



Indiana Data Exchange Return on Investment



Final as of October 2011

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Executive Summary

The Indiana Data Exchange (IDEx), a 21-agency effort that includes federal, state and local association participation, launched as a proof-of-concept in August 2011 under Indiana Department of Homeland Security's leadership. The initiative seeks to connect data from disparate justice and public safety systems together for enhanced decision making and increased public safety, leveraging prior investments.

As the planning, design and initial capital investment was paid for through grant funding, IDEx is an **example of how the State of Indiana has leveraged federal grant funding to initiate projects that will result in immediate and long-term cost savings and efficiencies within the State.** Additionally, the initiative includes a demonstrable return on investment – from both an IT cost savings and a business cost avoidance perspectives. The details of the expected ROI from the IDEx initiative are highlighted below. Of note, this return on investment analysis is an exercise to explore if all data sharing gaps and needs identified in the strategic planning phase were implemented, what would it cost in a point-to-point manner, and what would it cost in an enterprise environment? This analysis is not suggesting that all data sharing gaps and needs will be implemented; rather, it is a math exercise to show the potential savings between the current approach with point-to-point exchanges versus the enterprise approach with one to many. Therefore, the analysis is not intended to recommend that all exchanges would – or should – be implemented, nor is the analysis intended to advocate that the state must spend money to save money. Rather, the analysis intends to demonstrate that if data exchanges among agencies continue to be developed as is anticipated, what is the more cost effective option – to continue down the current point-to-point path, or rather implement the exchanges in an enterprise, managed model?

IT Cost Savings and Business Cost Avoidance

By implementing consolidated solution architecture with an enterprise service bus (ESB) and a portal to facilitate cross-agency and cross-domain information sharing, both technology costs and business costs are significantly reduced. By leveraging national data sharing models and standards, and reusing common information exchange languages, the state is reducing development costs as more and more agencies request the same data from a common system. **It would be remiss to not mention the initial investment in the IDEx infrastructure, totaling approximately \$325,000 to move from the proof-of-concept to the full production environment. The initial outlay could potentially be paid for by grant funding.** While the technology environment will need to be scaled with additional hardware and software as new connections are made at some point, the base infrastructure is in place and has already been budgeted and paid for through the proof-of-concept project. Additionally, this investment can be leveraged elsewhere across the state enterprise, to create similar services for other agencies looking to exchange data such as FSSA for health exchanges.

It is estimated that the state could potentially save approximately \$2 million in upfront IT development costs and an additional \$3 million annually in business cost avoidance from gained process efficiencies, through the analysis of gaps and needs identified by the core 12 justice and public safety agencies. These findings are displayed by domain in the following table. **Of note, this analysis found that implementing exchanges using the enterprise model, specifically leveraging**

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...this analysis found that implementing exchanges using the enterprise model, specifically leveraging NIEM, produces the return when more than two agencies request access to the same data set.

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Expected One Time IT Cost Savings

Agency By Domain	Data Sharing Requests (Gaps/ Needs)	Total Development Investment if Implemented Point-to-Point	Total Development Investment if Implemented through IDEX	IT Cost Savings
Emergency Management (IPSC)*	5	\$ 185,417	\$ 276,773	\$ (91,356)
Homeland Security (IDHS)*	31	895,167	911,345	(16,178)
Intelligence/Fusion (IIFC)	55	1,756,116	1,678,001	78,115
Justice (ICJI, IDOC, IPAC, IPDC, JTAC)	185	8,464,677	6,759,515	1,705,162
Law Enforcement (DNR, ISEP, ISP)	103	3,467,863	3,165,792	302,071
Total	379	\$ 14,769,239	\$ 12,791,427	\$ 1,977,813

*Note: as anticipated, cost savings within a domain with one agency does not achieve cost savings (e.g., emergency management and homeland security above). The savings occurs with multiple agencies, requesting similar data, to solve similar business items, as demonstrated with the remaining domains above

Expected Annual Business Cost Avoidance

Agency By Domain	Data Requests	Annual Business Cost Avoidance
Emergency Management		
IPSC	5	\$ 488
Homeland Security		
IDHS	31	302,170
Intelligence/Fusion		
IIFC*	55	55,836
Justice		
ICJI	30	n/a
IDOC	23	177,870
IPAC	56	594,424
IPDC*	51	500,000
JTAC	25	1,463,001
Law Enforcement		
DNR	31	9,530
ISEP	19	5,940
ISP	53	42,347
Total	379	\$ 3,151,607

*ICJI did not report business cost avoidance because utilization of information sharing would provide them with a more robust data set, not necessarily time savings over the current process. IPDC, due to very

manual processes today, could realize several million in savings each year through usage by local public defenders. For this analysis, to remain conservative, we have used a \$500,000/year number, to align more closely with the IPAC numbers.

Conclusion

IDEx is an investment for the State of Indiana. The successful continued build-out will require a commitment of time, energy, and resources of many state agencies and a long-term commitment to ongoing training and system maintenance. **However, it is clear through this ROI analysis that there are significant benefits – both from a true cost savings and also from a business process/operational savings –** in making this investment. Ultimately, it also increases effectiveness and efficiency of governmental services by placing the right information in the right person's hands at the right time – all critical elements in ensuring a safe community for residents of the Hoosier state.

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1. Introduction

*"We are now looking at having agencies share...across boundaries, instead of building...multiple times."*¹

- NASCIO (2010). "2010 State CIO Survey." p. 3

1.1 Background

With budget dollars tight, government projects are under enhanced scrutiny to demonstrate cost savings and cost avoidance. According to the 2010 survey of State CIOs, two-thirds of CIOs expect to face lower IT budgets in 2011 through 2013 (State CIO Survey, p 3). It is stressed by federal partners, particularly the US Office of Management Budget (OMB), that it is not so much how many resources are invested in IT infrastructure, rather, how those resources are utilized. "Despite spending more than \$600 billion on information technology over the past decade, the Federal Government has achieved little of the productivity improvement that private industry has realized for IT" (25 Point Implementation Plan, p 1). OMB stresses the need to move to more cost effective technologies, such as shared services, that reach across jurisdictional boundaries. Information technology projects that do not produce a return on investment (ROI) come under scrutiny when limited funding is available.

The State of Indiana's public safety agencies, through the leadership and funding of the Indiana Department of Homeland Security, began a large-scale technology project in the fall of 2011, utilizing a business first approach. The goal of this initiative was to exchange data from disparate systems utilizing national models and standards.

The initiative was designed to enhance public safety, but, perhaps most importantly, was also designed to demonstrate the ability to leverage scarce resources in a more effective manner including grant funding, ultimately demonstrating savings through cost avoidance and true cost savings.

The project, called the Indiana Data Exchange (IDEx), is a statewide initiative to advance information sharing. The State of Indiana desired to emerge as a national leader in public safety information sharing in order to better equip public safety and criminal justice officials with critical data, supporting better decision making.

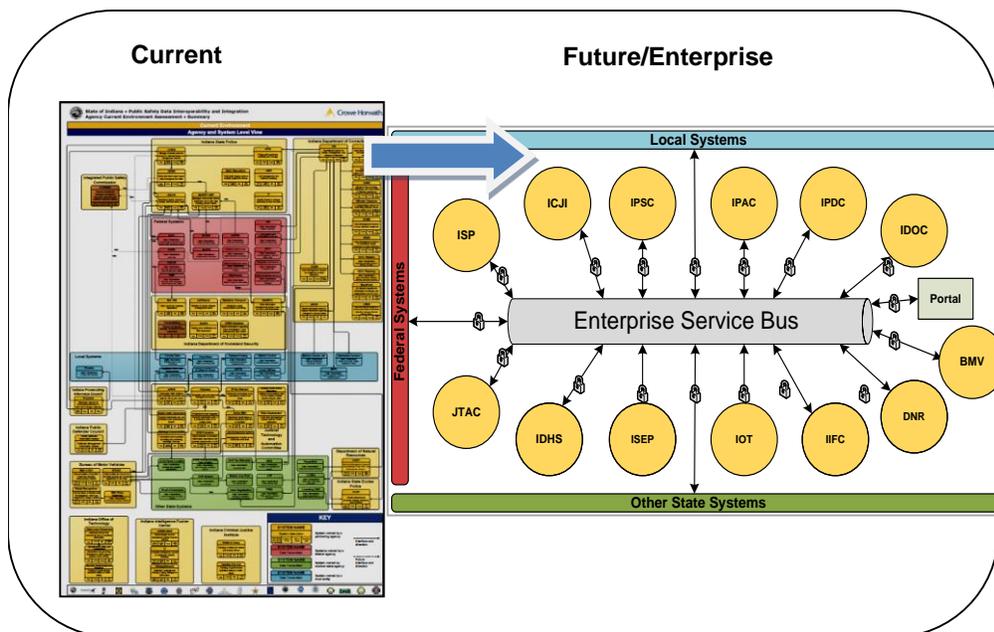
Indiana justice and public safety agencies have historically made independent decision on what types of data to exchange including how to design, build and implement the exchange, and what, if any, national models to leverage. These data exchanges have historically been built in a point-to-point fashion, with one system sending the data and another system receiving the information, without taking into account the ability for other agencies to also receive the same data in a one-to-many model. Agencies will continue down this independent approach to planning and implementing data exchanges through point-to-point interfaces, given the ongoing need to share data electronically.

