# Kentucky Dataseam Initiative

# Memorandum of Agreement (MOA) between the Kentucky Department of Education and Kentucky Dataseam Initiative, Inc.

**Prepared by**

**Finance and Administration Cabinet**

**Office of the Secretary**

**Office of Policy and Audit**

**August 14, 2020**

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Governor

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**Holly M. Johnson**
**Secretary**

**Gerald W. Hoppmann**
Executive Director

# MEMORANDUM

TO: Holly M. Johnson, Secretary
Finance and Administration Cabinet

FROM: Gerald W. Hoppmann, Executive Director
Office of Policy and Audit (OPA)

DATE: August 14, 2020

RE: Kentucky Dataseam Initiative, Memorandum of Agreement (MOA) between the Kentucky Department of Education and Kentucky Dataseam, Inc. (PON2 540 1900002589)

The Office of Policy and Audit (OPA) is pleased to report the results of *Kentucky Dataseam Initiative, Memorandum of Agreement (MOA) between the Kentucky Department of Education and Kentucky Dataseam, Inc.*

The FY 2020 contract (PON2 540 1900002589) was effective from May 1, 2019 through June 30, 2020. OPA conducted its audit based on authority pursuant to HB 268 (2019 Regular Session-KY Acts Ch. 193) and language in the MOA.

The Kentucky Dataseam Initiative, Inc., Kentucky Department of Education, the University of Louisville, Morehead State University, and K-12 school districts, provided OPA auditors with programmatic, financial, and accounting data to complete the audit.

The general objective of the audit is to determine costs and benefits of the contractual arrangement by which Apple computers are provided to Kentucky school districts in exchange for the use of available computer processing power for cancer and other research. The timeframe for OPA's audit work and analysis is from FY 2007 through FY 2020.

The results of the audit will assist all interested parties moving forward to determine whether the contract is in the best interest of the Commonwealth.

The audit yielded reportable facts related to the following areas:

- *Multi-Faceted Program Purposes;*
- *Benefits and Costs to Multiple Parties;*
- *Broadly Written Contracts; and*
- *District Impressions of the Program*.

CC: Robin Fields Kinney, Kentucky Department of Education, Associate Commissioner, Office of Finance and Operations

# EXECUTIVE SUMMARY

## Purpose

Pursuant to HB 268 (2019 Regular Session-KY Acts Ch. 193), the Secretary of the Finance and Administration Cabinet (FAC) shall provide approval and oversight of all contracts related to the Dataseam Initiative.

More specifically, the FY 2020 contract (page 4/12) states that *"…Office of Policy and Audit has the authority to conduct an internal audit, investigation, or management review related to the Secretary's duties and responsibilities as chief financial officer of the Commonwealth."* Section 16 of the Standard Terms and Conditions on page 7 discusses FAC's access to records for the purpose of financial audit or program review.

The general objective of the audit is to determine costs and benefits of the contractual arrangement by which Apple computers are provided to Kentucky school districts in exchange for the use of available processing power for cancer and other research. The timeframe for OPA's audit work and analysis is from FY 2007 through FY 2020.

## Background

In 2006, a Kentucky Economic Development Finance Authority (KEDFA) Grant provided $1,900,000 for the purchase of 2,000 computers, which expanded an earlier Pilot Project that provided $175,000 from *"…the high-tech investment pool, including some Local Government Economic Development Fund coal county funds for a Pilot Project on September 29, 2005."*

During the 2006 Regular Session, HB 380 transferred oversight of the program from KEDFA to the Kentucky Department of Education (KDE) and appropriated $2,500,000 each year *"…for the purpose of enhancing education technology in local school districts within coal-producing counties."*

Using its proprietary DataseamGrid, Dataseam Initiative, Inc. maintains a high performing computer grid used for cancer research at James Graham Brown Cancer Center (BCC) at the University of Louisville.

The DataseamGrid consists of 6,846 computers in 33 K-12 school districts located in Eastern and Western Kentucky. At the time of this writing, Dataseam anticipated connecting additional computers in 15 school districts prior to June 2020.

The BCC accesses computers when the school districts' computing power is available.

## Results in Brief

### *Chapter #1: Multi-Faceted Program Purposes.*

The Kentucky Dataseam Initiative (program) placed 26,600 Apple computers in K-12 school districts in coal counties since 2005. School districts use the computers for classroom instruction, but the computers also provide the technical backbone from which to operate the DataseamGrid.

The DataseamGrid uses a proprietary software program that utilizes the MacOS. The University of Louisville, James Graham Brown Cancer Center (BCC) uses the DataseamGrid for cancer research, with the intention to "…*accelerate the time from research to commercialization of new pharmaceuticals."*

Appropriations, grant, and contract language express multiple purposes for the program, but language is also confusing related to oversight of the program. The contracts have never been competitively bid.

## *Chapter #2: Benefits and Costs to Multiple Parties*

The multi-faceted Dataseam Initiative (program) primarily benefits three (3) entities: **1)** University of Louisville James Graham Brown Cancer Center (BCC); **2)** Dataseam Initiative, Inc. (Dataseam); and **3)** Participating K-12 school districts.

According to Dataseam and BCC officials, the primary purpose of the program is for Dataseam to operate its proprietary DataseamGrid for cancer research conducted by the University of Louisville (University). Using the DataseamGrid allows the BCC to conduct *"hundreds of years' worth of calculations every week."* According to Dataseam's Executive Director, *"It's counterintuitive that this high-end research is being done in one of the poorest parts of the country."*

According to the BCC, the DataseamGrid has identified between 100-250 potential drugs for over 50 targets, with two (2) drug candidates making it to clinical trials. Over ten (10) drugs are currently in development for lead candidate selection for potential clinical trials. Zero (0) drugs have been approved by the United States Food and Drug Administration (FDA). Dr. John Trent, Deputy Director of Basic and Translational Research at the BCC, noted however, that drug development is a long and very expensive process.

From 2012-2019 an average of 43 research targets per year were submitted on the DataseamGrid. According to Dr. Trent, *"For each target several "runs" or "jobs" are made screening over 40 million compounds against a single target, sometimes significantly more."* He also stated that over 90 patent applications on drug discovery were filed over the past ten years. The DataseamGrid has allowed BCC to qualify for $41 million in federally funded research grants, with an additional $18 million recently awarded, according to Dr. Trent.

Participating school districts have paid Dataseam $2,922,346 for Professional Development (PD) throughout the program. The PD provided to participating districts consists of teacher training, as well as technical certifications, both of which are important to keep computers active on the Dataseam Grid.

Dataseam officials stated that PD is important to maximize the effectiveness of the technology in the classroom. The University in turn is able to conduct important cancer research in hopes of commercializing new drugs to fight cancer.

## *Chapter #3: Broadly Written Contracts.*

The initial contracts in 2006 and 2008, were written in a manner that provided specificity with respect to the requirements of the program (formerly the Coal County Computing Program), as well as program oversight. Although the contracts were administered by KDE, incorporated Grant

Agreements ensured that KDE, the Cabinet for Economic Development (CED), as well as Dataseam worked together to place computers in coal-producing counties.

After the 2008 contract, however, Grant Agreements were no longer incorporated by reference into the contracts. As a result, Dataseam, through the use of its Participating Partner Agreements (PPA), increased requirements for participating school districts without additional review by KDE or CED.

*Chapter #4: District Impressions of the Program.*

Feedback from ten (10) K-12 participating school districts and comments from 31 survey respondents from participating school districts generally showed favorable feedback. Participating school districts that generally reported favorable feedback also voiced some concerns.

Interviews with district officials from ten (10) formerly participating school districts also identified unfavorable feedback about the program, especially with respect to the cost of Professional Development (PD).

**Conclusion**

From 2006-2018, the Kentucky General Assembly used compulsory language to create an oversight framework with respect to the implementation the *Coal County Computing Program.* For example, HB 380 transferred oversight of the program from Kentucky Economic Development Authority (KEDFA) to the Kentucky Department of Education (KDE).

Subsequently, it approved appropriations language to ensure that KDE used appropriations in conjunction with the Cabinet for Economic Development (CED), Department of Commercialization and Innovation.

Moving forward, all interested parties have an opportunity to reexamine this program. Also, participating agencies including the Finance and Administration Cabinet, Kentucky Department of Education, and the Cabinet for Economic Development (2006-2018) have an opportunity to consider whether competitive bidding is practicable and feasible.

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# OBJECTIVE, SCOPE & METHODOLOGY

## AUDIT REQUEST

Pursuant to HB 268 (2019 Regular Session-KY Acts Ch. 193), the Secretary of the Finance and Administration Cabinet (FAC) shall provide approval and oversight of all contracts related to the Dataseam Initiative.

The FY 2020 contract was effective from May 1, 2019 through June 30, 2020, which allows Kentucky Dataseam Initiative, Inc., to build and manage a *"…powerful high performance computing environment."*

The contract's *Scope of Work* provides additional information related to the multi-faceted nature of the program: *"Dataseam will run the Kentucky Dataseam Initiative program. This includes the provisioning and maintenance of the DataseamGrid for Kentucky-based cancer research, placement of approximately 1,300 workstations in participating KY-12 districts, scholarship, education and workforce development initiatives."*

As part of FAC's oversight, its Office of Policy and Audit conducted an audit of the Dataseam Initiative. More specifically, contract language (page 4/12) states that *"…Office of Policy and Audit has the authority to conduct an internal audit, investigation, or management review related to the Secretary's duties and responsibilities as chief financial officer of the Commonwealth."* Section 16 of the Standard Terms and Conditions on page 7 discusses FAC's access to records for the purpose of financial audit or program review.

## OBJECTIVE

The general objective of the audit is to determine costs and benefits of the contractual arrangement by which Apple computers are provided to Kentucky school districts in exchange for the use of available processing power for cancer and other research.

The timeframe for OPA's audit work and analysis is from FY 2007 through FY 2020.

## SCOPE OF WORK

OPA conducted audit and other work in the following areas:

- Contract deliverables;
- Programmatic and administrative expenditures;
- Quarterly and other reporting requirements;
- DataseamGrid functionality;
- DataseamGrid past and current users;
- Benefits and costs to participating Kentucky school districts (e.g., training, infrastructure, support, and contractual obligations);
- Initiative parity (school districts and universities);
- Catalog for Federal Domestic Assistance (CFDA) grant requirements for cancer research;
- District and school visits; and
- Other initiatives.

## SCOPE EXCLUSION

Because of issues related to proprietary information, auditors were not able to fully understand or quantify the architecture of the DataseamGrid. This could be considered a scope limitation had the audit plan focused primarily on issues related to the DataseamGrid itself. For example, whether statewide or other resources could definitively be used to operate the DataseamGrid or run the proprietary software.

Because the appropriation bill and contract language focused largely on providing Apple computers to Kentucky school districts however, auditors did not identify constraints related to Dataseam's proprietary information and encrypted research content as a limitation. However, auditors did review and analyze *"AT&T's Special Report on the Bandwidth and Computer Consumption of the DataseamGrid upon the Kentucky K-12 Internet Network"* to ensure that the DataseamGrid is actually being used by the University of Louisville to conduct cancer research.

More specifically, auditors reviewed *Dataseam Statewide Traffic* for the following periods: September 25, 2019 through October 6, 2019; October 21, 2019 through October 28, 2019; and December 24, 2019 through December 31, 2019. Testimonial and other evidence from the University of Louisville, as well as auditors' observation of the DataseamGrid, satisfied auditors that the DataseamGrid is being used for cancer research.

Dataseam officials also stated that it designed the DataseamGrid and research process *"so that it would have minimal network footprint in order not to have a negative effect on education traffic".*

## METHODOLOGY AND DATA SOURCES

OPA auditors conducted their work following statutory requirements, professional standards, and methods for governmental audits.

From October 2019 through February 2020, OPA conducted its research and analysis, which primarily focused on programmatic information and financial and accounting data provided by the Kentucky Department of Education (KDE), Dataseam Initiative, Inc., and K-12 school districts. OPA also conducted additional analysis of federal tax and other information as needed.

Research

1) Reviewed *Kentucky Data Research Initiative Report, March 2006* prepared by the Kentucky Council on Postsecondary Education (CPE).

2) Reviewed *Coal County Computing Program, 'Kids Cancer, Computers'* prepared by Dataseam Initiative, Inc., for the Program Review and Investigations Committee, November 10, 2011.

3) Reviewed *Kids, Computers and Cancer Research: Mining a cure for Kentucky's future* prepared by Dataseam Initiative, Inc., for the Program Review and Investigations Committee, November 10, 2011.

4) Reviewed *Program Review and Investigations Committee Minutes* from the Committee's November 10, 2011 meeting.

5) Reviewed the May 17, 2017 correspondence from the Office of State Budget Director (OSBD) to Dataseam Initiative, Inc. requesting information and data as a result of the veto message (Local Government Economic Assistance Fund) related to HB 303 (2016 Regular Session Chapter 149).

6) Reviewed the May 30, 2017 correspondence from Dataseam Initiative, Inc., responding to OSBD's information and data request of May 17, 2017.

7) Reviewed the June 22, 2017 correspondence from Dataseam Initiative, Inc., responding to OSBD's follow up information and data request of June 14, 2017.

8) Using the Secretary of State's *Online Services*, identified basic organization and other information on Dataseam Initiative, Inc., and reviewed its Articles of Incorporation.

9) Researched the following states to determine the type of grid-computing that occurs at public universities; 1) Pennsylvania; 2) Indiana; 3) Ohio; 4) Tennessee; 5) West Virginia; 6) Wyoming; 7) California; 8) Virginia; 9) Colorado; 10) Washington; and 11) New Jersey.

Interviews

1) Interviewed the following Dataseam Initiative, Inc. employees: Chief Executive Officer; Chief Operating Officer; and Dataseam Initiative, Inc., Board Chair. Interviews were conducted throughout the audit process to learn about the history, funding, and implementation of the initiative.

2) Interviewed the following Kentucky Department of Education (KDE) officials: Associate Commissioner, Office of Finance and Operations and Associate Commissioner, Technology and Chief Information Officer. Interviews were conducted to learn about contracting, reporting, and technical requirements of the initiative.

3) Interviewed (telephonically) the Committee Staff Administrator (CSA) of the Program Review and Investigations Committee to learn about the Committee's November 10, 2011 meeting and handouts.

4) Interviewed (telephonically) the Kentucky Council on Postsecondary Education's General Counsel, to learn about the Council's early involvement in studying the Kentucky Data Research Initiative created in 2005.

5) Interviewed the following University of Louisville officials: Deputy Director, Basic and Translational Research, James Graham Brown Cancer Center and Executive Director, Administration. Interviews were conducted to gain an understanding of the types of cancer research conducted at the center, the use of the DataseamGrid for cancer research, as well as Dataseam scholarship information.

6) Interviewed the following Morehead State University officials: Assistant Vice President for Enrollment and the Chief Information Officer. Interviews were conducted to gain an understanding of the agreement between the University and Dataseam Initiative, Inc., as well as Dataseam scholarship information.

District Superintendent Survey

1) Using SurveyMonkey, sent survey questionnaires to 120 County School Districts and 56 Independent School Districts (ISD) to gather information and data related to district participation in the Dataseam Initiative, as well as cost and other data. **Note**: Overall response rate was 53%, with 94 responses; however, the response rate of actively participating districts in the Dataseam Initiative as of February 17, 2020 was 74%, with 31 of 42 responding.

District Site Visits

1) Conducted ten (10) district site visits to gather information about the following: **1)** History of district participation in the Dataseam Initiative; **2)** Number of computers received and how they are used; **3)** Opinions on the Professional Development (PD) provided by Dataseam Initiative, Inc.; and **4)** Dataseam Initiative scholarships.

2) Conducted telephonic interviews with six (6) districts that stopped participating in the Dataseam Initiative after 2009, as well as four (4) districts that stopped participating in the Dataseam Initiative after 2014. The interviews were conducted primarily to gather information related to the districts' participation, as well as the reason(s) districts stopped their participation.

Analysis

1) Reviewed and analyzed appropriations bills from FY 2006 through FY 2019 to identify programmatic, funding, and other legislative requirements.

2) Reviewed and analyzed Personal Service Contracts (PSC) from 2006 through 2010 and Memorandum of Agreements (MOAs) from 2012 through 2020 to identify contract deliverables, administrative costs and programmatic requirements for participating districts, Morehead State University, and the University of Louisville.

3) Reviewed and analyzed eMARS expenditures from the Kentucky Department of Education to Dataseam Initiative, Inc., from FY 2007 through FY 2020.

4) Reviewed and analyzed invoices submitted to the Kentucky Department of Education for reimbursement related to computer purchases. Invoices also included the number of Professional Development (PD) trainings provided to K-12 school districts.

5) Reviewed and analyzed IRS 990 Forms for Dataseam Initiative, Inc., from 2006 through 2019 to understand aggregated revenue and expenditure information that occurred as a result of the Commonwealth's funding.

6) Reviewed and analyzed IRS W-2 Reports for Dataseam Initiative, Inc., from 2006 through 2018 in order to disaggregate IRS 990 expenditure data.

7) Reviewed and analyzed additional disaggregated Professional Development (PD) information provided by Dataseam Initiative, Inc., to determine cost and other impact at the district level, as well as to identify how additional revenue from the districts and other entities was expended by Dataseam Initiative, Inc.

8) Reviewed and analyzed Kentucky Department of Education Dataseam Statewide Traffic data (August 1, 2019 through September 9, 2019, September 25, 2019 through October 6, 2019, and October 21, 2019 through October 28, 2019) to gain a better understanding of the following: **1)** District rank by traffic; **2)** Data transferred (GB); **3)** District Internet capacity; **4)** GB availability; **5)** GB usage per day; and **6)** Grid usage as a percentage.

9) Requested and analyzed information from the University of Kentucky to determine the following: **1)** Types of cancer research; **2)** Systems and processes for grid-computing; and **3)** Federal funds coming into the University for cancer research.

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## BACKGROUND

In 2006, a Kentucky Economic Development Finance Authority (KEDFA) Grant provided $1,900,000 to Dataseam Initiative, Inc. (Dataseam) for the purchase of 2,000 computers, which expanded an earlier Pilot Project that provided $175,000 from *"…the high-tech investment pool, including some Local Government Economic Development Fund coal county funds for a Pilot Project on September 29, 2005."* The University of Louisville, James Graham Brown Cancer Center (BCC) worked with Dataseam to place eMACs in Jefferson and Caldwell County school districts during the Pilot Project.

According to Dataseam's initial KEDFA grant application, it provides high performance computing to state researchers, while using the results of the research to enhance workforce development in P-12 schools. It anticipated using the initial KEDFA grant award to *"…allow the Brown Cancer Center to complete computational work on six additional cancer targets to accelerate drug discovery."* Dataseam also envisioned the program to serve *"…as a model for a larger computing utility that may support additional researchers in the state."*

Subsequent involvement of the Commonwealth into what is currently the Kentucky Dataseam Initiative, was administered by the Kentucky Department of Education (KDE) and the Cabinet for Economic Development (CED), as the Coal County Computing Program.

During the 2006 Regular Session, HB 380 transferred oversight of the program from KEDFA to the Kentucky Department of Education (KDE) and appropriated $2,500,000 each year *"…for the purpose of enhancing education technology in local school districts within coal-producing counties."* The appropriations language also stated that *"The Commissioner of the Department of Education shall use $2,500,000 of the above $5,000,000 appropriation to continue the Coal County Computing Program."*

Table 1 provides additional detail on programmatic funding and reimbursements to Dataseam.

**Table 1**
**Kentucky Dataseam Initiative, Inc.**
**Budget Appropriations, Contracts, and Kentucky Department of Education Expenditures**

| Biennium Fiscal Year | *Appropriation | Contract Amount | KDE Expenditures (eMARS) | Fund Source |
|---|---|---|---|---|
| 2006-2007 | 2,500,000 | 2,500,000 | 2,942,595 | Restricted Fund |
| 2007-2008 | 2,500,000 | 2,500,000 | 2,057,092 | Restricted Fund |
| 2008-2009 | 2,500,000 | 2,500,000 | 2,499,972 | General Fund |
| 2009-2010 | 2,500,000 | 2,500,000 | 2,486,826 | General Fund |
| 2010-2011 | 2,500,000 | 2,500,000 | 2,497,829 | General Fund |
| 2011-2012 | 2,500,000 | 2,500,000 | 2,499,105 | General Fund |
| 2012-2013 | 2,500,000 | 2,500,000 | 2,499,637 | General Fund |
| 2013-2014 | 2,500,000 | 2,500,000 | 2,499,185 | General Fund |
| 2014-2015 | 1,750,000 | 1,750,000 | 1,749,108 | General Fund |
| 2015-2016 | 1,750,000 | 1,750,000 | 1,752,570 | General Fund |
| 2016-2017+ | 0 | 0 | 0 | - |
| 2017-2018++ | 0 | 3,100 | 2,891 | General Fund |
| 2018-2019 | 1,750,000 | 1,750,000 | 1,750,000 | General Fund |

| Biennium Fiscal Year | *Appropriation | Contract Amount | KDE Expenditures (eMARS) | Fund Source |
|---|---|---|---|---|
| 2019-2020 | 1,750,000 | 1,750,000 | **1,750,000 | General Fund |
| **Total** | **$27,000,000** | **$27,003,100** | **$26,986,810** | **-** |

**Source**: Office of Policy and Audit from information gathered from Kentucky Dataseam Initiative, Inc. contracts and expenditures from eMARS.
**Note**: The Legislation changed the Coal Severance Appropriation from the General Fund to the Discretionary General Funds, which removed the Information Technology (IT) designation.
*Appropriations bills respectively: HB 380 (2006); HB 406 (2008); HB 1 (2010); HB 265 (2012); HB 235 (2014); HB 303 (2016); HB200 (2018); and HB 268 (2019).
**Anticipated expenditures for FY2020.
+2016 Regular Session, Kentucky Acts Chapter 149, House Bill 303; line item veto occurred.
++KDE entered into a contract with Dataseam to produce an educational video.

