Implementation Planning Kit
Introduction

Some people make integrating technology sound easy, but others recognize that acquiring the best technology can be very complicated. If you believe that it is important to make good decisions about selecting, acquiring, implementing, and managing data integration this Toolkit is for you.

The purpose of this Toolkit is to provide school and district personnel with the necessary information and resources to successfully integrate management information systems using Schools Interoperability Framework data standards and SIF Certified software. It is designed to make it easier for people in educational settings to plan and make the best possible decisions as they implement the SIF standards.

One of the keys to any integration project is in viewing all of the components as part of a system. The underlying theme of this document is that schools and districts interested in implementing SIF Certified software should see this as an opportunity to begin creating an Enterprise Information Management System (EIMS) for their organization. To assist with that task, this Toolkit will walk districts through the planning process from conception-of-need to the deployment of the technology based on the premise of that systemic approach, and a recognition that the integration will evolve over time. Within the Toolkit you will find the steps you should take to identify your data integration needs, consider your options, acquire the technology, and implement the SIF solution that will serve you today and provide a foundation for the future.

There are seven major phases that a school and/or district will need to engage in to achieve the first successful implementation. You may not need help with all of them, but to make this planning process simple and relevant, this guide has been developed in the context of a typical project that might be undertaken by a school district.

What is Presented in This Toolkit?

The focus of this document is primarily about integrating SIF Certified software that is used to meet administrative and instructional needs in the context of establishing an Enterprise Information Management System. It should be clearly understood that the technical standards and relevant products will mature over time. Hopefully you will find the in the set of generic questions presented, many that will help you with your decision making process both now and in the future. These are common-sense, experience-based ideas, rather than approaches tied to specific situations or products. These ideas are based upon experience implementing integration technology within schools and districts across the country.

This Toolkit contains information about project planning, data management, computer hardware, software, and networking, as well as budgetary and human resource concerns. This information relates to the use of integration technology as a tool for:

- Managing information management activities related to instruction.
- Improving decision making by providing information that is timely, accurate, and comparable.
- Automating and streamlining day-to-day operations.

This Toolkit was designed to provide educators with a process for getting the best possible technology solution for your school and/or district. Within the kit, you will find a series of steps that you should take to:

- Identify your data and systems integration needs
- Thoughtfully consider your options
- Acquire the appropriate technology,
- Implement a solution that will serve you today
- Provide a foundation for the future.
This kit covers a variety of issues you are likely to encounter during the process. You may not experience all of them, but you should be aware of them so that you can ensure that the solution you choose will reflect your organization’s needs and the context in which your school or district works.

Throughout this document, we will follow a hypothetical case study of a school district’s SIF Implementation Project. In addition, there will be other sections describing responses to specific issues. These case studies illustrate many of the key points being conveyed in each chapter.

**Who Should Use This Toolkit?**

This Toolkit was developed for people in one of three roles:

- Persons who will be providing executive leadership to the data integration initiative;
- Persons who have been given the responsibility to manage the data integration in an education organization;
- Persons who will be responsible for data integrity within any applications which will be part of the implementation.

The individuals who might fill these roles include principals, superintendents, business managers, information technology staff, technology coordinators, school registrars, food service staff, librarians, transportation supervisors, integrators, consultants and others. They may be the ones with final decision making authority over what will be done, or they may make recommendations to the ultimate decision maker.

If you perform one of the roles mentioned above, this kit will help you answer real-world questions about how - and how not - to go about the process of putting SIF-enabled technology into place. The expectation is that as you go through the process outlined in the kit, you will find a number of useful ideas that can be applied to your specific situation.

The Toolkit is not designed to cover the range of technical issues one might encounter during a SIF Implementation. The document is focused on those non-technical issues, yet it includes terminology and concepts basic to understanding this technology. Definitions are provided throughout and can also be found in the glossary.

The guidelines provided in this Toolkit are expected to be most useful to persons in schools or districts. The examples were obtained from different types of education organizations who have actually engaged in SIF Implementations.
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How SIF Works

Beginning in late 1998 a group of dedicated software engineers and educators began the development of the SIF Implementation Specification to enable software application to share data quickly, dynamically and securely. This group, which has expanded over the years, was drawn from companies and districts large and small, and from all across the K-12 landscape. They represented countless years of institutionalized software development and database design, and each had a vested interest in preserving the systems they helped create. But they also realized that enabling software programs to “talk” to each other and share data was so important that they needed to overcome their own company centric view of the problem. They needed to develop a solution that was flexible, scalable, reliable, secure and affordable, both for the schools as well as the vendors.

Their solution, the SIF Zone, meets all of these needs with remarkable grace. The SIF Specification views a school or district as a single system of data in which the software applications make up the component parts. This logical grouping of software applications is called the SIF Zone.

At the center of this Zone is a software application called a Zone Integration Server (ZIS). This program serves as the “central nervous system” of the Zone by tying together all of the applications, facilitating their communication and regulating their activities (see image at right). The school’s or district’s technical administrator determines the manner in which a ZIS structures the Zone, including all security and authentication parameters.

Data Objects and Agents

Many of the companies involved in the initial creation of the Specification had already invested significant resources in developing and maintaining software applications. The question was how to get each of these different, and sometimes competing, software applications to talk to each other and share data. The answer was twofold: the Data Object and the Agent.

A Data Object is a standard definition of some piece of school system information. For example, a student’s name, address and phone number are part of the “StudentPersonal” Data Object. By having different software programs understand this common definition of a student, it is possible for them to share this information properly.

The SIF Implementation Specification currently defines 129 Data Objects, with thousands and thousands of elements, and more to be defined as the Specification evolves. By agreeing on these definitions, SIF makes it possible for software programs built on different platforms and with different database designs to share data.
How each application moves and processes these Data Objects is the job of the Agent. The list of things this Agent is required to do is documented in the SIF Specification. Because this functionality is specified in a standard format, software vendors have some choice about how this Agent functionality is added to their software applications. Some vendors have chosen to make the Agent functionality built into their application, while others have chosen to have the Agent run as a separate module or service. Regardless of how it is implemented, all Agents produce the same results, because the rules for Agent behavior are specified and agreed upon.

**SIF Zone Functions**

Now that we understand the parts of a SIF Zone — the ZIS, the Agents and the Data Objects — let’s take a closer look at how a Zone functions. A SIF Zone uses a “publish and subscribe” model, which is similar to how you get a magazine delivered to your home. Unless you register with the magazine you will not receive it. (We’ll leave junk mail out for the moment). Once you have registered with the magazine, subscribed in fact, you receive a copy of the magazine whenever it is published.

Agents do the same thing in a SIF Zone. Once a ZIS is set up, each SIF-enabled software application registers with the ZIS so that it can communicate with the SIF Zone. An Application can then act as a provider for and/or a subscriber to various Data Objects. In a basic example, a Student Information System (SIS) might act as the provider of the StudentPersonal Data Object and a Library or Food Service Application would subscribe to events for that object. Since each of these applications is part of the Zone, whenever there is a change to student information in the SIS system, the SIS would publish an Event that is relayed by the ZIS to all subscribers. This lets them know that a change has taken place (see Overview of a SIF Zone and SIF Messaging on Pages 6-8).

Because of the way a Zone is configured, all of this notification happens instantly and automatically. As a result, as soon as a new student is added to the school or someone’s phone number is updated, that information is automatically transferred to all of the subscribing systems and updated almost instantly. In addition, because of the way the Zone is configured, it is possible to distribute this information to as many systems as are authorized to receive it, eliminating large amounts of data entry.

**Creating an Enterprise Information Management System**

SIF “works” when a software application using its Agent sends out a message to the ZIS with information that another software application needs. The ZIS forwards that information onto the requesting application through the receiving application’s Agent. SIF-enabled software applications and Agents don’t talk to each other directly; each application talks to its Agent which talks to the ZIS, which in turn handles all further communication. The ZIS’ role as a “third-party message handler” means that the SIF Framework is easily expandable, very reliable and relatively straightforward for software companies to write Agents for. As you can see, creating an enterprise information management system to move data has tremendous advantages for school management. By moving data quickly
and accurately, costly and redundant data entry is eliminated, freeing staff to focus on delivering services directly to students. In addition, because all of the data is based on the same source, changes are distributed quickly.

This guarantees that everyone has access to the most current and accurate data available. However, creating an Enterprise Information Management System (EIMS) for school data management requires more than just SIF- software. It also requires that the school or district undertake a system-wide analysis of what data is currently collected and some decisions about how this data is to be shared.

Because of the flexibility inherent in the SIF Data Model, schools and districts can establish a wide range of business rules that meet their particular needs and then implement SIF Certified Applications in support of those rules. However, without agreement within a school or district about issues such as data ownership and clarity surrounding which offices or individuals are responsible for adding or updating data, establishing a fully functional SIF Zone would be a difficult task.

The underlying premise of SIF — creating a uniform and unified data system — can act as the catalyst to the kind of management review and business reengineering in education, which many private sector businesses undertook a decade or more ago. By looking at their data management and operational systems from a data perspective, many businesses were able to implement technology to improve efficiency and help improve their operations. SIF offers the same opportunity to schools today. With budgets under scrutiny and federal and state accountability increasingly apparent, operational efficiency and the ability to generate valid and timely reporting is critical to the successful operation of a school or district. By taking a systematic approach to data management, and by implementing SIF-enabled software to support those systems, schools can redirect resources and staff from redundant data-centric tasks to more valuable child centered education.

This Toolkit is designed to help schools through the internal review necessary to establish an EIMS and to implement SIF Certified software in support of that system.

<table>
<thead>
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<th>Overview of a SIF Zone &amp; SIF Messages</th>
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- The situation in many schools and school systems is that there are a series of software applications which all may require the same data, but which have no way to talk to each other.
- It may be possible for one or two applications to share data through proprietary methods, but open, dynamic and synchronized data sharing does not occur.

| **SIF ZONE**                           |
| SIS                                    |
| Cafeteria                              |
| Phone                                  |
| Library                                |
| Transportation                        |

- A SIF Zone is a logical grouping of applications, in which each application has an Agent that communicates with other Agents through the Zone Integration Server (ZIS).
- The ZIS handles all security information and message routing.
- A SIF Zone is platform independent and vendor neutral, meaning that all data can be shared dynamically.
• Each Agent sends a SIF_Register message to become part of the Zone.
• The ZIS then sends an acknowledgment or SIF_ACK message to confirm the registration.

• An application wishing to serve as the Provider of a data object sends a SIF_Provide message to the ZIS.
• The ZIS enters this information into the Access Control List (ACL).

• Each application wishing to subscribe to this data object sends a SIF_Subscribe message to the ZIS.
• Any events generated for this object will be sent to all Subscribers.
• The Provider may also be a Subscriber.

• In this example, the SIS application is the provider of the Student_Personal data object and the other applications are subscribers.
• When a new student is added to the SIS application, a SIF_Event is generated.
• This SIF_Event informs all of the subscribing applications about the addition, and each application in turn processes the new student into their database.
• In this example, the SIS application is the provider of the Student_Personal data object and the other applications are subscribers.

• The Library application has just been installed and needs to be populated with existing students. The Library application, through its Agent, sends a request for all student records.

Upon receiving the SIF_Request, the SIS application Sends a SIF_Response to the ZIS containing all of the student record information.

The ZIS forwards the request to the requestor, in this case the library system, and the library system is now synchronized with the SIS without the need for manual re-entry of all of the student records.
Planning for Success

Making Project Decisions – Process or Prognostication

The decision making process established for a project is critical to its success. If the process is not well defined, there is a high risk of producing a solution that is not aligned to the needs.

Consider the following analogy that is commonly referred to when broaching the development of a solution to meet a need:

The superintendent has been approached by a principal with a request for a swing desired by the students in his elementary school. His vision for the swing is #1.

1. As Proposed by the Project Sponsor
2. As Specified in the Project Request
3. As Designed by the Facilities Department
4. As Built by the High School Woodshop
5. As Installed by the School Maintenance Staff
6. What the Kids Wanted

The superintendent thinks this is a great idea and he generates a Project Request Form with a sketch of the swing (shown above in #2) to the facilities department.

The Director of Facilities sends an e-mail his construction manager telling him that the superintendent wants a swing built out at the elementary school. The construction manager writes up a work order which is taken on by a staff member who has time to design it for someone else to build. His specifications will result in #3.

The high school woodshop class has been assigned the task of building the swing. A student reviews the specifications and immediately determines that the design won’t result in a swing that works. Modifications are made and the product in #4 is made available for installation.

The school maintenance person doing the installation receives the swing, determines that the tree that is to hold the swing needs to be modified to allow the swing to swing. The result is #5.

Once the students see the result of their request, they are mortified. All they wanted was a tire swing that would be hung from a branch of the tree as in #6.