An alternative approach to building data exchanges in a point-to-point fashion is to implement data sharing in a shared enterprise environment, facilitated by an enterprise service bus. As shown in the diagram below, this approach provides the

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¹ NASCIO (2010). "2010 State CIO Survey." Retrieved from <http://www.nascio.org/publications/documents/NASCIO-2010StateCIOSurvey>

ability to reuse, given the ability to direct the sending agency's data to not one, but many receiving agencies using the ESB to facilitate the exchange. The diagram below shows a series of graphics illustrates the proposed movement from the current point-to-point data sharing environment to a managed, service oriented architecture environment by leveraging an enterprise service bus and portal, coupled with national data sharing models and standards. The diagram on the left represents the current state; the 54 systems owned by the 12 primary public safety agencies, with 66 point-to-point data exchanges. The second graphic shows the proposed new flow of information with the implementation of a service oriented architecture. ***This new streamlined architecture enables efficient and cost effective exchange of information.***



Why the enterprise approach? Agencies will continue to build interfaces between systems in a point-to-point fashion, as they have historically done. The enterprise approach provides the opportunity to leverage investments that will already be made, by allowing other agencies to also receive the data if desired.

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This provides the following benefits:

- Leverage investments already planned by one agency
- Pool resources together among agencies to better share investments in data exchanges
- Centralized management of the data sharing environment to reduce overall costs

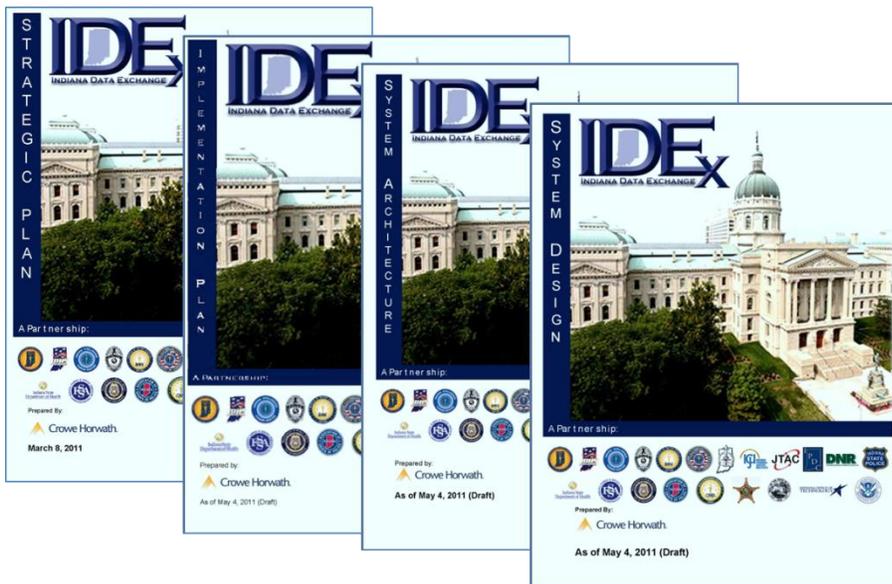
This return on investment analysis is an exercise to explore if all data sharing gaps and needs identified in the strategic planning phase were implemented, what would it cost in a point-to-point manner, and what would it cost in an enterprise environment? This analysis is not suggesting that all data sharing gaps and needs will be implemented; rather, it is a math exercise to show the potential savings between the current approach with point-to-point exchanges verses the enterprise approach with one to many. Therefore, the analysis is ***not intended to recommend that all exchanges would – or should – be implemented, nor is the analysis intended to***

advocate that the state must spend money to save money. Rather, the analysis intends to answer the question that if data exchanges among agencies continue to be developed as is anticipated, what is the more cost effective option: to continue down the current path of point-to-point interface development, or implement the exchanges in an enterprise, managed model that leverages national models.

This document depicts the expected Return on Investment (ROI) for the IDEX project by outlining how resources may be saved through cost savings and cost avoidance.

1.2 Components of the ROI

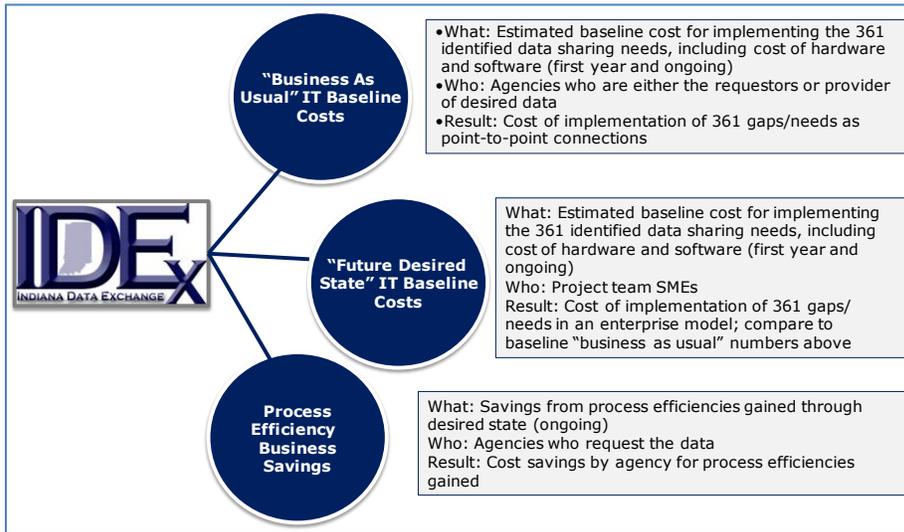
To plan and deploy a proof-of-concept for IDEX, the effort included the development of the following five guiding documents:



- **Strategic Plan:** The IDEX **Strategic Plan** lays out why the state desires to create an information sharing initiative, provides evidence for its importance, and describes the vision for IDEX.
- **Implementation Plan:** The IDEX **Implementation Plan** is a companion document to the Strategic Plan. It answers two additional questions: *How will IDEX be implemented initially and over the long-term and When will the implementation activities be conducted?*
- **Architecture Document:** The **Architecture Document** is a supplemental document to the strategic and implementation plans. It describes the architecture of the components and system models, including national model and standards, that the IDEX solution will be built upon.
- **Design Document:** The **Design Document** is a companion to the Architecture Document. It provides the specifics of the technology components and how they will be implemented using the selected technology stack.
- **Return on Investment:** The **Return on Investment** document provides the anticipated cost savings and cost avoidance achieved through standards-based information sharing.

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Together, the documents above serve as the foundation for IDEX. This document, the last on the list above, is based on the following diagram:



This report provides the calculations and analysis to demonstrate the expected benefit of the IDEX implementation. Specific attention is paid to the IT standards leveraged in the IDEX project and the benefits of cross domain information sharing.

This document does not calculate the cost of moving current interfaces to a shared environment, as quicker data sharing success may be achieved by focusing on data that is not currently being shared electronically.

To fully set the stage for the ROI calculations and analysis, it is important to recap information gathered in previous phases in the IDEX project. This ROI utilizes the data sharing gaps and needs identified from the strategic planning process as a basis for calculating the potential benefit that may arise from enterprise information sharing. **Over 360 individual data sharing needs** were identified from 12 core public safety agencies, which were **consolidated into 170 common themes, called events**. This suggests that more often than not, agencies desire access to the same or similar data, thus building a case for utilizing standards to easily share data across more than one agency. The 170 common information exchanges will serve as a basis for many points of analysis in this report.

