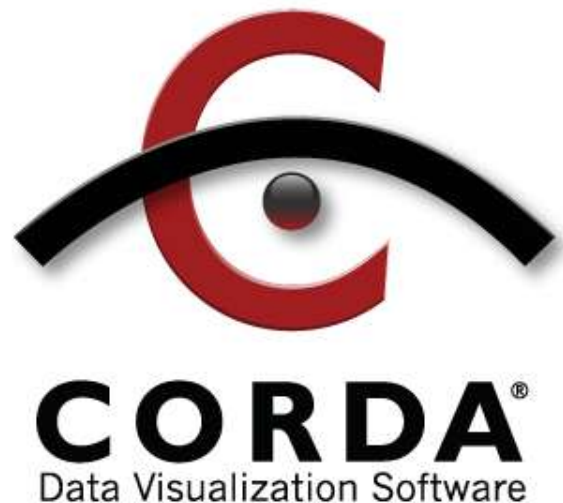




Best Practices in Dashboard Design



Neal Williams

President & CEO, Corda Technologies



Session Outline

- How can a dashboard improve the performance of your business?
- What are the different types of dashboards?
- Choosing your key performance indicators (KPIs)



What is a Business Performance Dashboard?

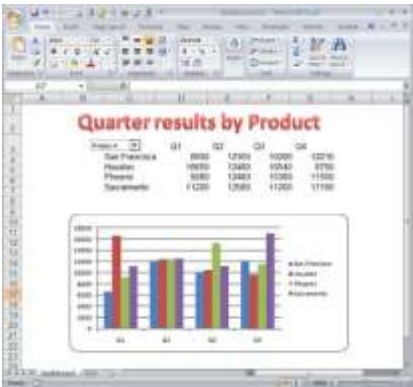
A very simple explanation,

**A visual reporting tool that helps
you manage your business**



Ways to Implement a Dashboard

Excel Spreadsheet

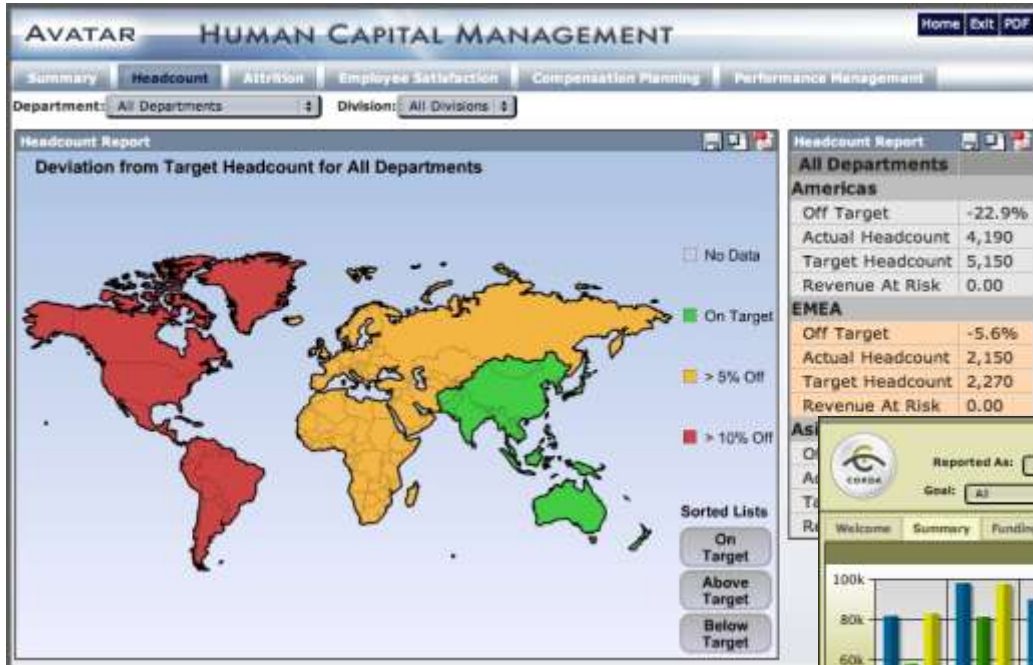


Overhead Monitor Display



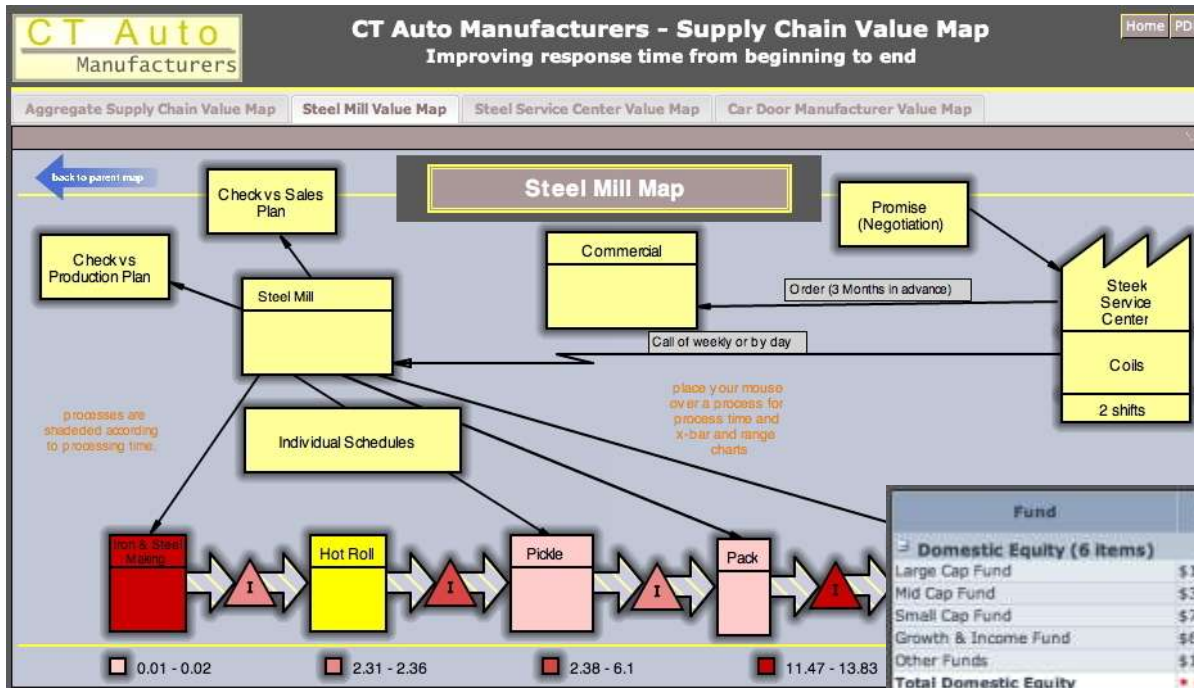
Web Portal





Example Dashboards





Example Dashboards

Fund	Q1 Starting Value	Total Contributions	Change in Value	Current Value
Domestic Equity (6 items)				
Large Cap Fund	\$12,345.00	\$0.00	\$2,547.00	\$14,892.00
Mid Cap Fund	\$32,236.00	\$0.00	\$3,721.00	\$35,957.00
Small Cap Fund	\$7,392.00	\$300.00	\$540.00	\$8,232.00
Growth & Income Fund	\$6,197.00	\$300.00	\$437.00	\$6,934.00
Other Funds	\$12,545.00	\$0.00	\$352.00	\$12,897.00
Total Domestic Equity	* \$70,715.00 !	\$600.00	\$7,597.00	* \$78,912.00 !
Foreign Equity (4 items)				
Europe Fund	\$5,597.00	-\$300.00	\$401.00	\$6,298.00
Pacific Rim Fund	\$5,021.00	\$0.00	-\$3.00	\$5,018.00
Emerging Markets Fund	\$2,777.00	\$300.00	\$894.00	\$3,971.00
Total Foreign Equity	\$13,395.00	\$600.00	\$1,292.00	\$15,287.00
Bonds (4 items)				
Long Term Bond Fund	\$14,345.00	\$300.00	\$1,807.00	\$16,452.00
Medium Term Bond Fund	\$5,021.00	\$0.00	-\$139.00	\$12,984.00
Other Bond Funds	\$16,456.00	\$0.00	-\$108.00	\$16,348.00
Total Bonds	\$35,822.00	\$300.00	\$1,560.00	\$45,784.00
Cash (1 item)				
Total Cash	\$18,117.00	\$0.00	\$250.00	\$18,367.00
Other (1 item)				
Total Other	\$17,921.00	\$0.00	-\$902.00	\$17,019.00
Total Value Of 401k	\$292,201.00	\$3,000.00	\$20,246.00	\$315,352.00

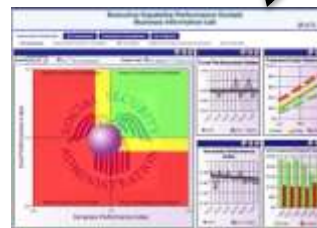
* Values > \$50,000.00



Dashboards can be simple



Dashboards can be multi-layered and detailed



Fund	Startings	Value	Risk	Contribution	Change In	Current
- Domestic Equity (6 Items)						
Large Cap Fund	\$12,245.00	\$0.00	\$0.00	\$2,247.00	\$14,492.00	
Mid Cap Fund	\$32,296.00	\$0.00	\$0.00	\$5,771.00	\$38,067.00	
Small Cap Fund	\$7,392.00	\$0.00	\$0.00	\$1,610.00	\$9,002.00	
Divid & Income Fund	\$6,197.00	\$0.00	\$0.00	\$437.00	\$6,634.00	
Other Funds	\$12,445.00	\$0.00	\$0.00	\$330.00	\$12,875.00	
Total Domestic Equity	\$67,575.00	\$0.00	\$0.00	\$7,995.00	\$75,570.00	
- Foreign Equity (4 Items)						
Europe Fund	\$5,097.00	\$0.00	\$40.00	\$0.00	\$5,137.00	
North Am Fund	\$5,051.00	\$0.00	\$0.00	\$0.00	\$5,051.00	
Emerging Markets Fund	\$2,775.00	\$0.00	\$0.00	\$0.00	\$2,775.00	
Total Foreign Equity	\$13,923.00	\$0.00	\$40.00	\$0.00	\$13,963.00	
- Bonds (4 Items)						
Long Term Bond Fund	\$14,245.00	\$0.00	\$0.00	\$1,807.00	\$16,052.00	
Medium Term Bond Fund	\$5,021.00	\$0.00	\$0.00	\$1,190.00	\$6,211.00	
Other Bond Fund	\$14,496.00	\$0.00	\$0.00	\$1,000.00	\$15,496.00	
Total Bonds	\$33,762.00	\$0.00	\$0.00	\$3,997.00	\$37,759.00	
- Cash (1 Item)						
Total Cash	\$18,117.00	\$0.00	\$0.00	\$0.00	\$18,117.00	
- Other (1 Item)						
Total Other	\$17,921.00	\$0.00	\$0.00	\$0.00	\$17,921.00	
Total Value of Assets	\$137,282.00	\$0.00	\$0.00	\$12,992.00	\$150,274.00	
Value = \$10,000.00						



Your Business Performance Dashboard will end up being one of the following,

- 1) A visual reporting tool that does little to change organizational performance
- 2) A powerful tool that provides valuable insight and drives breakthrough performance



What Affects the Success of your Business Performance Dashboard

- How it's Designed
- How it's Deployed
- How it's Maintained
- How Accountability and Responsibility are Handled



What is the purpose of a performance dashboard?

Facilitate Execution



Execution -

‘The gap between what a company’s leaders want to achieve and the ability of their organizations to deliver it’

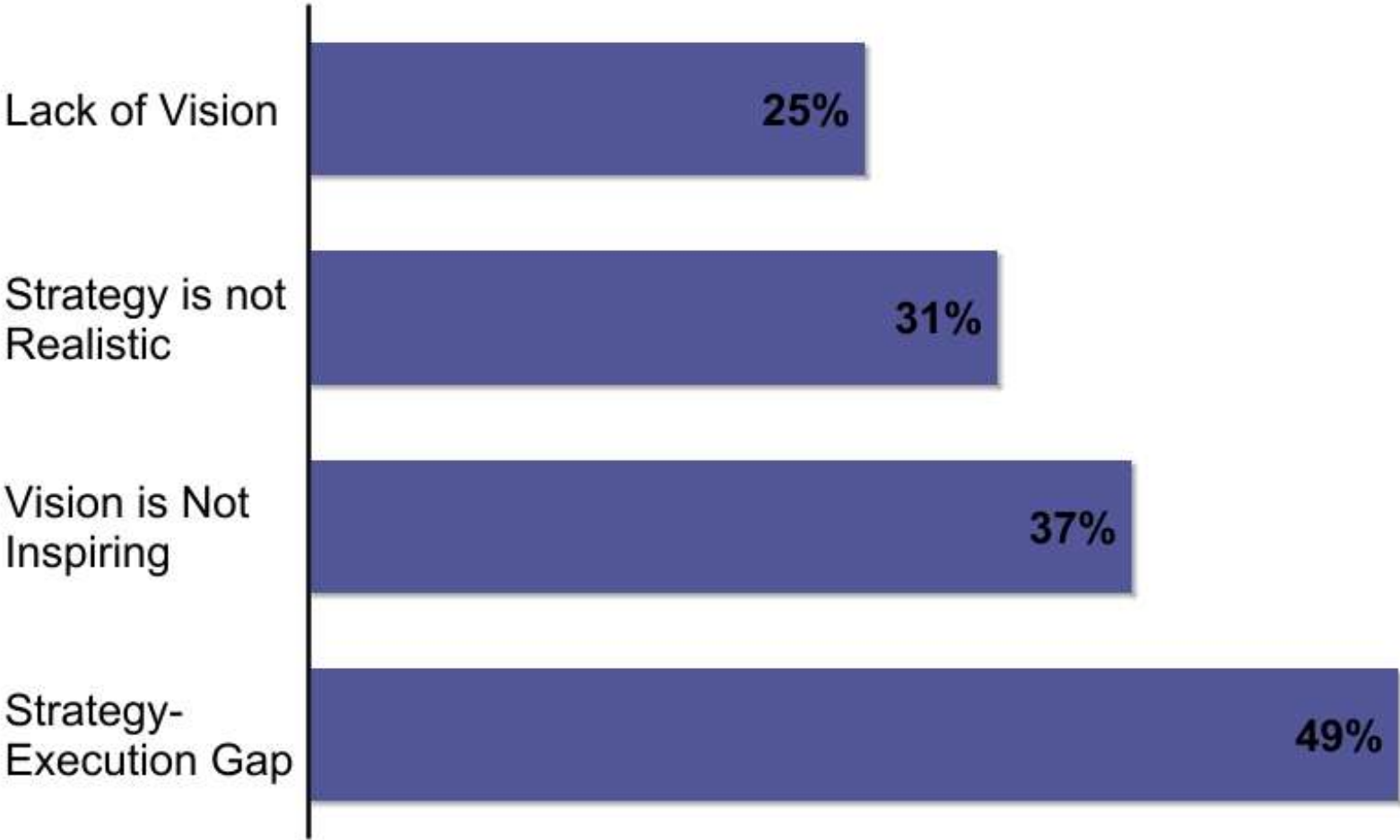
- Larry Bossidy and Ram Charan, (2002) Execution: The Discipline of Getting things Done

‘Strategy is important, but it is execution that counts’

- Jeff Call, CEO & Founder of Focus & Execute



What is the main barrier to your company's success?





