



Understanding the Use of Measures in the DC A 2005 Workplace Study



GEORGIA SOUTHERN
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Why We Conducted the Second Annual Study



- Identify Commonly Used Distribution Measures
- Understand Key Measures
 - By Industry Type
 - By Business Type
- Understand Importance of Various Measures
- Link Key Measures by:
 - Industry Type
 - Supply Chain Structure
 - Business Strategy
- Understand Cultural Impact of Performance Measurement

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Our Discussion Today



- About the study
- Demographics of Respondents
- Overall Survey Findings
- Impact on Culture
- Survey results
- Point of View

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How The Study Was Conducted



- WERC and DC Velocity e-blast invitation to participate in an on-line survey in January
 - 530 respondents provided 384 usable responses
- Data continues to be analyzed
 - WERC Watch will be completed shortly
- Data on usage of measures and benchmark data will be available via the web site

*A special thanks to WERC membership and
DC Velocity readers for their assistance*

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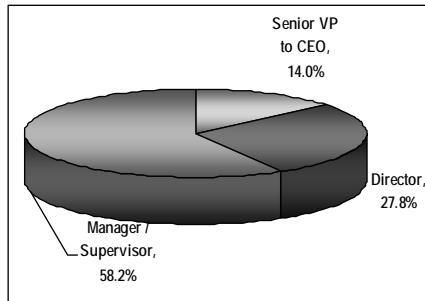
Study Demographics



Participant Profile



- Majority of Respondents were Managers or Supervisors
- Over 40% were Director, Senior VP or Higher



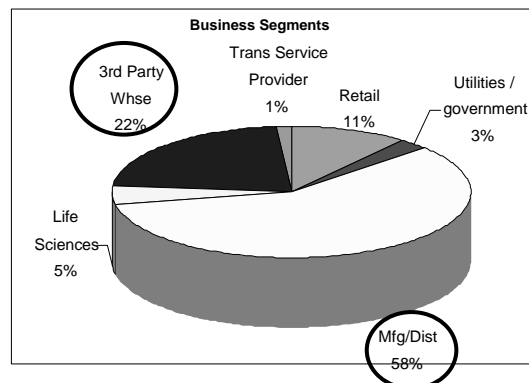
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The Type Of Industry That My Division Or Business Unit Is Related



- Breakdown by Business Segment



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Nature of Work at the Facility



- Majority (66%) Focus on Case vs. Pallet Picking

Measure	Average
Broken Case Picking	36%
Full Case Picking	30%
Full Pallet Picking	21%
Partial Pallet Picking	13%

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Nature of Work by Industry



- Case vs. Pallet Picking Bias Holds True with Exception of 3rd Party Whse and TSP's

Industry	Broken Case	Full Pallet
Retail	43%	20%
MFG/DIST – General	50%	16%
MFG/DIST – Consumer products	45%	36%
MFG/DIST – Aerospace / defense	75%	0%
MFG/DIST – High technology	55%	13%
MFG/DIST – Automotive	65%	30%
Utilities / government	49%	15%
Life Sciences – Pharmaceuticals	83%	38%
Life Sciences – Medical devices	94%	40%
3rd party warehouse	22%	39%
Transportation Service Provider	25%	25%

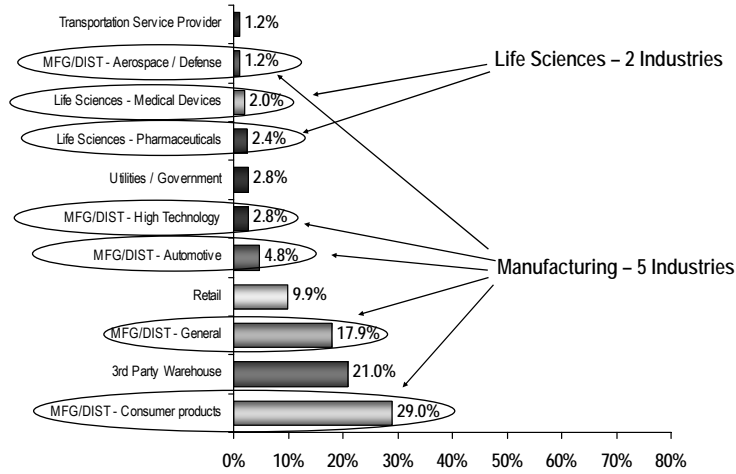
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The Type Of Industry