This ROI focuses on estimating the cost of gaining access to the data requested during the gaps and needs discussions, by providing agencies with additional data to increase the efficiency of their daily operations. ***This document does not calculate the cost of moving current interfaces to a shared environment, as quicker data sharing success may be achieved by focusing on data that is not currently being shared electronically.***

The initial cost of implementing information sharing architecture is an investment, requiring resources for development and additional hardware, software, licensing and maintenance for system deployment and operation. However, at the same time, the IDEX project will be utilizing national information sharing models and frameworks to reduce implementation costs for the future. By utilizing the 170 common themes of data requests, it is possible to begin calculating the IT cost savings that might result from an information sharing initiative that is leveraging national standards.

1.3 Importance of National Models

Specifically, agencies requesting the same theme will be able to reuse the development of a NIEM-conformant Information Exchange Packet (IEPD). After the initial development investment of creating the IEPD and the first connection, additional agencies may then invest a minimal development cost to connect to the system. Overtime, development costs are reduced, especially as more and more agencies utilize a particular IEPD. NIEM is the National Information Exchange Model, a national information sharing approach to implement standardized schemas that allow systems that might not otherwise be able to communicate to share information.

NIEM, supported by the Global Reference Architecture (GRA) for service oriented architecture and the Global Federated Identity and Privilege Management (GFIPM) for security, helps to ensure that the implemented information exchange meets business process needs in a secure manner.

By leveraging national standards, the State of Indiana developed a solution that can connect disparate information systems held by different agencies in different domains. The sharing between and across domains allows for the reuse of standards. **“By reusing standards, federal agencies have been able to realize savings of 10% to 30% in development time and cost, from planning stage to design stage” (NIEM Assessment, pg 13).² In the case of IDEX, the cost savings is conservatively calculated between 10 and 15%.**

This report describes the cost savings and cost avoidance of implementing and utilizing a shared architecture for information sharing. First, the expected cost savings will be described, followed by an analysis of the expected cost avoidance achieved from gained process efficiencies.

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² Federal CIO Council (2010). “Agency Information Exchange Functional Standards Evaluation: Adoption and Use of the National Information Exchange Model.” Retrieved from <https://www.niem.gov/documentsdb/Documents/Other/AssessmentReport.pdf>

2. IT Cost Savings

“First, NIEM is federated. This enables interoperability across multiple domains, with each domain managing its data models and content standards separately, while benefiting from central investment in tools, training, model management, and governance”³.

-Federal CIO Council (2010). “Agency Information Exchange Functional Standards Evaluation: Adoption and Use of the National Information Exchange Model.” p15

2.1 Overview

Of the agencies participating in IDEX, five were asked to report data to calculate IT cost savings that would be extrapolated to the other primary agency stakeholders for the purposes of the ROI study. Five agencies were selected due to the time intensive nature of data collection for this analysis by the agencies, and the ability of the project team to extrapolate the information to other agencies due to the similarity of information requested. The entities that reported the estimated exchange costs included:

- **Indiana Department of Correction (IDOC)**
- **Indiana Department of Homeland Security (IDHS)**
- **Indiana Intelligence Fusion Center (IIFC)**
- **Indiana State Excise Police (ISEP)**
- **Judicial Technology Automation Committee (JTAC)**

Each entity was asked to report the estimated costs to develop an interface between the agency’s systems and the other identified systems to share information. These reported estimations were then averaged among sending systems, and extrapolated to those agencies that were not asked to report requests. The reported numbers were also averaged, both exclusively using the reported exchanges and including the extrapolated costs. In both cases, the average was approximately \$30,000 for the development of each point-to-point interface. Therefore, for those exchanges that could not be reported, for varying reasons, and average development cost of \$30,000 was applied. This average cost was supported by project subject matter experts, although was described as a conservative estimate.

After the development costs were determined for all data requests, cost for interface definition, design and testing were added, based on subject matter expert assumptions was then applied.

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³ Federal CIO Council (2010). “Agency Information Exchange Functional Standards Evaluation: Adoption and Use of the National Information Exchange Model.” Retrieved from <https://www.niem.gov/documentsdb/Documents/Other/AssessmentReport.pdf>

- **Interface Definition and Design is, on average, 40% of the total interface deployment costs, for a conservative estimate, based on results from IDEX and the knowledge of national subject matter experts on Justice Information Exchange Modeling (JIEM)**
- **Testing is, on average, about 10% of deployment costs, for a conservative estimate, based on results from IDEX**
- **The total of development, interface definition and design and testing is used as the total exchange costs.**

2.2 Definitions

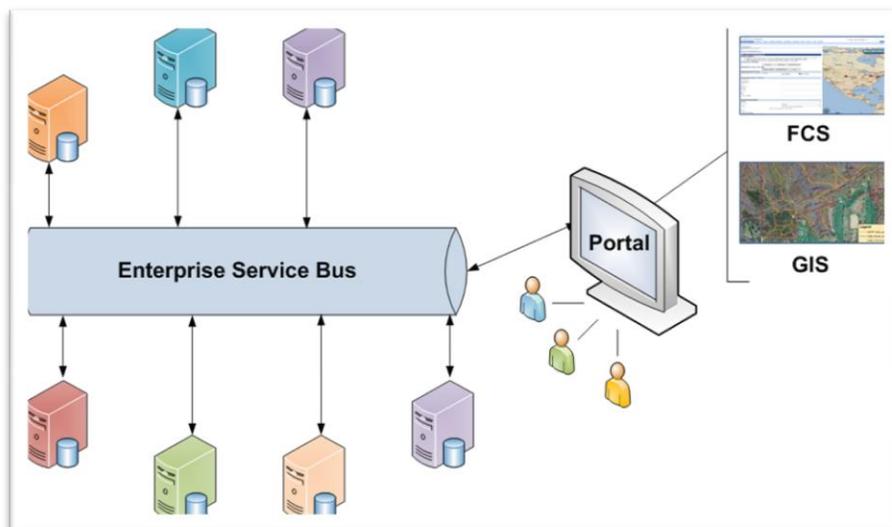
To establish consistency in understanding and analysis, some common terms must be defined. First, cost savings is defined as spending less than previously spent or less than quoted options. It is the benefit realized by eliminating a planned expenditure, such as a budgeted or contractual expense. In this case, cost savings will result from a reduction in development and deployment costs, and more effective management of an enterprise environment.

To determine an all encompassing IT cost savings calculation, the total IT cost in both environments account for all capital and operational cost components. Capital costs, or initial implementation costs, are goods and services that can be directly associated with project implementation and do not extend beyond. Examples of these costs are the purchase of equipment, network components, software, and contracted services, e.g., developers. Additionally, operational costs are IT expenditures that are ongoing for the life of the IT system, such as software or hardware annual maintenance or server charges. Both of these costs must be considered to compare the IT costs of an enterprise and point-to-point environment.

2.3 Onetime Capital Costs

The initial capital cost of implementing the IDEX information sharing architecture can be high when compared to gradually implementing point-to-point exchanges. However, this is an example of how federal grant dollars may be leveraged to reduce state costs.

In this case, cost savings will result from a reduction in development and deployment costs, and more effective management of an enterprise environment.



Below is a chart that shows the anticipated expenses that will be necessary to set-up the foundational, proof-of-concept data sharing environment, including servers, software licenses, and user licenses. Additional hardware and software will need to be added over time to support additional data connections to the enterprise environment. Further testing, once IDEX is deployed, will be required to understand the potential long-term needs.

Component	Quantity	Unit Price	Total
BizTalk Server	2	\$16,883	\$33,766
BizTalk License	2	\$28,500	\$57,000
SharePoint/Fusion Core Solution Server	1	\$16,883	\$16,883
SharePoint/Fusion Core Solution License	1	\$5,000	\$5,000
SharePoint/Fusion Center User Licenses	200	\$55	\$11,000
SQL Server	4	\$14,508	\$58,030
SQL License	8	\$18,000	\$144,000
Total			\$325,679

Additional hardware and software will need to be added over time to support additional data connections to the enterprise environment.

2.4 Deployment and Operational Costs

To remain consistent with the vision of becoming a cross-jurisdictional data sharing initiative, a focus is placed on cost aggregated by domain. Below, each of the participating public safety and criminal justice agency's data sharing IT costs for implementing gaps and needs are reported individually, but then also as a part of their respective domain total.