**KRS Chapter 45A Exemption.** Because legislative language stated that KDE *"continue"* the Coal County Computing program, it requested that the Finance and Administration Cabinet (FAC) grant an exemption from procurement requirements of KRS Chapter 45A and allow KDE to pay Dataseam, as outlined in a Grant Agreement. More specifically, KDE requested an exemption *"from the competitive bidding requirements of KRS Chapter 45A.095 (1) and FAP 111-09-00 as we believe that competition is not feasible to bid in this situation."* The exemption, requested by KDE's Deputy Commissioner and General Counsel, received approval.

According to KDE, provisions within KRS 45A.690(1)(d) legally exempt agencies from competitive bidding requirements for contracts with non-profit 501(d)(3) organizations. More specifically, KRS 45A.690(1)(d) includes non-profit organizations under the definition of Memorandum of Agreement (MOA), which does not require competitive bidding.

After the initial sole-source approval, the non-competitive arrangement carried forward until MOAs were used after the 2010 contract. However, since Cloud and other network computing technologies are currently available, it may be practicable or feasible to conduct competitive bidding moving forward. KDE officials stated that while an agency *"may still within its discretion decide to issue a competitive solicitation…the recommendation to consider competitive solicitation is fair."*

**Dataseam Initiative, Inc.** Dataseam is a non-profit organization based in Louisville, Kentucky. Dataseam started as for-profit corporation on July 7, 2004. Its organizational structure is listed on the Secretary of State's (SOS) website currently as, a non-profit company, in active status, and in good standing.

On September 30, 2005 the Articles of Incorporation were amended to make Dataseam a 501(c)(3) organization. Officials within the non-profit organization include the Chief Executive Officer (CEO), whom has also served as a Director, since the company's inception, as well as a Chief Operating Officer (COO).

According to Dataseam officials, the change to non-profit occurred in order to complete preliminary work started in 2003, demonstrating the computing infrastructure technology. Officials also stated that *"The board very quickly decided to move all operations of the business to a non-profit and the for-profit entity was terminated."*

Using its proprietary DataseamGrid, Dataseam maintains a computer grid, which *"aggregates computers located in school classrooms using proprietary software and tools created by Dataseam including dGrid and dStat."* The DataseamGrid consists of 6,846 computers in 33 K-12 school districts located in Eastern and Western Kentucky. At the time of this writing, Dataseam anticipated connecting additional computers in 15 school districts prior to June 2020.

The BCC accesses computers to conduct cancer research when the school districts' computing power is available. Ultimately, the BCC intends to commercialize the discovery of anti-cancer drugs, which according to Dataseam is an economic impact and core of the original intention of the program.

Table 2 provides the current number of active school districts and computers operating on the DataseamGrid.

**Table 2**
**Active School District Computers**

| District | Computers Active on the Dataseam Grid |
|---|---|
| Allen* | 0 |
| Breathitt | 450 |
| Carroll* | 0 |
| Clay | 352 |
| Corbin Independent | 11 |
| Crittenden | 145 |
| Daviess | 454 |
| Elliott | 483 |
| Gallatin* | 0 |
| Hancock | 385 |
| Harlan Independent | 31 |
| Hazard Independent | 72 |
| Jackson Independent | 107 |
| Jefferson | 2 |
| Jenkins Independent | 135 |
| Johnson | 722 |
| Lawrence | 467 |
| Martin | 225 |
| McClean | 87 |
| Menifee | 227 |
| Middlesboro Independent | 107 |
| Morgan | 358 |
| Ohio | 592 |
| Owensboro Independent | 419 |
| Paintsville Independent * | 0 |
| Pikeville Independent | 107 |

| District | Computers Active on the Dataseam Grid |
|---|---|
| Pineville Independent | 40 |
| Rowan* | 0 |
| Russell Independent | 86 |
| Trigg* | 0 |
| Webster | 339 |
| Whitley | 319 |
| Williamsburg Independent | 124 |
| **TOTAL** | **6,846** |

**Source**: Office of Policy and Audit from information provided in the Dataseam Quarterly Report: October-December.
*New districts have 30 days from receipt of computers to have them operational for research and student use.

Figure 1 shows a typical computer lab connected in Pikeville Independent School District.

**Figure 1**
**Computer Lab in Pikeville Independent School District**


Source: Office of Policy and Audit from Pikeville Independent School District site visit.

**Dataseam Revenues and Expenditures.** From 2007-2020, Dataseam's Program Source and Use invoices show that it received $26,983,919 from the Commonwealth to place computers in K-12 school districts as part of the Coal County Computing Program. After accounting for actual and estimated administrative expenditures ($5,494,789), the invoices show that Dataseam purchased $21,489,130 worth of computers (26,600) during the program for an average of $808 per computer.

The FY 2020 contract for $3,500,000 set a cap of 18% for administration of the program. Once this amount ($630,000) is backed out from the total appropriated amount, $2,870,000 is left for the purchase of 2,600 computers at a cost of $1,104 per computer. According to Dataseam, it purchased KDE approved models from state contracts from 2007-2020, which varied in specifications as well as price per computer. Dataseam also stated that on occasion, it made special bulk purchases of computers with better specifications at lower prices, which it invoiced to the State at *"net cost"* for reimbursement.

Table 3 provides additional detail on program revenue and computer expenditures over the life of the program, while Table 4 breaks out administrative expenditures into Operations and Personnel.

**Table 3**
**Dataseam Revenues and Expenditures**
**2005-2018**

| Years | Revenue | Computer Costs | Computers Purchased | Cost Per Computer | Administration |
|---|---|---|---|---|---|
| 2007-2016 | $23,483,919 | $18,619,130 | 24,000 | $776 | *$4,864,788.95 |
| 2019-2020 | 3,500,000 | **2,870,000 | 2,600 | 1,104 | ***$630,000 |
| **Total** | **$26,983,919** | **$21,489,130** | **26,600** | **$808** | **$5,494,788.95** |

Source: Office of Policy and Audit from eMARS and Dataseam's Program Source and Use Forms.
*Actual administrative expenditures from 2009-2016, but estimated at 20% for 2007 and 2008.
**Anticipated expenditures based on reimbursement from the purchase of 2,600 computers at $1,104 per computer.
***Amount based on the 18% administrative cap set on the FY 2020 contract.

**Table 4**
**Dataseam Administrative Expenditures**
**FY 2007-FY 2020**

| Year | Contract Amount | Operations | Personnel | Administrative Total | Percentage of Contract Amount |
|---|---|---|---|---|---|
| *FY 2007 | $2,500,000 | - | - | - | - |
| *FY 2008 | 2,500,000 | - | - | - | - |
| FY 2009 | 2,500,000 | 101,280.25 | 366,887.76 | 468,168.01 | 19% |
| FY 2010 | 2,500,000 | 108,169.70 | 338,358.07 | 446,527.77 | 18% |
| FY 2011 | 2,500,000 | 94,369.06 | 439,418.31 | 533,787.37 | 21% |
| FY 2012 | 2,500,000 | 88,680.44 | 443,133.25 | 531,813.69 | 21% |
| FY 2013 | 2,500,000 | 77,883.16 | 389,471.87 | 467,355.03 | 19% |
| FY 2014 | 2,500,000 | 73,550.48 | 427,558.51 | 501,108.99 | 20% |
| FY 2015 | 1,750,000 | 66,356.75 | 389,359.56 | 455,716.31 | 26% |
| FY 2016 | 1,750,000 | 67,281.44 | 393,030.34 | 460,311.78 | 26% |
| **FY 2017 | | - | - | - | - |
| **FY 2018 | | - | - | - | - |
| FY 2019 | 1,750,000 | +157,500 | +157,500 | +315,000.00 | 18% |
| FY 2020 | 1,750,000 | +157,500 | +157,500 | +315,000.00 | 18% |
| **Total** | **$27,000,000** | **$992,571.28** | **$3,502,217.67** | **$4,494,788.95** | **-** |

Source: Office of Policy and Audit from Coal County Computing Program Source and Use Invoices.

*Invoice not available from Kentucky Department of Education. OPA estimated an additional $1 million in administration based on a 20% calculation.
**Veto years.
+Estimates based on the 18% cap on administrative expenses in the FY 2020 contract.

**Dataseam Uses Participating Partner Agreements**. Dataseam requires that participating districts complete a *Dataseam Participating Partner Agreement (PPA).* This agreement is prescriptive in terms of requirements, as well as commitment to pay for Professional Development (PD).

See Appendix A and Appendix H for additional detail on the PPA.

There are two types of PD offered by Dataseam. Teacher training is the first type, which, usually happens once per educator, but in many cases teachers attend multiple sessions, according to Dataseam. These trainings are identified below, as introductory classes, iLife Workshops and the Digital Classroom.

The second type of PD is industry standard certifications for technical employees at the district. These are the types of training previously discussed as, stackable certifications. In order words, Dataseam encourages additional certifications any time a new MacOS software update is introduced. According to Dataseam, it "*encourages that at least one technician in the district maintain a certification for the current Operating System (OS) being run in the school district."*

According to KDI, the following types of PD are provided:

- ***Introductory Classes***. *Dataseam provided a series of DGL (Digital Learning) classes that introduced teachers and technicians to basic operation of the computers. Dataseam developed the curriculum. Dataseam generally paid two instructors from Morehead State University to conduct the 3-hour, hands-on classes in the district for 20-30 teachers. Program (2005-2011) cost was $1,500 per class.*

- ***iLife Workshops***. *With increased technology and teacher engagement we provided iLife Classes designed by Apple, which helped teacher understand the full iLife suite of applications available on the computers they received. This was a 3 and 4-day, in-district class for 25 teachers lead by of our instructors. Dataseam contracted, trained and managed a number of certified Kentucky classroom teachers to facilitate the workshops. Program (2009-2013) cost including meals and testing fees was $12-15,000 per class.*

- ***Technical Certification***. *In order to better prepare school technicians to set-up and maintain the more complex enterprise system in schools and to ensure our computing grid operated at greater efficiency, we became an Authorized Apple Training Center and offered the full suite of technical certification classes. These 3-5 day sessions were offered at Kentucky State Parks, our office and a limited number in district. There have been as many as 5 separate certifications available. We currently offer 1 certification and Dataseam has developed an additional class that covers specific Kentucky school issues. Program (2007-current) cost was $1,800 - $2,500 including meals and testing fees.*

- ***The Digital Classroom***. *Dataseam developed an intense, 2-day, hand-on teacher workshop that helped teachers integrate digital projects in to their dialing instruction and directly support Kentucky education standards. Dataseam developed the curriculum in collaboration with our cadre of instructors and representatives at Morehead State Universities 21-Century Education Enterprise. Classes were conducted in district by our cadre of Kentucky educators with 2-3 instructors per 20 teachers. Each teacher was required to post a final project. Program (2014-2015) cost including meals and materials was $12,000-14,000 per class.*

- ***Misc. Workshops***. *Dataseam has provided a range of education programs including iMovie Workshop, Tech Institute, Production 101, WKU Mountain Workshops. These have been free to minimal charges.*

**PD Costs to Districts.** OPA's review of the 990 IRS tax documents, identified $2.9 Million derived from PD. These revenues are generated from participating school districts.

Table 5 provides additional detail on overall PD costs by year.

**Table 5**
**Professional Development**

| Year | Amount |
|---|---|
| 2005 | - |
| 2006 | 33,150.00 |
| 2007 | 168,661.00 |
| 2008 | 146,733.00 |
| 2009 | 364,465.00 |
| 2010 | 608,840.00 |
| 2011 | 236,520.00 |
| 2012 | 401,391.00 |
| 2013 | 359,776.00 |
| 2014 | 280,385.00 |
| 2015 | 322,425.00 |
| 2016 | - |
| 2017 | - |
| 2018 | - |
| **Total** | **$2,922,346.00** |

Source: Office of Policy and Audit from IRS Form-990s.

**Morehead State University.** Morehead State University (MSU) also participated at one time in the program, allowing Apple computers provided by Dataseam to operate on the DataseamGrid. However, it was not required to complete PD, in order to receive computers. According to Dataseam, MSU personnel attended certification classes in the past, but could not state whether it paid for PD.

Currently, the 30 computers used at MSU's Craft Academy are not connected to the DataseamGrid. According to MSU's CIO, *"Dataseam authorized MSU to remove the Xgrid server in August 2019."* Dataseam stated that it granted a request from MSU Craft Academy to establish a lab and worked with

MSU's IT personnel to overcome university network security protocols, which caused "access issues in order to run research." As a result, Dataseam stated that it *"determined that the computers at the Craft Academy were not going to meet research needs and abandoned the effort."*

According to the Assistant Vice President of Enrollment, MSU has provided $904,645.25 in Dataseam scholarships from 2010-2019. Dataseam did not provide requested information to identify the funds from which the 30 computers were purchased.

Dataseam has worked with MSU's Space Science Center *"on a range of education and science projects since 2005"*, according to MSU's CIO. He also stated that Dataseam has been working with MSU toward building commercial capacity to leverage *"our faculty and facilities, with the intent of expanding our research and development."* Dataseam also leads a Business Mapping project in 2018 to *"identify specific market areas and projects."* Dataseam mentioned other MSU projects such as the MSU 21st Center Education Enterprise, which provided PD programs to other schools.

**University of Louisville Additional Computing Resources.** The University of Louisville (UofL) also uses a high performance supercomputer, called the Cardinal Research Cluster (CRC). This computer operates by clustering computing power into one computer, much like the coupled processing power or grid computing, being performed by Dataseam. The UofL Cardinal Research Cluster is open to any and all researchers and faculty.

The CRC website has taken steps to ensure and aid users in obtaining grant funding by citing use of the supercomputing/technology resource the CRC provides. The CRC website illustrates that all systems are operational and provides status updates for the supercomputers performance. CRC could be an alternate computing resource for BCC to utilize if needed; although it is not 100% dedicated to cancer research as is the DataseamGrid.

**University of Kentucky Computing Resources.** Based on the Markey Cancer Center (MCC) website, the University of Kentucky (UK) employs resources at the UK Center for Computational Sciences, in order to perform cancer research. When asked about the use of computer grid technology, a UK official stated, *"To date, grid computing has not been a major factor in MCC research, but other high performance computing (HPC) resources are essential, particularly for genomic and other multi-omics analyses.* However, that GridChem, provides the chemistry community with access to grid computing.

The MCC credits recent accomplishments with securing CFDA funding to UK's high performance computing, stating HPC is *"often critical to secure CFDA funding. Many of MCC's federal grant proposals require the use of high-performance computational (HPC) resources. Recently funded grant proposals that require HPC resources involve large genomic datasets for bioinformatics analyses, large collections of narrative documents for deep learning in natural language processing and large sets of digital pathology images involving deep learning for feature extraction. MCC research involving computational methods in molecular docking and drug discovery are also reliant on the use of HPC resources. We typically cite access to XSEDE via UK's Center for Computational Sciences as a resource available to our investigators in grant proposals."*

When OPA inquired with MCC to see if there has ever been any interest in employing the DataseamGrid for cancer research, it indicated that they would not have a use for it in the research being performed at MCC. The respondent went on to say, *"We have not engaged in communications*

*specific to the Dataseam Initiative, partly because we have not identified a need to develop applications to run in this highly distributed, low performing, computational environment. Our current computational needs are better suited for locally hosted, KyRIC or cloud-based HPC resources as previously described. Privacy concerns would also limit the utility of this resource for many of our high throughput computing tasks."*

See Appendix B for a comparison of BCC and MCC cancer research programs.

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## Chapter #1: Multi-Faceted Program Purposes

The Kentucky Dataseam Initiative (program) placed 26,600 Apple computers in K-12 school districts in coal counties since 2005. School districts use the computers for classroom instruction, but the computers also provide the technical backbone from which to operate the DataseamGrid.

The DataseamGrid uses Dataseam's proprietary software program that utilizes the MacOS. The University of Louisville, James Graham Brown Cancer Center (BCC) uses the DataseamGrid for cancer research, with the intention to "…*accelerate the time from research to commercialization of new pharmaceuticals."*

Multiple Purposes in Appropriations, Contract, and Grant Language

Language in past appropriations bills, Kentucky Department of Education (KDE) contracts, and two initial Grant Agreements suggest multi-tiered program purposes, as well as ambiguity with respect to contract management. According to KDE, confusion exists with respect to contract oversight and monitoring, as well as how contracts should be written.

Dataseam officials stated however, that it reported to KDE multiple times per year and met on various occasions with different KDE officials during user conferences and other events. Dataseam also stated that it discussed budgetary issues and coordinated with KDE to ensure that future Dataseam funding remained separate from KDE's Office of Education Technology's (OET) budget. Other issues related to contract revisions as well as legislative intent, were also discussed with KDE, legislative staff, and individual legislators according to Dataseam.

Two Grant Agreements were incorporated into the first and second KDE contracts to provide additional guidance with respect to the expenditure of restricted monies. Grant Agreements are unique to economic development initiatives, in that they provide additional requirements than with ordinary contracts. The parties to the agreements included the Cabinet for Economic Development (CED), KDE, and Dataseam Initiative, Inc. (Dataseam).

**2006 Regular Session.** During the 2006 Regular Session, HB 380 transferred oversight of the program from Kentucky Economic Development Authority (KEDFA) to KDE. It required that restricted appropriations from the Local Government Economic Development Multi-County Fund be used *"…for the purpose of enhancing education technology in local school districts within coal-producing counties."*

Language also required that *"The Commissioner of the Department of Education shall use $2,500,000…to continue the Coal County Computing program."* For purposes of this report, the Coal County Computing program has a primary focus of building and administering the statewide research computer infrastructure for cancer research.

Dataseam officials further stated that the intent of the Coal County Computing Program is to provide *"high performance computing to state researches and enhances workforce development in P-12 schools."* Officials added that, "*All work, efforts and direction emanates from the Kentucky Economic Development Finance Authority project: Kentucky Dataseam Initiative (Coal County Computing Program)."*

KDE approved a Personal Service Contract (PSC) to build and administer a statewide research computer infrastructure, which would also benefit school districts. More specifically, it envisioned that funds be used for *"…building and administering the statewide research computer infrastructure by leveraging current desktop computers and network assets in the state's school districts and purchasing additional desktop computers to add to this network. The combined processing power of the networks will accelerate research to commercialize products and the research will provide relevant education outreach to Kentucky students."*

Contract language also stated that "*This program was originally administered by the Cabinet for Economic Development and will continue to be administered by the Economic Development Cabinet under the terms of a grant agreement between the Cabinet for Economic Development, the Department of Education, and the Kentucky Dataseam Initiative, Inc."*

However, the Grant Agreement between the parties primarily tasks KDE with the responsibility of "*direction and supervision"* of the *Coal County Computing Program*. It envisioned that KDE would oversee the program based on the requirements of the earlier KEDFA grants and to further expand the Pilot Project.

**2008 Regular Session.** Similarly, HB 406 passed during the 2008 Regular Session directed the use of funds for education technology and retained language that requires the Commissioner of the Department of Education use appropriated funds *"to continue the Coal County Computing program."* Language also provided that funds be used *"…for the purpose of enhancing education technology in local school districts within coal-producing counties."*

The Grant Agreement includes similar language as stated above, with the primary focus of establishing and maintaining a statewide research computer infrastructure. One important requirement identified in this particular Grant Agreement however, includes a measurable expectation that Dataseam Initiative, Inc., conduct training for 1,000 teachers at *"individual school expense"*, which appears to be the precursor for districts to continue to experience recurring costs.

See Appendix C for additional detail related to the multi-tiered purpose within bill language, as well as in contract and grant language since 2006.

**Dataseam Initiative Inc., Participating Partner Requirements.** When discussing contract wording with Dataseam, one official opined that the nebulous wording in the contracts allows it to run the program with more flexibility. Dataseam uses this flexibility to require that participating districts complete the *Dataseam Participating Partner Agreement*. This agreement is prescriptive in terms of requirements, as well as commitment to pay for Professional Development (PD).

According to Dataseam officials, the agreements annotate additional requirements for participating school districts, similar to those in earlier KEDFA grants. For example, the 2008 Grant Agreement included a measurable expectation that Dataseam Initiative, Inc., conduct training for 1,000 teachers at *"individual school expense."*

Although this particular language was not found in subsequent contract language, Dataseam uses it as a basis to require participating districts to pay them for PD as part of the *Participating Partner Agreement (Section 4).* Officials have stated on numerous occasions that they view the additional requirements as *"district skin in the game."* Dataseam officials further clarified this phrase as *"a term*

*used in economic development projects, which was an important element in receiving the initial CCCP (Coal County Computing Program) funding."*

Table 1.1, provides additional information related to the requirement that participating districts pay for PD.

**Table 1.1**
**Dataseam Participating Partner Agreement (PD Requirement)**

| Participating Partner Agreement Sections | Requirements |
|---|---|
| Section 4: Equipment Addendum to Science and Lab Agreement | 1. School District agreement to pay for professional development.<br>2. Work to coordinate additional Dataseam partnership activities, subject to lab availability. |

Source: Office of Policy and Audit from Gallatin County Schools Participating Partner Agreement approved on 11/6/19.

**Districts pay Dataseam for PD**. Since the start of the program, school districts have paid Dataseam close to $3 million in order to *"earn"* computer labs or individual teacher computers, money which is used by Dataseam to defray the administrative and training costs of the program. More specifically, districts are required to pay for PD, which consists of a combination of teacher training and technical certification. Districts are responsible for these additional costs, which come from their local budgets, or from other state, federal or private sources if available.

Dataseam's 2006-2020 IRS 990-Forms shows a total of $2,922,346 paid to Dataseam by school districts for PD. Upon request, Dataseam provided disaggregated PD costs broken out by PD type from 2008-2020, which is $421,600.23 less than what the federal tax information showed.

