Kentucky Department of Education
May 2014

Kentucky K-12 Data Quality Study

These are the key findings and recommendations for properly managing expectations and improving the understanding of data governance, data quality and data stewardship in the Kentucky Department of Education and all KY K-12 school districts.

Executive Summary

The Kentucky Department of Education (KDE) completed the most comprehensive study on K-12 data governance, data quality and data stewardship in US history in May of 2014. The 10 major findings and recommendations from this yearlong study greatly impacts our data quality work in KDE and KY K-12 school districts going forward for the foreseeable future. For example, the findings/recommendations in this study will help us better understand and manage the data quality expectations of employees within KDE and school districts. There was a time, not too long ago, that: (a) there was an extremely unrealistic expectation that every data element was going to be close to 100% in accuracy and/or needed to be at 100% accuracy, (b) KY K-12 wasn't strategic enough on which specific data elements really needed to be collected and could reasonably be expected to be of high quality, (c) KY K-12 wasn't sensitive enough of the burden/inefficiency of collecting too many data elements, and (d) KY K-12 wasn't frequently enough evaluating the existing data elements already collected and challenging themselves each year on if that data element really still needed to be collected. This study's results will help us manage expectations of data quality, improve the quality of specific data elements and totally remove specific data elements as people come and go over the next 10-20 years within KDE and KY K-12 school districts.

The findings and recommendations of this study also provides an opportunity educate folks on (1) which specific KY K-12 data elements are most and least likely to have a high level of quality, (2) the five factors that have the biggest impact on the quality and level of accuracy of each KY K-12 data element, (3) what can and can't be done to improve the quality of a specific KY K-12 data element, (4) asks how much is it really needed and worth in time, resources and money to improve the accuracy of a specific data element (how big of a hammer or more enticing carrot do you really have and how often can you really use that bigger hammer or more enticing carrot to improve the accuracy of a specific data element) or is the data quality really "good enough" after all, as is, and (5) the 10 basic roles, responsibilities and best practices of data stewards at KDE and KY K-12 school district level.

It's no secret that everyone at the state and local level wants to utilize certain data elements to make the best decisions that most benefit our students, staff and all shareholders throughout Kentucky. KDE's technology office, led an effort to analyze just how well we're doing with different data-related challenges. Do we have the right data systems in place? Who has access to which data elements? Is the data up to date? Is it accurate? These questions lead to other questions and, eventually, they have led to a series of observations and suggested tasks and "best practices" that will serve us well within our KY K-12 school districts and within KDE .

We asked Gartner, Inc. (the world's leading information technology research and advisory company) to review (a) this specific study's findings and recommendations and (b) other independent studies, evaluations, and audits on KY K-12 data systems that have occurred over the last 12 years[1]. Gartner is considered the "Consumer Reports" of the IT industry and we value their input on our work. Any comments in bold and italicized in *orange* font throughout this document represent informal comments by a Gartner K-12 analyst during the initial review of this document.

Therefore this document represents input from many studies from multiple organizations and it serves to point out two things: (1) Kentucky is already doing well with our education data systems and data quality, and (2) as is always the case, there are areas that we need continuous attention and improvement.

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[1] Gartner Group's 2004 IT study of KIDS, Commonwealth Office of Technology's (COT), 2011 Portfolio Analysis of KDE Data Systems, Office of Education Accountability's (OEA) 2013 Data Systems Study, 2013 KY Working Conditions Survey (aka) TELL, 2013 Data Quality Campaign (DQC) results, 2013 Are We Making Progress survey of KDE staff, 2014 State CIO meeting of RTTT states, comprehensive data report on the other 49 states, 2014 KIDS data awareness meetings/training with KDE offices, 2014 meeting with the national DOE, 2014 Gartner's ITscore and 2014 Auditor of Public Accounts' (APA) IT audit.

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Background

The Kentucky Education Reform Act (KERA), enacted in 1990, made many changes to our educational processes to better provide equitable educational opportunities for all Kentucky students. It led to the creation of the Kentucky Education Technology System (KETS), which led to the creation of a statewide "Master Plan" for technology and, to support equity, it required us to create technology standards for all districts to use. Some quick highlights of the KETS program include:

Major Kentucky Achievements Since KETS Began in 1992

- First state to have all districts and schools connected to the Internet and fiber.
- National leader in K-12 cloud based computing and, in many cases, the first and largest to do so in each major category (e.g., financial management with Tyler, e-mail communications with Exchange, document/video storage/delivery with KET/Discovery, instructional improvement system with SchoolNet/Pearson). *Saved significant $$$ and lowered ongoing support costs*
- National K-12 leader in having mandatory product standards in key data systems and infrastructure *Economy of scale... Total Cost of Ownership (TCO) reduction because of standard support possibilities*
- Recognized as Top 5 state access and use in instruction by *Edweek*
- Recognized as a Top 3 state by Data Quality Campaign
- Equity of access and services
- Stewardship of taxpayer funds
- Recognized as Top 10 state in education quality by *Edweek*

As noted above, one key component of KERA was the mandatory standardization of key technology systems, including several critical data systems (e.g., financial management, student information, user authentication, assessment, e-mail communications, and Internet connections/access). Having a single standard for these products has allowed Kentucky to significantly reduce *direct and indirect* costs, ease support costs and expedite systems integration (e.g., integrating student, assessment and financial data into the Instructional Management System (IMS), Kentucky P-20 Data System and Kentucky K-12 Open House). Kentucky is the only state to have required state product standards for all of these data systems and, according to a previous Gartner study of Kentucky, "no state has successfully standardized statewide applications for education to the extent of Kentucky. KDE is potentially saving millions through this strategy." The Gartner study also highlighted the financial benefits Kentucky has seen as it relates to:

- Standardized products allow the products themselves to cost less due to the scale of the purchase
- Training cost savings - with fewer platforms, there are fewer products on which to be trained. More importantly, as people transfer from one part of the organization to another, there is no loss in productivity due to lack of training. *Or district to district or want to share training costs or lessons learned, etc.*
- Help desk support - fewer products to support reduces the complexity of the help desk environment and enables an enterprise help desk consolidation, providing consistent service to everyone in the organization
- State master contracts for hardware, software and services save considerable amounts of money due not only to the cost of the product, but also due to the challenges avoided by managing many smaller contracts, procurement processes and relationships with partners throughout the state

However, even with all those advantages of having state product standards in Kentucky, if it is a requirement that every student, teacher and administrator in KY K-12 uses a product standard, then that means the product needs to

