

Collecting and Managing Data

2005 Show-Me The Measures Summit

Jefferson City, Missouri

July 13, 2005

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Office of Social & Economic Data Analysis (OSED)

Overview of Presentation

- What are “data” and why do we care?
- The focus of *performance measurement*
- Collecting Data (types, methods, issues)
- Managing Data (coping with complexity)
- Discussion

Selected Sources, Links and References—web links at...

www.oseda.missouri.edu

Context provides meaning and relevance to data

- Data
- Information
- Knowledge
- Wisdom

“The construction of knowledge involves the orderly loss of information, not its mindless accumulation.” Kenneth Boulding

How do we know we're asking the
“right” question and answering it in
the “right” way?

*We need a contextual framework—
a theory of action.*

Frameworks for Performance Measures and Decisions

- **Basic research**
 - Theories lead to hypotheses
- **Policy (applied) research**
 - Policy frameworks focus key questions and *indicator requirements*

Review of some performance measurement frameworks guiding data collection choices

- Budget guidance (State of Missouri)
- Utilization focused evaluation (Patton)
- Program logic models (Kellogg Foundation)
- Balanced score card (State of Missouri OIT)
- Local government (Fairfax County, Virginia)

Missouri State Budget Guidance

Policy Measures of...

- Effectiveness (success or impact)
- Efficiency (ratio of outputs to inputs)
- Clients/Individuals Served
- Customer Satisfaction, if available

Utilization Focused Evaluation

- Who are the decision makers
- What are the decisions
- Reducing the risk of making decisions

There is always an implicit programmatic decision...
sustain, increase or decrease support

Evaluative Decisions (eMINTs)

- If the students in the high-tech classrooms score better than the other students, we will expand eMINTs. (Otherwise, we will allocate resources elsewhere.)
- Because inquiry-based instruction and good tech support are critical to impact, we will monitor both and augment if needed.

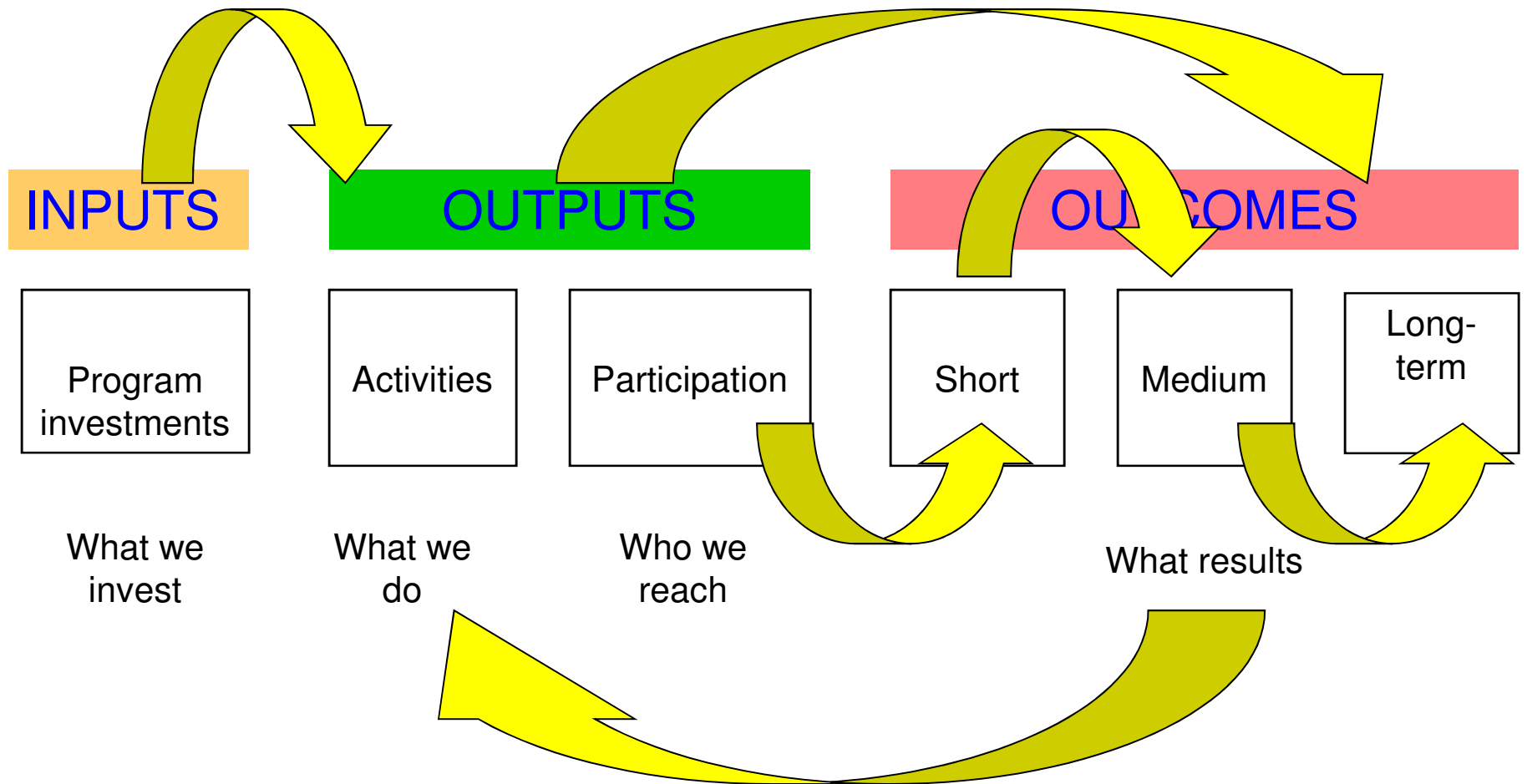
Source: www.oseda.missouri.edu/educational_reports/