Chances are, you’ve seen lots of really cool swings but because you’ve never built one you may not have a clue on how to get started. The key to ensuring that the Enterprise Information Management System you put together will meet your school/district’s needs and that the anticipated benefits will be realized is to follow a proven logical process for sound decision making. You want to identify your data sharing requirements and keep them in the forefront. How will you know when you are done if you have no concept of where you are going?
Case Study: Chapter 1 - District Data Management Nightmare

We’ve seen it coming for years – accountability for educating children. Shortly after his election, President Bush and Congress focused on education and passed sweeping legislation called the No Child Left Behind Act or (NCLB) that calls for improving student performance AND reporting Adequate Yearly Progress towards achieving that goal.

After perusing the nearly 1,400 pages of legislation it becomes clear that State Education Agencies will soon be asking for significantly more data from schools to respond to this legislation. Data from across a host of offices and systems including performance data broken down by economic disadvantage, minority, special needs, migrant, gifted, and limited English proficient students to name but a few. Because NCLB calls for comparative performance among all students, there will have to be a great deal of information collected and reported on each student.

The questions that are asked may require this data to be separated or ‘disaggregated’ by race/ethnicity, grade level, and gender by the school or district. Or the state may be building a state-wide student records data warehouse require individual student records containing key performance indicators be submitted by the school or district in electronic format on a monthly basis. Because students in low performing or persistently dangerous schools will have the opportunity to attend higher performing or safer schools, it may also be a requirement to track students attending schools outside of their residential attendance area.

Schools and districts across the country are moving quickly to assess where this information might be kept in their district hoping they have it in an accessible, electronic medium. There may be good news – the food services department knows who the economically disadvantaged students are. The special education department knows what children are in that program and why. Migrant education has information on the students that are eligible for that program. The transportation department can identify those students attending a school outside of their attendance area. Your state accountability system possesses annual student performance data on the state assessment. The schools have captured race/ethnicity and are tracking information on students in the gifted and talented program along with limited English proficiency in the student management system.

However, digging deeper to find out where and how this information is maintained immediately may result in a migraine headache. The food services department is using an automated lunchroom accounting system that houses the information you need to identify economically disadvantaged students by storing eligibility status for free and reduced lunch. Your special education and transportation departments are managing records for students in applications designed specifically for their needs. Information on student performance on the state assessment and migrant children is maintained on systems located at the state education agency. The student management system has the capacity to manage a good portion of this data, however, the district has not created a data management infrastructure and standards to make this happen.

While the district may have most of the information needed, it is scattered among a variety of different databases using different formats, procedures and rules for entry and management. The data must be standardized and synchronized in order to be meaningful and usable. Now, it’s your problem. You call together your management team to discuss the problem and decide what to do next.

The management team listens carefully to your concerns and also comes down with migraine headaches. They are aware of ways to import and export information between systems, however, these methods are inefficient and the systems are never in synch. They call Alice, the Director of Technology into the meeting to get her input. She has heard about an initiative called the Schools Interoperability Framework that could facilitate this data synchronization between Certified administrative software applications.

The superintendent and management team are thrilled. She is immediately assigned the task of implementing the project. Because they recognize the data integration will cross all department boundaries, she is promoted to Chief Information Officer reporting directly to the superintendent. Now she has a migraine headache.
**Data Integration Project Management**

There are many published methods for building technology solutions of all types and levels of complexity. Regardless of the variety, these generally contain a similar set of elements. This document describes the different steps of the process in a way that will help to meet your specific needs in educational settings. Specifically, you will find guidance on the following steps:

1. Developing a project charter which:
   - defines your overall purpose, objectives, goals, and assumptions,
   - identifies project participants along with their roles and responsibilities,
   - establishes timelines.
2. Beginning a project plan organized by objective, defining each task and the steps needed to undertake the task.
3. Conducting a needs assessment and defining your requirements.
4. Describing your current environment.
5. Evaluating options and determining your implementation strategy.
6. Implementing the selected technology solution(s).
7. Training the users.
8. Making plans for supporting, maintaining, and growing your technology solution on an ongoing basis.

These steps are illustrated here:

The rest of this document is designed to provide your SIF Implementation Project Team with some ideas, suggestions and tools to guide you through the various steps of this process. Following this map will lead you to make the decisions that will best meet your districts data integration needs.
Step I
Develop a Project Charter

Objective: By the end of this section you will understand how to create and use a Project Charter to establish an effective data integration project.

_What Is A Project Charter?_

Have you ever tried to develop a curriculum without learning objectives? Or get funding without a plan on how it will be used? Or host a meeting without an agenda? The result is often chaos and anarchy at worst and inefficiency and redundancy at best.

It is true that SIF is a set of technology solutions, but they are technology solutions in support of a management solution. Before you can fully consider implementing SIF Certified products and solutions, you have to decide what you want them to do. This is not an easy task, especially if you don’t know everything that this technology can and will be able to do.

The Project Charter is a single, consolidated source of information about the project in terms of initiation and planning, and provides information about project scope, objectives, deliverables, risks, and issues. It also lays the foundation for how the project will be structured, and how it will be managed in terms of change control, oversight and control, and risk and issue resolution.

The Project Charter is a tool to help you scope your project and obtain commitment from all of the affected groups and individuals within your organization who are associated with the project.

It is not only an effective project planning tool, it is a communication vehicle that can be referenced throughout the project. It is a quick reference and overview of what the project is about, why it is being conducted, who is involved and in what capacity, and the general approach and timeline that exists for the project.

The Project Charter can most succinctly be described as the agreement between the technical and business groups within an organization and which defines:

- Partners and external stakeholders;
- The project management framework to be used _on_ the project;
- Roles, responsibilities, accountabilities, and activities of the team members;
- Management commitments (specifically in terms of communications and control); and,
- The empowerment framework.

The Project Charter does not change throughout the project life cycle. It is created at the beginning of the project, approved by the key project stakeholders, and is available for reference throughout the project life cycle.

_Case Study
Chapter 2 - Storming & Norming_

Alice leaves the meeting and immediately takes something to relieve her migraine. When she returns to her office, she quickly gets on to the Internet and accesses the Schools Interoperability Framework Web-site to learn as much as she can about the initiative. She finds that there are school districts that are successfully sharing data between applications using the SIF standards and SIF Certified software available from many vendors.

To her surprise, she also comes upon an SIF Implementation Toolkit designed to guide districts and schools through the deployment process. After reading the document, she determines that the scope of this effort could quickly become unmanageable and that there is an immediate need to control expectations.

She remembered the disaster that occurred several years ago when the district attempted to implement a scheduling system at the high school. The goals were equally admirable but expectations got out of control immediately and continued to accelerate to the point where the project was abandoned leaving the technology staff exhausted, the administration frustrated, the consultants gone and the district still without the ability to get a handle on their data.

As recommended in the guide, she drafts a Project Charter that proposes an initial project designed to determine exactly what needs to be done and the best approach to take. She then presents it to the Superintendent and Management team for their review, input, and approval.
Why Create A Project Charter?

A Project Charter provides a consolidated and summary level overview of the project. It allows all parties involved in the project (stakeholders) to document the agreed upon scope and objectives, approach and deliverables of the project. It also, at the outset of the project, documents the agreed upon communications plans, control mechanisms, and responsibilities of team members. In other words, the Project Charter is a fundamental communications tool within the project environment.

Additionally, the Project Charter contributes to the following key success factors:

- Structured management organization;
- Disciplined management processes;
- Project governance;
- Project management best practices; and,
- Internal/external communications.

Having a project charter will provide the following benefits:

- Improved client partnerships;
- Improved project management processes;
- Improved communications;
- Better project sponsorship;
- Recognition of Senior Management’s role;
- Progress towards best practices;
- Improved relationships with users; and,
- Improved on-time and on-budget delivery of projects.

Who Is Responsible For The Project Charter?

The Project Manager has ultimate responsibility for ensuring that the Project Charter is developed and approved. Development of the Project Charter cannot be done in isolation by any one party since it outlines an agreement between the project stakeholders of what the project will deliver and how. The Project Sponsor is instrumental in providing the Project Manager with a solid understanding of the background of the project. The Project Sponsor provides support and approval for the Project Charter.

What goes into the Project Charter?

The framework for an effective Project Charter provides the structure within which to document the knowledge areas and processes that are considered fundamental to project success. These include:

- Project management disciplines;
- Project governance processes;
- Formal risks and issues management;
- Use of and role of the project office (where appropriate);
- Problem management; and,
- Structured communications processes.

Though the Project Charter contains an overall, high-level description of both the project and product scope, it should not be confused with the Needs Assessment or Functional Requirement Specifications. These specification documents are outcome-oriented.

Case Study

Chapter 3 - Establishing the Project Foundation

The meeting with the Superintendent and Management Team was one of the most intense Alice had ever been through. As with the scheduling project, it had been assumed that the data integration could be readily implemented within the bounds of current processes and procedures with little impact on district operations.

Fortunately, she was able to articulate a high level description of the district’s data management problems, pointing out that the information resources at their disposal had each been selected and implemented separately to solve departmental, school, or program needs and were never viewed in light of the needs of the entire educational enterprise. As a result, these efforts, while worthy in their own right, created a data management environment wrought with duplication of effort and student information that was inaccurate, out-of-date, and incomparable. Using the Schools Interoperability Framework standards and tools as the mechanism to assign ownership of data and then automating the sharing of it among applications held promise in overcoming these problems.

She went on to explain that automating the sharing of data between these applications will change the way people out in the field work. In order to manage this change, she explained, it will be crucial to first understand how things are done today, what problems or opportunities exist, and then determine how they should change in the new environment.

Once this was understood, she was able to present the following Project Charter for their review. Anxious to get the show on the road, the group approved the charter as proposed providing her with the authority needed to move forward with the next steps.
deliverables and will be produced within the context of the project. Within the Project Charter, the description of the project outcome should be limited to a high level description. For an example of a Project Charter see Appendix A.

Step II
Assess Needs

**Objective:** By the end of this section you should be able to successfully engage in a needs assessment that will serve as the foundation for your data integration project.

You Know You Want to Be There! – Knowing What You Need

One of the key elements to constructing a successful Enterprise Information Management System (EIMS) is having some clear ideas about what you want to be able to do with your data. Chances are that there are people who work with you who have additional ideas about what would be valuable. The following section is designed to help you gather all the possibilities (i.e., perform a needs assessment) and lead you to consider the priorities for your SIF Solution (i.e., define your requirements).

What Is A Needs Assessment?

You've probably heard of a “needs assessment” before, but it might be useful to explain what is meant by it here. Often a needs assessment is an evaluation of the existing environment and capabilities of an organization in order to determine what interventions will be needed. In the case of technology implementation, a needs assessment is an evaluation of the needs you hope the technology will meet. You should try to imagine all the ways in which linking your organizations data systems could make life at the school or district level easier and more effective. Chances are very good that the SIF standards encompass most if not all of your current data needs. As such, begin by defining your business requirements and identifying the characteristics of the data that you need shared between or among software systems. Then identify the SIF objects and data elements that currently apply and which SIF-Certified applications support those data objects. If there happen to be any data that you require and which are not covered by the SIF Standards you are able to request that SIF add those data in a future release of the specification.

Who Should Do Your Assessment?

There is one school of thought that posits that you can’t carry out a needs analysis because you don’t thoroughly understand the technology necessary to support those needs. Truth be told, it is the individuals involved in daily operations who are the ones ideally suited to define data sharing requirements because they are the ones who are most familiar with their organization’s functions, current needs, and goals for the future. They must define their needs before solutions can be put into place.

However, it is also true said that “a prophet is never honored in his own house”, indicating that sometimes an external perspective is critical to pointing out unpleasant issues or identifying needs or impediments that those most closely involved can miss. As a result, you may want to bring someone with systems integration experience into the organization that is able to explain what is possible and to help guide you through the process. Also, staff may want to visit another SIF Implementation Site to make some comparisons, or participate in discussions on the SIF Users Group to share their ideas or questions with others in the midst of similar projects.

Regardless of whether you do it by yourself or bring in a consultant, it is important to include as many staff as possible in your discussions about district data sharing needs. This will be instrumental for gaining cooperation, support and "buy in" from across the organization. You will want to involve all individuals whose job will be impacted by the data integration.

Ensuring that there is strong support from the top of the organization is also a critical success factor. Because a SIF Implementation to support an EIMS involves staff from across the district, it is important that key member or members of senior management be identified as the project “champion(s).” Without such sponsorship, hurdles across departments can become insurmountable, doors will remain closed, agendas will remain unchanged, and the risk of failure increases dramatically.
An important step in defining your data sharing needs is to look at the entire data management enterprise for your organization. If you miss this step, the needs you identify may be just a small portion of the district’s overall data integration needs. Because of the technologies underlying SIF, SIF is a scalable solution that can eventually meet all, or nearly all, of your school district’s needs.

To manage an EIMS integration strategy takes organization, coordination and cooperation. Remember: the result will be better than if all your separate needs are dealt with independently. Also keep in mind that selecting a solution or set of solutions that meets all of your organization's data sharing needs may compete with other potential uses of the district’s scarce resources. If the district has a Technology Plan it would be wise to have this project included within it.