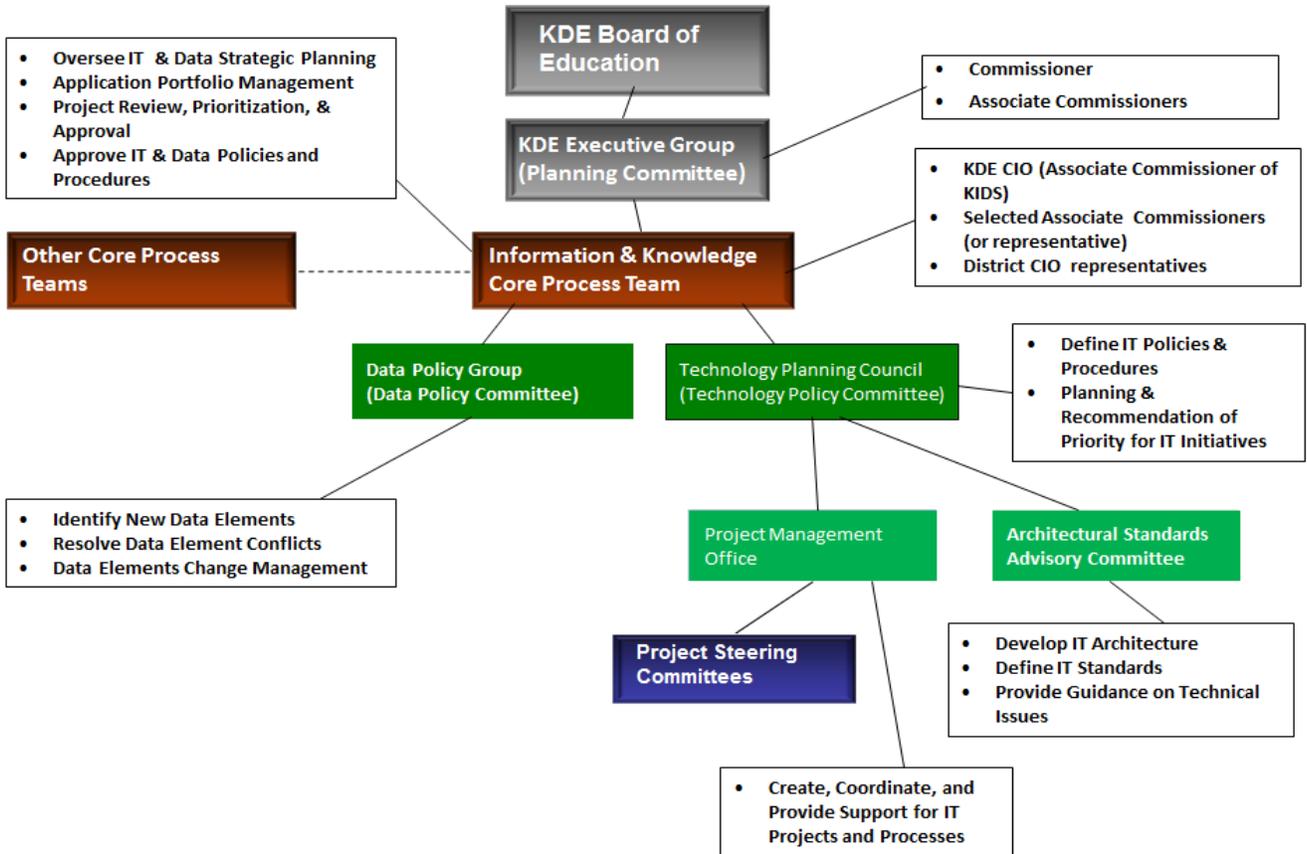provide a very good experience for them.

The Need for "Data Governance" and KDE's Response

With so much data to be managed, one industry term that developed was "data governance." Data governance involves the overall management of data, including its availability, accuracy, security and usability. In large organizations, data governance can involve a governing body, policies and procedures related to data and a plan to execute those policies and procedures. You'll also see references to "data stewards". Data stewards are those who are responsible for the accuracy and upkeep of data elements.

After a 2004 Gartner study of the KIDS organization, we implemented Gartner's recommendation for data governance as shown in the complex chart below. A Data Policy Committee (DCP) was created, consisting of data stewards from every KDE office and chaired by KDE's chief data officer (CDO). This committee coordinates the collection, definition, creation, modification and removal of data elements across KDE. This committee can also be assigned specific projects to work on (e.g., establishing a data collection calendar, data security/privacy). If this committee cannot quickly resolve an issue, it is escalated to the KIDS Core Process Team (KCPT).

The KCPT has representation from every KDE office and is chaired by the KDE Chief Information Officer (CIO). This team approves or modifies data polices and resolves any data-related conflicts. Data policies approved here can be immediately implemented. Nearly every conflict with data coming before this team is resolved by this team or by the CIO working directly with a KDE office Associate Commissioner.

If, due to its importance or controversy, this team cannot resolve a policy issue, one final option exists. The data policy is then brought before the KDE Commissioner or the KDE Planning Committee to provide final resolution on the matter. Much of what is described here is represented in this "KDE Data Governance" chart:

KDE Board of Education

- Oversee IT & Data Strategic Planning
- Application Portfolio Management
- Project Review, Prioritization, & Approval
- Approve IT & Data Policies and Procedures

KDE Executive Group (Planning Committee)

- Commissioner
- Associate Commissioners

Information & Knowledge Core Process Team

- KDE CIO (Associate Commissioner of KIDS)
- Selected Associate Commissioners (or representative)
- District CIO representatives

Other Core Process Teams

Data Policy Group (Data Policy Committee)

Technology Planning Council (Technology Policy Committee)

- Define IT Policies & Procedures
- Planning & Recommendation of Priority for IT Initiatives

- Identify New Data Elements
- Resolve Data Element Conflicts
- Data Elements Change Management

Project Management Office

Architectural Standards Advisory Committee

Project Steering Committees

- Develop IT Architecture
- Define IT Standards
- Provide Guidance on Technical Issues

- Create, Coordinate, and Provide Support for IT Projects and Processes

Top Ten Findings and Best Practice Recommendations

1. **KDE and districts always need to be on a healthy data diet. This includes being very strategic, frugal and selective (i.e., healthy) when (a) identifying the data elements that need to be collected for the very first time and added to the data collection plate, as well as regularly evaluating and challenging themselves on if existing data elements can be taken off the data collection plate, and (b) identifying the data elements that need to be considered as the "most important" and needing the "highest level of accuracy". A selective and limited amount of data elements, that are truly the most needed, fresh and valuable for decision making and have a realistic level of acceptable quality, is an approach that is reasonable and doable from the perspective of those folks in schools, districts and KDE that must supply those data elements.** However, gradually or suddenly adding lots of new data elements that must be collected from districts or KDE program areas without carefully considering the impact on those folks that must provide those data elements, while at the same time not regularly and aggressively removing the data elements that are already collected, quickly leads to a bloated and unmanageable amount of data elements that are collected from districts and KDE program areas. If an enormous and unreasonable amount of data elements are collected, then that directly impacts the ability of the data quality assurance process to keep up with that huge volume, which in turn results in a high number of data elements with low quality. For a sustained healthy data diet, KDE and districts must always be sensitive to the size of the data collection plate, how high they are stacking data elements on that plate, the true necessity/nutritional value of each data element and the expiration date of each data element that they are consuming for critical decision making purposes.

   Well intending employees, sometimes read too much into a new law and collect (a) far more data elements than was intended by the legislators, and (b) far more data elements than can be provided with high quality. Each program area also needs to annually evaluate each data element that they are the data steward for and give a thumbs up or thumbs down on if that data element really still needs to be collected at all or less often or needs to defined differently, as time passes and people come and go, so that data element is still meaningful, valuable, fresh and worthy of collecting. As time passes and as people change positions/organizations, certain data elements go stale, lose their value, are no longer relevant or are totally unneeded. Collecting data elements that no longer need to be collected and retaining them for longer periods than they need to be retained is a data security risk (**http://tinyurl.com/KY-K-12-data-security**). Therefore there is a need for regularly evaluating the current value/need for still collecting/keeping each data element. Outdated and low quality data elements need to be removed from the KY K-12 data diet.

   At the same time, KDE staff and school districts should strive to (a) provide and have a deeper understanding of the existing KY K-12 data systems and the data elements in those existing KY K-12 data systems, and (b) better utilize those existing data system for data-driven decision-making. There are some really great existing data elements that are not being used by some KDE, district and school employees, mainly because of the lack of awareness that these data elements exist. Also if an employee is unaware that an important data element is already being collected and available to them in an existing data system, then they are much more likely to create a duplicative data collection system (e.g., a survey, Excel spreadsheet) to collect that same data element again. This lack of awareness of the existing data systems also has a direct impact on the quality of

that data element since the primary way a data element can improve in quality is if school/district employees and district staff regularly use that data element for decision making.