How Does a Dashboard Facilitate Execution?

- 1. Valuable Insight**
- 2. Organizational Alignment**
- 3. Workforce Focus**

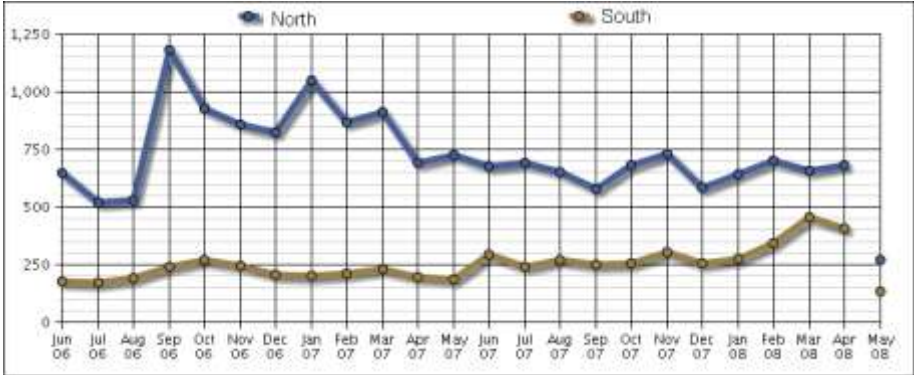


How Does a Dashboard Facilitate Execution?

- 1. Valuable Insight**
- 2. Organizational Alignment**
- 3. Workforce Focus**



Visual is better...





“run” your business, without having to take your eye off of your business





If a Business Performance Dashboard is to be adopted by your organization it must be **Easy to Use**





Indicators



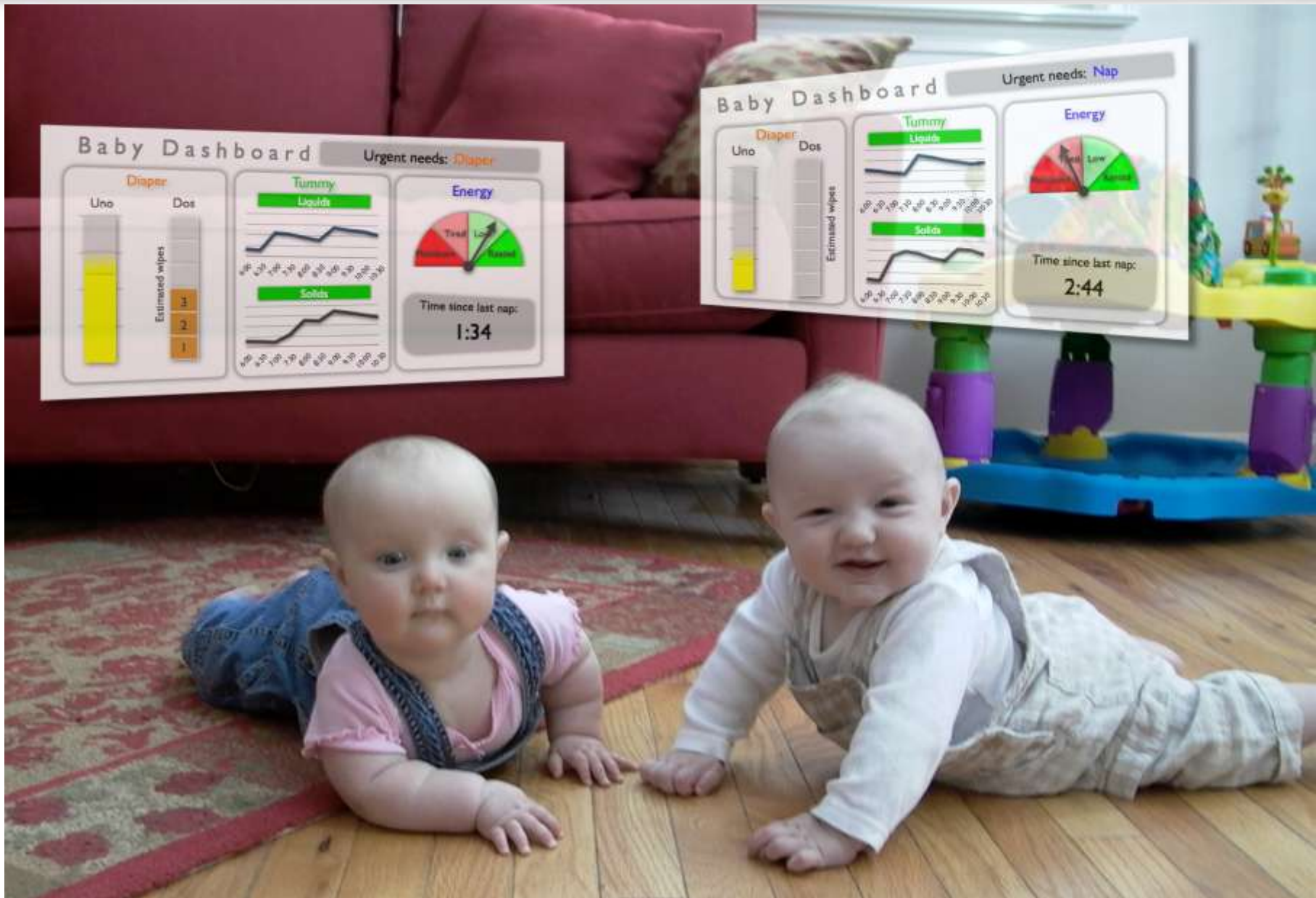
Alerts





Valuable Insight

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“Intelligence is the most important work, because the entire force relies on it for every move. It is the essence of strategy.”

-Sun Tzu, the Art of War





Do you feel like you are guessing when it comes
To making important decisions?

Can you make timely decisions, or do you delay
because of uncertainty?

The inability to make timely
and informed decisions is a
barrier to execution.





Naked Eye Observations

Some things in your business are visible to the naked eye.

Other things are not.





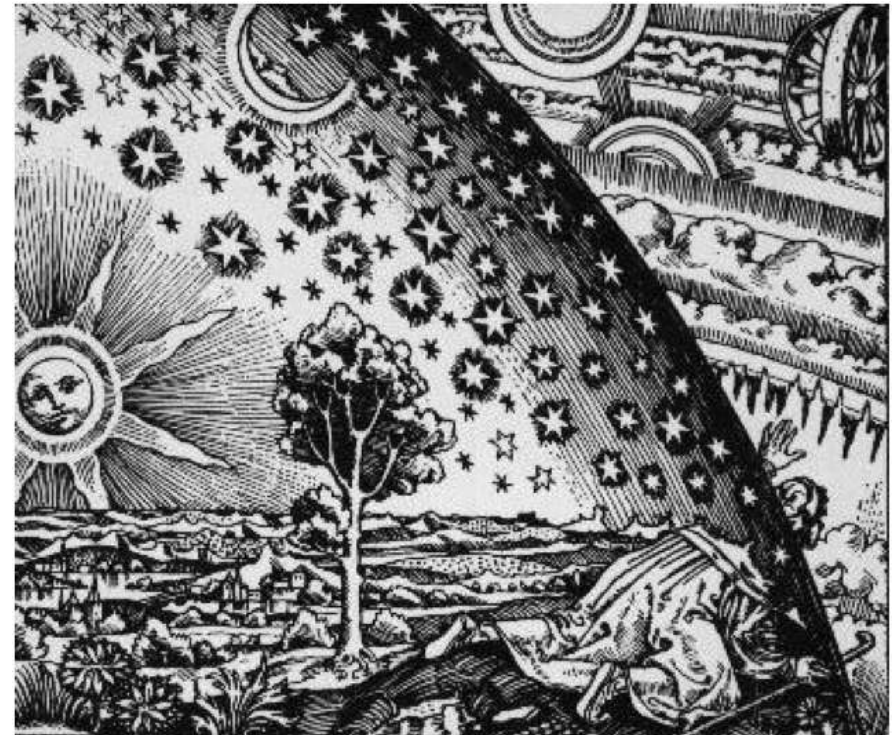
As we measure and gather data,

- Things that were invisible become visible
- Cause and effect relationships become clear
- Old models and belief systems are proven false
- New models and belief systems are born
- Outliers become apparent
- Predictive indicators are revealed



History illustrates how our understanding increases as we move beyond naked eye observations, and begin to measure.

Ancient astronomers using naked eye observations, developed a model of the universe





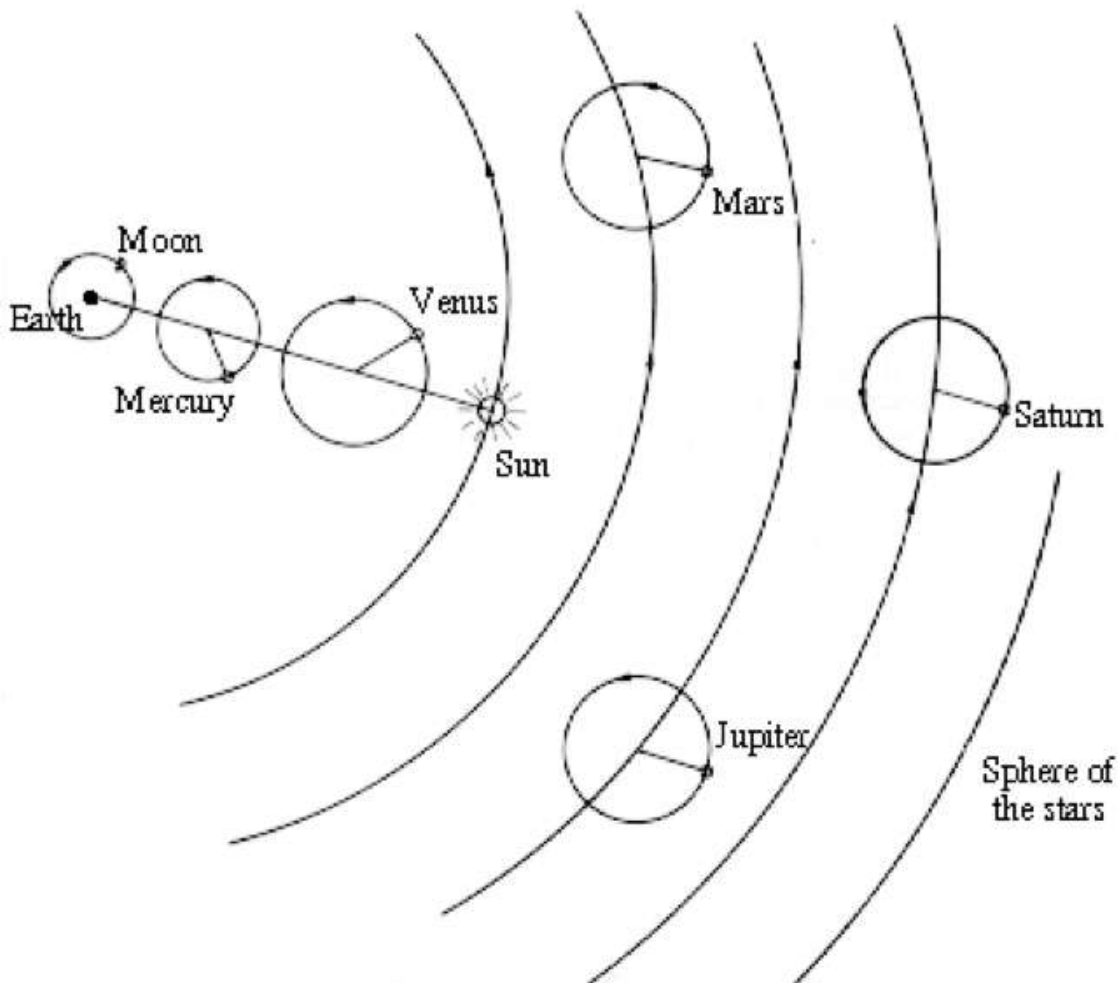
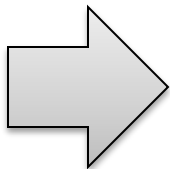
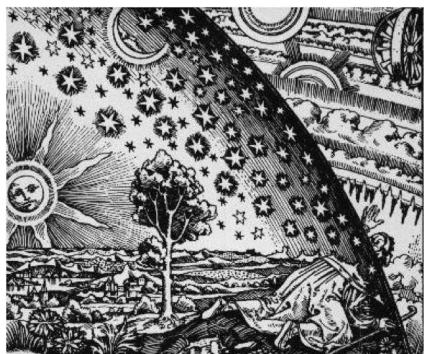
A new instrument is invented which allowed measurement of celestial movement--The Armillary Sphere