Other school districts that are engaging in or have completed SIF implementations may also be a great source of information and expertise. You will likely find that they have identified needs that are similar to yours. You might also find identification of needs you hadn’t even thought of. More information on contacting these districts can be found on the SIF website at http://www.sifassociation.org.

**Who Should Participate in the Needs Assessment Process?**

To understand the data sharing needs of your district, you must talk to the individuals responsible for performing those tasks or the “end users.” Typically they are the instructional or administrative staff that are trying to provide and manage effective instruction or efficient administrative support.

End users are the key category of participants who must be involved in defining needs. They may not have a full grasp of technology, but they are the experts in what they need every day on the job. You need to be aware that many technology initiatives fail because they were designed for users, but without their crucial input.

There are four major staff groups within school districts that must be involved in defining needs for data sharing. These include:

- School and District Administrators
- Teachers
- Instructional & administrative support staff
- Technical support staff

District and school administrators are an important group of users who should participate in a needs assessment. Administrators generally need summary information at a broader level of detail than their staffs. For these participants, the data integration problems must be presented in a way that describes the organization’s operations and potential impact data sharing can have on efficient use of resources as well as decision making.

It is critical that these administrators first gain a good grasp of the entire data management enterprise across the school district in order to appreciate how serious the data integration problem is. The figure below is a broad illustration of the types of systems one would find in a school district.

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**Example from the Field**

One of the early SIF Implementation sites had decided to link their SIF Certified transportation and student management systems.

There was a fairly good understanding of the needs from the student data management perspective, however, familiarity with the data flow from within the transportation department was limited.

The district wanted to synchronize the enrollment process between the two systems by having the student system publish basic demographics including addresses for consumption by the transportation system. The expectation was that this would reduce the data burden within transportation as well provide for consistent and more accurate data across these applications.

Once the Zone Integration Server was brought on-line each vendor installed their SIF Agents and the first testing began. The result of the first successful exchange between the two applications was that the transportation department was up in arms about automatically accepting the address information from the student management system.

Had the district worked more closely with the transportation department users during the needs analysis phase, they would have learned this would be an issue and found ways to resolve it prior to implementation.
To-date the Schools Interoperability Framework has been focused on the Administrative Support layer shown above, however, it is recognized that the other dimensions to the educational enterprise such as Teaching and Learning, Reporting and Accountability and Analysis and Planning have data sharing needs as well. SIF’s goal is to expand the data set covered by the SIF Specifications to encompass these areas, and there is already significant progress being made in those areas. By beginning with a SIF implementation focused on the Administrative Support layer today, schools and districts are prepared to take advantage of future enhancements in the SIF Specifications.

The diagram below illustrates a fairly typical school environment with multiple systems managing student related information.

As the diagram shows, these multiple systems are problematic because they lack the ability to efficiently share commonly needed information. Not only is this inefficient, it results in inaccurate and inconsistent information about students.

Instructional staff are another extremely important category of users that benefit from electronic data sharing. Their jobs include such tasks as grading, managing class assignments, reporting on student attendance, writing lesson plans, or developing interactive or multimedia learning activities for their students. Any one of these tasks may be assisted by a computer-based tool; however, it’s unlikely that any linkages between them exist today. Teachers are also an excellent source of ideas on how they could leverage interoperability in order to address the needs of their students. Other staff members that provide support to the delivery of educational services, such as school registrars, secretaries, and librarians/media specialists, should also be consulted in the needs definition process. Their needs could be unique to their positions or may be common to the needs of administrators and instructional staff.

Technical support staff will be charged with maintaining and supporting the data integration technology. Because SIF in your district may require a wide area network, they should be intimately involved in the needs assessment. They will likely have concerns related to the following:

- The data integration tools compatibility with the existing infrastructure, equipment and software.
- Adherence to technical standards.
- Network and system capacity (e.g., amount of transactions it can process simultaneously, per day or per month, number of applications to be integrated, back-up issues).
- Wide area network requirements (e.g., stability of network connections, connectivity to the district office, centralized vs. decentralized applications).

Information Technology or research staff may also have insight into the basic information requirements of others throughout the district, especially if they are the ones constantly asked to generate reports combining disparate types of information from different sources.

Last but certainly not least, you may want to consider involving your clients – students and parents. They will be the ultimate beneficiaries from integration services because they are constantly asked for the same information over and over to update these multiple systems. They may also have different or fresh ideas about concerning data integration needs.
It's clear that there are many groups of individuals that can be impacted by implementation of the data integration technology and their needs should be assessed. If it is not possible to include them all in the needs assessment process, consider involving representatives of each group. Recruit individuals who are the best at doing their job; not those who are inefficient or ineffective. Inclusion of those folks with “best practices,” will result in getting the most reliable information on which to build your integration solution.

**Tip:** Information can be gathered using a variety of techniques. Once you completed this, prioritize your needs according to what will make your district more effective.

**What Tasks Are Involved In the Needs Assessment Process?**

As soon as you have identified the major requirements, begin collecting more specific information. You may want to handle the needs assessment as a project of its own even though it is really just one piece of the planning process. It is important that the decision makers have all of the information they need in order to make appropriate, educated decisions.

Once you have recruited the participants who will provide input to the needs assessment, the key tasks are:

1. Identify the needs-related information.
2. Clearly define the needs and the underlying reason behind each one.
3. Prioritize the needs.
4. Report the results.

**Task 1. Identifying the Needs**

This part of the process can take some time and should be managed carefully. Establish a realistic schedule and stick to it as closely as possible. Provide all participants sufficient time to be heard and listen carefully. Often individuals will find it difficult to describe a problem because they would rather solve it. Another situation you will likely discover is that issues are identified; however, no one is sure of the underlying reasons behind them. Your job is to probe deeper to try and uncover those factors. Think of yourself as a “data therapist” who is there to identify data management problems.

There are several methods that can be utilized to collect information for defining data integration needs. The following table contains a few examples.

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
<th>Approach Assets</th>
<th>Approach Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone Survey</td>
<td>Structured interviews that take place over the phone, are short in duration, and mediated by trained interviewers, instead of self-administered by respondents.</td>
<td>Provides control over the number of respondents. Interviewers ensure accurate and complete questionnaire completion. Allows for gathering information rapidly along with choice of the most appropriate sample group.</td>
<td>Questions need to be carefully constructed to avoid misinterpretation. Because the results are self-administered by respondents return rate can be low and quality of information can be poor.</td>
</tr>
<tr>
<td>Written Questionnaire</td>
<td>Survey instrument designed to capture needs from individuals independent of time or place.</td>
<td>Consistent format allowing for easy compilation of results. Convenient for respondents.</td>
<td></td>
</tr>
<tr>
<td>Interviews: One-on-One</td>
<td>Meeting with individuals using a list of questions designed to elicit responses that reveal needs.</td>
<td>Personalized approach encourages sharing and allows for deeper exploration into topics.</td>
<td>Requires significant time investment. More difficult to draw conclusions across multiple sources.</td>
</tr>
<tr>
<td>Method</td>
<td>Description</td>
<td>Approach Assets</td>
<td>Approach Liabilities</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Interviews: Group</td>
<td>Meeting with a group of individuals using a list of questions designed to elicit responses that reveal needs.</td>
<td>Works well when the group is comfortable with one another and can provide a well-rounded exploration and identification of needs. Better use of time than individual interviews.</td>
<td>Groups may intimidate some participants which will limit the amount of information that is revealed.</td>
</tr>
<tr>
<td>Focus Groups</td>
<td>The convening of a small group of people (8-10) for question-driven discussion about needs under the guidance of a moderator.</td>
<td>Provides insight into peoples’ shared perceptions and allows for time-efficient direct involvement of multiple users.</td>
<td>Some staff may limit their participation because groups intimidate them. Requires thoughtful preparation of a skilled moderator.</td>
</tr>
<tr>
<td>Direct Observation</td>
<td>Analysts observe users at their place of work in order to identify data sharing needs.</td>
<td>Users are behaving in their natural habitat, instead of an artificial environment. Reveals needs arising from everyday situations that the users may not articulate in other settings.</td>
<td>Can be time-consuming and being observed can make some staff uncomfortable.</td>
</tr>
</tbody>
</table>

The following questions could be used in a data integration needs assessment for an education agency.

1. What is your job?
2. What are the principal types of information you deal with in your job?
3. Where does the information come from?
4. How is the information collected and maintained?
5. Who uses the information and what do they use it for?
6. What is the primary mechanism used for communicating the information?

**Task 2. Reviewing and Prioritizing the Needs**

Following the collection of the information regarding your district’s data integration needs, you will need to analyze, sort, filter, and finally disaggregate the needs that have been expressed. The review process first involves studying the input with a goal of identifying the major needs that were described. This activity is highly organizational in nature and will typically begin with general, high level requirement statements.

Upon review of the data sharing requirements that were revealed during the data gathering process you will likely be able to come up with a basic listing of all systems that could benefit from linkages working between or among them.

Most SIF Implementations have begun with the synchronizing the basic student enrollment process between systems. Put quite simply, when a new student enrolls, basic elements from their enrollment record in the student information system are published for consumption by other applications. For example, the food services system needs to know enough information to be able to fulfill the student’s nutritional needs while they are at school. The library management system has a new patron which should be established before the student appears in the library. The transportation system may need to offer immediate transportation services. The student will likely need an identification card so the system that provides that service may need to receive the data and a network account to log on to the network.

Begin by creating a list of all of them followed by statements of data sharing need. The following table represents some of the systems that might be listed.
<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Management</td>
<td>System used to manage student records throughout their academic career in the district.</td>
<td>The student management system needs to share data with the lunchroom, library, transportation, and classrooms.</td>
</tr>
<tr>
<td>Food Services</td>
<td>System used to manage the distribution and consumption of student meals.</td>
<td>Food services needs to know specific information about students in order to serve their nutritional needs.</td>
</tr>
<tr>
<td>Library Services</td>
<td>System used to manage learning resources of the school library.</td>
<td>The library needs to know when a new student has enrolled to be able to manage library materials for them.</td>
</tr>
<tr>
<td>Transportation</td>
<td>System used to manage transportation needs for the district.</td>
<td>The transportation department needs to have current information regarding student addresses.</td>
</tr>
<tr>
<td>Identification Cards</td>
<td>System used to issue student identification cards.</td>
<td>The identification card system needs to know when a new student has enrolled to be able to issue a card for them.</td>
</tr>
<tr>
<td>Network Account Management</td>
<td>System that keeps track of and authenticates users on the school’s network.</td>
<td>These accounts need to be generated ASAP so that a new student and/or teacher can sign on to the network for applications/ assignments on the first day of school/work.</td>
</tr>
<tr>
<td>Staff/Student E-Mail</td>
<td>System that provides e-mail accounts for students, teachers and staff.</td>
<td>These accounts need to be generated ASAP so that a new student/teacher has e-mail communication on their first day of work/school.</td>
</tr>
<tr>
<td>District Data Warehouse</td>
<td>System that enables the collection of data in support of district decision making processes.</td>
<td>The district’s data warehouse needs to know about new students who have enrolled in the district.</td>
</tr>
<tr>
<td>Teacher Grade book</td>
<td>Classroom instructional management tool.</td>
<td>The teacher grade book application needs to know about new students that will be receiving instructional services from a teacher.</td>
</tr>
<tr>
<td>Learning Management</td>
<td>System that focuses on the computer directly delivering integrated content to students with reports and management tools for educators.</td>
<td>The LMS needs to know about new students, create courses, know about teachers, provide grade book, assessment and activity information back to the SIS and grade book.</td>
</tr>
<tr>
<td>Assessment</td>
<td>Systems that offer both formative (practice, embedded) and summative (controlled, high stakes) assessments.</td>
<td>Assessment systems need to know about new students, register students for the assessments, provide accommodations for students and report scores back to the SIS or Instructional Management System.</td>
</tr>
<tr>
<td>Special Program</td>
<td>Systems that sometimes standalone, sometimes packaged with other functionality, Special Education management software is typically used to develop and manage U.S. IDEA-mandated Individual Education Plans (IEPs).</td>
<td>These systems need to know about new students, manage a student’s program, track test accommodations and provide information for federal reporting.</td>
</tr>
</tbody>
</table>
Once information has been gathered, you must review the needs and determine which ones are most important for inclusion in your integration solution.

First, you must extract the key nuggets - the statements of discrete, separate needs, each of which can be assessed and addressed. Hopefully, many participants will cite the same or similar needs. Keep these needs to a reasonable number, perhaps by listing the needs at a fairly general level. Remember, at this point there is no need to think about how the actual technology will work; focus on what data the participants need and want.

Now you must prioritize the needs. It is likely that the set of needs you’ve gathered is a mixed bag of things that could best be addressed in a number of different ways:

1. Some needs (such as ones involving repetitive tasks and mass storage and retrieval of data) are best carried out using technology.
2. Some other needs or tasks are best done manually.
3. Some needs are problems that can be solved by changing your organization’s policies and procedures ("business process re-engineering" is the buzzword most often applied to this procedural improvement).
4. Finally, there are some needs that, while real, simply don’t make the cut. You can afford to defer or ignore them, and live with the consequences.

