AN INFRASTRUCTURE AND A METHODOLOGY FOR BUSINESS PROCESS MANAGEMENT

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ABSTRACT

AN INFRASTRUCTURE AND A METHODOLOGY FOR BUSINESS PROCESS MANAGEMENT

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This thesis explains in detail an infrastructure and a methodology for business process management as BPM requires much more of a partnership between business and IT. With the proper methodology the business will get the strategy defined so that IT can create the best infrastructure for the situation.

The Infrastructure has been created utilizing the 5 step approach defined in the methodology explained in detail further down in the document. The Infrastructure has been includes a network of Microsoft products such as operating systems, applications and tools. The network is a fully operating small domain of servers and client machines. Once the environment was deployed and ready, an application is created using the Visual Studio .net 2003, as a sample implementation.

This infrastructre demonstrates how to implement a BPM solution to any organization using the processes defined in this thesis.

ÖZET

AN INFRASTRUCTURE AND A METHODOLOGY FOR BUSINESS PROCESS MANAGEMENT

GÜÇLÜ, T. Kamil

Bu döküman iş süreç yönetiminin altyapısı ve metodolojiyi detay olarak anlatıyor çünkü BPM İş ve Bilgi Teknolojileri arasındaki ortaklıktan daha fazlası gerektiren bir süreç yönetimidir. Doğru metodoloji ile İş'te belirli bir strateji uygulanırsa , Bilgi Teknolojileri o iş için en iyi altyapıyı kurabilir.

Metodolojinde anlatılan 5 adımlık yaklaşım kullanarak bu altyapı yaratıldı. Altyapı Microsoft işletim sistemleri, uygulamalar ve araçlar gibi ağ ürünleri içeriyor. Bu ağ, sunucular ve istemciler ile çalışan küçük bir domaindir. Gerekli ortam hazırlandığında, Visiul Studio 2003 kullanılarak örnek bir uygulama oluşturuldu.

Bu tez, burada anlatılan yöntemlerle, herhangi bir şirketin, bir BPM çözümünü nasıl uygulayacağını gösterir.

to my wife

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TABLE OF CONTENTS

ABSTRACT 3

ÖZET 4

ACKNOWLEDGEMENTS 6

TABLE OF CONTENTS 7

LIST OF FIGURES 10

LIST OF TABLES 12

1 OVERVIEW 13

1.1 Introduction 13

1.2 What is Business Process Management – BPM? 13

2 BPMS METHODOLOGY 15

2.1 Manual for implementing a BPMS 15

2.2 PHASE 1 – MOBILIZATION 15

2.2.1 Objectives 15

2.2.2 Methodology processes 15

2.2.3 Conclusion 16

2.3 PHASE 2 - BUSINESS SYSTEM EVALUATION 16

2.3.1 Objectives 16

2.3.2 Methodology processes 16

2.3.3 Conclusion 17

2.4 PHASE 3 - BUSINESS SYSTEM REDESIGN 17

2.4.1 Objectives 17

2.4.2 Methodology processes 18

2.4.3 Conclusion 18

2.5 PHASE 4 - IMPLEMENTATION PLANNING 18

2.5.1 Objectives 18

2.5.2 Methodology processes 19

2.5.3 Conclusion 19

2.6 PHASE 5 - IMPLEMENTATION 19

2.6.1 Objectives 19
2.6.2 Methodology processes 20
2.6.3 Conclusion 20
3 BPMS INFRASTRUCTURE 21
3.1 Architecture Based on Existing Tools 21
3.1.1 Introduction 21
3.1.2 Selected Existing Tools 22
3.1.3 A New Paradigm 22
3.1.4 Microsoft Technology for BPM 23
3.1.5 BizTalk Server 2004 25
3.1.6 Office 2003 27
3.1.7 Exchanging Information 29
3.1.8 Bringing the pieces together 29
3.1.9 Understanding BPEL 31
3.1.10 Business Rules in Business Processes 32
3.1.11 BPM and the Service Oriented Architecture 33
3.1.12 Operational Support for BPM Technology 33
3.2 Configuring selected tools for BPM 35
3.2.1 Architecture Overview 35
3.2.2 Installation Steps 35
3.2.3 Detailed Instructions 40
3.2.4 Connection Tip: 48
3.2.5 Databases: 48
3.2.6 Load Balancing 50
3.2.7 Installing MSMQ and MSMQT on a BizTalk Server 51
3.2.8 Hardware Requirements 53
3.2.9 Update to Installation Steps 54
3.3 EXAMPLE APPLICATION 57
3.3.1 Methodology - An example application of a BPMS definition using the defined infrastructure 57

3.3.2 Infrastructure - An example application of a BPMS definition using the defined infrastructure 59
3.3.3 Prerequisites 59
3.3.4 Steps for Creating the Example 60
4 CONCLUSION AND RECOMMENDATIONS FOR FUTURE WORK 96
REFERENCES 97
APPENDIX A ABBREVIATION 98

LIST OF FIGURES

FIGURE TITLE PAGE

Figure 3.1 Installation and Configuration Steps-1 36

Figure 3.2 Installation and Configuration Steps-2 37

Figure 3.3 Installation and Configuration Steps-3 38

Figure 3.4 Installation and Configuration Steps-4 39

Figure 3.5 Organize Prerequisites for Multiple Installs 40

Figure 3.6 Installing BizTalk Server 2004 Development Tool-only 44

Figure 3.7 Current Purchase Process 57

Figure 3.8 Purchase Order to-be Process 58

Figure 3.9 Creating the Strong Name Key File 60

Figure 3.10 Create an Empty Biztalk Project 61

Figure 3.11 Associating the key file with assembly 62

Figure 3.12 Create an XSD Schema 63

Figure 3.13 Target Namespace 63

Figure 3.14 XSD TowerOrderProcess-1 64

Figure 3.15 XSD TowerOrderProcess-2 65

Figure 3.16 XSD Property Schema, Code. 66

Figure 3.17 Promoted Amount 67

Figure 3.3.18 Sharepoint Server Site 2 69

Figure 3.19 Team Web site 69

Figure 3.20 Team Web site 2 70

Figure 3.21 New Document Library 71

Figure 3.22 Configuring SharePoint Security 73

Figure 3.23 Creating Receive Ports 74

Figure 3.24 Creating Receive Locations 75

Figure 3.25 Send Port Properties window 77

Figure 3.26 Pipeline Drop-Down list, XML Transmit. 77

Figure 3.27 Enabling Receive Location 78

Figure 3.28 Creating new Document Library ... 79
Figure 3.29 Data Source Wizard ... 80
Figure 3.30 Data Source Task Pane. ... 81
Figure 3.31 Modify SharePoint Document Libraries ... 82
Figure 3.32 Modify the Destination Document Library ... 83
Figure 3.33 Creating the Orchestration ... 83
Figure 3.34 Adding Receive Port to the Orchestration ... 84
Figure 3.35 Port Binding Screen ... 85
Figure 3.36 Decide Shape ... 87
Figure 3.37 Order Process > 1000 ... 88
Figure 3.38 Port Properties ... 88
Figure 3.39 Port Types ... 89
Figure 3.40 Port Binding ... 89
Figure 3.41 Create Approval ... 90
Figure 3.42 Creating a New Expression ... 91
Figure 3.43 Expression Configuration ... 92
Figure 3.44 Create an InfoPath Form to Send through the System. ... 94

LIST OF TABLES

TABLE TITLE PAGE

Table 3.1 User Accounts & Groups for BizTalk Server 41

Table 3.2 Databases Created by BizTalk Server 2004 49

Table 3.3 MSMQ Protocols & Ports.. 50

Table 3.4 Infrastructure Used for This Laboratory... 53

Table 3.5 New Expression 90

Table 3.6 Construct Shape 92

1 OVERVIEW

1.1 Introduction

A business is a collection of processes objects that represent the typical business activities performed that produce value, serve customers and generate income. Managing these processes is the key to the success of an organization. Hence "An Infrastructure and a Methodology for Business Process Management" is very important to an organization in our current world.

Unfortunately, most organizations are not set up to manage processes. Instead they manage tasks. As a result, their staff is unaware of their role in the "bigger" picture, often expending effort in the wrong areas. Waste and inefficiency creeps into the business process, leading to declining profits, productivity and competitive advantage.

For an organization to overcome this gap they will need to design their infrastructure and a methodology for BPM. This thesis will first define an architecture based on existing tools. Secondly it will talk about configuring these tools for BPM. It will also provide a manual for implementing a BPMS for a particular organization using the infrastructure. And it will have an example application of a BPMS definition using the infrastructure for demo purposes.

The methodology provided in this thesis ensures that a organizations processes have visibility and the accountability for their execution is assigned to the organizations staff, by building comprehensive process models that can be deployed in WEB ready or traditional hardcopy formats.

1.2 What is Business Process Management – BPM?

Business Process Management or BPM is the practice of improving the efficiency and effectiveness of any organization by automating the organization's business processes. BPM used to be also known as Business Process Reengineering (BPR).

Many companies have business processes that are unique to its business model. Since these processes tend to evolve over time as the business reacts to market conditions, the BPM solution you choose must be easily adaptable to the new conditions and requirements and continue to be a perfect fit for the company.

In order to use BPM effectively, organizations must stop focusing exclusively on data and data management, and adopt a process-oriented approach that makes no distinction between work done by a human and a computer.

The idea of BPM is to bring processes, people and information together. Dynamic infrastructure requires separation of flows, business rules and services. Identifying the business processes is relatively easy. Breaking down the barriers between business areas, and finding owners for the processes is difficult.

BPM not only involves managing business processes within the enterprise but also involves real-time integration of the processes of a company with those of its suppliers, business partners, and customers. BPM involves looking at automation horizontally instead of vertically. Business Activity Monitoring (BAM) is essential for measurement of BPM impact.

2 BPMS METHODOLOGY

2.1 Manual for implementing a BPMS

The Business Reengineering Methodology is a complete life cycle approach to identify and implement business process and infrastructure support redesigns for business processes of a company. It is comprehensive and complete, addressing such activities as organizing the project, assessing the current business process, designing the reengineered business process, planning the implementation and implementing the business solutions.

The methodology is divided up into five phases, comprising thirteen methodology processes, forty-two activities, and over 250 tasks. Sixteen major deliverables are defined, and over ninety outputs comprising those deliverables are outlined, and supported by over 150 examples from actual business reengineering projects. A brief overview follows:

2.2 PHASE 1 – MOBILIZATION

2.2.1 Objectives

The major objectives in performing this phase are to lay the groundwork for managing client expectations, gain early definition of the business process under review, gain early client commitment to the business reengineering process, identify the areas of greatest need and opportunity for reengineering, address any critical issues, and begin preparing for the impact of change.

2.2.2 Methodology processes

The Mobilization Phase contains three methodology processes.

Organize Project:

The first process, Organize Project, ensures that a clear understanding as to the project scope, objectives, deliverables, and other areas exists between the client and the project team.

Establish Enterprise Reengineering Program:

The second process, Establish Enterprise Reengineering Program is used to develop an overall plan for business reengineering in the company, establishing a case for action, a governance structure for subsequent projects and partitioning the enterprise into manageable, prioritized projects.

Develop Change Management Program:

The third process, Develop Change Management Program, recognizes that the management of change is a critical factor for the successful implementation of business reengineering recommendations, and develops the change management program early in the overall project life cycle.

2.2.3 Conclusion

The phase ends with a management sign-off of the overall project definition, project and plan, the enterprise reengineering plan and the change management program.

2.3 PHASE 2 - BUSINESS SYSTEM EVALUATION

2.3.1 Objectives

This phase essentially performs almost the entire data gathering required to address the subsequent reengineering of the business processes. The four processes are not conducted sequentially, but are conducted in more of a parallel fashion.

2.3.2 Methodology processes

The Business System Evaluation Phase contains four methodology processes:

Measure Service Quality:

The first process, Measure Service Quality, addresses customer and supplier service quality levels and their impact on the business process.

Evaluate Current Processes:

The second process, Evaluate Current Processes, looks at the business process itself, and develops the detailed documentation and analysis that forms the basis for identifying process-oriented reengineering opportunities.

Assess Information Technology:

The third process, Assess Information Technology, identifies the impact on the information technology infrastructure on the business process.

Assess Infrastructure:

The fourth process, Assess Infrastructure, identifies the impact on the business process of external and internal factors ranging from the regulatory environment to business policies to organizational and human factors.

2.3.3 Conclusion

The processes are brought to a conclusion simultaneously in a major milestone, the Phase 2 management review.

2.4 PHASE 3 - BUSINESS SYSTEM REDESIGN

2.4.1 Objectives

This phase essentially performs all of the reengineering activity and produces the recommendations to establish the new business processes and effectively support them with information technology and internal infrastructure capabilities.

2.4.2 Methodology processes

The Business Redesign phase contains three major methodology processes:

Redesign Business Processes:
The first process, Redesign Business Processes, utilizes the redesign workshops and information gathered in Phase 2 to develop change ideas, analyze change feasibility, and create the new business process.

Redesign Information Technology:
The second process, Redesign Information Technology, identifies the information technology components required to support the reengineered process, and maps those requirements against the current level of IT support to identify the magnitude of IT change required.

Redesign Infrastructure:
The third process, Redesign Infrastructure, maps the reengineering recommendations against the internal infrastructure (jobs, organization, policy, management systems, recognition and reward systems) to determine the recommended changes in those areas.

2.4.3 Conclusion

Phase 3 concludes with an important management review in which the recommendations are reviewed for implementation approval.

2.5 PHASE 4 - IMPLEMENTATION PLANNING

2.5.1 Objectives

This phase essentially performs overall implementation plan with defined reengineering projects.

2.5.2 Methodology processes

The Implementation Planning phase contains three methodology processes;

Establish Performance Requirements:
The first process, Establish Performance Requirements, identifies the resources required to perform the new business process, and establishes the business performance objectives of the new process.

Plan Continuous Improvement:
The second process, Plan Continuous Improvement, addresses the need to establish mechanisms to sustain the reengineering gains, and make additional gains.

Develop Implementation Plan:
The third process, Develop Implementation Plan, addresses the cost/benefit aspect of the reengineering recommendations, defines the implementation projects, and defines an overall implementation plan.

2.5.3 Conclusion

The phase concludes with an important management presentation, presenting the overall implementation plan with defined reengineering projects and anticipated benefits.

2.6 PHASE 5 - IMPLEMENTATION

2.6.1 Objectives

This phase essentially performs the implementation of the plan that was approved from phase 3.

2.6.2 Methodology processes

The Implementation phase contains two methodology processes;

Implement Business Solution:
The first process, Implement Business Solution, initiates, conducts and manages the implementation of the reengineering recommendations through a defined plan of implementation projects, including prototyping, piloting and roll-out.

Conduct Post-Implementation Review:
The second process, Conduct Post-Implementation Review, conducts an assessment of the results of completing key projects to identify what further changes may be necessary to fully achieve targeted benefits.

2.6.3 Conclusion

The phase concludes with a sign-off from the management.

3 BPMS INFRASTRUCTURE

3.1 Architecture Based on Existing Tools

3.1.1 Introduction

Business processes are dependant and ordered activities that result in predictable and repeatable outcomes. Consisting of an organization's operating procedures, institutional working knowledge, and information resources, business processes are designed to satisfy defined business objectives in an efficient and timely manner. In an efficient environment, the functional components of a process can be readily identified, adapted, and deployed to address ever-changing corporate requirements—a capability termed as business agility. By definition, business agility is an organization's systemic ability to fluidly marshal and reconfigure resources in response to business requirements and opportunities. Business Process Management (BPM) tools are designed to provide for such agility by facilitating the creation and execution of highly transparent and modular process-oriented workflows that meet the operational performance standards IT organizations demand.

Automated business processes developed and executed within such an environment are characterized by the following attributes:

- Visibility of end-to-end process activities
- Process components and functionality that are exposed and self-describing
- Ability to integrate disparate information source and application functionality into a process
- Information flow and event notification that can be automated and monitored throughout a process
- Workflow participation that makes the most of desktop productivity and communication tools

- Service level agreements that can be specified, monitored, and enforced for activities in a process
- Ability to add, remove, or reconfigure any process activity or component, without disrupting the process
- Processes that can be monitored in real time or near real time
- Process designs that can accommodate any exception handling requirement
- Processes that can be easily replicated, extended, and scaled

With the support of XML and Web Services, BPM systems are transforming the way in which IT organizations are implementing and executing workflow components. XML applies structure to information, freeing it from any functional dependency on the software that operates on it. Web Services on the other hand provide the framework for application-to-application messaging and invocation over an unbounded network. BPM tools provide the additional support infrastructure to harness these capabilities to create, deploy, and execute the entire scope of workflow management, enterprise application integration (EAI), and trading partner integration (TPI).

3.1.2 Selected Existing Tools

This thesis has selected Microsoft's tools for Business Process Management and supporting technologies facilitate the creation of processes that share the characteristics defined previously. The thesis also describes how XML and Web Services are deployed within a BPM solution to achieve unprecedented modularity and extensibility. Finally, the document illuminates the gains in development and operational productivity that BPM technology engenders, which in turn enables real-time business agility.

3.1.3 A New Paradigm

Just as standards-based Web servers and browsers facilitated the communication and distribution of information between people, BPM tools that employ standards-based

XML and Web Services technologies will facilitate the wide-scale proliferation of automated and distributed business processes.

A defining characteristic of BPM technology is the elevation of design and development functions from the program layer to the information (document) and transport (messaging) layer. An application is no longer an opaque data-centric procedural construct; it is a messaging event or messaging agent capable of processing the exposed declarative properties of rich (XML) documents. Workflow processes, integration scenarios, or trading partner interactions consist of an orchestrated flow of messages that are routed, transformed, and processed according to message content, formatting requirements, and business rules.

Transparency and modularity are also defining characteristics of BPM technology. Not only are documents and messages exposed, self-describing, and extensible, but so are the communicating endpoint definitions, services, business rules, transformation maps, and process execution instructions that exchange and act upon the messages and documents. A process component can be "loosely coupled" with any other component so that a modification made to one activity or component in a process does not necessitate changes to other activities or components. Each component is functionally independent of any other component.

3.1.4 Microsoft Technology for BPM

Business Process Management technology represents a major conceptual reorientation of the methodologies of workflow development and deployment for business processes. As with any paradigm shift, it must result in significant benefits to be justified. Substantial evidence already indicates that users of BPM technology are achieving dramatic development efficiencies, accelerated returns on their investment, and most importantly, reduced resource requirements. Although XML, Web Services, and BPM platforms impose a new conceptual model on business process development and execution, the technologies required to do so are proven Microsoft® products that have been augmented to support this new paradigm. This section describes the core and supporting component technologies that constitute Microsoft's process development and execution suite.

BizTalk® Server is Microsoft's central platform for Enterprise Application Integration (EAI) and BPM and embodies the integration and automation capabilities of XML and Web Services technologies. BizTalk Server functions as a process execution engine and as a multi-transport hub for messaging and document transformations.

Visual Studio® .NET is Microsoft's flagship integrated development environment. The Orchestration Designer module found in previous versions of BizTalk Server is now an integral part of Visual Studio .NET with significantly more functionality. It is a visual development tool for building sophisticated workflows and processes that incorporate business rules, events, transactions, and exceptions and for linking these elements to implementation objects and messaging events. The assembled process generates an XML-based run-time script (BPEL) of the process that is executed in BizTalk Server.

SQL Server is tightly coupled with BizTalk Server and functions as its real-time data store for document tracking information and dehydrated instances of long-running processes.

Office 2003 redefines the functional concept and capabilities of Word and Excel by making XML the native file format. The applications can now behave like network clients, in the manner of a Web browser or e-mail client, but are capable of far more sophisticated and automated interactions with any source of XML information. Furthermore, in Office 2003, Microsoft also introduces InfoPath, an XML-based form application designed to address complex workflow documentation requirements. Because these applications can generate and decode XML documents with their respective schema definitions and processing instructions, they can directly engage in event-level interactions with BizTalk Server.

Active Directory® provides automated and federated authentication and authorization facilities as part of the process development and execution architecture. Its authentication and authorization capabilities facilitate sophisticated workflow processes that involve multiple participants, applications, documentation flows, and information sources. Active Directory also defines role-based participation attributes for workflow activities.

Host Integration Server and BizTalk Server Adapters facilitate integration with enterprise applications, legacy networking and transport protocols, and numerous data formats.

Microsoft Operations Manager and Application Center provide data center class system tools for building, monitoring, and scaling high-performance, mission-critical deployments of BizTalk Server and its supporting technologies.

Microsoft is at the forefront of XML, Web Services, and Business Process Management development and is committed to the implementation of these enabling technologies throughout its products. Nowhere are the potential capabilities of XML and Web Services more evident and maximized than within Microsoft's integration, development, and productivity technologies. The core XML and Web Services capabilities found in the new releases of BizTalk Server, Visual Studio .NET, Visio, and Microsoft Office 2003 demonstrate a coherent vision for distributing EAI and BPA development and deployment activities, both along functional lines and among stakeholders. The details of this vision become apparent through an examination of the new features and functions of the component technologies described previously.

3.1.5 BizTalk Server 2004

BizTalk Server is the central product of the Microsoft Enterprise Application Integration (EAI) and Business Process Management (BPM) toolset and embodies the application integration and process automation capabilities of XML and Web Services technologies. BizTalk Server has two core functions:

- A process execution engine that manages the steps, applies the business logic, and invokes the supporting applications of a complex process and/or transaction set.
- A multi-transport messaging hub for transforming and routing information to and from applications and process steps.

The release of BizTalk Server 2004 represents Microsoft's third generation of BPM technology. The initial introduction of BizTalk Server 2000 demonstrated Microsoft's early leadership in defining BPM functionality and supporting XML. BizTalk Server 2002 provided feature set refinements and performance enhancements. The new version of BizTalk Server is a major upgrade that incorporates the recommendations of thousands of users. BizTalk Server 2004 offers many new features and has been reengineered to provide substantial upgrades including improved performance and monitoring of process execution, robust Visual Studio .NET integration for programmatic control, and enhanced workflow modeling capabilities.

By leveraging the application integration and process automation capabilities of BizTalk Server and Microsoft Office, Microsoft has adopted the W3C XML Schema Recommendation. XML Schema is a specification that formally defines an extensive array of data type primitives and structural components for creating XML documents; it serves as a dictionary of abstract elements, attribute entities, and organizational rules. Creating XML documents that conform to the schema delivers a significant advantage: the meaning, function, and application of the document's content is comprehensible to, and operable by, any XML-enabled application that can access the document's underlying schema.

Every industry-specific initiative to develop a common vocabulary and set of procedures for the exchange and processing of information is based on XML Schema. By using XML Schema internally, BizTalk Server can import any XML schema definition natively without translation. This significantly reduces the time and effort required to facilitate sophisticated, interactive business scenarios—particularly those that involve the exchange of multiple document types. For example, consider the emergence of generic business-to-business (B2B) framework specifications for standardizing document content and data exchange procedures and behavior. There are typically hundreds of document types and exchange scenarios identified in each initiative specification, all of which are defined using XML Schema. By supporting XML Schema natively, the BizTalk Server messaging infrastructure and process execution engine can effectively support any B2B framework initiative.

3.1.6 Office 2003

XML Schema also figures prominently in the release of Microsoft Office 2003 as Word and Excel adopt XML as a native document format using an XML schema definition file. Also in Office 2003, Microsoft introduces InfoPath™, an XML-based form tool designed to propagate automated workflow capabilities throughout an organization. InfoPath allows workflow participants who create new information or perform analytical or content collection functions to generate, interact with, and exchange structured information. Typically, these activities are paper-bound or use a digital representation of paper. A form created in a word processing or spreadsheet program can be filled out easily enough, but the information that is entered in the form cannot be understood or processed without programmatic or manual intervention. Generating, conveying, extracting, manipulating, and reorganizing unstructured information in and from these formats is extremely labor intensive, inefficient, and costly.

InfoPath addresses this problem by creating smart forms that generate structured XML information, including processing instruction metadata. Underlying an InfoPath form is a template that incorporates one or more XML schemas, XSLT style sheets, embedded controls, and business logic instruction sets. The template controls the behavior of a form in the following ways:

- Generates multiple form views of the same information

- Constrains data types and values that can be entered in a form
- Defines and controls the dependencies for entering information
- Generates automatic, derived, and computed values
- Invokes events, prompts, and instructions based on dependencies
- Provides access to remote information sources
- Enables the incorporation of digital signatures

Form templates are created in a WYSIWYG design tool and require no procedural programming, predefined XML schemas, or XSLT style sheets. The schema and processing instructions are implicitly defined as the form template, which is represented in XML, is constructed from a palette of drag-and-drop controls, wizards, and dialog boxes. When an InfoPath form is populated, it generates an XML document that contains the entered and derived information, required metadata, processing instructions, and digital signatures of the participants who have accessed the form. The document also includes references to the template schemas and XSLT files required by other XML-enabled applications.

By enabling Microsoft Office applications to automatically recognize and process the information and metadata contained in a document, they become capable of engaging in event-level interactions. These “content-responsive” applications have the ability to facilitate automated workflow processes that take place between applications, and between applications and participants. This is the same fundamental premise of Web Services, and it redefines the functional concept and capabilities of these applications. They now behave as network clients, in the manner of a Web browser or e-mail client, but are capable of engaging in sophisticated and automated interactions with any source of XML information. Participants using these tools still engage in their workflow functions, but much more efficiently because of the elimination of manual processing tasks that are irrelevant to the effective execution of those functions.

3.1.7 Exchanging Information

BizTalk Server provides extensive transport and messaging services such as receive and send locations, adapters, pipelines and publish and subscribe distribution capabilities through a message box data store-all of which support content-based routing and processing. These facilities combined with the BizTalk Server document tracking and process monitoring capabilities, provide an overlay infrastructure for managing workflow processes. With BizTalk Server as the messaging and process hub and Office 2003 applications as XML-processing clients, participant involvement in workflows can be orchestrated, monitored, and qualified for reliability and performance metrics. This has the potential to radically alter the dynamics and efficiencies of workflow processing on an enterprise-wide basis.

The methodologies and technologies of process design, implementation, and execution are also undergoing a paradigm shift. As such, Microsoft is introducing key innovations in its BPM tools that will significantly improve process development and deployment. One of these innovations is the introduction of a set of high-level process-design and implementation tools that correspond to the roles of the participants involved in process development. These tools make it possible to graphically construct the business logic model of a process, link the steps in the model to actual implementation agents and components, and then generate an executable run-time instruction set of the finished process model in XML.