Additionally, it is anticipated that one Information Exchange Packet can be developed per data theme, which will be analyzed in this section. "The common data connections developed using NIEM result in reusable artifacts that reduce future development costs resulting in cost avoidance" (NIEM Assessment Exec Summary, p1).⁴ When multiple agencies request the same data type, an IEPD will only have to be developed once, and each agency that requests to access that data will have a reduced development cost. Investment to design an IEPD in the shared environment is assumed to be greater, due to ensuring the developed schema will meet the needs of all stakeholders as determined through the use of the Justice Information Exchange Model (JIEM).

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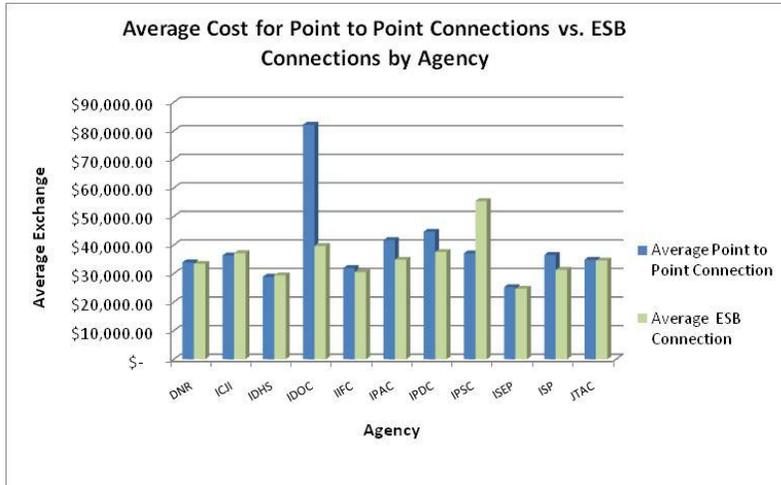
* ICJI requested information for analysis purposes. In addition to creating connections to all requested information systems, an additional purchase of a Business Intelligence (BI) tool would be necessary for full analytical capabilities.

As shown in the chart, cost savings within a domain with one agency does not always achieve cost savings (e.g., emergency management and homeland security above), as multiple agencies have not requested access to this data. **Cost savings occurs when multiple agencies, requesting similar data to solve similar business challenges, reuse NIEM-conformant IEPDs as demonstrated in the chart.** The intelligence domain is an exception to this rule, which may be attributed to the federated search needs of the agency.

It is noted that ICJI will also require the implementation of a business intelligence tool to reach their full data sharing potential. ICJI manages grants for public safety and criminal justice agencies and utilizes a variety of data sets to award various funds. In their line of business, they rely upon analysis of aggregate statistics to identify trends, as opposed to receiving real-time case management and calls for service data that the other agency partners requested. Therefore, their IT costs are extrapolated based on what other agencies reported for the same exchanges. Of note, an analytics/ business intelligence tool has been outlined as a potential next step in the IDEx implementation plan.

The major argument is that cost savings occur as a result of implementing information sharing architecture. The following bar chart demonstrates the estimated difference in IT costs that each agency can expect, assuming all exchanges are implemented in year zero. IDOC is realizing the greatest benefit from information sharing, based on identified gaps and needs.

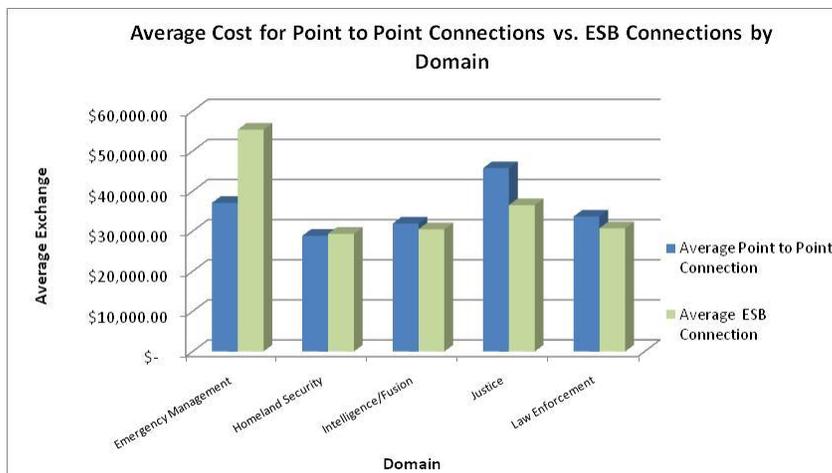
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As shown in the chart, the exchanges IPSC identified may not realize savings for the agency as the five exchanges identified were unique to IPSC. However, it is possible through the expansion of IDEX beyond the state that savings may be realized by uncovering opportunities to reuse these IEPDs.

The following table also draws a comparison between IT costs for 379 point-to-point implementations, and the same 379 exchanges, as common themes with shared IEPDs, implemented in the shared enterprise environment. In this chart, the data is compared at the domain level. The justice domain is anticipated to derive great savings, which is expected given the focus of this analysis on the core state justice and public safety agencies and that this domain is larger. The only domain not gaining value from the ESB implementation is the Emergency Management domain, which in this chart, is solely IPSC. However, in reality, the Indiana Department of Homeland Security also performs many emergency management functions, but is not included in this category, rather it falls in the homeland security category.

The Justice domain is anticipated to derive great savings, which is expected given the focus of this analysis on the core state justice and public safety agencies and that this domain is larger.



2.5 Cost Savings Analysis by Theme

To understand the maximum benefit of information sharing, specifically the value of leveraging NIEM IEPDs in exchange architecture, the data sharing gap and need requests were grouped into common data sharing themes, based on the data requested.

As depicted in the chart in **Appendix A**, the diagram shows each data exchange theme, how many agencies requested data that falls under that theme, the estimated point-to-point and ESB costs for each theme and estimated average exchange costs for each theme. Of note, the initial infrastructure investment has not been included in this analysis. As the chart suggests, as more agencies choose to utilize a particular IEPD, the total cost associated to connect to a system will decrease. After the initial development cost of the IEPD, each connection for an agency only costs a fraction of overall development (around 25%); therefore, the more agencies that choose to connect and reuse an IEPD, the greater value will result. ***This finding supports the idea of cost savings that result due to economies of scale.*** Based on economies of scale achieved from reuse, the following chart demonstrates the exchange themes with the highest number of requests. These top 10 exchanges result in significant cost savings for the state.

Top Ten Exchange Themes for Cost Savings

Data Theme	Number of Requests
Court case records	33
Criminal History	20
Offender information	30
BMV Data	23
Criminal Intelligence	10
Public safety incidents	14
Probation information	7
Professional licenses	9
Citations and warnings	12
DCS data	7

As more agencies leverage a particular IEPD, the cost savings for that data theme continues to increase. “With the use of the NIEM framework come[s] greater agility and efficiency in satisfying business needs and implementing repeatable processes” (NIEM Assessment Exec Summary, p1).⁵ ***The threshold for cost savings begins at more than two exchange connections.*** If there is only one request for the data theme, there is no change. The creation of one IEPD will be the same cost for development of a point-to-point exchange. When two requests are made for the same data theme, there is a loss on that exchange because of the cost of

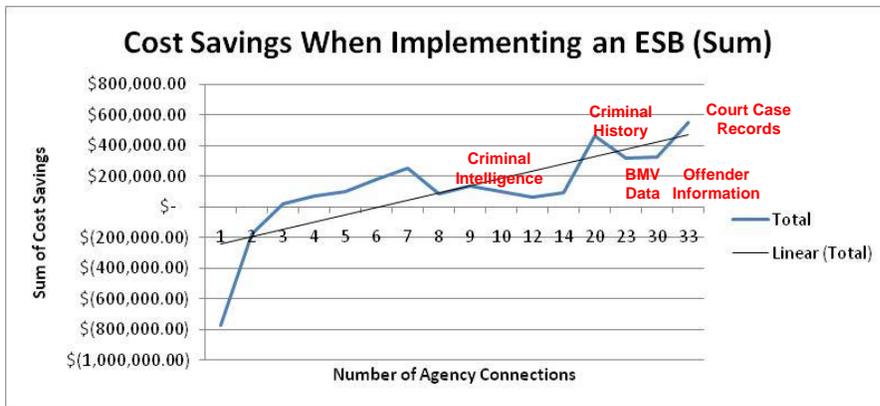
⁵ Federal CIO Council (2010). “Agency Information Exchange Functional Standards Evaluation: Adoption and Use of the National Information Exchange Model.” Retrieved from <https://www.niem.gov/documentsdb/Documents/Other/AssessmentReport.pdf>