By taking measurements of planetary movements, Ptolemy developed a new model of the universe



A new model of the universe is born





A new instrument is invented which allowed even more precise measurements of celestial movement--The telescope

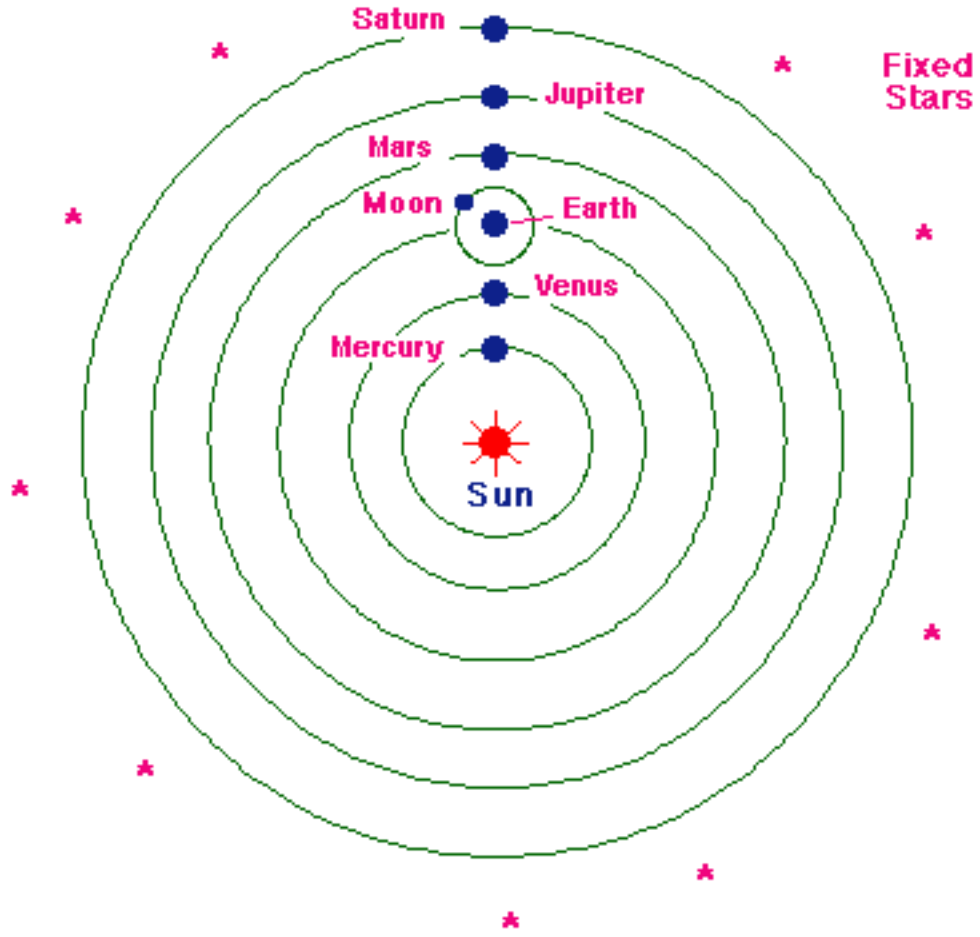
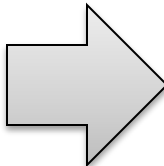
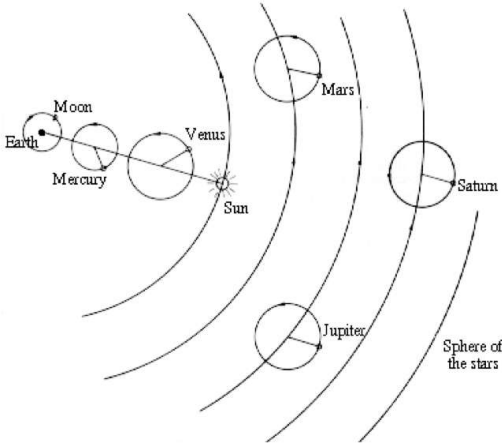


With this new device, Galileo developed a new model of the universe





A new model of the universe is born





Takeaways from this history lesson,

- The accepted model that has been around for a while may not be the correct model
- Accurately measuring something can lead to new revelations

Real World Example – Comcast's Maintenance Schedule



Type of insight,

- Discovery of predictors

Real World Example #2– Comcast's Customer Record Transaction System

- Outliers become visible

Real World Example #1– ASU's Help Desk



How Does a Dashboard Facilitate Execution?

- 1. Valuable Insight**
- 2. Organizational Alignment**
- 3. Workforce Focus**



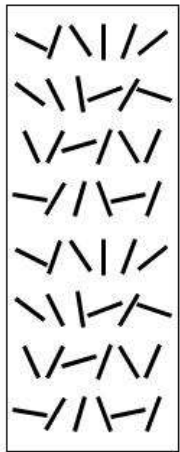
Lack of Alignment



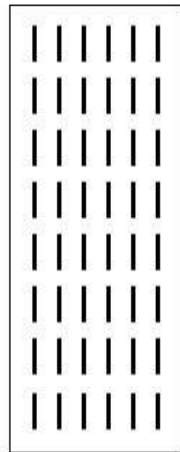


Alignment of magnetic particles in iron

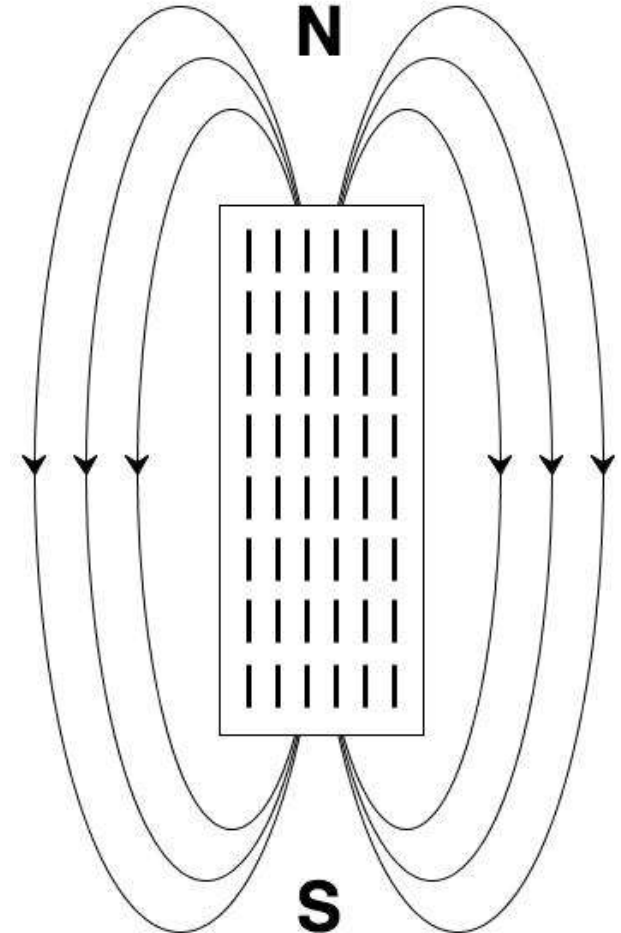
Normal Iron



Magnetized Iron

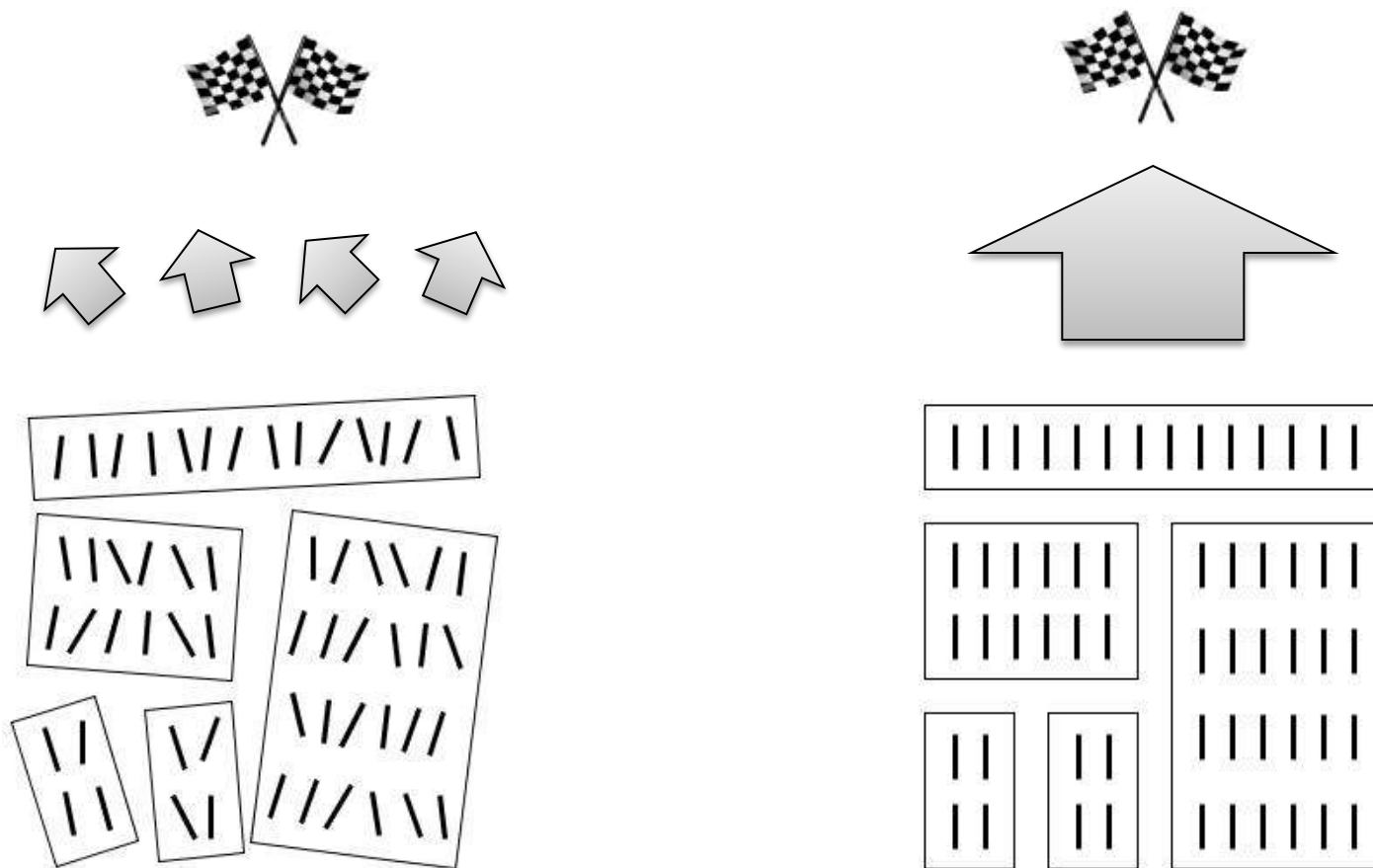


All iron contains magnetic particles. The only difference between normal iron, and magnetic iron is alignment.



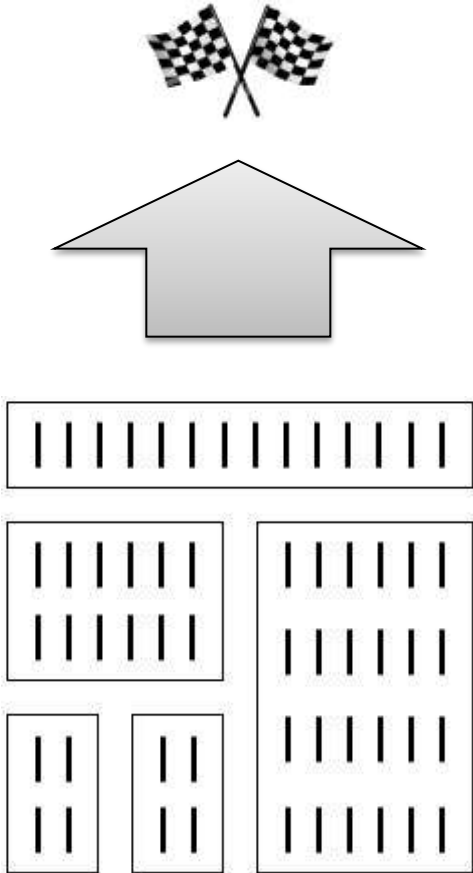


Is Your Organization Aligned?