**Table 1.2**
**Professional Development (PD)**
***2006-2020**

| # | School District | Technical Certification | Teacher Training | Total PD | Total Cost |
|---|---|---|---|---|---|
| 1. | Allen | 6 | 0 | 6 | $11,800.00 |
| 2. | Breathitt | 27 | 239 | 266 | 151,281.00 |
| 3. | Carroll | 3 | 0 | 3 | 7,000.00 |
| 4. | Casey | 0 | 0 | 0 | 10,000.00 |
| 5. | Clay | 26 | 237 | 263 | 80,564.00 |
| 6. | Corbin ISD | 2 | 0 | 2 | 5,000.00 |
| 7. | Crittenden | 21 | 65 | 86 | 59,475.00 |
| 8. | Daviess | 24 | 171 | 195 | 146,258.00 |
| 9. | Elliott | 29 | 288 | 317 | 106,820.00 |
| 10. | Estill | 0 | 0 | 0 | 50,000.00 |
| 11. | Fulton | 0 | 0 | 0 | 6,666.67 |
| 12. | Fulton ISD | 0 | 0 | 0 | 6,666.66 |
| 13. | Gallatin | 2 | 0 | 2 | 5,000.00 |
| 14. | Green | 0 | 0 | 0 | 5,000.00 |

| # | School District | Technical Certification | Teacher Training | Total PD | Total Cost |
|---|---|---|---|---|---|
| 15. | Hancock | 48 | 111 | 159 | 139,706.00 |
| 16. | Harlan ISD | 17 | 60 | 77 | 78,458.00 |
| 17. | Hazard ISD | 14 | 153 | 167 | 60,097.00 |
| 18. | Hickman | 0 | 0 | 0 | 1,666.66 |
| 19. | Jackson ISD | 22 | 118 | 140 | 61,819.00 |
| 20. | Jefferson | 12 | 0 | 12 | 30,150.00 |
| 21. | Jenkins ISD | 19 | 171 | 190 | 86,254.00 |
| 22. | Johnson | 35 | 374 | 409 | 196,917.00 |
| 23. | Lawrence | 37 | 452 | 489 | 171,663.00 |
| 24. | Lewis | 0 | 0 | 0 | 0.00 |
| 25. | Marion | 0 | 0 | 0 | 10,000.00 |
| 26. | Martin | 28 | 76 | 104 | 102,970.00 |
| 27. | McClean | 6 | 0 | 6 | 11,798.00 |
| 28. | Menifee | 18 | 390 | 408 | 88,773.00 |
| 29. | Middlesboro ISD | 34 | 113 | 147 | 90,449.78 |
| 30. | Morgan | 39 | 173 | 212 | 126,213.00 |
| 31. | Nelson | 0 | 0 | 0 | 0.00 |
| 32. | Ohio | 38 | 390 | 428 | 141,888.00 |
| 33. | Owensboro ISD | 21 | 44 | 65 | 58,293.00 |
| 34. | Paintsville ISD | 12 | 125 | 137 | 26,200.00 |
| 35. | Pikeville ISD | 21 | 56 | 77 | 54,694.00 |
| 36. | Pineville ISD | 87 | 93 | 180 | 67,280.00 |
| 37. | Rowan | 2 | 0 | 2 | 5,150.00 |
| 38. | Russell ISD | 17 | 39 | 56 | 15,000.00 |
| 39. | Trigg | 14 | 0 | 14 | 11,825.00 |
| 40. | Webster | 10 | 113 | 123 | 96,571.00 |
| 41. | Whitley | 46 | 72 | 118 | 92,833.00 |
| 42. | Williamsburg ISD | 8 | 0 | 8 | 17,200.00 |
| **Total** | | **745** | **4,123** | **4,868** | **$2,495,399.77** |

Source: Office of Policy and Audit from information provided by Dataseam Initiative, Inc.
*According to Dataseam' s IRS 990-Forms, it received an additional $33,000 and $168,000 in PD revenue from school districts for FY 2006 and FY 2007 respectively, which totals $2,696,399.77. However, Dataseam's IRS-990 forms show a total of $2,922,346 earned from PD.

Confusing Oversight Requirements

**KDE and CED conjunction.** It is interesting to note that appropriations language after 2006 and 2008 maintains a requirement that KDE use funds to *"…continue the Coal County Computing Program,"* but adds additional language for it to administer the program *"…in conjunction with the Cabinet for Economic Development through its Department of Commercialization and Innovation."* However, it appears there has been no real collaboration between the two entities since 2010.

The lack of CED participation after 2010, may have created challenges for KDE to administer a multi-tiered contract on its own. In other words, it appears the Legislature intended the program, because of its multi-tiered nature, to be administered jointly by entities with technical expertise in those areas.

It is not until 2019 (HB 268) that this language is stricken. Instead, language in HB 268 requires the Finance and Administration Cabinet (FAC) to provide approval and oversight of all contracts with the Dataseam Initiative. According to appropriation language, monies were appropriated each fiscal year for the Kentucky Dataseam Initiative, "*for the purpose of enhancing education technology in local school districts."*

**FAC oversight requirements**. More specifically, *"Included in the General Fund appropriation is $1,750,000 in each fiscal year for the Kentucky Dataseam Initiative for the purposes of enhancing education technology in local school districts. Notwithstanding KRS 42.726 to 42.730, the Secretary of the Finance and Administration Cabinet shall provide exclusive approval and oversight of all contracts related to the program."*

The FY 2020 contract also includes similar wording, *"Contractor agrees pursuant to KRS 42.065 (1), that the Office of Policy and Audit has the authority to conduct an internal audit, investigation, or management review related to the Secretary's duties and responsibilities as chief financial officer of the Commonwealth."*

HB 268 deleted the term *"Coal County Computing Program"* and replaced it with *Kentucky Dataseam Initiative."* The use of the latter term could be confusing in terms of whether the Legislature envisioned appropriating money directly to the Kentucky Dataseam Initiative, Inc., or for the program itself. Looking back at the initial contract in 2006 (PON2 540 0600002568 3) however, appears to provide some context.

More specifically, FAC granted an exemption from the procurement requirements of KRS Chapter 45A, which allowed KDE to pay Kentucky Dataseam Initiative, Inc. The exemption was based on a letter from KDE to FAC stating the following: *"The program was originally administered by the Cabinet for Economic Development. Since the legislation mandates that KDE 'continue' the Coal County Computing Program, KDE has entered into the attached agreement with Economic Development which contains the implementation provisions. KDE believes that the budget language requires them to continue with the same vendor, namely the Kentucky Dataseam Initiative, Inc."* This exemption appears to be the basis for sole-sourcing the contracts throughout the entirety of the program.

Differing Views of the Program

Dataseam officials stated they view the program as an economic development initiative, with cancer research as the *"Tip of the Spear."* This view envisions the use of *Participating Partner Agreements* to be signed by districts that receive Apple computers.

Dataseam has stated repeatedly, that computers should be *"earned"* by the districts as part of the agreement to benefit from the use of Apple computers for instructional purposes. And, that districts must follow additional requirements to maintain the computers on the DataseamGrid. For example, reporting whether computers are on/offline, reporting system values related to memory, free disk space, etc.

The competing view of the program comes from KDE. Officials view the program as one that should primarily benefit school districts throughout the Commonwealth, especially with respect to placement of computers, which have already been purchased with state funds. KDE officials have questioned

whether it is appropriate for school districts to pay for these computers, which could prevent schools from participating.

According to KDE officials, questions related to the intent of the program, placement of computers, as well as payment for PD are often met in a dismissive manner. Conversely, Dataseam makes competing comments about the lack of understanding by KDE about the overall purpose of the program.

**How the program operates**. The program operates in a manner by which participating districts are required to pay for PD in order to receive computers for classroom instruction. Revenue, which is used to defray administrative and other costs. For example, according to a Dataseam official, because the FY 2020 contract caps administrative costs to 18% (like most commodity-based contracts), Dataseam has increased the cost of PD to districts to offset any difference that is expended above the 18%.

However, from reading language in past appropriations bills and contracts, it is not evident that the program should be run in this manner. For example, there is no mention that districts must follow stringent requirements, nor is there explicit language that participating districts are required to pay Dataseam to receive PD. Other than repeating language that refers to continuation of the *"Coal County Computing Program"* the appropriations and contract language is silent on the issue of PD and responsibility for its cost, as well as whether Dataseam has the authority to obligate participating school districts to pay for PD as part of a Participating Partner Agreement.

K-12 district use of Apple Computers

Apple computers are a very small percentage of over digital readiness. According to KDE's Digital Readiness Report for 2018-2019, there are 794,702 computers across the Commonwealth in K-12 districts. However, the majority of those devices operate on Windows operating systems.

As seen from Table 1.3, only 30,513 or 4% of computers in Kentucky school districts use a MacOS. And, the number of active Dataseam computers as of December 2019, is 6,846 or ≤ 1%. Based on this information, it is difficult to make an argument that Apple computers, as part of the program, is benefitting all school districts.

However, the existence of Apple computers provided by the program, serve primarily as the technical backbone, from which to operate the DataseamGrid.

**Table 1.3**
**Kentucky Department of Education**
**Statewide Digital Readiness Reports**
**(2018-2019)**

| Operating System | Number | Percentage |
|---|---|---|
| Windows-Pre Window 7 | 353 | 0.0 % |
| Windows 7 | 53,397 | 6.7% |
| Window 8 (8.1 & RT) | 2,956 | 0.4% |
| Windows 10 | 170,497 | 21.5% |
| MacOS X 10.9 (or earlier) | 6,399 | 0.8% |

| Operating System | Number | Percentage |
|---|---|---|
| MacOS X 10.10 (or later) | 24,114 | 3.0% |
| Chrome OS (Chromebook OS) | 434,476 | 54.7% |
| iOS 9.x or earlier | 38,734 | 4.9% |
| iOS 10.x or newer | 53,038 | 6.7% |
| Android 6.0.1 (Marshmallow) or earlier | 1,542 | 0.2% |
| Android 7.0 (Nougat) or newer | 2,773 | 0.3% |
| Other Android base OS (i.e. Kindle, etc.) | 6,376 | 0.8% |
| Other Desktop OS (e.g., Linux) | 47 | 0.0% |
| **Total** | **794,702** | **100.00%** |

Source: Office of Policy and Audit from information provided by KDE's Digital Readiness Reports (2018-2019).

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## Chapter #2: Benefits and Costs to Multiple Parties

The Dataseam Initiative (program) primarily benefits three (3) entities: **1)** University of Louisville James Graham Brown Cancer Center; **2)** Dataseam Initiative, Inc. (Dataseam); and **3)** Participating K-12 school districts.

James Graham Brown Cancer Center (BCC)

According to Dataseam and BCC officials, the primary purpose of the program is for Dataseam to operate its proprietary DataseamGrid for cancer research conducted by the University of Louisville (University). Using the DataseamGrid allows the BCC to conduct *"hundreds of years' worth of calculations every week."* According to Dataseam's Executive Director, *"It's counterintuitive that this high-end research is being done in one of the poorest parts of the country."*

Essentially, researchers are looking for chemicals that will inhibit the growth of cancer. When research is performed on a particular type of cancer, it is referred to as a target. This is done by using 3D models of cancer proteins to look for a match against a molecular model of a chemical. According to BCC, *"If the chemical or molecule binds or blocks the protein, it may be able to stop its growth in a cancer cell."*

The next step is to test the chemical in the laboratory to see if the molecule(s) actually bind to the cancer proteins. If this step is successful, the chemical (potential cancer drug) may be a candidate for testing for use in humans.

According to the BCC, the DataseamGrid has identified between 100-250 potential drugs for over 50 targets, with two (2) drug candidates making it to clinical trials. Over ten (10) drugs are currently in development for lead candidate selection for potential clinical trials. Zero (0) drugs have been approved by the United States Food and Drug Administration (FDA). Dr. John Trent, Deputy Director of Basic and Translational Research at the BCC, noted however, that drug development is a long and very expensive process.

From 2012-2019 an average of 43 research targets per year were submitted on the DataseamGrid. According to Dr. Trent, *"For each target several "runs" or "jobs" are made screening over 40 million compounds against a single target, sometimes significantly more."* He also stated that over 90 patent applications on drug discovery were filed over the past ten years. **Note**: See page 53 of the report for additional information provided by Dataseam discussing the external impacts of the program.

**University Cost.** According to Dr. Trent, using the DataseamGrid is preferable primarily because BCC is able to conduct its research for zero cost, with respect to computing time on the DataseamGrid. In addition, the DataseamGrid is dedicated primarily to BCC's research, which allows for the scheduling and prioritization of research. And, since the Mac platform is Unix-based, Dr. Trent stated it is easier to run scientific software that they run in conjunction with the laboratory.

However, he stated that it does cost the BCC money to run the DataseamGrid related to paying researchers and other employees. He discussed that the *"drug discovery operation was continuously funded by competitive Federal funds for 15 years and ranked as "outstanding" by the National Institutes of Health."* He also stated that BCC's annual research budget is over $25 million.

See Appendix D and Appendix E for additional information on how BCC uses the DataseamGrid.

Dr. Trent stated that the DataseamGrid allowed BCC to conduct the research necessary to qualify for $41 million in federally funded research grants. He also said that additional funding in the amount of $6.5 million from the National Institutes of Health (NIH) for Kentucky Network for Innovations & Commercialization ("KYNETIC") and $11.5 million from NIH, Center for Cancer Immunology and Immunotherapy (CCII) to establish a center of excellence in cancer immunology and immunotherapy at the University of Louisville, has been awarded. In 2009, Kosair Charities provided $12.5 million for pediatric cancer drug discovery.

If BCC was not able to use the DataseamGrid, this money could conceivably be at risk, unless an alternative research capability, such as a dedicated supercomputer or Cloud Computing was funded. Another option could be the use of existing computers, for example the use of state computers at the Alternative Data Center (ADC), to establish another dedicated computer network.

However, such an effort would cost additional money and possibly take a year to develop, according to Dr. Trent. He also stated however, that there would be challenges to this approach: **1)** ADC does not run MacOS computers; **2)** Uncertain availability; **3)** Lack of control over research time and deployment; and **4)** No proprietary DataseamGrid software equivalent available to actually deploy and run research.

According to University officials, it has provided $496,000 in Science, Technology, Engineering, and Mathematics (STEM) undergraduate scholarships since 2007. Scholarships are intended for students in high schools within participating school districts. According to Dr. Trent, these scholarships to the University are beneficial for building a potential pipeline of researchers. However, the $496,000 is simply a reallocation from existing scholarship funds that existed prior to the relationship to Dataseam, as opposed to new scholarship funds.

The University is also benefitting because the participating school districts currently pay for the physical space, physical security, electricity, and technical staff to ensure functionality of the system. In other words, these costs would be borne by the University if it used a stand-alone system. However, BCC does make its staff and facilities available for student tours, which represents a marginal time cost to the University.

Dataseam Initiative, Inc.

As a 501(c)(3), Dataseam is required to file federal Form 990 on an annual basis. Form 990 consists of a number of forms and schedules that detail financial information including revenues, expenses, assets, and liabilities. OPA reviewed Dataseam's Form 990s from 2005 through 2018 to determine additional benefits related to its contractual agreement with the Commonwealth.

**Government Grants.** As discussed previously in the report, Dataseam has received a total of $26,983,919 from the Commonwealth to place computers in K-12 school districts as part of the Coal County Computing Program. After accounting for actual and estimated administrative expenditures ($5,494,789), the invoices show that Dataseam purchased $21,489,130 worth of computers during that period for an average of $808 per computer.

In addition to the $5,494,789 Dataseam received for administering the program over the years, it has received additional revenue from five (5) noteworthy sources in the amount of $6,677,610.

Table 2.1 provides additional detail with respect to additional revenue source codes through 2018.

**Table 2.1**
**Dataseam Initiative, Inc.**
**Statement of Revenues (2005-2018)**

| Revenue Source Code | 2017-2018 | 2015-2016 | 2013-2014 | 2011-2012 | 2009-2010 | 2007-2008 | 2005-2006 | Totals |
|---|---|---|---|---|---|---|---|---|
| Professional Development Fees | 0 | 322,425 | 640,161 | 637,911 | 973,305 | 315,394 | 33,150 | 2,922,346 |
| Equipment Fees | 0 | 400 | 12,782 | 10,999 | 27,352 | 645,497 | 199,777 | 896,807 |
| Participating Partner | 0 | 0 | 517,156 | 418,670 | 441,170 | 434,670 | 184,369 | 1,996,035 |
| Investment Income | 138,088 | 137,535 | 111,830 | 78,139 | 48,133 | 37,482 | 13,271 | 564,478 |
| Realized Gain on Investments | 182,552 | 16,579 | 57,474 | 29,449 | 11,890 | 0 | 0 | 297,944 |
| Totals | **$320,640** | **$476,939** | **$1,339,403** | **$1,175,168** | **$1,501,850** | **$1,433,043** | **$430,567** | **$6,677,610** |

Source: Office of Policy and Audit from information provide in Dataseam's IRS 990-Forms.

**Professional Development Fees.** Dataseam requires that K-12 school districts pay for PD in order to *"earn"* individual or laboratory computers. According to Dataseam officials, PD revenue is used to offset administrative and other expenses related to providing the training itself, as well as other programmatic expenditures. From 2005 through 2018 Dataseam received PD revenue in the amount of $2,922,346.

According to Dataseam officials, "*While this program provides millions of important dollars in technology to K-12 schools it was never intended to be a giveaway for school districts. As outlined in the original KEDFA grant, schools needed to continue to invest in their network, workforce and equipment to support education. Dataseam helped accelerate those efforts and the research grid is able to leverage those assets to benefit the state.*"

Although it appears that the Legislature intended the previously named *Coal County Computing Program* to continue into the future, it is not clear however, whether the Legislature intended the participating districts to pay for PD in order to participate in the program.

**Equipment Fees**. According to Dataseam, it identified $700,000 in Equipment Fees with approximately $670,000 in pass through equipment purchases by schools. It stated that $30,000 of that amount related to district upgrades from a Level 1 machine ("eMac") to a Level 2 machine ("iMac") late in 2006.

It also stated that districts requested upgrades to different models of the iMac after 2006. However, Dataseam stated "*From our records prior to 2018 it is hard to determine exactly what is upgrades and what are computers purchased by the school district from Dataseam."* Dataseam went on to state that

*"Most of the charges seem to be from pass through charges where schools purchased computers from Dataseam as part of a special purchase from Apple."*

This information corresponds with comments auditors heard during site visits to ten (10) school districts and interviews with formerly participating school districts. More specifically, certain districts indicated Dataseam offered the lower model *"eMAC"* and the much preferred *"iMAC"* was only available at an additional charge.

**Participating Partner Fees**. According to Dataseam, these fees primarily come from Apple and "*were used to support annual conferences, ongoing education programs, technical support for schools, educational equipment, and regular operating funds.*"

Dataseam is an Apple Authorized Training Center (Education) and offers a variety of curriculum to its clients. More specifically, as an authorized training center, it offers classes to provide the industry-standard technology certifications throughout the Commonwealth.

According to its website, Dataseam offers MacOS Support Essentials 10.14, which is a three-day course for a $2,500 fee. The training includes various elements as follows: **1)** Installation and configuration; **2)** User accounts; **3)** File systems and storage; **4)** Data management; **5)** Apps and processes; **6)** Network configuration; **7)** Network services; and **8)** System management. Dataseam officials stated that it also *"currently offers Mac Deployment and Management in Kentucky Schools, as well as several other courses and opportunities for teachers."*

From 2005-2018, Dataseam has received close to $2 million from Apple related to these fees. Dataseam officials stated that *"Apple provided funding, personnel and equipment, particularly in the early years to help advance technician and educator programs."*

Dataseam officials stated that its *"operation as an AATC (Education) is separate from Apple Education. It (Dataseam) is responsible for the cost of all books, instruction materials, certified and approved instructors, test codes and other costs associated with providing certification training."* It is not clear however, whether the Participating Partner Fees also include some type of compensation for Dataseam's operation as an Apple Authorized Training Center (Education).

**Investment Portfolio.** The Form 990s show that Dataseam benefits from an investment portfolio, which originated with $1,280,971 of net deposits. The portfolio grew by $564,478 (investment income) and $297,944 (realized gains on investments) from 2006-2018.

According to Dataseam, its investment pool diminished in order to fund operations during the veto period beginning July 1, 2016. By the end of 2018 the portfolio had been reduced to $914,923. Dataseam officials indicated the portfolio was necessary to address contractual obligations they entered into with the school districts. More specifically,

> "*As a non-profit organization, Dataseam's mission is to provide research computing and workforce education programs to Participating Partner Schools for the benefit of Kentucky economic development specific to the coal regions. Like any responsible non-profit, our financial plan ensures stability for the program. Our objective was to create three years of operating funds and a fund to make small investments in coal region technology companies. In the event the state discontinued funding computers to schools Dataseam is*

*able to fulfill obligations to operate the research grid, manage education programs, and continue basic operations for three years (tied to 3-year computer commitment by the schools outlined in previous document). Funds are also used to manage cash flow. The State Grant contracts require us to draw down funds based on expenses incurred. Particularly in the early years of the program, a combination of slow payments by the state and large equipment invoices has caused Dataseam cash flow challenges. Delayed payment by individual school districts created additional cash flow issues. The portfolio is kept in a Kentucky-based brokerage firm with a conservative set of stocks, bonds, mutual funds and money market accounts…*"

Dataseam stated that three (3) year computer commitments are the reason that it requires operating funds for an equal number of years. More specifically, *"The three year period corresponded with the three-year extended warranty required for all computers on the state purchase agreement."*

OPA's review of ten (10) Participating Partner Agreements identified that PPAs are cancellable with either 30 or 60 day notice. Also, it is not clear if Dataseam discussed with KDE, whether the use of PD or other revenues for this purpose is allowable pursuant to appropriations and contract language. Dataseam did state however, that it *"continued to communicate with KDE representatives during the non-funded period."* More specifically, officials stated they met with the Commissioner's Office and other KDE officials for periodic updates and to discuss *"efforts to restore funding."* KDE officials stated that no commitments were made with respect to continued or restored funding.

Expenditures

After additional review of Dataseam's Form 990s, it identified expenditures in the amount of $6,683,113 to pay salaried and contract employees, which is $3,180,895.33 higher than the amount calculated using information from its *Program Source and Use Invoices*, submitted for reimbursement.

Table 2.2 provides additional detail.