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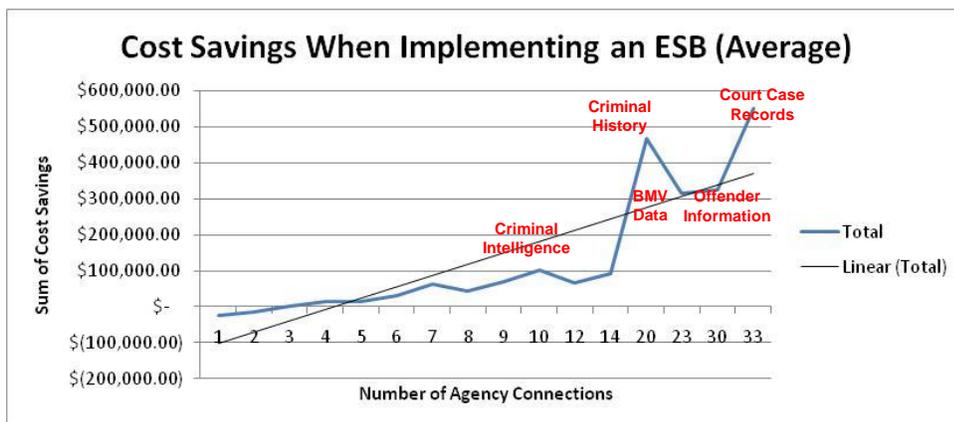
implementation, due to the increased time for data modeling. The following graph shows a positive trend for cost savings as more and more agencies choose to connect to the ESB, after the initial development of the IEPD has occurred. The line moves along the X axis as more and more requests are made for a data theme. The Y axis demonstrates the expected total cost savings from those exchange implementations.

The dips in the chart show differences in the average implementation cost for each exchange theme. The top five cost savings exchanges are labeled on the chart, showing court case records and criminal history data resulting in the greatest cost savings. Between the numerous agency requests for this information, and the estimated cost to implement point-to-point exchanges, a large cost savings is expected. The dip in between these two exchange requests are offender information and BMV data, which also gained numerous requests from agencies, but are not as expensive to implement. The expense is a result of the difficulty to implement an exchange, be it data that is residing in multiple local systems, like court case records, or information that is sensitive in nature, like criminal history.



By using this method, it is determined that the State has the potential to save close to \$2 million dollars in true IT development costs alone.

The following chart utilizes the same data, but shows a positive trend for an average cost savings for each exchange, once again, as more and more agencies choose to connect. This is the benefit of leveraging the NIEM framework and developing IEPDs.



Understandably, not all 379 exchanges would be implemented at the same time, and also many may not be implemented due to funding constraints and other considerations.

However, through this exercise and by using the enterprise approach, it is determined that the State has the potential to save close to \$2 million dollars in true IT development costs alone. In the next section is a discussion for even greater cost savings by leveraging the potential to streamline business processes throughout the state by giving users single sign-on and federated query capabilities.

Understandably, not all 379 exchanges would be implemented at the same time, and also many may not be implemented due to funding constraints and other considerations.

3. Business Cost Avoidance

"The greatest ROI becomes possible when automating and improving operational decisions across the enterprise."⁶

James Taylor, Business Rule Revolution: Running Business the Right Way

3.1 Overview

In order to calculate business cost avoidance, the core justice and public safety agencies that participated in the gaps and needs analysis were asked to estimate personnel and material costs associated in a manual or point-to-point exchange environment. Because 379 individual data requests were made, only the high impact requests were estimated. High impact exchanges were determined by agency leadership during the gaps and needs analysis, indicating that the automation of that exchange would bring a higher business value when compared to the other exchange requests.

3.2 Definitions

The term cost avoidance is used as a means to communicate the costs that will no longer be incurred as a result of an increase in efficiencies. The resources that are saved may be allocated to a different process or reduce the costs of government services. Examples of cost avoidance can include eliminating low value-added activities, streamlining business or work flow process, reducing time to access information, and reducing management and oversight activities.

As Business Processes may be time consuming to calculate, the high impact exchanges were the only exchanges calculated. That totaled 93 out of 379 exchanges. The number of exchanges reported is determined by two factors:

- 1) How many high impact exchanges were identified by the agency, which is a factor of how many exchanges were requested
- 2) The degree of difficulty of reporting on the business process

In many cases, exchanges were not occurring in a manual method because of the high time investment or other costs associated to that exchange. Although these are not reported, this should be kept in mind as additional cost avoidance that could be realized after the ESB implementation.

3.3 Cost Avoidance Analysis

The following table shows the cost avoidance that is expected for each agency, grouped by domain. The value to be gained from the implementation of the exchanges totals over \$3 million annually. It is important to note that this savings may be achieved through other implementation methods, meaning both within and outside the enterprise approach

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⁶ *James Taylor, Business Rule Revolution: Running Business the Right Way*

Expected Annual Business Cost Avoidance

Agency By Domain	Data Requests	Annual Business Cost Avoidance
Emergency Management		
IPSC	5	\$ 488
Homeland Security		
IDHS	31	302,170
Intelligence/Fusion		
IIFC*	55	55,836
Justice		
ICJI	30	n/a
IDOC	23	177,870
IPAC	56	594,424
IPDC*	51	500,000
JTAC	25	1,463,001
Law Enforcement		
DNR	31	9,530
ISEP	19	5,940
ISP	53	42,347
Total	379	\$ 3,151,607

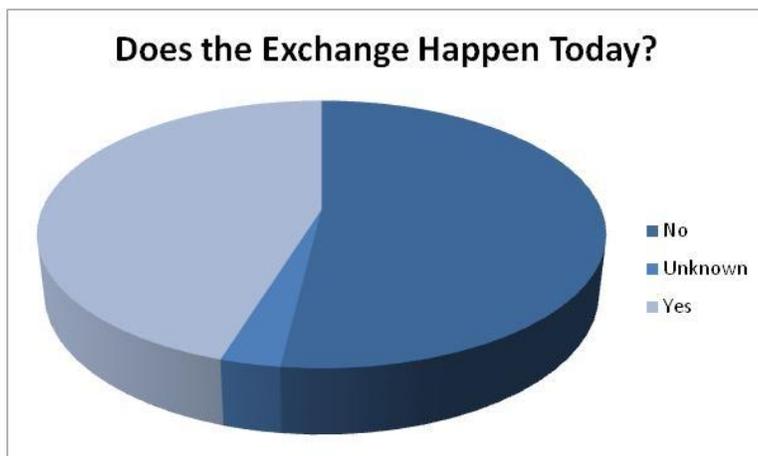
**ICJI did not report business cost avoidance because utilization of information sharing would provide them with a more robust data set, not necessarily time savings over the current process. IPDC, due to very manual processes today, could realize several million in savings each year through usage by local public defenders. For this analysis, to remain conservative, we have used a \$500,000/year number, to align more closely with the IPAC numbers.*

Although there is variation in the reported results, an understanding of each agency's current business processes and current level of access to critical information puts the results in perspective. Currently, the IPDC relies on several time intensive, manual processes to receive information regarding their clients and cases. In fact, so many of the exchanges are so time-intensive, they are not even performed. One example process is the collection of jail behavior records by public defenders. A defender must drive to the jail, request the record, wait around 30-45 minutes for the record to be retrieved by jail personnel, and then additional time in transit back to his or her office. The ability to automatically fill this information into the Public Defender Information System (PDIS), or even supply credentials to pull information from the IDEX portal, will dramatically reduce time spent requesting information.

The agencies with more enhanced current capabilities are those in the Law Enforcement domain, consisting of the Department of Natural Resource, Indiana State Excise Police, and the Indiana State Police. In their current processes, these agencies have enhanced access to information through accessing a variety of system directly; the potential for savings comes through the potential of greater federated search functionality in the portal, as more data is connected to the enterprise environment. This is explained further in Section 6, which discusses additional value that will result from the IDEX project that may not be quantifiable, at least at this time.