The program logic model

- The program logic model is “a picture of how your organization does its work—the theory and assumptions underlying the program.”

Source: W.K. Kellogg Foundation (2004), Logic Model Development Guide, Battle Creek, Michigan.

Programs have *logical* (if then) relationships about which we can inquire and develop performance indicators and collect data.



Indicator strategies for elements of a program logic model

- Resources
 - Compare actual resources to anticipated
- Activities
 - Compare actual activities and participation levels
- Outputs
 - Compare quality & quantity of service delivery
- Outcomes & Impacts
 - Compare baseline indicators before and after

Balanced Score Card

- Stakeholders
- Customers
- Business Processes
- Financial Issues
- Learning & Growth
- Objectives
- Measures
- Definition
- Targets (rubrics)
- Actions

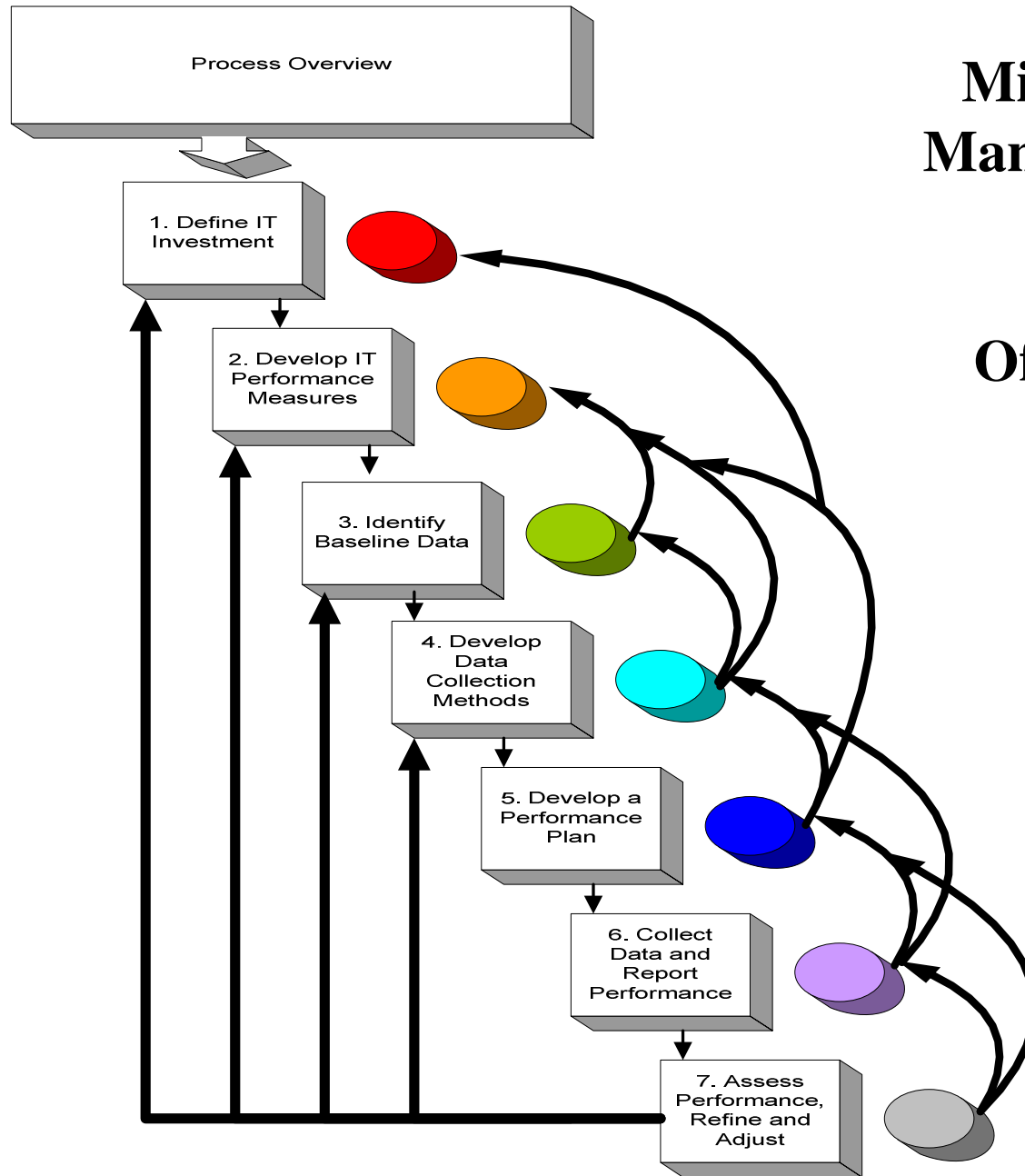
Missouri Performance Management Framework