**Table 2.2**
**Dataseam Initiative, Inc.**
**Salaries and Contract Labor (2005-2018)**

| | Salaries | Other Salaries and Wages | Compensation Not Included to Disqualified Persons | *Contract Labor | Total |
|---|---|---|---|---|---|
| 2005 | $47,450 | 0 | 0 | 0 | $47,450 |
| 2006 | 409,407 | 0 | 0 | 68,224 | 477,631 |
| 2007 | 375,120 | 0 | 98,529 | 87,551 | 561,200 |
| 2008 | 433,761 | 40,052 | 0 | 41,651 | 515,464 |
| 2009 | 285,683 | 59,752 | 0 | 137,776 | 483,211 |
| 2010 | 324,124 | 83,134 | 0 | 128,275 | 535,533 |
| 2011 | 317,237 | 132,282 | 0 | 150,400 | 599,919 |
| 2012 | 319,184 | 158,407 | 0 | 112,070 | 589,661 |
| 2013 | 338,000 | 202,088 | 0 | 53,385 | 593,473 |
| 2014 | 323,992 | 182,962 | 0 | 40,155 | 547,109 |
| 2015 | 338,734 | 150,787 | 0 | 32,400 | 521,921 |

| | Salaries | Other Salaries and Wages | Compensation Not Included to Disqualified Persons | *Contract Labor | Total |
|---|---|---|---|---|---|
| 2016 | 294,992 | 115,201 | 0 | 0 | 410,193 |
| 2017 | 274,000 | 95,500 | 0 | 0 | 369,500 |
| 2018 | 278,827 | 152,021 | 0 | 0 | 430,848 |
| **Total** | **$4,360,511** | **$1,372,186** | **$98,529** | **$851,887** | **$6,683,113** |

Source: Office of Policy and Audit from Dataseam's IRS Form 990s.

*According to Dataseam officials, contract labor paid for the following: Approximately $575,000 to instructors for Certification and Teacher trainings. Some was direct and some was distributed through Morehead State University Education Department. In addition, the first $175,000 one employee's compensation was in contract labor. Approximately $50,000 to another employee. $50,000 repaid a loan from BCC Foundation. Approximately $35,000 to individuals for programming and technology work leaving $13,000 in small payments to individuals.

Although Dataseam generally explained that contract labor was primarily used to pay instructors for PD, it did not provide disaggregated data to show additional detail with respect to individuals, duties, responsibilities, etc. It also initially refused to provide disaggregated data related to salaried employees.

As a result, OPA requested and reviewed Dataseam's W-2 reports from the Kentucky Department of Revenue and determined that from 2006-2019, Dataseam employed a total of 21 employees. During initial meetings with Dataseam however, officials stated that it generally has 3-5 employees at any one time.

OPA followed up with Dataseam to request additional detail about the job responsibilities of the 21 salaried employees. According to Dataseam officials, the salaried employees carried out the following job responsibilities: administration and bookkeeping; development and delivery of training programs; developing and managing the research-computing infrastructure; video production; internships; coordination of teacher training program; technical assistance to school districts; online education; development of education program tied to space science; COO duties; and CEO duties.

Participating School Districts

Participating school districts benefit from the Program by receiving Apple computers for classroom instruction. In exchange, districts are required to pay for PD to *"earn"* their computers. Dataseam stated that *"school districts have also used local investments in classroom upgrades, networks, hiring experienced personnel, and computers purchased to 'earn computers.'"*

The PD provided to participating districts consist of teacher training, as well as technical certifications, both of which are important to keep computers active on the Dataseam Grid. Dataseam officials also stated PD is important to maximize the effectiveness of the technology in the classroom. As discussed previously, participating districts have paid Dataseam $2,922,346 for PD throughout the program.

Participating school districts also incurred additional costs for requesting upgrades to computers initially offered by Dataseam, which were not as powerful for classroom instruction. According to Dataseam's IRS 990 forms, Dataseam received $896,807 related to equipment costs. Of that amount, Dataseam officials stated that districts paid $670,000 for a combination of upgrades and additional computers.

Upgrades occurred primarily, because school districts preferred not to use the less expensive eMacs for classroom instruction; rather, they preferred the faster and more expensive iMacs. Apple

introduced the eMacs as a low cost alternative for schools, which did not keep pace with changes in the iMac as it upgraded to a G5 processor and then an Intel processor.

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## Chapter #3: Broadly Written Contracts

The initial contracts in 2006 and 2008 were written in a manner that provided specificity with respect to the requirements of the program (formerly the Coal County Computing Program), as well as program oversight. Although the contracts were written by KDE, incorporated Grant Agreements ensured that KDE, the Cabinet for Economic Development (CED), as well as Dataseam worked together to place computers in coal-producing counties. According to Dataseam, *"CED set the direction for the Coal County Computing Program (CCCP) and KDE administered the money and worked with Dataseam to operate in a responsible way within the Office of Education Technology (OET) environment."*

Contracts After 2008

After the 2008 contract, Grant Agreements were no longer incorporated by reference into the contracts. As a result, Dataseam, through the use of its PPAs, provides the specificity related to programmatic requirements. More specifically, it established requirements for participating school districts. Dataseam officials stated that *"copies of school agreements were provided to KDE through the OET representative. The KDE representative was also part of discussions, meeting and communication of other relevant technical issues affecting schools, networks, and equipment."*

As discussed earlier, appropriations language from 2008 through 2015 and 2019 included a requirement that KDE work in conjunction with CED to administer General Fund appropriations for the program; however, the interaction between the two entities essentially stopped after 2010.

KDE was left in a position to work with Dataseam to administer and oversee a multi-tiered program that included aspects outside of its technical core, aspects included as part of the original Coal County Computing Program: **1)** Building and administering the state research computer infrastructure to increase the computing capacity available to cancer drug researchers at the James Graham Brown Cancer Center; **2)** Commercialization of new pharmaceuticals; and **3)** Distribution of computers to coal producing counties. This resulted in a situation where KDE was responsible for the contract, but Dataseam used the PPA to require additional requirements for districts outside of the contract.

As stated earlier in the report, the multi-purpose language within the appropriations language and contracts has caused confusion over the years, in terms of identifying the primary purpose of the program. Some officials within KDE view the program simply as an opportunity to provide Apple computers to struggling school districts. However, Dataseam and University of Louisville officials view the program primarily as an opportunity from which to operate the DataseamGrid to conduct cancer research, ultimately leading to the commercialization of drugs to fight cancer.

**Sole-source contracts.** A 2006 exemption by the Finance and Administration Cabinet (FAC) to award a contract to Dataseam without competitive bidding pursuant to KRS 45A.095 (1) and FAP 111-09-00, has effectively been the reason Dataseam received sole-source contracts throughout the life of the program. KDE requested the exemption in 2006, primarily because it believed that *"…the budget language requires them to continue with the same vendor, namely the Kentucky Dataseam Initiative, Inc."* After 2010, contracts changed from Personal Service Contracts (PSCs) to Memorandum of Agreements (MOA); competitive bidding is not required for MOAs.

At the time, this exemption may have been applicable due to the innovative approach of the program. In other words, competition may not have existed at the time for a practicable or feasible bid. As discussed in Chapter #1, Dataseam was the original vendor under the Pilot Project and expansion of the Pilot Project as part of earlier Kentucky Economic Development Finance Authority (KEDFA) grants.

When asked about the possibility of competitive bidding moving forward, Dataseam stated that purchasing the same type of cloud computing system that would be available to run research 24-hours a day for 365 days a year, could cost between $1 million to $2.5 million per year. This amount would not include additional programming, software, and management costs.

Table 3.1 illustrates how the contracts evolved from fairly detailed and specific terms, which was required as part of earlier Grant Agreements for 2006 and 2008, to much more broad and ambiguous language through the life of the program.

**Table 3.1**
**Contract Language Evolution**

| Contracts Number | Procurement Type | Contract Inclusions |
|---|---|---|
| **PON2 540 0600002568**<br>Sole Source Letter October 15, 2006 | Personal Service Contract (PSC) with Grant Agreement | Covers FY2007 and FY2008, only lists "services" on the commodity line for $2,500,000 per fiscal year. The contract does not delineate the direct program costs from the administrative costs, nor are the program deliverables clearly stated. However, the Grant Agreement provides specificity with respect to the program. |
| **PON2 540 0800009150**<br>Effective Date: August 1, 2008 to<br>June 30, 2010 | Personal Service Contract (PSC) with Grant Agreement | Covers FY2009 and FY2010, The contract only lists "services" in the commodity line; however the Grant Agreement was very specific related to funding amount, number of computers for placement, discussion of PD for teachers, and other programmatic requirements related to DataseamGrid reporting, number of researchers, as well as funding attracted by research with Intellectual Property. |
| **PON2 540 1000002686**<br>Effective Date: July 1, 2010 to June 30, 2012 | Personal Service Contract (PSC) | The contract did not include a Grant Agreement. Contract mentions appropriated amounts and multi-tiered purposes. |
| **PON2 540 1200003157**<br>Effective Date: July 1, 2012 to June 30, 2013 | Memorandum of Agreement (MOA) | The contract did not include a Grant Agreement. Contract mentions appropriated amounts and multi-tiered purposes. |
| **PON2 540 1400003084**<br>Effective Date: July 1, 2014 to June 30, 2015 | Memorandum of Agreement (MOA) | The contract did not include a Grant Agreement. Contract mentions appropriated amounts and multi-tiered purposes. |

| Contracts Number | Procurement Type | Contract Inclusions |
|---|---|---|
| **Line-Item Veto (2016)** | - | In the 2016 budget bill, the Governor vetoed budget language that provided funding for the Coal County Computing Program, also known as, Dataseam Initiative. |
| **PON2 540 1900002589**<br>Effective from 05/01/2019 to 06/30/2020 | Memorandum of Agreement (MOA) | Procured by KDE with assistance from the Finance and Administration Cabinet.<br><br>The contract covers FY2019 and FY2020, and provides more detail on deliverables, direct costs, and administrative costs. The contract provisions limited total personnel and operational costs to 18% of the total contract amount, while not exceeding $26,250 per month. Each fiscal year allotted $1,750,000 for Dataseam Initiative expenses.<br><br>Additionally, the contract contained several key provisions:<br>• Purchase and install 1,300 computer workstations per fiscal year;<br>• Build, manage, optimize the proprietary high-performance computing environment for research commercialization valued at 1.5M per year;<br>• Offer College Scholarships valued at $160,000 per year;<br>• Create additional Matching Computers and Educational and Workforce Development Programs value at participating schools;<br>• Quarterly Reports submitted to the Finance and Administration Cabinet, Office of the Secretary;<br>• Payments made quarterly upon receipt of invoice; and<br>• Both Quarterly Reports and Invoices submitted simultaneously. |

**Source:** Office of Policy and Audit.

**Contract vagueness allows Dataseam to create requirements.** Essentially, the lack of KDE interaction with CED to manage a multi-tiered program, as well as sole source contracting throughout the life of the program, has resulted in a situation where Dataseam has filled a void to administer the program based on language in its PPAs.

When discussing contract wording with Dataseam, one official opined that the nebulous wording in the contracts allows it to run the program with more flexibility. Dataseam uses this flexibility to require that participating districts complete the *Dataseam Participating Partner Agreement*. This agreement is prescriptive, as well as the commitment to pay for PD. According to Dataseam however, it *"has always had contractual requirements for school district receiving computer*s."

Appendix A provides a general illustration of the PD requirements for districts that wish to participate in the program, including the requirement that districts pay for PD (Section 4). Appendix H provides a sample of an actual PPA.

**Districts have paid close to $3 million to Dataseam for PD.** According to federal tax information, participating school districts have paid Dataseam $2,922,346 in PD over the life of the program. It is interesting to note that during 2005 and 2006, $33,000 was charged to participating districts for PD.

Afterwards however, extraordinary increases are apparent. For example, the initial increase from 2006 to 2007 is 409% from $33,000 to $168,000. According to Dataseam however, *"there were fewer participating school districts in the early years resulting in fewer trainings."* And, it added that over a 15-year period, less than $200,000 was expended each year.

Table 3.2 provides additional specificity related to the types of PD provided at the district level throughout the program.

**Table 3.2**
**Professional Development (PD)**
**2006-2020**

| # | School District | Technical Certification | Teacher Training | Total PD | Total Cost |
|---|---|---|---|---|---|
| 1. | Allen | 6 | 0 | 6 | $11,800.00 |
| 2. | Breathitt | 27 | 239 | 266 | 151,281.00 |
| 3. | Carroll | 3 | 0 | 3 | 7,000.00 |
| 4. | Casey | 0 | 0 | 0 | 10,000.00 |
| 5. | Clay | 26 | 237 | 263 | 80,564.00 |
| 6. | Corbin ISD | 2 | 0 | 2 | 5,000.00 |
| 7. | Crittenden | 21 | 65 | 86 | 59,475.00 |
| 8. | Daviess | 24 | 171 | 195 | 146,258.00 |
| 9. | Elliott | 29 | 288 | 317 | 106,820.00 |
| 10. | Estill | 0 | 0 | 0 | 50,000.00 |
| 11. | Fulton | 0 | 0 | 0 | 6,666.67 |
| 12. | Fulton ISD | 0 | 0 | 0 | 6,666.66 |
| 13. | Gallatin | 2 | 0 | 2 | 5,000.00 |
| 14. | Green | 0 | 0 | 0 | 5,000.00 |
| 15. | Hancock | 48 | 111 | 159 | 139,706.00 |
| 16. | Harlan ISD | 17 | 60 | 77 | 78,458.00 |
| 17. | Hazard ISD | 14 | 153 | 167 | 60,097.00 |
| 18. | Hickman | 0 | 0 | 0 | 1,666.66 |
| 19. | Jackson ISD | 22 | 118 | 140 | 61,819.00 |
| 20. | Jefferson | 12 | 0 | 12 | 30,150.00 |
| 21. | Jenkins ISD | 19 | 171 | 190 | 86,254.00 |
| 22. | Johnson | 35 | 374 | 409 | 196,917.00 |
| 23. | Lawrence | 37 | 452 | 489 | 171,663.00 |
| 24. | Lewis | 0 | 0 | 0 | 0.00 |
| 25. | Marion | 0 | 0 | 0 | 10,000.00 |

| # | School District | Technical Certification | Teacher Training | Total PD | Total Cost |
|---|---|---|---|---|---|
| 26. | Martin | 28 | 76 | 104 | 102,970.00 |
| 27. | McClean | 6 | 0 | 6 | 11,798.00 |
| 28. | Menifee | 18 | 390 | 408 | 88,773.00 |
| 29. | Middlesboro ISD | 34 | 113 | 147 | 90,449.78 |
| 30. | Morgan | 39 | 173 | 212 | 126,213.00 |
| 31. | Nelson | 0 | 0 | 0 | 0.00 |
| 32. | Ohio | 38 | 390 | 428 | 141,888.00 |
| 33. | Owensboro ISD | 21 | 44 | 65 | 58,293.00 |
| 34. | Paintsville ISD | 12 | 125 | 137 | 26,200.00 |
| 35. | Pikeville ISD | 21 | 56 | 77 | 54,694.00 |
| 36. | Pineville ISD | 87 | 93 | 180 | 67,280.00 |
| 37. | Rowan | 2 | 0 | 2 | 5,150.00 |
| 38. | Russell ISD | 17 | 39 | 56 | 15,000.00 |
| 39. | Trigg | 14 | 0 | 14 | 11,825.00 |
| 40. | Webster | 10 | 113 | 123 | 96,571.00 |
| 41. | Whitley | 46 | 72 | 118 | 92,833.00 |
| 42. | Williamsburg ISD | 8 | 0 | 8 | 17,200.00 |
| **Total** | | **745** | **4,123** | **4,868** | **$2,495,399.77** |

Source: Office of Policy and Audit from information provided by Dataseam Initiative, Inc.
*According to Dataseam' s IRS 990-Forms, it received an additional $33,000 and $168,000 in PD revenue from school districts for FY 2006 and FY 2007 respectively, which totals $2,696,399.77. However, Dataseam's IRS-990 forms show a total of $2,922,346 earned from PD.

**District participation by providing PD.** Although districts have paid $2.9 million for PD throughout the life of the program, Dataseam also contracts with district employees to help provide training to other districts.

According to federal tax information, Dataseam paid out $851,887 in contractor fees to district employees and other trainers to provide PD at participating school districts throughout the life of the program. Although overall provisions within the PPA appear to encourage district participation in PD, there is no statutory or contractual authority that discusses the ability of Dataseam to actually pay district employees to provide PD in other districts.

Paying district employees to provide PD to other districts, could pose an ethical problem if the additional revenue was used to encourage participation in the program. Dataseam officials stated that they do not allow certified or trained district employees to provide training to their own employees and ask that all participating district employees identify themselves to their districts as instructors.

Allowing certified and trained employees to provide training within their own districts however, could lessen the local budgetary impact with respect to participating in the program. Dataseam said it *"tried some in district train-the-trainer programs in order to build capacity and defray cost for the district."* However, because *"content, cooperation, and performance suffered"* it abandoned that option.

Quarterly Reporting

According to the FY 2020 contract, Dataseam is required to report quarterly to the Finance and Administration Cabinet to address the following areas. After the Cabinet received oversight responsibility for the program, it required additional quarterly reporting in the following areas.

- Computer Distribution by School Districts, as well as the number of operational computers currently on the DataseamGrid. Dataseam also reports the dollar amounts of purchased computers.

- Professional Development and Training Numbers by District to report the number of educators that receive technical certifications and teacher training.

- Travel Expenses.

- Technology Support, which includes the dates of various events and locations.

- Cancer Research Statistics, Projects, and Highlights, which includes the ongoing research jobs that support the University of Louisville, as well as dollar amounts of grants and researchers.

- Scholarship Awards, to include the names and dollar amounts of the awards.

## Chapter #4: District Impressions of the Program

Feedback from ten (10) K-12 participating school districts and comments from 31 survey respondents from participating school districts generally showed favorable feedback. Participating school districts that generally reported favorable feedback also voiced some concerns.

Interviews with district officials from ten (10) formerly participating school districts also identified unfavorable feedback about the program, especially with respect to the cost of Professional Development (PD).

Participating K-12 School Districts

OPA visited ten (10) school districts to conduct face-to-face interviews in an effort to understand what the districts liked about the program and what they did not like. These interviews took place with District staff, such as the Superintendent, Chief Information Officer (CIO), and District Technology Coordinator (DTC). Overall, the districts consider their experience to be positive or favorable, but some districts do have concerns about the program.

Table 4.1 provides additional information about the districts visited.

**Table 4.1**
**Participating K-12 Site Visits**

| School District | Years of Participation | Location |
|---|---|---|
| Clay County | 2010-2013<br>2019-Present | Manchester |
| Elliott County | 2005-Present | Sandy Hook |
| Jenkins ISD | 2007-Present | Jenkins |
| Lawrence County | 2007-Present | Louisa |
| Morgan County | 2007-Present | West Liberty |
| Ohio County | 2007-Present | Hartford |
| Pikeville ISD | 2007-Present | Pikeville |
| Webster County | 2012-Present | Dixon |
| Whitley County | 2006-Present | Williamsburg |
| Williamsburg ISD | 2007-2008<br>2018-Present | Williamsburg |

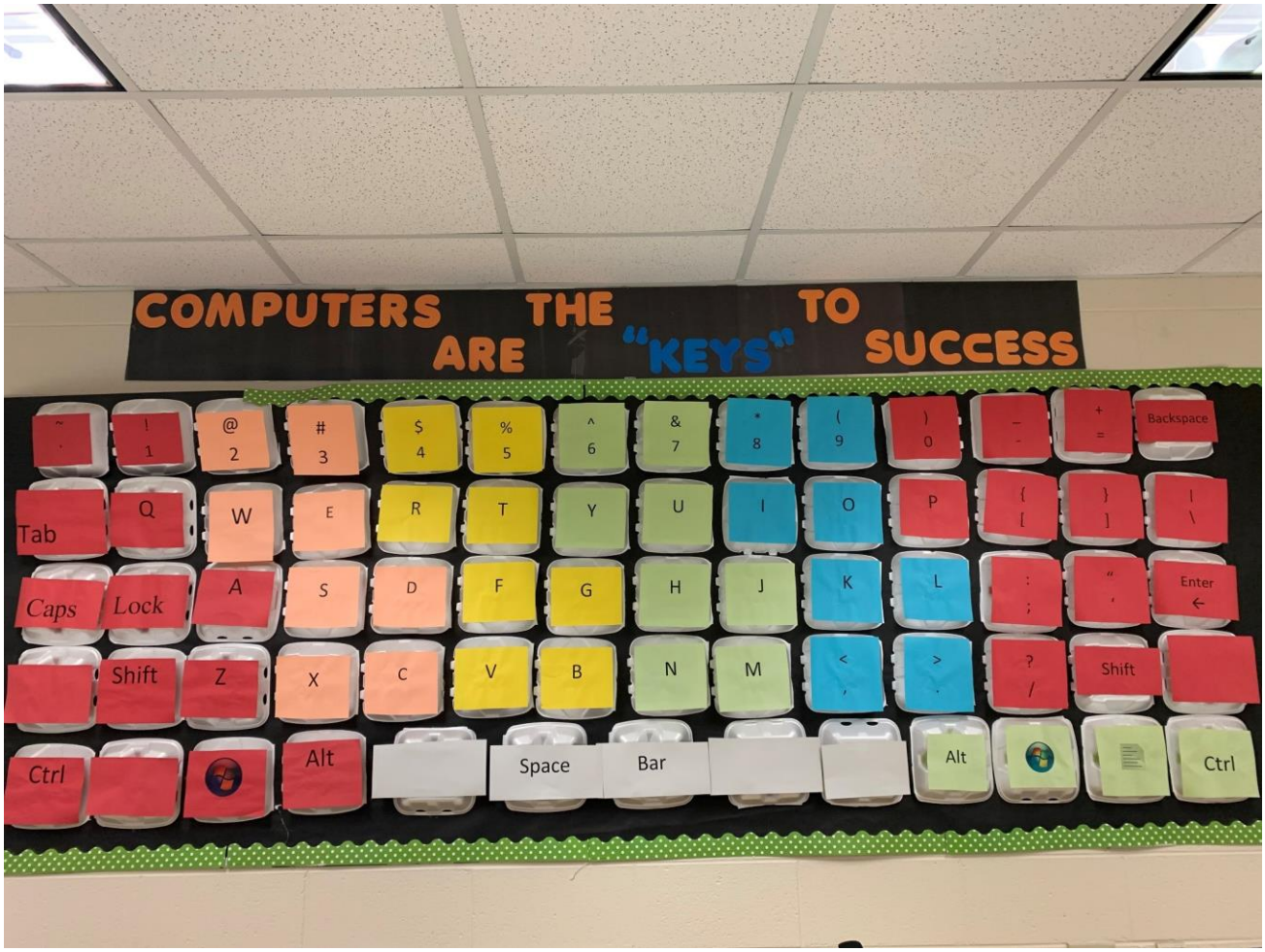
Source: Office of Policy and Audit.