However, it is clear through this ROI analysis that there are significant benefits – both from a true cost savings and also from a business process/operational savings – in making this investment.

In more than one case, agencies were not able to actually apply a value to exchanges. At this point, it is just too expensive for them to even execute as they are manual processes. The pie chart shows more than half of the requested exchanges considered to be high impact to each agency do not occur today, because agencies do not have the resources to make the exchange a reality.



This is one reason why the Indiana Criminal Justice Institute (ICJI) has been left blank in the Cost Avoidance Overview box. Most of the information that ICJI requested enhances the data set that the agency already accesses via spreadsheets, providing additional data that is received in real-time or is of better quality. For this agency, the calculation is not cost avoidance; rather, the value is in performing the same amount of work, but utilizing a better, more complete data set. Access to this data expands the agency's current capability to collect and analyze aggregate data. Additionally, ICJI would benefit from a business intelligence tool to allow the agency to manipulate the data, drawing additional and more advanced conclusions. This will help ICJI develop data-driven strategies for limited federal funding. At the time business process costs were collected, it was determined to be time prohibitive for ICJI to gain access to additional information so that statistical calculations could be more accurate and reliable. IDEX will be able to provide ICJI with enhanced data, but it won't necessarily change the extent or amount of time the agency spends evaluating policies and applying for and reporting on grants, without an analytics tool.

Although the best effort was put forth to put a price tag on the value of the high impact exchanges, there are still additional considerations and value that will result from the IDEX project. This discussion takes place in the forthcoming section.

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4. Additional Benefits Stemming from Information Sharing

“Traditional ROI measures fail to account for some of the unique functions that government performs, like public safety – for example, what is the ROI of preventing crime? – which contain both hard and soft cost savings”⁷.

Terri Jones, government industry manager of Hyland Software, “What’s Our Payback,” p 25

4.1 Overview

There are additional benefits to sharing information and utilizing national standards that might not be quantifiable, at least not at the present time. The following sections will introduce and discuss the added benefits of information sharing:

- **Public value**
- **Enhanced decision making**
- **Increased value of technology**
- **Alignment of technology with Federal and State policy and performance**

4.2 Public Value

Government IT is trending toward leveraging technology and standards to connect systems. As a result of the large upfront investments, it is important to demonstrate all value added by these projects, and not just focus on crunching IT cost savings. “These projects require a way of assessing public value that matches their greater scope and complexity, a way that can build the needed public support and guide development” (Burke, Cresswell, and Pardo, p 37). Specifically with public projects, the value to citizens needs to be demonstrated.

A framework introduced by the Center for Technology in Government at the University at Albany, SUNY argues for the consideration of public value in ROI analysis. Specifically, they suggest “that the value of a government’s investment in IT should be assessed from the point of view of the public it serves” (pg 37). IT value creation is much more than a difference in IT development costs, or even the internal agency ROI resulting from more efficient business processes; the public receives indirect value from these efficiencies as well. One example is improved customer service resulting from a streamlined business process.

Additionally, an IT investment, like the IDEX project, can add value to relationships between those who directly benefit from IT improvements, and with other entities in the public area. This might include increased government transparency, realization of agency missions, enhanced safety and a reduction of crime rates, or additional services for residents made available by avoiding costs in other areas.

Cross domain information sharing leads to enhanced decision making by putting mission critical information in the hands of those with a responsibility to know.

⁷ Terri Jones, government industry manager of Hyland Software, “What’s Our Payback,” p 25

Moreover, it increases the credibility of agencies by reducing often publicized data sharing failures. This is often achieved by reducing human processes that sometimes fail by leveraging IT and built-in business rules.

4.3 Enhanced Decision Making

Cross domain information sharing leads to enhanced decision making by putting mission critical information in the hands of those with a responsibility to know. When public safety and criminal justice officials have all the information they need, they are able to better track persons of interest and keep themselves safer when responding to incidents (e.g., warrants, sex offenders, etc.).

By sharing information, data analytics is further enhanced. Links can more easily be created and connections are made between people, places, and things. Agencies have the option to leverage the advanced intelligence to draw conclusions and take the appropriate action on those conclusions.

The goal of standardizing cross-boundary information exchange is to promote and enhance agency capabilities for the development of shared services and increasing the sharing of information. Standardizing information exchange includes the business processes, policies, procedures, architecture, and governance that support effective decision-making and mission-focused actions by providing timely, accurate, and relevant information to the appropriate individuals across all levels of government. (NIEM Assessment, pg 1)

4.4 Increased Value of Technology

In recent years, streamlining and centralizing data and technologies has become a priority for many governmental organizations; specifically, the initiative is supported by the US Office of Management Budget. “Many years of decentralize IT oversight, redundant IT software development and hardware purchasing, a disjointed approach to infrastructure, and failed IT projects created an information technology patchwork that increases the cost of government and puts mission critical systems at risk” (NIEM Assessment, pg1). ***In short, standards reduce complexity (NIEM Assessment, p 12).⁸ Reduced complexity results in increased efficiency and better management.***

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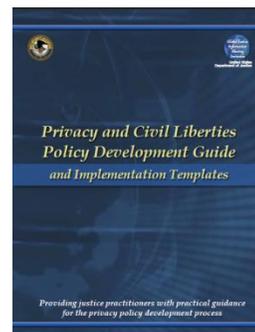
⁸ Federal CIO Council (2010). “Agency Information Exchange Functional Standards Evaluation: Adoption and Use of the National Information Exchange Model.” Retrieved from <https://www.niem.gov/documentsdb/Documents/Other/AssessmentReport.pdf>

The IDEX project leverages a national framework for data privacy. Project architecture has extensive privacy and security features so that data flowing through the enterprise service bus can only be accessed by authorized users. Each system owner will be able to establish the guidelines for data access. In keeping with an emphasis on national information methodologies and frameworks, the IDEX project is leveraging Global Federated Identify and Privilege Management (GFIPM). GFIPM supports three major areas of security for interoperable projects, such as IDEX:

- **Identification/Authentication - Who is the end user and how were they authenticated?**
- **Privilege Management - What certifications, clearances, job functions, local privileges, and organizational affiliations are associated with the end user that can serve as the basis for authorization decisions?**
- **Audit - What information is needed or required for the purposes of auditing systems, systems access and use, and legal compliance of data practices?**

Justice Information Sharing, U.S. DOJ, <http://www.it.ojp.gov/gfipm>

The IDEX privacy workgroup was assisted through the creation of a privacy policy process by the Institute of Intergovernmental Research and the U.S. Bureau of Justice Assistance. The institute specializes in law enforcement, juvenile justice, criminal justice and homeland security issues, and has provided technical oversight throughout policy writing. With help from national and state subject matter experts, the appropriate security measures are in place for enterprise data sharing. They will be effective and could improve overall security for many of the systems connecting to the Enterprise Service Bus.



Additional value that will result from implementing information sharing technology is the scalability of the solution. This allows for changes to the system to be more easily made when compared to traditional point to architecture. Systems can be connected to the ESB and system hardware can be upgraded as needed with a smaller investment of resources.

4.5 Alignment with Federal and State Policy and Performance

Streamlining technology and management of data across domains is the theme of cost savings and cost avoidance. Additionally, it is an alignment of multiple agencies missions and visions. An aligned vision and mission leads to integrated planning and budgeting objectives. Instead of competing for funding, agencies are working together to use allocated IT funds effectively.

There is support for information sharing initiatives from the federal government in the way of funding opportunities. Specifically, the Department of Justice, working through the Bureau of Justice Assistance and Department of Homeland Security, has included grant language to encourage the use of national information sharing standards. “Language includes but is not limited to “...requires all grantees to use the latest NIEM specifications and guidelines regarding the use of Extensible Markup Language (XML) for all grant awards” (NIEM Assessment Exec Summary, p3).

Integrating information systems opens doors to increasing potential grant funding, using that funding more efficiently and allowing for easier reporting on the use of those funds.

Additionally, health and human services agencies have the ability to leverage the investment too.

Currently, less than a quarter of State CIOs measure the progress of IT investments against performance metrics that are tied to the goals set forth in strategic plans. (State CIO Survey, NASCIO, 2010). In order to qualify for, and continue to receive grant funding, accurate reporting is a must. By leveraging standards and centralizing IT systems, reporting becomes more manageable. Performance measures were identified in the IDEX strategic plan.