3.1.8 Bringing the pieces together

In the workspace, Visual Studio .NET reconstitutes the diagrammatic representation of the business process. In addition to the primitive element design palette found in Visio, it also contains a palette of implementation objects: application integration components, COM objects, Web Services, XML documents, messaging and transport facilities, and transformations. These objects are visually “bound” to the design objects through messaging events or method calls using drop, drag, and connect activities. Furthermore, the implementation mechanisms for highly complex functions, such as transactions requiring two-phase commit, rollback, and so on, are built-in functions— thus eliminating the need to write complicated procedural code.

Because the primary dynamic of BPM exchanges is based on sending, receiving, inspecting, and transforming exposed XML documents, a BPM development tool should be capable of visually mapping the flow and exchange of information in a messaging event associated with a process step. This is facilitated through a special "Data" template that graphically represents the message flow in a process as well as the transformation of, and operations performed on, document elements through the process flow.

This assembly approach to building process applications incorporates the modular, loosely coupled, and exposed paradigm for creating any type of interaction or event. Each implementation binding or messaging event is functionally independent of any other binding or messaging event. A change on the design side does not affect the operation, function, structure, or integrity of the objects on the implementation side. In conventional process development, a complex integration or process scenario is embodied in opaque programming code. That code incorporates the structure of the endpoint objects, the process flow logic, the conversion of data formats, business rules, and the bindings to transport infrastructure. If a modification is required to any one facet of the integration module, the integrity of the entire exchange implementation is compromised. The risk of introducing unexpected behavior when modifying code has always been a pitfall of software development and it accounts for the hesitancy to make ongoing process changes in response to business requirements.

It is no accident that the tools and methodologies for developing business processes exemplify the modular, loosely coupled, and exposed paradigm that characterizes the processes themselves. This paradigm is fundamental to every aspect of the Microsoft BPM environment. The ability to visualize and comprehend complex business logic and its implementation mechanisms makes process development and maintenance infinitely more efficient and manageable—enabling organizations to flexibly adapt to new business requirements and opportunities.

3.1.9 Understanding BPEL

Real-world business processes are complex and incorporate numerous integrity controls: ACID transaction support, stateful persistence of long-running interactions, nested and parallel operations, compensation and exception mechanisms, acknowledgements, and correlation capabilities. As process complexity increases, the value of being able to design, implement, and document highly dependant and sophisticated behavior using a visual assembly methodology becomes more apparent. This is especially the case when processes require modification or one process design serves as the basis for another.

The Business Process Execution Language for Web Services (BPEL4WS or BPEL) is another key standard supported by Microsoft in BizTalk Server 2004. Developed collaboratively by Microsoft, IBM, and BEA Systems, BPEL was designed to orchestrate and coordinate Web Services so they can be engaged in collaborative and transactional behavior. The BPEL specification has been submitted to the OASIS standards body for review and eventual designation as a protocol standard.

While Web Services provide the methodology for application-to-application messaging and method invocation over an unbounded network, by themselves they cannot satisfy the operational requirements of a business process. A business processes is a set of dependant and ordered activities, the execution of which results in a predictable and repeatable outcome in a timely manner. BPEL will enable Web Services to ultimately meet these requirements. BPEL formally defines basic and structured activities that are used to compose sophisticated business processes. Because a BPEL instruction set is an XML representation of a process with a precise language and grammar structure, it provides a readable and understandable instruction set for documenting a process. In fact, the object primitives used in BizTalk Server Orchestration Designer are direct representations of basic and structured BPEL elements such as receive, invoke, sequence, flow, switch, partners, role, link, and source.

3.1.10 Business Rules in Business Processes

Business processes are driven by business rules, and the majority of modifications to a business process life cycle pertain to changes in business rules (as opposed to technology-related modifications). However, because business rules in conventional applications are embodied in opaque programming code, they cannot be accessed or modified easily and without potential disruption to running processes. There's no argument that isolating business rules from procedural code or any process implementation mechanisms dramatically improves the efficiencies of managing and adapting business processes in response to new requirements or business conditions.

It is therefore of particular significance that, in BizTalk Server 2004, Microsoft introduces the Business Rules Composer. The Business Rules Composer consists of a business rule editor and engine for creating and processing sophisticated rule sets using a forward-chaining inference model. A rule set (or "Policy") that drives a specific activity or function is created with the Business Rules Composer and becomes a resource object that is referenced in a BizTalk Server orchestration. Transparency and loose coupling governs the creation and implementation of business rules. A rule set incorporated within a BizTalk Server orchestration can be viewed, modified, or replaced both at design and run time, without affecting any other operational aspect of a process or interrupting running instances of the affected process.

Isolating, exposing, and publishing business rule sets as services that can be accessed by any application or process provides one of the most compelling value propositions for the Services Oriented Architecture paradigm. As such, the Business Rules Composer module is one of Microsoft's most noteworthy products.

3.1.11 BPM and the Service Oriented Architecture

The next era of computing will be characterized by the detachment of information from applications, leading to a widely distributed Service Oriented Architecture.

- The meaning, function, relationships, and presentation of information will be self-describing and embedded in the information itself, using schema vocabularies and style sheet references.
- Information will be generated and published without knowledge of how it will be consumed or used.
- Applications will be capable of consuming information and the methods of other applications, while being consumed themselves.
- Processes will be self-configurable and self-modifying based on event-level interactions between rule sets and information.
- Entirely new applications and business models will evolve from this paradigm.

Microsoft's BPM tools and the XML technologies on which they are built introduce the next era of computing based on the Services Oriented Architecture paradigm. In examining the innovations being introduced in Microsoft's BPM toolset, it becomes apparent how cumulative XML functionality accrues: XML Schema enables Web Services and InfoPath. XML technologies embedded in BizTalk Server enable an entirely new model for application integration and process management. Each manifestation by itself has significant value, but combined, they offer the potential to facilitate wholesale efficiencies and innovative solutions. It is an object lesson in the whole being greater than the sum of the parts.

3.1.12 Operational Support for BPM Technology

It is one matter to have a vision of how things can work; it is another to actually make that vision work. The innovations engendered by XML require operational support context. On their own, they cannot be simply inserted into an organization's existing infrastructure and expected to provide functional efficiencies, or to conform to the operational performance standards to which IT organizations are accustomed. Their value is actualized when implemented within a framework of complementary and supporting technologies that facilitate their use within an embedded infrastructure. Just as InfoPath and BizTalk Server complement each other, Microsoft's array of proven enterprise applications (SQL Server, Active Directory, Host Integration Server, Microsoft Operations Manager, and Application Center) complement and support the implementation of these applications in a real-world, mission-critical context.

SQL server provides the transaction record data store for all BizTalk Server messaging events as well as dehydrated instances of long-running processes. Because SQL Server directly supports XML, it can maintain a record of the document instance associated with each message event as well. In this capacity SQL server provides the persistence capabilities of BizTalk Server.

The BizTalk Server application integration methodology is based on converting the native file formats of legacy and packaged applications into an internal XML representation, which is then transformed according to the requirements of the integration exchange. A prerequisite of this conversion function is knowledge of the native file formats. Microsoft's Host Integration Server and other third-party adaptors provide this information to BizTalk Server in a comprehensible and usable way. Furthermore, these products provide transport gateways between supported transport facilities in BizTalk Server and the transport protocols used by legacy systems. Lastly are the requirements for system performance, availability and scalability. Any enterprise-class application must be engineered to accommodate performance metrics monitoring, operational redundancy, and scalability at a granular level. This fine grain level of performance management, failure prevention, and scalability can be achieved with the support of Microsoft Operations Manager (MOM) and Applications Center. These tools are tightly integrated with all Microsoft server products and provide the operational assurances necessary for enterprise class information processing.

3.2 Configuring selected tools for BPM

3.2.1 Architecture Overview

- 2 BizTalk servers (APPSVR1 – 2) with full install of BizTalk Server 2004 except no development tools
- 1 SQL server (DBSVR1) housing all BizTalk databases
- 5 development workstations (WKS1 – 5) with BizTalk Server 2004 development and administration tools
- 1 Domain controller (DC1), governing the MYDOMAIN.LAB domain.

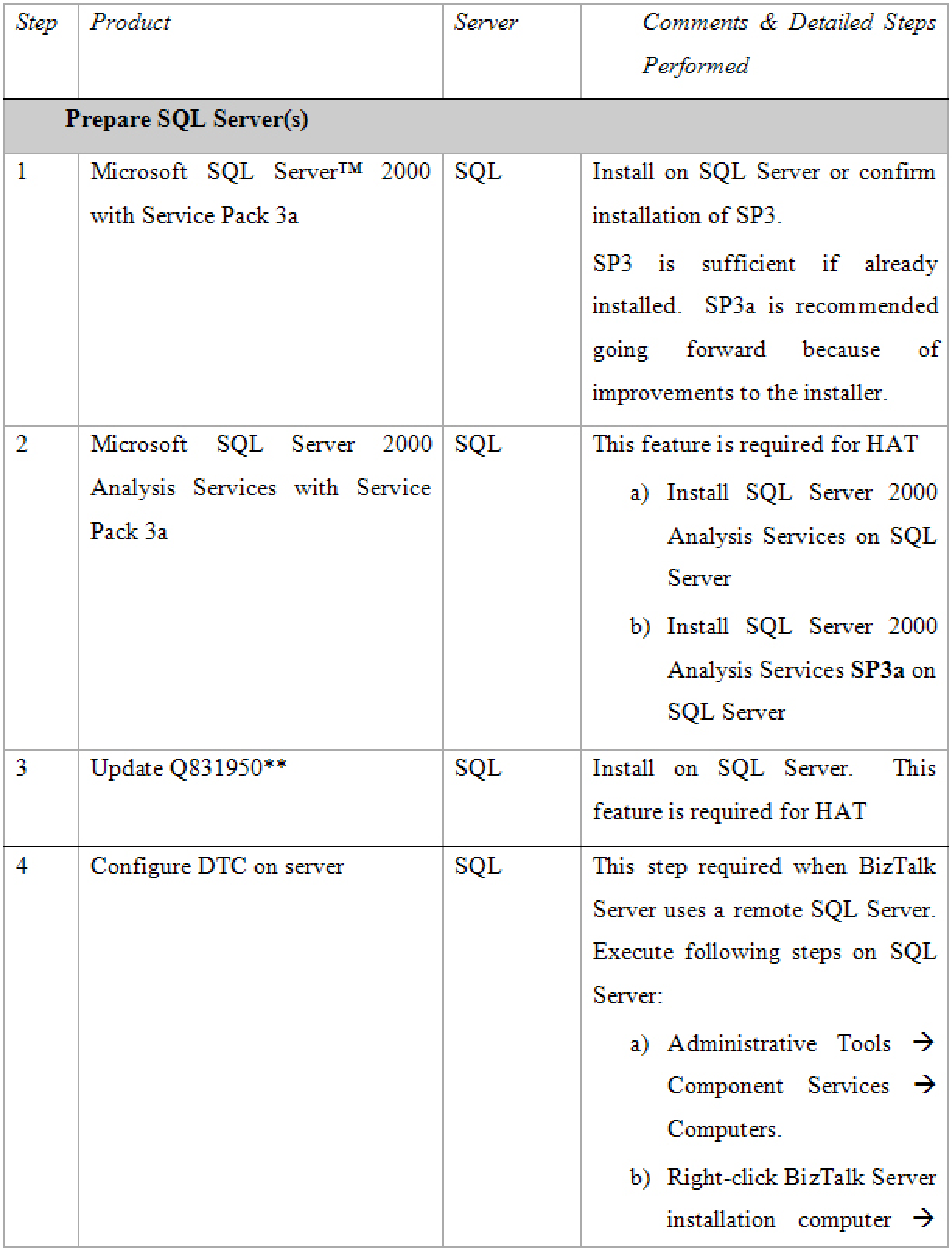
Windows Server 2003 is the operating system used on all machines in this configuration.

This example has been updated with the current technology the demo is currently running on

- 1 Machine hosting: Biztalk Server 2006, SQL and development station
  - Windows Server 2003 is the operating system on this machine.
- 1 Machine hosting: Domain Controller governing KAMILLOCAL.COM domain, IIS, Windows SharePoint Services
  - Windows Server 2003 is the operating system on this machine.
- 1 Machine hosting: Client applications – Outlook, Infopath, IE Browser.
  - Windows XP Professional is the operating system on this machine.

3.2.2 Installation Steps

Figure 3.1 shows a list of steps for installing and configuring BizTalk Server 2004 to work in the multi-server configuration. This table is adapted from the *Installation Guide.htm* file that ships with BizTalk Server 2004. The ordering of steps has been changed in some instances to aid preparation, and a few steps have been added to smooth the process. The *Server* column tells you on what machines to perform each step.

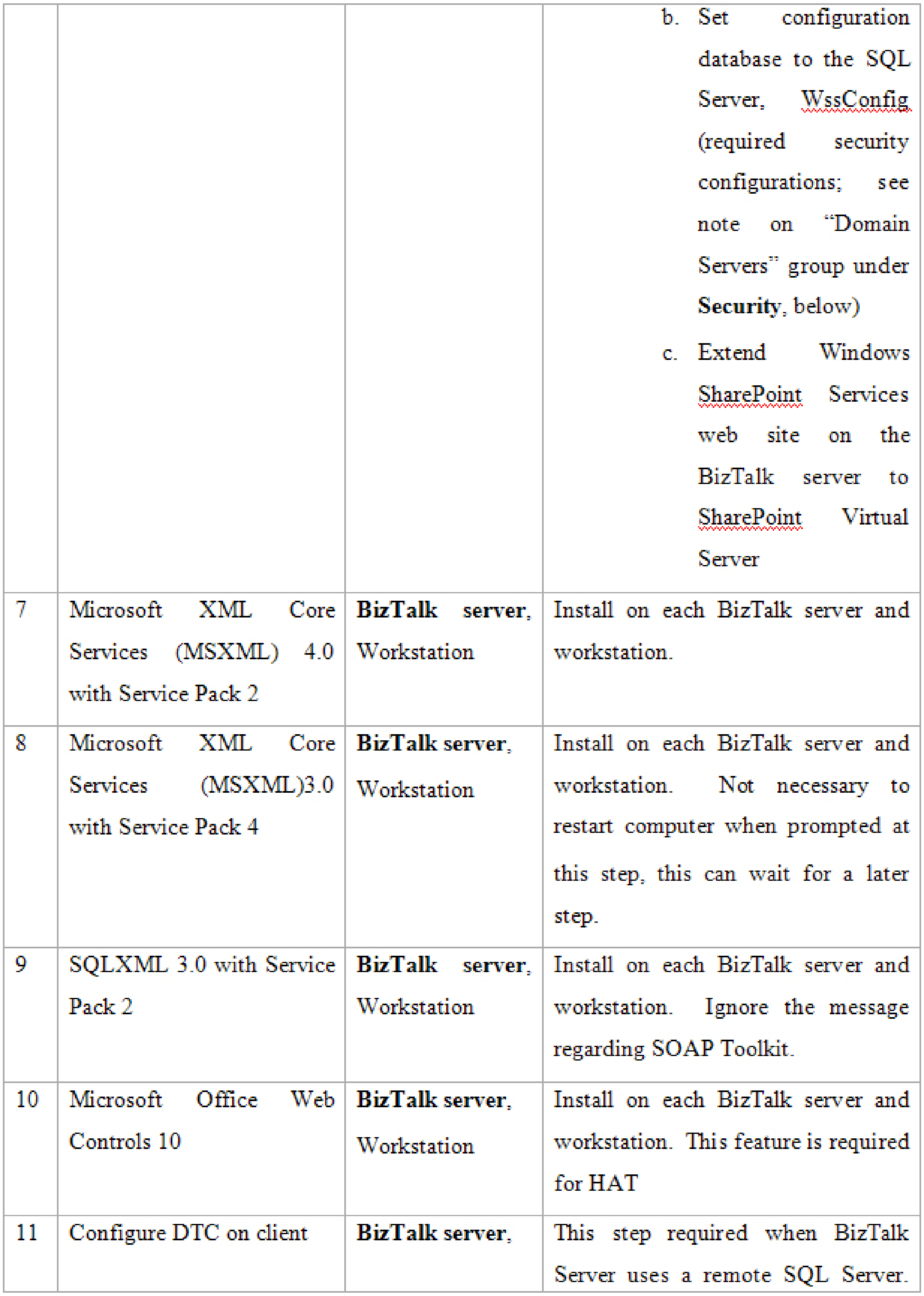


Step	*Product*	*Server*	*Comments & Detailed Steps Performed*
Prepare SQL Server(s)			
1	Microsoft SQL Server™ 2000 with Service Pack 3a	SQL	Install on SQL Server or confirm installation of SP3. SP3 is sufficient if already installed. SP3a is recommended going forward because of improvements to the installer.
2	Microsoft SQL Server 2000 Analysis Services with Service Pack 3a	SQL	This feature is required for HAT a) Install SQL Server 2000 Analysis Services on SQL Server b) Install SQL Server 2000 Analysis Services **SP3a** on SQL Server
3	Update Q831950**	SQL	Install on SQL Server. This feature is required for HAT
4	Configure DTC on server	SQL	This step required when BizTalk Server uses a remote SQL Server. Execute following steps on SQL Server: a) Administrative Tools → Component Services → Computers. b) Right-click BizTalk Server installation computer →

Figure 3.1 Installation and Configuration Steps-1

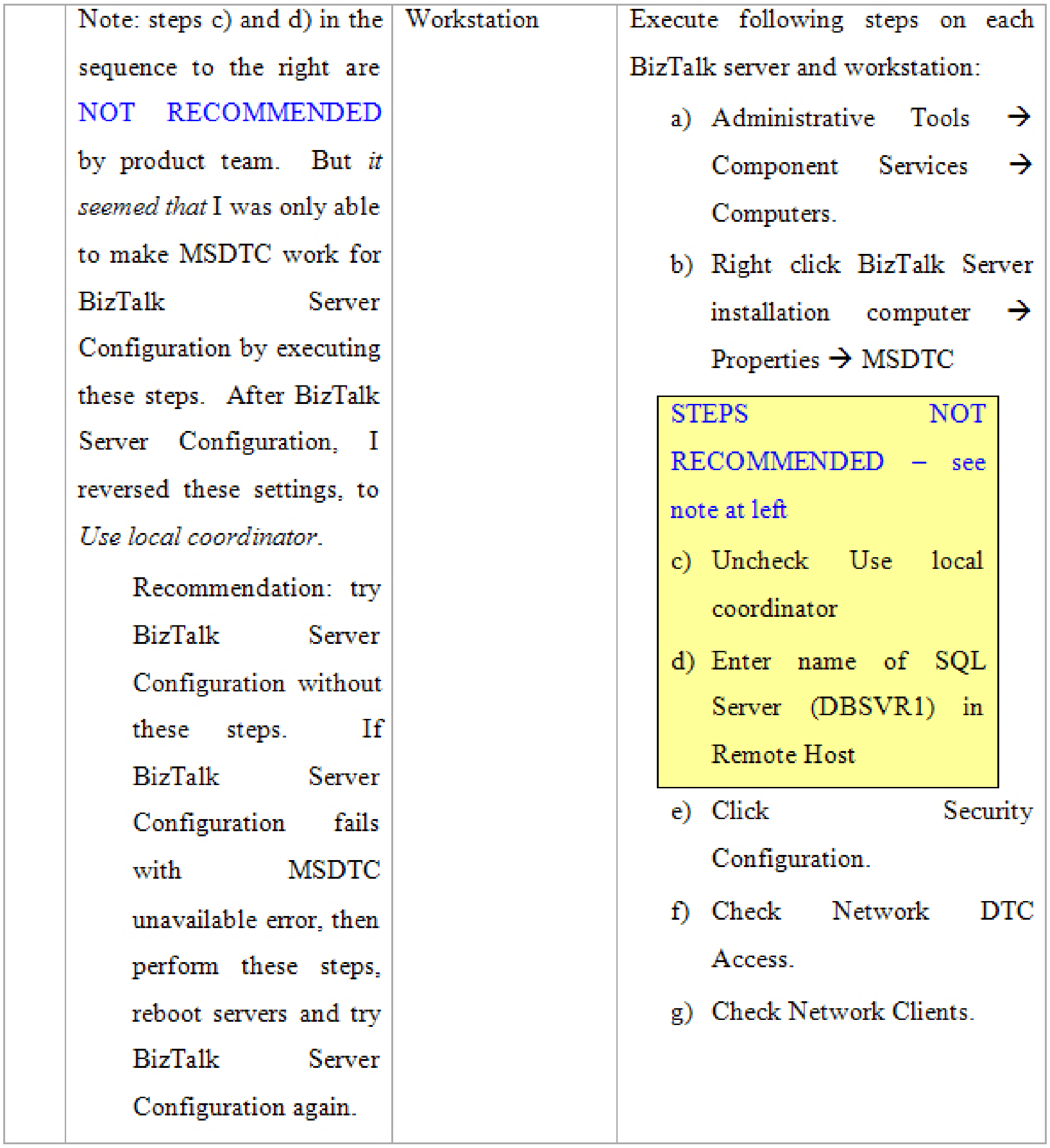
Prepare BizTalk server(s) and Workstation(s)			
	Microsoft® .NET Framework 1.1	**BizTalk server**, Workstation	Install on each BizTalk server and workstation.
5	Microsoft Visual Studio® .NET 2003	Workstation	Install on each BizTalk workstation. Not required on BizTalk application servers
6	Microsoft Windows® SharePoint™ Services	**BizTalk server**	This feature is required for BAM a) Confirm that ASP.NET Web Service Extensions are allowed b) Remove Front Page Server Extensions from the Default Web Site (IIS Mgr → right-click Default Web Site → All Tasks → Remove Front Page Server Extensions → Uninstall-not full). c) Install Windows SharePoint Services on the BizTalk server. Choose Server Farm installation to allow specification of SQL Server database after install rather than MSDE. d) Configure the Administrative Virtual Server a. Choose StsAdminPool for application pool

Figure 3.2 Installation and Configuration Steps-2



			b. Set configuration database to the SQL Server, WssConfig (required security configurations; see note on "Domain Servers" group under **Security**, below) c. Extend Windows SharePoint Services web site on the BizTalk server to SharePoint Virtual Server
7	Microsoft XML Core Services (MSXML) 4.0 with Service Pack 2	**BizTalk server**, Workstation	Install on each BizTalk server and workstation.
8	Microsoft XML Core Services (MSXML)3.0 with Service Pack 4	**BizTalk server**, Workstation	Install on each BizTalk server and workstation. Not necessary to restart computer when prompted at this step, this can wait for a later step.
9	SQLXML 3.0 with Service Pack 2	**BizTalk server**, Workstation	Install on each BizTalk server and workstation. Ignore the message regarding SOAP Toolkit.
10	Microsoft Office Web Controls 10	**BizTalk server**, Workstation	Install on each BizTalk server and workstation. This feature is required for HAT
11	Configure DTC on client	**BizTalk server**,	This step required when BizTalk Server uses a remote SQL Server.

Figure 3.3 Installation and Configuration Steps-3



	Note: steps c) and d) in the sequence to the right are NOT RECOMMENDED by product team. But *it seemed that* I was only able to make MSDTC work for BizTalk Server Configuration by executing these steps. After BizTalk Server Configuration, I reversed these settings, to *Use local coordinator*. Recommendation: try BizTalk Server Configuration without these steps. If BizTalk Server Configuration fails with MSDTC unavailable error, then perform these steps, reboot servers and try BizTalk Server Configuration again.	Workstation	Execute following steps on each BizTalk server and workstation: a) Administrative Tools → Component Services → Computers. b) Right click BizTalk Server installation computer → Properties → MSDTC STEPS NOT RECOMMENDED – see note at left c) Uncheck Use local coordinator d) Enter name of SQL Server (DBSVR1) in Remote Host e) Click Security Configuration. f) Check Network DTC Access. g) Check Network Clients.

Figure 3.4 Installation and Configuration Steps-4

Other steps

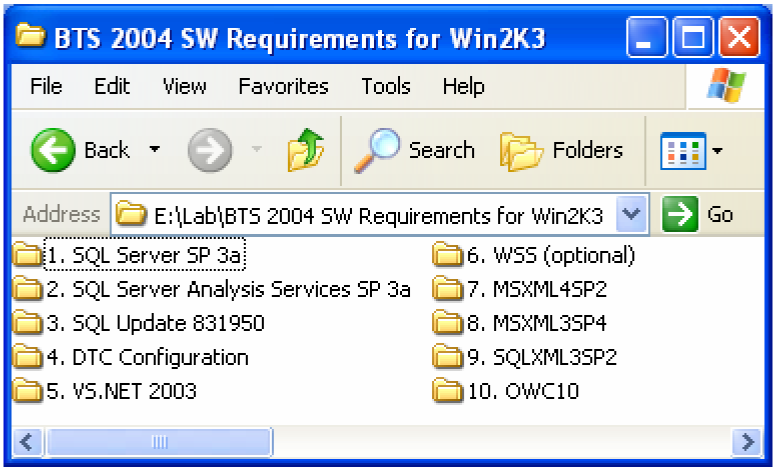
Create web site Windows SharePoint Services on KAMIL-BIZTALK port 80 for Windows SharePoint Services.

3.2.3 Detailed Instructions

Steps 1 – 13. Install Prerequisites:

Follow instructions in the Installation Steps table.

BEST PRACTICE: in most situations, it's helpful to organize the installation files for all of the prerequisites and store them on a network drive. Figure 3.5 shows an example where the folder names are keyed to the steps in Table3.1.



Address: E:\Lab\BTS 2004 SW Requirements for Win2K3

- 1. SQL Server SP 3a
- 2. SQL Server Analysis Services SP 3a
- 3. SQL Update 831950
- 4. DTC Configuration
- 5. VS.NET 2003
- 6. WSS (optional)
- 7. MSXML4SP2
- 8. MSXML3SP4
- 9. SQLXML3SP2
- 10. OWC10

Figure 3.5 Organize Prerequisites for Multiple Installs

Some steps such as DTC Configuration have no installation "bits," so in that folder I store a text file with instructions for performing the step. This helps avoid confusion that steps might be missing.

Step 14. Create Security Accounts and Groups:

BizTalk Server 2004 Security Accounts and Groups:

Before running the BizTalk Server 2004 Configuration Wizard, a number of security accounts and groups must be created in Microsoft® Active Directory®. The Installation Guide and BizTalk Server Help files discuss the details of this, but do so in separate pieces and appear to miss a few group memberships. Table 3.1 shows a complete list of accounts and groups that can be used for a successful install.

BEST PRACTICES:

- Create an OU called **BizTalkServer** and create all accounts and groups within that.
- Enter the *Full Name* and *Group Name* as shown in the lists below when you are creating the account. The configuration wizard will pick these up automatically… otherwise you'll have to pick the right one when it asks you for a different name.
- You don't have to enter a *First Name* and *Last Name* when creating the accounts; the ones shown here are just for completeness.
- Stick to the "backwards" naming of BtsInstanceHost and BtsInstanceIsoHost *Usernames* as shown.
- Do not create a new account for * entries… use the *Username* in parentheses when prompted for the account by its *Full Name* in the configuration wizard.