State of Missouri

Office of Information Technology

December, 2004

Planning Process



Missouri, OIT Data Collection Planning Process Guides

- Identifying data & gathering baseline data
- Determining data availability
- Developing a data collection method
- Questions for validating data collection

Source: State of Missouri, Office of Information Technology (2004), Missouri Performance Management, Part II: Performance Management Process and Core Measures.

Fairfax County—Data Collection for Performance Measurement Process and Documentation Steps

- Define objectives
- Design data collection process
- Test the collection method
- Gather the data
- Analyze the data
- Use the data
- Refine and improve processes
- Data Definition
- Collection Process
- Data Sources
- Data Manipulation
- Explanatory Data

Source: Fairfax County, Va., Department of Planning and Budgeting (2005),
Manual for Data Collection for Performance Measurement.

So, there are many types of performance measurement frameworks

- Budget guidance (State of Missouri)
- Utilization focused evaluation (Patton)
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Asking the right question in the right way:
many alternative frameworks

The point is that *the meaning, usefulness and cost effectiveness of indicators depends on the indicator's connection to decisions implicit in the conceptual framework adopted by the program.*

Disconnected data are not really “indicators” and rarely become “information” or “knowledge.”

Asking the right question in the right way:
many alternative frameworks

The challenge is not to merely capture data, but to use “information” to manage for results.

Because data collection is often expensive, it is wise to be “connected.” Good performance frameworks include planning guides to help accomplish this essential task (see links).

Dimensions of Data Collection

- Types of Data
- Data Collection Issues
- Data Collection Strategies
- Data Collection Methods

Types of Data

- **Quantitative** (counts, rates, means, closed-ended questions)
 - “hard”
 - Requires adequate statistical treatment
 - Require clear context for interpretation
- **Qualitative** (focus groups, case studies, open-ended questions)
 - “soft”
 - Requires interpretation
 - Can be powerful or perceived as self-serving

Data Collection Issues

- Validity and Reliability
 - Reproducible—transparent—public
 - Consistent—accurate—precise
 - Number of Cases
- Timeliness and Frequency of Measurement
 - Lagging indicators
 - Infrequent sources (U.S. Census)

Data Collection Issues

- Representative Measures
 - Selection bias – (intended or otherwise)
 - Types of sampling (cluster, stratified)
- Confidentiality (HIPAA/IRB)
- Historical and future availability (trends)
- Disaggregation categories (NCLB)
- Security (encryption, personnel, servers)

Data Collection Strategies

- Quality Assurance
 - Field control—training
 - *Pilot testing*
 - *Ongoing Monitoring*
 - Documentation
- Units of Analysis (smallest appropriate)
 - Data linkage (merging)
 - IDS and Confidentiality – extract files (without ids)
 - Careful about size of files (data handling – transfers)


