

DSS90 Presentation

May 22, 1990[©]

by

Arthur M. Schneiderman

Presentation date:	Venue:	Text:
May 22, 1990	DSS-90 Conference, Institute of Management Sciences	Current

One of my earliest lessons learned was to avoid creating the appearance of competition between traditional financial measures and their new non-financial siblings. It therefore seemed logical to integrate the scorecard into Analog's existing financial reporting system. This took on two forms: inclusion in the "Red Book" and Analog's online Executive Information System (EIS) called "IMAGE." The Red Book was the quarterly financial report (in a red binder, of course) that was prepared principally for the Board of Directors. IMAGE was a mainframe based data warehouse and graphics system, used principally by headquarters personnel, which could only be accessed in graphics form through hardwired remote color terminals.

Starting in February 1988, we included in the Red Book and IMAGE our corporate and divisional scorecards as well as our delivery performance metrics, which had already been included in IMAGE since late 1986. Because of inadequacies in the IMAGE system, we soon purchased Pilot Executive Software's Executive Information System. PILOT maintained all data on the mainframe (to assure its integrity) but the bulk of the graphics were done on local PC's that could connect to the mainframe using modems over local phone lines. By the end of 1988, we had completed the transition from the IMAGE to the PILOT delivery platform. To the user, the transition was transparent with regard to content and the various displays. However, navigation was now by mouse click and hardcopy could be generated at the PC's local printer.

Plans for expansion of the IMAGE/PILOT system included drilldown to lower level scorecards (the system only drilled down one level below the corporate scorecard), which would be inputted and maintained by its owner. We also planned to link PILOT to Lotus Notes for further expansion of the scorecard commentaries and integration into our meeting agendas and agenda item preparation materials.

In a February 1990 interview that appeared in ComputerWorld, I described our adaptation of a traditional financial EIS to non-financial metrics and the balanced scorecard and my expectation that it would eventually replace our traditional financial-only management system. Shortly after that, I was invited to be a plenary speaker at the Institute of Management Sciences DSS-90 Conference. What follows are the materials that I used in that presentation.

One of the other speakers at DSS-90, Jack Rockart, the Director of MIT's renowned Center for Information Systems Research (CISR), came to visit me on June 21, 1990 for a first-hand demo of PILOT. Jack was often referred to as the "father of EIS" so his visit and compliments were much appreciated. Jack invited me to speak at a CISR seminar held in December 1990. A month earlier, I had made a similar presentation at a seminar sponsored by Decision Support Technology, Inc. In both of these later presentations I uses updated versions of the relevant materials shown here.

PILOT's final tribute came in the fall of 1991 with Bob Kaplan's acceptance of my offer to set up a full working version of our system on the Harvard Business School's computer so that students could use it in conjunction with the Analog Devices case that he had recently written. David Friend, CEO of Pilot Executive Software, agreed to provide support and a free copy of his software. The three-way team of ADI-HBS-PES personnel did a masterful job of creating a working demo (much like the one on this website), which from all reports added significant value to the student's learning experience.

The first part of this presentation provides an overview of ADI and a description of the key elements of our QIP efforts. You can skip ahead to slide 20 where the description of the PILOT system starts.

(E) IS... THE FUEL FOR CONTINUOUS IMPROVEMENT

Art Schneiderman
Analog Devices

- Analog Devices at a Glance
- The Quality Improvement Process (TQM)
- Linking Performance Measurements to Corporate Goals
- The "Half-Life" Concept
- ADI's 1992 QIP Goals
- The Quarterly "Scorecard"
- ADI's Executive Information System
- An Example: Customer Service
- Lessons Learned

May 22, 1990

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Slide 1

5/22/90-05220-7

Analog Devices at a Glance

- Headquartered in Norwood Massachusetts
- Publicly Held (NYSE Symbol ADI)
- \$453 Million in Sales (FY1989)
- 48% of Sales Outside United States
- 5200 Employees Worldwide

ANALOG DEVICES AT A GLANCE

(cont)

- Products: ICs, assembled products, subsystems
- Applications: precision measurement & control
- Markets: data acquisition
 - 40% industrial/instrumentation
 - 30% military/avionics
 - 13% computer
 - 17% other
- Integrated supplier
 - design
 - manufacturing (8 locations)
 - direct sales (100 locations)

Slide 4

1989 Top Customers Worldwide

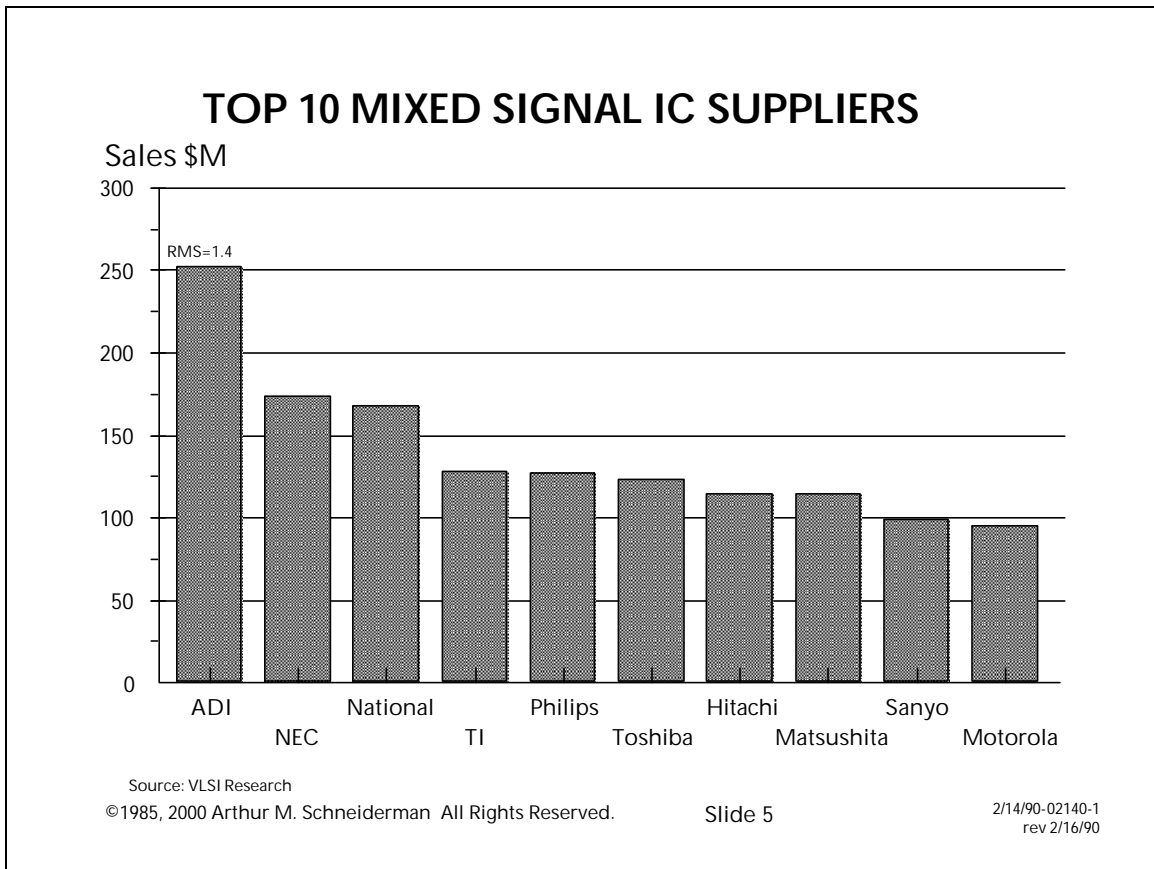
<i>Customer</i>	<i>Bookings</i>	<i>Cumulative</i>
	<i>\$M</i>	<i>%</i>
IBM (US, Japan & France)	26.8	6.0
GE/RCA	10.5	8.3
Fuji (Japan)	10.3	10.6
HP (US, UK & Germany)	9.1	12.6
Honeywell (US, Germany)	7.4	14.2
General Dynamics (US)	5.4	15.5
Raytheon (US)	5.1	16.6
Siemens (US, Germany)	5.1	17.7
TI (US)	4.1	18.6
Mitsubishi (Japan)	4.0	19.5
Fujitsu (Japan)	4.0	20.4
Toshiba (Japan)	3.7	21.1
Marconi (US, UK)	3.6	22.0
Hughes (US)	3.4	22.8
Rockwell (US)	3.3	23.5
Hitachi (Japan)	3.3	24.3
Westinghouse (US)	3.1	25.0
Philips (US, Europe)	3.1	25.6
Motorola (US)	3.0	26.3
DCASR (US)	2.7	26.9

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Slide 4

c. 1990-PREZ-11

Slide 5



This slide was used to demonstrate the changing nature of Analog's competition. In previous years, our major competitors were much smaller companies (Burr-Brown, Precision Monolithics, Crystal, Linear Technology, etc.), but as the technology changed, so did the competition. Now it included the powerhouse global semiconductor companies.