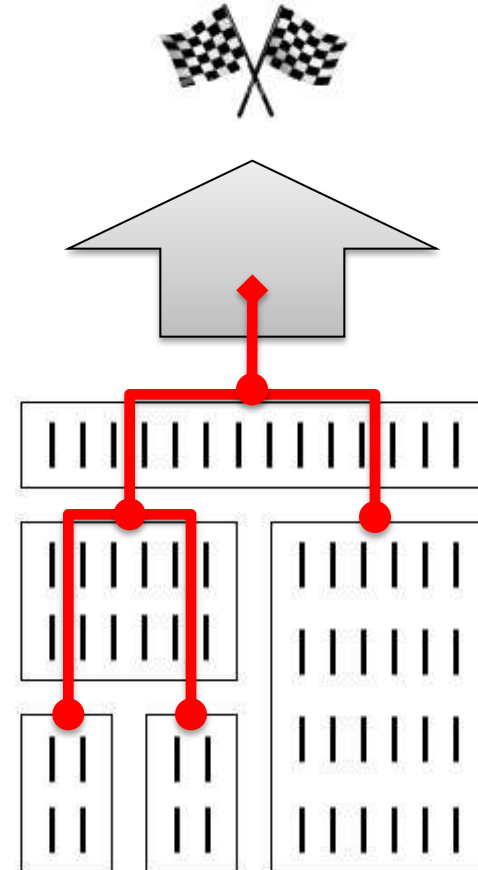
Keys to Organizational Alignment





Keys to Organizational Alignment

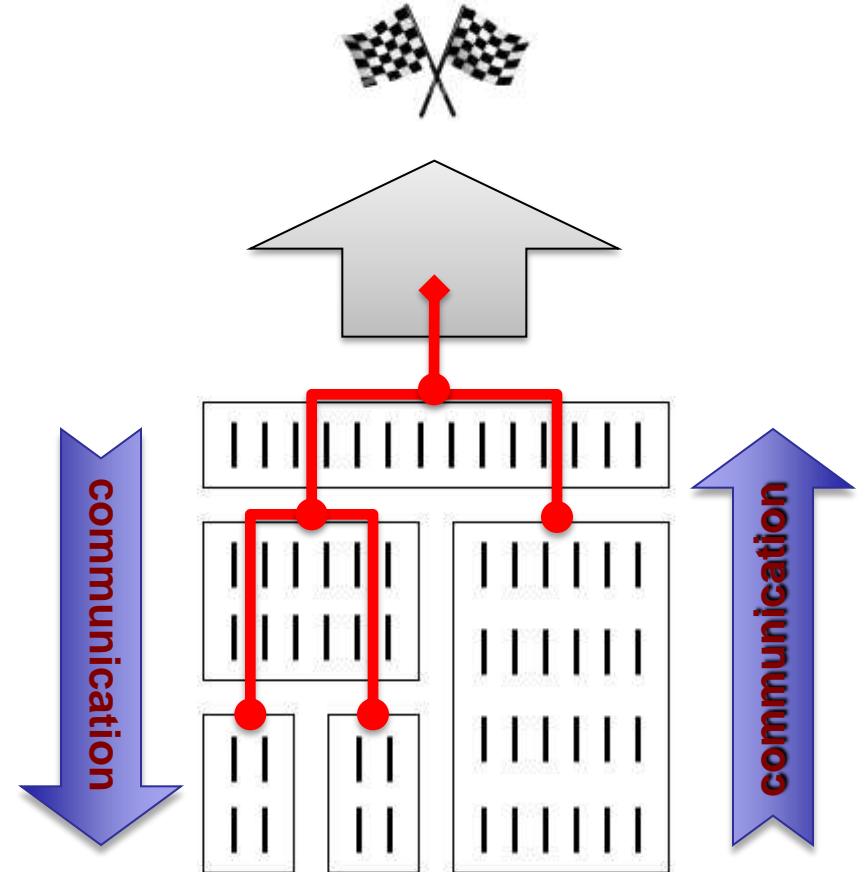
- Linked Goals (Trickle-Down Goals)





Keys to Organizational Alignment

- Linked Goals (Trickle-Down Goals)
- Two-Way Communication

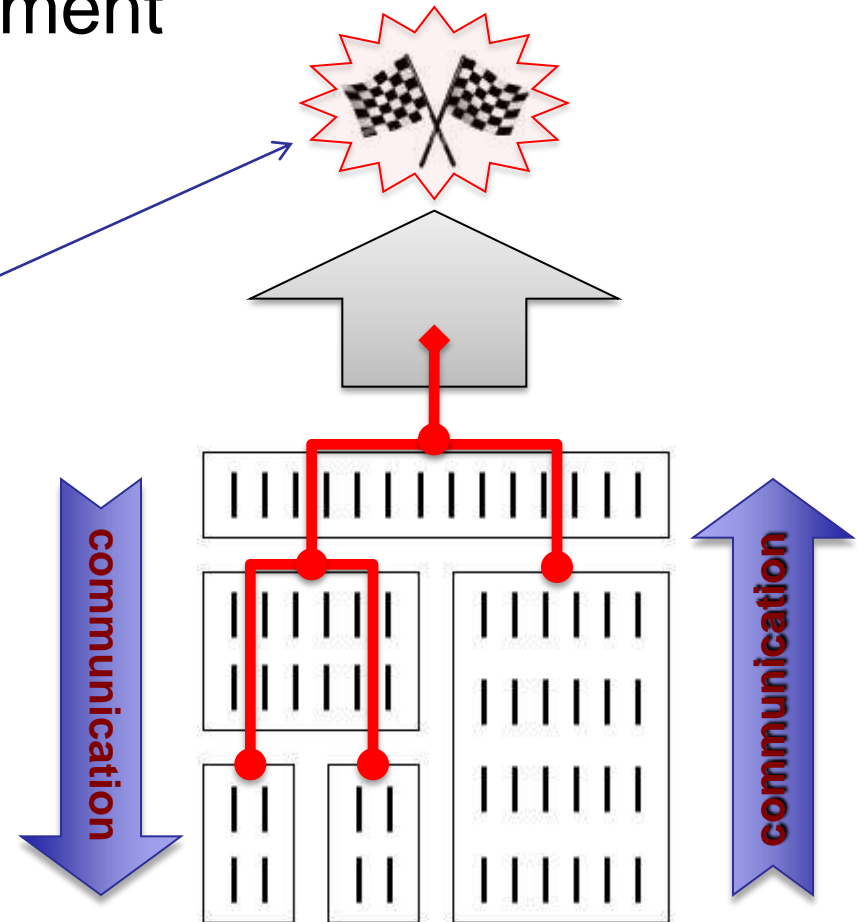




Keys to Organizational Alignment

- Linked Goals (Trickle-Down Goals)
- Two-Way Communication
- Single Version of the Truth

Real World Example – ASU's Research Grants





How Does a Dashboard Facilitate Execution?

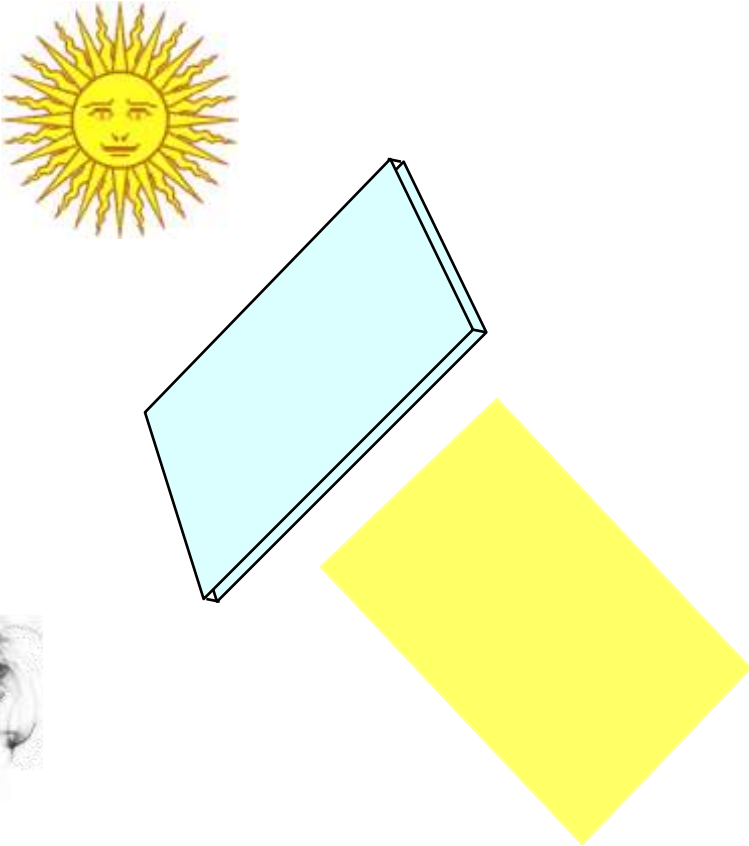
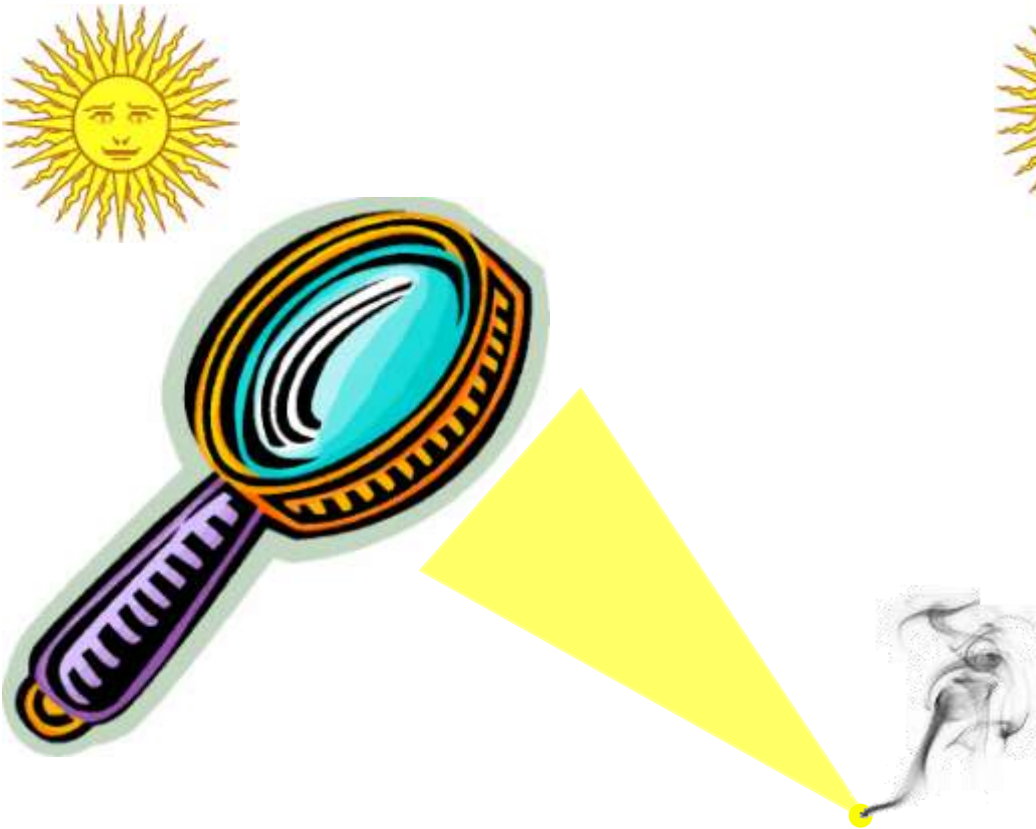
- 1. Valuable Insight**
- 2. Organizational Alignment**
- 3. Workforce Focus**



Focused Effort

OR

Lack of Focus





The Hawthorne Effect

- A change in the behavior of an individual or a group who know they are being observed to meet the expectations of the observer.
- The act of measuring in and of itself can increase performance.



Hawthorne Works (ca. 1924)



Real World Example – Ticket Handling



Design your Performance Dashboard to provide,

- 1. Valuable Insight**
- 2. Organizational Alignment**
- 3. Workforce Focus**



There Are Two Types of KPIs

1. Outcome KPIs
2. Driver KPIs



There Are Two Types of KPIs

1. Outcome KPIs

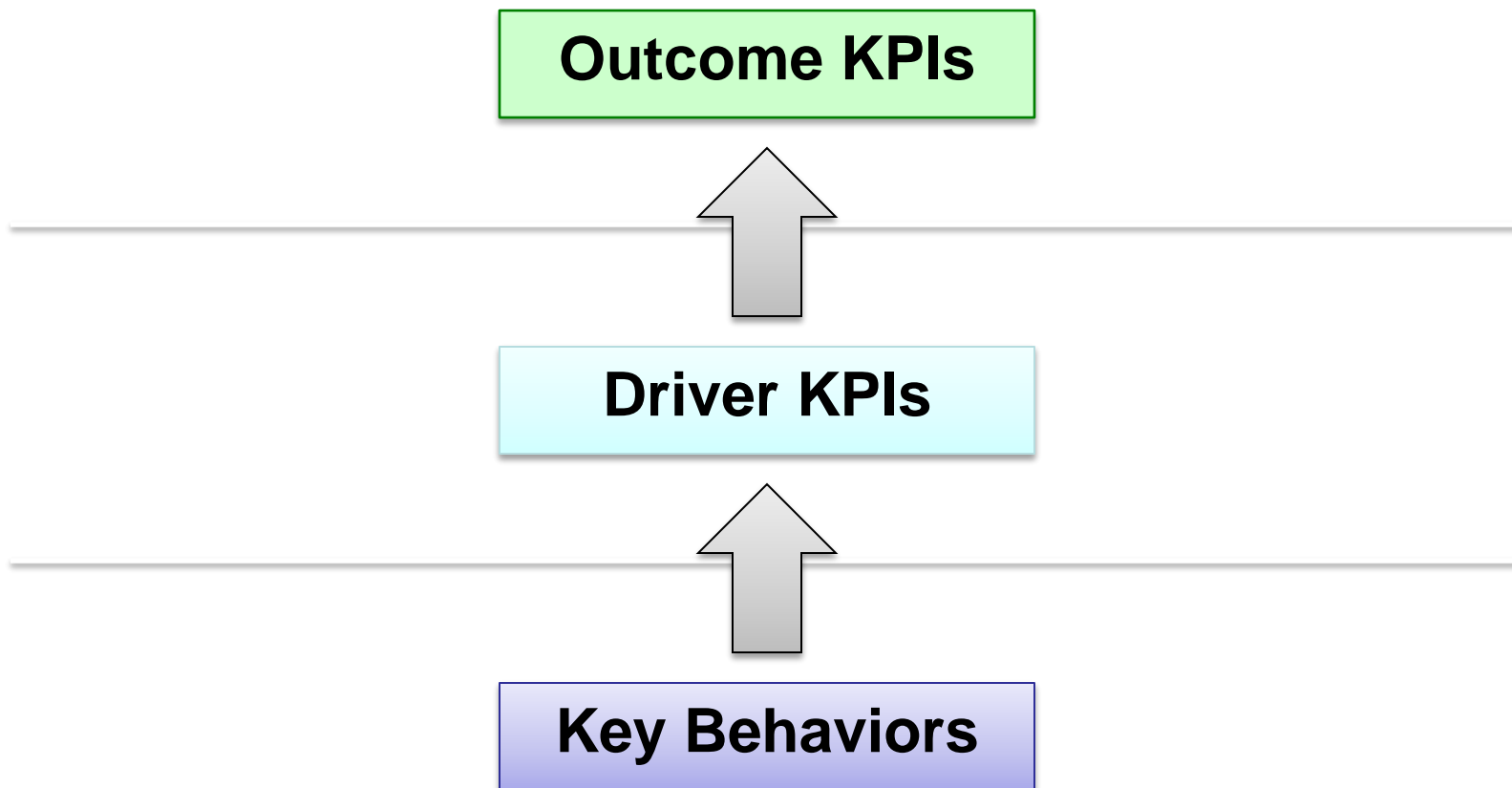
- Quarterly Revenue
- Customer Satisfaction
- Monthly Help Desk Calls