Table 3.1 User Accounts & Groups for BizTalk Server

Service Accounts			
First Name	*Last Name*	***Full Name***	***Username***
Bts	BTS2K4ser	BizTalk Service	BtsService
Host	BTS2K4ser	BTS Host Service	BtsHost
IsoHost	BTS2K4ser	BTS Isolated Host Service	BtsIsoHost
ESso	BTS2K4ser	Enterprise Single Sign-On S.	SsoService
Edi	BTS2K4ser	BizTalk Base EDI Service	EdiService
HostInstance	BTS2K4ser	BizTalk Host Instance Account	BtsInstanceHost
Humwflo	BTS2K4ser	Human Workflow Services User Account	HwfService
RuleEng	BTS2K4ser	Rule Engine Update Service	ReuService
BasAc	BTS2K4ser	BizTalk Server BAS Application Pool Account	BasService
BasWeb	BTS2K4ser	BizTalk BAS Publishing Web Service Account	BasWebService
* do not create	*	BizTalk BAS Management Web Service Account	(BasWebService)
User accounts			
First Name	*Last Name*	***Full Name***	***Username***
Admin	BTS2K4user	BizTalk Administrator	BtsAdmin

IsoHostInstance	BTS2K4user	BizTalk Isolated Host Instance Account	BtsInstanceIsoHost
TechManager	BTS2K4user	BizTalk BAS Tech Manager	Bastechmgmt
TechPublisher	BTS2K4user	BizTalk BAS Tech Publisher	Bastechpublisher
*	*	SSO Administrator	(BtsAdmin)
*	*	SSO Affiliate Administrator	(BtsAdmin)
*	*	BAM Query Web service	(Bastechmgmt)
Groups			
Group Name		***Members***	
BizTalk Server Administrators		**BtsAdmin, Bastechmgmt**, BasWebService, DoUsers	
BizTalk Application Users		**BtsHost,** BtsHostInstance	
BizTalk Host Users			
BizTalk Isolated Host Users		**BtsIsoHost**, BtsHostInstance	
EDI Subsystem Users		**EdiService**	
SSO Administrators		**SsoService**, **<logged on user>,** Domain Users	
SSO Affiliate Administrators			
BizTalk BAS Administrators		BtsAdmin	
BizTalk BAS Managers			
BizTalk BAS Users			
BizTalk BAS WS Group		**bastechpublisher**	

Group Notes:

- These are all Global groups and that works for this testing. But recall that only Domain Local groups may have Global Groups as members, so you may want to try different types of groups.
- The members shown in bold type are recommended by the configuration help file. I have found the other memberships to be necessary also.
- Adding the <logged on user> is easiest by adding the *Domain Users* group.
- I added *Domain Users* to *BizTalk Server Administrators* in order to allow HAT to attach orchestrations to the debugger. This could be accomplished with a more restrictive group for enhanced security… but it works for testing.

SQL Server 2000 Security Accounts and Groups:

For this laboratory, I also made security group for server access to database: *Domain Servers* is a Global Group containing APPSVR1 and APPSVR2 computer accounts.

Added this group as a SQL Server Login on DBSVR1, having Server Administration and db_owner privileges on Master, msdb, model and tempdb. This didn't allow Windows SharePoint Services Central Administration to set the database server, which was the intent. Setting MYDOMAIN\Domain Servers as a member of the BUILTIN\Administrators group worked.

Step 15. Install BizTalk Server 2004:

Installation is pretty straightforward; it's the troubleshooting and configuration that can run into some complexity. For troubleshooting, look in these places:

- Readme.htm
- Installation Guide.htm
- BizTalk Server Documentation (help file)
- The Galileo-Voyager Discussion (Technical) distribution group.

For installation in a remote development architecture:

1. Perform a complete installation of BizTalk Server 2004 onto the application servers. Note that development tools will not be installed because Visual Studio .NET 2003 is not installed on the application servers. The installer will give a warning about this but allow you to proceed.
2. Perform a development tools-only installation of BizTalk Server 2004 onto the client workstations.

On all these installs, be sure to use the "Set…" button on the install wizard's summary screen to set your password for automatic reboot. If this button does not appear, then no reboot will be needed.

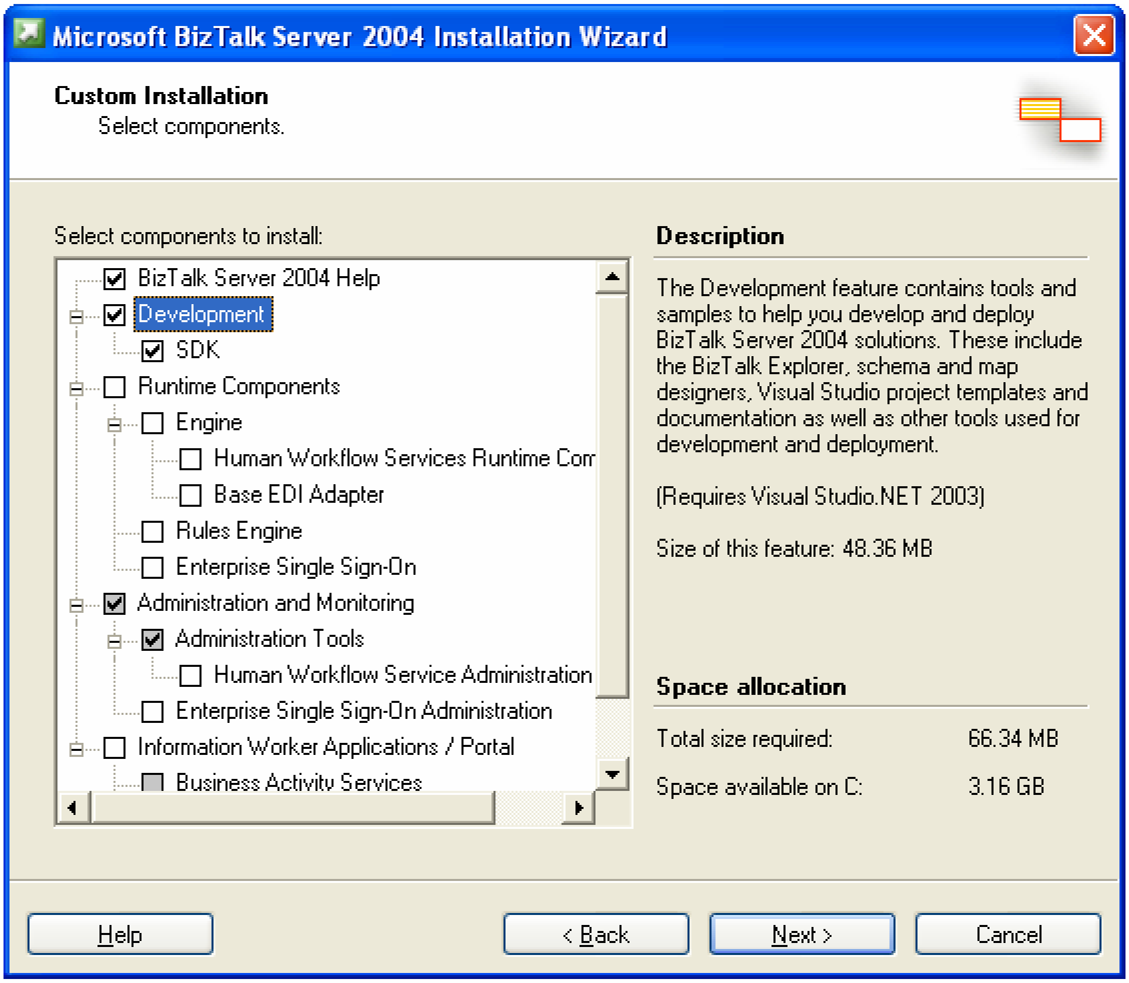
Step 16. Install BizTalk Server 2004 Development Tools:

Note: prerequisites listed in the Installation Steps table that are labeled "Workstation" are required on the workstations before performing this step.

From Installation Guide.htm:

> When performing a custom installation that only includes the Development option, two computers are required. You must perform a complete installation and configuration on the first computer, create a new BizTalk Group, and then on a separate computer perform a custom installation for Development only. During the Development-only installation, join the existing BizTalk group and specify the SQL Server where your group was created.

Run the BizTalk Server 2004 setup.exe on each development workstation. Choose Custom install, then uncheck all options except for *Development* and *SDK*. I recommend also installing *BizTalk Server 2004 Help* and *Administration Tools*, as shown in Figure 3.6.



Microsoft BizTalk Server 2004 Installation Wizard

Custom Installation
Select components.

Select components to install:

- ☑ BizTalk Server 2004 Help
- ☑ Development
  - ☑ SDK
- ☐ Runtime Components
  - ☐ Engine
    - ☐ Human Workflow Services Runtime Com
    - ☐ Base EDI Adapter
  - ☐ Rules Engine
  - ☐ Enterprise Single Sign-On
- ☑ Administration and Monitoring
  - ☑ Administration Tools
    - ☐ Human Workflow Service Administration
  - ☐ Enterprise Single Sign-On Administration
- ☐ Information Worker Applications / Portal
  - ▨ Business Activity Services

Description

The Development feature contains tools and samples to help you develop and deploy BizTalk Server 2004 solutions. These include the BizTalk Explorer, schema and map designers, Visual Studio project templates and documentation as well as other tools used for development and deployment.

(Requires Visual Studio.NET 2003)

Size of this feature: 48.36 MB

Space allocation

Total size required:	66.34 MB
Space available on C:	3.16 GB

Figure 3.6 Installing BizTalk Server 2004 Development Tool-only

From Readme.htm:

> If you perform a custom installation and install Development tools only, the file bm.exe.config is not installed and the file BAMconfiguration.xml is not created. You must perform the following procedure to install the missing files.
>
> 1. Open the command prompt.
> 2. At the command prompt, type the following:
>    ```
>    <installation directory>\Tracking
>    xcopy bm.exe.config.tmpl bm.exe.config
>    xcopy BAMconfiguration.xml.tmpl BAMconfiguration.xml
>    ```
> 3. In the BAMconfiguration.xml file, created in the previous step, edit the tags for the following databases to point to the correct database and server:
>   a. BAMPrimaryImport
>   b. BAMArchive,
>   c. BAMStarSchema
>   d. Analysis

Step 17. Configure BizTalk Server 2004:

By default, the Configuration Wizard will run automatically after BizTalk Server 2004. If your prerequisites are not in place (especially steps 11, 12 and 14 above), you may elect not to run the configuration wizard at this time in order to finish preparation. In this case, you may then launch the configuration wizard when ready from: C:\Program Files\Microsoft BizTalk Server 2004\ConfigFramework.exe.

Using the Correct Security Accounts and Groups:

When the Configuration Wizard asks you to configure which accounts and groups are to be used, it often lists its defaults without a domain qualifier. For each account and group, be sure to add the domain qualifier or configuration will fail.

Using the Correct Databases:

If you have SQL Server 2000 installed on the box on which you're installing BizTalk Server 2004, the Database Configurations screen of the Configuration Wizard will default all 13 databases onto the local SQL Server. Be sure to change them if that is not what you want.

IP Address:

The Configuration Wizard provides a choice for binding MSMQT to an IP address. Once this choice has been configured, a complete unconfiguration and re-configuration will be necessary to change it. In most cases, it is fine to accept the default to bind to all IP addresses on the box.

If you are load balancing your BizTalk servers, do *not* enter the virtual load-balanced address here; either leave it blank or enter the local IP address that the load-balanced address resolves to on this server.

Silent Configuration:

Silent configuration is very useful when configuring several BizTalk servers. You must first perform a successful manual configuration using the Configuration Wizard.

Steps:

1. Begin manual configuration using Configuration Wizard.
2. On the Summary page of the Configuration Wizard, click "Save…" to save the configuration to an XML file (defaults to ConfigXML.xml).
3. Finish the Configuration Wizard and ensure that it completes correctly.
4. Open the ConfigXML.xml, and replace each occurrence of ***Hidden*** (in the <PASSWORD> tags) with the correct password for each account.
5. Copy ConfigXML.xml to the next BizTalk server you wish to configure.
6. Run ConfigFramework.exe from the command line with the "/s" switch.
   Example: >configframework /s ConfigXML.xml /l config.log
   where /l sends the output to a log file.

Note that if you're installing BizTalk servers in a server group, you can't use the ConfigXML.xml file from the *first* configuration to silently install the *second*, because they're different configs: the first is to create the databases and the second is to join the databases. You can use ConfigXML.xml from the *second* to silently install the *third and subsequent* servers in the group.

Development Tools-only Configuration:

You must run the Configuration Wizard on workstations that have had a development tools-only installation, in order to join them to the BizTalk Server group that you wish to develop against. This is the simplest and quickest configuration: choose "Join" on the first screen of the Configuration Wizard then specify the BizTalk Server management database server on the next screen.

Manual Configurations:

After installation and configuration, you probably want to enable the MSMQT adapter. MSMQT is exposed to external servers exactly like an MSMQ private queue, and is recommended over MSMQ for BizTalk queuing. To enable, just add it as an adapter using the BizTalk Administration Console. This is a one-way operation; you can't remove it without a full reconfiguration. See "Configuring the MSMQ Transport Adapter" in BizTalk Server Documentation for full instructions.

BEST PRACTICE: back up the Master secret from the SSO database. If anything bad happens to the SSO database and you don't have a backup of the master secret, BizTalk Server won't work anymore, and only a full re-installation will fix it. You just need to run a single command:

```
ssoconfig -backupsecret <backup file>
```

See "Backing Up the SSO Master Secret Key" in BizTalk Server Documentation for full instructions.

3.2.4 Connection Tip:

You can use Windows Remote Desktop Connection to connect to servers for installation and management. To avoid issues related to installation over Terminal Server, add "/console" to the Computer name in the .rdp configuration file. Example:

Computer:	APPSVR1 /console
User name:	Administrator
Password:	•••••••
Domain:	MYDOMAIN

3.2.5 Databases:

Table 3 shows a list of databases that are created (for a full install) by the Configuration Wizard when you choose "Create" new BizTalk Server group on its first screen. The Configuration Wizard allows you to specify which database server should be used for each database, but it uses defaults for other details of database creation, such as initial size and location of the data and log files.

After creation, it is wise to change settings for some databases. For instance, **BizTalkMsgBoxDb** and **BizTalkDTADb** will process most of the normal messaging traffic, so they should be sized accordingly and placed on the fastest drive(s) available on the SQL Server. Furthermore, in cases where maximum performance is required, it is helpful to place log files and data files on different drive spindles, if possible (i.e., not two partitions on the same drive).

It is possible to edit the parameters of the SQL Server model database in order to provide defaults for databases that are created, but this is not recommended. If database creation takes too long (for example, several minutes for a 10GB database and a 5GB log file), the Configuration Wizard may time out due to non-responsiveness of SQL Server. Furthermore, we don't want all the databases to start this big.

BEST PRACTICE: let the Configuration Wizard create the databases using typical defaults, then move and resize selected databases as appropriate using SQL Server Enterprise Manager.

Table 3.2 Databases Created by BizTalk Server 2004

Database Description	***Database Name***	***Traffic***	***Size***
BAM Analysis Database	BAMAnalysis		
BizTalk Tracking Analysis Database	BizTalkAnalysisDb		
BizTalk Management Database	BizTalkMgmtDb		Small
BizTalk MessageBox Database	BizTalkMsgBoxDb	High	Large
BizTalk Tracking Database	BizTalkDTADb	High	Large
BAM Star Schema Database	BAMStarSchema		
BAM Primary Import Database	BAMPrimaryImport		
BAM Archive database	BAMArchive		
SSO Database	SSODB		
Rule Engine Database	BizTalkRuleEngineDb	Potentially high	Probably small
BizTalk Base EDI database	BizTalkEDIDb		
Human Workflow Services Administration Database	BizTalkHwsDb		
Trading Partner Management Database	TPM		

If the Configuration Wizard fails for the first BizTalk server of a group, the configuration will be transactionally rolled back to uninstall any changes so far. However, the rollback does *not* include deletion of the SQL Server databases, so these need to be deleted manually before configuration is attempted again. First be sure to do a ConfigFramework.exe /u to un-configure, and then use Enterprise Manager to delete any BizTalk Server databases that were created before the configuration failure.

3.2.6 Load Balancing

Load Balancing MSMQT:

To load-balance MSMQT over TCP/IP, the following table shows which protocols and ports must be enabled in the load balancer.

Table 3.3 MSMQ Protocols & Ports

Application protocol	***Wire Protocol***	***Port***	***Load Balance?***
MSMQ	TCP	1801	Yes
MSMQ	UDP	1801	Yes
MSMQ-DCs	TCP	2101	
MSMQ-RPC	TCP	2103	
MSMQ-RPC	TCP	2105	
MSMQ-Mgmt	TCP	2107	
MSMQ-Ping	UDP	3527	Yes
RPC	TCP	135	

Both transactional and non-transactional queues are expected to work in a load-balanced scenario.

Load Balancing File Receive:

It seems compelling to specify a file receive folder on a remote server that can be used by more than one BizTalk Server as a file receive folder, in order to provide a simple load-balancing scenario on a file receive. However, a race condition may arise in cases of heavy load that causes some messages to be locked and orphaned. A symptom of this is “File Not Found” errors appearing in the Application Event Log as one server tries to receive files that are already being received by another server. Therefore, it is not recommended to try to load balance file receive locations unless you have a compelling reason to make it work.

There is a workaround for the race-condition issue, and you may wish to investigate its suitability for your application. BizTalk Server 2004 is able to rename files before locking them for reception. Since the rename can be done in a single file system operation, it prevents other servers from attempting to receive them. To enable this feature, create a new registry key for all receiving servers: HKLM\System\CurrentControlSet\Services\BTSSvc{GUID}
RenameReceivedFiles DWORD 1. This has a few side effects:

- The files are renamed by being given a new extension (.BTS-WIP). This means that if there is any service interruption before reception is completed (such as dropping the SQL Server connection), these files could be orphaned because they will not be picked up under the file mask that filtes that receive location. You don't want to change the file mask to *.*, because this negates the effect of renaming the files. An idea for solving this is to create another receive port/receive location that is only serviced by a single BizTalk Server, and set its file mask to *.BTS-WIP. This will pick up any files in the receive folder that are orphaned by this issue.
- During failover, the file renaming option will not operate correctly. Since failover should be a rare occurrence, you may wish to accept this risk to gain the performance of load balancing a file receive location, if that is your requirement.

3.2.7 Installing MSMQ and MSMQT on a BizTalk Server

It is not recommended to install both MSMQ and MSMQT on a single machine. The best practice is to use MSMQT only for BizTalk message queuing; this is exposed to clients exactly as an MSMQ private queue.

In the case that your solution requires both queuing technologies, here are instructions for side-by-side installation of MSMQ and MSMQT on a single server.

1. Make sure your operating system will support side by side. Side by side is supported only on Windows Server 2003, Windows 2000 SP4, and Windows XP SP2.
2. You will need 2 IP addresses on every machine that will have BizTalk Server and MSMQ side by side. You can install two network adapters on these machines or add 2 static IPs on the same network interface card. If you choose the second option, both addresses must be in the same subnet. The first IP will be used by MSMQ and the second IP will be used by BizTalk Server/MSMQT.
3. You will need a new, unused computer name. The computer name will be used by BizTalk Server to store MSMQT configuration. If you append "MSMQT" to your computer name you will usually get an unused computer name.
4. For practical purposes, we will assume that your computer is called MyServer and BizTalk will use MyServerMSMQT.
5. Ask your network administrator to configure the DNS so that any query for MyServer will always return only IP1 and a query for MyServerMSMQT will always return only IP2. This can be achieved by disabling DNS registration on your machines and manually adding entries in the DNS tables.
6. Note: This is very important. If a query for MyServer will return both IP1 and IP2, messages sent to MSMQ might end up in BizTalk/MSMQT queues
7. Test the DNS configuration. From the command prompt, type "nslookup". Type MyServer and make sure that only IP1 is returned. Type MyServerMSMQT and make sure that only IP2 is returned.
8. Install MSMQ.
9. Configure MSMQ for side-by-side. Using the registry editor, browse to **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\MSMQ\Parameters**. Add a new string value called **BindInterfaceIP.** Set its value to **IP1**. Restart the MSMQ service.
10. Install BizTalk. In the configuration framework MSMQT screen, set the IP field to **IP2**. Set the computer name to **MyServerMSMQT.** If you plan to use

PUBLIC or PRIVATE format names, check the active directory box. Do not check the “register in dns” box unless advised so by the network administrator.

Side-by-side limitations:

- Communication between MyServer and MyServerMSMQT is only possible with the PRIVATE/PUBLIC format names.
- There are no restrictions when a third party communicates with MSMQ or MSMQT.

3.2.8 Hardware Requirements

The specific machines used in this lab and their software load are shown in;

Table 3.4 Infrastructure Used for This Laboratory

#	*Type, specs*	*Software | Infrastructure*
5	Dev workstations Single CPU, 1.8 GHz, 1.0 GB RAM	Visual Studio .NET 2003 BizTalk Server 2004 Development and Administration tools Windows Server 2003 with File, Print, Application
		WKS1 – WKS5 (145.205.1.51 – 55)
2	Application servers 8 CPU, 1.4 GHz, 7.5 GB RAM	BizTalk Server 2004 complete install (without development tools) Windows Server 2003 with File, Print, Application (allow ASP.NET)
		APPSVR1 – APPSVR2 (145.205.1.71 – 72)
1	Database server 8 CPU, 550 MHz, 8.0 GB RAM	SQL Server 2000 SP3a SQL Server 2000 Analysis Services SP3a Windows Server 2003 with File, Print, Application

		DBSVR1 (145.205.1.81)
1	Domain controller	Windows Server 2003 with Active Directory
		MYDOMAIN\DC1 (145.205.1.1)
1	Cisco load balancer	LB.MYDOMAIN.LAB (145.205.1.101)
		Balances between APPSVR1 and APPSVR2

3.2.9 Update to Installation Steps

Due to the update in the BizTalk installation to version 2006 the installation steps have been updated the following describes the updated steps.

- Install windows 2003 standard server to a Pentium IV 3.0 machine.
  - Install SP1 and the other security updates.
  - Install the DNS Server
  - Run on the command prompt, dcpromo command, it creates active directory forest.
  - Make sure all the configurations on DNS Server is correct. (Check the names of the forests, check the client IP addresses, check the nameservers, ldap ports, msdcs settings.)
  - Setup all active directory users and groups.
  - Make sure that all the BizTalk group types must be "security" and "global".
  - Please make sure that you use exactly the same names that we gave on our manual.
  - Install Exchange 2003 and SP1
  - Enable all exchange settings for all users.
- Install windows 2003 standard server for the 2nd Server for BizTalk

- Normally SP1 should be installed onto this server in the beginning, but we had some problems with BizTalk 2006 and Office Tool, so we did not install it at the beginning, we had waited until we install all the instruments.
- If you are working with BizTalk 2004 than install SQL 2000
- If you are working with BizTalk 2006 than install SQL 2005 (BizTalk 2006 may work with SQL2000 but recommended database is SQL 2005.) Standard installation will be fine.
- Install IIS 6.0 and do not forget the indexing services. Also do not forget to install ASP tools.
- Install .NET Framework 1.1.
- Install SharePoint Services 2.0
    - Make sure SharePoint services installation completed without msdn. For this feature you can use the command "setupsts.exe remotesql=yes" in the command prompt.
    - Configure the SharePoint services must use SQL2005 database.
    - Configure the SharePoint Services for the default website.
    - Make sure you can browse SharePoint services web page.
- Install Office 2003 and InfoPath.
    - Do not forget to install InfoPath after we had installed SP1 we had difficulties to install InfoPath or other office tools.
- Install Visual Studio without SQL Desktop Edition.
- Now, install Biztalk2006. It downloads some components from the internet so be sure that you have connected to internet with a stable internet connection.
    - If we compare with Biztalk2004 it is simple, mostly you click the next button and follow the instructions. But of course you have to configure and be careful with many settings.

        - After installation, it will automatically run configuration table.
            - You can’t skip any configuration, you have to follow it step by step.
            - Make sure you match the correct, user names, group names (it will automatically create the users on the local machine, but we need to use domain users and groups), database name and server name.
            - Important tip! At the middle of the configuration, export the file named “config” and save it to your hard drive, in case of any problem you can use it easily.
        - After the configuration check the SQL Server database, to see if the expecting databases has been appeared.
- **Important Tip !**
    - On the SQL Server Regional Settings must be United States. Because when you are installing SQL Server it looks at your regional settings and if it is for instance, Turkey, it installs with Turkish Character support settings and you keep on working until you have problem on BizTalk server configuration. You have to format your PC or server and install all from the beginning of course do not forget to change your Regional Settings to US.
    - Another important tip is, if your SQL server and your BizTalk Server are installed on different PCs, you may have MSDTC problem. It means that you are facing with a connection problem with two systems. Normally they say you can change it from component setting at MSDTC and Security Configuration or from the registry. But we could not succeed in most of the case. So if you face with the same problem, and if you can not solve it, just leave it and install them on the same server.
- **Client Configuration:**
    - Install windows XP Pro on a computer install SP2 and all security settings updates. Join this computer to active directory. Log on

this computer as an administrator, install office 2003 including infopath, visual studio, setup all the outlook settings.

3.3 EXAMPLE APPLICATION

3.3.1 Methodology - An example application of a BPMS definition using the defined infrastructure

Utilizing the methodology described above the Tower Organizations Purchase Order Process has been identified to be analyzed and automated.

Phase 1: Mobilization

It is understood that Tower Organization would like to minimize cost by automating the purchase order process in the organization. By automating the process the organization will reduce man hours spent on this process.

Phase 2: Business System Evaluation

The finance team is interviewed and the AS-IS environment is created. The below diagram shows the current process in the Tower Organization.

