** fixed costs because running a cutover requires a fixed set of programs and operations, e.g., tape mounts, which are not transaction dependent. Transaction dependent programs and operations are limited. A leverage factor of 0.2 is assigned indicating that for each increase in volume, costs will only increase at 20%, thereby taking advantage of scale economies
- ✓ **For example:**
  - Adding vendor (or customers) has **low** fixed costs because adding a new vendor or customer consumes as much resource (labor) as adding the last vendor or customer except for base investment required to be in business and the learning (experience) gained over time. A leverage factor of .7 is assigned indicating that for each increase in volume, costs will increase at 70%, thereby taking little advantage of scale economies
- ✓ **Other examples:**
  - Daily proof is **constant , all fixed**, and new volume results in no additional costs, therefore, the leverage factor is 0, taking full advantage of scale economies
  - Claims processing is **low** (leverage = .7) but is also, in part, a function of new accounts. Leverage may also be impacted by the anticipated growth in electronic payments as well as experience

To determine economies of scale and estimate profit potential it was also necessary to estimate the various stages of a customer's life cycle (e.g. development, adding new customers, constant usage) and the activities and activity consumption associated with each stage



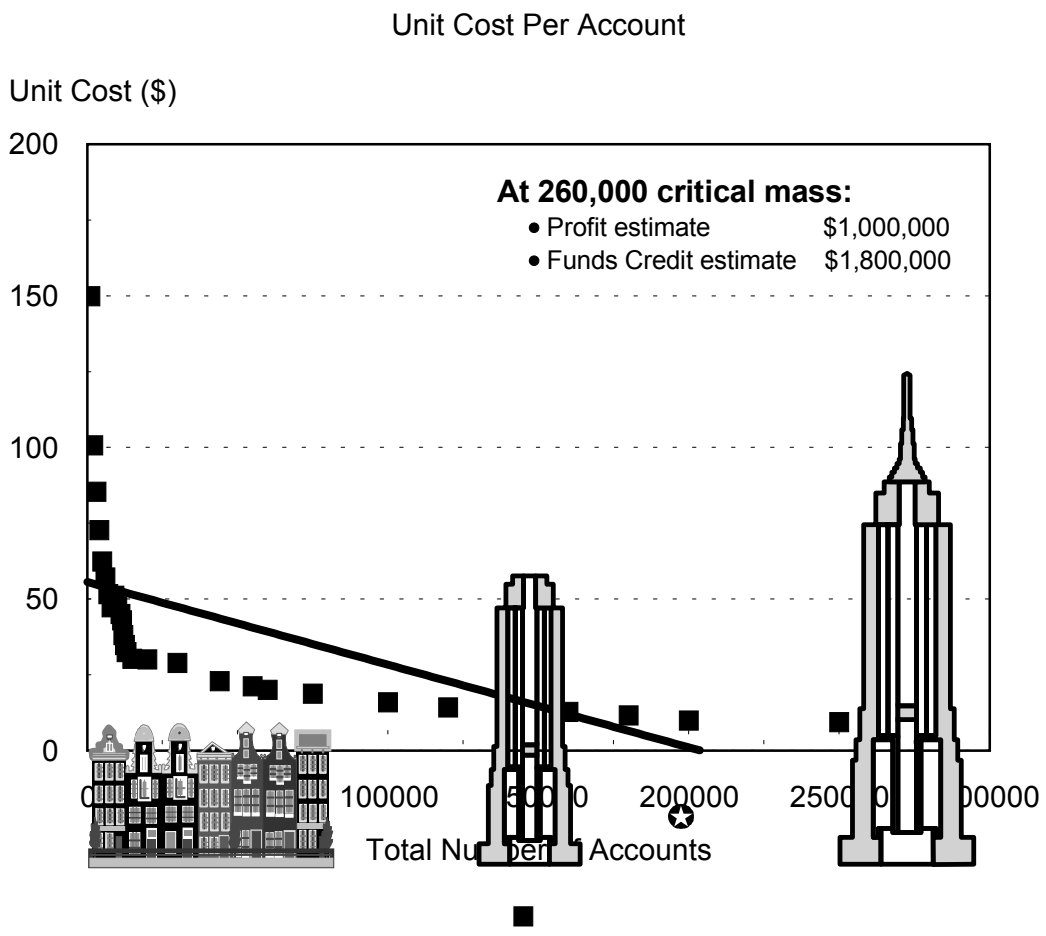
Knowing the costs and projecting the impact of leverage allowed a "look into the future". The intent of the analysis was to understand the conditions that had to take place to result in a good business. This became input to the investment strategy



	Current State	YE '92 State	Vision State
Channel 1 Cos	132.56	102.72	45.78
Channel 1 Rev	58.96	61.2	63.8
Channel 2 Rev	110	125.5	135.25

The end output was a projection of costs vs. revenues in a "vision state" showing the potential impact of reengineering and volume and scale economies

Finally, the financial implications of the vision include significant volume increases to move out on the economies of scale curve



Assumes proper mix of channels for critical mass

✓ **Critical mass can be achieved with 260,000 accounts across 9 channels**

- FI breakeven analysis varies by FI, but a sample for User B users shows:
- $4.00 per retail account per month with 20,000 customers
- $3.00 per retail account per month with 36,500 customers
- Contribute to economies of scale at approximately 13,000 to 14,000 accounts