2. Driver KPIs

- Sales Calls → Quarterly Revenue
- Product Quality → Customer Satisfaction
- Monthly Self Service Incidents → Monthly Help Desk Calls

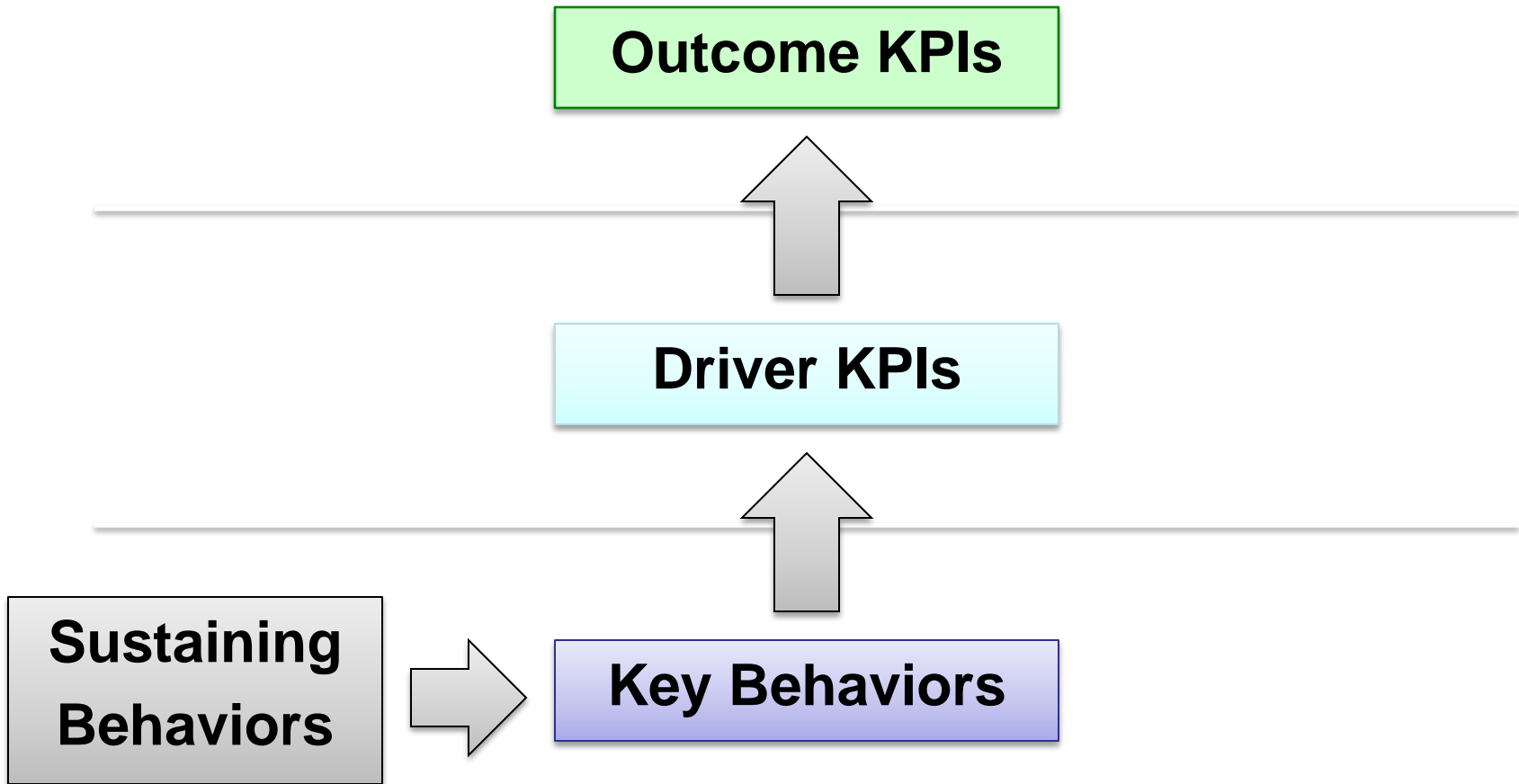


Beneath Outcome and Driver KPIs are Key Behaviors





Beneath Outcome and Driver KPIs are Key Behaviors





Performance Dashboards fall into one of three categories

- 1) High-Level Strategic
- 2) Organizational Management
- 3) Real-Time Operational



Performance Dashboards fall into one of three categories

1) High-Level Strategic

Purposes: Align entire company to strategy, monitor high-level performance objectives

Examples: Balanced Scorecard Dashboard, Board of Director's progress report

Attributes: Long term scope, measures change infrequently, primarily utilizes outcome KPIs

2) Organizational Management

3) Real-Time Operational



Performance Dashboards fall into one of three categories

1) High-Level Strategic

2) Organizational Management

Purposes: Increase performance of an organization

Examples: VP of Sales Dashboard

Attributes: Short term scope, measures change frequently, utilizes both outcome and driver KPIs

3) Real-Time Operational



Performance Dashboards fall into one of three categories

- 1) High-Level Strategic
- 2) Organizational Management
- 3) Real-Time Operational

Purposes: Optimize a process

Examples: Help Desk Dashboard

Attributes: Real-time, or close to real-time, utilizes primarily driver KPIs



What tasks are involved in building the system?

Design



Business Manager

- 1) Chooses what to measure
- 2) Defines the KPIs

Implementation



Technical Resource

- 3) Implements the design

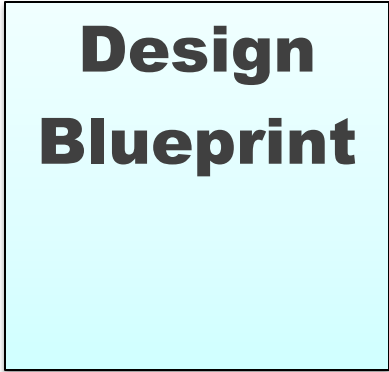


What tasks are involved in building the system?

Design



Business Manager



Implementation



Technical Resource

- 1) Chooses what to measure
- 2) Defines the KPIs

- 3) Implements the design



Design Blueprint

- Choice of Measures
- KPI Definitions
- User Access

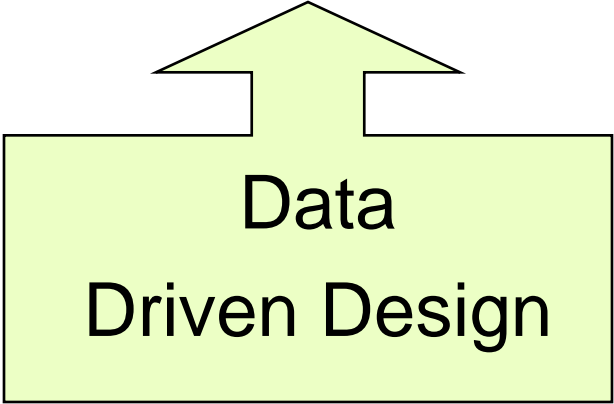


The 64 million dollar question is...

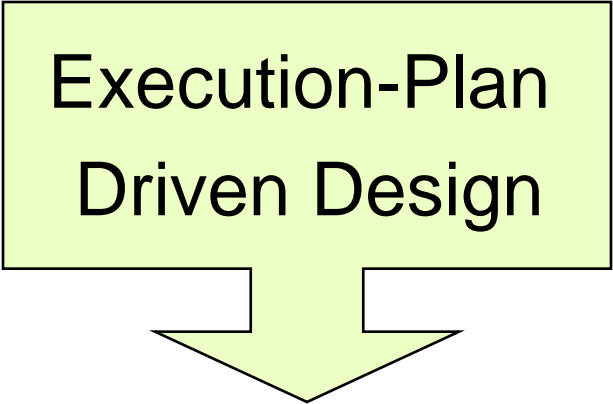
How Do I Choose my KPIs?

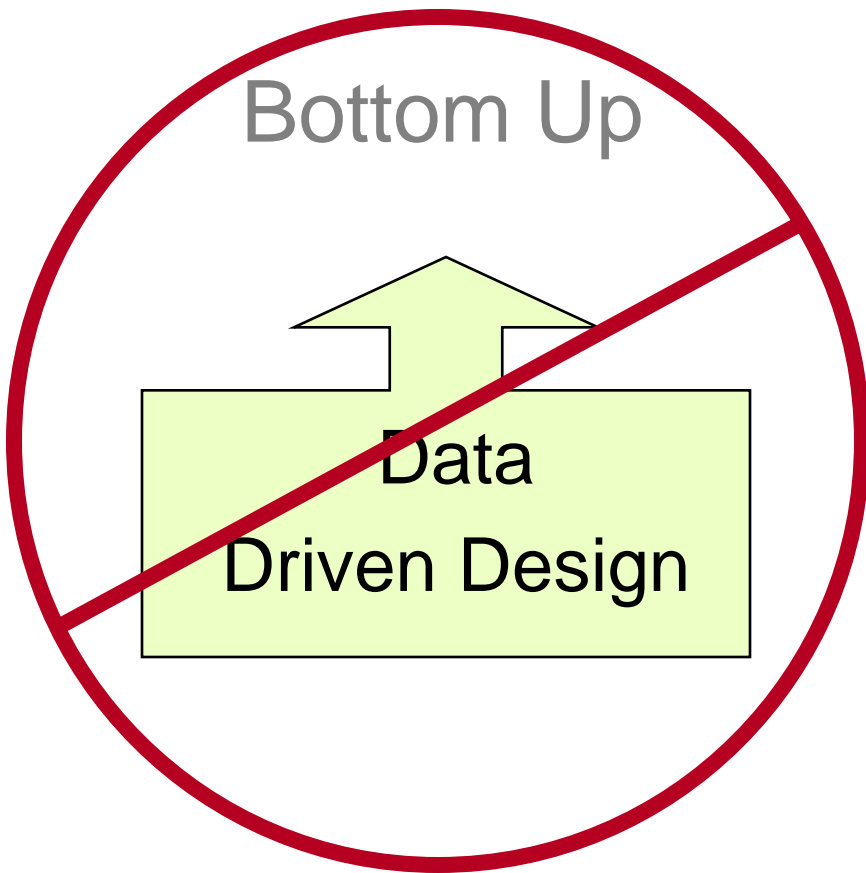


Bottom Up

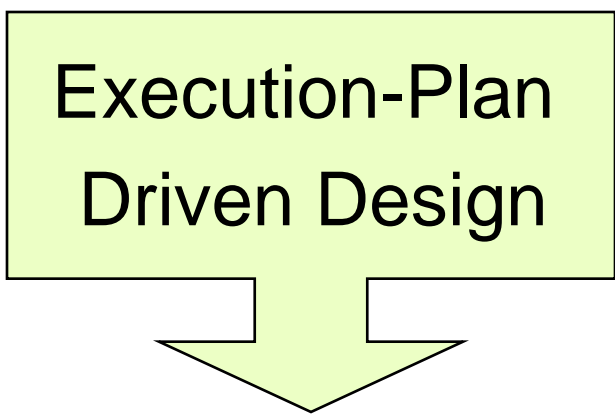


Top Down





Top Down





The 9 Steps of Choosing Your KPIs

**Design
Blueprint**

1. Create a framing statement
2. Create a list of questions that you would like the performance dashboard to answer
3. Determine a preliminary list of KPIs
4. Assign goals, targets, and benchmarks
5. Add structured navigation, and structured analysis
6. Determine the indicator type for each KPI
7. Check data availability
8. Check for compliance and balance
9. Assign owners and consumers. Assign triggers and alerts



1. Create a Framing Statement

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Your framing statement will serve as a guide to your design process and will allow you to quickly decide which elements belong in your dashboard, and which do not.

Your framing statement will describe in detail your short-term and long-term desired outcomes.