Financial Model FY 1987-FY 1992

Sales Growth	20-25 %/yr
Operating Profits	17 %
Profit after Tax	9.4 %
Return on Capital	15.0 %


Slide 7

ADI CORPORATE QIP COUNCIL



MEMBERS:	Jerry Fishman	Executive VP
	Kozo Imai	VP, Japanese Operations
	Larry LaFranchi	Operations Controller
	Bill Manning	Division GM
	Doug Newman	VP, Sales and Marketing
	Art Schneiderman, Chairman	VP, Quality/Productivity Improvement
	Ray Stata	Chairman of the Board and President
	Goodloe Suttler	Division GM
	Suzanne Thomson	Director, Training & Development
	Tom Urwin	VP, European Operations

- CHARTER:**
- QIP Organization
 - QIP Goals Deployment → priorities
 - Training → Juran
 - Monitoring → metrics
 - Incenting/Rewarding

Slide 8



THE QIP CULTURE

- We each have a dual function
 - daily job  SDCA cycle
 - process improvement  PDCA cycle
- We are committed to improving customer satisfaction
- We are dedicated to continuous improvement (kaizen)
- We are part of a parallel organization: functional and cross-functional
- We are a continuously learning organization

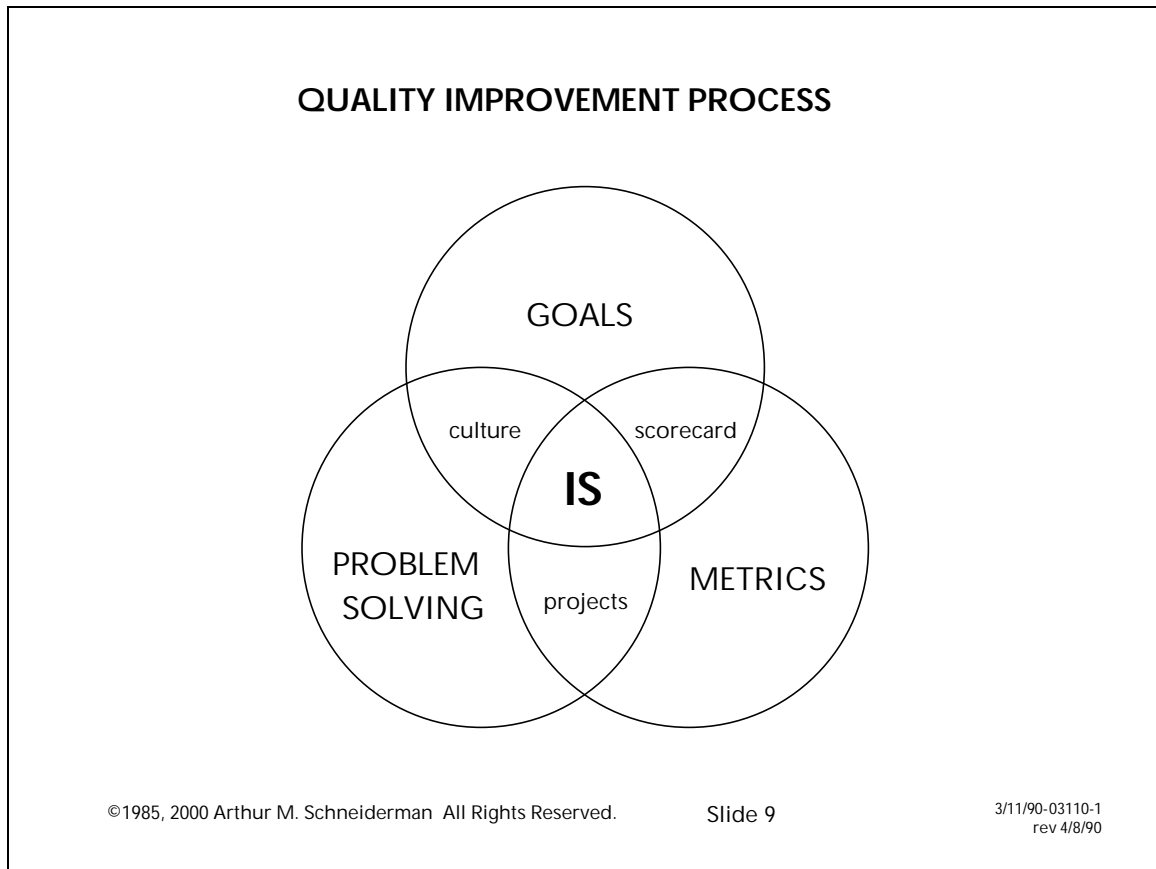
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Slide 8

4/8/90-04080-4


This slide was used to portray the kind of corporate culture that we were attempting to create. It provided the context for the model of partnership between the IS function as supplier and the QIP function as its customer that I was going to describe.

Slide 9



I had often described Information Systems as the “glue” that held together the three major elements of QIP. I used this slide to describe IS’s central role in dealing with such information based activities as metrics and scorecard management, project management and communications as a driver of the desired culture change.

Slide 10



PROBLEM SOLVING

Participants:
Cross Functional Problem Solving Teams (QIP Teams)
Task Forces
QC Circles
Individuals