2. **Data Element Accuracy and Freshness – Quantify It – After there is agreement that a specific data element needs to be collected, checked for completeness and accuracy, then (a) the level of precision (e.g. 99.5% or 90%), (b) frequency that it is collected (e.g., annually, quarterly, etc.) and (c) the specific date of the year it needs to be collected by (e.g., NLT Oct 1st) needs to be agreed upon by everyone who depends on that data element for decision making and reports.** The data steward must be expected to ensure that this quality standard for that data element is reached. Data stewards must have their data steward responsibilities (these are listed in the Appendix) in their formal or informal performance plans that they are evaluated against each year. Other program areas that depend on this data element must both trust and hold that data steward accountable for meeting the accuracy and freshness requirements of that data element versus just doing their own thing and separately collecting that same data element from. Doing your own thing leads to that data element being collected by different organizations, multiple times, which (a) significantly increases the burden on those that must supply that data element and (b) most often leads to a lack of consistency in how that data element is defined and its result between data systems and reports.

3. **Perfect data costs far more than acceptable/useful data. When is the data's accuracy "good enough"?** Some data elements cause a great deal of concern within KDE, with staff members seeking VERY high accuracy (e.g., 99.99%) rather than being content with what may be an acceptable accuracy level (99% as an example) for decision-making purposes. Everyone wants accurate data, but the amount of work (and cost) involved to get that extra 1% in our example may not be worth the benefit that is gained. In some cases, we've erred by having certain individuals, because of their perfectionist personality, spending too much effort to gain an additional fraction of accuracy when data that is "good enough" for effective decision-making could be collected sooner and at a lower overall cost to the overall organization. Senior leaders need to step in and address these perfectionist situations.

4. **When setting expectations for the accuracy of each specific data element, one must always keep in mind the 5 factors that are the best predictors of a data element's quality. KDE and district staff needs to be familiar with these factors when setting their expectation of a data element's quality.**
   1. **Does the school district see added value and regularly use the data element themselves?**
   2. **Does the data element have the power of law behind it? (e.g., is the district or state legally required to collect and maintain it?)**
   3. **Is there another strong incentive surrounding the data element? (e.g. does its accuracy level lead to financial gain/loss, does it create positive or negative press, is it used for other public awareness purposes)**
   4. **Is it important enough for regular inspection and follow-up by district data stewards?**
   5. **Is it important enough for regular inspection and follow-up by state-level data stewards?**

   If the data element doesn't have those first three factors behind it (perception of local value, the power of law, and/or a compelling incentive), then the expected accuracy of that data element by KDE should be very low. The power of law, on its own, may not ensure high data quality. The district may not regularly use that data element internally or may not be convinced of its local added value. If that is the case or if it doesn't seem that low accuracy will result in negative consequences to the

district, then it is very likely that the data element's accuracy will be lower than desired by KDE. The only way to increase accuracy in these situations is to either (a) educate school districts and convince them of the data's value, or (b) provide some other type of incentive/penalty (i.e., a bigger hammer or more enticing carrot) for increased accuracy. As is listed in the Appendix, KDE and our school districts have some significant differences when identifying the data elements they deem most critical for accuracy.

These five factors should be considered as new data elements are considered for collection and also for existing data elements whose usage may be increased. We can use these factors to set realistic expectations for accuracy (e.g., 99.95%, 99%, 90%) for each data element. We should be better able to determine which data elements should have the highest amount of accuracy and which elements may have a lower level of accuracy. As accuracy expectations decrease, we can determine if a data element is "good enough" to use for estimates during planning. If it is determined that a data element is of very low quality, it may become a candidate for elimination or it may be identified as needing to have significantly strengthened quality.

5. **There is a huge difference between the data governance, data stewardship and data quality culture in a private company and a state departments of education (DOE) when compared to school districts. While there is potential to address and improve certain aspects of the initial data entry, ongoing data quality governance, basic data quality stewardship, data system awareness and overall data quality culture in school districts, the reality is for certain things, it's just the way it is in districts, so DOEs will have to recognize that difference and adapt the best they can.** At KDE, we have attempted to follow Gartner's best practices for a data governance structure for the major KY K-12 data systems and also have designated individuals within the organization who are responsible for overall data quality within those systems and integration of the data elements between those systems. However this level of data governance is rare to find in school districts across KY and the school districts in other 49 states. There are some possible explanations for this difference in approach between a DOE and school districts. However, regardless of the reasons, this difference has a huge impact on (a) districts understanding the data in their data systems and how the data systems relate to each other, (b) data being accurately entered in those data systems by school and district office staff, (c) duplicate data elements being collected within the schools/districts, and (d) data elements being inspected by the district for accuracy (this is of great concern given a very high percentage of the data entry, for the data elements that need some of the highest quality, occurs in the classroom, the school office or district office).

This significant difference in data governance and data quality culture in districts is likely due to many of the other 9 findings/recommendations listed in this study (i.e., too many data elements are being expected to be entered and provided with high quality by a limited number of district staff, researchers mainly ask state and federal organizations versus the district for data, the data collected is considered by districts to be for the sake of compliance with a legal requirement rather than for a great amount of regular local analysis for future decision-making, difficulty in identifying any/enough district staff time to be spent on: improving data entry, basic data stewardship responsibilities, conducting data element quality assurance inspection, and coordination/education data systems within the district given all the other competing priorities in a district etc.). A high percentage of the initial data entry, for most of the KY K-12 data elements, is often done by district employees in positions with low pay, high turnover, limited training and minimal time available to focus on 100% accuracy during the entry process. Most districts do not have an assigned data steward for

each key data element, which means no one in the district is performing the 10 basic roles of a data steward, including the independent quality assurance inspection of a data element before that data element used in the district for decision making or before that data element is passed up to the state and federal level. Most of the data systems in districts are used/operated in complete silos with little or no data governance structure. In most districts there is no one educating districts employees on how the data systems relate to each other and there is no one acting as the overall air traffic controller/chief data officer for all data elements in the district. The closest person that plays that role in most districts is probably the Supt of the district and it is unrealistic for the Supt to be extremely successful playing that role given all the other responsibilities of the average Supt. For all of these reasons, this is perhaps the one finding out of the top ten findings/recommendations, that is most likely to continue impact lower than desired data quality since the initial data entry, data governance, basic data stewardship responsibilities, data systems awareness/coordination and data quality culture issues at the district level has no quick or easy fix…or may not be fixable at all for the foreseeable future.

6. **Greater time and focus on a data element's quality should improve its accuracy. Less time and focus will certainly lead to a lower degree of accuracy. KDE and districts will never have enough staff to have 100% accuracy with every data element collected, even if that were their full-time job. Therefore, KY K-12 needs to identify a subset of KY K-12 data elements that must have the very highest degree of accuracy. Everyone must recognize that we all have a finite number of staff and time available for data entry and quality inspection.** We must work together to best allocate the available personnel and time to the proper data elements, proportional to everyone's expectation for accuracy and desire for highest quality. When new data elements are identified as necessary for collection and inspection, we should naturally consider removing other older data elements to protect that finite amount of staff and time available (or increase staffing allocations if all data elements are deemed to be critical enough to require additional personnel).

For each of the existing and new data elements that are identified, the state data steward for that data element will estimate the amount of time required to enter that data at the district level and the time required to perform the district and state data steward responsibilities to assure the required minimum level of accuracy. They data steward can then determine if sufficient personnel and time (by the districts and the state) is going to be committed to meet those requirements. If so, then there is a recipe for success. If not, the data steward will have to determine how to best overcome the challenges identified with collecting that particular data element. For data elements not identified in the "highest criticality" subset, their collections will be considered a "best effort" and the expected accuracy must adjust accordingly (i.e., "best effort" should have lower expectations for high accuracy).