Standards enable a much clearer enterprise-level view of performance metrics and associated results. With cross-enterprise data, managers can aggregate results, and ascribe them to different contributing organizations and jurisdictions. That gives executives a much clearer view of who is doing the work, what's working, and what would be worth doing next. (NIEM Assessment, p 13).⁹

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⁹ Federal CIO Council (2010). "Agency Information Exchange Functional Standards Evaluation: Adoption and Use of the National Information Exchange Model." Retrieved from <https://www.niem.gov/documentsdb/Documents/Other/AssessmentReport.pdf>

5. Conclusion

“Policy makers – not to mention taxpayers – want to see a return on and IT spending; tools, and technologies must save money, improve services and boost productivity with a reasonable payback.”

Jim Romeo, What’s Our Payback: The Inexact Science of Measuring the Value of Public-Sector Technology, p 1

In preparation for this analysis and discussion, many academic documents and federal resources were examined. Throughout the research process, source after source cited the cost savings that would result from the implementation of an information sharing solution. Given a short analysis period and limited resources, this report attempted to prove these cost savings would also result from the efforts put forth in the State of Indiana. By leveraging national methodologies to streamline IT deployment costs and business processes, these sources’ findings were once again supported.

Important Takeaways

- **The State is on the way to realizing the vision of cross domain data sharing**
- **Streamlining business processes through the use of technology is expected to provide millions of dollars of cost savings annually.**
- **The implementation of an ESB is expected to result in approximately \$2 million in savings than if each exchange was implemented individually.**
- **Additional, unquantifiable benefits, such as public value, enhanced decision making, increased value of technology, and better performance measurement will exist as a result of information sharing.**

By utilizing the NIEM methodology, the reuse of IEPDs reduces the cost of IT implementation over time, as more and more agencies elect to connect to the ESB. Furthermore, with information sharing capabilities, agency business processes are not only streamlined, but also provide agency personnel and first line responders with a more robust data set. Access to information creates additional value for the state, by saving public funds and providing more enhanced safety to Hoosiers.

Moreover, as additional domains, including the health and human services domain, gain momentum with using NIEM, additional savings – both true IT cost savings and business process avoidance – may be realized. **Currently Indiana’s Family and Social Services Administration (FSSA) is exploring integration technology, and utilizing NIEM-conformant exchanges for their upcoming system replacement efforts. This is a national trend, with health and human service organizations moving to this type of architecture.** Other state agencies, such as FSSA, can utilize the IDEX architecture investment already made if the state adopts it as an enterprise service, as grant funding covers the initial investment in the technology infrastructure.. This would result in immediate cost savings to the state. As these opportunities continue in the state, the value of IDEX will only increase.

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6. Appendices and Calculations

Appendix A

Exchange Theme	Total Requests	Sum of IT Costs	Average IT Cost	Sum of ESB Exchanges	Average of ESB Exchanges	Exchange Theme	Total Requests	Sum of IT Costs	Average IT Cost	Sum of ESB Exchanges	Average of ESB Exchanges
Addresses	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00	Meth Sales	5	\$ 77,475.00	\$ 15,495.00	\$ 65,853.75	\$ 13,170.75
Arson investigation	3	\$ 135,000.00	\$ 45,000.00	\$ 132,750.00	\$ 44,250.00	Military records	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Asset Records	2	\$ 54,000.00	\$ 27,000.00	\$ 62,100.00	\$ 31,050.00	Offender information	29	\$ 984,400.00	\$ 33,944.83	\$ 679,975.89	\$ 23,447.44
BMV Data	23	\$ 1,030,336.00	\$ 44,797.22	\$ 714,515.62	\$ 31,065.90	Offender information	1	\$ 45,000.00	\$ 45,000.00	\$ 23,447.44	\$ 23,447.44
Building Plans	2	\$ 196,200.00	\$ 98,100.00	\$ 271,735.80	\$ 135,867.90	Offender phone records	6	\$ 270,000.00	\$ 45,000.00	\$ 220,500.00	\$ 36,750.00
Business Owner information	5	\$ 58,500.00	\$ 11,700.00	\$ 49,725.00	\$ 9,945.00	Phone numbers	5	\$ 18,900.00	\$ 3,780.00	\$ 16,065.00	\$ 3,213.00
Chemical Hazard Data	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00	Power outage data	2	\$ 108,084.00	\$ 54,042.00	\$ 124,296.60	\$ 62,148.30
Citations and warnings	12	\$ 248,700.00	\$ 20,725.00	\$ 182,380.00	\$ 15,198.33	Prescription Drug Information	5	\$ 109,750.00	\$ 21,950.00	\$ 93,287.50	\$ 18,657.50
Commercial vehicle records	5	\$ 111,000.00	\$ 22,200.00	\$ 94,350.00	\$ 18,870.00	Probation information	7	\$ 403,333.00	\$ 57,619.00	\$ 319,785.45	\$ 45,683.64
Coroner's database	3	\$ 135,000.00	\$ 45,000.00	\$ 132,750.00	\$ 44,250.00	Professional licenses	9	\$ 323,000.00	\$ 35,888.89	\$ 245,838.89	\$ 27,315.43
Court case records	33	\$ 1,724,400.00	\$ 52,254.55	\$ 1,173,114.55	\$ 35,548.93	Property records	3	\$ 365,000.00	\$ 121,666.67	\$ 245,833.33	\$ 81,944.44
Crash data	5	\$ 75,000.00	\$ 15,000.00	\$ 63,750.00	\$ 12,750.00	Protective orders	4	\$ 180,000.00	\$ 45,000.00	\$ 162,000.00	\$ 40,500.00
Criminal activity	6	\$ 270,000.00	\$ 45,000.00	\$ 220,500.00	\$ 36,750.00	Public Health Emergency Operatic	1	\$ 2,750.00	\$ 2,750.00	\$ 4,537.50	\$ 4,537.50
Criminal History	20	\$ 1,611,168.00	\$ 80,558.40	\$ 1,087,702.74	\$ 54,385.14	Public safety incidents	14	\$ 332,390.00	\$ 23,742.14	\$ 239,795.64	\$ 17,128.26
Criminal Intelligence	10	\$ 407,335.00	\$ 40,733.50	\$ 305,501.25	\$ 30,550.13	Public Safety information	6	\$ 111,600.00	\$ 18,600.00	\$ 91,140.00	\$ 15,190.00
Crisis Management Data	4	\$ 98,000.00	\$ 24,500.00	\$ 88,200.00	\$ 22,050.00	Radiological transports	1	\$ 4,700.00	\$ 4,700.00	\$ 7,755.00	\$ 7,755.00
DCS data	7	\$ 315,000.00	\$ 45,000.00	\$ 249,750.00	\$ 35,678.57	Registered Sex Offenders	4	\$ 223,500.00	\$ 55,875.00	\$ 217,912.50	\$ 54,478.13
Dealer Plates	1	\$ 11,700.00	\$ 11,700.00	\$ 19,305.00	\$ 19,305.00	Road and traffic information	2	\$ 48,450.00	\$ 24,225.00	\$ 55,717.50	\$ 27,858.75
DOC Policies	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00	Salvage yard inspections	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Drug Crime Data	1	\$ 15,200.00	\$ 15,200.00	\$ 25,080.00	\$ 25,080.00	Social Services	6	\$ 210,000.00	\$ 35,000.00	\$ 171,500.00	\$ 28,583.33
Emergency Room Admissions	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00	State Epidemiology report	1	\$ 36,250.00	\$ 36,250.00	\$ 59,812.50	\$ 59,812.50
Emergency shelters	1	\$ 2,450.00	\$ 2,450.00	\$ 4,042.50	\$ 4,042.50	Substance abuse data	1	\$ 36,250.00	\$ 36,250.00	\$ 59,812.50	\$ 59,812.50
Employment Data	8	\$ 137,118.30	\$ 17,139.79	\$ 106,266.68	\$ 13,283.34	Surveillance	1	\$ 28,500.00	\$ 28,500.00	\$ 47,025.00	\$ 47,025.00
FCC License and Tower info	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00	Suspensions and expulsions	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Federal Immigration	2	\$ 90,000.00	\$ 45,000.00	\$ 103,500.00	\$ 51,750.00	System monitoring	2	\$ 32,000.00	\$ 16,000.00	\$ 28,750.00	\$ 14,375.00
Financial Crime Data	2	\$ 90,000.00	\$ 45,000.00	\$ 103,500.00	\$ 51,750.00	Tax information	8	\$ 261,600.00	\$ 32,700.00	\$ 202,740.00	\$ 25,342.50
Financial Data	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00	Teacher Licenses	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Finger print data	7	\$ 274,750.00	\$ 39,250.00	\$ 217,837.50	\$ 31,119.64	Tips and Leads	3	\$ 135,000.00	\$ 45,000.00	\$ 132,750.00	\$ 44,250.00
Firearms data	9	\$ 260,000.00	\$ 28,888.89	\$ 197,888.89	\$ 21,987.65	Tower status and location	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Flight Data	1	\$ 11,000.00	\$ 11,000.00	\$ 18,150.00	\$ 18,150.00	Traffic safety grant activities	1	\$ 22,500.00	\$ 22,500.00	\$ 37,125.00	\$ 37,125.00
Gaming licenses	2	\$ 90,000.00	\$ 45,000.00	\$ 103,500.00	\$ 51,750.00	Treatment Statistics	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Gang Information	6	\$ 104,500.00	\$ 17,416.67	\$ 85,341.67	\$ 14,223.61	Uniform Crime Report Statistics	2	\$ 90,000.00	\$ 45,000.00	\$ 103,500.00	\$ 51,750.00
Genesis network activity	2	\$ 90,000.00	\$ 45,000.00	\$ 103,500.00	\$ 51,750.00	University employees	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Hazardous Materials	3	\$ 24,300.00	\$ 8,100.00	\$ 23,895.00	\$ 7,965.00	Veteran Benefits	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Health Statistics	1	\$ 2,750.00	\$ 2,750.00	\$ 4,537.50	\$ 4,537.50	Victim Claims	2	\$ 90,000.00	\$ 45,000.00	\$ 103,500.00	\$ 51,750.00
Hunting and fishing licenses	3	\$ 39,000.00	\$ 13,000.00	\$ 38,350.00	\$ 12,783.33	Violent Crime Records	3	\$ 135,000.00	\$ 45,000.00	\$ 132,750.00	\$ 44,250.00
Infrastructure	7	\$ 224,600.00	\$ 32,085.71	\$ 178,075.71	\$ 25,439.39	Vital Records	6	\$ 15,250.00	\$ 2,541.67	\$ 12,454.17	\$ 2,075.69
Inspection records	4	\$ 67,750.00	\$ 16,937.50	\$ 60,975.00	\$ 15,243.75	Voter registration	1	\$ 36,200.00	\$ 36,200.00	\$ 59,730.00	\$ 59,730.00
Insurance Crime data	4	\$ 180,000.00	\$ 45,000.00	\$ 162,000.00	\$ 40,500.00	Apportioned Plates	1	\$ 37,100.00	\$ 37,100.00	\$ 61,215.00	\$ 61,215.00
Jail Booking information	3	\$ 464,250.00	\$ 154,750.00	\$ 456,512.50	\$ 152,170.83	Census and Poverty Data	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Judicial statistics	2	\$ 90,000.00	\$ 45,000.00	\$ 103,500.00	\$ 51,750.00	Juror Data	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Lab data	5	\$ 225,000.00	\$ 45,000.00	\$ 191,250.00	\$ 38,250.00	National Crime Victimization Surv	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Lottery winnings	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00	Roll of Attorneys	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Medical Malpractice Claims	1	\$ 45,000.00	\$ 45,000.00	\$ 45,000.00	\$ 45,000.00	Unclaimed Property	1	\$ 45,000.00	\$ 45,000.00	\$ 74,250.00	\$ 74,250.00
Mental Health information	2	\$ 86,250.00	\$ 43,125.00	\$ 99,187.50	\$ 49,593.75						
Totals							379	\$ 14,769,239.30	\$ 37,794.18	\$ 12,791,426.57	\$ 44,168.06