The greatest take away from the district site visits was a consensus about the ability for districts to obtain computers at a reduced cost. Apple computers are generally more expensive than Windows computers, and without the program, many of the districts would not have been able to purchase iMacs.

Generally, districts' ability to obtain these computers through the program resulted in upgraded computer labs, or in some cases allowed the district to create entirely new computer labs in schools. One district official stated, they were *"Leveraging more funds for more technology (desktop computers) at a discounted price."* The ability to purchase the Professional Development (PD) from Dataseam, and then receive computers helped alleviate tight technology budgets. Another district

official reiterated several times that the district had received more value in computers, than was spent for PD.

**Figure 4.1**
**Computer "Keys" Clay County**




Source: Office of Policy and Audit from information obtained during the Clay County site visit.

**Professional Development.** Each district OPA visited was very complimentary of the PD obtained through Dataseam. The districts consistently said the PD was valuable, and one district official commented the PD training was the *"…best and very hands on."* This official opined that the training could easily be applied, while keeping the district current on the Mac operating system (MacOS). During an interview, another district official stated that the training provided teachers with high quality training, which gave them valuable information to maximize tools made available through the Apple computers/MacOS.

One district official spoke of how the Professional Development set the tone for the district moving forward, stating, "*The training was a very rigorous hands on training where teachers had to complete a project to earn their workstation. This training set the tone for what we as a district wanted from our students and staff, in order to gain knowledge and move the district forward*." A few years later, the district was able to approve a Chromebook initiative, which *"could not have been possible without*

*the partnership with Dataseam."* The official added, *"The knowledge gained by teachers and staff has brought a different and aggressive approach to help students in their educational needs."*

Additionally, the majority of districts believe that PD allows employees to hold industry recognized Apple training certifications, which increases technical and other expertise within their counties.

**CIO and Technical Staff Networking.** Another positive aspect brought out in the interviews during site visits, was the ability for school districts to network with one another. Insight has been gained through communicating with each other to help troubleshoot problems with the Apple computers. One district official referred to this as a "*fraternity*" that was beneficial to their community and Eastern Kentucky.

A few districts were introduced to the program by a newly hired superintendent or CIO/DTC, whom had come from a district that currently participated or had participated in the past. Their experiences were positive enough for them to encourage the new district to apply.

**Some Concerns.** Although, participating school districts generally had positive things to say about the program, there were some concerns expressed.

One of the most prevalent concerns, was the amount of required PD, in order to remain in the program. Various district officials stated that the length of time to attend trainings kept them away from their districts, which hampered their ability to service the needs of the districts.

One district official commented on the time required to attend PD classes, which took away from classroom instruction hours. Another district official questioned the need for so many additional PD trainings after the initial training. For example, the official stated that every time Apple rolls out an update or a new version of the MacOS, districts are required to purchase and complete additional PD. Over the course of one district's participation, it was obligated to attend 14 technical education classes, between two staff members. Another district official provided information that he attended 21 similar trainings throughout the district's participation.

A comment reiterated several times during the site visits, focused on the lack of information related to the University of Louisville's (University) role in the program. One district official was concerned with what appeared to be a lack of participation on the University's part. Some officials stated they believe the University should "*kick in more…*" based on the benefits it receives from the DataseamGrid.

This aligns with comments made by a few other district officials about the inconsistent communication from Dataseam, dependent on how involved the districts were in the program. For example, **s**ome districts were unaware that the University offered scholarships designated for students in Dataseam participating districts, or that it worked with Dataseam to offer workforce development opportunities for teachers and students.

The lack of communications caused some districts to miss out on opportunities that could have benefitted students to apply for and/or receive scholarships. Another district official said they were unaware of Dataseam Scholarships until recently. It is interesting to note that this particular district has been an active participant in the program since 2010.

One other district official whose district has been participating since 2007, told OPA they would like to see more transparency in regards to how Dataseam expends money from state contracts. A report showing the total expenses disaggregated by computers and salaries, as well as offsetting PD and other revenue would be beneficial. Such a report would help districts and taxpayers to better understand the program and how it benefits the Commonwealth.

Other concerns related to the following: **1)** Warranty issues; **2)** Lack of state support for Macintosh computers; **3)** Problems switching from PCs to Apple computers for teachers and students; **4)** Compatibility issues; **5)** Computer placement; and **6)** Uncertainty of state funding.

Formerly Participating K-12 School Districts

OPA contacted ten (10) districts by telephone, which had participated in KDI; however, were no longer participating. OPA wanted to gain an understanding of why the districts were no longer participating, as well as, their overall experience. Unlike the favorable impression received during the site visits, district officials from formerly participating districts viewed their prior experience in the program very unfavorably.

The districts were categorized into two groups. The first group were districts that stopped participating between 2006 and 2009, and the second group were districts that stopped participating after 2014.

Table 4.2 provides additional information about the districts visited.

**Table 4.2**
**Formerly Participating School Districts**

| District | Time Frame of Participation | Location |
|---|---|---|
| Carter County | 2006-2009 | Grayson |
| Floyd County | 2006-2014 | Prestonsburg |
| Harlan County | 2006-2009 | Harlan |
| Knott County | 2006-2014 | Hindman |
| Lee County | 2006-2014 | Beattyville |
| Leslie County | 2006-2009 | Hyden |
| Letcher County | 2006-2009 | Whitesburg |
| Paintsville ISD | 2006-2009 & 2019 | Paintsville |
| Perry County | 2006-2014 | Hazard |
| Raceland ISD | 2006-2009 | Raceland |

Source: Office of Policy and Audit.

Overwhelmingly, officials from these school districts had negative comments in the following areas: **1)** PD cost and time; **2)** Lower value eMACs; **3)** District treatment by Dataseam; **4)** Computer placement; and **5)** Student technology needs.

**PD Costly and Time Intensive.** The majority of districts believed that the intent of the program initially was to provide computers to less affluent school districts at no cost, in return for allowing the DataseamGrid to operate for cancer research. And, that districts had the opportunity to receive PD, only if they chose.

However, officials stated that once the computers were installed, additional requirements to pay for PD were a surprise. One official stated that the new requirements gave the appearance that Dataseam was making money from a program that was supposed to benefit schools in coal producing counties. Officials were also concerned about the strict requirements to ensure that computers stayed active on the DataseamGrid.

Similar to the comments made during the site visits, former participating districts revealed one of the biggest reasons for no longer participating, was the amount of PD district staff time required to attend annually, in order to continue in the program. One district official stated that in order to continue participating, the district would have to send both technicians for three to five days of training. The cost and time associated with the travel to attend PD, was ultimately considered more than the computers were worth. There were feelings of being misled by the "*fine print*" in the Participating Partner Agreement (PPA), after districts decided to participate in the program. Officials also stated the requirements constantly changed.

Another district official sent an employee to five (5) weeks of PD, an "*intense condensed training*", at a cost of $2,000 a class or $10,000 in total. This particular employee commented, "*I got tired of the cost and time away from the district."* They further stated it was difficult to *"manage the district's needs"* and concluded by saying*, "glad to phase the Mac out."*

In line with the prior comments, an official from another district felt that the technical training requirements were too great. The requirement to attend three weeks of training out of town each year was burdensome, since the district only had two technicians. The expenses for hotel, meals, travel and the PD fees when compared to the computers received, were not worth the money and time paid by the school district.

**Lower Value eMACs during initial years.** During the initial years (2005-2007), Dataseam provided the Apple eMac computer, which was not favorably viewed by some of the districts. Officials from two (2) were initially under the impression their districts would be receiving iMacs and not the lesser valued eMacs.

Districts had the option to upgrade to the iMac; however, they would have to pay the difference in value between the two computers. One district official stated it felt as if the district had been deceived. Another district official felt that after the first year it didn't make sense to participate. For example, the free computers were "*sorry*" and the upgrade costs for better machines was not worth it.

Also, there were no cost savings to the district, with limited staff that had to attend PD. The district could have purchased Windows machines for the same amount or less. Officials opined that it would have been better to initially hand out fewer higher-quality iMacs, which have ultimately benefitted the districts.

**District Treatment by Dataseam.** During the telephone interviews, district officials made some extraordinary remarks about negative experiences dealing with Dataseam management. For example, some district officials believed that Dataseam arbitrarily added and changed requirements in order for districts to keep the machines that had already been *"earned"* through the purchase of PD.

Multiple officials stated that districts were threatened with the removal of computers if there was any *"pushback"* about the way in which the program was being run. For example, one district official

stated that Dataseam Management was upset about how a district employee spoke negatively in regards to the amount of time required to attend PD. In this particular instance, the employee was concerned about being away from family for a week. When the comments got back to Dataseam, officials met with the district to voice their displeasure. Dataseam further stated that they would come back at a later time to pick up the machines, which was perceived as a threat by this particular official.

According to Dataseam, *"In the early years of rolling out the program, Dataseam learned very quickly Superintendents would make commitments technology staffs are not capable or willing to make."* They also stated that on occasion, *"Dataseam has agreed to terminate the district contract and return any training money after the technology people told the Superintendent they did not want to participate."*

The above actions align with comments made about Dataseam's Management from another district official. This official stated the district stopped participating in the program because of uncomfortable dealings with Dataseam. They described Dataseam to be very arrogant, demanding, difficult to get along with, and many districts had an issue with the way it ran the program. A poignant remark made by one district official was that in Eastern Kentucky, the cancer rate is high; but the relationship with Dataseam has to be a *"partnership not a dictatorship."*

**Computer Placement.** The number of computers a district receives after purchasing and participating in PD is initially outlined in the Participating Partner Agreement (PPA). Districts complete the application, where Dataseam defines the number of computers the district will receive, based on the number of staff attending PD. However, this process has been questioned by districts on multiple occasions.

One district official alluded that no clear method or formula seems to exist with respect to handing out computers. The official went on to state he would like the Kentucky Department of Education (KDE) to make decisions with distribution of the computers, rather than Dataseam. Another district official made a similar comment, stating that the program could be really great, if it was run correctly by an entity other than Dataseam.

This was not the only district to make these comments. For example, another district official stated that the number of computers each district received was not consistent and there does not seem to be any type of formula related to the placement of computers. The official stated that to ensure a fair distribution of computers, some type of formula similar to SEEK, should be used.

The district official also shared an encounter during a summer retreat attended by multiple school districts from the area. The officials stated that the Dataseam CEO who attended the retreat, ended up in a heated discussion with a staff member from a neighboring district. The argument was based on the lack of consistency in the number of computers each participating district received, which resulted in someone having to physically step between both parties.

According to Dataseam, the CEO was invited to the retreat and the *"staff member from a neighboring district has since apologized for his actions at the meeting and during the confrontation."*

**Student Technology Needs.** Phone conversations with districts also revealed a change in philosophy concerning student technology needs. Districts began shifting from a traditional computer lab setting to the adoption of a *"one-to-one"* policy. For example, when a school district gives each

student a Chromebook, which reduces or eliminates the need for a computer lab. The use of Chromebooks fulfills students' needs, while putting a computer directly in their hands. The following are some of the advantages of Chromebooks, according to the districts interviewed:

- Cost is less than $200
- Not limited to a Computer Lab
- Mobile - Students can take them anywhere, such as home
- Only requirement is internet access
- Can use Google Classroom (mentioned preferred by one districts teachers)
- Browser-based simplicity - if you can use the internet, you can use a Chromebook
- Fits most classroom needs (read a book, write a paper, math, and conduct research)

According to Dataseam, Apple computers are used as part of the program because of its operating system. *"The MacOS is based on UNIX core, the same as most scientific workstations and supercomputers."* Officials also stated that Chromebooks are not usable devices *"for a research-computing infrastructure."*

Survey of 31 Participating School Districts

Using SurveyMonkey, OPA received completed questionnaires for the 31 participating districts discussed in this report. The questionnaire results showed, for the most part, that districts were approached by Dataseam to participate in the program and took responsibility for various aspects of the program.

District superintendents from participating school districts who completed the questionnaire, also provided general comments about the program. Generally, the comments received were complimentary of the program.

See Appendix F and Appendix G for additional information related to District Superintendents' responses.

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## CONCLUSION

Since the Regular Session (2006), the Kentucky General Assembly used compulsory language to create an oversight framework with respect to the implementation the *Coal County Computing Program.* For example, HB 380 transferred oversight of the program from Kentucky Economic Development Authority (KEDFA) to the Kentucky Department of Education (KDE). Subsequently, it approved appropriations language to ensure that appropriations were used by KDE in conjunction with the Cabinet for Economic Development (CED), Department of Commercialization and Innovation.

The language envisioned a multi-tiered program, not only for the purpose of enhancing education technology in local school districts, but also to provide for the building and administering of a state research computer infrastructure to increase the computing capacity available to cancer drug researchers at the James Graham Brown Cancer Center (BCC). It appears the Legislature intended for multiple agencies with respective technical cores to administer the multi-faceted program.

However, in 2010 after the program received funding from the General Fund, the interaction between KDE and CED fostered by earlier Grant Agreements under KEDFA, all but disappeared. In its place, KDE was left to administer the program by itself, wrestling with the best way to oversee a multi-faceted program, which included areas clearly outside of its technical core.

The vacuum that was left after 2010, resulted in contracts that were broad and ambiguous. This allowed Dataseam to provide additional specificity with respect to technical and PD requirements as part of its PPAs. However, the requirements within the PPA were not reviewed or approved by CED or KDE to determine if they were in the best interest of the program.

Moving forward, interested parties have an opportunity to reexamine this program. The participating agencies including the Finance and Administration Cabinet, Kentucky Department of Education, and the Cabinet for Economic Development (2006-2018) also have an opportunity to consider whether competitive bidding is practicable and feasible.

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# Agency Response(s)

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# Kentucky Department of Education

**Andy Beshear**
**Governor**

**Lt. Gov. Jacqueline Coleman**
**Secretary**
**Education and Workforce Development Cabinet**

**Kevin C. Brown**
**Interim Commissioner of Education**
**KENTUCKY DEPARTMENT OF EDUCATION**
**300 Sower Boulevard • Frankfort, Kentucky 40601**
**Phone: (502) 564-3141 • www.education.ky.gov**

April 17, 2020

Gerald W. Hoppmann
Executive Director
Office of Policy and Audit
702 Capital Avenue
Capitol Annex, Room 493
Frankfort, KY 40601

Dear Mr. Hoppmann:

The Kentucky Department of Education appreciates the opportunity given to our agency throughout the preparation of this report to provide input, clarification and explanation on the Dataseam Initiative, a/k/a, the Coal County Computing Program. The Finance and Administration Cabinet allowed our agency the opportunity to explain, from our perspective, the challenges for our agency and the cost and benefits for local school districts as participants in the program as administered by Dataseam. This has been reflected in the final report.

As funding was not provided for the project in the appropriations for the Kentucky Department of Education in the most recent executive branch budget for FY 21, we do not feel it necessary to comment on recommendations relating to the continued operations, procurement and funding of the program in the future by the Commonwealth.

We enjoyed working with you. Stay safe and healthy.

Sincerely,

Robin Fields Kinney
Associate Commissioner
Office of Finance and Operations

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# Office of Policy and Audit Response to Kentucky Dataseam Initiative, Inc. Formal Response

Commonwealth of Kentucky
Finance and Administration Cabinet
OFFICE OF THE SECRETARY
**OFFICE OF POLICY AND AUDIT**
Room 493, Capitol Annex
702 Capital Avenue
Frankfort, Kentucky 40601
(502) 564-7236
(502) 564-7882 Fax

**Andy Beshear**
Governor

**Holly M. Johnson**
Secretary

**Gerald W. Hoppmann**
Executive Director

**DATE**: August 14, 2020

**TO**: Audit Report Users

**FROM**: Gerald W. Hoppmann, Executive Director
Finance and Administration Cabinet
Office of Policy and Audit (OPA)

**SUBJECT:** Response to *Formal Written Response* (Audit April 15, 2020) from the Kentucky Dataseam Initiative, Inc. **Note**: This correspondence also serves as OPA's response to the University of Louisville (James Graham Brown Cancer Center) on page 63.

The Office of Policy and Audit provides the following responses to statements made by Dataseam in its Formal *Written Response.*

**Dataseam Statement #1**: *The audit does not provide a complete and accurate analysis of the work accomplishments of Dataseam, Participating Partner School Districts, Participating Partner Universities, Researches, State Agencies, or other stakeholders.*

**OPA Response #1**: The scope of the audit was limited to determining costs and benefits of the contractual arrangement by which Apple computers are provided to Kentucky school districts in exchange for the use of available processing power for cancer and other research. More specifically, auditors identified monetary and time costs and benefits to Kentucky school districts, the University of Louisville, as well as Dataseam.

The audit was not intended to comprehensively detail work accomplishments of Dataseam, participating school districts, or the University of Louisville outside of contractual requirements. However, auditors included sufficient and relevant information about the placement and use of

computers in the participating school districts, as well as the use of computers as a base from which to operate the DataseamGrid for cancer research.

**Dataseam Statement #2**: *The scope and objective of the audit are inconsistent with the clear guideposts set for the program by the original KEDFA grant and initial 2006 initial General Assembly Funding.*

**OPA Response #2**: Two (2) grant awards by the Kentucky Economic Development Finance Authority (KEDFA) to Dataseam from the high-tech investment pool on September 29, 2005 and December 16, 2005, do not automatically establish criteria from which to audit the program in 2020. Instead, auditors relied on current and past contractual language in Personal Service Contracts (PSCs) and Memorandum of Agreements (MOAs) to measure against the actual number and cost of computers placed in K-12 school districts.

The audit scope and objective is consistent with General Assembly funding from 2006-present. Auditors used language in the appropriations bills as criteria for developing the audit plan and to determine how computers are purchased, placed, and used in K-12 districts in order to meet legislative intent.

**Dataseam Statement #3**: *The report contains factual errors addressed during the exit conference regarding computing, computer equipment, timeframes, and contract language that have since NOT been corrected. These factual errors are undisputable, verifiable facts from industry information, state records, or correspondence.*

**OPA Response #3**: OPA provided a confidential draft of the audit report to Dataseam officials on March 5, 2020. Dataseam was given the opportunity to review the draft report and provide feedback by March 13, 2020. OPA anticipated an exit conference during the week of March 16, 2020. However, Dataseam requested that it be given until March 19, 2020 to provide feedback, which OPA granted. It was not until March 24, 2020, that Dataseam provided written feedback to OPA.

On March 25, 2020, OPA met with Dataseam officials via exit conference call to discuss its written feedback. The entire OPA audit team participated on the call, which lasted 4 ½ hours. OPA took extensive notes during the call and subsequently made multiple revisions to the draft audit report to address Dataseam's concerns in various areas.

Dataseam's *Formal Written Response*, however, does not include or even mention the revisions made to the draft audit report by OPA as a result of the exit conference. Rather, Dataseam included the text of the March 5, 2020 draft report, with its initial feedback (40 pages) as part of its written response. This could give the impression that OPA did not make any changes to the final version of the April 3, 2020 draft, as a result of the exit conference.

**Dataseam Statement #4**: *Important information related to the primary focus of the program, research and research computing, is minimized, misrepresented, or completely omitted.*

**OPA Response #4**: See OPA Response #3 above.

**Dataseam Statement #5**: *Auditor statements are unclear, lack context, timing references, and contains language that may mislead the reader to draw incorrect conclusions.*

**OPA Response #5**: OPA provided Dataseam the opportunity to contact the Executive Director during the period from April 3, 2020 through April 15, 2020, if officials had specific questions about OPA's revisions to the April 3, 2020 draft audit report. However, Dataseam officials did not contact OPA to discuss concerns about the revised draft.

**Dataseam Statement #6**: *Information supplied by Dataseam in writing on multiple occasions is misrepresented and often misconstrued.*

**OPA Response #6**: See OPA Response #5 above.

**Dataseam Statement #7**: *This audit is inconsistent when representing fact versus opinion. Specifically, it represents important verifiable information provided by Dataseam to help the auditors understand complex issues as only "statements" of the company. Opinions by other organizations are also represented as "facts".*

**OPA Response #7**: Much of the information and data provided by Dataseam to OPA throughout the audit did not specifically fulfill requests by OPA. In addition to constantly missing OPA's initial deadlines, the information and data were often incomplete, contradicting, and/or not fully supported. Admittedly, Dataseam on multiple occasions stated that it could not provide complete and accurate data in response to auditor requests. In other instances, Dataseam declined multiple requests from OPA to provide detailed information and data related to certain areas.

Information provided by other entities such as the Kentucky Department of Education and participating and non-participating school districts either came directly from primary sources or was attributed in the report as testimonial evidence.

**Dataseam Statement #8**: *Dataseam's full comments as outlined in this response and the factual errors pointed out during the exit conference are attached again for convenience.*

**OPA Response #8**: See OPA Response #3 above.

**Note**: OPA did not include the 40 pages of the original draft audit report (March 5, 2020) and Dataseam's initial feedback as part of the incorporated response in the revised draft. To do so, could give readers the impression that OPA did not make revisions after the exit conference.

However, it did include the last nine (9) pages of Dataseam's response as part of the incorporated response. Although not directly related to the audit scope, the information is relevant and provides additional detail with respect to Dataseam, research conducted by the James Graham Brown Cancer Center, DataseamGrid computing resources, as well as impact on education and workforce.

According to Dataseam, these pages represent information that was provided to the Legislative Research Commission, the Finance and Administration Cabinet, as well as individual legislators in October of 2018.

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# Kentucky Dataseam Initiative, Inc.