The more linkages established between applications, the more costly and difficult it may be to implement and support. Caution is recommended when working with users not to raise expectations prematurely so don’t promise the participants that the links will occur right away. Adapt the following questions and use them as a guide for prioritizing.

**Key Questions to Ask About Your District’s Data Synchronization Needs**

Because this project will require dedication of budgetary resources, it is a good idea to link needs to the district mission, vision and goals. You can easily make these links by answering the following questions:

- How will meeting this need support the district’s mission?
- Who will benefit from this need being achieved and how?
- Would meeting this need aid the district in meeting its goals?
The needs you define at this point, and the priorities you attach to them, will be used during the next phase of the overall process: development of the implementation strategy.

Step III
Define Requirements

At this point in the process, a general statement describing each need is what is required. It is not necessary to delve into information about the technology. This will be done later in the process when it’s time to define the functional requirements. Develop enough descriptive information that documents what has been learned so far.

The following outline is recommended for development of a Requirements document:

1. Introduction
   1.1. Document Purpose
   1.2. Background
   1.3. Scope
   1.4. Objectives
   1.5. Assessment Process
2. Requirement Conventions
3. Data Integration Requirements
   3.1. Requirement
   3.2. Identification Number
   3.3. Description
   3.4. Priority
   3.5. Procedural Impact
   3.6. Acceptance Plan
   3.7. Source(s)
   3.8. Rationale
4. Business Process Re-engineering
   4.1. Current Business Process Flow
   4.2. Future Business Process Flow
5. Appendices (source documents, etc)

Each section is described below:

1. Introduction
   This section should reflect what was developed in the Project Charter along with a description of the assessment process employed to capture, analyze, and prioritize the requirements.

2. Requirement Conventions
   The requirement conventions should explain how the requirements were identified, written and prioritized. The following table contains a list of commonly used terminology when developing requirement statements.

<table>
<thead>
<tr>
<th>Item</th>
<th>Convention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shall/Must</td>
<td>When a requirements statement uses the words shall or must, it implies a firm or binding requirement, also known as a hard requirement.</td>
</tr>
</tbody>
</table>
### Item | Convention
--- | ---
**Should** | Requirements statements using the word should imply a requirement that might not be fulfilled, also known as a soft requirement.

**will, are, is** | Using the terms, will, are, or is imply statements of fact.

**Requirement statements** | All of the requirements in this document have been assigned a unique ID. Each requirement ID is composed of a third-level number representing first the module; then the area or issue; and finally a letter (a through z) representing the individual statement.

For traceability reasons, existing requirement IDs will not be altered or reused following the first official publication of this document.

Requirements are shown in the following format. Material that appears in any other format is explanatory in nature and does not constitute a binding requirement.

<table>
<thead>
<tr>
<th>Req ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;#&gt;</td>
<td>&lt;text of requirement&gt;</td>
</tr>
</tbody>
</table>

**Rationale:** When appropriate for an individual requirement, a brief justification is given. Or, authors can also choose to group a set of requirements and provide one justification for the group.

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### 3. Data Integration Requirements

The *Data Integration Requirements* are intended to capture user needs. These are the tasks or actions that the integration technology is intended to accomplish.

Because you are targeting the SIF Data Standards for the integration, it would make sense to group them according to the high level categories recognized by the initiative.

- Assessment
- Data Analysis & Reporting
- Food Services
- Financials
- Geographic Information
- Grade book
- Human Resources
- Instructional Services
- Library
- Network/E-mail Account Management
- Professional Development
- Special Programs
- Student Record Exchange/eTranscript
- Student Information
- Transportation
- Vertical Reporting

Because your district may have systems that contain functionality from several categories listed above, you may want to group those together.
3.1 Identification Number
Each major requirement should be assigned a unique identification number. If there are related sub-requirements, assign those a sub-number (ie 3.1.1).

3.2 Description
As you describe each requirement make sure they are concise and written in such a way that they can be used to test against.

3.3 Priority
Based upon the requirement conventions, assign a value to each requirement. Those statements contain the terms “shall” or “must” are hard requirements and must be met. Requirements that are desirable but not mandatory will contain the term “should.”

3.4 Procedural Impact
If the requirement involves changing policies or procedures in the district, this should be noted here. This will be important because these must be in place and documented prior to deployment.

3.5 Acceptance Plan
To make sure the statement is concise enough to be measurable, describe what user expectations would be to indicate that this requirement has been fulfilled.

3.6 Source(s)
Identify where the requirement came from. This may be an individual, group, or external source. It’s important because additional questions may come up later and you will want to follow up with the appropriate individuals.

3.7 Rationale
The supporting rationale for each requirement should be described here. If it is not understood why a need exists, it’s likely the solution may not satisfy it correctly.

The following is an example of how the requirements might be documented.

<table>
<thead>
<tr>
<th>Req ID</th>
<th>Priority</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Student Information Enrollment Data</td>
<td>1</td>
<td>The school secretaries and registrars must be able to efficiently share enrollment information with all other departments in the district that need to know about them in order to provide services.</td>
</tr>
<tr>
<td>Rationale</td>
<td></td>
<td>The school secretaries and registrars are the official “owners” of student enrollment data and the first to know about the entry of a new student. In order to provide immediate services to new students, other departments must be aware of their existence as soon as possible.</td>
</tr>
<tr>
<td>Source</td>
<td></td>
<td>John Jones, Principal, Boomtown HS</td>
</tr>
<tr>
<td>Procedural Impact</td>
<td></td>
<td>Currently this information is shared using paper forms as the communications medium. Each department initials the form indicating their awareness of the new enrollment. New procedures will need to be developed for each affected department prior to deployment of the integration.</td>
</tr>
<tr>
<td>Acceptance Plan</td>
<td></td>
<td>Individuals responsible for sending and receiving information between systems must be satisfied with the timeliness, quality, and reliability of information</td>
</tr>
<tr>
<td>1.0.1 Student Information Enrollment Data Food Services</td>
<td>1</td>
<td>The school secretaries and registrars must be able to share new student enrollment information with food services.</td>
</tr>
</tbody>
</table>
Rationale | The school secretaries and registrars are the official “owners” of student enrollment data and the first to know about the entry of a new student. In order to provide immediate meal services to new students, food services must be aware of their existence as soon as possible.

Source | Kathy Smith, Head Cook, Boomtown HS

Procedural Impact | Current procedure has the student showing up at lunchtime with a paper form from the main office indicating the type of lunch to be served. If the student is receiving free or reduced lunch this event can cause embarrassment. Because the food services staff will have access to timely information regarding new students, new procedures may need to be developed to determine service requirements prior to the child showing up.

Acceptance Plan | Food services staff need to verify that the data was received and consumed appropriately into their system. School secretaries and registrars need to know that the data they sent was successfully received and processed.

4. Business Process Re-Engineering

Business process reengineering (BPR) is the analysis and redesign of workflow within and between enterprises. It promotes the idea that redesign and reorganization of a business or institution is necessary to lower costs and increase quality of service and that technology can be the key enabler for that change. It assumes the design of workflow in most large organizations is based upon assumptions about technology, people, and goals that are no longer valid. There are typically seven principles of reengineering to streamline the work process and thereby achieve significant levels of improvement in quality, time management, and cost:

1. Organize around outcomes, not tasks.
2. Identify all the processes in an organization & redesign them in a prioritized order.
3. Integrate information processing work into the real work that produces the information.
4. Treat geographic dispersed resources as though they were centralized.
5. Link parallel activities in the workflow instead of just integrating their results.
6. Put the decision point where the work is performed, and build control into the process.
7. Capture information once and at the source.

Data integration technology is clearly an enabler for business process reengineering. Because of this, it is recommended that this be done along with the data integration implementation.
4.1 Current Business Process Work Flow

Workflow is a term used to describe the tasks, procedural steps, organizations or people involved, required input and output information, and tools needed for each step in a business process. A workflow approach to analyzing and managing a business process tends to focus on documents or objects and data elements. In general, workflow management focuses on processes rather than documents.

This section will focus on the current business processes that are being used to manage this information. It is recommended that each step in the process be described along by area of responsibility along with an estimate of the time it takes to complete each step. This will be critically important information that you may want to use should you need to produce a cost/benefit analysis to justify use of any additional funds for this project.

The diagram below illustrates a fairly typical scenario where common information about students needs to be shared among multiple groups. What needs to be described is what happens today that provides those areas with the information they need.

Attempt to derive the reason behind each task and be prepared to discover that the reason might be: “because it’s always been done that way.” Once completed you should have a good description of your starting point.

The diagram on the following page contains an example of how the enrollment process might work in a secondary school. It is included to provide an illustration of how work flow diagrams provide an excellent tool for understanding and communicating a current business process.

4.2 Future Business Process Work Flow

Now that you understand all of the steps that are currently followed to get a task done, consider how that process may change in an environment supported by SIF data integration. It is recommended that a new process be defined taking into account the streamlining that your district and school will enjoy. This can lead to the need to modify current policy and procedures or create a situation where new ones need to be developed.

You might want to return to the current work flow diagram and modify it to represent how the process should work once the data integration is in place.

5. Appendices

The appendices should contain source documents and reference materials that were used in the development of the requirements.
Writing Your Requirements

Okay, you’ve defined and prioritized a set of user requirements. Your next step involves translating these into a statement of what your integration solution should do. Now, try to produce a Requirements Definition document that is thorough and self-explanatory, so your successor or others will have no trouble seeing what you’ve done and how you’ve reached your conclusions. The more people participate in these discussions and the development of these plans, the more they will “buy-in” to the solution, and “buy-in” is critical for success.

Presenting Your Findings: The Requirements Walk-Through

You will want to provide the opportunity for your management and the user community to review your findings. This can be accomplished by hosting sessions designed to walk stakeholders through the requirements to ensure your findings are accurate. In addition to gaining assurance that you understand the needs thoroughly, this also serves as an excellent mechanism to gain the support and commitment necessary to effectively manage change.

The walk through should be presented in a non-threatening environment that encourages participation. Make sure the input received is documented and incorporated into the document where appropriate. If there are significant changes that need to be made, you might want to schedule a follow-on session to present the final document and get sign off.

You should now have enough information to begin development of the functional requirements that will define how the data integration must perform. Before launching into this phase, you should consider doing a readiness assessment to measure how prepared the stakeholders are to handle the change that will occur as a result of the data integration.

A Readiness Assessment survey that can be used for this purpose is included in Appendix B of this Toolkit.
**Functional Requirements**

Congratulate yourself!! You have made major in-roads towards getting your data integration in place. You now understand what is required from the user’s perspective and you have prepared the district to be ready for the changes to come. Now is the time to roll up your sleeves and describe how the software needs to behave to meet the needs.

**What Should Be Included in the Functional Requirements?**

Up to now, your task has been to identify and examine the needs of your district that might be addressed by implementing SIF integration solutions. The discussion, thus far, has focused on an "integration solution," rather than the set of standards driven tools, that will meet your needs. Even if you are not thoroughly knowledgeable about SIF implementations, you may know enough to begin considering how to address your organization’s needs by leveraging the technology to streamline processes, including the reengineering of some existing procedures.

The **Functional Requirements** can be inserted into each of the requirements identified in your Needs Assessment. They should describe how a product will work entirely from the user’s perspective. The functional requirements don’t talk about how the thing is implemented, it talks about what the features are supposed to do. A **Functional Requirement** states in detail what exactly the SIF integration technology should be expected to do (rather than what your district should be able to do).

Consider this analogy. You’re shopping for a new house, but you first create a check list of your needs. Your house must be:

- Large enough to accommodate your family of four.
- Enough bedrooms to allow each child a room of their own.
- Room for hosting out of town guests.
- Enable the hosting of large dinner parties.
- Have a two car garage to house your Ferrari and Jaguar.
- State of the art kitchen for preparing meals for large dinner parties.
- Large yard for the children to play in.
- Located in a nice neighborhood with low traffic volume.
- Have an office for your spouse to be able to telecommute.
- Etc.

Armed with your list, you approach a real estate agent to get help finding the ideal home for your family. Without such a list you are likely to settle upon a home that won’t satisfy your needs. The Functional Requirements play the same role in specifying what capabilities the data integration must have. You don’t care how it works internally; you do care what services are delivered to those who will use and maintain it.

There are many approaches to developing Functional Requirements. The typical approaches used by the computer industry usually involve using function charts, data and/or process modeling, diagramming, and other techniques that educational decision makers find difficult to comprehend. The most direct and simple approach that can satisfy all audiences is to look at the Functional Specifications as a clear description of what the data integration needs to do.

It is recommended that details related to current processes and systems be included in the Functional Requirements. This should cover the type of information the systems are responsible for managing as well as a high level description of the processes and procedures utilized by the users to maintain the data. Because the integration technology will change these processes and procedures by streamlining the flow of information, it is critical that all of the user’s current responsibilities are well understood.