Data Collection Strategies

- Proxy Measures
 - “Proxy measures of health care status”
 - “Mothers’ level of education”
 - “repeat clients”—”customer satisfaction”
- Collaborations
 - Sharing existing data files
 - Bundling effort (teams, samples, infrastructure)
 - MOUs
- Stratified Sampling (categories of interest)

Data Collection Methods

- ↙ Existing Data
 - ↙ Secondary Data Sources
 - ↙(Census, MCDC, MICA, MERIC, OSEDA)
 - ↙ Agency Files and Records (Access)
- ↙ New Data Collection (adjusting practices)
 - ↙ Clear planning (roles and responsibilities)
 - ↙ Direct Costs
 - ↙ Impact on Business Practices
 - ↙Personnel
 - ↙Impact on Transaction files

Publications	Data Archives	Projects	Presentations	Contact	Search
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Office of Social and Economic Data Analysis

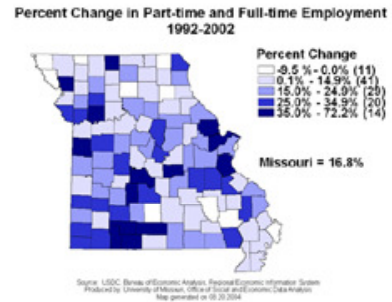
Transforming Data into Information

- Home
- [About OSEDA](#)
- [Staff](#)
- [Register as a User](#)
- [Related Sites](#)

- Events**
- MCDC Training Conference**
July 25, 2005
Columbia, Mo.
 - 44th Annual Cooperative Conference for School Administrators**
July 31-August 2, 2005
Osage Beach, MO

Full- and Part-time Employment by County and Region

All but 11 Missouri counties increased in total full- and part-time employment from 1992-2002. Six of those 11 counties are located in rural north Missouri with an additional three located in the rural southeast part of the state.



Changes in Wage and Salary Employment, 1992-2002

Of the 2,977,374 total employed in 1992, 2,469,417 were employed as wage and salary workers (82.9 percent of total employment). However, there were significant differences among the counties in the amount of change. At the two extremes there were 17 counties which had a decline in wage and salary employment from 1992-2002, while there were 43 counties in which wage and salary employment increased by more than 20.0 percent.

Missouri Ranks 16th Nationally in Total Full- and Part-time Employment 2002


According to the 2002 BEA employment report by states Missouri had 3,477,873 full- and part-time workers which ranked 16th

- OSEDA Features**
- [MoDOT SEIR](#)
 - [DESE SEIR](#)
 - [MCDC](#)
 - [Community Connection](#)
 - [KidsCount](#)
 - [Regional Profiles](#)
 - 2000 Census
 - Beyond 2000
 - [Project Success](#)
 - [Close the Gap](#)
 - [Step by Step](#)
 - [County Facts](#)

- Collaborations**
- OSEDA projects are always collaborations. In this section we highlight a project each month that is in early stages of development in order to invite comment and possible participation.
- Missouri Project Success**
Missouri Project Success works cooperatively with local school districts to: 1) Overcome difficulties meeting Missouri School Improvement Program performance standards, and 2) Encourage long term, sustainable school improvement

U.S. Census Bureau

Statistical Abstract of the United States

[PDF] or  denotes a file in Adobe's [Portable Document Format](#). To view the file, you will need the [Adobe® Acrobat® Reader](#) available for **free** from Adobe.

Note: If you experience difficulty printing Statistical Abstract tables to HPPCL printers, please read this [technical note](#).

To view: [1995-2000](#)

Section	2001	2002	2003	2004-2005
Section 1. Population	1-67	1-65	1-82	1-69
Section 2. Vital Statistics	68-118	66-111	83-126	70-113
Section 3. Health and Nutrition	119-204	112-197	127-216	114-201
Section 4. Education	205-290	198-282	217-304	202-288
Section 5. Law Enforcement, Courts, and Prisons	291-342	283-334	305-358	289-345
Section 6. Geography and Environment	343-377	335-369	359-395	346-383
Section 7. Elections	378-412	370-404	396-430	384-416
Section 8. State and Local Government Finances and Employment	413-456	405-448	431-474	417-460
Section 9. Federal Government Finances and Employment	457-489	449-483	475-508	461-491
Section 10. National Defense and Veterans Affairs	490-517	484-509	509-533	492-517
Section 11. Social Insurance and Human Services	518-566	510-559	534-586	518-568
Section 12. Labor Force, Employment, and Earnings	567-639	560-630	587-658	569-640
Section 13. Income, Expenditures, and Wealth	640-690	631-679	659-711	641-696
Section 14. Prices	691-709	680-698	712-730	697-715
Section 15. Business Enterprise	710-766	699-751	731-781	716-763
Section 16. Science and Technology	767-795	752-780	782-804	764-786
Section 17. Agriculture	796-845	781-831	805-852	787-840