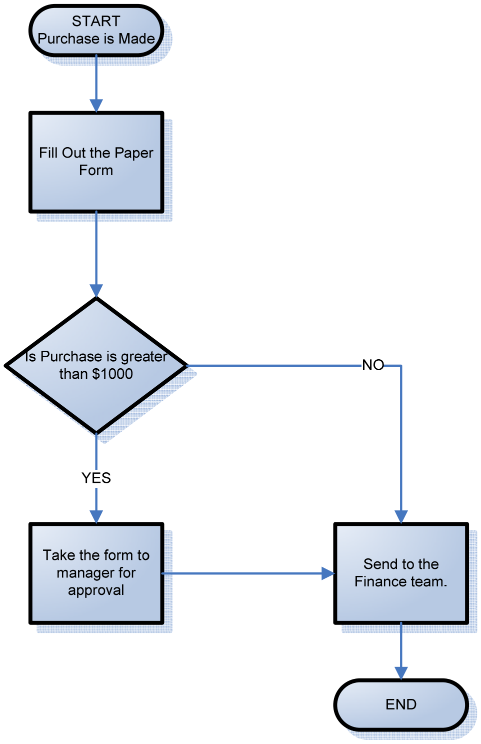

START
Purchase is Made
Fill Out the Paper Form
Is Purchase is greater than $1000
NO
YES
Take the form to manager for approval
Send to the Finance team.
END

Figure 3.7 Current Purchase Process

Phase 3: Business Systems Redesign

The AS-IS environment is analyzed and the TO-BE environment is created. The below diagram displays the Purchase Order to-be process for the Tower Organization.

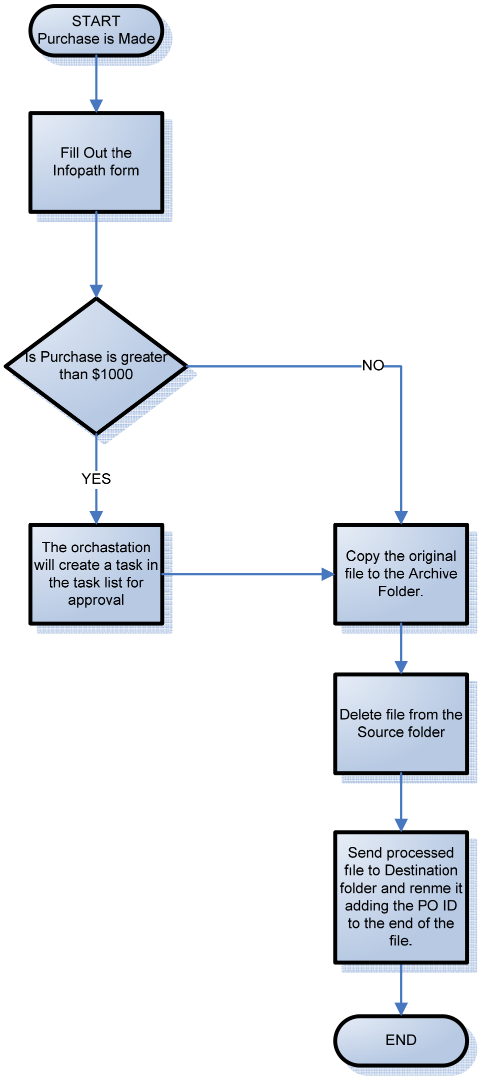

START
Purchase is Made
Fill Out the Infopath form
Is Purchase is greater than $1000
NO
YES
The orchastation will create a task in the task list for approval
Copy the original file to the Archive Folder.
Delete file from the Source folder
Send processed file to Destination folder and renme it adding the PO ID to the end of the file.
END

Figure 3.8 Purchase Order to-be Process

Phase 4: Implementation Planning

It is understood that Tower Organization would like to have the application available 24-7 and centrally available to all users via a web browser.

Phase 5: Implementation

The Microsoft solution is selected because over the last two years, based on thousands of successful deployments, BizTalk Server has clearly demonstrated that a platform

based on XML technologies can dramatically improve the efficiencies and economics of application integration development. With the innovations introduced in BizTalk Server 2004, Office 2003, Visio, and Visual Studio .NET XML technologies will demonstrate an even greater potential to deliver operational efficiencies and benefits—and will, no doubt, assume a prominent role in enterprise computing.
And also Tower Organization currently has a Windows based network which makes the integration process less costly, painless and quick.

3.3.2 Infrastructure - An example application of a BPMS definition using the defined infrastructure

The following example displays how to configure BizTalk Server 2006 to send and receive messages using the Windows SharePoint Services adapter and Content Based Routing (CBR), incorporating integration with Microsoft Office, and finally how to access the Windows SharePoint Services context properties of an incoming message at run time and then determine the destination of that message based on a property using dynamic ports in an orchestration.

This example assumes that Tower Holding is the organization who requires a Purchase Order automation application.

3.3.3 Prerequisites

The example utilizes a single server deployment with a complete installation of BizTalk Server 2006 running on Windows Server 2003. The environment also includes the following applications running on Windows 2003;

1. WSS (Windows SharePoint Services)
2. WSS Connector for BizTalk Server 2006
3. Visual Studio 2005
4. SQL Server 2005

This example utilizes the latest technology that was provided by Microsoft.

Note: Initially this thesis started using the BizTalk 2004 technology. Due to a late release by Microsoft this thesis adopted the new BizTalk 2006 server and the code of the example has been converted from the BizTalk 2004 version to the new BizTalk 2006 for it to proper in the latest technology.

3.3.4 Steps for Creating the Example

Create a BizTalk Project:

In this procedure an empty BizTalk Project and a schema is created using the BizTalk Editor.

Create a strong name key file:

1. Click **Start**, **Programs**, **Visual Studio 2005**, **Visual Studio Tools**, and then click **Visual Studio Command Prompt**, shown at figure 3.5.
2. Type *sn -k C:\KamilTez\tower.snk*, and then press **Enter**. The key pair will be written.

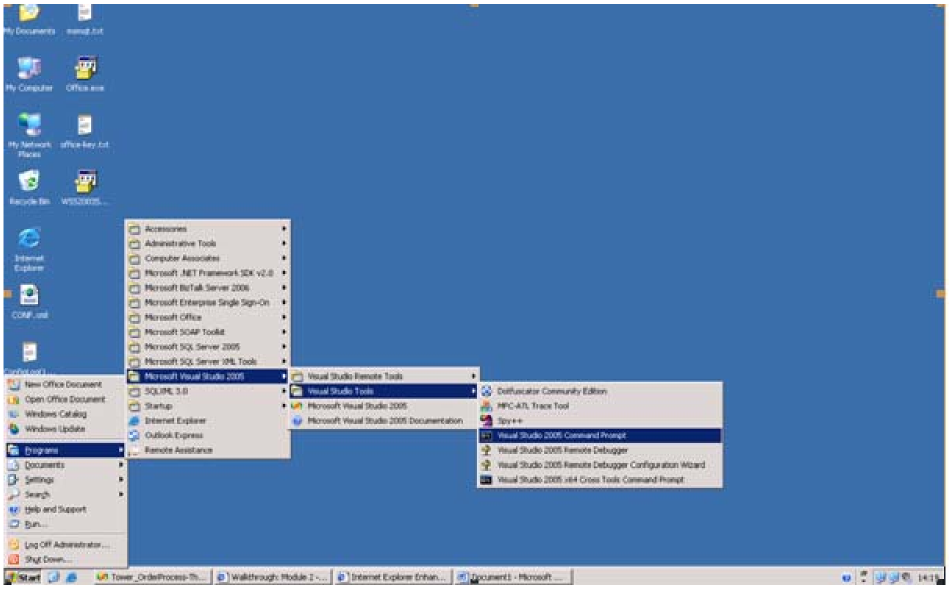
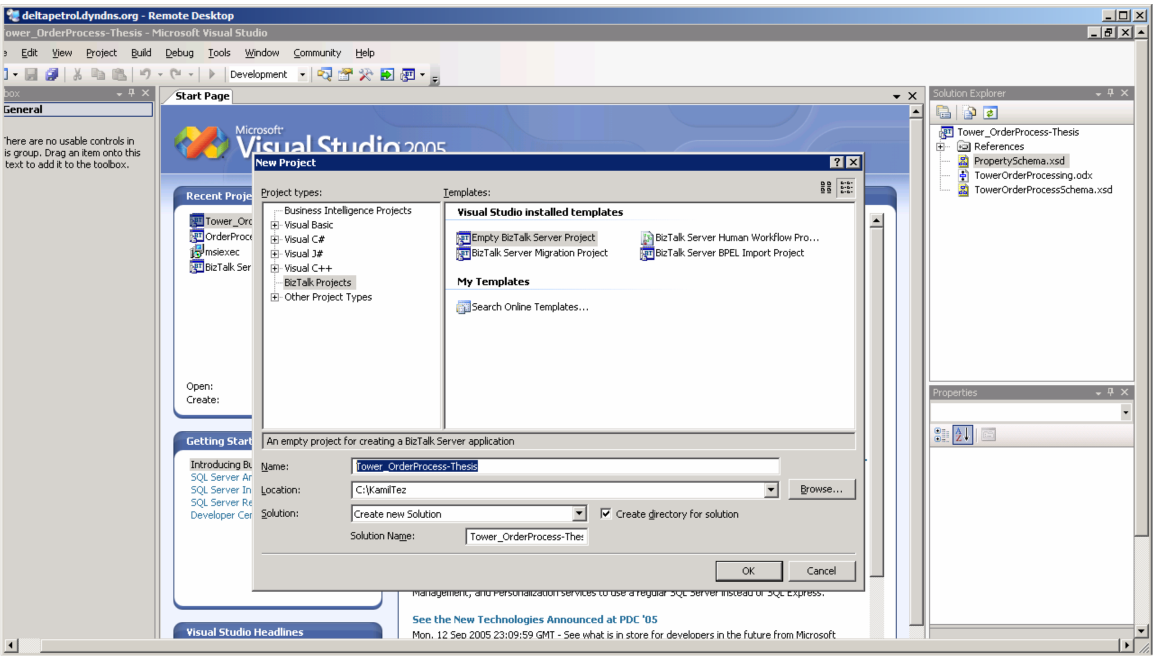

My Documents
manuel.txt
My Computer
Office.exe
My Network Places
office-key.txt
Recycle Bin
WSS2005...
Internet Explorer
CONF.xml
Accessories
Administrative Tools
Computer Associates
Microsoft .NET Framework SDK v2.0
Microsoft BizTalk Server 2006
Microsoft Enterprise Single Sign-On
Microsoft Office
Microsoft SOAP Toolkit
Microsoft SQL Server 2005
Microsoft SQL Server XML Tools
Microsoft Visual Studio 2005
SQLXML 3.0
Startup
Internet Explorer
Outlook Express
Remote Assistance
Visual Studio Remote Tools
Visual Studio Tools
Microsoft Visual Studio 2005
Microsoft Visual Studio 2005 Documentation
Dotfuscator Community Edition
MFC-ATL Trace Tool
Spy++
Visual Studio 2005 Command Prompt
Visual Studio 2005 Remote Debugger
Visual Studio 2005 Remote Debugger Configuration Wizard
Visual Studio 2005 x64 Cross Tools Command Prompt
New Office Document
Open Office Document
Windows Catalog
Windows Update
Programs
Documents
Settings
Search
Help and Support
Run...
Log Off Administrator...
Shut Down...
Start
Tower_OrderProcess-Th...
Walkthrough: Module 2 -...
Internet Explorer Enhan...
Document1 - Microsoft ...

Figure 3.9 Creating the Strong Name Key File

Create an Empty BizTalk Project:

1. Click **Start**, **Programs**, **Microsoft Visual Studio 2005**, and then click **Microsoft Visual Studio 2005**.
2. Click **File**, **New**, and then click **Project**. Under **Project types**, select **BizTalk Projects**. Under **Templates**, select **Empty BizTalk Server Project**.
3. Type "**Tower_OrderProcess-Thesis**" in the **Name** field.
4. Type C:\KamilTez as the working directory in the **Location** field.
5. Click **OK**. The screenshot below displays the create a new project screen in Visual Studio 2005.


deltapetrol.dyndns.org - Remote Desktop
Tower_OrderProcess-Thesis - Microsoft Visual Studio
Edit View Project Build Debug Tools Window Community Help
Development
Start Page
Solution Explorer
Tower_OrderProcess-Thesis
References
PropertySchema.xsd
TowerOrderProcessing.odx
TowerOrderProcessSchema.xsd
Properties
General
Recent Projects
Getting Started
Visual Studio Headlines
See the New Technologies Announced at PDC '05
New Project
Project types:
Business Intelligence Projects
Visual Basic
Visual C#
Visual J#
Visual C++
BizTalk Projects
Other Project Types
Templates:
Visual Studio installed templates
Empty BizTalk Server Project
BizTalk Server Migration Project
BizTalk Server Human Workflow Pro...
BizTalk Server BPEL Import Project
My Templates
Search Online Templates...
Browse...
OK
Cancel

An empty project for creating a BizTalk Server application

Name: Tower_OrderProcess-Thesis

Location: C:\KamilTez

Solution: Create new Solution ☑ Create directory for solution

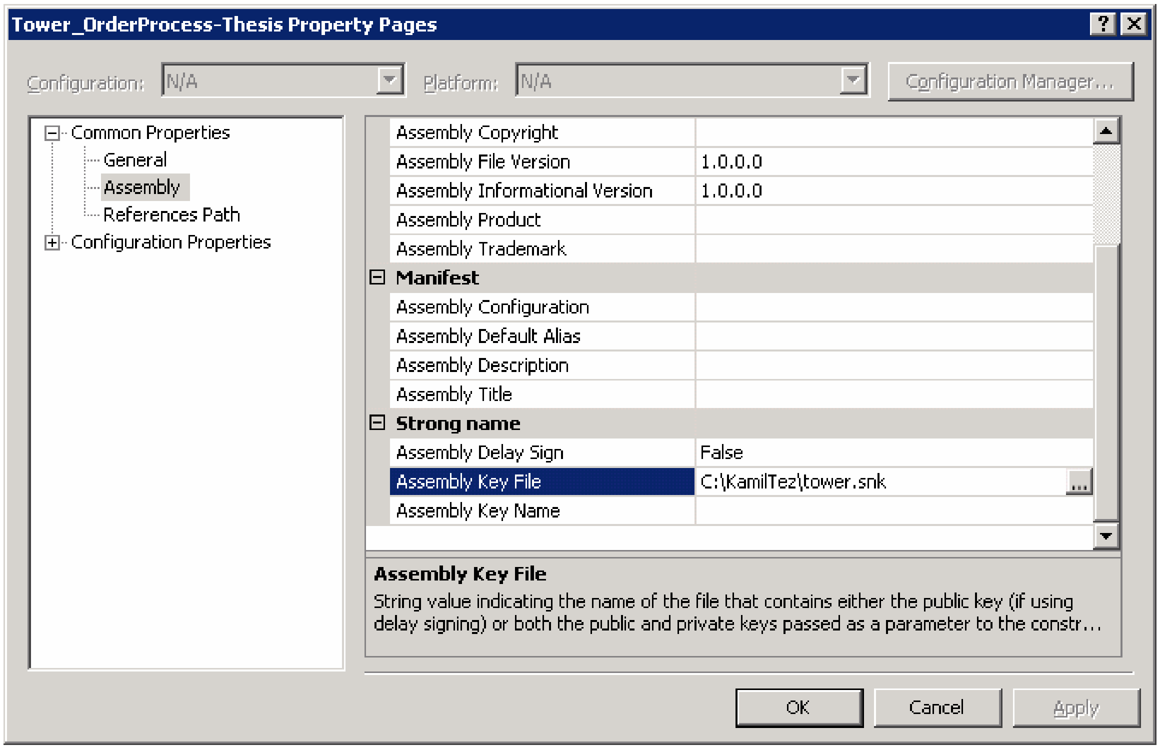
Solution Name: Tower_OrderProcess-Thes

Figure 3.10 Create an Empty Biztalk Project

Associate the key file with the assembly

1. In Solution Explorer, right-click the ***"Tower_OrderProcess-Thesis"*** project, and then click **Properties**.
2. Under **Common Properties**, select **Assembly**.

3. Under **Strong Name**, in the **Assembly Key File** field, type *C:\KamilTez\tower.snk*.
4. Click **OK**.



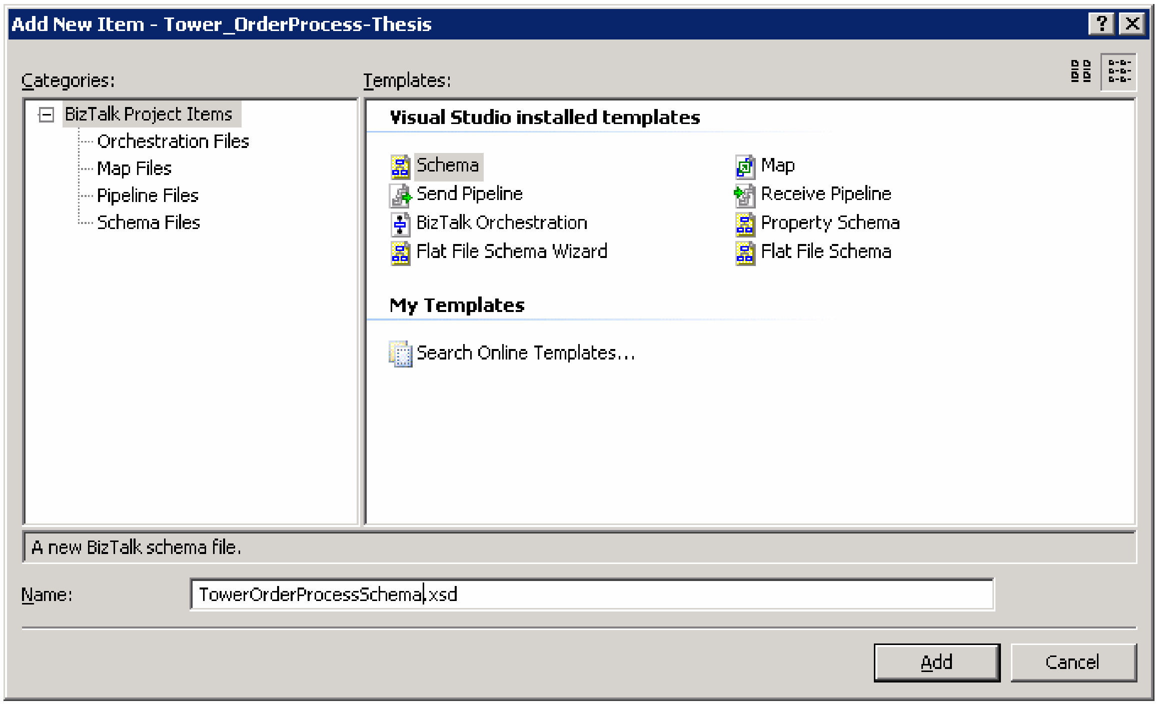
Assembly Copyright	
Assembly File Version	1.0.0.0
Assembly Informational Version	1.0.0.0
Assembly Product	
Assembly Trademark	
Manifest	
Assembly Configuration	
Assembly Default Alias	
Assembly Description	
Assembly Title	
Strong name	
Assembly Delay Sign	False
Assembly Key File	C:\KamilTez\tower.snk
Assembly Key Name	

Assembly Key File
String value indicating the name of the file that contains either the public key (if using delay signing) or both the public and private keys passed as a parameter to the constr...

Figure 3.11 Associating the key file with assembly

Create an XSD Schema using the BizTalk Editor

1. In Solution Explorer, right-click the ***"Tower_OrderProcess-Thesis"*** project, click **Add**, and then click **New Item…**
2. Under **Categories**, click **Schema Files**.
3. Under **Templates**, click **Schema**.
4. Type Tower*OrderProcessSchema* in the **Name** field, and then click **Add**.



Add New Item - Tower_OrderProcess-Thesis

Categories:

- BizTalk Project Items
  - Orchestration Files
  - Map Files
  - Pipeline Files
  - Schema Files

Templates:

Visual Studio installed templates

Schema	Map
Send Pipeline	Receive Pipeline
BizTalk Orchestration	Property Schema
Flat File Schema Wizard	Flat File Schema

My Templates

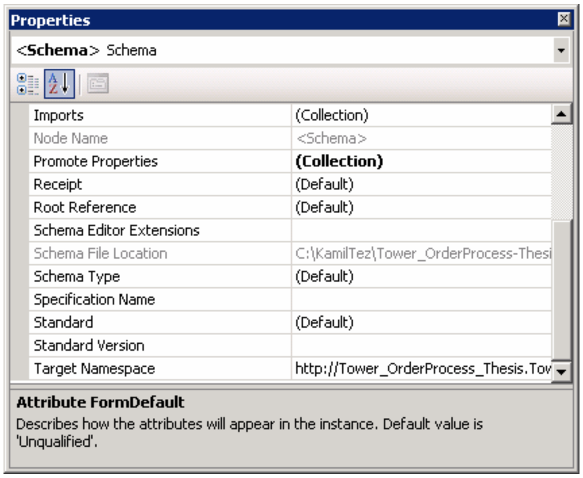
Search Online Templates...

A new BizTalk schema file.

Name: TowerOrderProcessSchema.xsd

Figure 3.12 Create an XSD Schema

5. In the Properties Window for Tower*OrderProcessSchema*, select *Qualified* for the **Element FormDefault** property.
6. In the Properties Window for Tower*OrderProcessSchema*, type *http://Tower_OrderProcess_Thesis.PurchaseOrder* in the **Target Namespace** field.



Properties

<Schema> Schema

Imports	(Collection)
Node Name	<Schema>
Promote Properties	**(Collection)**
Receipt	(Default)
Root Reference	(Default)
Schema Editor Extensions	
Schema File Location	C:\KamilTez\Tower_OrderProcess-Thesi
Schema Type	(Default)
Specification Name	
Standard	(Default)
Standard Version	
Target Namespace	http://Tower_OrderProcess_Thesis.Tov

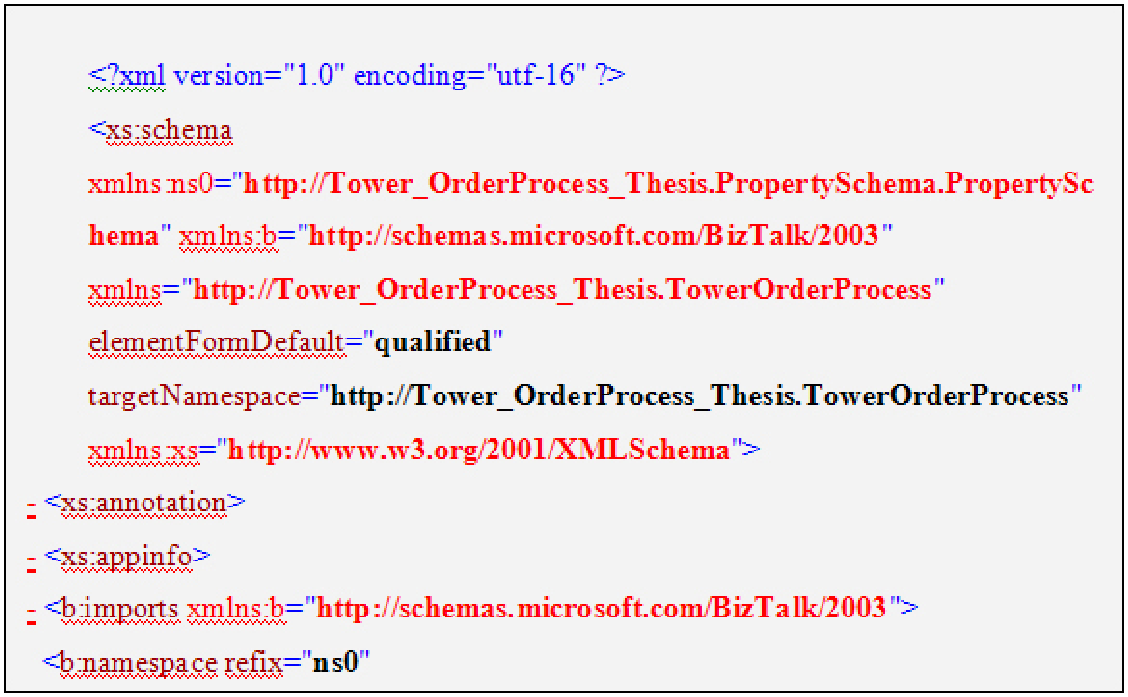
Attribute FormDefault

Describes how the attributes will appear in the instance. Default value is 'Unqualified'.

Figure 3.13 Target Namespace

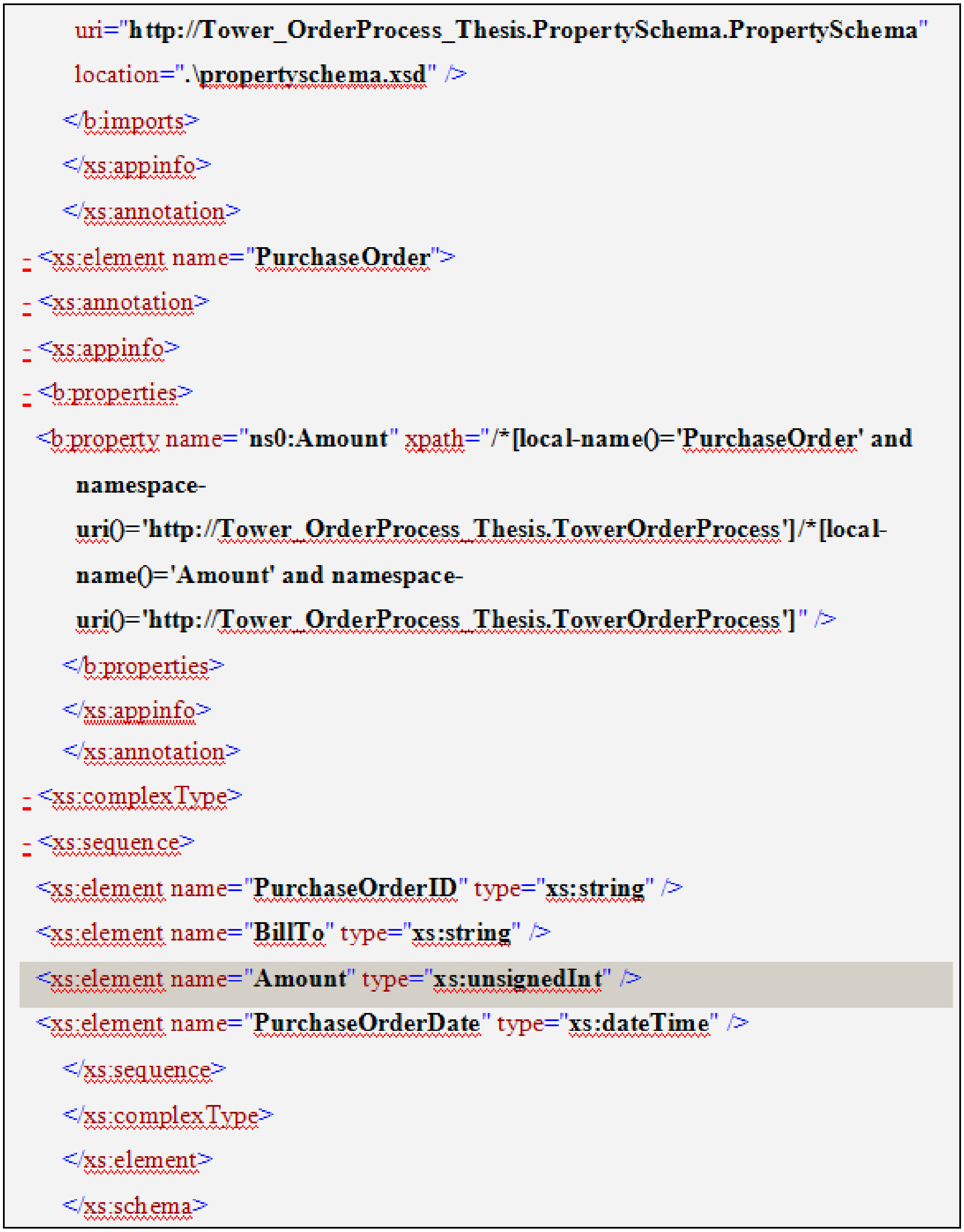
7. In the **BizTalk Editor**, right-click *Root*, click **Rename**, and then type *PurchaseOrder*.
8. Right-click the **PurchaseOrder** node, click **Insert Schema Node**, then click **Child Field Element**.
9. Name it *PurchaseOrderID*.
10. Create another child field element and name it *BillTo*.
11. Create another child field element and name it *Amount*.
12. In the Properties Window, set the **Data Type** property for *Amount* to xs:unsignedInt.
13. Create another child field element and name it *PurchaseOrderDate*.
14. In the Properties Window, set the **Data Type** property for *PurchaseOrderDate* to xs:dateTime.
15. Right-click *Amount*, click **Promote**, and then click **Quick Promotion**.