7. **Beyond data collection, there's a great need for the average employee to have the skills to manipulate, assemble and present the data for best use versus always counting on someone to do that for them.** Consider a hardware store and its shoppers. Some shoppers are very skilled at building and remodeling and know exactly what they need. Many others are not, hopelessly wandering the aisles in the hopes that they'll stumble across what they need for their project to come together. In the K12 data environment, we have many users needing to analyze data, draw conclusions and (ideally) make intelligent decisions driven by the data collected. For this to occur, we need more than the data itself. The data has to exist in a way that's helpful

to the person looking to analyze it. For this reason, it's important to be aware of your staff capabilities and consider ways to foster growth in not only the collection of accurate data, but also in the skills related to manipulate, assemble, analyze and present the data for best use. Can your data collectors do this? Are they forced to attempt to do this due to a lack of personnel? In KDE, we've attempted to train many data collectors to help them improve their skills beyond the mere collection of the data. There are not enough positions in KDE and district offices to be able to be extremely responsive to all the data analysis and reporting needs of all employees. Some employees are very adept at manipulating and assembling data in different ways, due in part to their deeper understanding of the data's meaning and how others may seek to use it. All employees won't have that same understanding, but regular mentoring and training by a "resident data analysis/reporting expert" can improve everyone's basic understanding and get them beyond the point of only collecting a piece of data. Another analogy is teaching all employees to fish for themselves and to properly prepare their own data for consumption, analysis and reporting versus those employees just waiting at a table with a fork and knife in hand saying "just feed me" data analysis and reports, especially when it's possible and practical for those same employees to do that analysis and report generation for themselves.

Whether you use the same or different "resident data analysis/reporting experts", there is the need to understand not only the data being collected, but also the technology tools used to collect and present the data. Today's database and reporting technology is phenomenal, allowing a great deal of data manipulation and analysis to be done quickly and by any user. In the right hands, this is powerful. If you've ever struggled with these tools, you know that they are of no help to an untrained user. If (as discussed previously) we know the expected quality of various data elements, we can combine that knowledge with these advanced data manipulation skills to produce some high-quality data for everyone's benefit. These skills are valuable and staff with these skill sets are often hard to acquire and maintain. It's a constant battle to train others and share this knowledge to avoid finding yourself too dependent on a few skilled data analysis and report generation experts, as it takes time and money to find and replace these rare types of positions.

8. **KDE needs to continue identifying state-level resources and producing reports and standards that are of great value to those at the district and state level. These include a KY K-12 data calendar, improvements to Open House and School Report Card and Data Security and Privacy Guidelines and Regulations.**

9. **Research, based upon available KY K-12 data, is needed and valuable, however a researcher's appetite must be properly managed or it can quickly become a huge burden and distraction for KDE staff in the program areas and districts that must feed that strong appetite. At times, to those that must provide data to researchers, it seems like it is a belly that can't be filled. While well intended, typically the more data given to a researcher, the more they want. Therefore KDE and districts should have an updated "Research Plan" that is very strategic, disciplined and focuses how much KDE and district staff time is going toward providing data to researchers.** If properly executed, this will help researchers and the program areas that must provide data to researchers, avoid the panic that is created by sudden compressed requests for mission critical data. It also keeps employees from spending lots of time responding to data research requests that are not part of that formalized research plan (e.g., providing data for an individual's PhD dissertation or a private sector survey, whose final report would be "nice to have" versus mission critical). Internal researchers within KDE and districts would have a research roadmap and direct access to KY K-12's "big data" systems (i.e., Instructional Management System (IMS), P-20 Data System (aka

KCEWS), Open House, etc.) as well as the Infinite Campus state accumulator (when needed). The KDE Research Plan would also provide a mechanism for external researchers to best utilize a self-service approach with public KY K-12 data systems (e.g., Open House).

10. **Thanks to having an environment that started with the Kentucky Education Reform Act (KERA) and KETS in the early 1990's, standardizing on key technology data systems, Kentucky is perhaps the best positioned of all states to continue our success in the area of data and data systems. Continuous improvement is required, using suggestions such as these, to build upon what we've already done.** Other states have found value in the work that Kentucky has undertaken thus far. While working with the other district and state-level K-12 CIOs, we will continue to refine and update the products of this report to be used internally and externally.

Appendix

2004's Gartner Group Study of OET (KIDS)

In May 2004, KDE engaged Gartner to perform a KDE IT Assessment and Optimization Study. This engagement covered the following key objectives:

- Assess the efficiency and cost structure of Office of Education Technology (OET) IT services
- Assess the alignment of OET's IT strategy to KDE's business strategies and priorities
- Review the effectiveness of the following OET IT management functions and processes
    o IT governance
    o IT program management
    o IT investment management
    o IT vendor management

In its findings, the report stated "OET continues to operate at a higher efficiency than peer organizations in most IT areas." One of the primary purposes of the study was to determine how to better meet KDE's business expectations, with a shift toward informational and strategic support. This required more collaboration, integration, and a more formal governance structure among KDE's offices. Gartner provided several key recommendations. Below are those tactical and strategic recommendations, all of which have been implemented or addressed.

- Conduct a formal review of all IT Projects Over $250,000 (or determined size)
- Continue infrastructure consolidation
- Increase IT effectiveness
    o Fully develop the role of IT Business Relationship Manager for KDE agency
    o Develop a formal and regular communications process with school districts
    o Create and test an IT Disaster Recovery and Business Continuity Plan
    o Fully develop a Division of Instructional Technology within KDE
- Institute a well-defined IT governance structure
- Officially define OET's IT Service Delivery Model
- Develop a Portfolio Management Investment Management Process
- Set up a Program Management Office

- Further develop an IT sourcing strategy for application development and future shared services
- Establish a vendor management competency
- Deploy an asset management system
- Leverage possible IT shared services with other government IT entities

At the time of the study, our office was the Office of Education Technology. Today, we are the Office of Knowledge, Information and Data Services (KIDS). That restructuring is proof that the importance of data has increased since the Gartner study. KDE created a Division of Enterprise Data to further support the importance of accurate and timely data for decision making at all levels. The director of that division, Dede Conner, is KDE's Chief Data Officer.

The study indicated that we needed a more formal structure that supported KDE's IT governance. Gartner recommended the development of a "Data Policy Group," whose goal would be to provide a forum for sharing, discussion and resolution of policy issues impacting or impacted by IT systems and initiatives. The group would also set data policy standards. As a result, KDE established the Data Policy Committee. This committee's role was established and continues to evolve as our IT governance and data policy needs change.