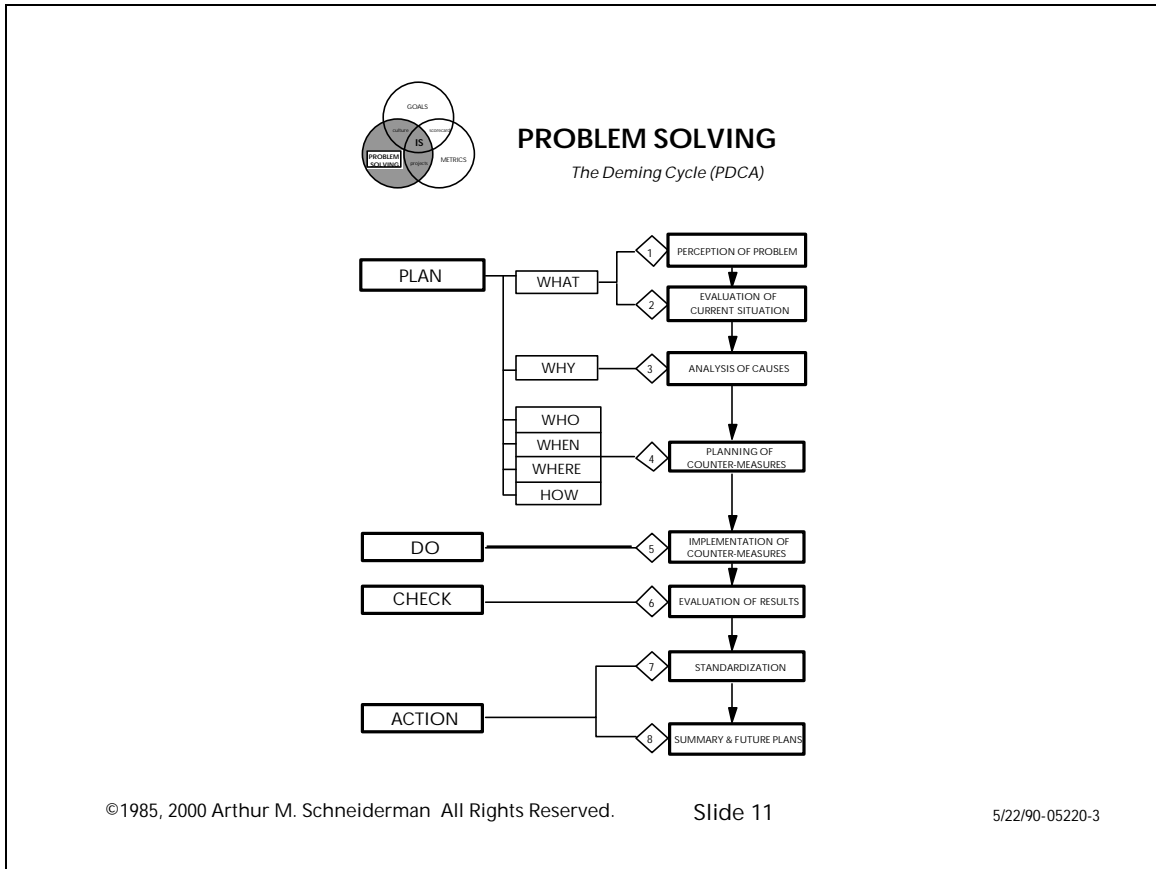
Systematic Approach:
Deming Cycle (PDCA)

Tools:
7 QC Tools (fishbone, histogram, ...)
7 Management Tools (KJ Method, affinity diagram,...)
Design of Experiments (Taguchi, etc.)
SQC (control charts)
SPC (Cp, Cpk)
Quality Cost (failure, prevention, appraisal)
QFD
Hoshin Kanri
SMED
TPM
EI
JIT/Kanban (cycle time, WIP reduction)

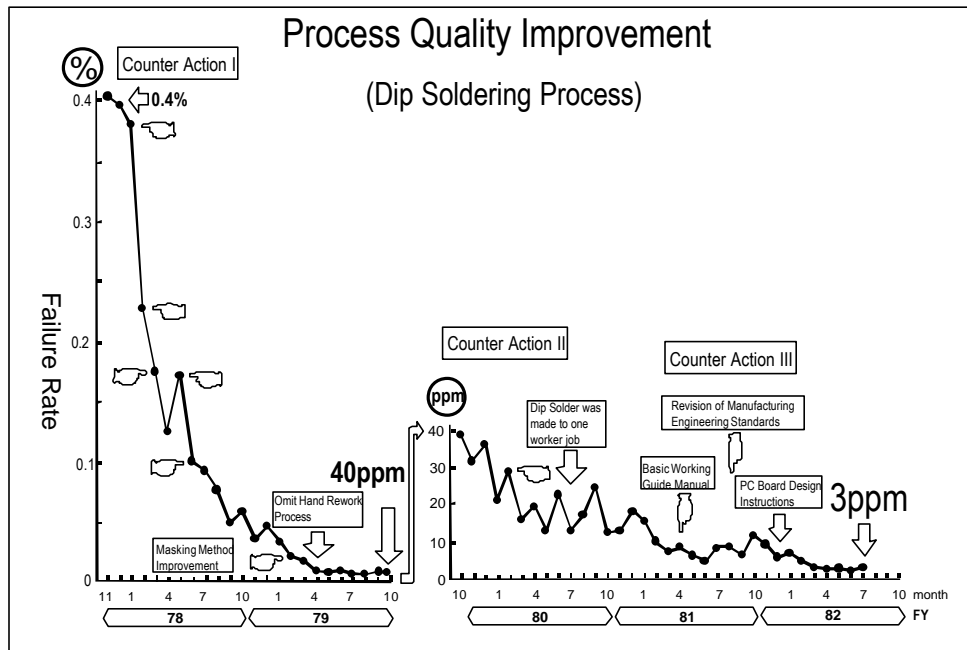
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As a prelude to our approach to creating the management information system that I was about to describe, I used this slide to describe the approach that we would be taking. I stressed the importance of a systematic, data driven, team based model. Since the audience for this presentation was principally IT professionals, I used the next several slides to provide a context for what we were trying to accomplish.

Slide 11



Slide 12

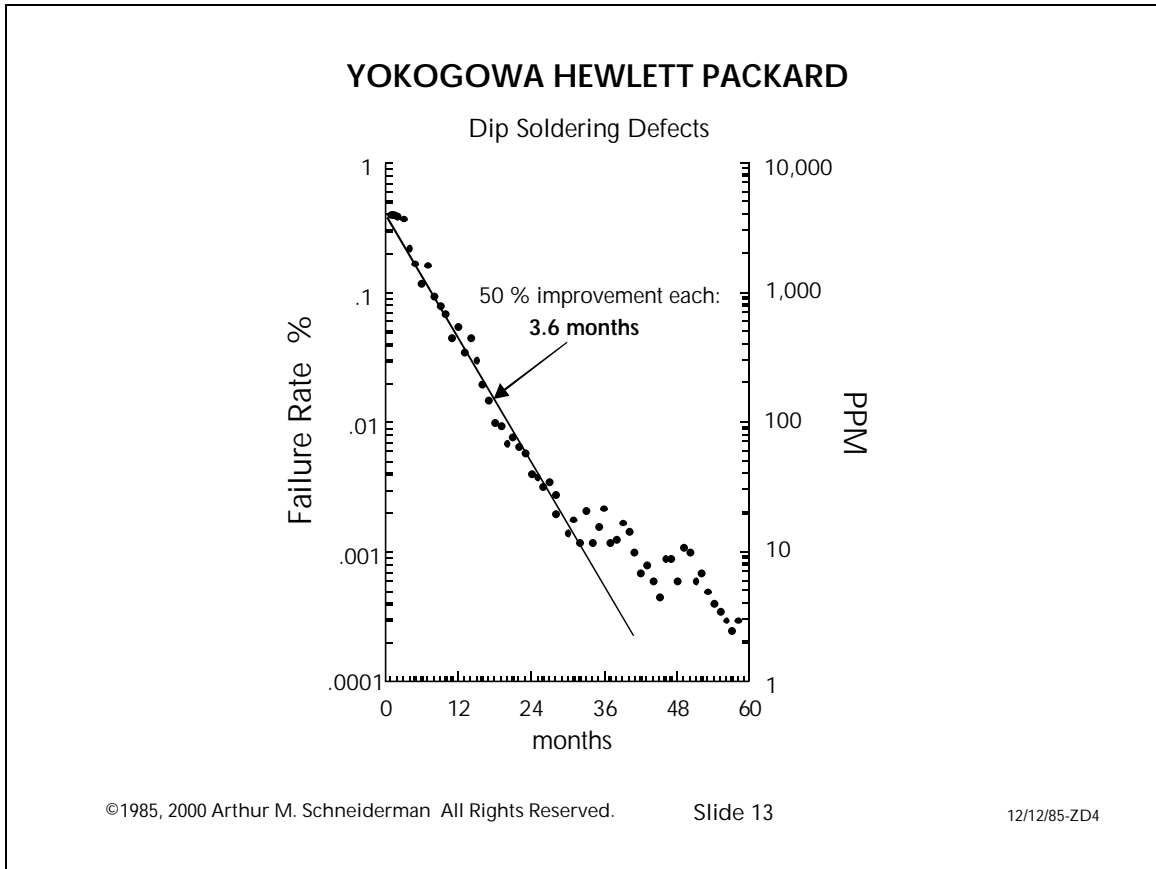


Source: Kenzo Sasaoka, President
Yokagawa-Hewlett-Packard 7/84

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Slide 12

c. 1982-YHP



PROPOSED HALF-LIFE MODEL VALUES

<u>PROJECT TYPE</u>	<u>EXAMPLES</u>	<u>MONTHS</u>	
		<u>MODEL HALF-LIFE</u>	<u>EXPECTED RANGE</u>
<i>uni-functional</i>	operator errors WIP	3	0 to 6
<i>cross-functional</i>	new product cycle time outgoing PPM	9	6 to 12
<i>multi-entity</i>	vendor quality warranty costs	18	12 to 24