16. Click **File**, and then click **Save All**.



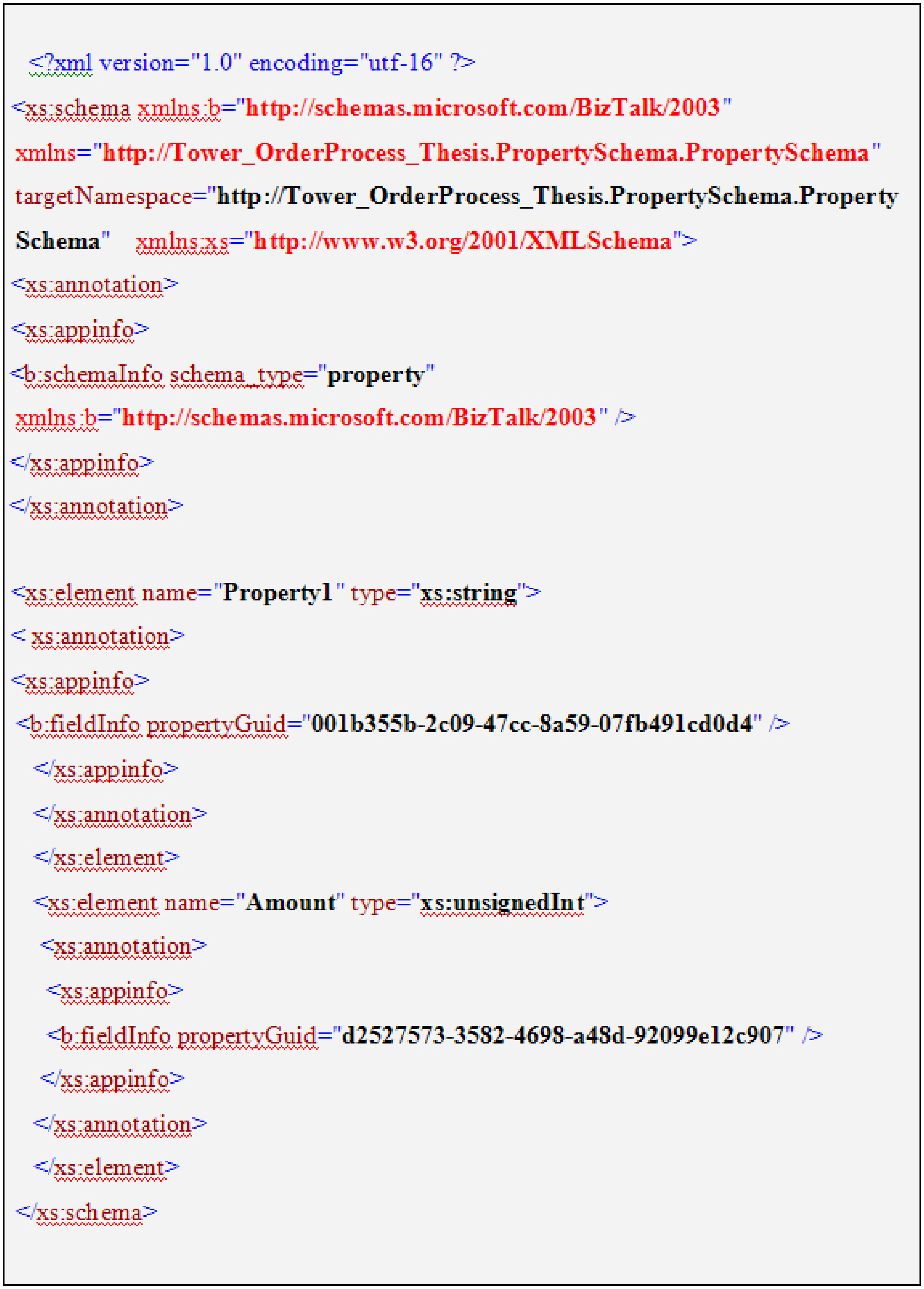
```
    <?xml version="1.0" encoding="utf-16" ?>
    <xs:schema
    xmlns:ns0="http://Tower_OrderProcess_Thesis.PropertySchema.PropertySc
    hema" xmlns:b="http://schemas.microsoft.com/BizTalk/2003"
    xmlns="http://Tower_OrderProcess_Thesis.TowerOrderProcess"
    elementFormDefault="qualified"
    targetNamespace="http://Tower_OrderProcess_Thesis.TowerOrderProcess"
    xmlns:xs="http://www.w3.org/2001/XMLSchema">
- <xs:annotation>
- <xs:appinfo>
- <b:imports xmlns:b="http://schemas.microsoft.com/BizTalk/2003">
  <b:namespace refix="ns0"
```

Figure 3.14 XSD TowerOrderProcess-1



```
    uri="http://Tower_OrderProcess_Thesis.PropertySchema.PropertySchema"
    location=".\propertyschema.xsd" />
   </b:imports>
   </xs:appinfo>
   </xs:annotation>
- <xs:element name="PurchaseOrder">
- <xs:annotation>
- <xs:appinfo>
- <b:properties>
  <b:property name="ns0:Amount" xpath="/*[local-name()='PurchaseOrder' and
    namespace-
    uri()='http://Tower_OrderProcess_Thesis.TowerOrderProcess']/*[local-
    name()='Amount' and namespace-
    uri()='http://Tower_OrderProcess_Thesis.TowerOrderProcess']" />
   </b:properties>
   </xs:appinfo>
   </xs:annotation>
- <xs:complexType>
- <xs:sequence>
  <xs:element name="PurchaseOrderID" type="xs:string" />
  <xs:element name="BillTo" type="xs:string" />
  <xs:element name="Amount" type="xs:unsignedInt" />
  <xs:element name="PurchaseOrderDate" type="xs:dateTime" />
   </xs:sequence>
   </xs:complexType>
   </xs:element>
   </xs:schema>
```

Figure 3.15 XSD TowerOrderProcess-2

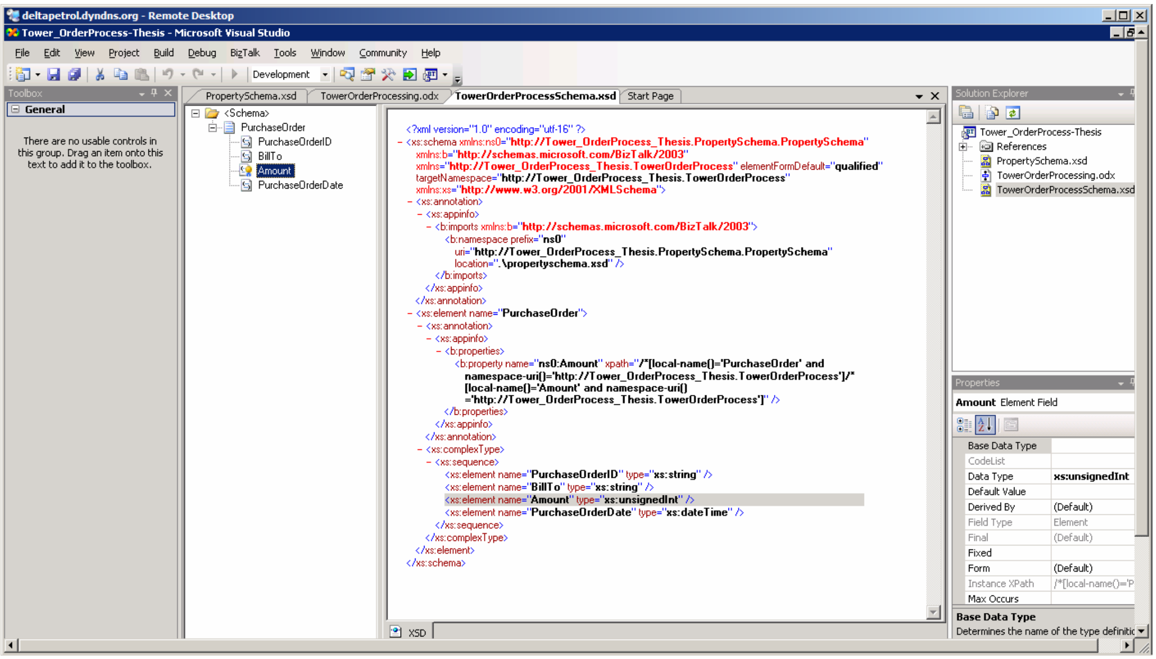


```
 <?xml version="1.0" encoding="utf-16" ?>
<xs:schema xmlns:b="http://schemas.microsoft.com/BizTalk/2003"
 xmlns="http://Tower_OrderProcess_Thesis.PropertySchema.PropertySchema"
 targetNamespace="http://Tower_OrderProcess_Thesis.PropertySchema.Property
 Schema"   xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:annotation>
<xs:appinfo>
<b:schemaInfo schema_type="property"
 xmlns:b="http://schemas.microsoft.com/BizTalk/2003" />
</xs:appinfo>
</xs:annotation>

<xs:element name="Property1" type="xs:string">
< xs:annotation>
<xs:appinfo>
 <b:fieldInfo propertyGuid="001b355b-2c09-47cc-8a59-07fb491cd0d4" />
   </xs:appinfo>
   </xs:annotation>
   </xs:element>
   <xs:element name="Amount" type="xs:unsignedInt">
    <xs:annotation>
     <xs:appinfo>
     <b:fieldInfo propertyGuid="d2527573-3582-4698-a48d-92099e12c907" />
    </xs:appinfo>
   </xs:annotation>
   </xs:element>
 </xs:schema>
```

Figure 3.16 XSD Property Schema, Code.

The figure displays the look of the field Amount after being promoted.


deltapetrol.dyndns.org - Remote Desktop
Tower_OrderProcess-Thesis - Microsoft Visual Studio
File Edit View Project Build Debug BizTalk Tools Window Community Help
Development
Toolbox
General
There are no usable controls in this group. Drag an item onto this text to add it to the toolbox.
PropertySchema.xsd
TowerOrderProcessing.odx
TowerOrderProcessSchema.xsd
Start Page
<Schema>
PurchaseOrder
PurchaseOrderID
BillTo
Amount
PurchaseOrderDate
XSD
Solution Explorer
Tower_OrderProcess-Thesis
References
PropertySchema.xsd
TowerOrderProcessing.odx
TowerOrderProcessSchema.xsd
Properties

```
  <?xml version="1.0" encoding="utf-16" ?>
- <xs:schema xmlns:ns0="http://Tower_OrderProcess_Thesis.PropertySchema.PropertySchema"
    xmlns:b="http://schemas.microsoft.com/BizTalk/2003"
    xmlns="http://Tower_OrderProcess_Thesis.TowerOrderProcess" elementFormDefault="qualified"
    targetNamespace="http://Tower_OrderProcess_Thesis.TowerOrderProcess"
    xmlns:xs="http://www.w3.org/2001/XMLSchema">
  - <xs:annotation>
    - <xs:appinfo>
      - <b:imports xmlns:b="http://schemas.microsoft.com/BizTalk/2003">
          <b:namespace prefix="ns0"
            uri="http://Tower_OrderProcess_Thesis.PropertySchema.PropertySchema"
            location=".\propertyschema.xsd" />
        </b:imports>
      </xs:appinfo>
    </xs:annotation>
  - <xs:element name="PurchaseOrder">
    - <xs:annotation>
      - <xs:appinfo>
        - <b:properties>
            <b:property name="ns0:Amount" xpath="/*[local-name()='PurchaseOrder' and
              namespace-uri()='http://Tower_OrderProcess_Thesis.TowerOrderProcess']/*
              [local-name()='Amount' and namespace-uri()
              ='http://Tower_OrderProcess_Thesis.TowerOrderProcess']" />
          </b:properties>
        </xs:appinfo>
      </xs:annotation>
    - <xs:complexType>
      - <xs:sequence>
          <xs:element name="PurchaseOrderID" type="xs:string" />
          <xs:element name="BillTo" type="xs:string" />
          <xs:element name="Amount" type="xs:unsignedInt" />
          <xs:element name="PurchaseOrderDate" type="xs:dateTime" />
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:schema>
```

Amount Element Field

Base Data Type	
CodeList	
Data Type	**xs:unsignedInt**
Default Value	
Derived By	(Default)
Field Type	Element
Final	(Default)
Fixed	
Form	(Default)
Instance XPath	/*[local-name()='P
Max Occurs	

Base Data Type
Determines the name of the type definitic

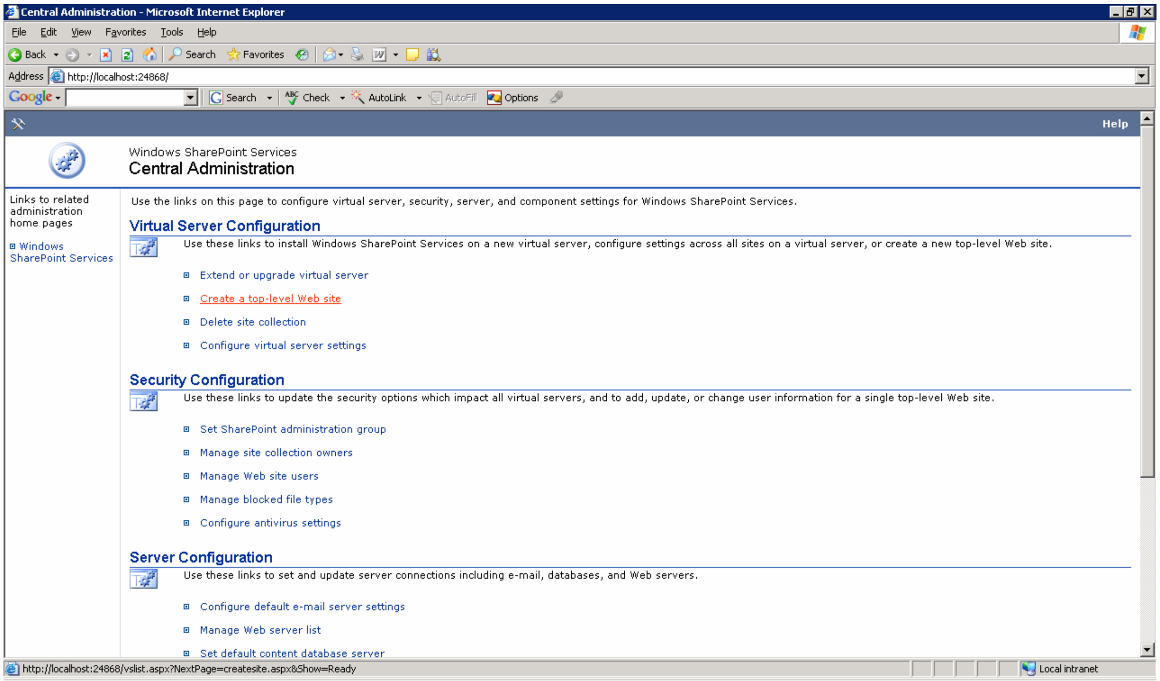
Figure 3.17 Promoted Amount

Configure Windows SharePoint Services

In this procedure we will create a SharePoint top-level Web site that contains three document libraries. The Windows SharePoint Services Adapter uses these libraries to move a message from a source library to a destination library. This message is also archived in a document library.

Create a Windows SharePoint Services Site:

1. Click **Start**, **Programs**, **Administrative Tools**, and then click **SharePoint Central Administration.**
2. Under **Virtual Server Configuration**, click **Create a top-level Web site**.


Central Administration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:24868/
Google Search Check AutoLink AutoFill Options
Help

Windows SharePoint Services
Central Administration

Links to related administration home pages

- Windows SharePoint Services

Use the links on this page to configure virtual server, security, server, and component settings for Windows SharePoint Services.

Virtual Server Configuration

Use these links to install Windows SharePoint Services on a new virtual server, configure settings across all sites on a virtual server, or create a new top-level Web site.

- Extend or upgrade virtual server
- Create a top-level Web site
- Delete site collection
- Configure virtual server settings

Security Configuration

Use these links to update the security options which impact all virtual servers, and to add, update, or change user information for a single top-level Web site.

- Set SharePoint administration group
- Manage site collection owners
- Manage Web site users
- Manage blocked file types
- Configure antivirus settings

Server Configuration

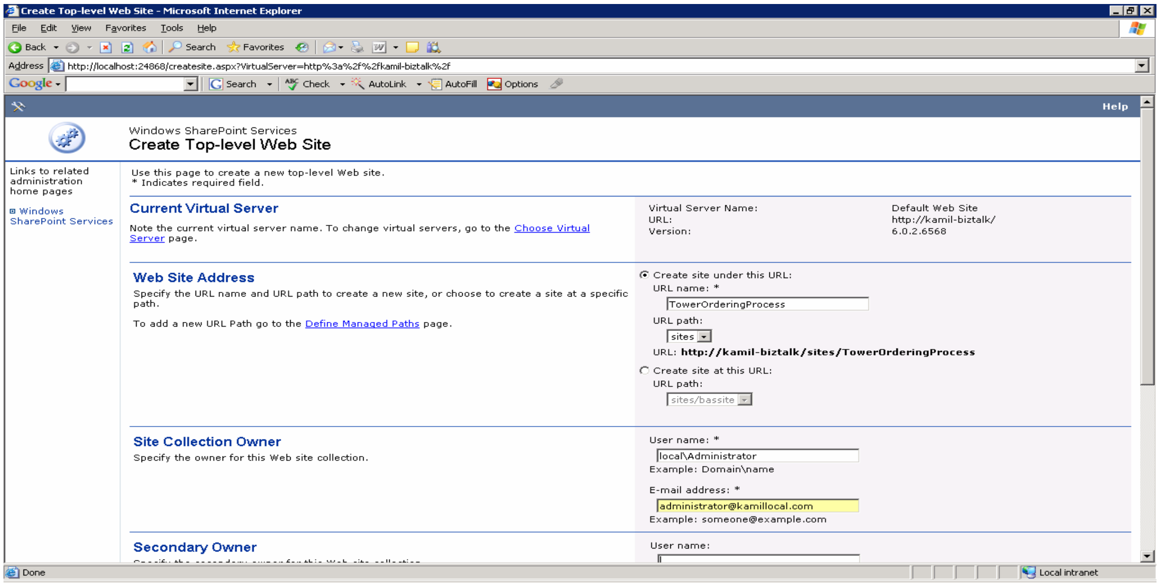
Use these links to set and update server connections including e-mail, databases, and Web servers.

- Configure default e-mail server settings
- Manage Web server list
- Set default content database server

http://localhost:24868/vslist.aspx?NextPage=createsite.aspx&Show=Ready

Figure 3.17 Sharepoint Server Site 1

3. Under **Virtual Server List**, select the Web site that you installed the Windows SharePoint Services Adapter on. For example, *Default Web Site*.
4. In the **Web Site Address** section, in the **URL name** field, type *WSSAdapterWalkthrough*.
5. In the **Site Collection Owner** section, in the **User name field,** type in a user name. This user will be the owner for the web site and does not need special permissions in BizTalk Server.
6. In the **Site Collection Owner** section, in the **E-mail** field, type in an e-mail address.
7. Click **OK**.


Create Top-level Web Site - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address
http://localhost:24868/createsite.aspx?VirtualServer=http%3a%2f%2fkamil-biztalk%2f
Google Search Check AutoLink AutoFill Options
Help

Windows SharePoint Services

Create Top-level Web Site

Links to related administration home pages

Windows SharePoint Services

Use this page to create a new top-level Web site.
* Indicates required field.

Current Virtual Server

Note the current virtual server name. To change virtual servers, go to the Choose Virtual Server page.

Virtual Server Name: Default Web Site
URL: http://kamil-biztalk/
Version: 6.0.2.6568

Web Site Address

Specify the URL name and URL path to create a new site, or choose to create a site at a specific path.

To add a new URL Path go to the Define Managed Paths page.

● Create site under this URL:
URL name: * TowerOrderingProcess
URL path: sites
URL: **http://kamil-biztalk/sites/TowerOrderingProcess**

○ Create site at this URL:
URL path: sites/bassite

Site Collection Owner

Specify the owner for this Web site collection.

User name: * local\Administrator
Example: Domain\name

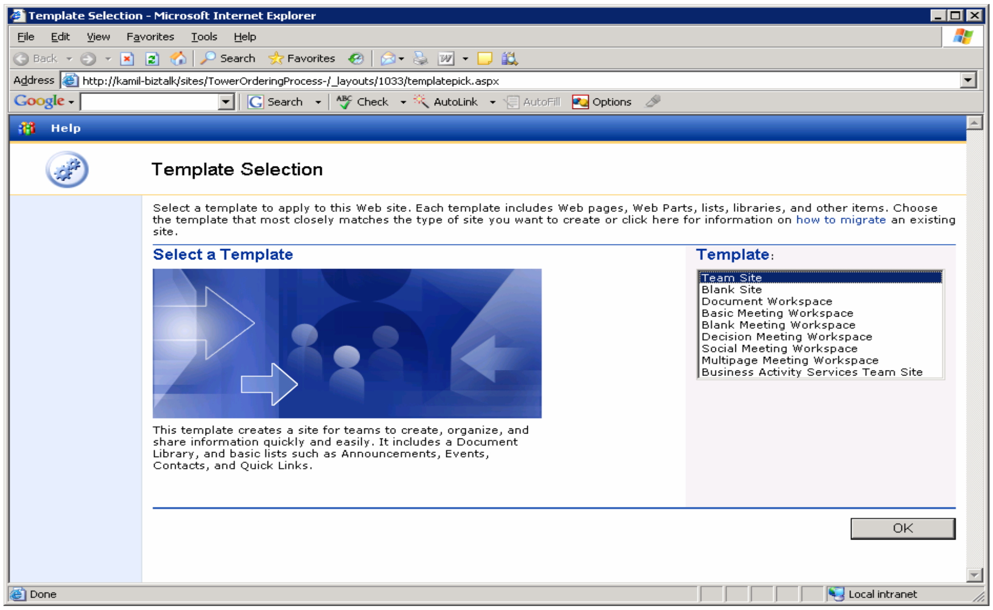
E-mail address: * administrator@kamillocal.com
Example: someone@example.com

Secondary Owner

User name:

Figure 3.3.18 Sharepoint Server Site 2

8. On the **Top-Level Site Successfully Created** page, click the new top-level Web site you just created. For example, *http:// kamil-biztalk /sites/ TowerOrderingProcess*.
9. Select the **Team Site** template from the list of templates, and then click **OK**. This will open the Team Web Site Home page.


Template Selection - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address
http://kamil-biztalk/sites/TowerOrderingProcess-/_layouts/1033/templatepick.aspx
Google Search Check AutoLink AutoFill Options
Help

Template Selection

Select a template to apply to this Web site. Each template includes Web pages, Web Parts, lists, libraries, and other items. Choose the template that most closely matches the type of site you want to create or click here for information on how to migrate an existing site.

Select a Template

This template creates a site for teams to create, organize, and share information quickly and easily. It includes a Document Library, and basic lists such as Announcements, Events, Contacts, and Quick Links.

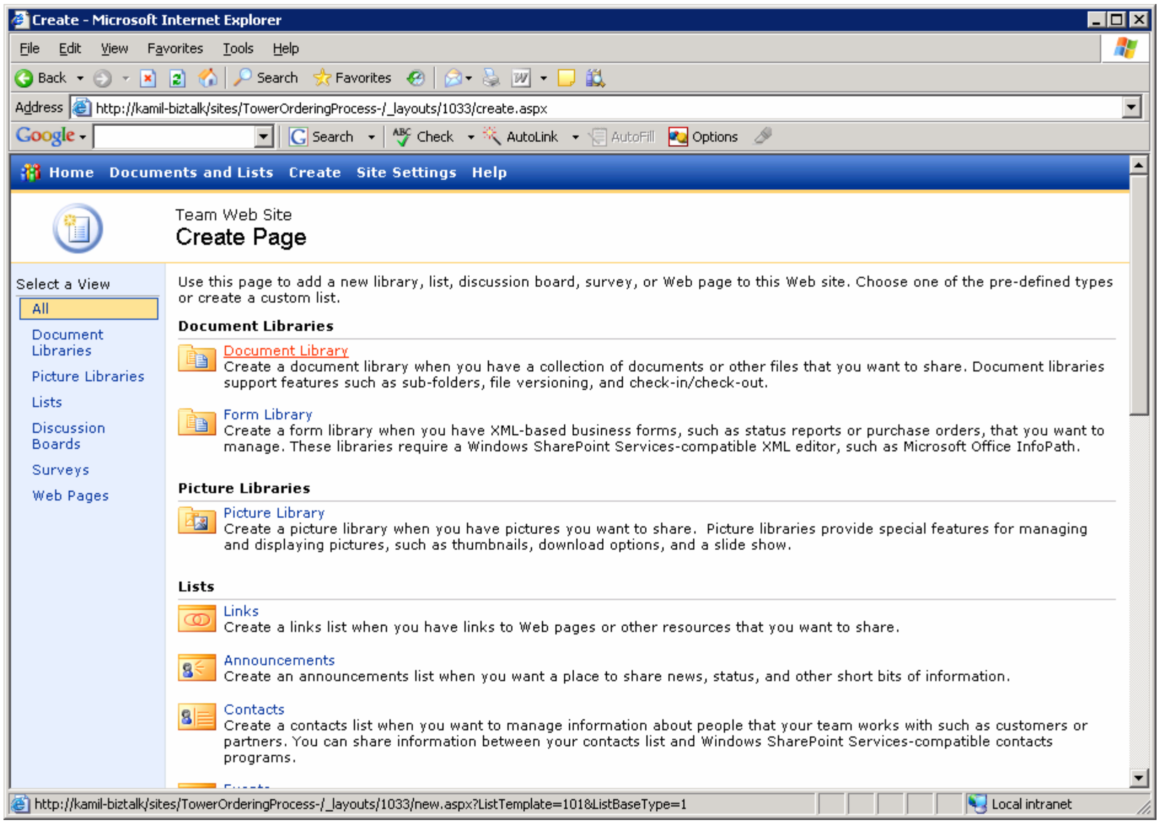
Template:

Team Site
Blank Site
Document Workspace
Basic Meeting Workspace
Blank Meeting Workspace
Decision Meeting Workspace
Social Meeting Workspace
Multipage Meeting Workspace
Business Activity Services Team Site

Figure 3.19 Team Web site

Create a "Source" Document Library:

1. On the Team Web Site Home page, on the top navigation bar, click **Create**.
2. Under **Document Libraries**, click **Document Library**.