Example Framing Statement

The performance dashboard for Company X's Customer Service and Support Department will facilitate the following tasks,

Improve Customer Satisfaction by providing above industry average performance in the following areas,

- MTTR (Mean Time To Repair)
- Backlog
- Defect Ratio

Increase Profit Margin to 25% by yearend 2010, and 30% by yearend 2011 by doing the following,

- Achieve a Self Service Ratio of at least 30% by yearend 2010, and 40% by yearend 2011
- Achieve a Contract Renewal rate of at 90% by yearend 2010, and 92% by yearend 2011



A Good Framing Statement -

- Is Concise
- Explicitly States Goals, Milestones, and Benchmark Comparisons
- Has the Buy-in of your Key Team Members
- Is your action plan that your performance dashboard will help your execute against

The performance dashboard for Company X's Customer Service and Support Department will facilitate the following tasks,

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- Achieve a Contract Renewal rate of at 90% by yearend 2010, and 92% by yearend 2011



2. Create a List of Questions

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The questions will flow out of your framing statement

From the Framing Statement

Improve Customer Satisfaction by providing above industry average performance in the following areas,

- MTTR (Mean Time To Repair)
- Backlog
- Defect Ratio

Increase Profit Margin to 25% by yearend 2010, and 30% by yearend 2011 by doing the following,

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- Achieve a Contract Renewal rate of at 90% by yearend 2010, and 92% by yearend 2011

Example Questions

How does my MTTR compare to industry average?

How does my Backlog compare to industry average?

How does my Defect Ratio compare to industry average?

What is my Customer Satisfaction rating?

What is my Profit Margin, and am I meeting my target?

Am I meeting my Self Service Ratio goals?

Am I meeting my Contract Renewal Rate goals?



3. Determine a Preliminary List of KPIs

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Create a KPI to answer each of your questions.

- **Some questions will require multiple KPIs**
- **Some KPIs can answer multiple questions**



Describe in Detail your KPIs

KPI	
Measure	
Dimension 1	
Dimension 2	
Compare To	
Drill To	
Indicator Type	
Drill From	
Perspective	
Notes	



Measure

Dimension



Examples Measures,

- Customer Satisfaction
- Revenue
- Profit Margin
- Contract Renewal Rate

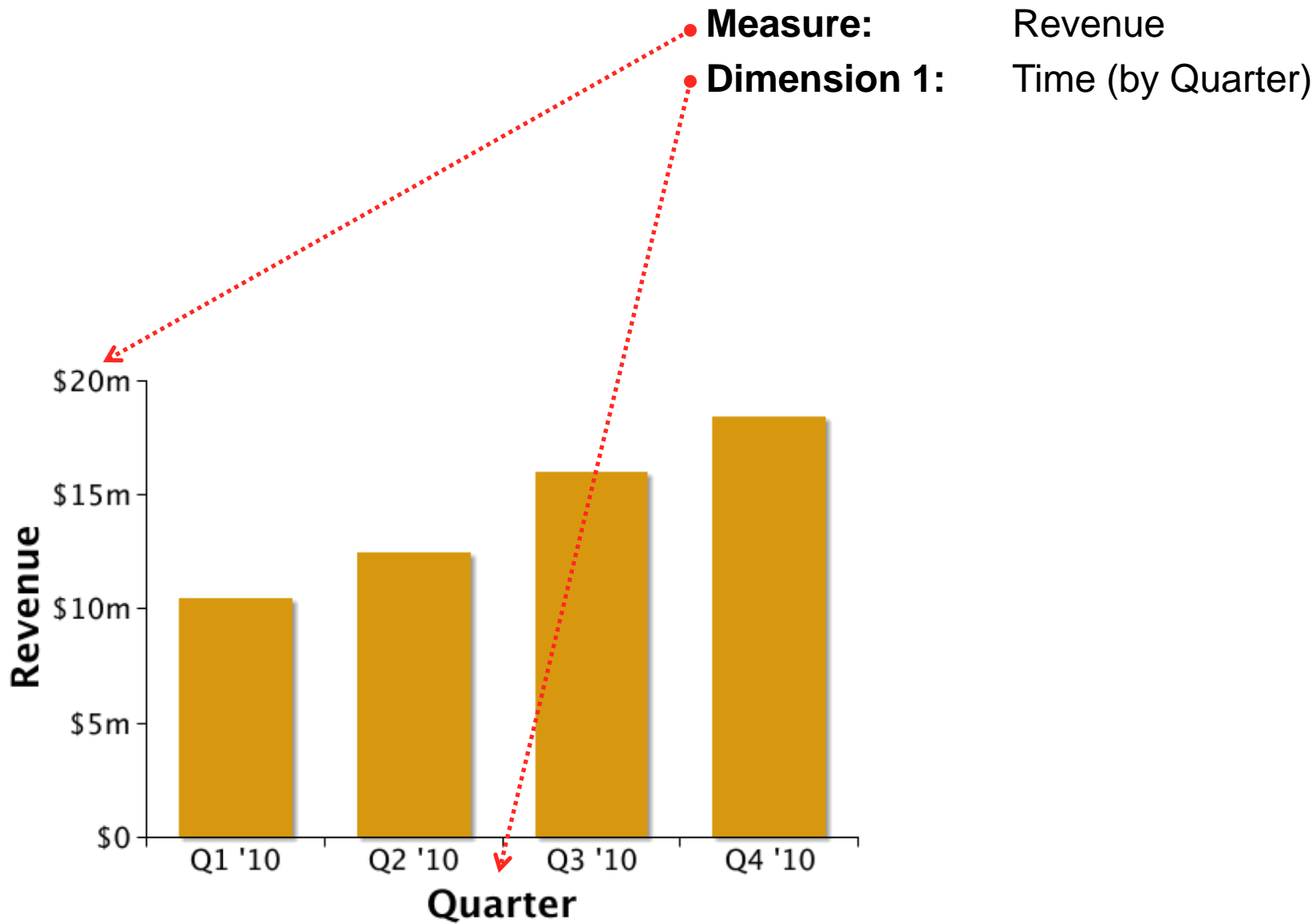


Example Dimensions

1. Time (Quarterly)
2. Type (Product 1, Product 2)

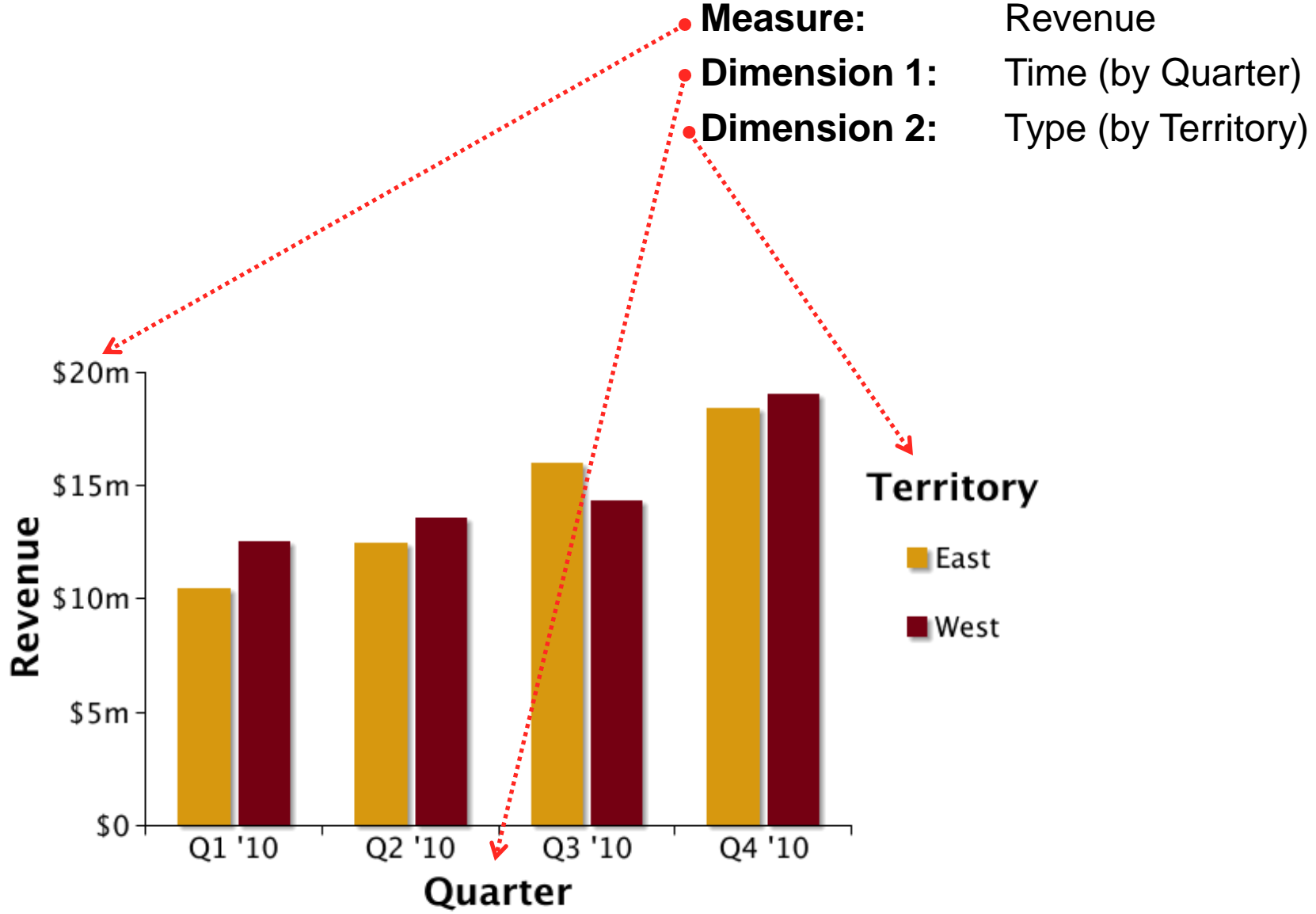


Definitions



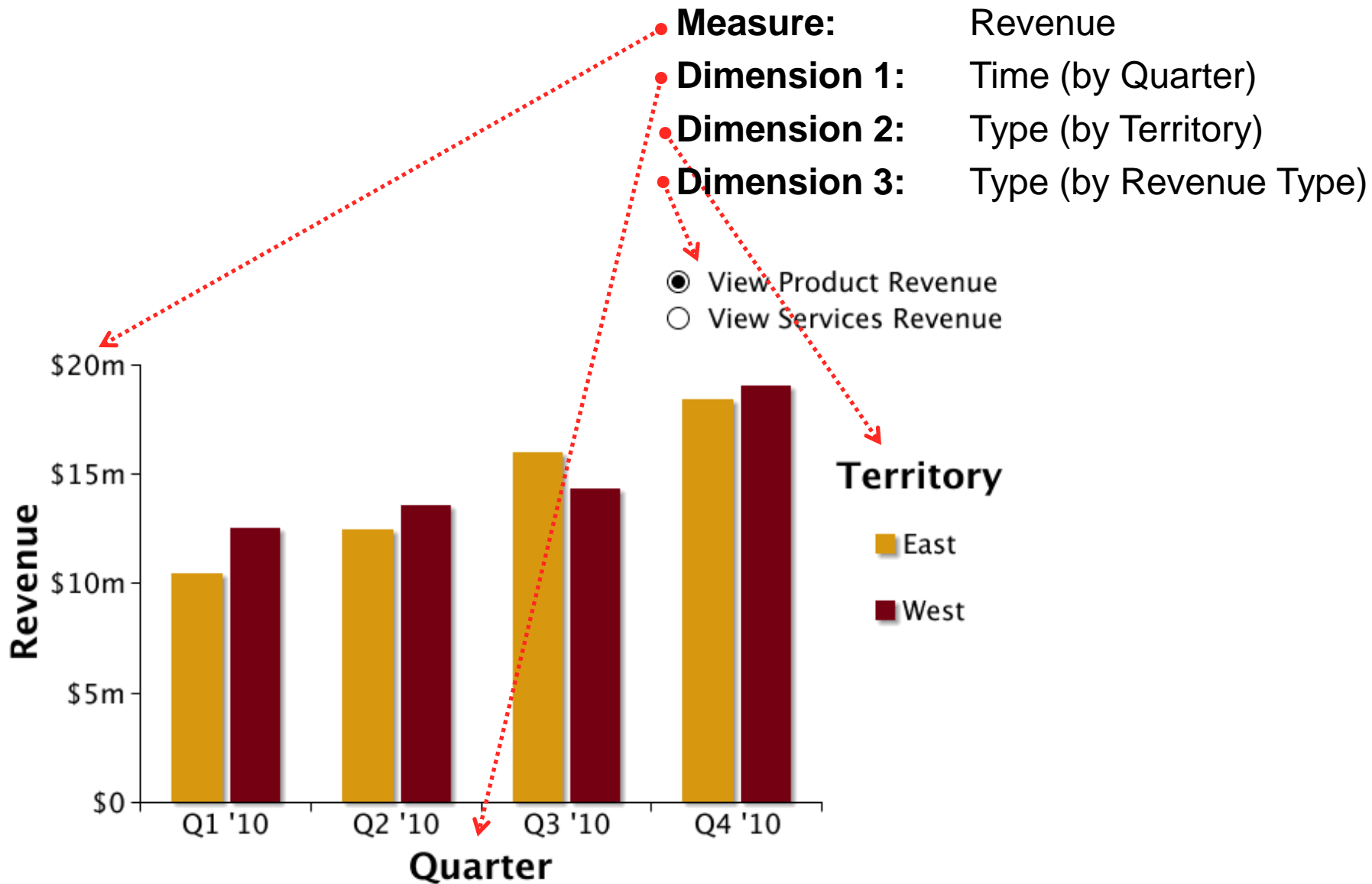


Definitions





Definitions





Exercise #1

Design a KPI to answer this question...

- What is my Profit Margin, and am I meeting my target?

Profit Margin KPI	
Measure	
Dimension	



Exercise #1

Design a KPI to answer this question...