The Functional Requirements should be developed with direct alignment to the Requirements. It should describe the characteristics or functions to be carried out within the data integration. Include all the information that you feel comfortable with; but don’t feel like you must include everything.
The table below suggests how Functional Requirements might be documented using the Requirements as your baseline.

<table>
<thead>
<tr>
<th>Req ID</th>
<th>Priority</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Student Information</td>
<td>1</td>
<td>The school secretaries and registrars must be able to efficiently share enrollment information with all other departments in the district that need to know about them in order to provide services.</td>
</tr>
<tr>
<td>1.0.1 Student Information Enrollment Data</td>
<td>1</td>
<td>The school secretaries and registrars must be able to share new student enrollment information with food services.</td>
</tr>
<tr>
<td>Rationale</td>
<td></td>
<td>The school secretaries and registrars are the official “owners” of student enrollment data and the first to know about the entry of a new student. In order to provide immediate meal services to new students, food services must be aware of their existence as soon as possible.</td>
</tr>
<tr>
<td>Source</td>
<td></td>
<td>John Jones, Principal, Boomtown HS</td>
</tr>
<tr>
<td>Procedural Impact</td>
<td></td>
<td>Currently this information is shared using paper forms as the communications medium. Each department initials the form indicating their awareness of the new enrollment. New procedures will need to be developed for each affected department prior to deployment of the integration.</td>
</tr>
<tr>
<td>Acceptance Plan</td>
<td></td>
<td>Individuals responsible for sending and receiving information between systems must be satisfied with the timeliness, quality, and reliability of information</td>
</tr>
<tr>
<td>Functional Requirement 1.0.1</td>
<td></td>
<td>The student information system must be able to send enrollment information to the library and food services systems as soon as the student record is entered into the system.</td>
</tr>
<tr>
<td>1.0.1.1 Student Information Enrollment Data Food Services</td>
<td>1</td>
<td>The school secretaries and registrars must be able to share new student enrollment information with food services.</td>
</tr>
<tr>
<td>Rationale</td>
<td></td>
<td>The school secretaries and registrars are the official “owners” of student enrollment data and the first to know about the entry of a new student. In order to provide immediate meal services to new students, food services must be aware of their existence as soon as possible.</td>
</tr>
<tr>
<td>Source</td>
<td></td>
<td>Kathy Smith, Head Cook, Boomtown HS</td>
</tr>
<tr>
<td>Procedural Impact</td>
<td></td>
<td>Current procedure has the student showing up at lunchtime with a paper form from the main office indicating the type of lunch to be served. If the student is receiving free or reduced lunch this event can cause embarrassment. Because the food services staff will have access to timely information regarding new students, new procedures may need to be developed to determine service requirements prior to the child showing up.</td>
</tr>
<tr>
<td>Acceptance Plan</td>
<td></td>
<td>Food services staff needs to verify that the data was received and consumed appropriately into their system. School secretaries and registrars need to know that the data they sent was successfully received and processed.</td>
</tr>
<tr>
<td>Functional Requirement 1.0.1.1</td>
<td></td>
<td>The student information system must be able to send enrollment information to the food services system as soon as the student record is entered into the system.</td>
</tr>
<tr>
<td>Functional Requirement 1.0.1.2</td>
<td></td>
<td>The food services system must be able to communicate that the enrollment transaction was received from the student information system.</td>
</tr>
<tr>
<td>Functional Requirement 1.0.1.3</td>
<td></td>
<td>The food services system must only accept transactions from an authorized individual.</td>
</tr>
<tr>
<td>Functional Requirement 1.0.1.4</td>
<td></td>
<td>If the food services system is not available, there should be a mechanism to hold the transaction and make repeated attempts at delivery until it is successfully received.</td>
</tr>
<tr>
<td>Req ID</td>
<td>Priority</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Functional</td>
<td></td>
<td>Requirement 1.0.1.5</td>
</tr>
<tr>
<td>Requirement</td>
<td></td>
<td>The data must be mapped using the Schools Interoperability Framework data</td>
</tr>
<tr>
<td>1.0.1.5</td>
<td></td>
<td>standards.</td>
</tr>
<tr>
<td>Functional</td>
<td></td>
<td>Requirement 1.0.1.6</td>
</tr>
<tr>
<td>Requirement</td>
<td></td>
<td>The vendor tools included in the data integration solution must be</td>
</tr>
<tr>
<td>1.0.1.6</td>
<td></td>
<td>Certified with SIF.</td>
</tr>
<tr>
<td>Functional</td>
<td></td>
<td>Requirement 1.0.1.7</td>
</tr>
<tr>
<td>Requirement</td>
<td></td>
<td>The student information system must be able to respond to a request for</td>
</tr>
<tr>
<td>1.0.1.7</td>
<td></td>
<td>enrollment information from the food services system.</td>
</tr>
</tbody>
</table>

**Technical Requirements**

The technical requirements section follows the functional requirements and should address the following:

**Data Flow**

Documenting the flow of data can be a time consuming task fraught with detail and complexity. The figure below is an illustration of the Schools Interoperability Framework’s data model and flow for the standards.

The red boxes represent student data; the blue boxes contain data describing schools; and the remaining boxes each cover different subject areas.

What you will want to do in this section is describe in a big picture view the data objects and elements that you will want to be exchanged and what each department needs to send and/or receive. In this section you will also estimate the number, type, and frequency of transactions that will need to be transmitted.

**Data Mapping Requirements**

The data mapping requirements should reveal what data is needed to be sent and received by each application involved in the integration. Included in the Toolkit is a spreadsheet designed to accomplish this mapping. The following is an example of a worksheet for mapping student enrollment data.
### SIF Data Mappings

**OBJECT Name:** StudentSchoolEnrollment

(*Note: "A" indicates elements that are received from an "Add" Event. All other elements would be received in an "Update" Event or a Response to a Request*)

<table>
<thead>
<tr>
<th>Element 1</th>
<th>Attribute and Value</th>
<th>*Rev. Mode</th>
<th>Formatting/Expected Values</th>
<th>Maps to Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>StudentSchoolEnrollment</td>
<td>RefId</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>StudentPersonalRefId</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SchoolInfoRefId</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MembershipType</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TimeFrame</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EnrollStatus</td>
<td>Code</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EntryDate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EntryType</td>
<td>Code</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GradeLevel</td>
<td>Code</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homecom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RoomInfoRefId</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>StaffAssigned</td>
<td>Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>StaffPersonalRefId</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ExitDate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ExitStatus</td>
<td>Code</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ExitType</td>
<td>Code</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The sample workbook includes sample worksheets for mapping the following SIF Objects:

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>StudentPersonal</td>
<td>The student personal object contains data elements that describe demographic characteristics of a student.</td>
</tr>
<tr>
<td>StudentContact</td>
<td>The student contact object contains data elements that characterize the demographics of a person described as a contact for the student.</td>
</tr>
<tr>
<td>StudentSchoolEnrollment</td>
<td>The student school enrollment object contains data elements that characterize a student’s entrance and/or withdrawal from the school.</td>
</tr>
<tr>
<td>StudentPicture</td>
<td>The student picture object contains the photographic image of the student.</td>
</tr>
<tr>
<td>StaffPersonal</td>
<td>The staff personal object contains data elements that describe demographic characteristics of staff members.</td>
</tr>
<tr>
<td>SchoolInfo</td>
<td>The school info object contains data elements that characterize demographics of a school.</td>
</tr>
<tr>
<td>SchoolCourseInfo</td>
<td>This object is for course information</td>
</tr>
<tr>
<td>AttendanceCodeInfo</td>
<td>This object is to provide information about a particular attendance code, allows applications to synchronize each other’s attendance code tables, or to provide a dynamic list of attendance codes</td>
</tr>
<tr>
<td>SectionInfo</td>
<td>This object provides information about the section -- the specific time period a session of the course meets.</td>
</tr>
<tr>
<td>StudentDailyAttendance</td>
<td>This object provides daily attendance information for a particular student in a particular school on a particular date.</td>
</tr>
<tr>
<td>StudentSectionEnrollment</td>
<td>This object contains information about a student’s enrollment in a section of a course.</td>
</tr>
<tr>
<td>RoomInfo</td>
<td>The room info object contains data elements characterizing a room within a school.</td>
</tr>
<tr>
<td>RoomType</td>
<td>The room type object contains data elements defining the type of room it is.</td>
</tr>
<tr>
<td>LibraryPatronStatus</td>
<td>The library patron status contains data elements that describe a student’s status and use of library materials.</td>
</tr>
<tr>
<td>StudentMeal</td>
<td>The student meal object contains data elements that characterize student meal consumption by type and status.</td>
</tr>
<tr>
<td>StudentTransportationInfo</td>
<td>The student transportation info object contains elements that describe a student’s transportation schedule.</td>
</tr>
<tr>
<td>BusStopInfo</td>
<td>The bus stop info object contains data elements that describe the geographic locations of bus stops.</td>
</tr>
<tr>
<td>BusRouteInfo</td>
<td>The bus route detail object contains data elements that describe characteristics of each bus route</td>
</tr>
<tr>
<td>BusRouteDetail</td>
<td>The bus route detail object contains data elements describing the bus schedule for each route.</td>
</tr>
<tr>
<td>BusInfo</td>
<td>The bus info object contains data elements that characterize each vehicle.</td>
</tr>
<tr>
<td>BusEquipment</td>
<td>The bus equipment object contains data elements that characterize equipment used for bus maintenance.</td>
</tr>
<tr>
<td>TermInfo</td>
<td>This object provides information about a term; i.e., a reportable period of time.</td>
</tr>
<tr>
<td>Payment</td>
<td>The payment object contains data elements characterizing payments and their status.</td>
</tr>
<tr>
<td>Billing</td>
<td>The billing object contains data elements describing billing transactions.</td>
</tr>
</tbody>
</table>

Once you have defined the applications, objects, and elements that will be used in your data integration, you should be ready to establish your implementation strategy.
Step IV
Establish an Implementation Strategy

Objective: By the end of this section, you will know how to plan, staff, manage and direct an effective data integration implementation strategy.

Where Can I Find SIF Certified Software And A Zone Integration Server?
If you've gotten this far and are not using the services of an Integration consultant, you're ready to begin looking for SIF Certified software. A complete list of SIF Certified applications and Zone Integration server vendors can be found on the SIF Website at http://www.sifassociation.org. These vendors can also develop custom SIF agents for high priority legacy/custom applications.

What Financial Resources Are Required?
You must first get a handle on the needed budget by doing some research. Because you will likely be integrating applications already in place, you will need to find out what, if anything, each vendor will charge for their SIF Agent software and support services. There will also be a need to acquire Zone Integration Server software, hardware, and services, which will likely have associated costs. If you are unsure of these costs, one option is to develop an RFI and distribute it to vendors who are operating in this market space. You also need to examine your network infrastructure to ensure that SIF can be implemented successfully in your district, there may be a cost associated with creating or upgrading your wide area network.

What Financial Resources Are Available?
Perhaps you've been granted unlimited funds to do as you please. If you believe this is the case then you are probably in for some exciting surprises most of which may not be pleasant. If, on the other hand, you have decided to implement data integration and have determined an approximate budget, funding for purchases, training and maintenance may be an issue for you.

There are many sources of help in this area. Many state education agencies and federal agencies and programs provide support for computer technology development. In addition, many corporations and foundations will also provide financial and/or technical assistance in response to written grant applications.

What Human Resources Are Required?
The staffing requirements for data integration will vary in accordance to the scope of the implementation. A constant is that you must dedicate a Project Manager to ensure that all tasks are defined, scheduled, assigned, and monitored in order to ensure that the integration is successful. In a project of this nature this can be tricky because it is likely the Project Manager does not have direct authority over all participants. They must manage tasks that have been assigned to vendor representatives and district staff that report to someone else. This is another reason for making sure early on that you have the commitment of upper management.
Finding the Right Solution

A strategy that has proven to be effective in obtaining the most appropriate and cost efficient solution is to develop and publish a Request for Proposal (RFP) for potential vendors to bid upon. The advantage of doing so provides formal guidance to the vendor community regarding specifics such as desired product functionality, equipment, costs, and delivery schedule and creates competition between companies which can lead to a reduction in costs. Many districts are required to approach new business such as this using a competitive bidding process. Because of this, there isn’t sufficient rational behind focusing your search down to a single solution since all vendors will be required to submit a proposal.

In the development of your Request for Proposal, you will want to collaborate with the individual responsible for administration of purchases in your district. If you are not part of the Management Information Systems department you will want to draw them in as well. Be warned that delays are likely to result if you wait too long before doing so. In addition to assisting you with decisions on how to best request what’s needed, these individuals can be instrumental in circumventing any barriers you might face that might further frustrate impatient users and reduce the value of the needs assessment. It’s likely that you will find when working with your purchasing administrator and/or MIS group that your district already has a template format that you should use.