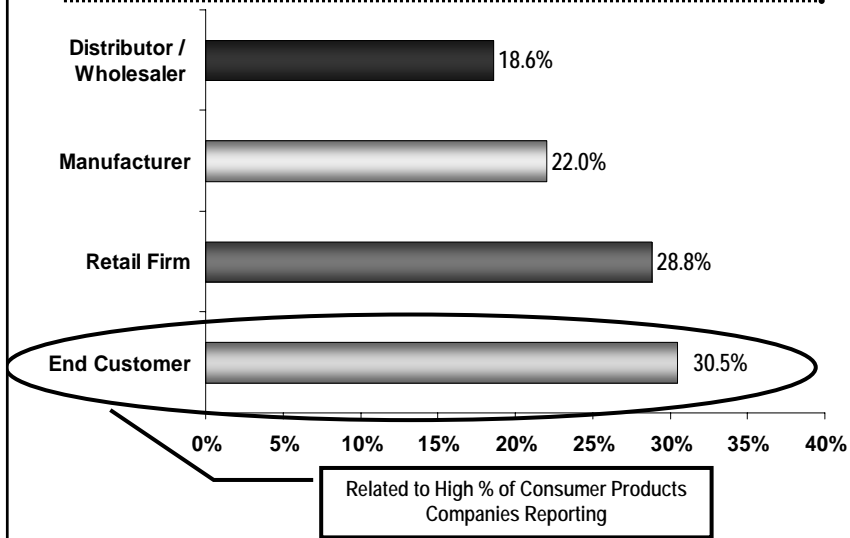
• Breakdown by Industry



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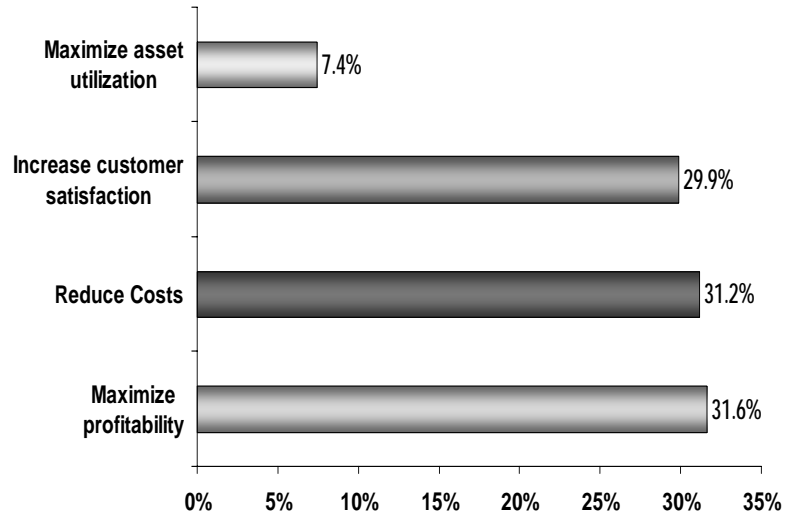
Primary Customer Served



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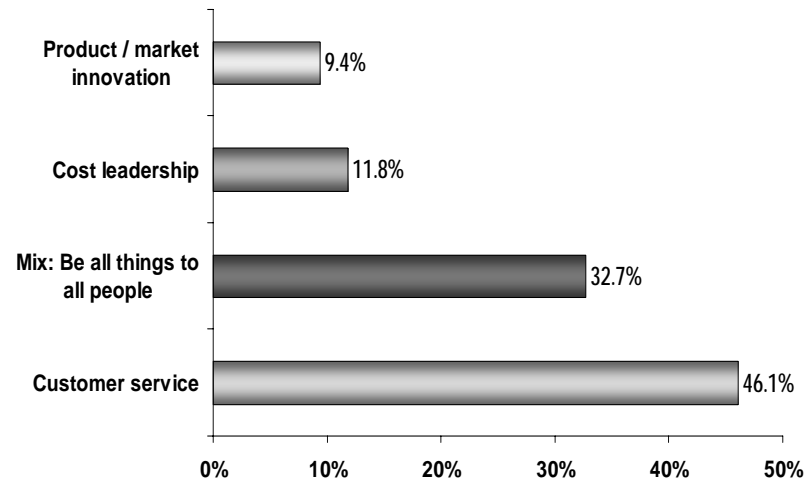
Business Objective / Goal For Division or Business Unit