Appendix B: Methodology and Assumptions

“When budget dollars are tight, government leaders must look to technology to make the utilization of those dollars more efficient and more productive.”¹⁰

Center for Digital Government (2011). “Cutting the Cost of Government.” p 7

B.1 Overview

Partner agencies played an important role in providing data and assumptions for ROI calculations. Agency leadership and IT directors were introduced to the purpose of the ROI calculations and the tools to be used for agency data gathering. All data gathered is found in Appendix A.

An initial meeting was held with representatives from each agency to introduce the purpose of ROI and the data collection tool. The tool was set up in an Excel document, and aimed to collect information to calculate IT costs and business process costs. The information collected is explained further below. Each agency was e-mailed their respective data collection tool, and continual follow-up took place through e-mail as needed.

B.2 IT Calculations and Assumptions

IT Calculation data was provided by five of the participating agencies. Since this is a more time intensive data gathering exercise, it was decided that five agencies, ranging in size and domain, would gather the data and extrapolate the results to the cost of implementing all 379 exchanges. The agencies selected were Indiana Department of Correction (IDOC), Judicial Technology Automation Committee (JTAC), Indiana Department of Homeland Security (IDHS), Indiana Intelligence Fusion Center (IIFC) and Indiana State Excise Police (ISEP).

IT capital and operations costs were captured in the IT data collection tool. Assuming all 379 requested information exchanges were implemented at once, this tool assess the difference between 379 point-to-point implementations and 379 exchanges implemented through an enterprise service bus. Items considered under capital costs are hardware, software, development and training. Additionally, operational cost such as software licensing, maintenance, administration and training were collected if available. Assumptions for the enterprise environment were made by the IDEx team, leveraging their expertise in NIEM and Microsoft tools.

Assumptions:

- 1) Capital costs for 379 point-to-point exchanges and 379 ESB exchanges will be assumed to be fully implemented in year zero of the project, for sake of analysis
- 2) **Development:** Assumed average exchange implementation costs, for those IT costs that could not be calculated by system owners, such as federal connections or local connections, it was assumed that those exchanges would cost the average of \$30,000 (which was the average from the costs provided by the agencies)

¹⁰ Center for Digital Government (2011). “Cutting the Cost of Government.” Retrieved from <http://www.govtech.com/library/papers/Cutting-the-Cost-of-Government.html>

- 3) **Development:** Assumed that an IEPD costs the same as it does to develop an exchange, given this is the creation of the XML for the exchange and supporting documentation.
- 4) **Design:** Assumed that design, discovery and management when developing each agency connection to the ESB costs 40% of the implementation costs, based on IDEX results
- 5) **Training:** Assumed training costs about 10% of deployment costs, based on conservative IDEX results
- 6) **Total:** Assumed the total of design, development, training, and implementation is used as the total exchange costs
- 7) **ESB Connections:** Assumed that each connection using an already developed IEPD will cost 25% of the implementation cost, based on IDEX results for calculations of additional connections of same information (this is to connect the receiving system to the ESB).

For effective analysis, the exchange requests were linked to the 170 information sharing themes. When leveraging the NIEM framework, agencies that are requesting similar data (themes) will all utilize the same IEPD in order to facilitate information sharing; therefore, after IEPD development cost, each agency is able to connect to the information sharing architecture at a reduced development cost.

B.3 Business Process Calculations and Assumptions

Since 379 requests were made for additional information, it would have been a large task to estimate the process improvement value for each agency for each request that was made. As a result, it was decided to focus on the 96 exchanges that were rated as having a high impact on agency daily business process.

Each agency participated in data gathering activities to estimate cost avoidances from data sharing, as a result of business process improvements. This tool was created to collect the actual or hypothetical costs of business activities without the implementation of the enterprise service bus. The receiving agency was asked to report whether or not this information exchange occurs today in any form; how much agency personnel time it takes to process the transaction; if known, how much time it takes the sending agency to process the transaction; if there are any additional materials or handling costs; and what is the annual volume of transactions. The total cost savings is then determined by considering the annual salary and of a state employee of \$55,000 or \$0.44 a minute.

Assumptions:

- 1) Average salary for state employees is \$55,000 (including all fringe), which was converted to \$0.44/minute in order to put all calculation in common terms. This value was used to calculate the value of exchanges in both environments.
- 2) It was determined that in order to maintain validity, business process costs would not be extrapolated. It is assumed that business processes and other factors result in varying degrees of time spent by agency representatives requesting and gathering data.

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