ADI RESPONSE TO HALF-LIFE CONCEPT

Supporters

Embodies the concept of KAIZEN
Easy to understand
Makes sense
Data not negotiation based ⇨ realistic
Accepted by line organization
Works
focuses on results not process

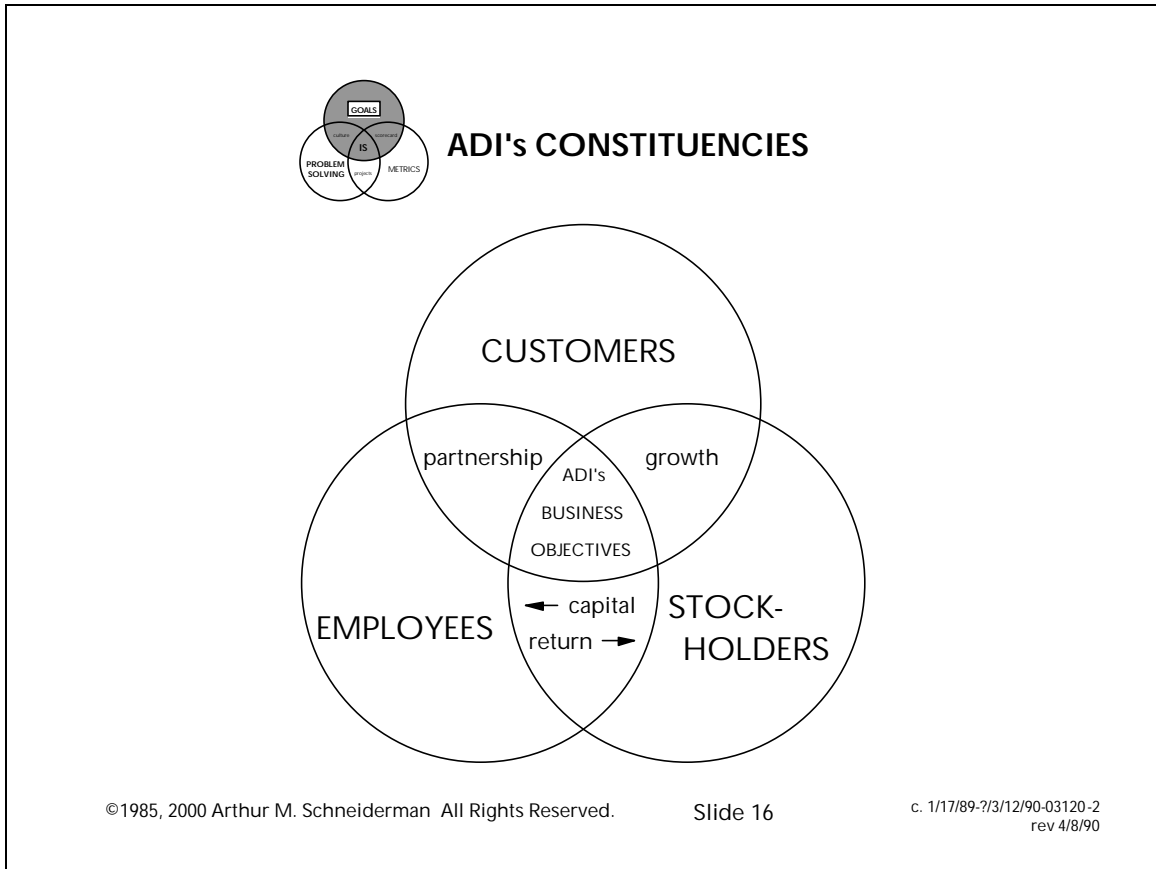
Critics

Doesn't reflect where we need to be
Hard to understand
Hard to use
manual vs. computerized
assumes instant startup
assumes constant rate of learning
focuses on results not process

**"...the rate at which individuals and organizations learn
may become the only sustainable competitive advantage..."**

Ray Stata

Slide 16



Slide 17



ADI QIP GOALS

BUSINESS

MARKET LEADERSHIP (RMS)

OBJECTIVES:

REVENUE GROWTH

PROFITABILITY

DRIVERS:

BE RATED #1 BY OUR CUSTOMERS
IN **TOTAL VALUE DELIVERED**

EXTERNAL LEVERS:

PRODUCTS

DEFECT LEVELS

ON-TIME DELIVERY

LEADTIME

PRICE

RESPONSIVENESS

INTERNAL LEVERS:

TIME TO MARKET

PROCESS PPM

MANUFACTURING CYCLE TIME

YIELD

Slide 18

<u>METRIC</u>	<u>1987</u>	<u>HALF-LIFE</u>	<u>1992</u>
EXTERNAL			
On time delivery	85%	9	>99.8%
Outgoing defect levels	500 PPM	9	<10 PPM
Lead time	10 wks	9	<3 wks
INTERNAL			
Manufacturing Cycle Time	15 wks	9	4-5wks
Process Defect Levels	5000 PPM	6	<10 PPM
Yield	20%	9	>50%
Time to Market	36 mths	24	6 mths


WHILE AGGRESSIVELY PURSUING
CORPORATE-WIDE COST MANAGEMENT

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rev. 7/25/87

Slide 19

FY1990 CORPORATE SCORECARD											
FINANCIAL	End FY89	Q1 90		Q2 90		Q3 90		Q4 90		FY 90	
	ACTUAL	BHMK	ACTUAL	BHMK	ACTUAL	BHMK	ACTUAL	BHMK	ACTUAL	BHMK	ACTUAL
SALES											
SALES GROWTH YTY											
CONTRIBUTION MARGIN											
ROA (CM)											
<i>O/P</i>											
ON TIME DELIVERY (To FCD)											
% CRDs NOT MATCHED											
EXCESS LEADTIME											
LABOR TURNOVER											
<i>MANUFACTURING METRICS: IC PRODUCTS</i>											
OUTGOING PPM											
PROCESS PPM											
CYCLE TIME											
YIELD											
<i>MANUFACTURING METRICS: ASSEMBLED PRODUCTS</i>											
OUTGOING PPM											
PLUG-IN YIELD											
CYCLE TIME											
% COST OF SCRAP/REWORK											
<i>NEW PRODUCTS</i>											
BOOKINGS POST-85 PROD	ACTUAL	FY87 PLAN	ACTUAL	FY87 PLAN	ACTUAL	FY87 PLAN	ACTUAL	FY87 PLAN	ACTUAL	FY87 PLAN	ACTUAL
FORECAST 3 rd YR BOOKINGS of new product releases	FY89	1Q90	2Q90	3Q90	4Q90	FY90					


Slide 20



PERFORMANCE MEASUREMENT

**If you don't measure it,
it will not improve.**


does not mean

measurement  improvement

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This slide stressed the importance of metrics and goals in Analog's implementation of TOM. I also stressed that although they were necessary, they were not sufficient to assure achievement of our overall business objectives.

In later versions of this slide, I added: "If you don't monitor it, it will get worse" to emphasize the importance of integration of measurement into the normal management systems.