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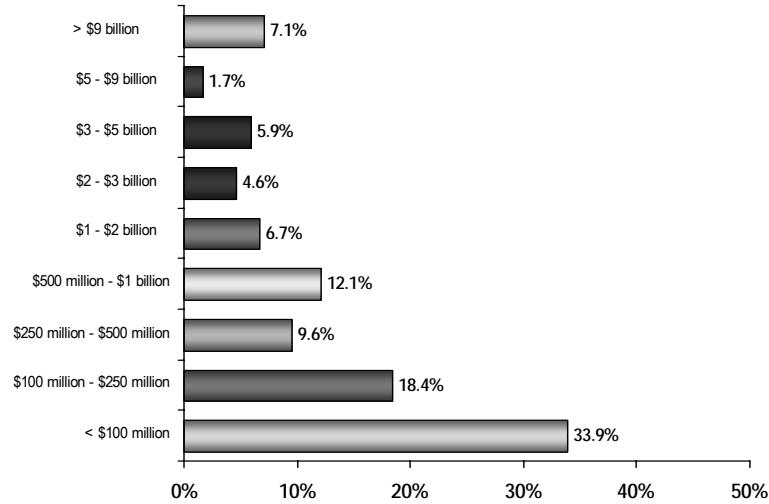
Strategy For Division or Business Unit



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75% Of Respondents Have Sales < \$1 Billion



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Overall Survey Findings



Background Look at Measures



- Usage
 - Is this measure used within your facility
- Importance
 - Very Important
 - Important
 - Neutral
 - Not Important
 - Not Very Important
- Performance
 - 2004 year performance level
 - Best Practice from those ranking in top 20%

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What's Hot – Most Used Metrics



Rank	Measure Used	Percent Using	Average Performance (1)	Best Practice (2)
1	On-time shipments	96%	98%	99-100%
2	% of overtime hours	92%	10%	0-4%
3	Inventory count accuracy (% by units)	91%	99%	100%
4	On-time receipts	90%	92%	98-100%
5	% orders shipped complete	87%	96%	99-100%
6	Order picking accuracy (% by order)	84%	99%	100%
7	Annual work force turnover	83%	10%	0-3%
8	% of orders shipped without errors	83%	99%	100%
9	Fill rate-order	81%	96%	99-100%
10	Average warehouse capacity used (% used ÷ total capacity)	81%	85%	93-100%
11	On-time delivery	81%	Varies by definition	

(1) Performance is average of responses across all demographics

(2) Best Practice is drawn from responses ranked in top 20%

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Drill Down into Top 3 Measures Overall



On time shipments	
Greater than 99%	36.8%
97 - 99%	23.9%
95 - 97%	14.4%
93 - 95%	5.3%
90 - 93%	12.9%
Less than 90%	6.7%

Inventory count accuracy	
Greater than 99.5%	41.9%
99 - 99.5%	15.5%
98.6 - 99%	2.0%
98 - 98.5%	10.1%
97.5 - 98%	0.7%
Less than 97.5%	29.7%

% of overtime hours	
Greater than 15%	27.2%
12 - 15%	8.1%
9 - 12%	16.8%
6 - 9%	15.6%
3 - 6%	20.8%
Less than 3%	11.6%

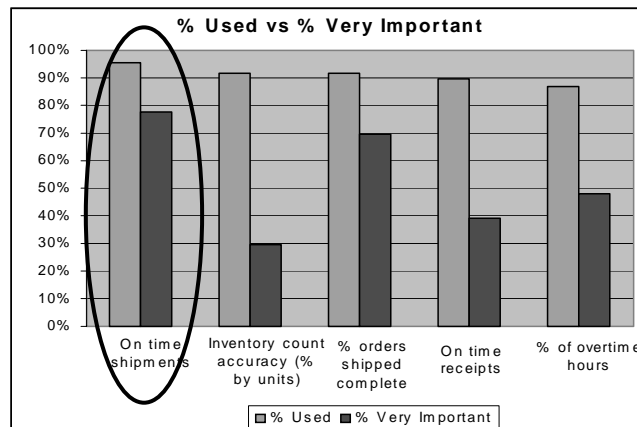
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Usage versus Importance



- On-time Shipments was not only the most used, but also the most important.