No. 420. Government Current Receipts and Expenditures by T 1990 to 2003

[In billions of dollars (1,707.8 represents \$1,707,800,000,000). For explanation of national income comprehensive National Income and Product Accounts (NIPA) revision was released on December information on this revision of NIPA, go to www.bea.doc.gov/bea/dn/2003benchmark/CR2003content indicates a deficit.]

Item	1990	1995	1998	1999	2000	2001
Current receipts	1,707.8	2,212.6	2,724.2	2,895.0	3,125.9	3,125.9
Current tax receipts	1,161.9	1,517.2	1,911.7	2,036.2	2,206.8	2,206.8
Personal current taxes	592.8	744.1	1,027.0	1,107.5	1,235.7	1,235.7
Taxes on production and imports	425.5	558.2	639.8	674.0	708.9	708.9
Taxes on corporate income	140.6	211.0	239.2	248.8	255.0	255.0
Taxes from the rest of the world	3.0	3.9	5.7	5.9	7.3	7.3
Contributions for government social insurance	410.1	532.8	624.2	661.4	702.7	702.7
Income receipts on assets	98.7	92.1	102.4	106.8	117.4	117.4
Interest and miscellaneous receipts	98.4	91.1	100.7	105.0	115.6	115.6
Dividends	0.2	1.0	1.7	1.8	1.9	1.9
Current transfer receipts	35.6	59.1	75.5	80.6	93.7	93.7

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Data Collection Methods

↙ Sample Surveys

- ↙ Interviews (direct and phone)
- ↙ Questionnaires (differential response rates)
- ↙ Direct Observation (protocols)

↙ Design issues

- ↙ Instrument construction
- ↙ Sampling
- ↙ Statistical Analysis and reporting
- ↙ Web Applications (Simple—Complex)

Data Collection Methods

↳ Qualitative Methods

- ↳ Focus Groups
- ↳ Case Studies
- ↳ Open Ended Interviews

↳ Design issues

- ↳ “Emergent Issues”
- ↳ Time frames
- ↳ Representativeness
- ↳ Analysis and reporting

Managing Data

- “Only” 52 million Google hits on topic
- Scale, Complexity and Change
- The *World is Flat* (Thomas Friedman)
 - The global integration of computing and communication technologies via the WEB with business practices...including performance measurement
 - For example: SIF” -- School's Interoperability Framework –XML

Coping with Complexity

- Build as simple a plan as possible—determine what you really need & stick to it
- Plan all the way through analysis & reporting
- Build a capable team to work your plan
- Consider both internal and external talent
- Adopt an appropriate approach
 - e.g. Kellogg, Missouri Project Management, Balanced Score Card.

Selected Davidson's Principles

- Back it up --- Do it now!
- You can't analyze what you don't measure.
- Take control of the structure and flow of your data—save a copy of the original data.
- Change awareness—keep a record of data changes and manipulations (diagrams help).
- Implausibility—always check for outliers.

Source: Davidson, Fred, (1996) Principals of Statistical Data Handling, Sage Publications, Thousand Oaks, Ca.

Helpful Data Management Tools

- Database management systems
 - Pick up trucks (Access) and dump trucks (SQL)
 - Design, Design and Design (Architecture)
- Statistical analysis systems (SAS, SPSS)
- Spreadsheets -- Graphics
- Geographic Information Systems (GIS)
- Web applications
 - “dynamic” On-line analytical processing (OLAP)
 - “dynamic looking” -- Menu guided pages with tables and charts (gif) images

Data Collection Public Resources

- Universities
 - Truman School – affiliated centers
 - Extension – OSEDA
- State agencies, including..
 - MERIC (DED)
 - Missouri Information for Community Assessment (MICA) (DHSS)
 - MCDC – Missouri Census Data Center

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Related Sites Demographics

Missouri:

[Missouri Census Data Center-MCDC](#) - is the state's official site for census-related data. It is a partner of the U.S. Census Bureau.

[Missouri Economic Policy and Research Center](#) - provides a diverse database extraction system that is the basis for the Missouri Statistical Abstract for counties.