GOAL:
IMPROVE CUSTOMER SERVICE

CUSTOMER SERVICE METRICS

ON TIME
% late  % on time
% early

RESPONSIBILITY
factory credit
warehouse customer

LATENESS/EARLINESS
shipped late, how late?
shipped early, how early?
still late, how late?
months to ship late backlog

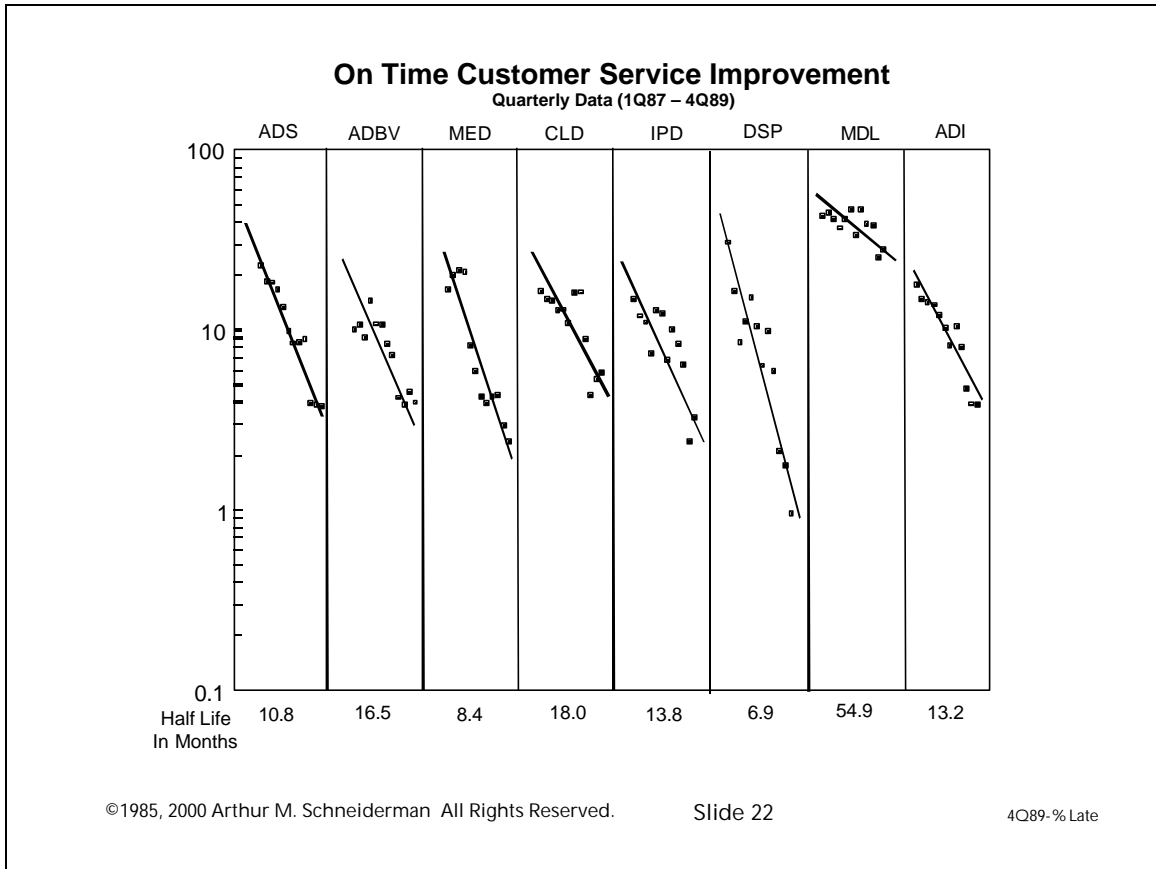
LEAD TIME
customer requested lead time
% CRD's matched
excess lead time

RESPONSIVENESS
time to schedule an order

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rev 5/13/90

This slide introduced the comprehensive set of measures that Analog developed for its order fulfillment process. Not only did we measure our overall performance in terms of late shipments, but also we recognized the emerging customer requirement that we not ship early either. To start the journey to root causes, we measured responsibility of the late shipment. The lateness/earliness measures addressed the “societal loss” associated with not being on time. To a customer, responsiveness (an other emerging customer requirement) took the form of how quickly we made a delivery commitment after their initial query.

Slide 22



This slide showed the rapid improvement that we were achieving in our most important order fulfillment process metric.

Slide 23

CREDITS

Elizabeth Derwin

Jim Doscher

Wally Francis

Rich Lynch

Ira Moskowitz

Holley Murphy

Art Schneiderman

Pilot Executive Software

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Having established the kind of information we would be dealing with as well as how we were using this information in the management of our business, I next introduced to the audience the cross-functional team that was currently given the responsibility of developing and implementing our system.

The team consisted of three members from my staff and three members from our Corporate Information Systems group (which reported to Analog's CFO) as well as me. My job was to assure that the team's product met the needs of all users of the system and to obtain the needed resources.

Our efforts at using information systems to manage our metrics and scorecard actually started in late 1986. Team membership changed as members moved on to other assignments, but always consisted of a similar mix of individuals.

Analog Devices - 1990 Scorecard				
ADI				
Qtr 1 1990				
Metric	Actual	Plan	Variance	% Variance
QIP:	.00	.00	.00	.00
On Time Delivery % (To FCD)	95.90	96.70	-.80	-.83
% CRDs Not Matched	51.40	46.10	5.30	11.50
Excess Leadtime (Weeks)	2.90	3.40	-.50	-14.71
Employee Turnover %	11.10	13.00	-1.90	-14.62
IC Outgoing PPM	1023.00	1481.00	-458.00	-30.93
IC Process PPM	1601.00	1966.00	-365.00	-18.57
IC Cycle Time	62.60	52.10	10.50	20.15
IC Yield	35.70	38.70	-3.00	-7.75
AP Outgoing PPM	5746.00	1715.00	4031.00	235.04
Plug In Yield	91.70	90.50	1.20	1.33
AP Cycle Time	23.90	24.20	-.30	-1.24
Scrap/Rework Cost	12.50	8.80	3.70	42.05

Retrace Utilities 1989 Scorecard Commentary Return

©1985, 2000 Arthur M. Schneiderman All Rights Reserved. Slide 24 1Q90-Scorecard-1

This is page one (of two) of the first screen in the resulting system. It's the Corporate Balanced Scorecard for the first quarter of 1990. I refer you to the working model of Pilot for a detailed description of the navigation rules for the system.

The next slide contains the second page. Two pages (rather than the one page I normally required) were necessary to assure legibility on all of our computer monitors. Today, both screens would easily fit on a single page.

From the original creation of these data in late 1986/early 1987, I was sent each month a set of transparencies of the major "screens" in the system. I would replace the old ones with the new ones, so that I could always show people our latest results. This, and the following slides represent a snapshot of the contents of my "transparency folder" as of April 1990. I brought it to all meetings and could quickly retrieve the appropriate data when it was appropriate.

?