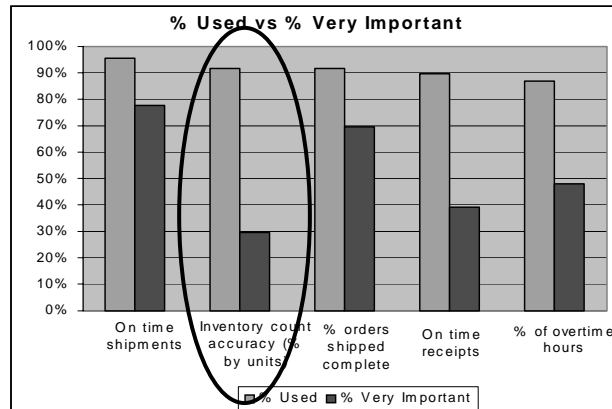
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Usage versus Importance (Cont.)



- Some others such as Inventory Count are highly used, but not considered so important



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Usage versus Importance (Cont.)



- Many of the Top 10 measures are seen as not important, or are not used

Rank	Measure Used	% Using	% Not Important	% Not Using
1	On-time shipments	96%	5.2%	4.5%
2	% of overtime hours	92%	9.0%	8.5%
3	Inventory count accuracy (% by units)	91%	15.5%	15.5%
4	On-time receipts	90%	18.4%	17.5%
5	% orders shipped complete	87%	12.1%	10.3%
6	Order picking accuracy (% by order)	84%	14.6%	13.1%
7	Annual work force turnover	83%	20.0%	19.2%
8	% of orders shipped without errors	83%	14.6%	8.4%
9	Fill rate-order	81%	22.5%	19.4%
10	Average warehouse capacity used (% used ÷ total capacity)	81%	26.6%	25.0%

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What Does it Mean to be On-time?



- On-time Shipments ranked # 1 during each of the past 2 surveys
- However, On-time Delivery has failed to make the top of the list.
- Which would your customer say is the most important?
- Is Delivery simply too hard to measure?
- The survey indicates that 70% of respondents indicate their customers have varying definitions of “On-time Delivery”

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Defining On-time Delivery



<i>Definitions of On-time Delivery</i>	<i>Percent Using</i>	<i>Actual Performance</i>
+ 15 minutes from the appointment time	5.3%	93.5%
+ 30 minutes from the appointment time	12.6%	98.0%
+ 1 hour from the appointment time	10.6%	97.4%
On the requested day	52.7%	96.0%
On the agreed upon day	18.8%	96.5%
Average Performance – overall		96.4%

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Other Definitions of On-time



- In addition to the previous responses there were many categorized as “Other”
 - No line down time
 - By 4:00pm
 - Within window
 - 19% said “on agreed upon day”
- Difficulty meeting customer service level do to lack of standards and definitions

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Usage of the Perfect Order Index (POI)



- Widely recommended measure to close gap between company and customer definitions
- A Perfect Order means:
 - The right items delivered to the right place
 - At the right time
 - In defect free condition
 - With correct documentation & pricing / invoicing
- No matter who the customer is, they will want these features to be fully satisfied

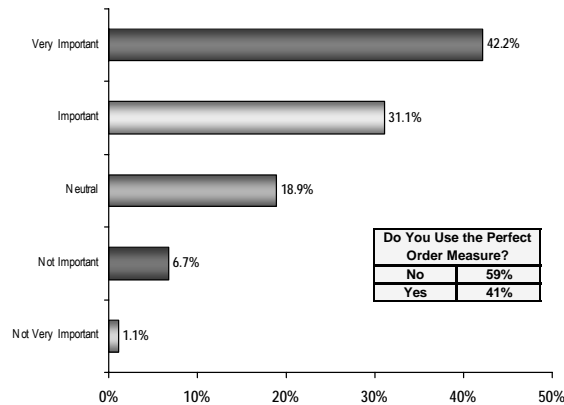
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Usage of the Perfect Order Index (Cont.)