Detailed Findings, Best Practices and Recommendations

Finding	Recommendation
Finding #1: Only two KDE offices (ONGSD and ONGL) identified that they needed a small number of data elements but were unsure of their location. KIDS showed these offices which KY K-12 data system contained the elements in question. KDE offices with a high percentage of staff who don't work regularly with either the KY K-12 main authoritative sources (IC, MUNIS, Assessment) or the KY K-12 "big data" system (Instructional Management System (IMS), P-20, Open House) are more likely to be unaware that the data elements are available to them.	Ensure that everyone knows that KDE's Chief Data Officer (Dede Conner) is available to answer questions that a KDE staff member may have. Also, at least annually, KIDS should offer every KDE office the ability to submit a list of data elements that they don't believe they have access to in order to complete their job. *Not part of this review – but are there standard reports or dashboard like portals for each office that lets them drill down to different levels of granularity? Might be especially useful for offices that make use of data from multiple systems.*
Finding #2: It has been rare for a KDE office or staff member to indicate an inability to access a needed KY K-12 data system. All KDE offices have been informed in various ways regarding systems access and the supervisor's role in identifying user rights for positions.	Continue to ask each KDE Office annually about access to KY K-12 data systems and address it during regular data systems awareness training as a reminder for existing staff and to inform new staff.
Finding #3: Very few KDE staff have an identified need to access student-level data and other confidential data elements in Infinite Campus and Instructional Management System (IMS), though some staff may believe they have such a need.	Before approving an employee's access to sensitive student-level data, the supervisor must ask themselves: 1. Is access to this confidential data a work requirement or a convenience? 2. Can I defend the employee's access to this confidential data if someone were to question their access? *Liability. Either they need it or they don't... role –based. Ultimately, it is not the Supervisor at risk... it is the entire chain.*
Finding #4: Many users in various KDE offices indicated during the KY K-12 data systems awareness training that they	This training needs to be offered annually (at minimum). The supervising Associate, depending on results of the *Are We*

were unaware of the basic capabilities in certain KY K-12 data systems (e.g., MUNIS, Instructional Management System (IMS), IC, etc.).	*Making Progress* survey, could require it. Offer concierge-level services for the remaining KDE offices and new employees.
Finding #5: Two issues were identified regarding the expected accuracy of specific data elements within KDE: (1) Certain staff expect data elements to be (practically 100%) perfect. Significant staff time is being spent in this pursuit of perfection. (2) For a few specific key data elements in KDE, the data steward in one office is meeting the minimal accuracy threshold for their own office, but that minimal threshold is lower than what is required/wanted by other KDE offices. This inconsistency frustrates staff in other offices that expect (and may truly need or not need) a higher level of data accuracy than is being provided. One example of the strain of high expectations is the pursuit of perfection with matching up 100% of 650,000 student identifiers. If there is 99.99% accuracy that would leave 325 potential errors (e.g. duplicate SSID's). KDE and districts can and do spend significant time and money tracking down these duplicate ID's and the reasons for those discrepancies. Millions of dollars could be spent each year to address that last 325, but is it worth millions of dollars each year to fix 325 potential errors or is 99.99% accuracy good enough? It is also noted that some data and reports could be compiled and distributed much sooner if a lower level of accuracy (e.g. 98-99%) could be sufficient instead of a level that is (practically) perfect. For example, a preliminary report with 98% accuracy could perhaps be sent to districts for review with several months of review time to deal with corrections and review. If forced to wait until 99.95% accuracy before release, districts might only have two weeks for correction and review, increasing the frustration and stress in the review process.	We have to quantify the level of data accuracy expected and distinguish between data elements that data elements that need to be (practically) perfect and those that can be substantially accurate (e.g. "good enough"). For each data element that KDE identifies as needing to be highly accurate, we must identify an agreed upon level of accuracy that is really needed (100%, 99%, 95%, etc.). A Gartner best practice states that, in many situations, a "good enough" level below 100% perfection exists, especially at the DOE level for some summative data totals. It is very costly, unrealistic and often unnecessary to have absolute 100% accuracy for a given data element. *Probably want to make sure that the "good enough" reaches up and down the chain.* Once a level of accuracy is agreed upon between the impacted Associate Commissioners and the KDE CIO, all parties must agree to not only work collectively to reach that accuracy level, but also to stop the unnecessary additional work once the agreed upon accuracy level is reached. There are challenges to be overcome both with those who care too little about data accuracy and with those who care too much about it, forsaking other critical work. Data stewards and Associate Commissioners need to understand their responsibility to reach the agreed upon accuracy level and to be satisfied once that level is achieved. This accuracy level could also be part of a formal or informal performance plan for a data steward.
Finding #6: The most accurate KY K-12 data elements will have a combination of the following: (1) districts see an **added value** in the data element, (2) a strong **incentive** (e.g., financial gain or loss), (3) **law** behind it, (4) the district data steward is inspecting for completeness and accuracy (5) the state level data steward is inspecting for completeness and accuracy. North Dakota says #1 is the strongest predictor of data quality. These five elements should be considered the guiding principles for the addition or change management of data elements. *ND is right... the overall solution has to resonate at the district/school level...avoid KDE centric viewpoint or bias.*	If KDE requests a data element from a district that does not have the law or a strong financial incentive behind it, then it's unlikely that the data element will be of high quality and accuracy. Even if there is a legal requirement for districts to provide a data element, the perceived added value of the data to districts will impact the quality of the submission. Furthermore, a very high desired accuracy level (e.g. 99.95%) will require a high amount of district and state "stewardship"... even if there is legal requirement, financial incentive and added value to a data element The Associate of ONGL recommended that KIDS provide a simple one-page checklist listing the items that help or hinder achieving a high level of accuracy for a data element. The checklist should also define the proper expectation for accuracy of that data element.
Finding #7: The number of data elements KDE requires of school districts also plays a role in the degree of overall accuracy obtained. Regulations and legislative priorities	KDE needs to go on a "healthy data diet". *Good (and strong) point! As before---Otherwise we are asking districts to "feed the DOE machine".* Therefore, KDE must be strategic

change over time. If we never examine our overall data set and purge data elements that are no longer required, the result can be a data set that is too large, with some data elements being collected without a current need having been identified for the data. In 2000, KDE eliminated 90% of data elements being collected from districts after a significant data analysis effort. Since that time, it appears that a gradual increase in data collection has taken place. It may be time for another data analysis, searching for data that is unnecessarily being collected. This may also need to become an annual activity.	and intentional with each data element that it requests from school districts. At least annually, each KDE office needs to examine every data element collected for its current relevance and requirement. Unnecessary data elements should be "dropped" and no longer collected. When new legislation or regulations create the need for additional data, this "healthy data diet" mindset should be maintained. Staff should add only the data elements specifically required to comply with the legislation or regulation. If we examine our entire data set and remove data elements that are not legally required or do not have noticeable incentive or value to users, we should find ourselves with a noticeably smaller set of data elements. In some cases, there may also be opportunity to examine laws or regulations to determine if these need to be changed or removed to remain current with the desires of the population. This might also result in the opportunity for some data elements to be removed and no longer collected.
Finding #8: Often, data elements in our K-12 authoritative data systems (e.g. Infinite Campus, MUNIS, assessment) are being populated by: ● Low-paid clerical staff where turnover and stress may be high and where training may be limited ● A teacher or staff member whose task list is already full and whose time is very limited ● A by-product of a student taking an assessment Very few individuals entering the data have taken the time to read the data element definitions or attend training that may be provided. School districts typically do not have a formal structure in place for data access, data stewardship, and data governance. School districts do not have the same culture of data quality that is more commonly found at the DOE level or in a private sector company. There's certainly a need to improve the data entry at the district and school level. *Good analysis/description*	State-level data stewards should consider the time and accuracy impacts for the district-level data stewards as it relates to new and existing data elements. Where applicable, intuitive field names should be used to assist where training has been limited. We could consider implementing concepts from other states. Massachusetts requires each district to have a team (Supt, CIO, etc.) trained on how to establish a culture of data quality. Virginia has a data quality program requiring a district to be certified in data quality (district data quality certification is also a suggestion of KDE's Chief Assessment Officer). Washington provides three online data quality lessons for districts. Georgia completes an onsite review of districts to inspect data quality and collection processes. Alabama does this as well. Data element training and review could be done by the appropriate state-level data steward, but might also involve state and district technology staff. These reviews and trainings should occur regularly to accommodate new staff, helping to ensure ongoing data quality and accuracy. *So… in essence KDE is establishing a hierarchy of data stewardship (good idea) that has the components described above. Should it be duplicated within each district and then each school?*
Finding #9: During a data systems awareness training for KDE staff, the top reason staff given for "doing their own thing" as it relates to data collection is that staff were unaware that the data was already being collected from districts (and when). Other reasons given were the immediate need for the data (being unable to wait for the next collection or software update), they simply liked doing their own thing, the existing data element was not current enough, or they did not have confidence that the existing data was accurate enough for their purposes (e.g. they needed 99.9% accuracy and 99% was "good enough" for the assigned data steward).	1. Provide annual KY K-12 data awareness training for KDE staff. *Mitigate or dispel data silo excuses.* This will ensure they are aware of the data elements that already existing in our various data systems and that they know that this data is being collected and reported. 2. Regularly remind KDE staff about the Data Policy Committee and its purposes related to data element definitions and agreeing on additions, deletions and changes to data elements. Staff should consult their committee representative before attempting any new data collection. 3. Discipline employees that knowingly collect data outside of the parameters agreed upon by KDE and its Data Policy Committee.