DATASEAM

April 15, 2020

Mr. Gerald W. Hoppmann
Executive Director
Finance and Administration Cabinet
Office of the Secretary
Office of Policy and Audit
Room 493, Capital Avenue
Frankfort, KY 40601

Re: Formal Written Response to Audit

Dear Mr. Hoppmann,

This audit does not provide a complete or accurate analysis of the work accomplishments of Dataseam, Participating Partner School Districts, Participating Partner Universities, Researchers, State Agencies or other stakeholders. It continues to have fundamental errors including:

- The scope and objective of the audit are inconsistent with the clear guideposts set for the program by the original KEDFA grant and initial 2006 General Assembly funding.
- The report contains factual errors addressed during the exit conference regarding computing, computer equipment, timeframes, and contract language that have since NOT been corrected. These factual errors are undisputable, verifiable facts from industry information, state records, or correspondence.
- Important information related to the primary focus of the program, research and research computing, is minimized, misrepresented, or completely omitted.
- Auditor statements are unclear, lack context, timing references, and contains language that may mislead the reader to draw incorrect conclusions.
- Information supplied by Dataseam in writing on multiple occasions is misrepresented and often misconstrued.
- The audit is inconsistent when representing fact versus opinion. Specifically, it represents important verifiable information provided by Dataseam to help the auditors understand complex issues as only "statements" of the company. Opinions by other individuals or organizations are also represented as "facts."

After providing hours of responsive testimony and extensive written follow up and data covering eighteen (18) years, Dataseam does not believe it will help the process to provide further specific information or correct this document since it is incomplete and inaccurate. Dataseam's full comments as outlined in this response and the factual errors pointed out during the exit conference are attached again for convenience.

Sincerely,

G. Henry Hunt
Chairman of the Board
Kentucky Dataseam Initiative, Inc.

# Kentucky Dataseam Initiative, Inc. (*Legislative Research Commission Document)*

## Dataseam

### Summary

Dataseam designed, built and manages an innovative solution to help advance Kentucky economic and workforce development. This unique program leverages reliable networks and underutilized education resources to provide incredible computing power, which allows the Commonwealth to realize advantages in cancer research, education and workforce development.

**Brown Cancer Center at the University of Louisville Research**

- Cancer Drug Pipeline (supported by DataseamGrid)
  - One potential drug to clinical trial*
  - 50 potential drugs to laboratory testing with 45 validated*
  - Recent discovery of potential therapy against 90% of all cancers*
- Cancer Drug Research
  - 264 cancer targets screened
  - 30 research teams*
  - $41 million in past and current federal grants*
  - $7.5 million in pending grants*
  - Additional $11.55 million in scheduled applications*
  - $11.55 could rise to $34.65 million*
- Cancer Drug Computing
  - Basic run rate of (1) target a week against 25 million compounds
  - At 2016 peak, DataseamGrid provided 90% of computing power with 4.5 times power of UofL and UofK computing clusters combined.
  - Use all of DataseamGrid and would use more if available.

**DataseamGrid Computing Resource**

- Currently provides 166 TeraFLOPS 24-hours a day 7-days a week.
- At peak (2016) provided 413 TeraFLOPS.
- Projected (January 2019) 299 TeraFLOPS
- dGrid proprietary software coordinates research across districts*

**Dataseam Education and Workforce**

- 23,284 computers provided to 49 school districts
- 85% of 9,000 computers in 31 districts currently on the grid
- $2.2 million in DataseamScholars at MSU and UofL*
- $260,000 in new scholarships annually funded by Universities*
- 113 Certified Support Specialists credentialed*
- Nearly 8,000 educators trained*
- State-wide IT Support Specialists Apprentice pilot program*
- 60-90 loaner computers to GSE, GSA, WKU workshops annually

* Not directly funded by state appropriation.

**Brown Cancer Center at the University of Louisville Research**

The Experimental Therapeutics Program at the Brown Cancer Center at the University of Louisville has created one of the largest pipelines of potential new cancer therapy drugs in America. The Cancer Center has leveraged the DataseamGrid (uniqueness and working power) to attract over $41 million and submit an additional $7.5 million (pending) in federal grants. There is an additional $11.55 NIH Center for Biomedical Excellence grant application scheduled for January 2019, which could expand to $34.65 million. Losing the DataseamGrid makes it much harder to complete existing work and makes future grant applications significantly less competitive.

The DataseamGrid contributes significantly to the work of 30 research groups at the Brown Cancer Center who have created a Drug Pipeline with over 50 targets of new potential anticancer drugs. The speed of drug discovery is directly proportional to the number of computers working on it. Historically the DataseamGrid provides 10 times more capacity than is otherwise available at UofL, 4.5 times more capacity from UofL and UK combined. Therefore, the amount of work we perform in 1 year would easily take more than 10 years without the DataseamGrid.

Except for isolated instances, Brown Cancer Center has generally used all the processing power available on the DataseamGrid. From the original 30-computer pilot, to early days with 1,000 cores, the Brown Cancer Center have been able to expand research. With additional cores available, industry advances in processors speeds, and additional grid software efficiencies Brown Cancer Center has dramatically expanded the number of targets, specificity of examination, and size of its compound library. The Brown Cancer Center runs enough research to use both the internal resources at the University of Louisville and DataseamGrid. Brown Cancer Center has examined using other computing sources but the cost or availability issues make the DataseamGrid the most workable solution for the Brown Cancer Center.

Brown Cancer Center used the DataseamGrid to examine the following number of cancer targets and compounds during the calendar year.

- 2016, 46 cancer targets screening a total of 861,953,743 compounds.
- 2017, 36 cancer targets screening a total of 735,298,761 compounds.
- 2018, 74 cancer targets screening a total of 1,462,534,882 compounds.

Attached is list of **Research Funding using Dataseam as a Critical Resource Support** as reported to Office of the State Budget Director in May 2017.

**DataseamGrid Computing Resource**

DataseamGrid(SM) is a cloud-based style computing service managed by proprietary dGrid management software providing computing power for the Brown Cancer Center.

- Peak (January 2016) DataseamGrid was providing Brown Cancer Center with 413,302 GFLOPS working power 24-hour a day, seven days a week.
    - Using an average of 11,000 school computers.
- Current (August 2018) DataseamGrid currently provides Brown Cancer Center with 166,248 GFLOPS of working power 24-hours a day, seven days a week.
    - Using an average of 7,000 school computers.
- Projected (January 2019) DataseamGrid anticipated providing Brown Cancer Center with 299,548 GFLOPS of working power 24-hours a day, seven days a week by adding 1,200 new computers with first year of state funding.
    - Using an average of 8,000 school computers

In addition to working power, the DataseamGrid meets the following requirements necessary to support the research.

- Research Task and Dataset distribution, scheduling, monitoring, error handling, rescheduling, results collection across variable number of client computing engine instances.
- 10 Terabytes permanent storage for results and data
- 5 Terabytes temporary storage
- UNIX command line access
- Remote access via SSH
- Perl and C programming languages
- Programmatic job submission, monitoring and collection interfaces
- Client Compute Engine
    - Intel CPU
    - UNIX based OS supported by modeling tool
    - UNIX Shell access
    - Remote Access via SSH
    - 500 Meg RAM per core
    - 5G temporary space

On a regular basis Dataseam and Brown Cancer Center review equipment, operations and alternative solutions to determine best practices.

- While the proprietary software could integrate non-MacOS computers and mobile devices with additional work, the additional ongoing software costs and upfront programming currently make these solutions less cost effective.
- Dataseam has experimented with vmware to virtualize Mac and UNIX OS, but this is not cost effective; does not work well in the education environment; and potentially violates software license agreements at this time.

**Dataseam Education and Workforce**

Workstations

Dataseam provided 23,284 computers to 49 school districts. **Computer and Professional Development Report** attached as reported to Governor's Office Review May 2017. There were 31 coal county school districts participating in 2016. Districts have not participated for various reasons internal to their operations, priorities or capabilities. Dataseam typically had between 11,000-14,000 workstations operating for instructional use at any one time. There are currently 9,000 computers on the grid in 31 school districts.

School Training Program

- Certified Technical Support. To ensure computers are kept online for instruction and research, each school district employs at least one certified support specialist trained and supported by Dataseam. 115 technicians have been credentialed.
- Teacher Professional Development. In order to ensure a proper instructional utilization of the technology, school districts are required to participate in additional instruction and practice with the computers. Dataseam has provided training and ongoing support and programs for nearly 8,000 teachers.
- School districts invest about 20% of the cost of the computers for training as part of their local investment, which is line with other grant programs.

Dataseam Scholars Program

As part of their participation in the program, the University of Louisville and Morehead State University provide specific STEM and STEM Education scholarships to students in participating school districts. This results in $260,000 in additional (Dataseam Specific) scholarship commitments each year with over $2.2 million over the life of the program.

IT System Support Apprentice Program

Dataseam is currently piloting the first IT Apprentice program in the Commonwealth geared towards K-12 learners with 4 high school students to gain additional education and work experience in a broad base of IT disciplines within the school. Approved by both state and federal departments of labor as well as the Kentucky Education and Workforce Cabinet. Dataseam is paying most of the pilot costs and expects to roll out to 30 students in fall 2019.

Attached is list of **Dataseam Career and Workforce Development** Programs as reported to Office of the State Budget Director in May 2017.

***Research Funding using Dataseam as a Critical Resource Support***

Active Projects

4/15-3/18 **U01 HL127518, Bates, Krentsel, Miller (Multi-PI)**
NIH (REACH Award) The ExCITE Program: Expediting Commercialization, Innovation, Translation, & Entrepreneurship
Total direct costs $3,000,000 UofL Match $3,000,000

8/16-7/18 **National Institute of Health R21 EY027032-01**
Identifying novel c-Cbl antagonists to promote corneal epithelial regeneration
Principal Investigator: Ceresa, B.
Total direct costs $275,000

2/012-3/17 **National Institute of Health RO1 GM077422-01**
Targeting Nucleic Acids with an Integrated Virtual and Actual Screen
Total direct costs $610,410

7/13-6/18 **NIH 1P30GM106396**
Miller, DM (PI)
Molecular Targets Phase III COBRE
$3,670,740 direct costs

2011-2017 **NCI 1R01CA149438-01A10**
Activation of Cyclin-Dependent Kinases by Fructose-2, 6-Bisphosphate
Direct Costs $1,037,500

2013-2018 **NCI 1R01CA175003-01**
Activating Bax as a therapeutic strategy for lung cancer.
Direct Costs $1,037,500

2014-2019 **NCI 1R01CA186661-01**
Small molecule targeting of MIF as a novel melanoma therapeutic.
Direct Costs $1,037,500

Completed Support

07/08-06/13 **NIH/NCRR 5P20RR018733**
Molecular Targets COBRE
Total Direct Costs all years: $6,849,162 (total costs: $10,120,679)

6/98-5/01: **Department of Defense Prostate Cancer Program DAMD17-98-1-8583**
"Unique G-rich Oligonucleotides which Inhibit the Growth of Prostate Carcinoma Cells"
Award: $423,000 total

6/01-5/03: **Department of Defense Prostate Cancer Initiative Phase II Award DAMD17-98-1-8583**
"G-rich Oligonucleotides as Novel Therapeutic Agents for Prostate Cancer" Award: $650,000 total

07/02-06/05 **Department of Defense Breast Cancer Initiative New Idea Award BC011113**
"Mechanisms for blocking breast cancer metastasis:CXCR4, a novel target" Award: $431,744 total costs

05/02-04/05 Kentucky Lung Cancer Research Program
"Design of Nucleolin Inhibitors"
Award: $296,010 total costs

11/05-10/07 KSEF-916-RDE-008. Kentucky Science & Engineering Foundation.
Emerging Technologies Cancer Drug Discovery using Distributed Computing.
Total Costs $100,000

09/03-06/08. **NIH/NCRR 1P20 RR18733**
Center of Biomedical Research Excellence in Molecular Targets
Total Direct Costs all years: $7,730,821 indirect costs ($11,596,200)

06/06-05/08 Kentucky Lung Cancer Research Program
Development of CXCR4 inhibitors
Total Costs $75,000 per year

04/05-03/10 **NIH/National Cancer Institute 1-R01-CA-113735-02**
Development of Nucleolin targeted Anticancer Compounds
Direct costs per year $177,500

07/05-06/10 **NIH:NCI 1R01: CA106281**
The CXCR4-SDF-1 Axis in Metastatic Rhabdomyosarcoma
Direct Costs per year $250,000

2/07-1/12 **National Institute of Health RO1 GM077422-01**
Targeting Nucleic Acids with an Integrated Virtual and Actual Screen
Total direct costs $610,410

**PENDING FUNDING**

Submitted NIH Oct 2016 cycle
Trent/Chaires Renewal RO1 $1,250,000 direct costs
Clark/Trent RO1 $1,250,000 direct costs

Submitted for NIH Feb 2017 cycle
Clark/Trent RO1 $1,250,000 direct costs

Submitted for NIH Mar 2017 cycle
Telang/Trent RO1 $1,250,000 direct costs

Total pending including indirect costs: $7,700,000

**Indirect costs are calculated and added to the direct costs range from 44% to current 54% over this time period. This is added to the direct costs and paid by the funding body.**

**COMPUTER & PROFESSIONAL DEVELOPMENT REPORT**
6/24/16

| | COMPUTERS | | | | PROFFESIONAL DEVELOPEMENT | |
|---|---|---|---|---|---|---|
| Coal County School District | 6-'15 | COMPUTERS | MATCH | TOTAL COMPUTERS | 15-16 | Total |
| Ashland Ind | 227 | 0 | 0 | 227 | 0 | 51 |
| Bell | 935 | 0 | 0 | 935 | 0 | 413 |
| Boyd | 657 | 15 | 15 | 687 | 0 | 156 |
| Breathitt | 591 | 94 | 94 | 779 | 0 | 238 |
| Carter *** | 127 | 0 | 0 | 127 | 0 | 3 |
| Clay | 632 | 0 | 0 | 632 | 0 | 269 |
| Crittenden *** | 501 | 0 | 0 | 501 | 0 | 179 |
| Daviess | 263 | 218 | 218 | 699 | 5 | 185 |
| Dawson Springs | 192 | 3 | 3 | 198 | 1 | 43 |
| Elliott | 928 | 34 | 34 | 996 | 0 | 306 |
| Fairview Ind | 481 | 20 | 20 | 521 | 0 | 155 |
| Floyd | 1,438 | 0 | 0 | 1,438 | 0 | 198 |
| Greenup *** | 483 | 0 | 0 | 483 | 0 | 84 |
| Hancock | 571 | 0 | 0 | 571 | | 145 |
| Harlan Co | 243 | 0 | 0 | 243 | 0 | 46 |
| Harlan Ind | 572 | 48 | 48 | 668 | 0 | 129 |
| Hazard Ind | 393 | 0 | 0 | 393 | 0 | 167 |
| Hopkins Co. | 68 | 0 | 0 | 68 | 0 | 38 |
| Jackson Co | 179 | 0 | 0 | 179 | 0 | 146 |
| Jackson Ind | 425 | 0 | 0 | 425 | 0 | 106 |
| Jenkins Ind | 379 | 70 | 70 | 519 | 0 | 236 |
| Johnson | 1,157 | 42 | 42 | 1,241 | 0 | 397 |
| Knott | 761 | 0 | 0 | 761 | 0 | 155 |
| Knox | 0 | 0 | 0 | 0 | 0 | 8 |
| Lawrence | 873 | 0 | 0 | 873 | 0 | 477 |
| Lee | 102 | 0 | 0 | 102 | 0 | 61 |
| Leslie | 30 | 0 | 0 | 30 | 0 | 1 |
| Letcher | 156 | 0 | 0 | 156 | 0 | 14 |
| Magoffin | 689 | 0 | 0 | 689 | 0 | 294 |
| Martin | 1,171 | 48 | 25 | 1,244 | 0 | 96 |
| McClean | 0 | 25 | 48 | 73 | 1 | 2 |
| Menifee | 659 | 0 | 0 | 659 | 0 | 402 |
| Mboro Ind | 462 | 20 | 20 | 502 | 1 | 139 |
| Morgan | 598 | 81 | 81 | 760 | 2 | 195 |
| Muhlenberg | 682 | 62 | 62 | 806 | 2 | 257 |
| Ohio Co | 1,036 | 40 | 40 | 1,116 | 0 | 419 |
| Owensboro Ind | 547 | 20 | 20 | 587 | 0 | 2 |
| Owsley | 270 | 15 | 15 | 300 | 0 | 79 |
| Paintsville Ind | 193 | 0 | 0 | 193 | 0 | 132 |
| Perry | 161 | 0 | 0 | 161 | 0 | 42 |
| Pikeville Ind | 284 | 20 | 20 | 324 | 0 | 96 |
| Pineville Ind | 381 | 0 | 0 | 381 | 0 | 154 |
| Raceland Ind | 124 | 0 | 0 | 124 | 0 | 64 |
| Russell Ind *** | 359 | 0 | 0 | 359 | 0 | 47 |
| Union | 186 | 15 | 15 | 216 | 1 | 115 |
| Webster | 256 | 95 | 95 | 446 | 2 | 117 |
| Whitley | 525 | 40 | 40 | 605 | 0 | 103 |
| Williamsburg Ind | 32 | 0 | 0 | 32 | 0 | 1 |
| Wolfe | 201 | 0 | 0 | 201 | 0 | 81 |
| Other | 83 | 139 | 139 | 361 | 0 | 134 |
| **TOTAL** | 22,263 | 1,164 | 1,164 | 24,591 | 15 | 7,397 |

* Changes in totals may occur due to movement of computers between school districts or from training pools to districts
** Changes in Professional Development totals may occur due to actual roster count.
*** No longer coal elligible

## Dataseam Career and Workforce Development

Through education initiatives, Dataseam provides profession-based training, certification classes and workshops for teachers, administration and students. These programs are designed to provide a project-based, real-world experience to enhance necessary skills for today's workforce. Here is a brief outline of programs.

**Apple Authorized Training Center** - Since 2007, Dataseam has provided the opportunity for industry standard training and certification in both the support and management of Apple workstations in a variety of networks and as well as in industry standard video editing techniques. These certifications have allowed technology professionals to advance within their own organization or pursue increased employment. Candidates have been able to convert these certifications to credit hours within the Kentucky University system towards 4-year degrees. Due to the direct efforts of Dataseam, Kentucky has the largest workforce per capita to support Apple technologies in the United States. http://www.kydataseam.com/training-and-certification

**Kentucky Space Movie Project** (Sci-Fi Project) – Annual project-based program that helps engage students in space science. Students create movies and documentaries on space subjects so they application of science concepts, project management and communication skills.
http://www.kydataseam.com/learninglibrary?pid=Kentucky+Space+Sci-Fi+Project

**Real World Biology** - Supplemental biology curriculum based on real cancer research at the James Graham Brown Cancer Center. Students are engaged and shown real world application of concepts they are learning in the classroom.
http://www.kydataseam.com/cancer-research-program

**Modern Maker: Programmable Electronics** – Four-day workshop that introduces students to electronic concepts as they are related to programming, coding and accomplishing tasks. Hands-on program complete with microelectronics kit allows students to build and experiment in the important world of micro sensors and controllers. Also provided in regular classroom setting.
http://www.kydataseam.com/learninglibrary?pid=Programmable+Electronics

**DataseamEducator Blog** – Real world examples of career and college opportunities and skills. Sharing best practices around project based learning that prepares students for exploring and meeting real world challenges.
http://www.kydataseam.com/category/educator-blog

**Learning Library** – Depository of resources for teachers. Holds videos, lesson plans, opinions and examples from Dataseam workshops, educators and professionals.
http://www.kydataseam.com/learninglibrary

**Basics of Photography** – Teaches not only basics of photography, but also works with students to analyze situations and solve problems to convey a message.
http://www.kydataseam.com/journalism

**Public Speaking –** Work with students to develop public speaking skills both in person and recorded messages. Each student is videotaped and evaluated to bring out their special skills and make sure that they deliver their message with impact.

**The Digital Classroom** – Two-day hands-on course for teachers in all subjects. Designed to help them develop classroom projects using digital tools and communications to enhance student learning in all subjects. Teachers develop project based on their lesson plan and execute the project to gain and understanding of challenges and learning students will experience.
http://www.kydataseam.com/learninglibrary?pid=Champions-in-the-Classroom

**WKU Mountain Workshops** – Total emersion in journalism skills with world-class instructors as part of Western Kentucky University workshop. While this workshop focuses on photo, video and recorded communication, it also helps teachers expand their ability to help students process information, come to a conclusion and communicate a meaningful message in any subject.
http://www.kydataseam.com/learninglibrary?pid=WKU+Mountain+Workshop

**MSU Space Science Center** – Help Space Science Center document projects and student achievement in order to recruit new students and attract new projects to the center. These videos and content are used to help K-12 students and teachers visualize potential careers in Kentucky's growing space industry. http://www.kydataseam.com/learninglibrary?pid=MSU+Space+Science

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# University of Louisville (James Graham Brown Cancer Center)

4/14/2020

Gerald W. Hoppmann, Executive Director
Office of Policy and Audit
Finance and Administration Cabinet

**RE: Formal Response to final Dataseam report.**

Dear Mr. Hoppmann,

I am responding to the report that your team generated on Dataseam. Research computing is the major component of our partnership we have with Dataseam, however there is very little information pertaining to this in the report. The research and research computing infrastructure are major emphases of this program, yet detailed examination of these aspects are lacking in this report.

It is stated in the cover letter of the report "The general objective of the audit is to determine costs and benefits of the contractual arrangement by which Apple computers are provided to Kentucky school districts in exchange for the use of available computer processing power for cancer and other research." However, several significant benefits were not included in the report, such as detailing the impact of the research, scale and scope of the research, detailed research funding, economic impact, outreach, and health benefits to the Commonwealth. It does not quantify the research computing or put it in context.

The report continues to have factual errors in it even after an exit interview where many of these factual errors were addressed. For example, it still does not get the name of the University of Louisville James Graham Brown Cancer Center name correct. The large amount of independently verifiable data that we have provided in the past, and as part of this process to your office regarding research, is not present or represented in the report.