Using Consultants

You may feel more comfortable outsourcing this activity to an organization or individual with experience in systems integration projects. This way you could leverage their experience in providing you with a design that will meet your requirements. This organization or individual needs to be familiar with SIF Specifications and know how to implement a school-related Enterprise Management Information System. They should have proven experience with SIF Agents and Zone Integration Server products. Be aware that any SIF-related customization that is outsourced to a consultant needs ongoing maintenance to keep in pace with SIF Standards as they evolve.

Requests for Information (RFI)

The Request for Information is another handy tool to engage in fact-finding concerning vendors and/or organizations available to provide products or services. It can assist in locating a multitude of potential resources available and can be extremely helpful in narrowing down your search for a solution. It is recommended that your district use the RFI to:

- Enable you to select a specific data integration solution from a desired vendor of a product or services.
- Specify only what you want the data integration to accomplish based upon your requirements. This allows the respondents to propose products, custom development, and services directing their solutions to be cost-effective towards meeting your needs.

Reference Checking

If you know someone else has implemented SIF, feedback from these districts can prove to be invaluable. This should happen early in the evaluation process because you will want to learn key information before making your decision. There are certain questions you should ask to help you compare their data integration to your own situation. If you choose to work with a vendor that is unfamiliar to you, you will want to ask the same questions of several of the vendor’s references.

1. What is the scope of integration that your district undertook?
2. Why did you select this solution?
3. What did you find most successful from the products and services?
4. What issues did you encounter when implementing the data integration?
5. If you could change certain aspects of the solution, what would you modify?

How Do You Implement the Solution?

Providing your district with a pre-defined template for implementing data integration is not something that is possible. What needs to be done and when will vary according to the scope of your project, the number of applications to be integrated, and the external resources made available from your vendors.
Because it is likely that this technology is new to your district it is highly advisable that you begin with a pilot project. Approaching your implementation this way minimizes risk and allows for measuring impact in a controlled environment which should result in providing you with valuable information for rolling the technology out to additional applications.

Implementation project plans will be specific to your circumstances. Therefore, the focus of this next section will be on key activities that are critical to a successful pilot implementation process, as well as the importance of project management and monitoring.

Because engagement in a pilot is just one phase in the overall scope of integrating data throughout your district, it is recommended that you treat it as a self-contained project. This means that it should have its own project charter, implementation team, and plan that should be aligned to the over-all goals of the district’s data integration. This will allow you to utilize project management rules and practices directly at this specific effort which should minimize the threat of scope creep.

**Step V**
Launch Pilot Implementation

**How Do You Assemble a Pilot Implementation Team?**

Up to this point you have been able to determine the overall size of the elephant using resources within the district. Now it’s time for the rubber to meet the road, demonstrate competency, and get some official recognition and visibility.

**Selecting an Pilot Project Manager**

The role of the Pilot Project Manager (PPM) is key because all participants will rely upon them for direction. This individual must have the authority to lead the team and make decisions without having to defer to others on the outside to resolve issues.

The importance of selecting the right person for this job can not be over emphasized. Choose someone who can make it happen; someone with proven leadership skills. Ideally it will be someone who has successfully managed similar implementations in the past or has been a member of comparable project teams. If no one suitable is available within the organization, it may be worthwhile to look toward other sources of help, such as external contractors.

**Establishing a Project Team**

The PPM oversees the efforts of the project team, which consists of people who are focused on the success of the project. Make sure the project team has sufficient manpower, but make it no larger than it needs to be to get the job done. The PPM should keep in mind that more is not always better, and that throwing more people at a project can often lengthen - not shorten - the process because of the need to get everyone oriented and coordinated in their efforts. The project team will encompass staff from other parts of the district and vendor representatives. Because of this it is important to make clear agreements up front about the percentage of each member’s time the project will demand. It is also important to give the project team the resources (money, time, equipment, and authority) it needs to get the job done.

**Appointing an Advisory Committee**

In order to encourage the spirit of collaboration and cooperation throughout the district you might also consider organizing an advisory committee. This group should meet periodically to review progress, and address the issues that can’t be dealt with effectively by the project team itself. Consider including:

- Users who will eventually have to accept and reap the benefits.
- A technical authority.
- Knowledgeable outside experts.

Remember, this technology is only a tool to solve the business problems experienced by people and doesn't implement itself; people implement technology.
Tip: Establish a realistic schedule for what, where, by whom and when each phase of the process will be done.

How Do You Develop A Pilot Project Implementation Plan?

Critical to making the team’s effort efficient and getting the job done is having a thorough and realistic project plan. Other documents prepared throughout the overall project will have covered the rationale for the project, the expected cost, the needs to be addressed, etc. The pilot project plan doesn’t need to repeat any of this. Instead, it should focus primarily on what is to be done, when, and by whom. As the project progresses, the plan should also reflect what has already been done, when and by whom.

Using Project Management Software

Use of Project Management Software will provide the team with a common communications platform that will keep everyone on the same page. It is useful for organizing the tasks, estimating effort, assigning responsibility, and establishing deadlines. Most project management software packages will aid projects by providing: integrated calendars, report generators, scheduling, charting, tracking, prioritizing and more.

Choose the package with the interface (look and feel) you prefer, and one that will function on whatever computer you expect to use for this purpose. The initial effort required to enter the data into PM software generally pays off many times as the work unfolds. If project team and steering committee members are connected on a network, PM software also makes it easier for them to view, comment on, and participate in the project on-line.

Scheduling Your Pilot Project

The project schedule serves as the organizational backbone to the effort. Its effectiveness is directly dependent on realistic goals which are attainable within the timeframe established. If the goals are unrealistic and deadlines are missed, later deadlines lose their credibility as well. Do not get caught in the trap of under-estimating the amount of time required to complete each task and make sure that the schedule takes task dependencies into account when setting the order. It is recommended that you build in at least a 10% contingency against each task to allow for slippage. Remember you are exploring new territory and there will be unforeseen elements that can affect timelines. This is especially true when your team depends upon external resources that are out of your control.

If your pilot involves the use of any contractors, it is recommended that you make the schedule an integral part of your contract. Some SIF Data Integration Projects are dependent upon the good will of each vendor involved. In these situations the risks are increased and you may want to add additional contingency to account for that. The entire team and advisory committee should be involved in the development of the schedule. It should cover each task, the effort required in person hours, by whom it will be done, and when it will be done for every phase in the implementation process. Any payment to outside contractors should be based on the submission of specific deliverable items according to an agreed upon schedule.

Other considerations when developing your pilot project schedule:

- Make sure that the project charter clearly defines what a successful pilot would look like.
- Based upon the possible outcomes of the pilot, the charter should spell out what the next steps will be.
- Closely examine other activities that could impact the pilot such as holidays, vacations, and other district events that could limit resource allocations at any time during the project.
- Don’t sacrifice quality in order to meet deadlines – be prepared to adjust the schedule.
- Watch out for projected dates (arrived at by detailed estimates) being overruled for "political" reasons, especially in the absence of additional resources.

The installation of hardware and/or software to support the data integration should first occur in a testbed environment. You will want to make sure that all of the components are working correctly before you move it into production. If you move to production too quickly, your applications could become polluted with bad data.
Monitoring the Progress of the Pilot

A key role of the project manager is to monitor progress on an ongoing basis. It works best to set up a routine where progress is reported on a weekly basis by the project team members to the project manager. Because a SIF data integration project involves vendors and internal district staff, it is recommended that weekly meetings be convened via conference call. This provides the means to have everyone affected to engage in solving problems and committing to appropriate tasks involved in resolution. The project manager then integrates these commitments into the plan to produce an overall status update for the project. Web-based message boards and other electronic communication tools are also helpful in keeping everyone informed and they provide a record of the conversations which can be useful both for documentation as well as in resolving recurring issues.

Handling Schedule Slippage

Murphy’s Law says: “If anything can go wrong, it will.” This is especially true when you are embarking on a project involving new technology. Plan for it.

All of the factors illustrated in the above example can lead to “schedule slippage.” The first and foremost rule you must practice in dealing with it is: honesty. If it’s occurring, don’t try to disguise it because the news will come out eventually. Breaking bad news gradually makes it more palatable than waiting to deliver a monumentally bad update all at once.

How Do You Make Sure the Data Integration is working?

Your integration pilot project is well underway. The student information system is talking to both the library system and lunchroom accounting. You are quickly approaching the day when your pilot data integration will be “complete.” How will you measure its success?

Fortunately the functional specifications you developed within the Requirements Document, will serve as the basis for your test plan. To verify the system’s completeness and proper functioning, test against each functional specification described. If the data integration pieces perform as expected, consider them complete.

Testing Issues Log

In order to manage the testing phase effectively, it is recommended that an Issues Log be maintained and made available to all members of the team. The following illustrates a tool that has been included within the SIF Implementation Toolkit that can serve as a log for managing testing issues.

### Murphy’s Law - Project Management

- **Logic is a systematic method of coming to the wrong conclusion with confidence.**
  - **Corollary:** Understand the business process knowing that it may be politically driven - not logical.
- **Whenever a system becomes completely defined, some fool will discover something which either abolishes the system or expands it beyond recognition.**
  - **Corollary:** Keep an eye on developer “creativity” and make sure everyone is following the SIF standards.
- **Technology is dominated by those who manage what they do not understand.**
  - **Corollary:** Don’t depend on management for technical decisions-make sure you’ve collaborated with the end users.
- **If builders built buildings the way programmers wrote programs, then the first woodpecker that came along would destroy civilization.**
  - **Corollary:** Don’t allow non-certified agents or zone integration servers to pollute your pilot implementation.
- **Tell someone there are 300 billion stars in the universe and they will believe you. Tell them a bench has wet paint on it and he’ll have to touch to be sure.**
  - **Corollary:** Great discoveries are made by mistake; don’t punish the pioneers.
- **If there is a possibility of several things going wrong, the one that will cause the most damage will be the one to go wrong.**
  - **Corollary:** If there is a worse time for something to go wrong, it will happen then.
- **Left to themselves, things tend to go from bad to worse.**
  - **Corollary:** If things go wrong, don’t practice denial. Deal with it immediately!!!
Data Integration Testing Pointers

Most testing issues will be reported at the weekly meeting. Some can be resolved quickly; while others will require additional research. To manage these, the following is recommended:

- Because of all the variables involved in a SIF Data Integration Project it can sometimes be difficult to identify the true source of an issue. Before pointing fingers, make sure all parties are involved in the initial issue identification.
- If the issue appears to be complex, assign the research to the appropriate individuals to resolve off-line with an agreement to communicate said problem identification and/or resolution to the team within an agreed upon timeline.
- Approach all issues with respect and professionalism. You must assume that everyone is doing the best they can within the constraints of time and knowledge at their disposal.
- Make sure the end user is the person responsible for testing and that they will be expected to sign off on each piece.

Testing the Data Integration

There are four important steps to conduct when your data integration is in place.

Hardware and software testing - Technical team members who are developing, integrating or customizing your data integration must include hardware and software testing as part of their routine work to verify that each product does what it was designed to do. Each component must be tested as it is brought on-line.

Integration testing - The fact that each component works in isolation doesn't mean the entire data integration will work. Applications need to be able to exchange information within a computer or over a network between multiple computers. The diagram on the right illustrates the multiple places where issues might arise.

A transaction may not be successfully delivered or received due to difficulties within a computer, application, agent, network, zone integration server, operating systems, or even human error. This makes problem resolution challenging but not impossible if your team is skilled, diligent and persistent.

Performance is another critical area that must be tested. You need to test the volume of transactions that the data integration can handle to determine what kind of limitations there might be and why. Refer back to the needs assessment for the expected volume of transactions each application might generate over a given period of time. Set up a test of sending and receiving...
transactions aligned to the “worst case” volume to make sure the data integration solution can handle it.

Quality Assurance Sign Off is the final step in the testing phase. Once the users are satisfied that all of the components are working together seamlessly, the project manager may deem the pilot has been successful. You should now be prepared to move from a pilot environment to production.

Moving From Pilot to Production

In the Pilot Implementation Project Charter you should have established what your next steps will be following a successful pilot installation. You might have decided to focus just moving the pilot site into production status or you are installing the software in multiple sites. In both cases, it is likely that there are users that will require training prior to installation.

Section VI
Conduct User Training

Objective: At the conclusion of this section you should be able to build and deliver an effective training curriculum to support your data integration installations.

Knowing How to Train Users

Districts implementing SIF should set up a training program to make sure that the affected staff understands the impact the data exchange has on information they use on a daily basis. They must also understand where the data is going to and coming from. As issues arise, they will need to effectively communicate with their peers and technology support staff to get resolution.

The training program should be designed so that it can be re-used as the SIF Standards evolve and the tools are upgraded to the next version. Standards are fluid and must be updated as needs change.

Who Should Receive Training?