Analog Devices - 1990 Scorecard

ADI

Qtr 1 1990

1

Metric	Actual	Plan	Variance	% Variance
NEW PRODUCTS:	.00	.00	.00	.00
Post 1985 Products	.00	39.10	-39.10	-100.00
Forecasted 3 rd Year Bookings	.00	14.20	-14.20	-100.00
FINANCIALS:	.00	.00	.00	.00
Sales	109.70	112.40	-2.70	-2.40
Sales Growth (YTY)	-3.90	-1.50	-2.40	160.00
Contribution Margin	7.20	7.80	-.60	-7.69
ROA (Contribution Margin)	6.90	8.60	-1.70	-19.77

Retrace

Utilities

1989 Scorecard

Commentary

Return

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Slide 25
1Q90-Scorecard-2

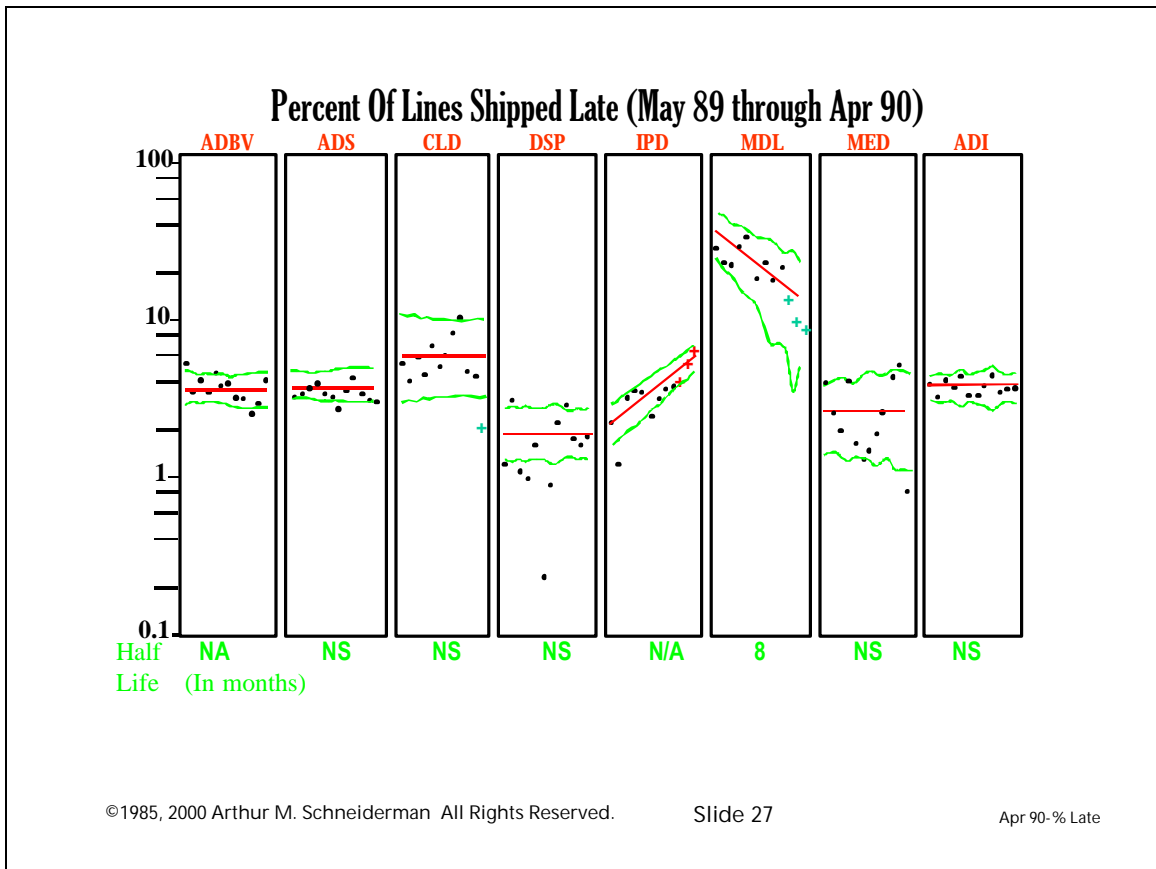
Slide 26

CUSTOMER SERVICE METRICS – ON TIME/RESPONSIBILITY						
April 1990						
	Early %	On Time %	Not Late %	Division %	Warehse. %	Credit %
ADBV	9.94	85.55	95.49	4.38	.29	.52
ADS	6.64	89.98	96.62	3.91	.34	.44
CLD	30.86	66.79	97.65	4.22	.18	.30
CTS	7.82	91.62	99.44	.56	.00	.00
DSP	2.52	95.50	98.02	2.52	.36	.18
IPD	5.67	88.20	93.87	6.87	.36	.23
MDL	61.94	28.39	90.32	8.39	.00	1.29
MED	20.24	78.87	99.11	2.58	.00	.10
ADI	9.28	86.72	96.00	4.53	.31	.39
ALL	9.28	86.72	96.00	4.53	.31	.39

[Utilities](#) [Change Metrics](#) [Return](#)

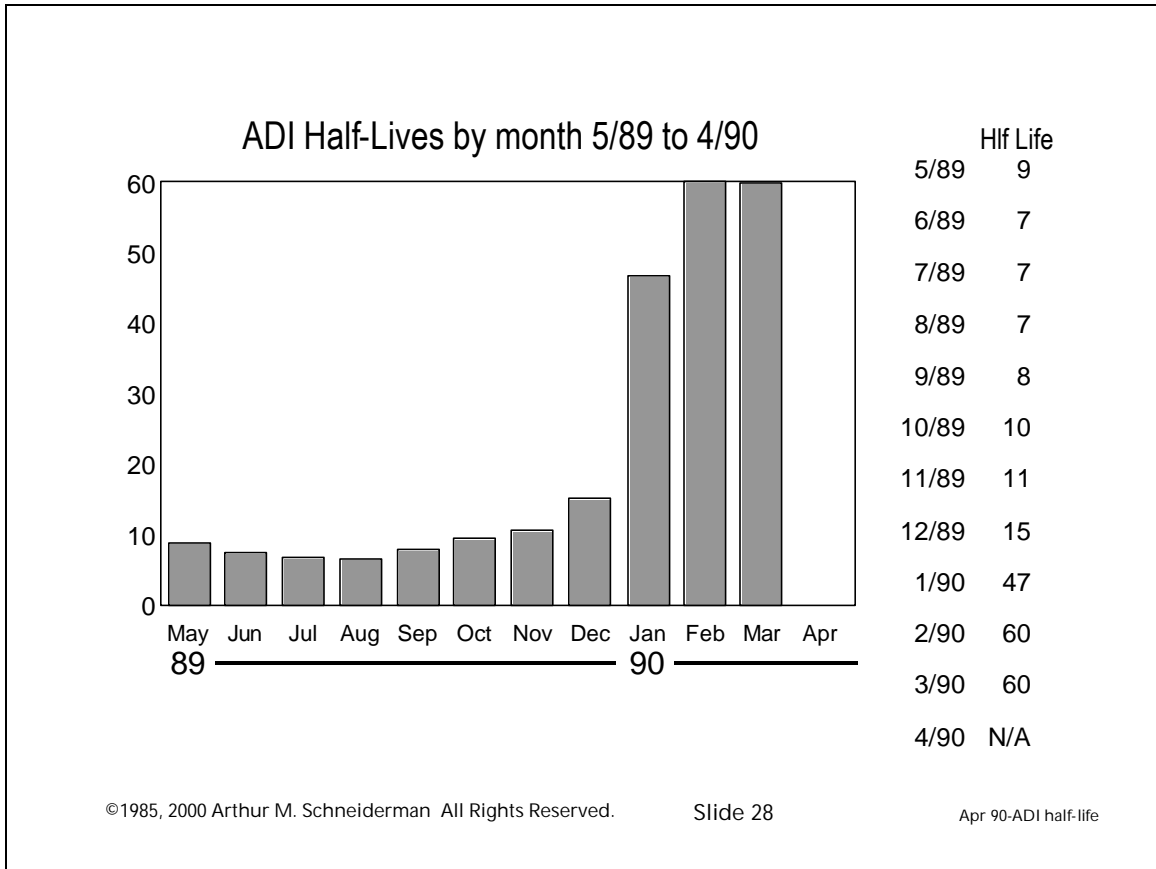
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Clicking on [On Time Delivery % \(To FCD\)](#) on the corporate scorecard brings you to this screen which gives the delivery metrics disaggregated by business unit.



Clicking on any of the numbers in the previous slide (here it's "not late" for the entire corporation) produces this standardized view. The metric is broken down by business unit (each column) and shows the most recent twelve months of results. The green "control limits" identify the band of statistical insignificance in month-to-month variation. The red line is a fit of my half-life model to the data. The resulting half-life is shown at the bottom of each column. If the half-life is statistically insignificant ($r^2 < .3$), the letters NS (i.e. not significant) appear in place of a numerical value. If the half-life is negative or greater than 5 years, then NA (for not applicable) appears. Clicking on a half-life value produces the next slide.