	4. Have the KIDS Core Process Team conduct a data "health check" at least annually for the "top" data elements identified by this team. Wisconsin does this.
	5. Provide a "data calendar" to districts and KDE staff. Maine and Oklahoma do this now. This should allow all parties to see the data collections being performed and when they take place, allowing for proper pacing of collections and providing shared knowledge about the age of all data being collected.
	6. Each KDE office needs an overall data element "air traffic controller" that works with KDE's Chief Data Officer (DeDe Conner). The Office of Next Generation Schools and Districts (ONGSD) with Windy Newton is the best model of this in KDE. This responsibility can resemble a full-time job depending on the amount of data involved. Utah has some good practices in this area.
Finding #10: Many states, with specific efforts taking place in the area of data quality, have roles very similar to those of the three groups in KDE for data governance (the Data Policy Committee for data steward governance, the KIDS Core Process team for IT and data policies and the KDE Planning Committee and Commissioner for an overall executive oversight) and other states have followed KY K-12's lead since that time. States similar to Kentucky were: Virginia, Iowa, Florida, Alabama, North Dakota, Wisconsin, and Oklahoma. Montana and other states have standing (versus temporary) subcommittees in their DPC equivalent. KDE's approach is that, as a project is needed (e.g., establishing a KY data calendar), a team within KDE's data governance (i.e., DPC or the KIDS Core Process Team) would temporarily be established to perform that work.	Kentucky's K-12 IT and data governance design is based upon a best practice recommendation by Gartner over a decade ago for both government and private industry. *This is a good working model if followed.* Other states have established both very temporary work groups for a specific project (e.g., to establish a data calendar) and subgroups that meet more regularly throughout the year (data security and privacy) within their equivalent team structures. Within our existing structure, Kentucky may need to consider a combination of one-time project-based subcommittees (as with the data calendar) and subcommittees that meet more regularly (e.g., quarterly) for other types of work that need to be revisited at least annually (e.g., data security and privacy concerns).
Finding #11: Where data quality is taken seriously, data stewardship is a must. Kentucky has identified and provided KDE staff and school districts a list of the "10 Responsibilities of a Data Steward." The USDOE and Gartner support those ten responsibilities. Other states have developed these roles as well. In states that have data stewards, it is a part-time role rather than a full-time position. Gartner also published a study containing critical points of data stewardship and they are included here as well. **The 10 Responsibilities of the KY K-12 Program Area Data Steward** 1. Identify the program area that will be the data steward 2. Create definition of data element that average person can follow 3. Identify the formula of data element (e.g., W= x+y/z) 4. Confirm that the data element is not duplicative 5. Identify the frequency and date the data element is collected 6. Identify other offices/orgs that have dependency for that data element 7. Identify the level of accuracy, freshness and precision needed by your program area (e.g. 90%) and other program areas (e.g., 99%) that depend on it.	KDE should continue to educate and train data stewards and build a culture of data quality at the KDE and school district levels. KDE should also make data stewardship responsibility part of an employee's performance plan. This enforces the fact that stewardship is a core part of someone's job. The data steward and their supervisor must agree upon the time required to meet those 10 responsibilities for their corresponding data elements with the agreed upon level of data quality (e.g., 99.5%) for that data element.

8. Inspecting the quality of the data entry (e.g., completeness, adds up, makes sense, state totals, compare with other states of equal size). 9. Communicate with the appropriate data steward and data entry clerk in the program office, district and/or school. Champion, provide guidance, mentor and answer questions of those in districts, schools or clerk. 10. Change management. If the definition/formula of the data element has changed or if the data element is no longer going to exist, consult with and confirm with all those within and outside the program area that all depend on that element. **Gartner's Top 10 best practice recommendations for Data Stewards** 1. Data Stewardship does not equal ownership. 2. Data Stewards must have specific goals for data quality improvement. 3. Data Stewards should reside in the business, not in the IT organization. 4. Data Stewards must be visible, respected and influential. 5. Data Stewardship should be based on manageable subsets of data. 6. Data Stewardship should be placed closest to the point of capture and maintenance of the data. 7. Data Stewards must be accountable. 8. Data Stewards are responsible for guiding the effort, not doing it themselves. 9. Data Stewardship efforts need to be consistent and leverage each other. 10. The success of Data Stewardship requires the right culture.	
Finding #12: Transparency of data helps increase data quality. Kentucky provides data transparency via Open House, School Report Card, Infinite Campus, P-20 and Instructional Management System (IMS). High-quality data can be supported via validation tools through ad hoc reports (which we have added to Infinite Campus), confirm buttons and edit checks in Infinite Campus software.	Continue current progress and direction in these areas.
Finding #13: Given financial realities and staffing in the KIDS Division of Enterprise Data, KDE will primarily rely on a self-service model for their data and information needs. KIDS will always be involved and willing to assist KDE staff as needed in situations where self-help isn't sufficient.	With limited resources, KDE staff will need to be capable of using the technology to get to the data they need. New and existing staff need basic skills with spreadsheets, systems and data management. A balance of program knowledge and technology data skills is a must. Staff will need to mine data to obtain what they need rather than relying on others to assemble the data for their consumption. Appropriate staff members need to be provided regular, basic training in Infinite Campus, the Instructional Management System (IMS), business objects and spreadsheet software. Office leadership will need to make this training a priority.
Finding #14: A common challenge for states is addressing the needs of internal and external researchers. Their data requests can be extensive and can become difficult for staff to accommodate in a timely fashion. Most states, including	A KDE Research Plan was presented to KDE's Planning Committee after this finding was documented. We should evaluate external research requests against the KDE Research Plan to determine compatibility. Research efforts outside of the plan can be directed to existing resources (e.g. Open

Kentucky, have a process allowing them to be strategic in their engagement with external research requests (identifying an internal executive sponsor, getting MOUs signed). For internal researchers, other states commonly have a research plan allowing them to plan for and prioritize research requests. With some external research requests having little perceived value to the DOE, other states may place a lower priority on the work or charge for their efforts in accommodating the researcher.	House) or they can work with the Kentucky Center for Education and Workforce Statistics (KCEWS) and their data resources.