The scope of the review that is defined in the report is to include the entire period that Dataseam has had State contracts. To a large extent this was already performed by Mr. Andrew McNeil under Mr. Bevin's administration in 2016-2017, yet no report was generated? Again, we provided detailed information to the State CIO in 2019. No fault or delinquency with the program were determined at that time with the program reviews.

The program was created *"with the intention to "…accelerate the time from research to commercialization of new pharmaceuticals"* (in the report executive summary), yet when I was interviewed by your office, this was not examined, or information requested about this, apart from the number of FDA-approved drugs. This report does not critically examine the program and the research it supports. I provided information after the exit interview after noting this deficiency, but it was not included in the report. Other metrics for determining if this accelerated research commercialization were not requested such as the established standards of patent applications, patents awarded, options, licenses, and contracts.

I also pointed out to your office via Email and at the exit interview why the comments from the University of Kentucky regarding research computing were either in error or not relevant as their officials stated that they have no interest or need for the DataseamGrid. I informed your office that I have run research on the DataseamGrid for University of Kentucky faculty. I have attached my comments I supplied you after the exit interview regarding this and other points mentioned above as there was not modification of the report to address this.

The conclusion section of the report does not mention any research metrics, benefits, or impact, nor are they detailed in the report. Therefore, the current report is inaccurate in reporting several of the main benefits of the Dataseam program and misrepresents the overall program as just an education computing initiative.

Sincerely,

John O. Trent Ph.D.
Deputy Director of Basic and Translational Research,
James Graham Brown Cancer Center
University of Louisville
Phone 502.852.2194
Email john.trent@louisville.edu

**Comments sent (3/31/2020) to Gerald W. Hoppmann, Executive Director, Office of Policy and Audit, Finance and Administration Cabinet. The specific grant information in the comments sent have been deleted.**

Past funding that used Dataseam as a resource just that Trent was involved in was $41M, new funding from 2019 and 2020 is an additional $18M. If facilitating research is a goal of the program then funding is extremely relevant. I've only listed federal funding, it does not include the $12.5M that Kosair Charities gave us in 2009 to do pediatric cancer drug discovery. Another benchmark for commercialization in drug discovery is patent applications. I have filed over 90 patent applications on drug discovery over the last 10 years. No mention of this is in the current draft and information regarding this was not requested.

The economic development and impact information that you requested was in the report sent to State CIO Grindle.

UK's comments are biased as they do not perform this type of research. UK IT unsuccessfully tried to get grid computing running, so of course it is not a priority for them. The comment on Gridchem shows a lack of understanding of UK's own research computing with respect to grid computing. Gridchem is not a grid-based platform like the DataseamGrid despite the name, it utilizes normal computing resources at UK and volunteered resources outside of UK. They list "*ab initio*" chemistry and molecular dynamics programs that can't run actually run on a perfectly parallel grid without highspeed interconnect of the processors. This is also not a dedicated constant resource such as the DataseamGrid. I have run research on the DataseamGrid for UK researchers as they do not have the expertise or available resources at UK. UK Markey Cancer Center does not do the sort of drug discovery that BCC does and has no concept of the scope or possibilities of it.

This program is unique so therefore an in-state comparison is not useful. The cancer research at UK is more traditional.

The scope of the research program is not mentioned in the report, and information regarding it was not requested. The list of Principal Investigators of research groups that have recently used the grid at UofL are Chesney, Telang, Trent, (Bates, Miller, Trent), Chesney, Mitchell, Clem, Bodduluri, Clark, Clark, Donninger, Chaires, (Chaires, Trent), Bates, Lane, Fan, Mitchell, Clem, Li, C., Tooley, Jonsson, Grimes, Hein, Hein, States, Eaton, Beverly, Lillard, Learner, Zundel, Clark, Ceresa, Li, B. (Trent, Chaires): if names are repeated they are for different projects, collections of names are for specific collaborative projects, many of these projects have multiple targets run against multiple libraries, and used the grid multiple times over the years.

# APPENDICES

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# APPENDIX A: Dataseam Participating Partner Agreement (PPA) Requirements

| Participating Partner Agreement Sections | Requirements |
|---|---|
| Section 1: Partner Agreement | 1. Term<br>2. Participating Partner's Obligations (5 requirements)<br>3. Dataseam's Obligations (6 requirements)<br>4. Ownership Interests (3 requirements)<br>5. Confidentiality<br>6. Representations and Warranties of Dataseam<br>7. Representations and Warranties of Participating Partner<br>8. General Provisions (7 requirements) |
| Section 2: Science and Lab Agreement | 1. Term<br>2. Dataseam' s Obligations (6 requirements)<br>3. School District's Obligations (7 requirements, 3 sub requirements)<br>4. Representations and Warranties of Dataseam<br>5. Representations and Warranties of School District<br>6. General Provisions (7 requirements) |
| Section 3: Confidentiality Agreement | 1. Confidential Information (3 requirements)<br>2. Excluded Information (4 requirements)<br>3. Non-disclosure<br>4. Permitted Disclosure<br>5. Prior Consent<br>6. Injunction<br>7. No Obligation<br>8. Governing Law<br>9. Assignment<br>10. Counterpart<br>11. Term |
| Section 4: Equipment Addendum to Science and Lab Agreement | 1. School District agreement to pay for professional development.<br>2. Work to coordinate additional Dataseam partnership activities, subject to lab availability. |

Source: Office of Policy and Audit from Gallatin County Schools Participating Partner Agreement approved on 11/6/19.

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# APPENDIX B: University Research Programs

| Research Program | University of Louisville | Research Program | University of Kentucky |
|---|---|---|---|
| **Cancer Prevention and Control** | *Building a program in cancer prevention and control to identify lifestyle, environmental, and genetic factors that influences cancer susceptibility and progression.*<br><br>*The mission of the Cancer Care and Control program is to reduce and eliminate the impact of cancer on the health and well-being of our patients, communities, and the healthcare system. We perform our research using a variety of techniques, including traditional basic science bench research, translational research with collaborating clinicians, and health services research techniques that may use large population-based and other administrative datasets to assess the impact of health care delivery systems on cancer development, treatment, and outcomes.* | **Cancer Prevention and Control (CP) Program** | *CP Program research examines and addresses factors associated with Kentucky's excessively high cancer incidence and mortality rates, with a focus on the state's rural and Appalachian populations. To address these challenges, CP members center their efforts around three aims: 1) identify behavioral, social, cultural, genetic and environmental factors that contribute to the high cancer burden in Kentucky; 2) design, test, implement and evaluate intervention strategies to reduce the cancer burden; and 3) develop population-based methods and measures that facilitate inter-programmatic cancer research.* |
| **Tumor Immunology** | *Strengthening cutting-edge research in tumor immunology, which harnesses the power of the immune system to fight cancer.*<br>*Decades of research suggest that a person's own immune system can be activated to attack cancer cells.*<br><br>*Paradoxically, inflammation mediated by the immune system can create a micro-environment that promotes cancer development. Tumor immunology research seeks to understand and manipulate this complex interplay to create new cancer prevention and treatment approaches.*<br><br>*The research goals of this program are thus two-fold: (1) to activate host immunity against cancer cells, and (2) to suppress inflammation that can lead to cancer.* | **Cancer Cell Biology and Signaling (CS) Program** | *The CS Program's mission is to identify basic signaling pathways and mechanisms by which cancer cells survive, proliferate, invade and metastasize in an effort to identify novel targets for prevention and treatment. Dovetailing with the cancer center's mission to reduce cancer incidence and mortality in Kentucky, the CS Program is organized around three key aims: 1) identify aberrant proliferation and survival networks that drive cancer development and progression; 2) define determinants of tumor progression and metastasis; and 3) determine the contribution of the tumor microenvironment to cancer progression.* |

| Research Program | University of Louisville | Research Program | University of Kentucky |
|---|---|---|---|
| **Clinical Trials** | *Introducing promising drugs, vaccines, and diagnostic procedures directly to patients through clinical trials.*<br><br>*After rigorous testing in animal models, new diagnostics and therapeutics discovered by JGBCC researchers enter into early-phase clinical trials (phases I, II, and III), which screen for safety and efficacy in humans. A strong clinical trials program at the JGBCC ensures that Kentuckians have access to cutting-edge anti-cancer agents without having to leave the state.* | **Drug Discovery, Delivery, and Translational Therapeutics (DT) Program** | *The Drug Discovery, Delivery and Translational Therapeutics (DT) Program is the most diverse scientific program, including members from five different colleges. The DT Program's collaborative physicians and scientists are devoted to driving discovery and translation through the drug development pipeline. The overarching goal of the DT Program is to discover, develop, and evaluate novel anticancer agents and biomarkers with a focus on targeted therapies of relevance to our catchment population.*<br><br>*Program members use their particular scientific expertise to help the program follow through on three goals: 1) identify catchment area specific targets and biomarkers; 2) discover and develop new anticancer agents; and 3) develop and participate in early phase clinical trials* |
| **Experimental Therapeutics and Diagnostics** | *Identifying, developing, and rigorously evaluating new tools for the treatment and detection of cancer by expanding research in experimental therapeutics. Researchers in this program identify molecular targets and pathways that may be used to develop the next generation of cancer therapeutics and diagnostics.*<br><br>*They use a unique structure-based strategy developed by Dr. John Trent that can greatly accelerate the clinical testing of promising drug candidates. Traditional drug design often means random testing of hundreds — if not hundreds of thousands — of compounds. But by knowing a drug candidate's precise structure (its shape and chemical properties), JGBCC scientists use a rational approach that quickly discards candidate molecules that have the wrong shape or properties.* | **Genomic Instability, Epigenetics and Metabolism (GEM) Program** | *The Genomic Instability, Epigenetics and Metabolism (GEM) Program strives to generate a comprehensive understanding of genomic instability, epigenetics, metabolism and DNA repair mechanisms to develop novel approaches for cancer prevention and therapy.*<br><br>*GEM Program members use their scientific expertise to forward the program's two three primary aims: 1) delineate mechanisms by which genomic instability and DNA repair contribute to carcinogenesis; 2) define how epigenetic mechanisms contribute to malignancy and tumor progression; and 3) determine how metabolic reprogramming contributes to cancer development and therapeutic responsiveness.* |

Source: Office of Policy and Audit from information provided on the James Graham Brown Cancer Center Website and Markey Cancer Center Website.

**Note**: According to Dr. Trent, *"The amount of continuous dedicated computing time on the DataseamGrid is not available on UofL or UK's computing infrastructure."* He also stated that *"national computing resources do not supply the amount of dedicated time that the DataseamGrid does."*

# APPENDIX C: Dataseam Initiative Bill and Contract Purposes

| Year | Bill | Bill Purpose | Contract | Commodity Line | Contract Purpose |
|---|---|---|---|---|---|
| +2006 | HB 380 | School Technology in Coal Counties<br><br>Coal County Computing Program | Personal Service Contract/Grant Agreement | Services | Continue the Coal County Computing Program.<br><br>*Building and administering the statewide research computer infrastructure. |
| +2008 | HB 406 | School Technology in Coal Counties<br><br>Coal County Computing Program | Personal Service Contract/Grant Agreement | Services | Enhancing education technology in local school districts within coal-producing counties.<br><br>*Building and administering the statewide research computer infrastructure.<br><br>*Provide a minimum 2,000 workstations in FY 08-09 and 2,000 workstations in 09-10. |
| 2010 | HB 1 | School Technology in Coal Counties<br><br>Coal County Computing Program | Personal Service Contract | Services | Mentions the Coal County Computing Program in the *Extended Description*, but does not list a specific purpose. |
| 2012 | HB 265 | School Technology in Coal Counties<br><br>Coal County Computing Program | Memorandum of Agreement | Services | Mentions the Coal County Computing Program in the *Extended Description*, but does not list a specific purpose. |
| 2014 | HB 235 | School Technology in Coal Counties<br><br>Coal County Computing Program | Memorandum of Agreement | Service | Mentions the Coal County Computing Program in the *Extended Description*, but does not list a specific purpose. |

| Year | Bill | Bill Purpose | Contract | Commodity Line | Contract Purpose |
|---|---|---|---|---|---|
| **2016 | HB 303 | School Technology in Coal Counties<br><br>Coal County Computing Program | - | - | - |
| 2019 | HB 268 | School Technology | Memorandum of Agreement | Services | Provide 1,300 workstations in participating KY-12 districts, scholarships, education and workforce development.<br><br>Dataseam will run the Kentucky Dataseam Initiative program. This includes the provisioning and maintenance of the DataseamGrid for Kentucky-based cancer research, placement of approximately 1,300 workstations in participating KY-12 districts, scholarships, education and workforce development initiatives. |

Source: Office of Policy and Audit from information provided in appropriations bills and KDE contracts.
*Language discussed in the Kentucky Economic Development Finance Authority (KEDFA) grants.
**Line-item veto occurred.
+Based upon language in HB 380 addressing the Commissioner of KDE to use the $2,500,000 to continue the Coal County Computing Program, the "*Finance and Administration Cabinet has granted an exemption from the competitive bidding requirements of KRS Chapter 45A.095(1) and FAP 111-09-00 as a contract where 'competition is not feasible to bid".* After 2008, appropriations from restricted funds were no longer expended for purposes of the program; rather, General Fund monies were appropriated.

# APPENDIX D: DataseamGrid Research Steps

| Steps | Description |
|---|---|
| 1. | Researchers submit research tasks on the DataseamGrid through the James Graham Brown Cancer Center (BCC) Molecular Modeling Core and in collaboration with Dr. Trent. Software allows for performance of the research task, which is *"…for docking small molecules into target"* proteins. Additional software allows preparation of the research and files used for virtual screening.<br><br>From 2012-2019 an average of 43 research targets per year were submitted on the DataseamGrid. According to Dr. Trent, *"For each target several "runs" or "jobs" are made screening over 40 million compounds against a single target, sometimes significantly more."* |
| 2. | Research task is received by Dataseam's Master Controller. |
| 3. | The Master Controller distributes the research request to the District Controller level. |
| 4. | At the District Controller level, computing occurs at the *Agent* or Mac Computer level in a coordinated fashion to accomplish the research task; however there may be additional tasks at the agent level to perform post-processing to reduce traffic back (i.e. research job result analysis). |
| 5. | Processed results from accomplished research tasks are returned to the University via the DataseamGrid server. Dr. Trent's laboratory wrote proprietary scripts that interface with the DataseamGrid, which allows for the automation of the process. |
| 6. | The data related to accomplished research tasks are extracted from the DatseamGrid server for assessment and evaluation to identify active or inactive molecules/compounds. Then, transferred back to the University BCC, Molecular Modeling Core. |

Source: Office of Policy and Audit from interviews with Dr. Jonathan Trent.

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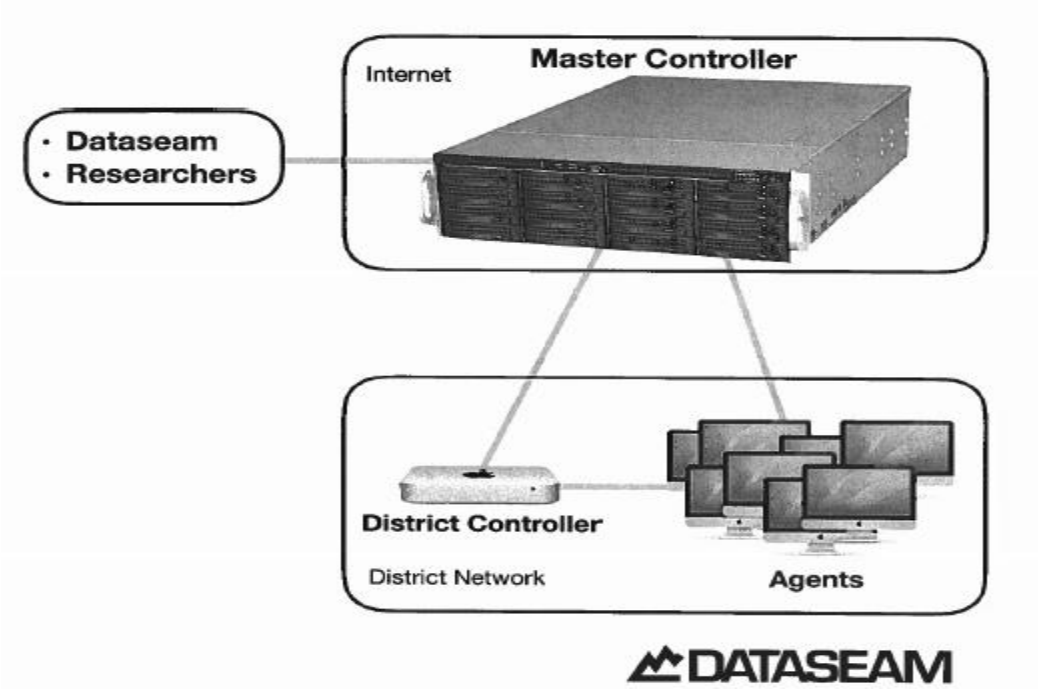
# APPENDIX E: Dataseam's Proprietary Distributed High Performance Computing




Source: Office of Policy and Audit from interviews with Dr. John O. Trent.

**Note**: The DataseamGrid, using a proprietary management software (dGrid©), continually monitors the *Agents'* (e.g., Mac computers) availability to coordinate and schedule the work related to research requests. Evaluation of data is completed by the use of virtual screening docking, which permits the assessment of protein/targets.

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## APPENDIX F: District Superintendent Questionnaire Responses Participating School Districts

| Salient Areas | District Percentages |
|---|---|
| Dataseam initiated the process from which to participate in the program. | 65% (20) answered "Yes"<br>6% (2) answered "No"<br>29% (9) no answer |
| Districts retain ownership of the computers after placement. | 61% (19) answered school district owns the computers for life<br>10% (3) answered "Other"<br>29% (9) no answer |
| *Districts place computers in schools covering all levels of K-12. | 61% (19) Elementary<br>68% (21) Middle School<br>68% (21) High School<br>32% (10) no answer |
| Computers are placed based on a combination of district, schools, and Dataseam collaboration. | 48% (15) answered "District office decides"<br>26% (8) answered collaboration occurs between the districts, schools and Dataseam with respect to computer placement<br>26% (8) no answer |
| *Computers are used primarily for academic instruction and research. | 65% (20) answered "Academic Instruction"<br>26% (8) answered "Student Research on the Dataseam Grid"<br>16% (5) answered "Faculty Research on the Dataseam Grid"<br>3% (1) answered "Other" |
| School districts and Dataseam troubleshoot problems | 42% (13) answered "School districts"<br>23% (7) answered "School districts and Dataseam"<br>3% (1) answered "Other"<br>32% (10) no answer |
| School districts monitor computers on the DataseamGrid | 45% (14) answered "Yes"<br>26% (8) answered "No"<br>29% (9) no answer |
| *Districts monitor computers in required areas | 29% (9) answered "Most recent check-in for each grid workstation"<br>45% (14) answered "Current on/offline status for each grid workstation"<br>16% (5) answered "System values for each grid workstation (e.g., memory and free disk space)"<br>3% (1) answered "Other" |

| Salient Areas | District Percentages |
|---|---|
| Districts use the online tool (dgStat.app) provided by KY Dataseam Initiative, Inc. | 39% (12) of answered "Yes"<br>10% (3) answered "No"<br>52% (16) no answer |
| Districts and Dataseam maintain the computer security | 42% (13) answered "School district maintains security"<br>10% (3) answered "School district and KY Dataseam Initiative, Inc. maintains security"<br>6% (2) answered "Dataseam Initiative, Inc. maintains security"<br>6% (2) answered "Not sure"<br>3% (1) answered "Other"<br>32% (10) no answer |
| Districts participated in Professional Development | 48% (15) answered "A great deal"<br>6% (2) answered "A lot"<br>6% (2) answered "A moderate amount"<br>39% (12) no answer |
| Districts paid for Professional Development | 61% (19) answered "Yes"<br>39% (12) no answer |
| Districts required to pay for Professional Development for computers | 55% (17) answered "Yes"<br>3% (1) answered "No"<br>42% (13) no answer |
| Districts favorably viewed the value of Professional Development | 6% (2) answered "A lot"<br>6% (2) answered "A moderate amount"<br>39% (12) no answer |

Source: Office of Policy and Audit, District Superintendent Questionnaire.
*Response rate greater than 31, because school districts had multiple options from which to select. As a result, the response rate can be greater than 100% due to computers placed in multiple schools for each district.

## APPENDIX G: District Superintendent Questionnaire Comments Participating School Districts

| Participating District Comments |
|---|
| Dataseam is a "lifeline" for our school district with regard to workstations. It has been a tremendous partnership where we are able to leverage our Dataseam to do more than we would ever do locally on our own. The PD our teachers have attended has historically been very good and the technical training allow us to support the work very easily. |
| These questions don't really capture how Dataseam helps or has helped districts in KY. The original Dataseam that was funded was for coal producing districts only. Just recently did this program open up to districts not on the coal list. This is all due to the funding sources that they got funded from. The professional development that they have provided are some of, if not the best professional developments that I have been a part of. |
| Dataseam has been a huge help for our district. They have provided great computers and scholarship opportunities for our students. We do not actively participate with them now, however we are interested in their internship program for students. |
| Without partnerships that we have formed with Dataseam, our district would not have had the number of devices and tools that has helped not only our staff, but students to advance in their uses of the 21st century digital skills that they need to be competitive in the state and the world. |
| Dataseam has been a valuable partner. There is no way we could offer our students the technology exposure without the Dataseam program. Being a partner with Dataseam has allowed us to use our KETS funds in other areas rather than buying workstations. We don't view Dataseam as a program but rather a community of educators who work together to make sure of the program's success in each district. We were so excited to find out Dataseam received funding and will be able to continue. Now that funding is no longer from coal severance funds but, general funds there will be districts that will be able join that didn't have that opportunity before. |
| Without Dataseam our schools would not be able to afford Apple computers. Apple computers provide students the ability to see and be very proficient in all computer platforms. |
| Prior to Dataseam many Eastern KY Schools had no computer labs. As a result of the Dataseam Initiative, schools across the coal region has received 1000's of computers that are dual purpose. One they provide data research on the grid, plus they provide useful tools for students in the classroom. |
| Appreciate the partnership. |
| I expect the experience with Dataseam to be positive based on my experience from a previous district. |

Source: Office of Policy and Audit, District Superintendent Questionnaire.