[Missouri Spatial Data Information Service-MSDIS](#) - is a data retrieval and archive system that provides geographic information systems and census data about the state of Missouri to the public by way of anonymous FTP and this World Wide Web site.

[Missouri Office of Administration, Budget and Planning](#) is home for the state demographer. In addition to releasing budget reports for the state, the official population projection estimates are housed here.

[Missouri Economic and Research Information Center-MERIC](#) is an entity of the Missouri Department of Economic Development. This site provides comprehensive analysis of key economic indicators for Missouri counties by economic regions.

[The Center for Agricultural, Resource and Environmental Systems-CARES](#) - provides an interactive map utility for various social and economic indicators and has built a number of applications for analyzing different scenarios of the data. An online atlas for Missouri counties is also available from this site.

Beyond Missouri:

[U.S. Census Bureau](#) - provides results from the decennial census surveys and produces a number of indicators for public use like poverty estimates.

[Statistical Abstract of the United States](#) - contains a collection of statistics on social and economic conditions in the United States. Selected international data are also included.

[State Data Center Clearinghouse](#) - provides an up-to-date account on issues and activities of the state data center participant agencies. It is a platform that provides collaboration between the



Performance Measurement Links

you are here: [homepage](#) > [government](#) > [county budget and finance](#) > performance measurement links

This site has links to the following five categories:

- [Local Government Sites](#)
- [State Government Sites](#)
- [Federal Government Sites](#)
- [Associations, Universities and Other Sites](#)

Budget Documents

- [Budget Archives](#)
- [FY 2006 Adopted Budget Facts](#)
- [FY 2006 Pay Plans](#)
- [Citizen's Guide To The Budget](#)
- [Overview](#)
- [General Fund \(Vol 1\)](#)
- [Capital Construction and Other Operating Funds \(Vol. 2\)](#)
- [Economic Indicators & Index](#)
- [Inventory of County Activities, Programs and Services \(ICAPS\)](#)
- [Carrvoer](#)
- [Capital Improvement Program](#)

Local Government Sites

[Sunnyvale, California](#)

The Adopted Budget for 2004-2005 can be found at this site.

[Orange County, Florida](#)

Performance Measurement data by department is available in the [2005 Budget](#). The manual for Orange County's [Performance-Based Measurement System](#) is also available online.

[Charlotte, North Carolina](#)

Charlotte's performance measurement/management strategy involves translating mission and vision into tangible and measurable objectives that are results-focused. The City of Charlotte's performance management approach consists of identifying organizational strategy through Council Focus Areas and the Strategic Plan, developing the City's Balanced Scorecard, and developing Key Business Unit and Support Business Unit business plans. The Balanced Scorecard has helped the City of Charlotte translate strategy into actions.

[Portland, Oregon](#)

Discussion -- Questions

Collecting and Managing Data

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July 13, 2005

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Identifying data and performing baseline:

- Determine data requirements and information sources
- Determine data availability
- Match existing data with data requirements for measures
- Document data definitions
- Collect data if available
- Document baselines

Source: State of Missouri, Office of Information Technology (2004), Missouri Performance Management, Part II: Performance Management Process and Core Measures.

Determining data availability

- What are the units of measure?
- What are the required data ranges?
- What is the frequency required?
- If the measure requires compilation of other data,
What are the sub-elements needed?
- If historical data is required, is it readily available?
- Who controls the data?
- Can the data be readily obtained?

Source: State of Missouri, Office of Information Technology (2004), Missouri Performance Management, Part II: Performance Management Process and Core Measures.

Developing a data collection method:

- Identify sources of existing data for each measure
- Establish agreements to collect new data if necessary
- Agree upon roles and responsibilities for data collection
- Determine the impact of the data collection processes
- Document the data sources and systems
- Use automated data collection where possible
- Collect and verify data
- Evaluate relevancy and accuracy of data

Source: State of Missouri, Office of Information Technology (2004), Missouri Performance Management, Part II: Performance Management Process and Core Measures.

Questions for validating data collection:

- How is the measurement taken?
- Who measures?
- When (how often) are the measurements?
- Where are the measurements results sent?
- Where are the results and who is the keeper?
- What is the cost of data collection?
- Who provides the resources to collect data?
- Will data collection significantly alter existing operational processes or negatively influence those who will have to collect the data?

Source: State of Missouri, Office of Information Technology (2004), Missouri Performance Management, Part II: Performance Management Process and Core Measures.