Everyone within your district who has responsibility for maintaining pieces of data in your Enterprise Information Management System should receive training. The scope of this will vary in accordance to the applications that are being connected. For example, you might just be linking enrollment data from a student information system to the library automation system. This scenario would involve a limited set of users which would make development of your training plan a fairly easy exercise. However, you might be including a teacher grade book package in the integration which would involve a user audience that is much larger – teachers. In this case your staff development plan will be more complex and training may have to be provided in phases.

You should be able to derive a list of users to be trained from the needs assessment you did early on in the project. The type of training may vary in accordance to their job responsibilities.

- Administrative staff members, consuming information that is part of the data integration, will need to understand where it’s coming from. This includes individuals who may maintain information on a limited basis, such as personnel who enter information about enrolling students.
- High level administrators should also have a general understanding of the data integration and its impact on student information. They may never access these systems directly however, they will request information from them.
- Any additional technical support staff responsible for installing and maintaining your data integration technology infrastructure, will need specific technical training. Because they will be required to provide support, these individuals should also attend the various types of user training sessions. This will enable them to learn about potential problems and user needs that are related to both the data integration and the applications.
- Teachers using applications that have been linked using the SIF Integration Technology will also require training. These applications could include instructional management software that assists with record keeping (e.g., grades, attendance) or instructional software specifically designed for integration into classroom lessons.
**Tip:** Everyone who will be impacted by the data integration should be trained at some level, including students, teachers, administrators, administrative staff, and technical support staff.

**When Should Initial Training Be Provided?**

The schedule for training should be targeted to occur right before the data integration components are installed at a site. It is recommended that you leverage the pilot implementation for demonstration purposes.

Participants should be temporarily released from their regular responsibilities or you might offer classes outside of normal office hours. Be aware that scheduling training during school may require having to arrange for substitutes which may place additional financial burden on the project.

**Tip:** Most of the training should be delivered just prior to the data integration installation to make sure the knowledge is still fresh in people’s minds.

**What types of training are needed?**

Using SIF to share data among departments will contribute to the district achieving their established goals. When designing your training make this the backbone of your curriculum. This, along with the need to develop a high comfort level with the data integration will be essential to your training objectives.

Because you may be preparing training for users with multiple levels of technical skills, you may have to target the lowest common denominator. Another approach would be to divide the training into multiple groups in accordance to their level of understanding and experience. If you don’t have the luxury of developing and delivering separate training modules it is better to err on the side of being too basic.

The training materials you develop should be made available in both hard (paper) and soft (electronic) mediums. It is also recommended that you make them available through a web-site if that is possible. These materials are important because they give users something to refer to when they have questions after the training. In addition, examples of success stories of how the SIF Data Integration Technology is being used elsewhere might further motivate staff receiving training.

**When is additional training needed?**

Even though school districts are all about education, it is not uncommon that on-going training has not been given the attention it needs. This can lead to a project failure because the end users become frustrated and decide they have better things to do with their time. You need to plan for follow-on training on a periodic basis. In addition, you will want to provide additional training when changes occur in the SIF Standards and accompanying software tools. It is also important to have a plan for training new users.

In-service or planned staff development days are excellent opportunities to schedule training sessions or report on enhancements that will be coming along. Consider developing and publishing a frequently asked questions (FAQ) document on the web. If you choose to do this, make sure the owner is clearly established and updates are made each time a new question arises. This information resource will aid immensely by enabling users to solve their own problems thereby reducing the support burden on your technical staff.
Step VII
Supporting, Maintaining and Growing Your SIF Data Integration

**Objective:** Provide the knowledge necessary for growing and maintaining your SIF Data Integration Solution.

Your data integration is in production and the district is receiving the benefits of more timely, accurate, and comparable data. Individuals who used to spend a lot of time entering and reconciling data now have time to focus on providing services to students. People in the district responsible for other applications that need the information but are not connected are clamoring to join in.

Great strides have been made in standardizing instructional, financial, and human resource data using SIF. The next release of the SIF Standards holds the promise of connecting new generations of applications. This section will examine specific issues pertaining to the support, maintenance and growth in use of your data integration once it is in operation.

To manage and grow your data integration solution it is imperative that you understand the SIF Standards Development Process, schedule, and versioning that will occur with the associated tools. You must also share the impact of these changes with your user community and involve them in expansion and upgrade decisions.

For example, the following is a list of key ongoing support and maintenance issues:

- Providing for ongoing oversight of the data integration.
- Providing ongoing user support through help desks, documentation, and training.
- Reviewing usage measurements.
- Maintaining technology components.
- Monitoring system effectiveness.
- Upgrading software to new releases.
- Replacing and redeploying equipment.
- Finding qualified help.

There may be additional sites in the district desiring to emulate the implementation you already have in production. At the same time, you may get requests to link add another application to the Zone. Unless you are allocated additional resources, you can’t do both. To solve this dilemma, you must collaborate with others in the planning for ongoing maintenance and timely support.

**Tip:** Because the data integration is an enterprise-wide asset, a district steering committee should be convened to assist in planning for enhancements and growth of the data integration.

**Who Should Serve On A Data Integration Steering Committee?**

Clearly you know by this time the individuals most interested and excited about the data integration. Many of them are already at your doorstep asking what is next. They should be made an integral part of the solution by advising you on these issues.

To create a data integration steering committee you should look for a good mix of members. You will want to recruit savvy users and technical staff that are respected by them. Be careful to include individuals that you can rely upon on to independently follow through with any assignments they might be given. Consider representation from both the Pilot Project Team and their advisory committee along with potential new users.

**How Do You Manage The Data Integration Steering Committee?**

Over time the make up of your data integration user community will change and this should be accommodated by the steering committee to ensure representation. You might want to rotate part of your membership on an annual basis. You do not want to replace everyone otherwise you will lose the institutional knowledge that is critical to their success.
Meetings should be scheduled on a regular basis in accordance to the need for collaboration on issues. This will vary depending on how ambitious your implementation schedule is. Make sure you have an agenda that is published well in advance. This will enable your members to do any research or fact finding prior to the meeting which will result in more effective use of everyone’s time.
Appendix A

Example Project Charter

Boomtown School District Data Integration

Project Charter

Overview

Project Purpose
The purpose of the Boomtown District Data Integration Project is to build the necessary infrastructure to facilitate data synchronization between administritive applications that need to share student information.

Project Scope
The scope of the project involves the following:

- Conduct a Needs Analysis to determine opportunities for dynamic electronic data sharing of student information.
- Develop Functional Requirements aligned to the identified needs in order to identify the tools and implementation strategy best suited to the school district.
- Develop a data integration implementation strategy and deployment plan.

Project Objectives
The objectives of the project are:

- Harmonized student records that will enable access to timely, accurate, and comparable information about children that will result in improved decision making at the classroom, school, district, state, and federal levels.
- To make more efficient use of scarce staff resources through streamlining the maintenance of student information.
- To improve quality and timeliness of service to students, families and staff.
- To leverage investment in application software and network technology.
- To eliminate duplicate student records across systems.

Assumptions

- The district will appropriate staff time and the financial resources necessary to conduct the project.
- The Schools Interoperability Framework organization will continue to develop and maintain the standards to meet district needs.
- Software vendors will create solutions that are compliant with SIF data standards.
- The district recognizes the value of information resources as a mission critical commodity necessary to successfully educate children.

Approvals
The Superintendent and the management team will collaboratively approve this Project Charter in its final release.

Approval of this document will be confirmed through the distribution of the document to all project stakeholders.
References

- Information on Schools Interoperability Framework (SIF), a component of the proposed architecture, is available at http://www.sifinfo.org/.

In most cases, this document does not re-state the information contained in the documents specified above. It is, therefore, recommended that the reader of this document refer to the other documents for additional information.

Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools Interoperability Framework (SIF)</td>
<td>An industry led initiative to develop an open specification using XML technology for ensuring that K-12 instructional and administrative software applications work together more effectively.</td>
</tr>
<tr>
<td>Extensible Mark-Up Language (XML)</td>
<td>Extensible Markup Language (XML) is a subset of SGML. Its goal is to enable generic SGML to be served, received, and processed on the Web in the way that is now possible with HTML. XML has been designed for ease of implementation and for interoperability with both SGML and HTML.</td>
</tr>
<tr>
<td>Zone Integration Server (ZIS)</td>
<td>Server software that manages the exchange of SIF messages by communicating with SIF Agents.</td>
</tr>
<tr>
<td>SIF Agent</td>
<td>A vendor provided interface program that connects products from various vendors together. When an application makes a change in one of the SIF objects, its agent will generate an Event message containing the changes that were made. The Zone Integration Server will receive this event and propagate it to all the other agents that are interested in updates to that particular object.</td>
</tr>
<tr>
<td>SIF Agent</td>
<td>The SIF Agent is a smart application that knows how to translate the data records to and from standard SIF objects.</td>
</tr>
</tbody>
</table>

Project Approach

The project will be broken into stages, and risk will be minimized by approaching project activities in a staged manner, adding successive complexity and detail to the project activities over the project life cycle.

3. Project Deliverables and Quality Objectives

This project will provide the following key deliverables which will be contained in a final report developed by the team.

Internal project deliverables will include:

- Weekly status meetings.

- Progress status reports will be published on a weekly basis in the form of meeting minutes organized in alignment to the project plan.
The overall project review, including lessons learned, will be developed at the end of the project with input from all project team members.

Project-oriented deliverables will include:

- Needs Assessment
- Functional Requirements
- Implementation Strategy
- Deployment Plan

4. Roles and Responsibilities.

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibility</th>
<th>Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager</td>
<td>Coordinates all aspects of the project ensuring that events and tasks occur when scheduled and are successfully accomplished.</td>
<td></td>
</tr>
<tr>
<td>Project Executive Sponsor</td>
<td>Decision-maker for Boomtown Public Schools.</td>
<td></td>
</tr>
<tr>
<td>Integration Consultant</td>
<td>Technical resource providing the district with guidance and direction targeting successful deployment of the data integration technology.</td>
<td></td>
</tr>
<tr>
<td>Business Analyst</td>
<td>Works with the Integration Consultant to collect, analyze and process information relative to needs analysis and requirements definition.</td>
<td></td>
</tr>
</tbody>
</table>

5. Dependencies.

The most critical dependency within the scope of this project is our reliance on timely and effective communication and support from the user community. Business priorities and technical barriers may prevent them from adequately participating in the project. These risks must be identified and an approach to address them should be included in the Risk Management section of the Charter.

6. Plans for Support Activities

Training: Project team members must have familiarity with the concepts technology proposed for this project. Business area representatives on the project may not have the same level of familiarity so an internal workshop should be conducted early in the project to explain the technology concepts and details to them.
Quality Assurance. User walkthroughs will be conducted upon completion of the first draft of each deliverable in order to ensure the information gathered and analyzed is accurate.

Documentation Support. Team members will be responsible for preparing the content of project deliverables. Clerical support will be provided for formatting and subsequent publication.

7. Project Resources and Facilities

External Staff Resources. Due tight time constraints, it is recommended that the district engage the services of an integration consultant with successful experience in implementing data integration technologies in a large organization.

Internal Staff Resources. The implementation team will require a full time business analyst to work with the integration consultant to identify needs and develop the data integration requirements. It is estimated that the project manager will dedicate 10% of their time towards management of the project.

Facilities. The team will require office and meeting space in order to conduct the work necessary.

8. Risk Management

The key risks identified for this project and the mitigation responses are identified below.

Staff Availability. As mentioned earlier in the document, we have a strong dependency on the selected staff to work within the schedule of this project to provide the support we require. Their own business priorities and technical barriers may limit their ability to participate. To mitigate this it is suggested that an early kick-off meeting with each of the identified users to gain their commitment by providing them with a detailed work plan of their required participation.

Following approval of the Project Charter, the Project Manager will work with the project team to identify, analyze, track and control risks throughout the duration of the project. The risks identified above, along with any additional risks, will be documented and managed in the project Risk Management Plan, which will be published.


We will be following the project life cycle approach allowing for minimal documentation and implementation preparation within the context of the pilot project activities. No deviations from this approach are being considered for this project.

10. Stages.

This project is being conducted in a staged approach, with each successive stage including additional levels of detail.

- Project Planning and Kick-off
  
  Build the project plan and kick-off the project.

- Stage 1: Education & Research
  
  Educate the team on the Schools Interoperability Framework standards and tools. Conduct research on the current state of information systems in the district. Determine the users to be consulted for collecting needs.

- Stage 2: Needs Analysis
  
  Collect, analyze, and prioritize data sharing needs from appropriate staff.
• Stage 3: Functional Requirements

    Based upon findings from the Needs Analysis, develop the functional requirements to support the expressed needs.

• Stage 4: Implementation Strategy

    Develop an implementation strategy that will be manageable for the district taking into consideration financial and time constraints.

• Stage 5: Deployment Plan

    Develop a deployment plan that operationalizes the implementation strategy.

11. Project Control

    Due to the short timeframe of this project, project control procedures have been kept to a minimum to facilitate a timely completion of the deliverables. Project Management software will be used to develop the project plan and to track and report on actual progress. Project Status reports will be provided on a weekly basis in the form of meeting minutes.