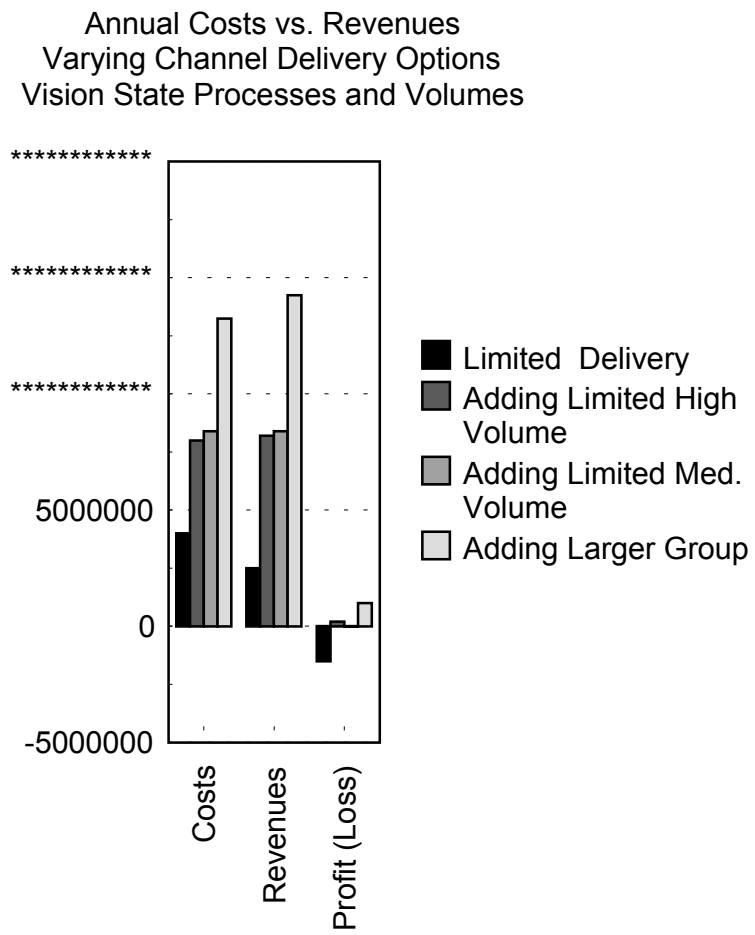
✓ **In summary,** gaining economies of scale requires:

- Standardization of business systems to converge the multiple economy of scale curves
- Changing to the new business vision to shift the economies of scale curve downward through changes to the business systems (process, organization, and technology)
- Significant increases in volumes as estimated by the channels*

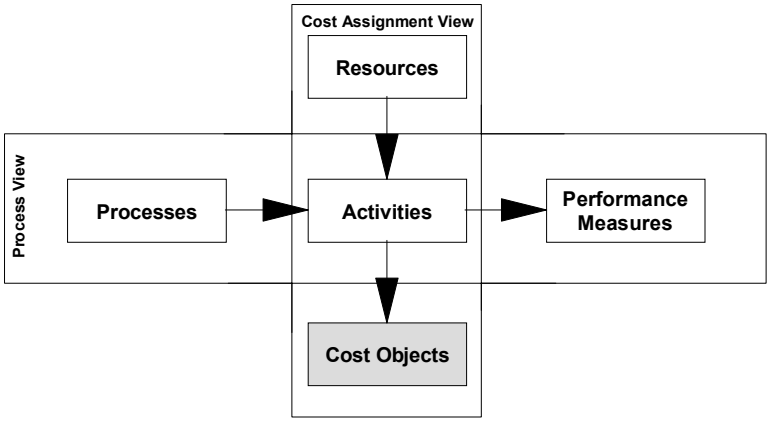
*Volume growth assessments are based on interviews with the channels and cross referenced by analyzing potential penetration rates and channel account data. It is recommended that the Bank perform primary research to validate market growth potential

Multiple models can be used to evaluate combinations of product delivery options. Scenarios can show the volume growth and business systems investments required to result in a profitable business

- ✓ **With a limited delivery option, analysis can show profit is not achievable even in the "vision state". Fixed costs could be too high for a limited business**
- ✓ **Addition of a limited number of high volume customers may show a profit opportunity if both process improvements are made and volume projections are achieved.**
  - Is this business achievable?
  - Is this business worth the investment?
- ✓ **Adding a limited number of medium volume customers may show minimal profitability (in the "vision state"), due to the "fixed cost" per customer.**
  - Could pricing actions result in profitability?
  - Is this business achievable?
- ✓ **Analysis can identify the business volumes required in the "vision state" to achieve desired profitability.**
  - It must be noted that each decision requires individual analysis. Each option requires the redistribution of their fixed costs to the remaining environment, at least in the short run.



EasyABC is an automated program that assists in building the ABC model



- ✓ EasyABC can read in the chart of accounts from any tab-delimited file
- ✓ The activities from the process flows are added manually
- ✓ The program has a user- friendly interface that facilitates the allocation of costs from resources to activities to cost objects