- Almost 60% do not use POI, even though 73% said it was important or very important



Do You Use the Perfect Order Measure?	
No	59%
Yes	41%

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Balanced Measures



- Current study confirms measures are used in a form of “Foxhole Management”
- Business areas and departments focused on their own performance
- Little regard for overall corporate plan or profitability
- Little concern for impact of improved departmental performance on other areas of the business, or even the customer

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Balanced Measures



- Top 10 measures are operational – capacity and quality related
- Bottom 10, the least used, are mostly financial
- Respondents are not focused on the bottom line, corporate goals and objectives
- Need a more even distribution, a “Balanced Scorecard” approach

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Not Too Balanced Measures



<i>Measure Used</i>	<i>Reported Usage</i>	<i>Usage as a % of All Respondents</i>
Honeycomb percent	47%	29%
Indirect distribution cost as % of total cost	44%	29%
Average cubic capacity used	42%	27%
Days of raw materials on hand	39%	27%
Equipment cost per unit/case/pound	39%	26%
Revenue per full-time equivalent worker	38%	21%
Cases/units shipped per equipment hour	37%	19%
Pounds shipped per worker hour	32%	22%
Average value of backorders as % of sales	32%	18%
Value added per employee	20%	11%

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Measures by Industry



Measures by Industry



Industry	Measure Used	Benchmark	Best Practice Range
MFG/DIST - General	Pieces shipped per person hr	190 Pcs	800-900 Pcs
	On-time shipments	97 %	99-100 %
	Order picking accuracy (% by order)	99 %	100 %
MFG/DIST - Consumer products	Pieces shipped per person hr	175 Pcs	421-1600 Pcs
	Inventory count accuracy (% by units)	99 %	100 %
	On-time shipments	97 %	100 %
MFG/DIST - Aerospace/defense	On-time receipts	NS	NS
	On-time shipments	NS	NS
	Fill rate-line	NS	NS
MFG/DIST - High technology	Inventory count accuracy (% by units)	90 %	100 %
	Inventory shrinkage as a % of total inventory	1 %	0 %
	On-time shipments	NS	NS
MFG/DIST - Automotive	On-time shipments	98 %	100 %
	Inventory count accuracy (% by units)	99 %	100 %
	Fill rate-line	97 %	98 %

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Measures by Industry



Industry	Measure Used	Benchmark	Best Practice Range
Utilities / government	On-time receipts	95 %	98 %
	On-time shipments	95 %	99 %
	Inventory shrinkage as a % of total inventory	1 %	0 %
Life Sciences – Pharmaceuticals	On-time receipts	97 %	100 %
	Fill rate-line	99 %	100 %
	Fill rate-order	97 %	100 %
Life Sciences – Medical devices	Fill rate-line	97 %	100 %
	Lines shipped per person hr	13 Lines	200 Lines
	Inventory count accuracy (% by units)	98 %	100 %
3rd party warehouse	Pieces shipped per person hr	121 Pcs	500-600 Pcs
	On-time shipments	99 %	100 %
	Inventory count accuracy (% by units)	99 %	100 %
Transportation Service Provider	% of orders sent damage free	98 %	98 %
	Inventory count accuracy (% by units)	99 %	99 %
	Order picking accuracy (% by order)	98	98
Retail	Not enough responses to provide detail		

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Measures by Industry



- Different level of usage between industry sectors

Measure	Most Used in Industry	Least used in Industry
Fill Rate – Order	Life Sciences – Pharmaceuticals	Mfg/dist – High Tech / A&D
Units Picked per Hour	Mfg/dist – A&D, Transportation Service Provider	Mfg/dist – High Tech
Inbound units unloaded & put away per person hour	Mfg/dist – A&D	Life Sciences – Medical Devices
Cases shipped per person / hour	Mfg/dist – High Tech / A&D Transportation Services Provider	Life Sciences – Pharmaceuticals
Lines shipped per person hour	Utilities / Government	Mfg/ dist – high tech
Days of Raw Material on hand	Mfg/dist – A&D	Utilities / government
Days of finished goods on hand	Transportation service providers	Life sciences – pharmaceutical
Backorders as % of total orders	Life sciences – pharmaceutical	Mfg/dist – consumer products
Order picking accuracy	Life sciences – pharmaceutical	Transportation service providers

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Measures by Supply Chain Position



Use by Supply Chain Position



Customer of Firm	Measure Used
Manufacturer	Inventory count accuracy (% by units)
	On-time shipments
	% of overtime hours
Distributor	On-time shipments
	Inventory count accuracy (% by units)
	% of overtime hours
Retailer	On-time shipments
	Inventory count accuracy (% by units)
	Order picking accuracy (% by order)
End User / Customer	On-time receipts
	% of overtime hours
	Inventory count accuracy (% by units)