- What is my Profit Margin, and am I meeting my target?

Profit Margin KPI	
Measure	Profit Margin
Dimension	



Exercise #1

Design a KPI to answer this question...

- What is my Profit Margin, and am I meeting my target?

From the Framing Statement...

“Increase Profit Margin to 25% by yearend 2010, and 30% by yearend 2011”

Profit Margin KPI	
Measure	Profit Margin
Dimension	Span-of-Time (Since Jan-01-2010, by Quarter)



Exercise #2

Design a KPI to answer this question...

- How does my Defect Ratio compare to industry average?

Profit Margin KPI	
Measure	Defect Ratio
Dimension 1	Span-of-Time (Since Jan-01-2010, by Month)
Dimension 2	By-Type (Product A, Product B)



4. Assign Goals, Targets, and Benchmarks **CORDA**[®]



Is there a target or a stretch goal for this KPI?

Is there a benchmark that this will be compared against?

Would a range be better than a target?

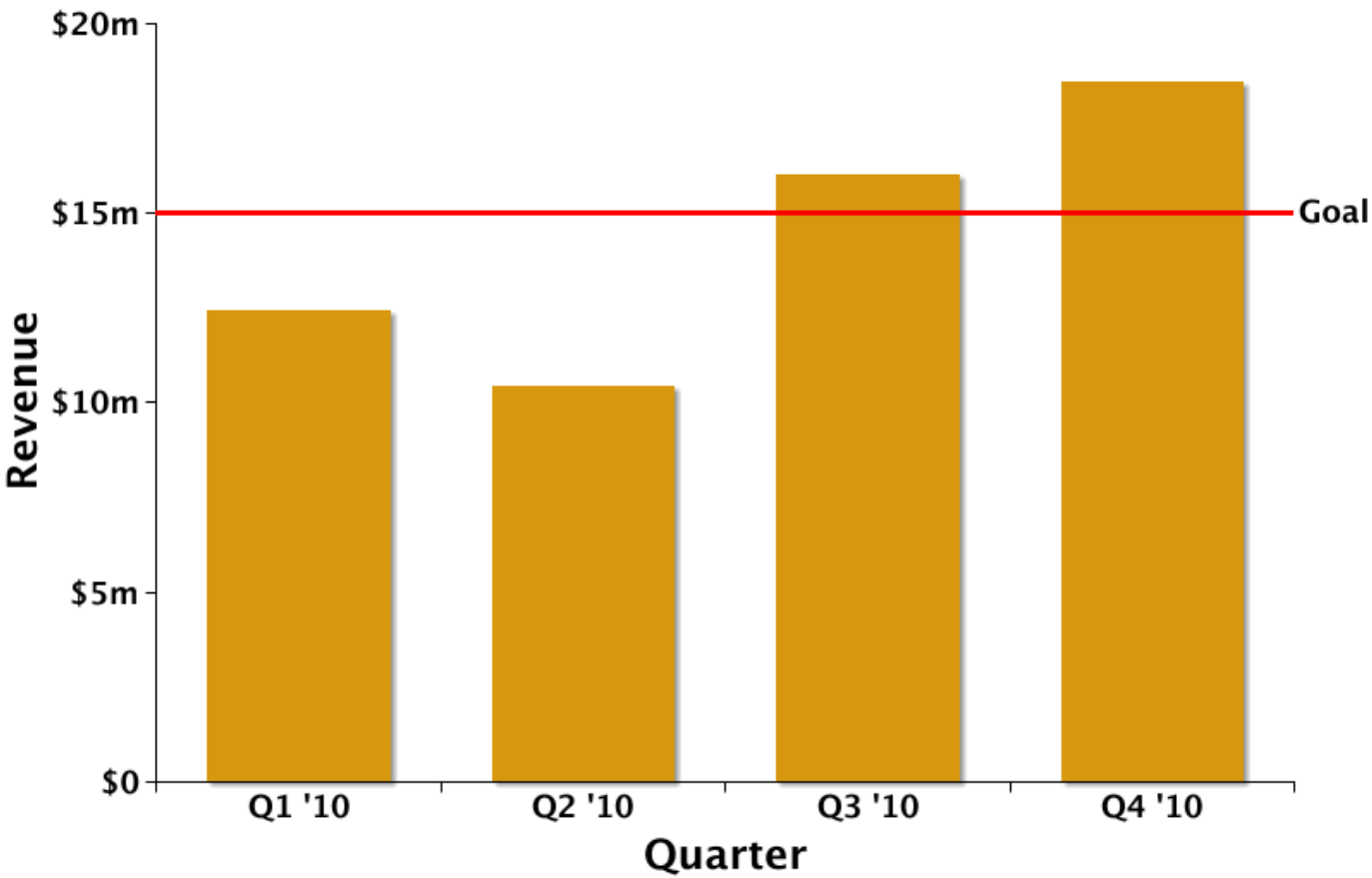
Can the Target, Benchmark, or Range be relative instead of absolute?

Is there consensus on these between CXOs, Managers, and Workers?

If there is a yearend target, can I interpolate milestones to compare against?



4. Assign Goals, Targets, and Benchmarks **CORDA**





Exercise #1

Design a KPI to answer this question...

- What is my Profit Margin, and am I meeting my target?

From the Framing Statement...

“Increase Profit Margin to 25% by yearend 2010, and 30% by yearend 2011”

Profit Margin KPI	
Measure	Profit Margin
Dimension	Span-of-Time (Since Jan-01-2010, by Quarter)
Compare to	25% for 2010, 30% for 2011



5. Add Structured Navigation, and Structured Analysis

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Which do you want in your Dashboard?

a) Ad Hoc Query Capability

b) Structured Navigation and Structured Analysis



Add structured navigation and structured analysis rather than ad hoc query capabilities

What detail behind the KPI is meaningful (drilldown path)?

What other ways would the user need to view this KPI?



Exercise #1

Design a KPI to answer this question...

- What is my Profit Margin, and am I meeting my target?

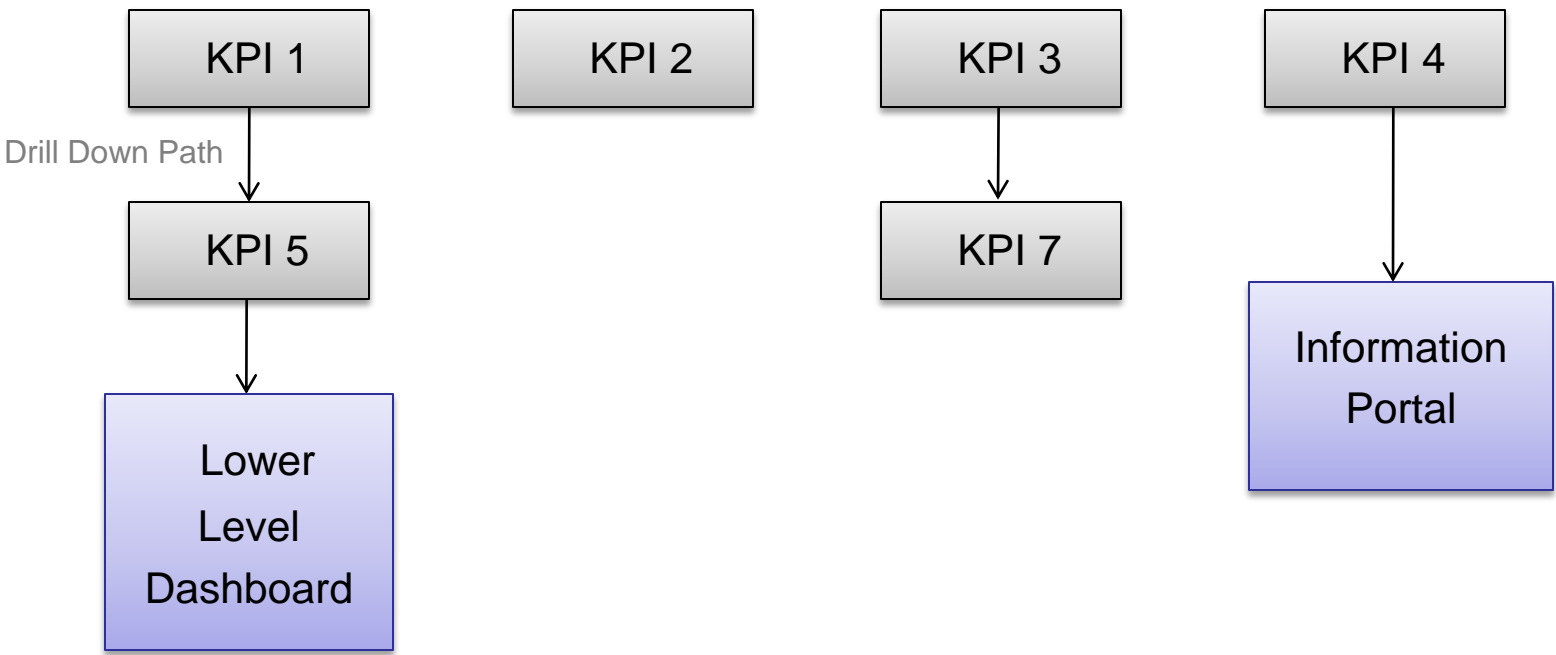
From the Framing Statement...

“Increase Profit Margin to 25% by yearend 2010, and 30% by yearend 2011”

Profit Margin KPI	
Measure	Profit Margin
Dimension	Span-of-Time (Since Jan-01-2010, by Quarter)
Compare to	25% for 2010, 30% for 2011
Drill to	Breakdown of actual cost of goods for each quarter



Diagram your KPIs to Show Navigation Structure





6. Determine your Indicator Types

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Types of Indicators

- **Outcome Indicators**

Indicates past or current performance

- **Driver Indicators**

Indicates future performance



1. Outcome Indicators

- Quarterly Revenue
- Customer Satisfaction
- Monthly Help Desk Calls

2. Driver Indicators

- Sales Calls → Quarterly Revenue
- Product Quality → Customer Satisfaction
- Monthly Self Service Incidents → Monthly Help Desk Calls



Identify the indicator type of each KPI

Profit Margin KPI	
Measure	Profit Margin
Dimension	Span-of-Time (Since Jan-01-2010, by Quarter)
Compare to	25% for 2010, 30% for 2011
Drill to	Breakdown of actual cost of goods for each quarter
Indicator Type	Outcome



Driver Indicators can be tremendously useful in a performance dashboard.

Do you have the right mixture of outcome and driver indicators?

Go through each of your Outcome indicators and list any factors that you think could end up being a Driver indicator. Decide whether or not the link is meaningful enough for you to consider adding this indicator to your dashboard.

Is the Driver Indicator Causative or Correlative?



Profit Margin KPI	
Measure	Profit Margin
Dimension	Span-of-Time (Since Jan-01-2010, by Quarter)
Compare to	25% for 2010, 30% for 2011
Drill to	Breakdown of actual cost of goods for each quarter
Indicator Type	Outcome

What are some possible Driver Indicators for this KPI?



What are the key behaviors that affect this KPI?

Does it make sense to measure and track some or all of the Key behaviors?

At a minimum the key behaviors should be communicated and reinforced regularly to the employees.

As you track KPIs over time more key behaviors will be revealed.



7. Check Data Availability

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Can this metric be accurately measured?

Is there a data source available for this measure?

Will IT give me access to this data?

Is the data available for the benchmark that you are comparing yourself against?

Is the data updated frequently enough?

Is the data feed reliable and accurate?

Is the data contaminated?



8. Check for Compliance and Balance

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Compliance

Does the KPI use standard definitions and terms that everyone will understand the same?

Is the calculation for this KPI one that everyone agrees with?

Is the KPI easily understood, or is it cryptic?

Is it a calculation that is hard to understand, and explain?



Balance

Is this a balanced measure?

Will optimizing this measure cause another measure to go out of wack?

You don't want to end up playing the wack-a-mole game





Balance

High-level Strategic	Organizational Management / Real-Time Operational
<ul style="list-style-type: none">•Financial•Customer•Operations•Learning & Growth <p>(Balanced Scorecard)</p>	<ul style="list-style-type: none">•Efficiency•Effectiveness•Productivity•Profitability•Quality•Customer Satisfaction•Employee Satisfaction



Balance

Organizational Management / Real-Time Operational

- Efficiency
- Effectiveness
- Productivity
- Profitability
- Quality
- Customer Satisfaction
- Employee Satisfaction

Profit Margin KPI

Measure	Profit Margin
Dimension	Span-of-Time (Since Jan-01-2010, by Quarter)
Compare to	25% for 2010, 30% for 2011
Drill to	Breakdown of actual cost of goods for each quarter
Indicator Type	Outcome
Perspective	Profitability



Balance

Can this KPI be “gamed”?



9. Assign Owners and Users. Assign Triggers and Alerts

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Assign Owners for each KPI

Business Owner

- Understands the KPI
- Can answer questions about the KPI
- Is responsible for the KPI

Data Owner

- Is in charge of the data integrity
- Can answer questions about the data feed



Assign Users

Who gets to see what?



Assign Triggers and Alerts

- Is there an alert state for this KPI?
- Is it an visual alert, or a notification alert?
- How often will the KPI need to be monitored for the alert state?
- Who will receive the alert notification?



You ended up with too many KPIs

You ended up with too few KPIs

4 – 6 Measures is optimum

80/20 rule



Your company strategy offers no insight into what your framing statement should be

...OR...

Your goal is simply to do more with less, or to grow faster

... How then do I choose my KPIs?



Your company strategy offers no insight into what your framing statement should be

...OR...

Your goal is simply to do more with less, or to grow faster

... How then do I choose my KPIs?