Most Important Data Elements to KDE and school districts:

This list reflects data elements that KDE staff identified in 2014 as the most important and where the highest data quality and accuracy is needed. Top elements were identified by each KDE office during the KIDS Core Process meetings in 2014. Their combined list is below, followed by each office's top five data elements in the table below:

1. Average Daily attendance (ADA) **F**
2. Student ID number (SSID) **F** **S/F**
3. Course Codes **S/F**
4. Teacher of Record **S/F**
5. Free and Reduced Lunch % **S/F** **L**
6. School name, School address, School grade level (e.g., the school has 9th-12th grade) **S/F**
7. Student grade level (e.g., 5th grade) **S/F**
8. Graduation code (e.g., graduated, did not graduate) **S/F**
9. Behavior (Resolution State Code Mapping, Behavior, Law and Board Resolution) **S/F** **L**
10. Title 1 indicator **F** **L** **S/F**
11. The other data elements listed in the office's top 5 (e.g., gap, final grades, Munis job class, Career CIP code) **S/F**

* Many data elements can be tied to all valued categories, the following indicates the primary impact area(s):

F Funding Impact   **L** Legal Impact

S Safety Impact   **S/F** State & Federal Impact

Office of Administrative Support (OAS)
1. Average daily attendance
2. Free and reduced lunch
3. School Name and Address
4. Graduation Code
5. MUNIS job class

Office of Next Generation Learners (ONGL)
1. Teacher of Record Data (who is the primary teacher for the class roster) contributing professional
2. Course Codes tied to teacher and students
3. Final Grade for Students tied to the Student
4. Enrollment Data (Sp lEP student)
5. Intervention Data (down the road)

Office of Next Generation Schools and Districts (ONGSD)
1. Behavior (Resolution State Code Mapping, Law and Board Resolution)
2. Title I Indicator
3. Homeless Indicator in IC
4. Direct Certification (Direct/non direct)
5. Resolution Type

Delivery Team
1. SSID
2. Teacher of Record
3. Gap Groups
4. Grade Level of Student

Office of Assessment and Accountability (OAA)
1. SSID
2. Graduation Codes
3. Course Codes
4. School Address and Name
5. Grade levels

Office of Career and Technical Education (OCTE)
1. SSID
2. State Course Codes
3. Career Pathway/CIP Code
4. TEDS Student Objective
5. Career Readiness Assessments

Office of Knowledge, Information and Data Services (KIDS)
1. Average daily attendance
2. Free and reduced lunch
3. Internet bandwidth and age of devices in districts
4. Total district spend each year on education technology *Do they really know? Do they track total cost, categories, etc.?* (Answer = yes with commodity codes. We recently reduced number of codes used from 100 to 25.
5. Uptime and usage rate of each K-12 technology service

When polling school district CIOs in 2014, they identified these top data elements as the most important and requiring the highest level of data quality:

1. Average Daily Attendance (ADA) / Enrollment **F**

2. Free and reduced lunch status **F**

3. State and local assessments (MAP, PAS, ACT, Compass, KPREP scores) **LV**

4. Student safety (e.g., Phone number of a parent, address of the parent, court ordered custody, etc.) **S**

5. SSID (impacts funding and assessment) **F** **LV**

6. Identification of a special needs student (impacts funding, legal accommodations) **F** **L**

7. Employee and student SSNs for payroll and for KEES (impacts funding) **F**

8. Teacher certification (certified or not certified?, in what content area?, used to ensure teacher is appropriately teaching correct grade and content area) **L** **LV**

9. School/District Financial Status (budget vs. spending) **F**

10. Identification of Title 1 **F**

11. Transportation Codes **F** **S**

12. Student Health Information (allergies, disabilities) (S)
13. Transfer Records (from previous district) (LV) (F)
14. Projected Financial Allocations from KDE (F)
15. Student Demographic Data (Name, Birthdate, Address, Primary Language, Ethnicity) (S) (L) (F)
16. Special Education and individual Education Plan (IEP) Status (F) (L)
17. Program Service Plan (F) (L)
18. 504 Plan/ Status (F) (L)
19. School-level discipline data (S) (L)
20. Individual Student Achievement Data (GPA in regards to KEES, Class Rank, AP, Grades for transcripts, etc.) (LV)
21. Truancy Data (F) (L)

* Many data elements can be tied to all valued categories, the following indicates the primary impact area(s):

(F) Funding Impact   (L) Legal Impact

(S) Safety Impact   (LV) Local Value Impact

U.S. Dept. of Ed. – Privacy Technical Assistance Center (PTAC) Best Practices or Observations Regarding KDE

- Everyone is part of data governance structure – staff should see themselves as stewards, create a culture of data stewardship and good data practices throughout entire K-12 system, including districts
- Best practices and ethics typically go beyond basic requirements of laws and rules
- Audit – traditionally focus on security, some data access. Seeing rise nationally in # of external hack attempts on student information systems. Include – training, data minimization in audit to position for long term.
- Email – minimize what's sent, encrypted and prevent "oops" moments.
- Best practices – know what data you have and have someone responsible for each data element in the organization.
- Data element inventory is difficult but important, the more detail the better. Data element dictionary important component.
- Data stewardship- 2nd most important priority. Regularly evaluate the usefulness of data, don't collect what you don't need.
- Data element stewardship-should be person that knows that data element better than anyone else.
- Data quality – critical component of data stewardship
- Would recommend adding to data steward responsibilities – input to protection/security of data element

Data About Data – Metrics Worth Mentioning

Before looking through the findings and recommendations, we'll take a quick walk through some of the data we used at KDE as part of an honest self-assessment. As with many improvement initiatives, true success starts with knowing where you are and being honest with yourself about why you're there.

Teaching, Empowering, Leading and Learning (TELL) survey

A few data elements from the *2013 Kentucky schools' TELL survey* are interesting when examined collectively:

1. 96.7% of KY Principals said their school is provided sufficient data and information to make informed decisions.
2. 96% of teachers said their school leaders facilitate using data to improve student learning.
3. 94% of teachers said they provide parents with useful information about student learning.
4. 85% of the teachers said that they are using data to identify student needs.

When we noticed the gap between the percentage of teachers using data to identify student needs and the percentage who admit that their school leaders facilitate the use of the data, it's no surprise that one recommendation was for us to determine why there are 15% of the teachers not using data to identify student needs. Are they not comfortable with the data's accuracy? Do they not understand it? Are they not properly trained to use the data? Do they simply feel that they don't need the data? Gartner's comment was as follows: *Great results, but this depends on the definitions or areas for which the data is used. Additional granularity would make these positive statements even more compelling arguments. More closely examine if they should be using a wider breath of data.* It's easy to see that there are many follow-up questions to be addressed during the quest for higher-quality data.

KDE internal data survey

Internally, we had a survey of KDE staff asking whether staff felt like they had access to the important data they need to do their work. We had significant improvement in affirmative responses (48% to 72.6%) between 2012 and 2013. As part of this analysis, we recommended regular awareness training on the KY K-12 data systems and feedback sessions to identify specific data elements needed for best work results. Gartner provided a relevant challenging statement here as well: *By awareness – there is the assumption that if they know of the availability or use cases that there would be more universal adoption or use of the data/service. Some of the same questions as stated for the schools/districts would be helpful.*