Create - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://kamil-biztalk/sites/TowerOrderingProcess-/_layouts/1033/create.aspx
Google Search Check AutoLink AutoFill Options
Home Documents and Lists Create Site Settings Help
Select a View
All
Document Libraries
Picture Libraries
Lists
Discussion Boards
Surveys
Web Pages
http://kamil-biztalk/sites/TowerOrderingProcess-/_layouts/1033/new.aspx?ListTemplate=101&ListBaseType=1
Local intranet

Team Web Site
Create Page

Use this page to add a new library, list, discussion board, survey, or Web page to this Web site. Choose one of the pre-defined types or create a custom list.

Document Libraries

Document Library
Create a document library when you have a collection of documents or other files that you want to share. Document libraries support features such as sub-folders, file versioning, and check-in/check-out.

Form Library
Create a form library when you have XML-based business forms, such as status reports or purchase orders, that you want to manage. These libraries require a Windows SharePoint Services-compatible XML editor, such as Microsoft Office InfoPath.

Picture Libraries

Picture Library
Create a picture library when you have pictures you want to share. Picture libraries provide special features for managing and displaying pictures, such as thumbnails, download options, and a slide show.

Lists

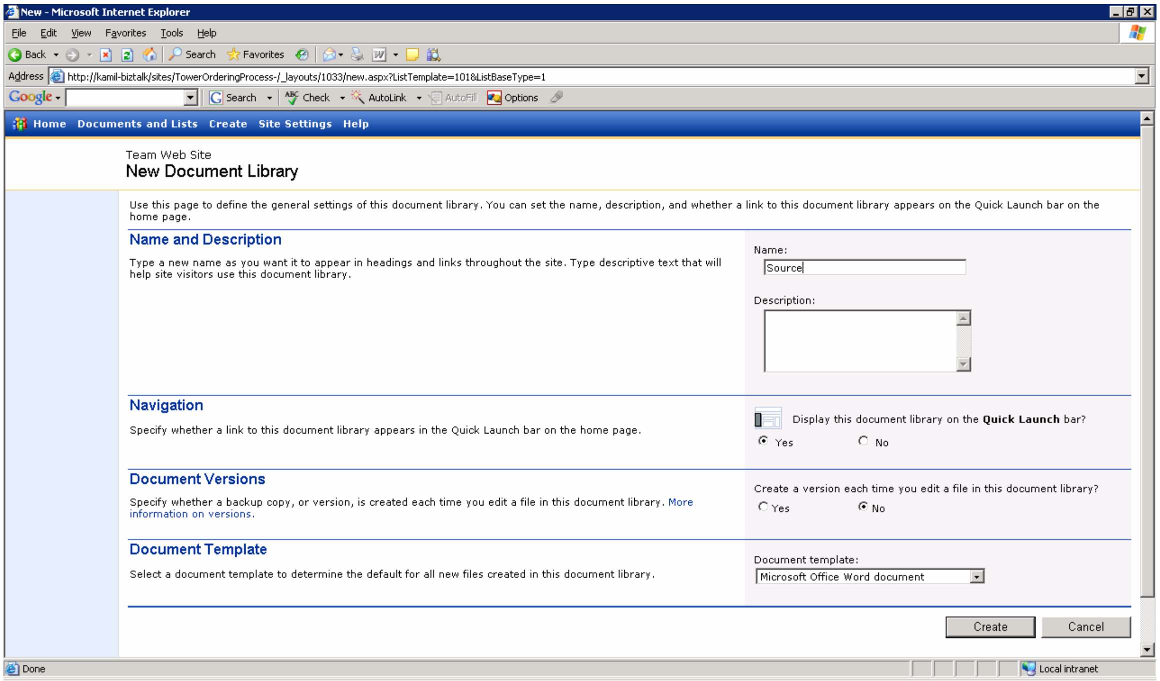
Links
Create a links list when you have links to Web pages or other resources that you want to share.

Announcements
Create an announcements list when you want a place to share news, status, and other short bits of information.

Contacts
Create a contacts list when you want to manage information about people that your team works with such as customers or partners. You can share information between your contacts list and Windows SharePoint Services-compatible contacts programs.

Figure 3.20 Team Web site 2

3. In the **Name and Description** section, in the **Name field,** type *Source*.
4. In the **Navigation** section, select **Yes** to display this form library on the Quick Launch bar.
5. In the **Document Template** section, in the **Document Template** drop-down list, select *None*.
6. Click **Create**. The document library will be created and you will be re-directed to the empty library.



New - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://kamil-biztalk/sites/TowerOrderingProcess-/_layouts/1033/new.aspx?ListTemplate=101&ListBaseType=1
Google Search Check AutoLink AutoFill Options
Home Documents and Lists Create Site Settings Help
Done
Local intranet

Team Web Site
New Document Library

Use this page to define the general settings of this document library. You can set the name, description, and whether a link to this document library appears on the Quick Launch bar on the home page.

Name and Description

Type a new name as you want it to appear in headings and links throughout the site. Type descriptive text that will help site visitors use this document library.

Name: Source

Description:

Navigation

Specify whether a link to this document library appears in the Quick Launch bar on the home page.

Display this document library on the **Quick Launch** bar?
● Yes ○ No

Document Versions

Specify whether a backup copy, or version, is created each time you edit a file in this document library. More information on versions.

Create a version each time you edit a file in this document library?
○ Yes ● No

Document Template

Select a document template to determine the default for all new files created in this document library.

Document template: Microsoft Office Word document

Create Cancel

Figure 3.21 New Document Library

Create a "Destination" Document Library:

1. On the Team Web Site Home page, on the top navigation bar, click **Create**.
2. Under **Document Libraries**, click **Document Library**.
3. In the **Name and Description** section, in the **Name field**, type *Destination*.
4. In the **Navigation** section, select **Yes** to display this form library on the Quick Launch bar.
5. In the **Document Template** section, in the **Document Template** drop-down list, select *None*.
6. Click **Create**. The document library will be created and you will be re-directed to the empty library.

Create an "Archive" Document Library:

1. On the Team Web Site Home page, on the top navigation bar, click **Create**.
2. Under **Document Libraries**, click **Document Library**.
3. In the **Name and Description** section, in the **Name field**, type *Archive*.

4. In the **Navigation** section, select **Yes** to display this form library on the Quick Launch bar.
5. In the **Document Template** section, in the **Document Template** drop-down list, select *None*.
6. Click **Create**. The document library will be created and you will be re-directed to the empty library.

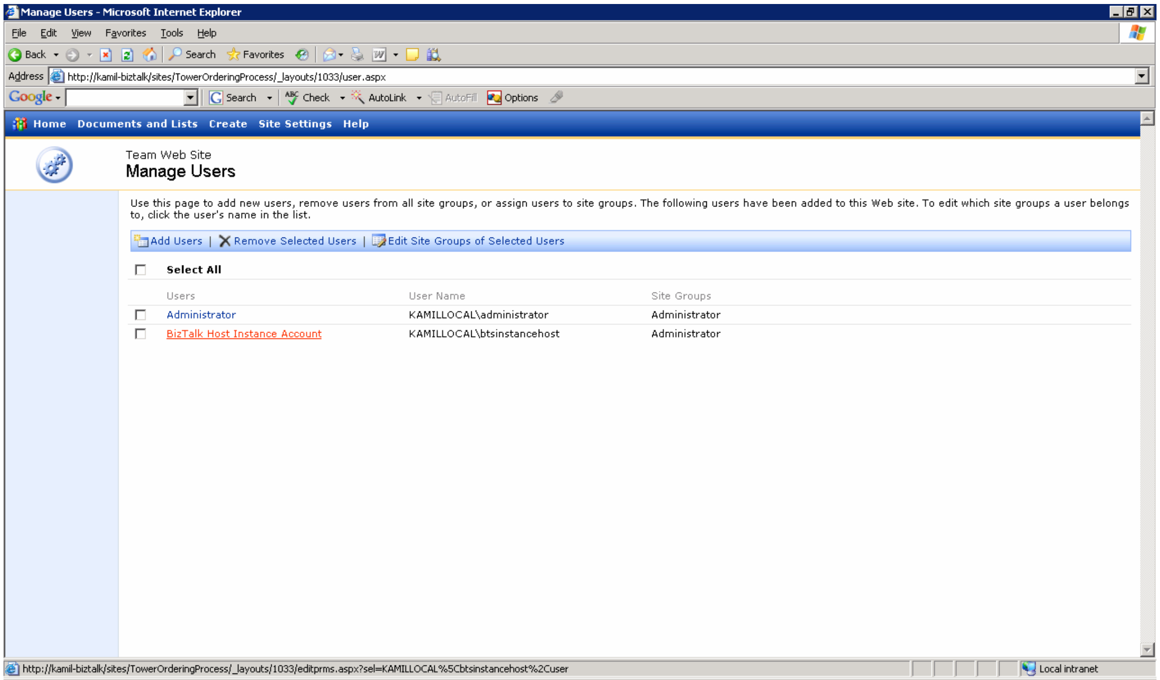
Configure Windows Security:

1. Click **Start**, **Programs**, **Administrative Tools**, and then click **Computer Management**.
2. In the console tree, expand **Local Users and Groups**, and then click **Groups**.
3. Right-click the **SharePoint Enabled Hosts** group, click **Add to Group**, and then click **Add**.
4. In the **Select Users, Computers, or Groups dialog box**, under **Enter the object names to select**, type the name of the account that we configured the BizTalk Server Host Instance to run under, and then click **OK**.
5. In the console tree, expand **Services and Applications**, and then click **Services**.
6. Right-click **BizTalk Service BizTalk Group: <BizTalk_Host_Name>**, and then click **Restart**.
7. Close **Computer Management**.

Configure SharePoint Security:

1. Open a web browser and navigate to *http://kamil-biztalk/sites/TowerOrdringPocess*.
2. On the Team Web Site Home page, on the top navigation bar, click **Site Settings**.
3. Under **Administration**, click **Manage users**.
4. Click **Add Users**.
5. In **Step 1: Choose Users**, type the name of the account that the BizTalk Server Host Instance is running under.

6. In **Step 2: Choose Site Groups**, select the **Reader** and **Contributor** checkboxes.
7. Click **Next**.
8. Uncheck **Send the following e-mail to let these users now they've been added**, and then click **Finish**.


Manage Users - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://kamil-biztalk/sites/TowerOrderingProcess/_layouts/1033/user.aspx
Google Search Check AutoLink AutoFill Options
Home Documents and Lists Create Site Settings Help
Team Web Site
Manage Users
Add Users | Remove Selected Users | Edit Site Groups of Selected Users
http://kamil-biztalk/sites/TowerOrderingProcess/_layouts/1033/editprms.aspx?sel=KAMILLOCAL%5Cbtsinstancehost%2Cuser
Local intranet

Use this page to add new users, remove users from all site groups, or assign users to site groups. The following users have been added to this Web site. To edit which site groups a user belongs to, click the user's name in the list.

☐ Select All

	Users	User Name	Site Groups
☐	Administrator	KAMILLOCAL\administrator	Administrator
☐	BizTalk Host Instance Account	KAMILLOCAL\btsinstancehost	Administrator

Figure 3.22 Configuring SharePoint Security

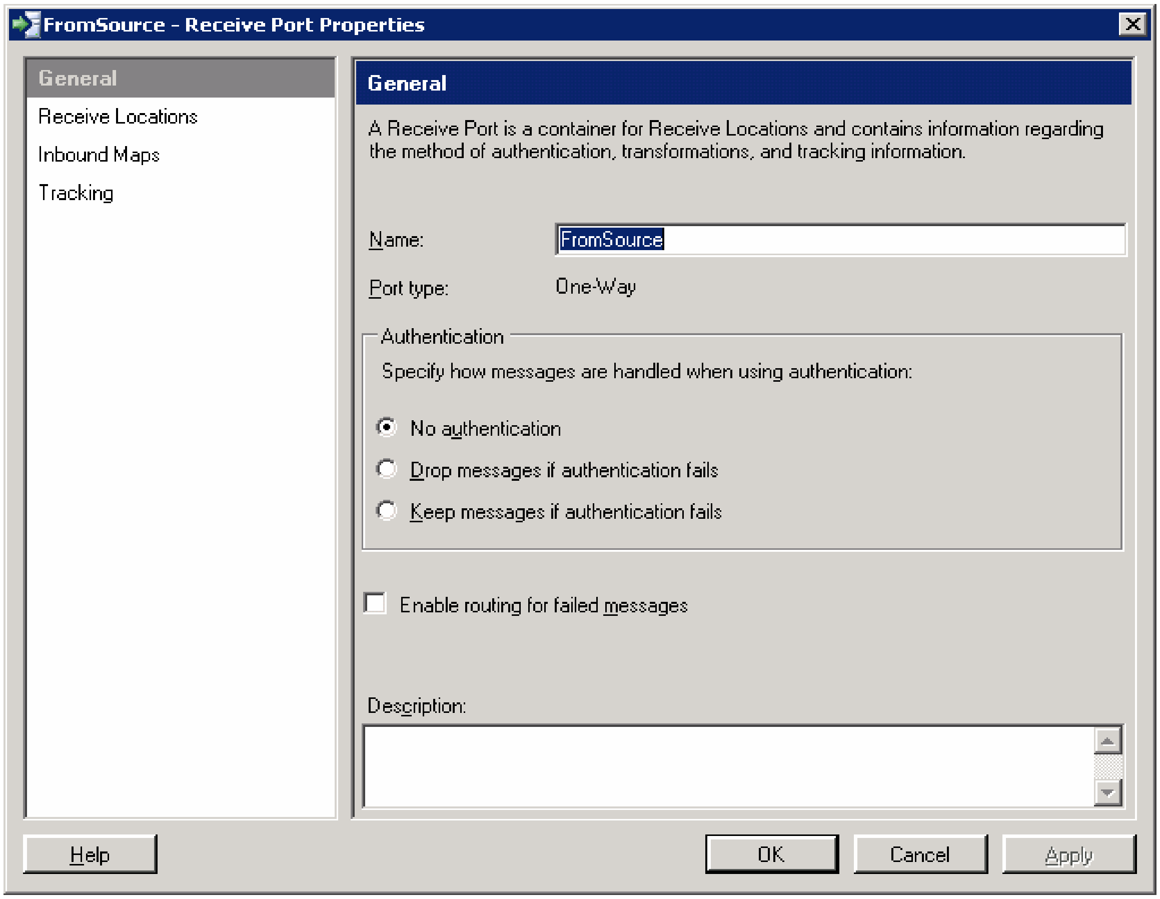
Create and Configure the BizTalk Server Ports

In this procedure you will create and configure the BizTalk Server Receive Ports, Receive Locations, and Send Ports for the Windows SharePoint Services Adapter.

Create the Receive Port:

1. Click **Start**, **Programs**, **Microsoft BizTalk Server 2006**, and then click **BizTalk Server Administration.**
2. Expand **Microsoft BizTalk Server 2006 Administration SnapIn**, expand **BizTalk Group**, expand **Applications**, expand **BizTalk Application 1**, right-click **Receive Ports**, click **New**, and then click **One-way Receive Port…**

3. In the **Receive Port Properties** dialog box, under **General**, type *FromSource* in the **Name** field.
4. Click **OK**.



FromSource - Receive Port Properties

General
Receive Locations
Inbound Maps
Tracking

General

A Receive Port is a container for Receive Locations and contains information regarding the method of authentication, transformations, and tracking information.

Name: FromSource

Port type: One-Way

Authentication

Specify how messages are handled when using authentication:

● No authentication

○ Drop messages if authentication fails

○ Keep messages if authentication fails

□ Enable routing for failed messages

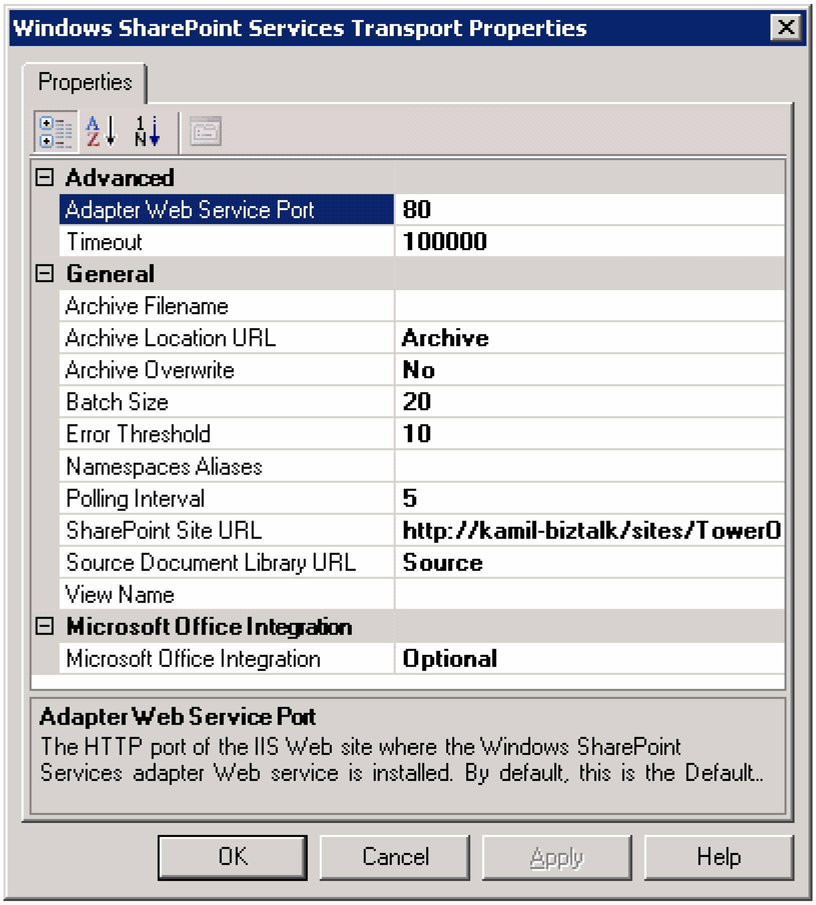
Description:

Figure 3.23 Creating Receive Ports

Create the Receive Location:

1. In the **BizTalk Administration Console**, right click the **Receive Locations** node, click **New**, and then click **One-way Receive Location…**
2. In the **Select a Receive Port** dialog box, select *FromSource*, and then click **OK**.
3. In the **Receive Location Properties** dialog box, under **General**, type *SourceLocation* in the **Name** field.

4. In the **Transport** section, in the **Type** drop-down list, select *Windows SharePoint Services*.
5. Click **Configure** to configure the Windows SharePoint Services adapter properties.
6. In the **Adapter Web Service Port** property, type the port number of the virtual server where the Windows SharePoint Services Adapter web service was installed. By default, this is port 80.
7. Type *Archive* in the **Archive Location** property.
8. Type *10* in the **Polling Interval** property.
9. Type *http://kamil-biztalk/sites/TowerOrdringPocess* in the **SharePoint Site Url** property. Type *Source* for the **Source Document Library** property.
10. Click **OK**.



Windows SharePoint Services Transport Properties

Properties

⊟ **Advanced**	
Adapter Web Service Port	80
Timeout	100000
⊟ **General**	
Archive Filename	
Archive Location URL	Archive
Archive Overwrite	No
Batch Size	20
Error Threshold	10
Namespaces Aliases	
Polling Interval	5
SharePoint Site URL	http://kamil-biztalk/sites/TowerO
Source Document Library URL	Source
View Name	
⊟ **Microsoft Office Integration**	
Microsoft Office Integration	Optional

Adapter Web Service Port
The HTTP port of the IIS Web site where the Windows SharePoint Services adapter Web service is installed. By default, this is the Default..

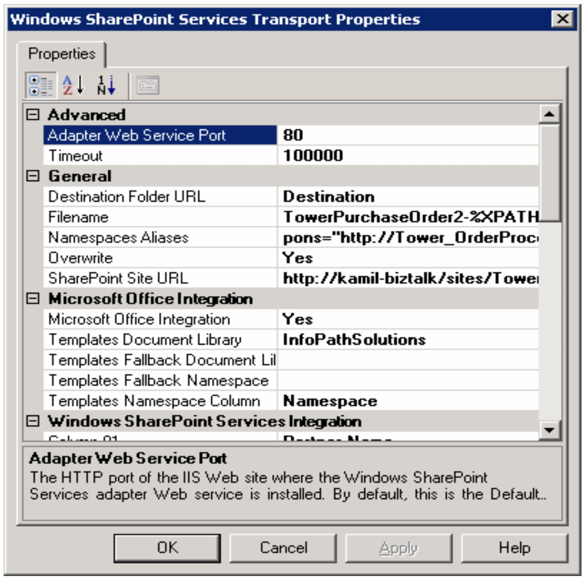
Figure 3.24 Creating Receive Locations

11. In the **Receive Location Properties** dialog box, select *BizTalkServerApplication* as the **Receive handler**.
12. In the **Receive pipeline** drop-down list, select *PassThruReceive*.
13. Click **OK**.

Create Send Port:

1. In the **BizTalk Administration Console**, right click the **Send Ports** node, click **New**, and then click **Static One-way Send Port…**
2. In the **Send Port Properties** dialog box, under **General**, type *TowerSendPort* in the **Name** field.
3. In the **Transport** section, select *Windows SharePoint Services* for the **type**.
4. Click **Configure** to configure the Windows SharePoint Services adapter properties.
5. In the **Adapter Web Service Port** property, type the port number of the virtual server where the Windows SharePoint Services Adapter web service was installed. By default, this is port 80.
6. Type in *Destination* for the **Destination Folder** property.
7. Type in Tower*PurchaseOrder2-%XPATH=// pons:PurchaseOrder/pons: PurchaseOrderID%.xml* for the **Filename** property.
8. Set the **Overwrite** property to *Yes*.
9. Type in the http://kamil-biztalk/sites/TowerOrderingProcess in the **SharePoint Site Url** property.
10. In the **Namespace Aliases** field, type *pons= "http://Tower_OrderProcess_Thesis.PurchaseOrder"*.
11. In the **Templates Document Library**, type *InfoPathSolutions*.
12. In the **Templates Namespace Column**, type *Namespace*.
13. Select *Yes* for the **Microsoft Office Integration** property.
14. Under **Windows SharePoint Services Integration**, type *Partner Name* in the **Column 01** field.

15. Type *%XPATH=//pons:PurchaseOrder/pons:BillTo%* in the **Column 01 Value** field, click **OK**, and then click **OK** again to exit the **Send Port Properties** dialog box.



Windows SharePoint Services Transport Properties

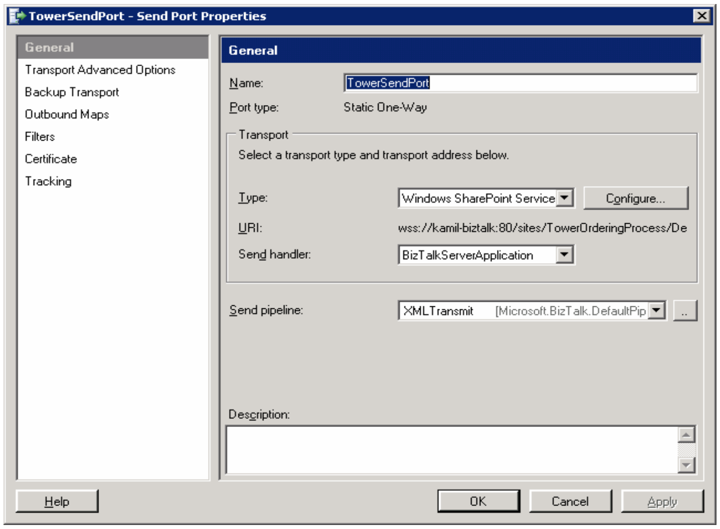
Property	Value
Advanced	
Adapter Web Service Port	80
Timeout	100000
General	
Destination Folder URL	Destination
Filename	TowerPurchaseOrder2-%XPATH
Namespaces Aliases	pons="http://Tower_OrderProc
Overwrite	Yes
SharePoint Site URL	http://kamil-biztalk/sites/Towe
Microsoft Office Integration	
Microsoft Office Integration	Yes
Templates Document Library	InfoPathSolutions
Templates Fallback Document Lil	
Templates Fallback Namespace	
Templates Namespace Column	Namespace
Windows SharePoint Services Integration	

Adapter Web Service Port
The HTTP port of the IIS Web site where the Windows SharePoint Services adapter Web service is installed. By default, this is the Default...

Figure 3.25 Send Port Properties window

16. In the **Send Port Properties dialog box**, in the **Send handler** drop-down list, select *BizTalkServerApplication*.

17. In the **Send pipeline** drop-down list, select *XMLTransmit* and click **OK**.



TowerSendPort - Send Port Properties

General

Name: TowerSendPort

Port type: Static One-Way

Transport

Select a transport type and transport address below.