You must take the fitting approach to choosing your KPIs

- 1) Assemble a list of potential KPIs
- 2) Carefully consider whether they are strategic to you
- 3) Do not measure for the sake of measuring



Don't wait for perfection or total consensus before deciding on your KPIs.

Designing your KPIs is an iterative process, and your business needs will change over time.

Get your best guess up in phase one and utilize iterative refinements to arrive at the perfect set of KPIs.



Keys to Successful Deployment

CORDA®



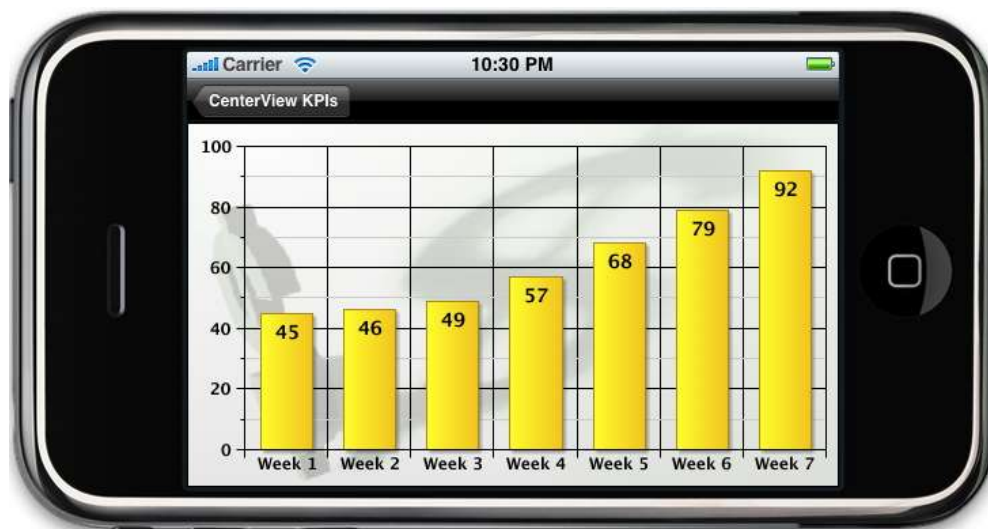
How do you get your people to use the dashboard system?

The Three Keys to User Adoption,

1. Make it Relevant
2. Make it Personalizeable
3. Make it Actionable



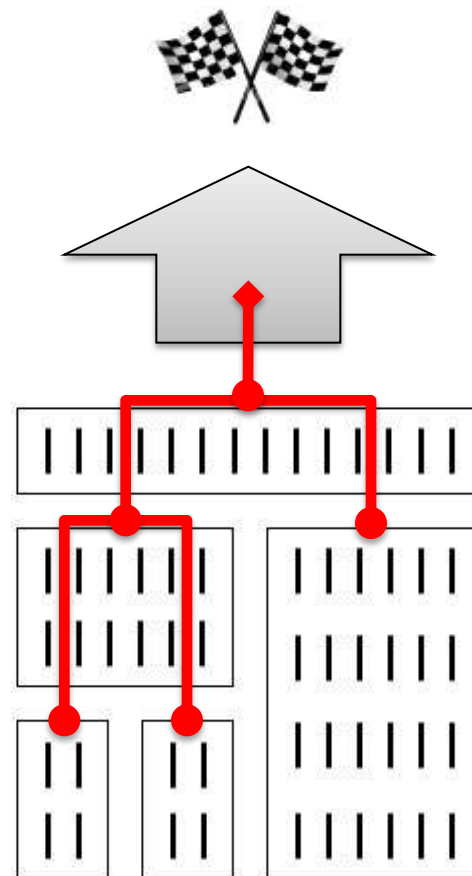
Do you need a mobile solution?





Optimize Your Alignment

Utilize a Dashboard Hierarchy to align effort and focus





Handling Responsibility and Accountability

- 1) Let Them Know you are Watching
 - Review results regularly in meetings
 - Refer to the dashboard regularly

- 2) Tie to Compensation or Perks
 - Do this carefully
 - You get what you pay for
 - Watch for “gaming the system”



**Dashboard
System Portal**



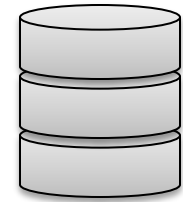
**The Dashboard becomes an entry point
for all of your BI systems**

This Creates the “Actionable” Dashboard

**Existing Applications
and Data Sources in
your Enterprise**



Legacy Systems



Databases



Spreadsheets



Companies that have transformed their business with Actionable dashboards

Old Dominion Freight Line (Logistics Dashboard)

– 2009 CIO 100 Award

Prudential Law Department (Operational Dashboard)

– Inside Counsel Magazine's 2009 Top Ten Innovative Law Departments

Montgomery County, MD (Operational Dashboard)

– NACo Award for creative use of real-time Performance Dashboards

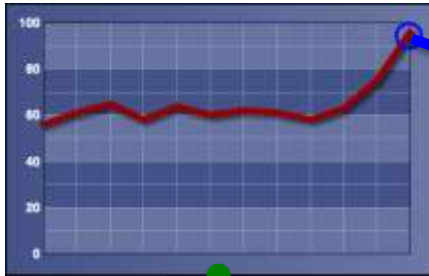


Actionable Dashboards

CORDA[®]

An effective dashboard will let you take action immediately once a problem is discovered

A potential problem is noticed



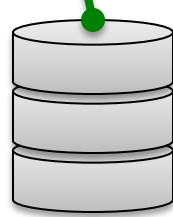
Drill down into the details

State	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Alabama	4,497,199	4,452,327	4,468,831	4,481,876	4,503,726	4,536,189	4,576,189	4,623,189	4,676,189	4,736,189
Alaska	628,832	627,339	632,599	640,841	649,282	659,438	670,594	682,750	695,906	710,062
Arizona	5,138,632	5,165,984	5,206,840	5,259,691	5,324,542	5,391,393	5,460,244	5,531,095	5,603,946	5,678,797
Arkansas	2,073,488	2,078,551	2,082,614	2,087,677	2,092,740	2,097,803	2,102,866	2,107,929	2,112,992	2,118,055
California	33,071,848	34,002,487	34,933,126	35,863,765	36,794,404	37,725,043	38,655,682	39,586,321	40,516,960	41,447,599
Colorado	4,301,181	4,327,020	4,427,289	4,495,077	4,574,865	4,654,653	4,734,441	4,814,229	4,894,017	4,973,805
Connecticut	3,465,085	3,422,282	3,433,243	3,459,900	3,496,900	3,534,400	3,571,900	3,609,400	3,646,900	3,684,400
Delaware	493,689	495,491	497,293	499,095	500,897	502,699	504,501	506,303	508,105	509,907
District of Columbia	572,239	571,840	569,406	564,643	557,632	548,621	537,610	524,599	509,588	492,577
Florida	11,062,376	11,244,831	11,433,286	11,627,741	11,828,196	12,034,651	12,247,106	12,465,561	12,689,016	12,918,471
Georgia	8,106,483	8,239,887	8,381,291	8,531,695	8,691,100	8,859,504	9,036,908	9,223,312	9,418,716	9,623,120
Hawaii	1,211,537	1,212,139	1,212,811	1,213,514	1,214,257	1,215,040	1,215,863	1,216,726	1,217,629	1,218,572
Idaho	1,263,903	1,269,677	1,276,238	1,283,599	1,291,760	1,300,721	1,310,482	1,320,943	1,332,104	1,343,965
Illinois	12,419,283	12,491,674	12,570,441	12,656,204	12,749,067	12,849,030	12,956,093	13,070,256	13,191,519	13,319,882
Indiana	6,066,483	6,061,640	6,127,732	6,204,237	6,291,242	6,388,747	6,496,752	6,615,257	6,744,262	6,883,267
Iowa	2,928,124	2,928,430	2,931,543	2,934,726	2,941,976	2,951,226	2,961,476	2,972,726	2,984,976	2,998,226
Kansas	4,468,676	4,468,631	4,468,532	4,477,940	4,488,948	4,500,956	4,513,964	4,527,972	4,542,980	4,558,988
Kentucky	1,174,602	1,177,383	1,181,633	1,187,383	1,193,633	1,200,383	1,207,633	1,215,383	1,223,633	1,232,383
Louisiana	3,298,496	3,211,588	3,179,401	3,161,214	3,147,027	3,136,840	3,129,653	3,124,466	3,121,279	3,119,092
Maine	639,697	639,652	639,607	639,562	639,517	639,472	639,427	639,382	639,337	639,292
Maryland	6,028,444	6,028,399	6,028,354	6,028,309	6,028,264	6,028,219	6,028,174	6,028,129	6,028,084	6,028,039
Massachusetts	4,912,478	4,912,433	4,912,388	4,912,343	4,912,298	4,912,253	4,912,208	4,912,163	4,912,118	4,912,073
Michigan	2,644,668	2,648,731	2,653,794	2,659,857	2,666,920	2,674,983	2,683,046	2,691,109	2,699,172	2,707,235
Minnesota	3,393,211	3,393,166	3,393,121	3,393,076	3,393,031	3,392,986	3,392,941	3,392,896	3,392,851	3,392,806
Missouri	822,278	822,233	822,188	822,143	822,098	822,053	822,008	821,963	821,918	821,873
Montana	1,711,283	1,711,238	1,711,193	1,711,148	1,711,103	1,711,058	1,711,013	1,710,968	1,710,923	1,710,878
Nebraska	1,098,337	1,098,292	1,098,247	1,098,202	1,098,157	1,098,112	1,098,067	1,098,022	1,097,977	1,097,932
New Hampshire	1,130,789	1,130,744	1,130,699	1,130,654	1,130,609	1,130,564	1,130,519	1,130,474	1,130,429	1,130,384

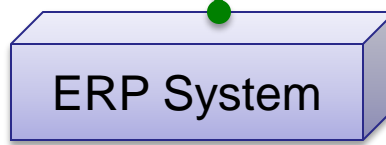
Drill to the source of the problem

A screenshot of the Salesforce CRM interface. The main content area displays a record for 'NO CONTRACTS'. The record includes fields for 'Contract Number', 'Contract Date', 'Contract Type', 'Contract Value', and 'Contract Status'. The 'Contract Status' field is highlighted in red, indicating a problem. The interface also shows a sidebar with navigation options and a top navigation bar.

Data Sources



Database



ERP System

salesforce.com.



Actionable Dashboards

CORDA[®]

An effective dashboard will let you take action immediately once a problem is discovered



A problem shows up

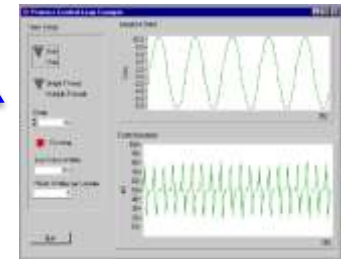


Drill to a historic report

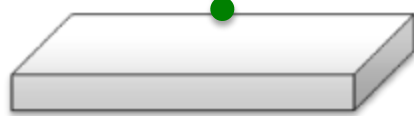


Drill to an integrated web application

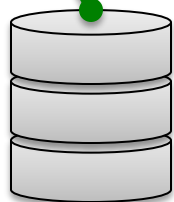
-  Schedule Repair
-  Remote Test



Data Sources



Monitoring System



Database



1. Executive buy-in and project definition workshop
2. Readiness assessment; plan creation and execution
3. Best practice look and feel design
4. Actual dashboard implementation
5. System infrastructure design and deployment
6. Dashboard deployment and feedback

The Executive Workshop



- Gain buy-in at top levels
- Allocate valuable resources
- Establish vision of what's possible
- Determine timeline, goals, success factors



Data Readiness Assessment

➤ Determine *consumable readiness* of every key data element

➤ Identifies data challenges early in the project; aids effectively remediation

➤ Ensures a dashboard with data that is accurate and timely

➤ Enables good user experience with fast performance

➤ Inspires user confidence in the data

➤ Ensures corporate security rule compliance



Best Practice Look and Feel Design



- Communicates the data in an easily understood way to the user audience
- Tells a compelling “story”
- Advances acceptance and actual usage of the dashboard by the target user audience
- Delivers an end experience that leverages color, space, animation, user interaction, drill paths and other features in a way that respects good design concepts.

Dashboard Implementation



- Project plan documents serve as a communication tool for all parties
- Detailed design plan helps to manage 'scope creep'
- Project progress can be easily measured vs. plan
- Inevitable changes are efficiently managed

Infrastructure Design and Deployment

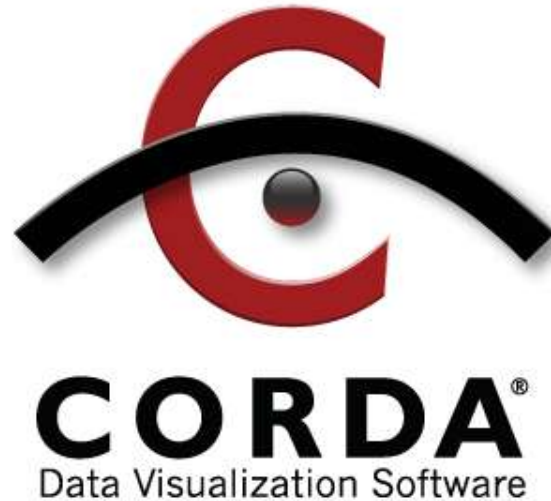


- Detailed planning helps to eliminate expensive surprises (dollars and/or time cost)
- Involves other organizational groups early in the process to get buy-in and to respect their availability
- Results in a robust, stable infrastructure environment with great performance

Dashboard Deployment and Feedback



- Gain feedback from a small group that is highly interested in the success of the dashboard
- Limit exposure of any unexpected data, design or software issues to a small group
- Tuning the dashboard with user feedback results in a solution that better meets needs of the community and drives acceptance and value



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