12. Project Schedule.

    This project is expected to be complete within 3 months of initiation. It is anticipated that deployment will occur shortly thereafter.
Appendix B
Readiness Assessment

READINESS SURVEY  The survey on the following pages is designed to measure individual perceptions about your district’s readiness for a data integration initiative. Read each statement in the survey and mark the response which most closely describes how you feel about that statement. The possible responses are:

1. **Strongly Disagree** - I am certain that this statement does not accurately describe my district and/or school.

2. **Disagree** - I do not believe that the statement describes my district and/or school.

3. **Neutral** - I am unsure of my district’s position with respect to the statement, have no opinion about the statement, or do not understand the meaning of the statement.

4. **Agree** - I believe that the statement describes my district and/or school.

5. **Strongly Agree** - I am certain that the statement accurately describes my district and/or school.

**Leave Blank** - I do not know how to respond.

Mark one, and only one, response for each statement or leave it blank. Work through the survey quickly, as your initial reactions provide the best measures for readiness assessment.
<table>
<thead>
<tr>
<th>Readiness Survey Item</th>
<th>1 strongly disagree</th>
<th>2 disagree</th>
<th>3 neutral</th>
<th>4 agree</th>
<th>5 strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I understand and support the business goals for the data integration project.</td>
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<tr>
<td>2 I understand the term “business process.”</td>
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<td></td>
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<tr>
<td>3 Our district has a formal data integration development methodology.</td>
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<tr>
<td>4 The staff understands the important role of information in business processes.</td>
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<tr>
<td>5 I know who is sponsoring our data integration initiative.</td>
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</tr>
<tr>
<td>6 The schools are ready and willing to participate in the data integration project.</td>
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<tr>
<td>7 Our Information Technology (IT) organization understands the business role of the data integration.</td>
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<tr>
<td>8 The IT organization has the knowledge and skills to support the data integration project.</td>
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</tr>
<tr>
<td>9 The schools and district office can identify and name the products and data to be integrated.</td>
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<tr>
<td>10 The sponsor of the data integration initiative is an executive over an area that will be directly affected.</td>
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<td></td>
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<tr>
<td>11 The IT organization understands the concept of business process re-engineering.</td>
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</tr>
<tr>
<td>12 I understand the business drivers that generate interest in and desire for data integration.</td>
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<td></td>
</tr>
<tr>
<td>13 The sponsor knows what is needed by the IT organization for a successful data integration project.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 The IT organization has established standards compatible with the data integration development methodology.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15 I can identify the main work flow processes in our business.</td>
<td></td>
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</tr>
<tr>
<td>16 The schools are prepared to assume an active role in implementing the integration technology.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>17 The sponsor will do whatever is necessary to ensure success of the data integration initiative.</td>
<td></td>
<td></td>
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<tr>
<td>18 I understand the kinds of results that must be produced by the data integration project.</td>
<td></td>
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</tr>
<tr>
<td>19 The schools and district are able to describe data sharing needs that are not currently being satisfied.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>20 The sponsor will ensure that the data integration methodology serves as an information resource “owned” by the appropriate school and district personnel.</td>
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<td></td>
</tr>
<tr>
<td>Readiness Survey Item</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>-----------------------</td>
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<td>---</td>
</tr>
<tr>
<td><strong>21</strong></td>
<td>I understand my role and responsibilities in the data integration initiative.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>22</strong></td>
<td>The IT organization will help to obtain and support the data integration technology.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>23</strong></td>
<td>School and district personnel understand their roles and responsibilities in the data integration initiative.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>24</strong></td>
<td>The school and district staff involved in the project can describe themselves in terms of business process responsibilities.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>25</strong></td>
<td>I believe that the data integration project can help achieve the district’s overall goals.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>26</strong></td>
<td>The sponsor will ensure that the school and district personnel have both time and responsibility to lead the data integration project.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>27</strong></td>
<td>The sponsor has a full and active interest in the success of the data integration initiative.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>28</strong></td>
<td>I understand the data integration methodology being deployed.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>29</strong></td>
<td>I understand the role of information in executing district business processes.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>30</strong></td>
<td>The school and district staff are prepared to lead the initiative and assume ownership of the data integration.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>31</strong></td>
<td>The sponsor has a good working relationship with the IT organization.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>32</strong></td>
<td>Our IT organization actively supports data integration for the right business reasons.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>33</strong></td>
<td>The IT organization focuses applications toward support of school and district business processes, not discrete units.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>34</strong></td>
<td>I believe that the sponsor understands the cost and effort required to accomplish data integration throughout the district.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>35</strong></td>
<td>Our IT organization can ensure the quality of data integration deliverables.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>36</strong></td>
<td>The district and school personnel know the users of all products to be integrated.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>37</strong></td>
<td>I understand the role of data integration in changing business processes.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>38</strong></td>
<td>The sponsor understands how the staff will be affected when the data integration is operational.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>39</strong></td>
<td>The IT organization is committed to selection of technology that helps the district achieve its mission and goals.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td><strong>40</strong></td>
<td>Critical decision support needs cannot be met without linkages between the district’s operational databases.</td>
<td>strongly disagree</td>
<td>disagree</td>
<td>neutral</td>
<td>agree</td>
</tr>
<tr>
<td>Readiness Survey Item</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>-----------------------</td>
<td></td>
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</tr>
<tr>
<td><strong>41</strong></td>
<td>The sponsor understands the changes that must occur for an IT organization to build and support a data integration methodology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>42</strong></td>
<td>I understand the role of business processes in producing information.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>43</strong></td>
<td>District and school staff understand that the data integration may change how they do their jobs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>44</strong></td>
<td>The IT organization is willing to provide support in a project led by the business organizations of the district.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>45</strong></td>
<td>The sponsor understands the time and resource demands that data integration will initially place on the district and school staff involved in the project.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>46</strong></td>
<td>I have previous experience using some type of data integration methodology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>47</strong></td>
<td>The IT organization can adapt the methodology to fit needs unique to our project.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>48</strong></td>
<td>I believe that the sponsor has established realistic goals for the data integration.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>49</strong></td>
<td>The sponsor understands and values the role of this integration technology in meeting district objectives.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>50</strong></td>
<td>I am prepared to do whatever is asked of me to achieve data integration success.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>51</strong></td>
<td>The district and school staff envision how their information needs will be translated into a data integration solution.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>52</strong></td>
<td>The IT organization understands the planned district business roles of the data integration solution.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>53</strong></td>
<td>The IT organization worked with all appropriate district and school staff to develop the data integration strategy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>54</strong></td>
<td>I understand the value of information when managing district business processes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>55</strong></td>
<td>The district business units openly share information across organizational lines.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>56</strong></td>
<td>The IT organization is prepared to support the data integration when it is operational.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>57</strong></td>
<td>The sponsor will help the IT organization acquire needed skills, knowledge, and technology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>58</strong></td>
<td>The district business units understand the need for a data integration methodology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>59</strong></td>
<td>Affected district business units believe in and support the data integration initiative.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>60</strong></td>
<td>Our IT organization effectively supports changing district business requirements.</td>
<td></td>
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</tr>
</tbody>
</table>
SCORING THE SURVEY

The following process describes the steps needed to manually score readiness survey results, and to perform analysis of those results.

This Toolkit provides a scoring spreadsheet to enhance the readiness assessment process. To use the spreadsheet enter the survey responses, filling one column for each survey. (Note: a blank item on the survey is scored as a zero.) Also enter the total number of completed readiness surveys. The spreadsheet is designed to perform all of the scoring calculations, and to view the results as a set of analysis tables and graphs.

Data Integration Readiness Tool Kit - Excel Version

This Tool Kit contains the Data Integration Readiness Tool Kit. The following documents are included in the DI Readiness Tool Kit:

Data Readiness Survey – Word Document named “Readiness Survey.doc”
Analysis Spreadsheet Template – Excel workbook named “DIREADAnalysis.XLW”.

Two sets of sample data – Excel workbooks named “surveyscore.XLW” and “surveyscorebyquest.XLW”.

Use the worksheet on the next page to manually score surveys. You’ll develop twelve separate scoring results (the right-most column of the matrix) following these steps:

1. Transfer responses from the survey sheets to the scoring matrix, matching survey statement numbers with the numbers of the cells in the scoring matrix. When scoring a single survey, enter the response from that survey. When scoring multiple surveys, enter the average of all responses for each statement number.

2. Sum the averages across each row in the scoring matrix, and record the sum in the total column.

3. Divide each row total by 5 to calculate an average for each row. Record the average in the right-most column of the scoring matrix.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>total</th>
<th>avg 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>25</td>
<td>37</td>
<td>50</td>
<td></td>
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<tr>
<td>2</td>
<td>22</td>
<td>32</td>
<td>44</td>
<td>56</td>
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<td></td>
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<td>17</td>
<td>27</td>
<td>34</td>
<td>48</td>
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<td>31</td>
<td>41</td>
<td>49</td>
<td>57</td>
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<td>20</td>
<td>26</td>
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<td>45</td>
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<tr>
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<td>18</td>
<td>21</td>
<td>28</td>
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<td></td>
</tr>
<tr>
<td>12</td>
<td>24</td>
<td>36</td>
<td>43</td>
<td>55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MEASURING YOUR DATA INTEGRATION READINESS

Now, use the results from the survey scoring matrix to develop a profile of your data integration readiness. Complete the readiness measurement table and readiness rating worksheet on the next page, following these steps:

1. Transfer the averages from the scoring matrix into the unshaded cells in the center of the measurement table. Match the cell numbers to place the averages into the correct cells. (Avg 1 is placed in the cell marked (1), Avg 2 is placed in the cell marked (2), . . .)

2. Sum the averages across each row, then multiply by the weighting factor shown in the row score cell. Record each result in the correct row score cell.

3. Sum the averages down each column, then multiply by the weighting factor shown in the column score cell. Record each result in the correct column score cell.

4. Follow the instructions contained in the readiness rating worksheet, to calculate an overall measure of your data integration readiness.
### READINESS MEASUREMENT TABLE

<table>
<thead>
<tr>
<th>People Readiness</th>
<th>Information Technology Readiness</th>
<th>Business Readiness</th>
<th>row scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[1]</td>
<td>[2]</td>
<td>[3]</td>
</tr>
<tr>
<td><strong>Business Imperative</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td><strong>Executive Sponsorship</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7)</td>
<td>(8)</td>
<td>(9)</td>
</tr>
<tr>
<td><strong>Data Integration Development Method</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(10)</td>
<td>(11)</td>
<td>(12)</td>
</tr>
<tr>
<td><strong>Business Process Orientation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>column scores</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(wt 1.5)</td>
<td>(wt 1.5)</td>
<td>(wt 2.0)</td>
</tr>
</tbody>
</table>

### READINESS RATING WORKSHEET

(a). Sum the four row scores and enter the total here

(b) Sum the three column scores and enter the total here

(c) Sum lines (a) and (b) and enter the result here

(d) Divide the amount on line (c) by 2

This is your overall Readiness Rating
Use the scale on the following page to evaluate the meaning of your overall readiness rating. Data integration can be a complex undertaking that requires careful planning and specific attention to risk management. This assessment can help to determine appropriate next steps for your organization based upon the level of readiness.

Examine individual row and column scores from the measurement table to help identify specific areas of strength and risk. Tailor your data integration initiative plans to leverage the strengths and mitigate the risks.

The assessment steps described above provide only a very high-level look at your organization’s readiness for data integration. Deeper analysis of the data, particularly evaluating the spread of multiple responses to a single survey statement, yields greater understanding. Extended analysis helps to discover:

- **Strengths** - Statements where the ratings are consistently high (all fours and fives) are indicators of organizational strengths. Adapt data integration initiative plans to recognize and leverage strengths.

- **Weaknesses** – Statements where the ratings are consistently low (zero, one, and two) indicate areas of weakness. Adjust plans to minimize impacts while gaining strength in these areas.

- **Risks** – Statements where ratings are widely divergent, ranging from high to low, indicate areas of disagreement among the team. Widely varied perceptions indicate areas of potential risk. Further explore these areas to understand the reasons for diverse beliefs. Work to build consensus, and adjust plans to mitigate any inherent risks.
<table>
<thead>
<tr>
<th>Readiness Level</th>
<th>Readiness Rating</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>91 – 100</strong></td>
<td><em>Integrated:</em> Data integration is used as an integral part of the district business processes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Point-Solution:</em> Data integration is used as a point-solution to meet local and specific information needs.</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td><strong>76 – 90</strong></td>
<td><em>First Increments:</em> The district is ready to build the data integration in increments, while learning from each project.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Prototyping:</em> The district is ready to try a pilot and/or proof-of-concept project as a learning experience.</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td><strong>46 – 75</strong></td>
<td><em>Investigating:</em> The district needs more education, investigation, and understanding to proceed.</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>26 – 45</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1</strong></td>
<td><strong>0 – 25</strong></td>
<td></td>
</tr>
</tbody>
</table>