Slide 28



This slide shows that during the period of May 1989 through April of 1990, Analog's rate of improvement was rapidly declining. This plateauing in improvement is discussed in several my other presentations.

Slide 29

Print
Adi Ontime
?

/ADI
CUSTOMER
TYPE

TABLE: CSTB	ERY_SHIP_PCT	ON_TIME_PCT	NOT_LATE_PCT	DIVISION_PCT
ENTITY	(4/90)	(4/90)	(4/90)	(4/90)
LATEST PERIOD	TOTAL	TOTAL	TOTAL	TOTAL
ADI	9.28	86.72	96.00	4.53

Reset
Metrics
Views
Calendar
Return

Select label, composite, or new key field.

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Slide 29
Apr 90-S&D-1

Our system was not only an EIS with predetermined views, but also a data warehouse where a wide variety of measures could be viewed through a process call "slice and dice." The user specified the Analog business unit, specific customer (if in the top 400) or customer category, product or product category, and time frame and then chose from a large variety of order fulfillment process measures.

?

ADI CUSTOMER SERVICE METRICS

ASAP	Number Of ASAP Orders Placed During The Period
ASAP_PCT	Percent Of Orders Received That Were ASAP
AVG_SHIP	Weighted Average Number of Shipments Per Period
BACKLOG	Total Number Of Unshipped Orders
CRD_HOLD_PCT	Percent Of Lines Late Due To Credit Hold
CRED_REF_PCT	Percent Of Lines Late Due To Credit Referrals
CREDIT	Number Of Lines Late Due To All Credit Causes
CREDIT_HOLD	Number Of Lines Late Due To Credit Hold Causes
CREDIT_PCT	Percent Of Lines Late Due To All Credit Causes
CREDIT_REF	Number Of Lines Late Due To Credit Referrals
CUST_STOP	Number Of Lines Late Due To Customer Stops
CUST_STP_PCT	Percent Of Lines Late Due To Customer Stops
CUSTOMER	Number Of Lines Late Due To All Customer Causes
CUSTOMER_LT	Average Customer Requested Lead Time
CUSTOMER_PCT	Percent Of Lines Late Due To All Customer Causes
DISTRIBUTION	Number Of Lines Late Due To All Distribution Causes
DISTRN_PCT	Percent Of Lines Late Due To All Distribution Causes
DIV_WAREHSE	Lines Late Due To Divisional Warehouse Error
DIV_WE_PCT	Percent Of Lines Late Due To Divisional Warehouse Error
DIVISION	Number Of Lines Late Due To All Divisional Causes

V END CANCEL CLEAR DONE

Select label, composite, or new key field

©1985, 2000 Arthur M. Schneiderman All Rights Reserved.Slide 30c. 1987-CS Metrics

Here's the first page of specific measures available in the system.

Slide 31

Print Adi Ontime ?
/ADI CUSTOMER TYPE

TABLE: CSTB
CUSTOMER ERY_SHIP_PCT ON_TIME_PCT NOT_LATE_PCT DIVISION_PCT
LATEST PERIOD Finished (4/90) (4/90) (4/90) (4/90)

CORPORATE KEY ACCOUNT
DOMESTIC KEY ACCOUNT
FOREIGN KEY ACCOUNT
KEY ACCOUNT
NON KEY ACCOUNT
ADKK
ALLEN BRADLEY
AMOCO
ARMCO
ATT
BEACKMAN
BENDIX
BETHLEHEM STEEL

Reset V END Metrics Views Calendar Return

Select label, composite, or new key field.

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This is the first page of choices for customer category and specific top customers.

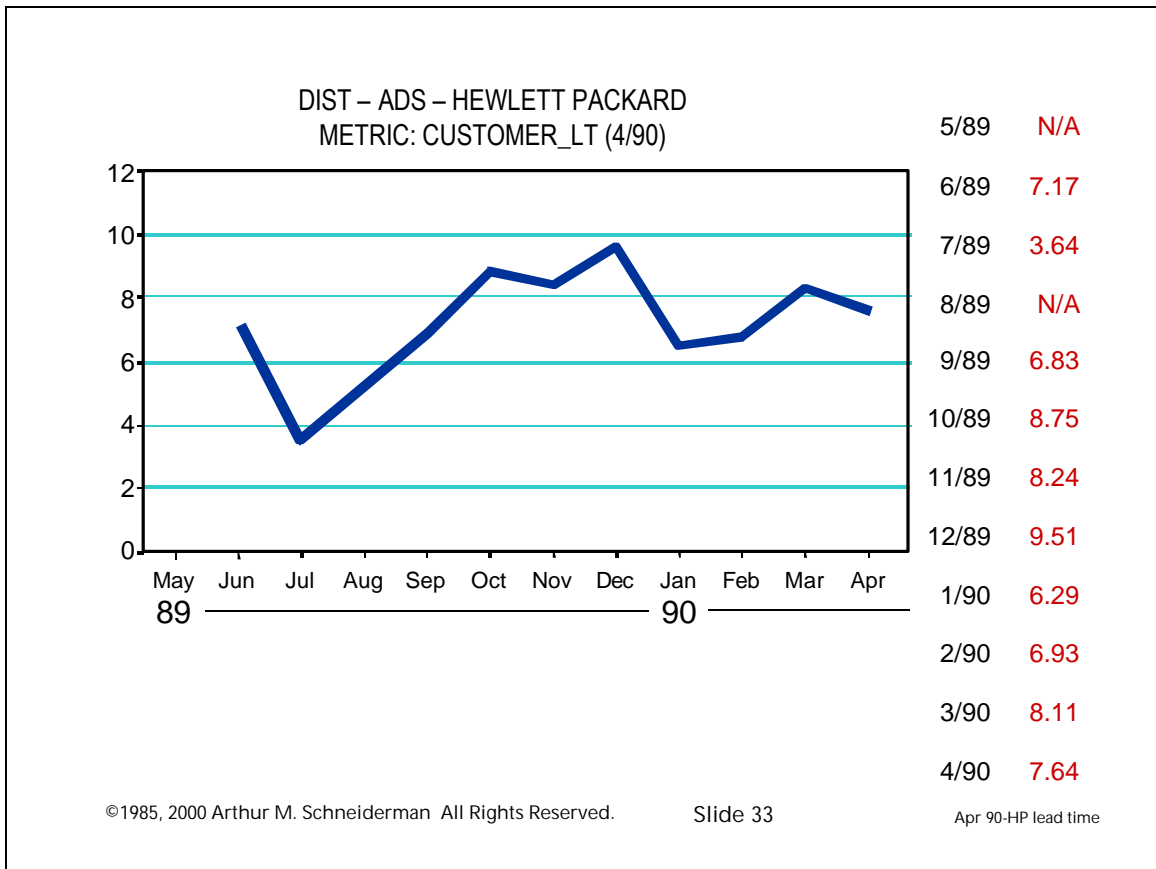
Slide 32

The screenshot displays a software interface with a navigation bar at the top containing buttons for 'Print', 'Adi Overtime', and a help icon '?'. Below the navigation bar, a table shows performance data for 'TABLE: CSTB' as of 'LATEST PERIOD' (4/90). The table compares 'DIST - ADI - HEWLETT' (7.64) and 'OEM - ADI - HEWLETT' (8.34) against a 'TOTAL' of 8.34. A bottom navigation bar includes buttons for 'Reset', 'Metrics', 'Views', 'Calendar', and 'Return', along with the instruction 'Select label, composite, or new key field.' The footer contains copyright information: '©1985, 2000 Arthur M. Schneiderman All Rights Reserved.', 'Slide 32', and 'Apr 90-S&D-3'.