2014 Gartner Group Business Intelligence and Performance Management Maturity ITscore

In March 2014, Gartner performed a maturity assessment on KDE's business intelligence and performance management. KDE scored a 3.3 on a 1-5 scale, grading our maturity level at "Level 3: Standards," which is very good for an initial assessment. The chart below details some of the factors that Gartner looks for when determining maturity levels for organizations. During this process, we recognized that one area to strengthen was our need to make better use of data that was already available to us. We see the need to continue to promote a "culture of data use" and to better train our data stewards. Gartner's suggestion and comment: *Consider professional analyst roles – or at the very least – heavy professional development that emphasizes true analysis (e.g., in education we often confuse association with correlation....)*
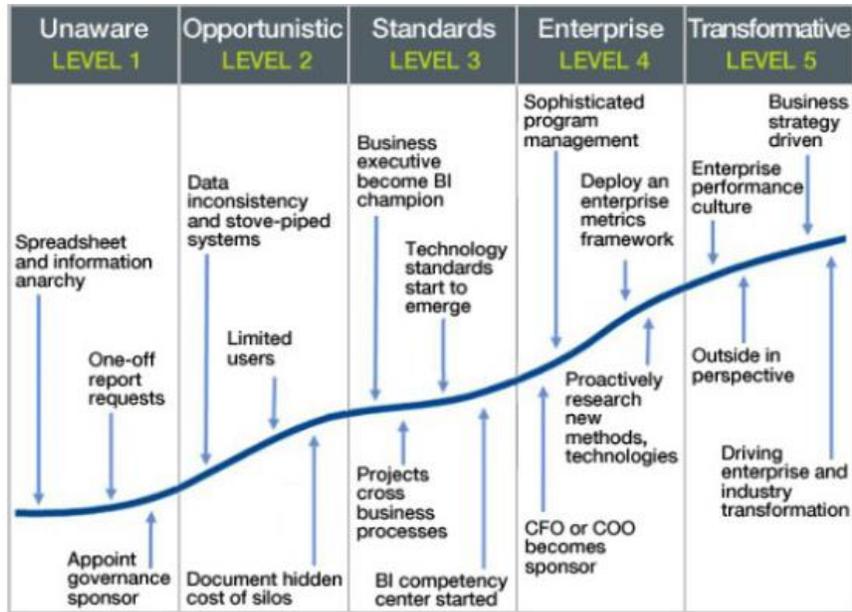
In addition to assessing ourselves as data users, we also see great value in reviewing some of the performance and usage metrics with KDE's major data systems. A sample of the elements examined include:

Data System Metrics and Usage Information

- Instructional Management System (IMS) – accounts created, logins, assessments and lesson plans created.
- Infinite Campus – usage and logins by students, staff and parents, portal access created.
- MUNIS – usage rates and roles established.
- Open House, the P-20 Data System and School Report Card – unique visits, page views, report requests established.

School districts should consider performing similar analysis within their environment. The school district's web site could be tracked for visitors, page views and client browsers used. Usage rates could be calculated for the various instructional applications in use. As with KDE, similar internal analysis could be done regarding the access to and importance of various data elements.

Data Related Best Practices and Recommendations

To identify best practices and recommendations, KIDS sought feedback from Gartner, KDE staff, our school districts, USDoE, and from other states. Below are short descriptions of those efforts followed by a detailed list of findings and recommendations.

1. On a 2013 KDE "Are We Making Progress" survey, in response to the question of "**Do you get all the important information to do your work?**" 73% of users stated that they did. As a follow-up, KIDS asked every KDE office to identify **the important information that they do not have to do their work**. For any data element(s) identified, KIDS mapped them to an existing KY K-12 data system (e.g., Infinite Campus or IC, MUNIS, Assessment) or state-level system (e.g., Open House, School Report Card, Instructional Management System (IMS), P-20 Data System) that contained the identified data element. KIDS reviewed this with KDE staff during follow-up training sessions. *Good follow-up. Identifying the critical data for each office as well as what they think they are missing and then mapping each set back to the systems makes sense (and informs the KDE offices that you are listening to them).* KIDS also used these sessions to gather feedback and provide an overview to all KDE offices on the major data/information that is available in certain specific authoritative data systems (e.g., IC) and state-level systems (e.g., Instructional Management System (IMS), Open House, P-20 Data System).

2. During the 2014 KIDS CIO Summit for the KY K-12 CIOs, we asked each CIO to respond to the following data related questions:
   - From your perspective, what are the top data elements that are the most important for decision making purposes in your district?
   - What are the data elements that we collect at the state level (in any program area) that you feel are the least important and question why it is being collected? *Great… most of our colleagues don't bother. That's why districts, schools and teachers often feel like they are constantly "feeding the DOE machine" with little return on their time and effort.*
   - With all the current national interest regarding security and privacy of data/information, what do you feel needs to be in place in KY K-12 to address this? (Note: We are referring to cloud-based services, who needs access to student level data, district level policies, etc.). *So… first they have to think about who has to know, who should know, and how can you tell who has the right to know etc. Also, what are the communication pieces with internal and external stakeholders so there is no "in Bloom" implosion. This is important, because it not only has to be done right, it has to be communicated so that everyone is assured of the fact. Perception is reality.*

3. In March 2014, KIDS hosted state-level K-12 CIOs from 17 Race to the Top (RTTT) states in Frankfort. In April 2014, KIDS also participated in a K-12 CIO meeting with an expanded group of CIOs that were not part of RTTT. During the same timeframe, we spoke with or researched the web sites of the remaining states regarding their K-12 data systems best practices.

4. In 2014, KIDS met with Michael Hawes from the U.S. Department of Education looking for feedback on best practices for data stewardship.

Gartner Research Applicable to Data Governance and Data Stewards

Below are links to recent research on Data Governance and Data Stewards that may be useful to the K-12 community

How Chief Data Officers Can Help Their Information Stewards

24 March 2014 G00257911

Analyst(s): *Andrew White | Debra Logan | Joe Bugajski*

Summary

Chief data officers and other information leaders are seeking clarity over what tools are required for information stewards to be successful in establishing and enforcing information policies to manage crucial information. Gartner outlines capabilities CDOs require to provide an effective solution.

Invest Implications: "The State of Data Quality: Current Practices and Evolving Trends"

12 December 2013 G00260474

Analyst(s): *John Rizzuto*

Summary

Organizations Gartner has surveyed estimate that poor-quality data is costing them, on average, $14.2 million annually. We describe the key trends in this vital area for information leaders, chief data officers, information governance stakeholders and data stewards responsible for data quality.

2014 Planning Guide for Data Management

03 October 2013 G00252164

Analyst(s): *Marcus Collins*

Summary

A new era has arrived. Information is playing an increasingly pivotal role in business success, and the convergence of cloud, social and mobile is creating new types of information. Enterprises that are effectively managing and analyzing this new data are gaining a competitive advantage.

Seven Best Practices to Make Information Governance Work

13 November 2013 G00258724

Analyst(s): *Svetlana Sicular*

Summary

Many organizations have the ingredients to make information governance work, but the recipe for success that combines them is often amiss. This guidance document explains the important "recipe" points that many governance programs overlook or miss when building a complete, cohesive program.

Twelve Ways to Improve Your Data Quality

17 February 2014 G00259288

Analyst(s): *Saul Judah | Ted Friedman*

Summary

Achieving business outcomes based on trusted, high-quality data is a core enterprise requirement. Unless CIOs, chief data officers and information leaders get this right by pragmatically improving their data quality, they will be unable to take full advantage of new information-driven opportunities.

How Chief Data Officers Can Help Their Information Stewards

24 March 2014 G00257911

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Chief data officers and other information leaders are seeking clarity over what tools are required for information stewards to be successful in establishing and enforcing information policies to manage crucial information. Gartner outlines capabilities CDOs require to provide an effective solution.

Use Incentives to Bolster BI Adoption and Advance Program Maturity

04 October 2013 G00257856

Analyst(s): *Josh Parenteau*

Summary

Business intelligence programs must deliver more than a promise of self-service to overcome inertia in organizations. Business unit leaders should encourage innovation by creating and sponsoring incentive-based programs focused on the development of a robust knowledgebase in the business community.

Data Stewardship: Critical Component of Data Architecture

07 February 2003 G00113028

Analyst(s): Ted Friedman

Summary

Data quality is an often-overlooked component of data architecture. By establishing a data stewardship program to increase the focus on data quality issues, enterprises can optimize results of their data architecture efforts.