Type: Windows SharePoint Service

URI: wss://kamil-biztalk:80/sites/TowerOrderingProcess/De

Send handler: BizTalkServerApplication

Send pipeline: XMLTransmit [Microsoft.BizTalk.DefaultPip

Description:

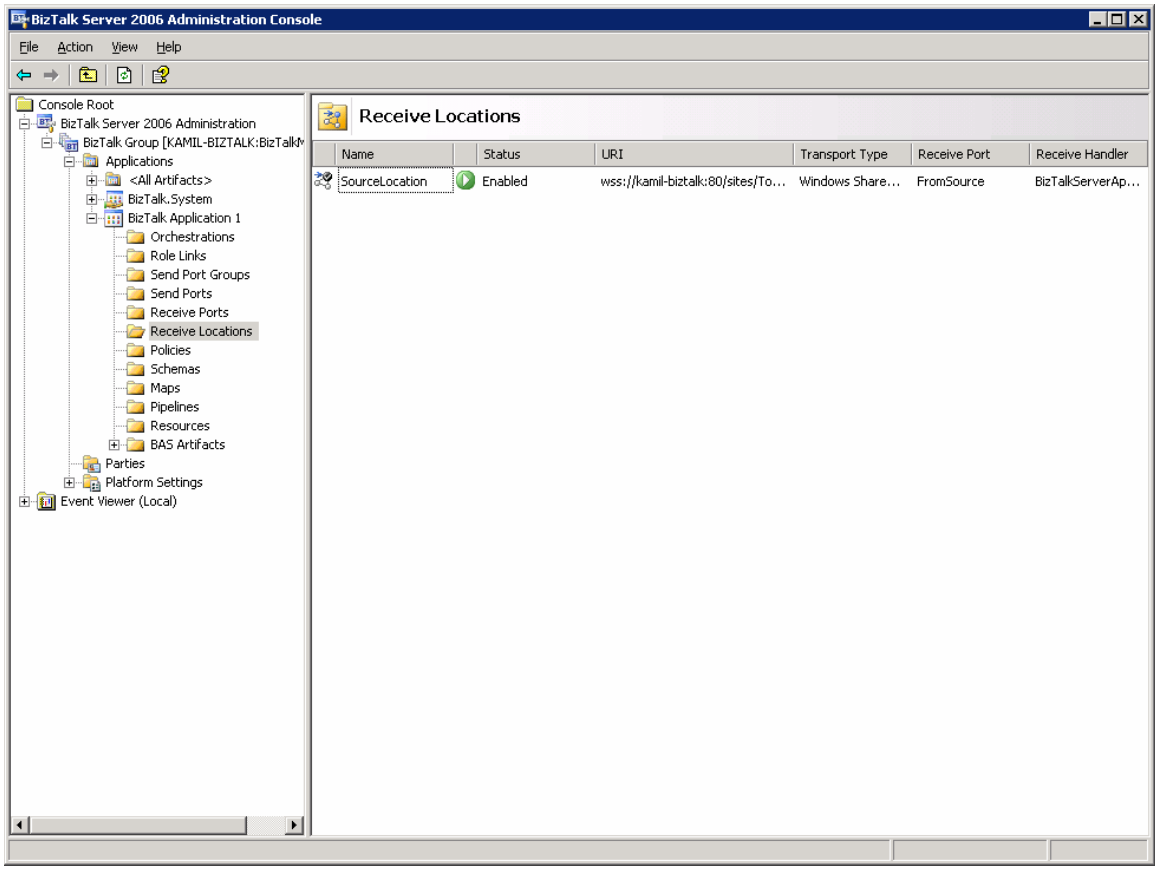
Figure 3.26 Pipeline Drop-Down list, XML Transmit.

Start Send Port:

1. In the **BizTalk Administration Console**, click the **Send Ports** node.
2. Right-click *TowerSendPort*, and then click **Start**.
3. Close the **BizTalk Administration Console**.

Enable the Receive Location:

1. In the **BizTalk Administration Console**, click the **Receive Locations** node.
2. Right-click *SourceLocation*, and then click **Enable**.



Name	Status	URI	Transport Type	Receive Port	Receive Handler
SourceLocation	Enabled	wss://kamil-biztalk:80/sites/To...	Windows Share...	FromSource	BizTalkServerAp...

Figure 3.27 Enabling Receive Location

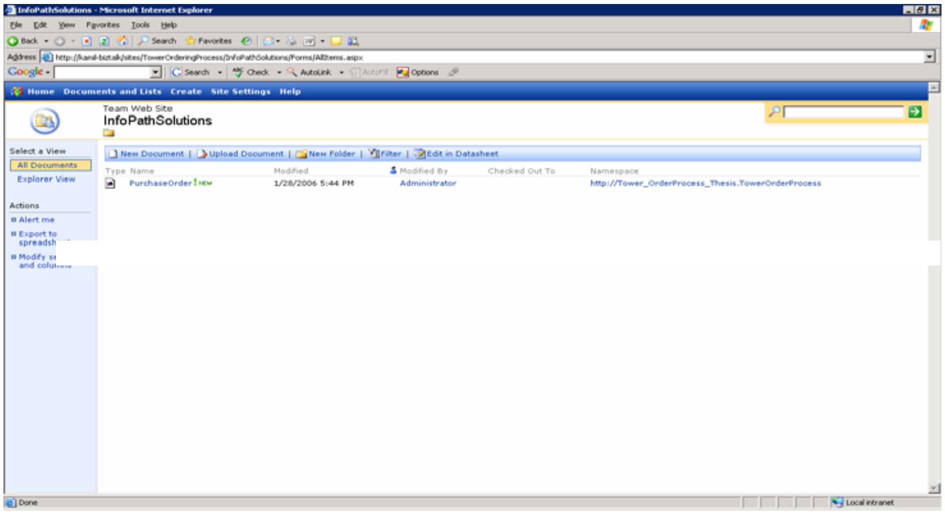
Create an InfoPath Form

In this procedure we will create another document library and an InfoPath form based on the schema we created in the last procedure.

Note: This section of the example requires Microsoft Office InfoPath 2003 SP1

Create a new Document Library:

1. Open a web browser and navigate to the URL of the site we created http://kamil-biztalk/sites/TowerOrderingProcess/default.aspx.
2. On the top navigation bar, click **Create**.
3. Under **Document Libraries**, click **Document Library**.
4. In the **Name and Description** section, type *InfoPathSolutions* in the **Name field**.
5. In the **Navigation** section, select **Yes** to display this form library on the Quick Launch bar.
6. In the **Document Template** section, select *None* for the **Document Template**.
7. Click **Create**. You will be redirected to the empty library you just created.
8. On the left hand side, click **Modify Settings and Columns**.
9. Under **Columns**, click **Add a New Column**.
10. Under **Name and Type**, type *Namespace* in the **Name** field.
11. Click **OK**.
12. The below screenshot displays the final look of the document library created in this procedure.


InfoPathSolutions - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Google Search Check AutoLink AutoFill Options
Home Documents and Lists Create Site Settings Help
Team Web Site
InfoPathSolutions
Select a View
All Documents
Explorer View
Actions
Alert me
Export to spreadsh
Modify se and colu
New Document | Upload Document | New Folder | Filter | Edit in Datasheet
Done
Local intranet

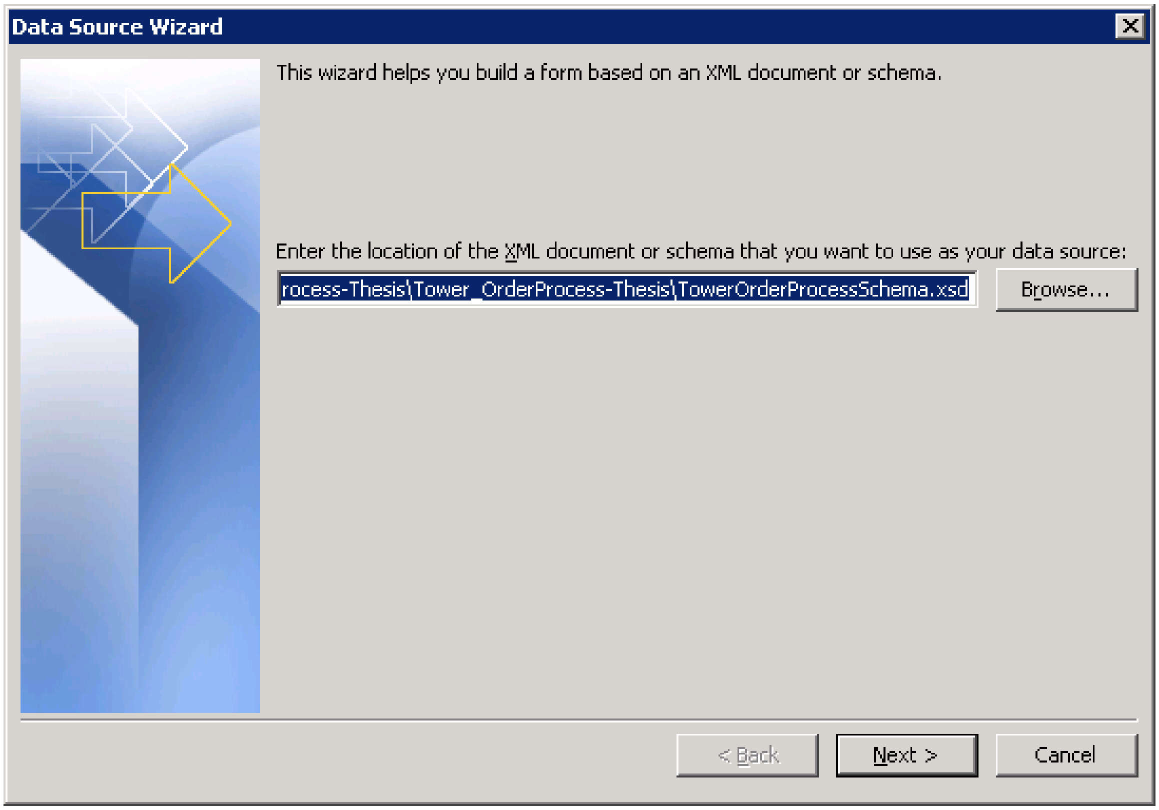
Address http://kamil-biztalk/sites/TowerOrderingProcess/InfoPathSolutions/Forms/AllItems.aspx

Type	Name	Modified	Modified By	Checked Out To	Namespace
	PurchaseOrder ! NEW	1/28/2006 5:44 PM	Administrator		http://Tower_OrderProcess_Thesis.TowerOrderProcess

Figure 3.28 Creating new Document Library

Create an InfoPath Form Based on the TowerOrderProcessSchema.xsd Schema File:

1. Click **Start**, **Programs**, **Microsoft Office**, and then click **Microsoft Office InfoPath 2003**.
2. In the **Fill Out a Form** dialog box, select **Design a Form.**
3. In the **Design a Form** task pane, select **New from XML Document or Schema.**
4. In the **Data Source Wizard**, click **Browse** and select the schema file you created in the last procedure. For example, *C:\KamilTez\Tower_OrderProcess-Thesis\Tower_OrderProcess-Thesis\TowerOrderProcessSchema.xsd*.


Data Source Wizard

This wizard helps you build a form based on an XML document or schema.

Enter the location of the XML document or schema that you want to use as your data source:

rocess-Thesis\Tower_OrderProcess-Thesis\TowerOrderProcessSchema.xsd

Figure 3.29 Data Source Wizard

5. Click **Next**, and then click **Finish**.

6. In the **Data Source** task pane, right-click the **PurchaseOrder** node, and then click **Section with Controls**. This will create the form on the template.

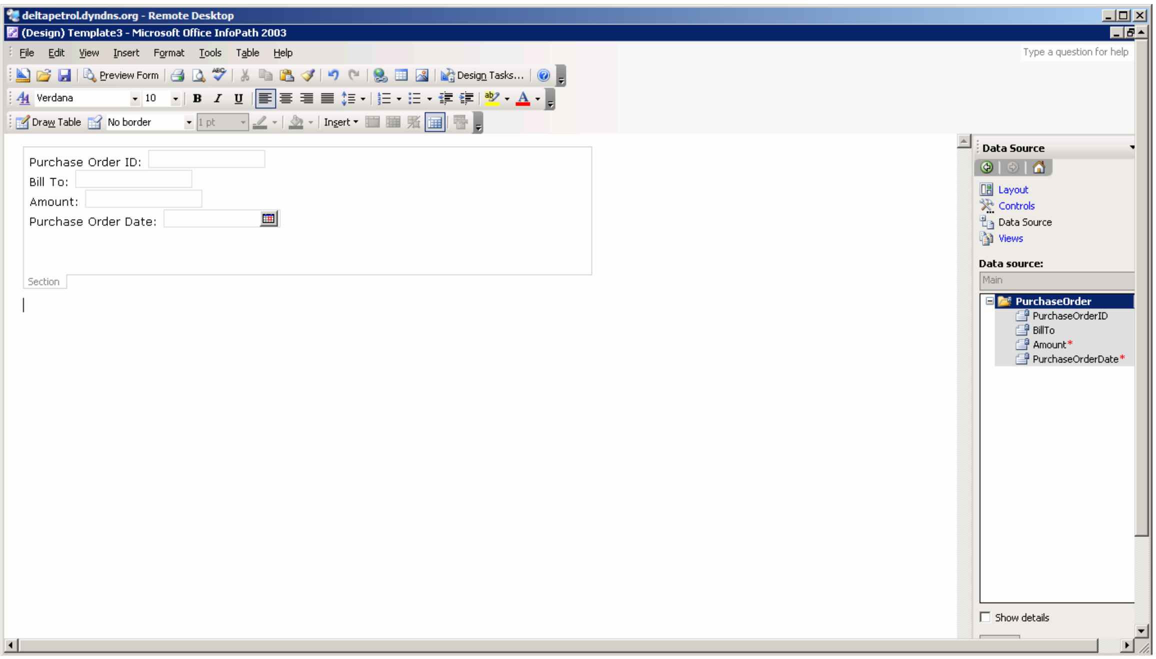


Figure 3.30 Data Source Task Pane.

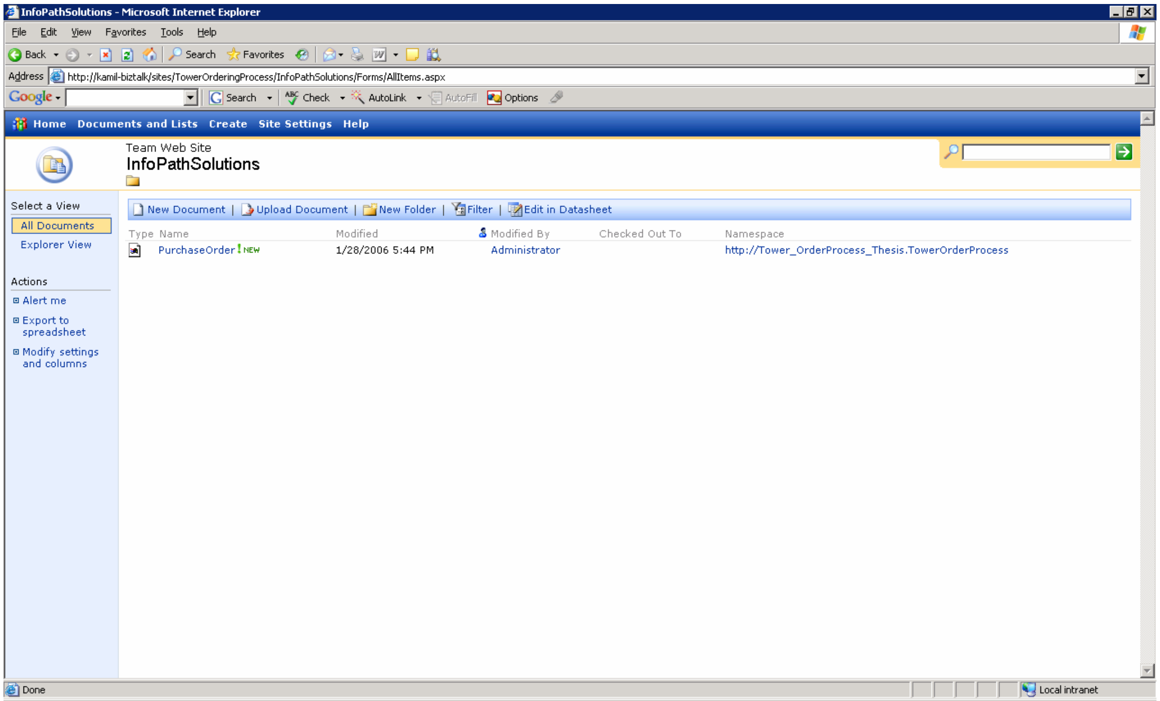
7. Click **File**, click **Save**, and then click **Save…**
8. In the **Save As** dialog box, type *PurchaseOrder.xsn* in the **File name** field, and then click **Save**.
9. Click **File**, and then click **Publish**.
10. In the **Publishing Wizard**, click **Next**.
11. Select **To a Web Server**, and then click **Next**.
12. Type the path and filename to your *InfoPathSolutions* document library, and then click **Next**. http://kamil-biztalk/sites/TowerOrderingProcess/*InfoPathSolutions/PurchaseOrder.xsn*
13. Click **Finish**, and then click **Close**.

Modify SharePoint Document Libraries

In this procedure we will update the namespace property for the PurchaseOrder.xsn file and modify the Destination Document Library.

Update the namespace for PurchaseOrder.xsn:

1. Open a web browser and navigate to the URL of the site, http://kamil-biztalk/sites/TowerOrderingProcess/.
2. On the left hand side, under **Documents**, click *InfoPathSolutions*.
3. Hover over and right-click *PurchaseOrder.xsn*, and then click **Edit Properties**.
4. Type http://Tower_OrderProcess_Thesis.TowerOrderProcess in the **Namespace** field, and then click **Save and Close**.
5. The below screenshot displays the modified document library.


InfoPathSolutions - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Google Search Check AutoLink AutoFill Options
Home Documents and Lists Create Site Settings Help
Team Web Site
InfoPathSolutions
Select a View
All Documents
Explorer View
Actions
Alert me
Export to spreadsheet
Modify settings and columns
New Document | Upload Document | New Folder | Filter | Edit in Datasheet
Done
Local intranet

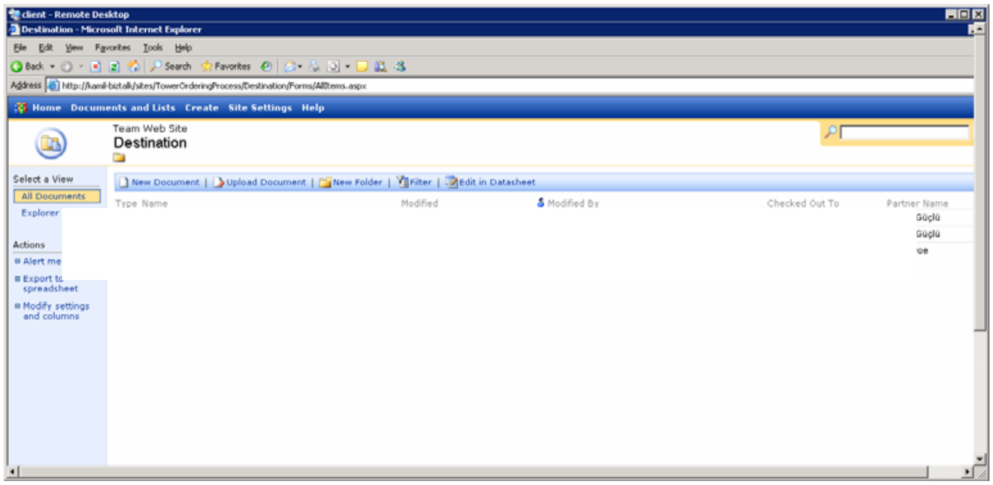
Address http://kamil-biztalk/sites/TowerOrderingProcess/InfoPathSolutions/Forms/AllItems.aspx

Type	Name	Modified	Modified By	Checked Out To	Namespace
	PurchaseOrder ! NEW	1/28/2006 5:44 PM	Administrator		http://Tower_OrderProcess_Thesis.TowerOrderProcess

Figure 3.31 Modify SharePoint Document Libraries

Modify the Destination document library:

1. On the top navigation bar, click **Documents and Lists**.
2. Under **Document Libraries**, click **Destination**.
3. On the left hand side, click **Modify Settings and Columns**.
4. Under **Columns**, click **Add New Column**.
5. Under **Name and Type**, type *Partner Name* in the **Column name** field.


client - Remote Desktop
Destination - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Home Documents and Lists Create Site Settings Help
Team Web Site
Destination
Select a View
All Documents
Explorer
Actions
Alert me
Export to spreadsheet
Modify settings and columns
New Document | Upload Document | New Folder | Filter | Edit in Datasheet
Type Name Modified Modified By Checked Out To Partner Name
Güçlü
Güçlü
oe

Address http://kamil-biztalk/sites/TowerOrderingProcess/Destination/Forms/AllItems.aspx

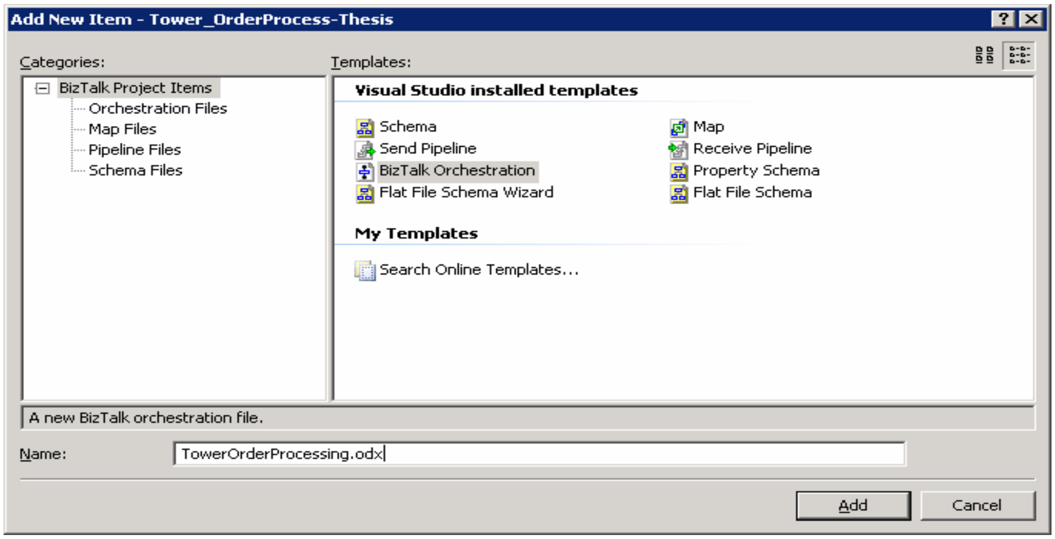
Figure 3.32 Modify the Destination Document Library

Create an Orchestration:

In this procedure we will create a new BizTalk Orchestration.

Add a BizTalk Orchestration:

1. In **Solution Explorer**, right-click the Tower_OrderProcess-Thesis project, click **Add**, and then click **New Item…**
2. Under **Categories**, select **Orchestration Files**.
3. Under **Templates**, select **BizTalk Orchestration**.
4. Type *TowerOrderProcessing* in the **Name** field, and then click **Add**.



A new BizTalk orchestration file.

Name: TowerOrderProcessing.odx

Figure 3.33 Creating the Orchestration

Create Receive Information:

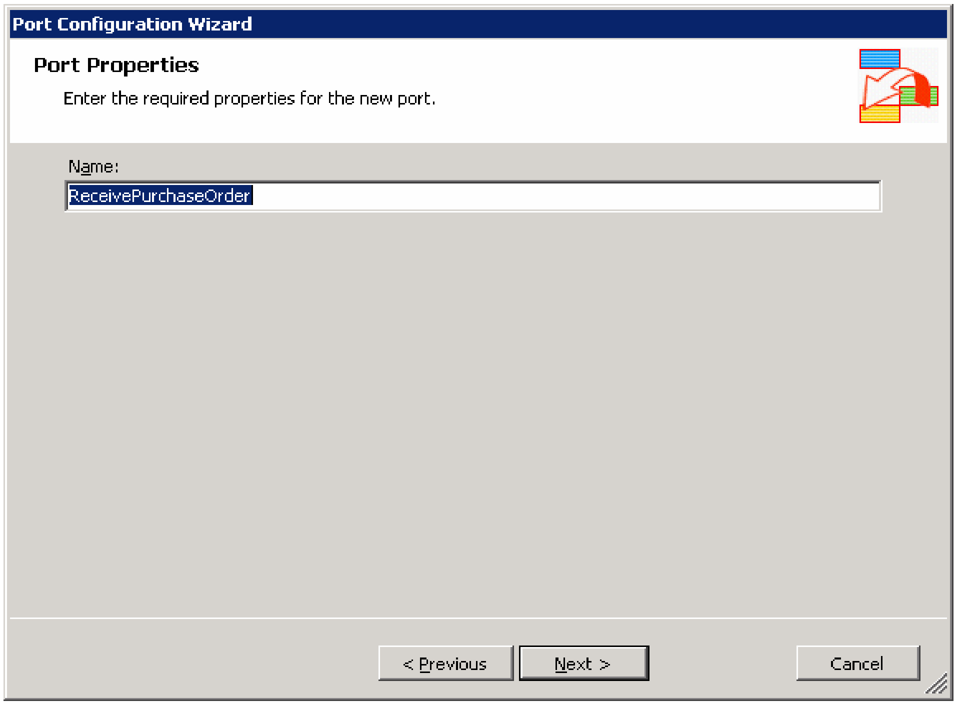
In this procedure we will create a new message, receive port, and receive shape for the orchestration.

Create a new Message:

1. In **Orchestration View**, right-click **Messages**, and then click **New Message**. This will generate a new message with the name *Message_1*.
2. Right-click *Message_1*, click **Rename**, and then type *Message_PO*.
3. Right-click *Message_PO*, and then click **Properties Window**.
4. In the **Message Type** property, expand **Schemas**, and then select *Tower_OrderProcess_Thesis.TowerOrderProcessSchema* schema.

Add a Receive Port to the Orchestration:

1. Under **BizTalk Orchestrations** in the Toolbox, drag a **Port** shape to the Port Surface. The Port Configuration Wizard will start.
2. On the Welcome screen, click **Next**.
3. Type *ReceivePurchaseOrder* in the **Name** field, and then click **Next**.