ENTITY	CUSTOMER_LT
LATEST PERIOD	(4/90)
	TOTAL
DIST - ADI - HEWLETT	7.64
OEM - ADI - HEWLETT	8.34

Here's an example of Analogs overall performance to Hewlett-Packard for OEM (specialty) and Distribution (commodity) products for the month of April 1990. Again, by clicking on a number, its time history would be displayed.

Slide 33



This is the twelve-month time history of Hewlett-Packard's requested leadtime (customer request date minus order entry date) for Analog's specialty products.

When meeting with customers. I always brought a set of customer specific results. Usually, it was the first time that they had seen actual data on our performance. In one case, a large German electronics customer who considered us to be one of their worst suppliers based entirely on anecdotal evidence moved us to the top of the list of their best suppliers after seeing our actual data.

In another case, Hewlett-Packard, we agreed to use our data at our regular quarterly meetings rather than their own internally generated numbers since they considered ours to be far more accurate and comprehensive.

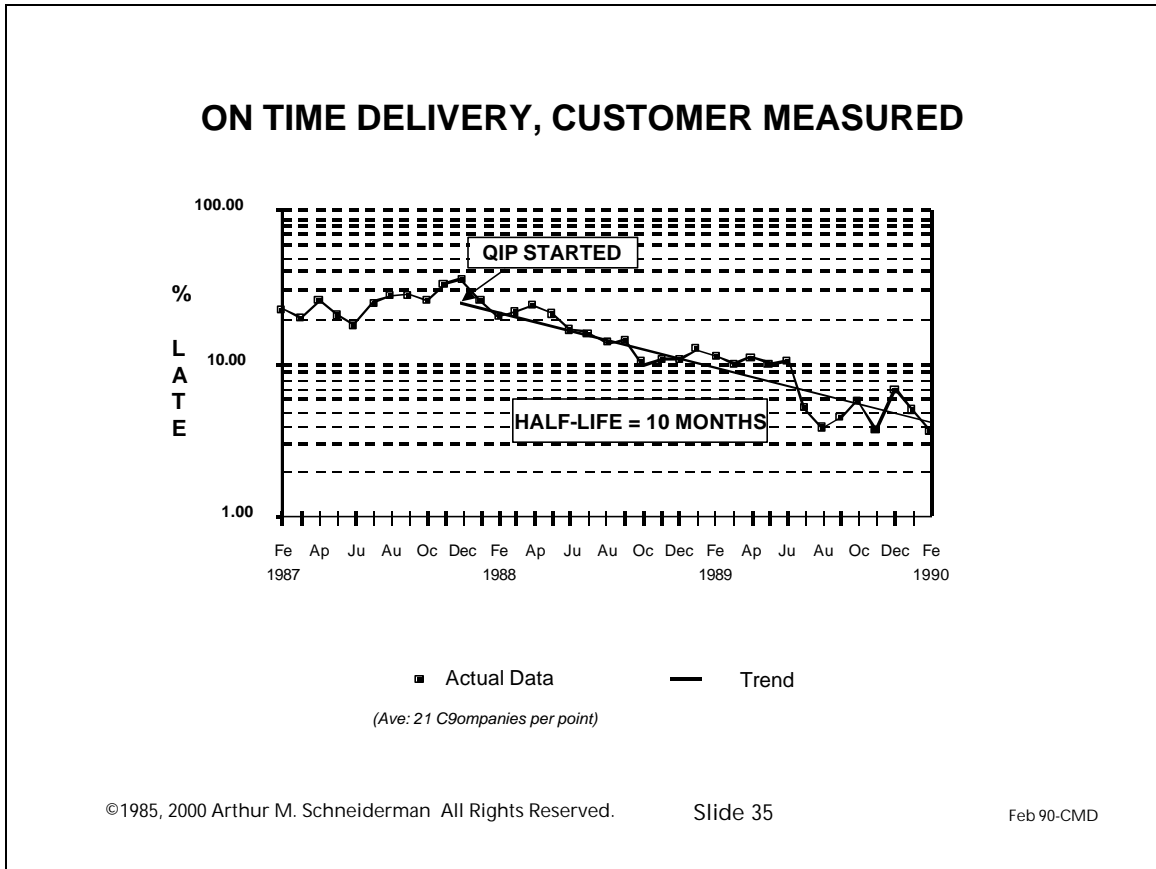
Slide 34

CUSTOMERS IN VENDOR RATING DATABASE

ABB
AFGA
Allen Bradley
Allied Signal
Ametek
Analogic
Apollo
AT&T
Bendix
Compugraphic
Eaton
Ford
General Electric
GEC
Gould
Hewlett-Packard
Honeywell
Hughes
Kodak
Loral
Lucas
M/A-COM
Marquette Electric
Masscomp
Measurex
Perkin Elmer
Raytheon
Reliance Electric
Rockwell
Sanders
Siemens
Sikorsky
Tektronix
Teledyne
Teradyne
Texas Instruments
Trillium
United Technologies
Waters Associates
Westinghouse

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From my frequent visits with customers, I discovered that many of them had vendor-rating systems in place. A surprising number of them didn't share this data with their suppliers. In other cases, the data was sent to an Analog salesperson where it subsequently disappeared. I started collecting these data and published a quarterly report of our aggregate performance as measured by our customers.



Here's the data for February 1990. The correlation of both level and half-life with our own internally generated numbers validated our internally generated view of our performance.

Slide 36

HEWLETT-PACKARD VENDOR RATINGS

<i>year</i>	<i>ADI rank</i>	<i>total suppliers</i>	<i>category</i>
1986	8	16	linear IC suppliers
1987	5	8	linear IC suppliers
1988	5	15	all IC suppliers
1989	1 *	12	all IC suppliers

* tied with one other supplier

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Slide 36

5/22/90-05220-1

Here's an example of one key customer's view of our performance improvement. HP's vendor ranking system placed us in the middle of the pack of its 1986 16 linear IC suppliers. The same year, they announced that they would be consolidating their number of suppliers by 50%. We made the cut and in 1987 ranked fifth of their now eight linear IC suppliers. Keeping the pressure on, they announced that they would no longer treat linear and digital ICs separately, and we moved to fifth place in this augmented supplier group. In 1989, we tied for the first place ranking in a further reduced qualified supplier pool.

Slide 37

(E)IS LESSONS LEARNED
May 22, 1990

- **The system MUST be:**
 - driven by business needs
 - user friendly
 - graphical, colorful
 - menu/mouse driven (no acronyms)
 - logical, intuitive and efficient
 - permit drilldown/consolidation
 - accessible and responsive
 - easy to get hard copy
 - available in 3-6 months
 - start with top management
 - financials first, then metrics
- **Be prepared for user proliferation**
 - top to bottom
 - err on the side of open access
- **Be prepared for information proliferation**
 - EIS to DSS

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In creating and implementing our non-financial performance measurement information system, our team, particularly the CIS based members, learned many important lessons. The most important lesson was that our customers had to perceive that the system really helped them to do a better job, in other words it satisfied a real and significant customer need.


PRACTICE THE PRINCIPLES OF QIP

Break down cross-functional barriers:


"You define the needs; we'll decide the best way to meet them".

vs.

"Let's work together to determine the best solution to the problem".



uncover latent needs
innovate new solutions



(E)IS, THE FUEL FOR CONTINUOUS IMPROVEMENT

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I made this slide, the final slide in my presentation, after our newly hired CIS Director met with me and complained about my role in championing our purchase of PILOT's EIS. He made the first statement in no uncertain terms. My response, the second quote, was instantly rebuffed. The "IS curtain," which had all but disappeared, instantly returned. I hope that some of his counterparts in the audience had a more favorable reaction to this slide and to our team's accomplishment. I am certain that without our customer-supplier partnership the resulting output would have been far less useful.