Use by Supply Chain Position



- Specific measures are seen as more important or less important by certain industry sectors

Measure	Most Used when Customer is	Least used when Customer is
Fill Rate – Line	Manufacturer	End Customer
Fill Rate – Order	Manufacturer	Retail Firm
Pallets shipped per person hour	End Customer	Manufacturer
Distribution costs as % of sales	Manufacturer	Retail firm
Value added per employee	Manufacturer	End Customer

- These divergent views create a disconnect between trading partners

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Measures by Strategy



Measure Use by Strategy



- The study group indicated that Customer Service (46%) was the primary focus
- The research team found that choice of measures is dependent on strategy
- Companies focused on Customer Service see On-time Shipments as the most important measure
- Others see the internal measure of Inventory Count Accuracy as most important

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Measure Used by Business Strategy



Business Strategy	Measure Used
Cost Leadership	Inventory count accuracy (% by units)
	On-time shipments
	On-time receipts
Customer Service	On-time shipments
	On-time receipts
	% of overtime hours
Product / Service Innovation	Inventory count accuracy (% by units)
	On-time shipments
	% of orders shipped without errors
Mix – Be All Things to All People	Inventory count accuracy (% by units)
	On-time shipments
	Order picking accuracy (% by order)

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Most and Least Used Measures By Strategy



Measure	Most Used with Strategy	Least used with Strategy
Warehouse Damage	Product / Market Innovation	Cost Leadership
Fill Rate – Order	Cost Leadership	Product / Market Innovation
Shop Floor / Direct Labor	Cost Leadership	Product / Market Innovation
Days of Raw Material on hand	Product / Market Innovation	Cost Leadership
Annual work force turnover	Cost Leadership	Customer Service

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Cultural Impact of Performance Measurement



Cultural Impact of Performance Measurement



- Study asked the following related to cultural impact
 - How has senior management interest in measures changed over the past year?
 - How well does management communicate the strategy / goals of the business?
 - How well do you understand this strategy?
 - Does management listen to and Implement improvement ideas?
 - Are performance measures used in determining compensation / bonuses?

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Executive Perspective on Measures



- Management understands the value of measures and interest is growing

Interest in Measures on the part of Senior Management during 2004		
Decreasing	Staying the Same	Increasing
3.3%	30.7%	66.0%

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Communications and Understanding



- 74% of respondents felt they understand where their company is going
- 89% understand their role in the company

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Management communicates effectively	12.4%	42.9%	28.3%	11.5%	4.9%
Corporate values are understood	22.6%	39.4%	25.2%	9.7%	3.1%
Understand where company is headed	27.8%	47.6%	17.6%	5.3%	1.8%
Understand my role in company	37.9%	51.1%	7.5%	3.1%	0.4%

- However, only 55% feel that management communicates effectively
- How does this impact a Balance Scorecard?

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Use of Improvement Suggestions



- Over 87% agree that management listens to improvement suggestions

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Management listens to suggestions	35.2%	52.9%	8.4%	1.8%	1.8%
Management acts on suggestions	22.6%	51.8%	19.9%	4.4%	1.3%

- However, only 75% see that management acts on these suggestions

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Effect of Performance on Compensation



- Regarding the use of performance measures to determine compensation and bonuses

Who	% Used	% Very Important	% Important
Corporate Officer	45%	22%	11%
Director	53%	33%	12%
Manager	60%	41%	15%
Staff Specialist	50%	19%	15%
Shop Floor/Direct Labor	52%	25%	11%
Temp Labor	35%	6%	5%

- Note that managers are impacted more than officers and directors
- How does this impact a Balanced Scorecard?

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Where Do We Go From Here?



Where Do We Go From Here



- Survey results are encouraging, particularly where we see an increased use and balancing of measures. However, we see the following action items:
 - There is a need to develop standards for use within specific industries and cross-industry
 - Management should work to improve communication to staff
 - Organizational units should work toward development of a more balanced set of measures
 - Management should close the gap between listening to suggestions and acting on them
 - DC professionals need to look at more cross functional / strategic measures, those that support the “Voice of the Customer”

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