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# APPENDIX H: School District Participating Partner Agreement (Sample)

## SCHOOL DISTRICT
## PARTICIPATING PARTNER AGREEMENT (Current Sample)

**THIS AGREEMENT** ("Agreement") is entered into effective this 30th day of August, 2019, by and between **Kentucky Dataseam Initiative, Inc.**, a Kentucky not-for-profit corporation, ("Dataseam"), with principal offices located **at 451 Baxter Avenue, Suite 109, Louisville, KY 40204** and **_____,** a School District duly created, organized and in good standing in accordance with the laws of the Commonwealth of Kentucky, ("Participating Partner") with its principal offices located at **_____.** The above entities may sometimes be referred to as the "Party" or the "Parties".

**WHEREAS,** Dataseam has developed a program designed to enhance education and research in the Commonwealth of Kentucky;

**WHEREAS,** Participating Partner has reviewed the Dataseam program merits and wishes to enroll and participate;

**NOW, THEREFORE,** in consideration of premises and for other good and valuable consideration, the receipt, adequacy and sufficiency of which are hereby acknowledged, the Parties agree as follows:

**1. Term.** This Agreement is effective from the date listed above and shall be automatically renewed for one (1) year on July 1 of each year ("Renewal Date") unless terminated by prior written notice received by Dataseam no fewer than 60 days prior to the Renewal Date. Dataseam may terminate this Agreement at any time upon 60 days prior written notice to the Participating Partner.

**2. Participating Partner's Obligations.** Participating Partner understands in order to participate in the program, Partner must provide the following:

**2.1** Access to the internal school network via a VPN account provided to Dataseam by the Kentucky Department of Education, Office of Education Technology.

**2.2** Donate exclusive access to district computer workstations adequate for research projects and grid-based computation.

**2.3** Physical access to those designated computers within the School District during set-up and provisioning process and from time-to-time during program period as needed to ensure proper functioning of the equipment and network. Access to be during hours agreed to by Participating Partner, not to be unreasonably withheld.

**2.4** Provide best effort to have designated computer workstations to be operational 24 hours a day, seven days a week.

**2.5** Provide necessary on-site support personnel during hours agreed to by School District.

**2.6** Provide suitable environment and management of computer server provided by Dataseam in accordance with Dataseam District Standard Configuration and Procedures provided and regularly updated by Dataseam.

**3. Dataseam's Obligations.** Dataseam agrees to provide Participating Partner School Districts the following:

**3.1** Work with Participating Partner to implement technologies and information technology strategies to help improve efficiency.

**3.2** Access to increased educational and technical opportunity from the higher education environment, which may include visits from the university researchers to talk with students and faculty.

**3.3** Participation in grant opportunities including funding and programs for education, IT, network, equipment, professional development and student workforce development programs.

**3.4** Agree not to intentionally affect the IT environment to the detriment of the daily educational environment.

**3.5** Work with the Participating Partner to promote aspects of the Participating Partner's involvement in the program and list Participating Partner as a participating partner of Dataseam.

**3.6** Provide computer servers in such numbers determined to facilitate proper running of research on the DataseamGrid.

**4. Ownership Interests.** The parties agree to honor and observe the respective ownership interests to the equipment and technologies as follows:

**4.1** Computer Workstations. Participating Partner shall have or retain sole ownership of computer workstations and other infrastructure utilized pursuant to this Agreement.

**4.2** Computational Grid. Dataseam shall have sole control of the computational grid, processes and associated technology.

**4.3** Research. The individual researchers shall be the sole owners of research running on the Participating Partner computers.

**5. Confidentiality.** Parties agree to sign a confidentiality agreement ("Mutual Confidentiality Agreement"), a copy of which is attached hereto and incorporated herein by reference.

**6. Representations and Warranties of Dataseam.** Dataseam warrants it is a non-profit corporation duly organized, validly existing, and in good standing under the laws of the Commonwealth of Kentucky. Dataseam has the corporate power and authority to carry out all its obligations under this Agreement. The execution, delivery and performance of this Agreement by Dataseam have been duly authorized by all necessary corporate action and are enforceable with accordance to its terms. Such execution, delivery and performance does not, and the consummation of the transactions contemplated with not, (a) result in a material breach of any provision of or constitute a material default under the Article of Incorporation or By-laws of Dataseam, or any agreement or instrument to which Dataseam is a party or by which it is bound, or (b) require the consent or approval of any other person or governmental agency or authority.

**7. Representations and Warranties of Participating Partner.** Participating Partner warrants it is a School District duly organized, validly existing, and in good standing under the laws of the Commonwealth of Kentucky. Further, it has the corporate power and authority to carry out all its obligations under this Agreement and knows of no impediment, legal or otherwise, that would prevent it from fulfilling its obligations hereunder. The execution, delivery and performance of this Agreement by Participating Partner has been duly authorized by all necessary organizational action and is enforceable with accordance to its terms. Such execution, delivery and performance does not, and the consummation of the transactions contemplated will not, (a) result in a material breach of any provision of or constitute a material default under any document establishing its existence or its organizational By-laws, or any agreement or instrument to which Participating Partner is a party or by which it is bound, or (b) or require the consent or approval of any other person or governmental agency or authority.

**8. General Provisions.** The following general provisions shall apply:

**8.1 Survival of Covenants, Warranties and Representations**. All representations, warranties, covenants and agreements of each of the Parties to this Agreement shall survive the consummation of the transactions contemplated in this Agreement.

**8.2 Governing Law; Venue.** This Agreement shall be governed by and construed in accordance with the laws of the State of Kentucky. In the event that any Party commences any action to enforce any terms of this Agreement, the parties hereto agree to submit the dispute to binding arbitration in lieu of formal litigation. Any litigated or arbitrated dispute shall be exclusively maintained in or subject to the venue of Jefferson County, Kentucky.

**8.3 Assignment.** No Party may assign any of its rights or delegate any of the obligations under this Agreement, except with the prior written consent of the other Party.

**8.4 Counterpart.** More than one counterpart of this Agreement may be executed by the Parties hereto by facsimile signatures, and each fully executed counterpart shall be deemed an original.

**8.5 Partial Invalidity.** Whenever possible, each provision of this Agreement shall be interpreted in such a way as to be effective and valid under applicable law. If a provision, is prohibited by or invalid under applicable law, it shall be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement.

**8.6 Remedies Cumulative**. The remedies provided in this Agreement shall be cumulative, and the assertion by any Party of any right or remedy shall not preclude the assertion by such Party of any other rights or the seeking of any other remedies.

**8.7 Entire Agreement; Amendments.** This Agreement constitutes the entire agreement among the Parties to it and supersedes any prior or contemporaneous understanding or agreement with respect to the matters contemplated herein. It may be amended only by a written instrument executed by all the Parties to it.

APPROVED:

| | |
|---|---|
| Chief Operating Officer<br>Kentucky Dataseam Initiative, Inc, | Superintendent<br>Sample School District |
| By: _____ | By: _____ |
| Date: _____ | Date: _____ |

**_____ County Schools Participating Partner and Lab Agreement**

# DATASEAM SCIENCE AND LAB AGREEMENT

**THIS AGREEMENT** ("Agreement") is entered into effective this 30th day of August, 2019, by and between **Kentucky Dataseam Initiative, Inc.**, a Kentucky not-for-profit corporation, ("Dataseam"), with principal offices located at **451 Baxter Avenue, Suite 109, Louisville, KY 40204**, and **_____**, a School District duly created, organized and in good standing in accordance with the laws of the Commonwealth of Kentucky, ("Participating Partner") with its principal offices located at **_____.** The above entities may sometimes be referred to as the "Party" or the "Parties".

**WHEREAS,** Dataseam has developed a program designed to enhance education and research in the Commonwealth of Kentucky;

**WHEREAS,** Dataseam may secure funding to provide desktop computer workstations to qualified schools to support research and educational efforts and this Agreement anticipates multiple shipments of computer workstations and other equipment over an extended period;

**WHEREAS,** School District has reviewed the merits of this Agreement and wishes to enroll and participate; in the program and

**NOW, THEREFORE,** in consideration of premises and for other good and valuable consideration, the receipt, adequacy and sufficiency of which are hereby acknowledged, the Parties agree as follows:

**1. Term.** The Initial Term of this Agreement shall commence on the date hereof and expire on the third anniversary of the Delivery Date of the computer workstations and equipment listed in the most recently executed Equipment Addendum.

**2. Dataseam's Obligations.** Dataseam agrees to provide to Agreement's participating members the following:

**2.1** May donate computers workstations to School District in such numbers as Dataseam shall determine subject to grants and funding subject to Dataseam use and access as described in Section 3 of this Agreement.

**2.2** Provide computer servers in such numbers as Dataseam shall determine to facilitate proper running of research on the DataseamGrid subject to use, access and conditions as described in Section 3 of this Agreement.

**2.3** May place a physical or electronic inventory tag and program identifiers on each machine, monitor and other equipment in order to facilitate tracking, management and operations of the program. An itemized inventory list identifying each piece of equipment and its respective delivery dated signed by representative designated by the parties hereto shall be attached to the Agreement and incorporated herein by reference. In the event the original of the inventory list is misplaced or otherwise inaccessible a photocopy may be attached instead.

**2.4** At the School District's option, make available university outreach in the form of professor visits to the schools.

**2.5** At the School District's option, make available special supplemental curriculum benchmarked to Kentucky standards.

**2.6** At the School District's option, make available special scholarship opportunity for students graduating from high school.

**3. School District's Obligations.** School District understands that in order to participate in the Agreement, School District must provide or do the following:

**3.1** The School District must be an active Dataseam Participating Partner.

**3.2** Provide, at all times, suitable environment and management of the equipment as determined by Dataseam and in accordance with Dataseam District Standard Configurations & Procedures provided and regularly updated by Dataseam.

**3.3** The Equipment shall be operational and available to external network access 90% of the time, 24 hours a day, seven days a week for a period of three years from the delivery date of the equipment and subject to all requirements set forth in Equipment Addendum attached to this document.

**3.4** Make available the School District Project Team as described in the Participating Partner Profile to facilitate on-going involvement in the program.

**3.4.1** Technical support during installation of Equipment and on-going, on-site support as needed.

**3.4.2** Facilitate educational outreach in the school (optional).

**3.4.3** Send at School District's expense teachers and/or staff to offered Professional Certification and Development by Dataseam, its designates.

**3.5** Take full responsibility for the Equipment and agrees to repair or replace any machines damages, stolen or become inoperable for any reason during the 3-year program period.

**3.6** To the extent permitted by Kentucky law, School District agrees to indemnify and hold harmless Dataseam, officers, directors, agents representatives and employees from all claims, losses, liabilities, and expenses (including attorneys' fees actually incurred) of any type, on account of death or injury to any person or damage to any property arising from School District's participation in the Dataseam program or the use of the Equipment. This indemnity shall apply without regard to whether the claim, damage, liability or expense is based on breach of contract, breach of warranty, negligence, gross negligence, strict liability or other tort. This indemnity shall survive the duration or termination of this Agreement.

**3.7 Intentionally left blank**

School District agrees, at its expense, to provide any additional software, internal modifications to the hardware, including, without limitation, any memory or other forms of upgrades, or additions of other computer related materials for educational use, which will, except for the software, become part of the Equipment.

Return the Equipment to Dataseam, if Dataseam at any time determines in its sole discretion that the above criteria are not being met. The School District will cooperate with the loading of Equipment for return to Dataseam with reasonable notice.

4. **Representations and Warranties of Dataseam**. Dataseam warrants that it is a non-profit corporation duly organized, validly existing, and in good standing under the laws of the Commonwealth of Kentucky. Dataseam has the corporate power and authority to carry out all its obligations under this Agreement. The execution, delivery and performance of this Agreement by Dataseam have been duly authorized by all necessary corporate action and are enforceable with accordance to its terms. Such execution, delivery and performance does not, and the consummation of the transactions contemplated will not, (a) result in a material breach of any provision of or constitute a material default under the Article of Incorporation or By-laws of Dataseam, or any agreement or instrument to which Dataseam is a party or by which it is bound, or (b) require the consent or approval of any other person or governmental agency or authority.

5. **Representations and Warranties of School District.** School District warrants that it is a School District duly organized, validly existing, and in good standing under the laws of the Commonwealth of Kentucky. Further, it has the corporate power and authority to carry out all its obligations under this Agreement and knows of no impediment, legal or otherwise, that would prevent it from fulfilling its obligations hereunder. The execution, delivery and performance of this Agreement by School District has been duly authorized by all necessary organizational actions and is enforceable with accordance to its terms. Such execution, delivery and performance does not, and the consummation of the transactions contemplate will not, (a) result in a material breach of any provision of or constitute a material default under any document establishing its existence or it organizational By-laws, or any agreement or instrument to which School District is a party or by which it is bound, or (b) require the consent or approval of any other person or governmental agency or authority.

6. **General Provisions.** The following general provisions shall apply:

**6.1 Survival of Covenants, Warranties and Representations**. All representations, warranties, covenants and agreements of each of the Parties to this Agreement shall survive the consummation of the transactions contemplated in this Agreement.

**6.2 Governing Law; Venue.** This Agreement shall be governed by and construed in accordance with the laws of the State of Kentucky. In the event that any Party commences any action to enforce any term of this Agreement, the parties hereto agree to submit the dispute to binding arbitration in lieu of formal litigation. Any litigated or arbitrated dispute shall be exclusively maintained in or subject to the venue of Jefferson County, Kentucky.

**6.3 Assignment.** No Party may assign any of its rights or delegate any of the obligations under this Agreement, except with the prior written consent of the other Party.

**6.4 Counterpart.** More than one counterpart of this Agreement may be executed by the Parties hereto by facsimile signatures, and each fully executed counterpart shall be deemed an original.

**6.5 Partial Invalidity.** Whenever possible, each provision of this Agreement shall be interpreted in such a way as to be effective and valid under applicable law. If a provision is prohibited by or invalid under applicable law, it shall be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Agreement.

**6.6 Remedies Cumulative.** The remedies provided in this Agreement shall be cumulative, and the assertion by any Party of any right or remedy shall not preclude the assertion by such Party of any other rights or the seeking of any other remedies.

**6.7 Entire Agreement; Amendments.** This Agreement constitutes the entire agreement among the Parties to it and supersedes any prior or contemporaneous understanding or agreement with respect to the matters contemplated herein. It may be amended only by a written instrument executed by all the Parties to it.

APPROVED:

| | |
|---|---|
| Chief Operating Officer<br>Kentucky Dataseam Initiative, Inc, | Superintendent<br>Sample School District |
| By: _____ | By: _____ |
| Date: _____ | Date: _____ |

**_____ County Schools Participating Partner and Lab Agreement**

# CONFIDENTIALITY AGREEMENT

THIS MUTUAL CONFIDENTIALITY AGREEMENT ("Agreement") is entered into by and between **Kentucky Dataseam Initiative, Inc.** ("Dataseam"), a Kentucky corporation, and **_____**. The above entities may sometimes be referred to as the "Party" or the "Parties".

**WHEREAS,** each party desires to review certain Confidential Information of the other Parties, and each Party is willing to disclose such information to the other Parties, subject to the terms of this Agreement;

**NOW, THEREFORE,** in consideration of premises and for other good and valuable consideration, the receipt, adequacy and sufficiency of which are hereby acknowledged, the Parties agree as follows:

**1. Confidential Information.** "Confidential Information" means any and all technical, business, financial or commercial information concerning the Parties which is confidential or proprietary or competitively sensitive and which is received from any Party or their representatives, whether before or after the date hereof, without regard to the form of the disclosure, including without limitation:

**(a) Technical Information.** All trade secrets, inventions, discoveries, know-how, formulas, formulations compositions, software, specifications, patents, patent applications, drawing, schematics, processes, process technologies, manufacturing techniques, tests, test results, research and development, and similar non-public technical information;

**(b) Business, Financial and Commercial Information.** All information concerning the business, financial condition, results of operations, marketing strategies, contracts with representatives, lists of Agents or representatives, contracts with customers and prospective customers, lists of customers and prospective customer representatives, costs, pricing, margins, terms of sales, quantities, product plans, contracts, market information, purchase orders, sources of supply, projections, confidential personnel information, and similar non-public commercial information; and

**(c) Recordings.** The contents of all notes, analyses, compilations, contracts, records, report studies and extracts in every recordable form, however and whenever arising, containing any Confidential Information.

**2. Excluded Information.** "Confidential Information" does not include any written information that any Party can demonstrate is:

**(a)** Information which is or becomes public knowledge through no fault of any Party;

**(b)** Information which is disclosed to any party not in violation of any contractual or legal obligation; or

**(c)** Information, which was in the possession of one Party prior to disclosure by the other Party.

3. **Nondisclosure.** The Parties agree that the Confidential Information will be used solely in connection with their consideration, analysis and evaluation of the potential agreement. The Parties agree to hold the Confidential Information in strict confidence and agree not to communicate, disclose, divulge, disseminate, publish or transfer the Confidential Information to any person except as expressly permitted hereby, without the prior written consent of the other Party.

4. **Permitted Disclosure.** The Parties may disclose some or all of the Confidential Information, solely for the purposes permitted by this Agreement, to their directors, employees, agents, representatives and their accounting, financial, legal and other advisors strictly on a need-to-know basis; provided that each such person agrees to be bound by the same restrictions required of the Parties hereunder. The Parties may disclose some or all of the Kentucky Confidential Information if required to do so under the Open Records Act.

5. **Prior Consent.** The Parties will not make any announcement of their discussions with each other without the other Parties' prior consent and approval of the contents thereof.

6. **Injunction.** The Parties agree that each Party would not have an adequate remedy at law, and each Party would be irreparably injured, if the Parties do not strictly perform their obligations in accordance with the provisions of this Agreement. Each Party agrees that the other Party shall be entitled to an injunction to require compliance herewith. This remedy is in addition to any other right or remedy to which the Parties may be entitled at law or in equity.

7. **No Obligation.** Neither this Agreement nor any discussions or disclosures hereunder shall be deemed a commitment to any business relationship, contact or future dealing with the other party, nor shall either party be prevented from conducting similar discussions or performing similar work, so long as such discussions or work do not violate this Agreement.

8. **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the State of Kentucky. In the event that any Party commences any action to enforce any term of this Agreement, then the prevailing Party in such action shall be entitled to recover it is reasonable attorney's fees, costs and expenses incurred therein.

9. **Assignment.** No Party may assign any of its rights or delegate any of the obligations under this Agreement, except with the prior written consent of the other Party.

10. **Counterpart.** The Parties may execute more than one counterpart of this Agreement hereto by facsimile signatures, and each fully executed counterpart shall be deemed an original.

**_____ County Schools Participating Partner and Lab Agreement**

**11. Term.** This Agreement shall be effective as of the date set forth below and shall continue until terminated by either party upon sixty (60) days prior written notice to the other.

All obligations undertaken with respect to Confidential Information disclosed pursuant to this Agreement shall survive termination of this Agreement for a period of three (3) years.

**IN WITNESS WHEREOF**, the Parties have executed this agreement as of the date set out below.

By: _____ By: _____

Title: _____ Title: _____

Date: _____ Date: _____

**_____ County Schools Participating Partner and Lab Agreement**

## Dataseam Participating Partner Profile

**School District Information**

| | | |
|---|---|---|
| **School District** | | |
| **County** | | **Date** |
| **Address 1** | | |
| **Address 2** | | |
| **City, State & Zip Code** | | |
| **Established Board Meeting Dates/Times** | | |

**School District Administration and Project Team Information**
**(This program involves several aspects within the school we find that a team approach works best)**

| **Contacts** | **Name (First & Last)** | **Title** | **Phone Number (xxx-xxx-xxxx)** | **Email Address** |
|---|---|---|---|---|
| **Primary (Administration)** | | | | |
| **Technical** | | | | |
| **Media** | | | | |
| **Education** | | | | |
| **Scholarship** | | | | |

| |
|---|
| **Primary – Responsible for district personnel assigned to the project and compliance with program requirements including contracts.** |
| **Technical – Responsible for all aspects of the School District's technology infrastructure and personnel.** |
| **Media – Responsible for coordination of all public and media relation efforts for this project.** |
| **Education – Responsible to work with educational programs available through Dataseam.** |
| **Scholarship – Responsible for scholarship applications and/or awards made available through the Dataseam program.** |

**Additional Notes:**

_____
_____
_____

**_____ County Schools Participating Partner and Lab Agreement**

# EQUIPMENT ADDENDUM
# DATASEAM SCIENCE AND DESIGN LAB AGREEMENT
## Sample School District
**Month #, Year**

This Addendum is executed by mutual agreement of the Parties to the Dataseam Science and Design Lab Agreement executed between Dataseam and the _____ Month #, Year.

WHEREAS, the School District has submitted a workstation placement narrative and has been approved to receive additional computer workstations. The School District understands and agrees that these computer workstations are provided with the same terms, obligations and other restrictions described in the Dataseam Science and Design Lab Agreement.

The School District further agrees to fulfill the obligations set forth below, which include but are not limited to:

1. School District employee to attend the OSX 10.14 Mojave Support and Mac Development and Management in KY Schools and pass the exams, at district expense (by Month #, Year).

2. Work to coordinate additional Dataseam partnership activities, subject to lab availability.

Dataseam agrees to:

1. Dataseam agrees to provide (XX) educational iMac workstations for completion of obligations by School District employee.

Obligations in this document must be completed to remain in good standing in the Dataseam program. Specific awards may reflect additional district involvement with Dataseam, state-funding conditions, or long-term district plans not outlined in this document. Workstations received per addendum will network from a dedicated Ethernet drop and not connect to district network via a hub or other non-approved KETS network devices. Wireless network connection is not acceptable for Dataseam workstations. Workstations received per addendum will be installed, imaged and operational for research and student use within 30 days of receipt.

| _____ | _____ | _____ | _____ |
|---|---|---|---|
| Dataseam | Date | District Representative | Date |

Offer good for 30 days from XX/XX/XX

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