Port Configuration Wizard
Port Properties
Enter the required properties for the new port.
< Previous
Next >
Cancel

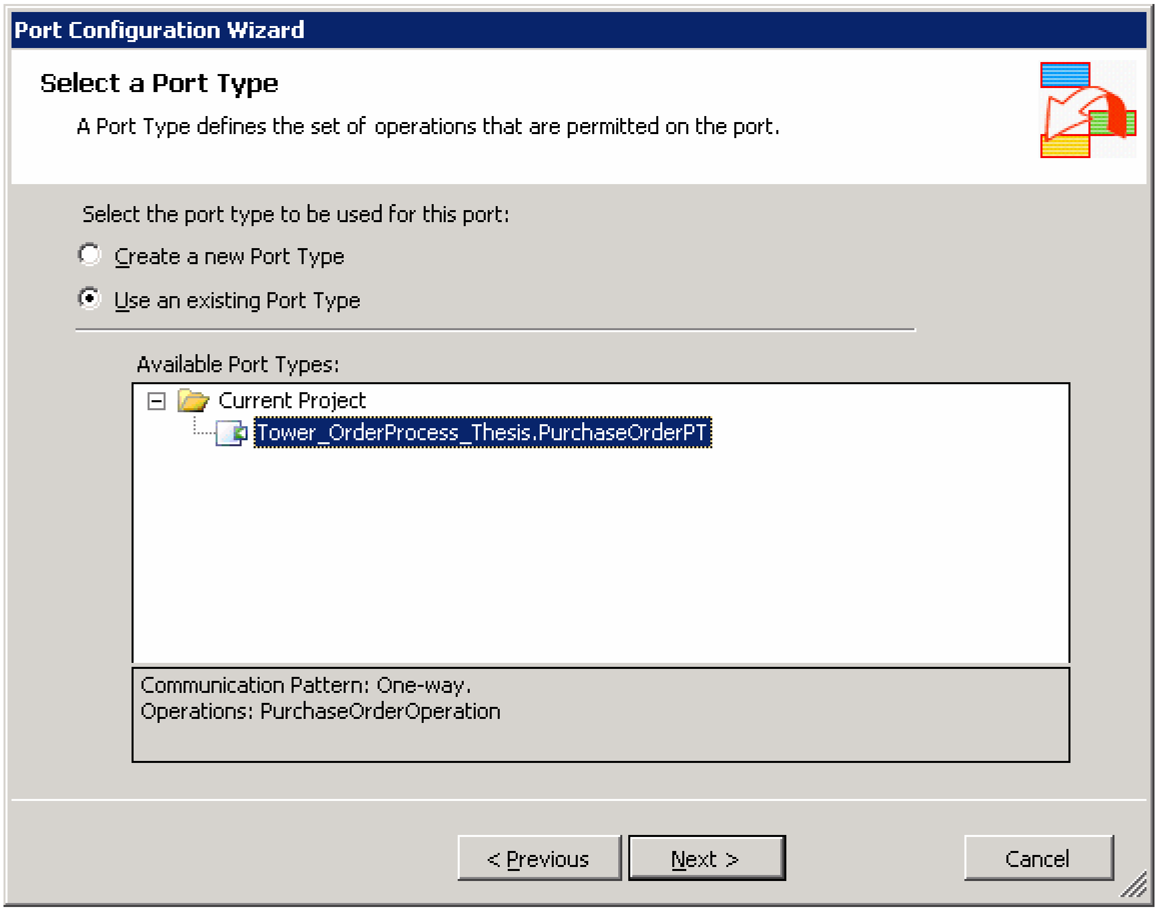
Name: ReceivePurchaseOrder

Figure 3.34 Adding Receive Port to the Orchestration

4. Select **Create a new Port Type**.

5. Type *PurchaseOrderPT* in the **Port Type Name** field, and then click **Next**.

6. On the **Port Binding screen**, leave the default values and then click **Next**.



Port Configuration Wizard

Select a Port Type

A Port Type defines the set of operations that are permitted on the port.

Select the port type to be used for this port:

○ Create a new Port Type

● Use an existing Port Type

Available Port Types:

Current Project

Tower_OrderProcess_Thesis.PurchaseOrderPT

Communication Pattern: One-way.
Operations: PurchaseOrderOperation

Figure 3.35 Port Binding Screen

7. Click **Finish**.

8. In **Orchestration View**, under **Port Types**, expand the *PurchaseOrderPT* port type.

9. Right-click *Operation_1*, click **Rename**, and then type *PurchaseOrderOperation*.

Add a Receive Shape to the Orchestration:

1. Under **BizTalk Orchestrations** in the Toolbox, drag a **Receive** shape to the Orchestration.
2. Right-click the receive shape, and then click **Properties Window**.
3. Set the **Activate** property to *True*.
4. Type *Receive_PO* in the **Name** field.
5. In the **Properties Window**, select *Message_PO* for the Message property.
6. Select *ReceivePurchaseOrder.PurchaseOrderOperation.Request* for the **Operation** property. This will tie the port to the receive shape in the Orchestration Designer.

Create Send Information:

In this procedure you create a new message, send ports, and decision structure to the orchestration.

Create a new Message:

1. In **Orchestration View**, right-click **Messages**, and then click **New Message**. This will generate a new message with the name *Message_1*.
2. Right-click *Message_1*, click **Rename**, and then type *Message_Task*.
3. Right-click *Message_Task*, and then click **Properties Window**.
4. In the **Message Type** property, expand **Schemas**, and then select *Tower_OrderProcess_Thesis.TowerOrderProcessSchema* schema.

Add a Send Port to the Orchestration:

1. Under **BizTalk Orchestrations** in the Toolbox, drag a **Port** shape to the Port Surface. The Port Configuration Wizard will start.
2. On the Welcome screen, click **Next**.
3. Type *SendPurchaseOrder* in the **Name** field, and then click **Next**.
4. Select **Use an existing Port Type**.
5. Under **Available Port Types**, select *Tower_OrderProcess_Thesis. PurchaseOrderPT*, and then click **Next**.

6. On the **Port Binding screen**, under **Port direction of communication**, select *I'll always be sending messages on this port*, and then click **Next**.
7. Click **Finish**.

Add a Send Shape to the Orchestration:

1. Under **BizTalk Orchestrations** in the Toolbox, drag a **Send** shape to the Orchestration Designer. Place it below the *Receive_PO* Receive shape.
2. Right-click the send shape, and then click **Properties Window**.
3. Type *Send_PO* in the **Name** field.
4. Select *Message_PO* for the **Message** property.
5. Select *SendPurchaseOrder.PurchaseOrderOperation.Request* for the **Operation** property. This will tie the port to the send shape in the Orchestration Designer.

Add a Decide Shape to the Orchestration:

1. Under **BizTalk Orchestrations** in the Toolbox, drag a **Decide** shape to the Orchestration Designer. Place it below the *Send_PO* Send shape.

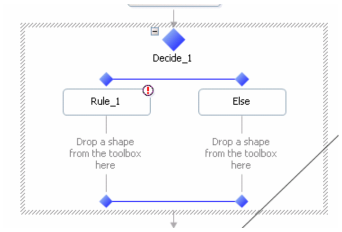
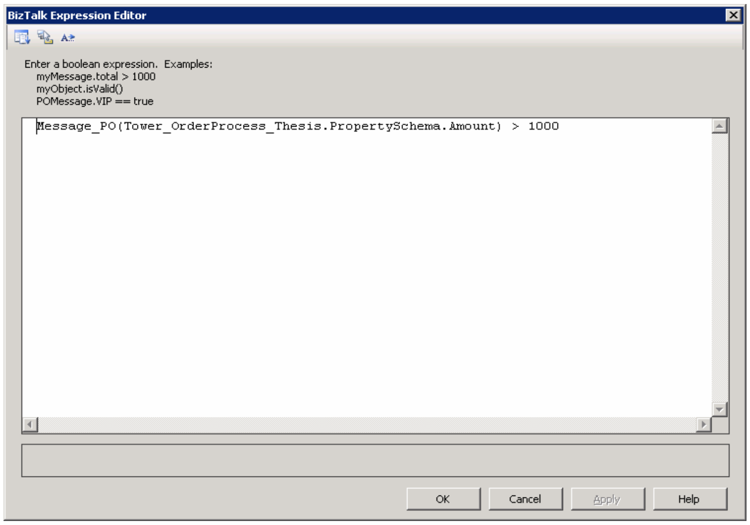

Decide_1
Rule_1
Else
Drop a shape from the toolbox here
Drop a shape from the toolbox here

Figure 3.36 Decide Shape

2. Right-click the Decide shape, and then click **Properties Window.**
3. Type *NeedsApproval* in the **Name** field.
4. In Orchestration Designer, click **Rule_1** on the Decide shape.
5. In the Properties Windows, type *ApprovalRequired* for the **Name** property.
6. Click the **Expression** property field, and then click (**…**).
7. In the BizTalk Expression Editor, type or copy the following:

```
Message_PO(Tower_OrderProcess_Thesis.PropertySchema.Amount) > 1000
```

8. Click **OK**.



BizTalk Expression Editor

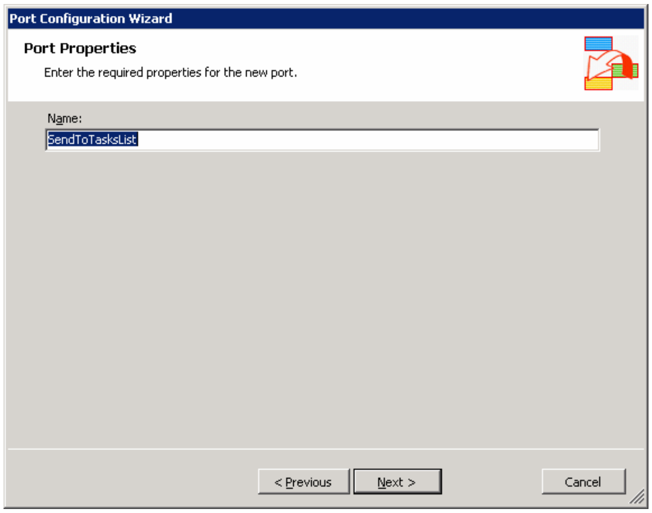
Enter a boolean expression. Examples:
myMessage.total > 1000
myObject.isValid()
POMessage.VIP == true

```
Message_PO(Tower_OrderProcess_Thesis.PropertySchema.Amount) > 1000
```

Figure 3.37 Order Process > 1000

Add another Send Port to the Orchestration:

1. Under **BizTalk Orchestrations** in the Toolbox, drag a **Port** shape to the Port Surface. The Port Configuration Wizard will start.
2. On the Welcome screen, click **Next**.
3. Type *SendToTasksList* in the **Name** field, and then click **Next**.



Port Configuration Wizard

Port Properties

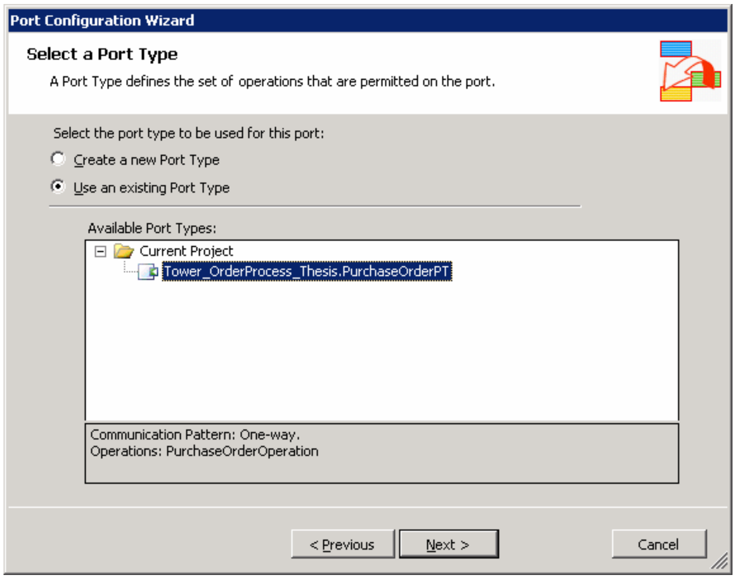
Enter the required properties for the new port.

Name: SendToTasksList

Figure 3.38 Port Properties

4. Select **Use an existing Port Type**.

5. Under **Available Port Types**, select Tower_*OrderProcess_Thesis.PurchaseOrderPT*, and then click **Next**.



Port Configuration Wizard

Select a Port Type

A Port Type defines the set of operations that are permitted on the port.

Select the port type to be used for this port:

○ Create a new Port Type

● Use an existing Port Type

Available Port Types:

Current Project

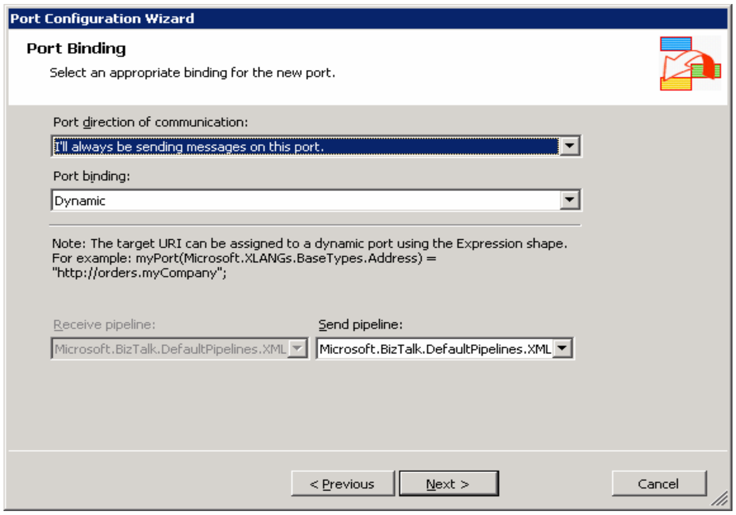
Tower_OrderProcess_Thesis.PurchaseOrderPT

Communication Pattern: One-way.
Operations: PurchaseOrderOperation

Figure 3.39 Port Types

6. On the **Port Binding screen**, under **Port direction of communication**, select *I'll always be sending messages on this port.*

7. Under **Port binding**, select *Dynamic*, and then click **Next**.



Port Configuration Wizard

Port Binding

Select an appropriate binding for the new port.

Port direction of communication: I'll always be sending messages on this port.

Port binding: Dynamic

Note: The target URI can be assigned to a dynamic port using the Expression shape.
For example: myPort(Microsoft.XLANGs.BaseTypes.Address) =
"http://orders.myCompany";

Receive pipeline: Microsoft.BizTalk.DefaultPipelines.XML

Send pipeline: Microsoft.BizTalk.DefaultPipelines.XML

Figure 3.40 Port Binding

8. Click **Finish**.

Add a Send Shape to the Decide Shape:

1. Under **BizTalk Orchestrations** in the Toolbox, drag a **Send** shape to the Orchestration Designer Place it below the *ApprovalRequired* shape.
2. Right-click the send shape, and then click **Properties Window**
3. Type *CreateApprovalTask* in the **Name** field.

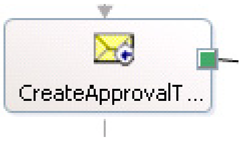


Figure 3.41 Create Approval

4. Select *Message_Task* for the **Message** property.
5. Select *SendToTasksList.PurchaseOrderOperation.Request* for the **Operation** property. This will tie the port to the send shape in the Orchestration Designer.

Create an Expression:

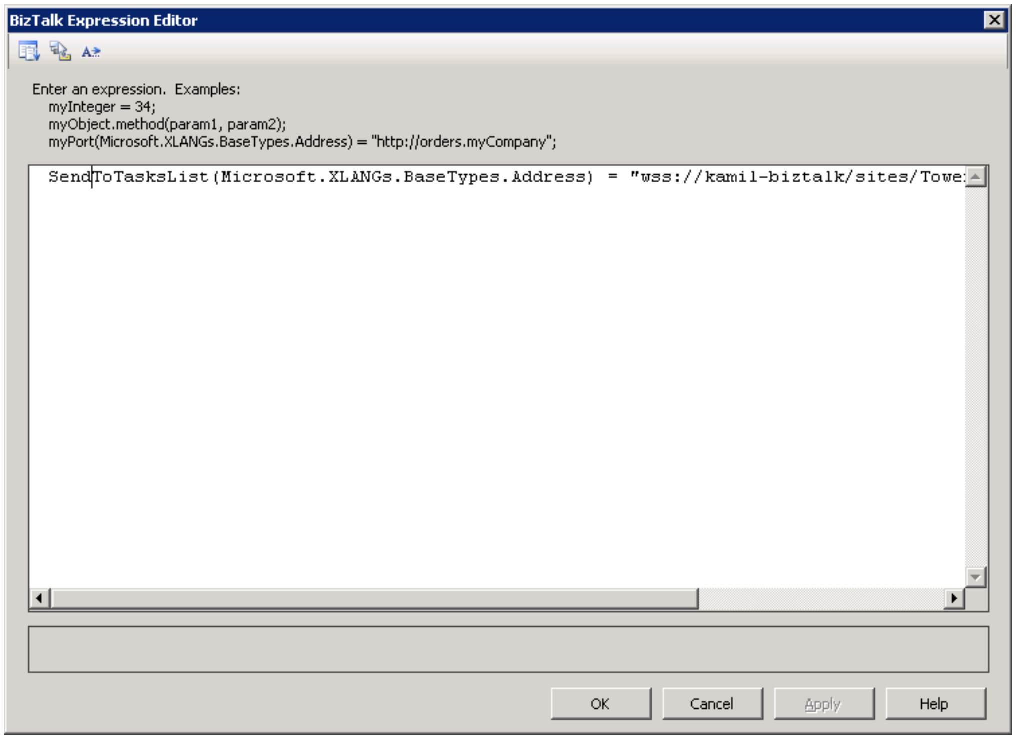
In this procedure you add an expression shape to your solution which assigns the Tasks path value to a variable.

Create a new expression:

1. Under **BizTalk Orchestrations** in the Toolbox, drag an **Expression** shape before the *CreateApprovalTask* Send shape.
2. Right-click the expression shape, and then click **Properties Window.**
3. Type *SetPortDestination* in the **Name** field.
4. Click the **Expression** property field, and then click (**…**).
5. In the **BizTalk Expression Editor**, type the following, then click OK.

Table 3.5 New Expression

```
SendToTasksList(Microsoft.XLANGs.BaseTypes.Address)          =
"wss://kamil-biztalk/sites/TowerOrderingProcess/Lists/Tasks/";
```



Enter an expression. Examples:

```
myInteger = 34;
myObject.method(param1, param2);
myPort(Microsoft.XLANGs.BaseTypes.Address) = "http://orders.myCompany";
```

```
SendToTasksList(Microsoft.XLANGs.BaseTypes.Address) = "wss://kamil-biztalk/sites/Towe
```

Figure 3.42 Creating a New Expression

Construct New Message:

In this procedure you add a construct shape to the solution which will construct a new instance of a message type within the orchestration.

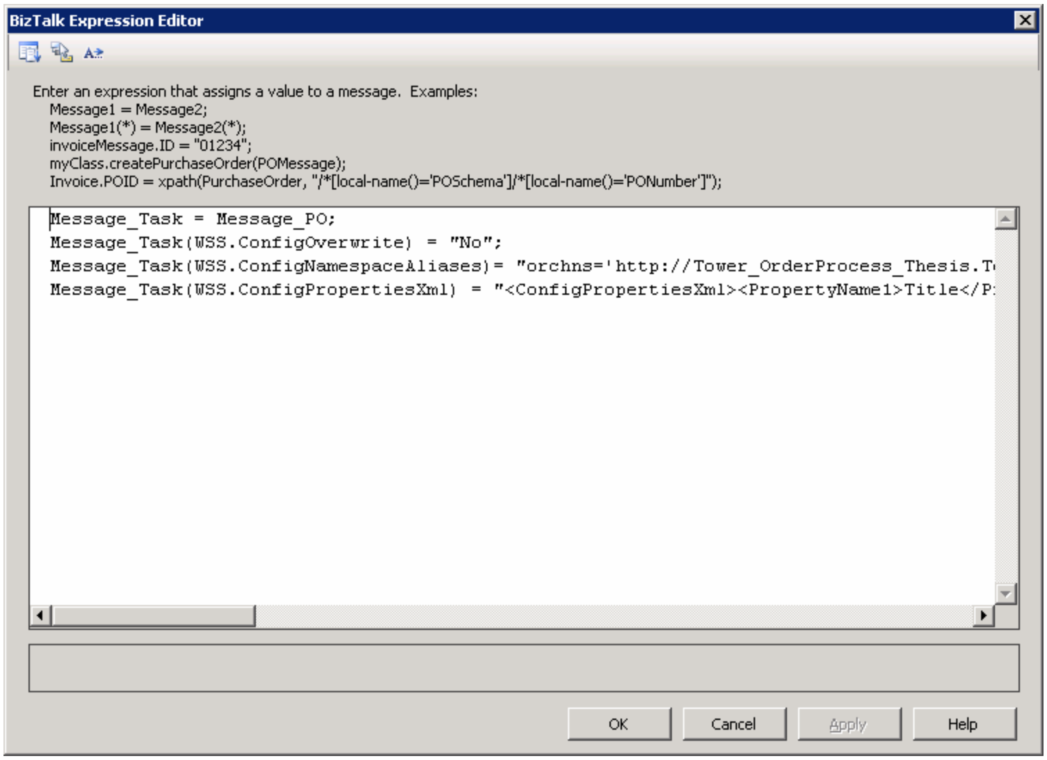
Add a construct Shape:

1. Under **BizTalk Orchestrations** in the Toolbox, drag a **Construct Message** shape before the *SetPortDestination* Expression shape.
2. Right-click the construct message shape, and then click **Properties Window.**
3. Type *ConstructTaskMessage* in the **Name** field.
4. Select *Message_Task* for the **Messages Constructed** property.
5. Under **BizTalk Orchestrations** in the Toolbox, drag a **Message Assignment** shape into the *ConstructTaskMessage* **Construct Message** shape.
6. In the **Properties Window**, type *InitTaskMessage* in the **Name** field.
7. Click the **Expression** property field, and then click (**…**).
8. In the **BizTalk Expression Editor**, type or copy the following:

Table 3.6 Construct Shape

```
Message_Task = Message_PO;
Message_Task(WSS.ConfigOverwrite) = "No";
Message_Task(WSS.ConfigNamespaceAliases)="orchns='http://Tower_OrderProcess_Thesis.TowerPurchaseOrder'";
Message_Task(WSS.ConfigPropertiesXml) = "<ConfigPropertiesXml><PropertyName1>Title</PropertyName1><PropertySource1>Approve %XPATH=//orchns:PurchaseOrder/orchns:PurchaseOrderID%</PropertySource1><PropertyName3>Status</PropertyName3><PropertySource3>Not Started</PropertySource3><PropertyName4>Priority</PropertyName4><PropertySource4>(1) High</PropertySource4></ConfigPropertiesXml>";
```

9. Click **OK**.
10. Click **File**, and then click **Save All**.



Enter an expression that assigns a value to a message. Examples:
Message1 = Message2;
Message1(*) = Message2(*);
invoiceMessage.ID = "01234";
myClass.createPurchaseOrder(POMessage);
Invoice.POID = xpath(PurchaseOrder, "/*[local-name()='POSchema']/*[local-name()='PONumber']");

```
Message_Task = Message_PO;
Message_Task(WSS.ConfigOverwrite) = "No";
Message_Task(WSS.ConfigNamespaceAliases)= "orchns='http://Tower_OrderProcess_Thesis.T
Message_Task(WSS.ConfigPropertiesXml) = "<ConfigPropertiesXml><PropertyName1>Title</P
```

Figure 3.43 Expression Configuration

Build Project:

In this procedure we will build and deploy the BizTalk Server project.

Build and deploy the solution:

1. Click **Build**, and then click **Build Solution**.
2. Click **Build**, and then click **Deploy Solution**.
3. Close Microsoft Visual Studio 2005.

Bind the Orchestration:

In this procedure you bind the orchestration to the specified ports.

Bind the orchestration:

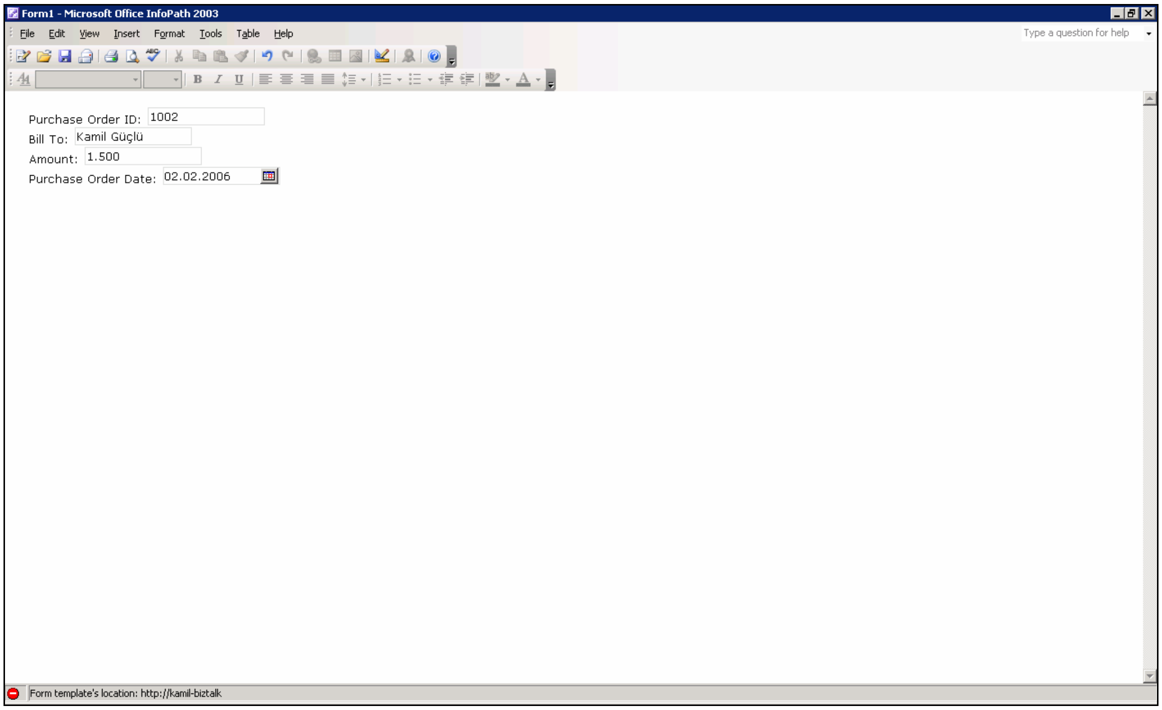
1. In the **BizTalk Administration Console**, click the **Orchestrations** node.
2. Right-click the *OrderProcess.MyCompanyOrderProcessing* orchestration, and then click **Properties**.
3. Select the **Bindings** tab.
4. Under **Host**, select *BizTalkServerApplication* in the **Host** field.
5. Under **Bindings**, select *FromSource* for the *ReceivePurchaseOrder* Inbound Logical Port.
6. Under **Bindings**, select *SendToDestination* for the *SendPurchaseOrder* Outbound Logical Port.
7. Click **OK**.
8. Right click *OrderProcess.MyCompanyOrderProcessing* orchestration, and then click **Start**.

Sending a Message through the System:

In this procedure you create an InfoPath form and upload it to the Windows SharePoint Services Web site. The Windows SharePoint Services Adapter will take that message, archive it in the Archive document library, and then send it to the Destination document library. During the processing of this message, Windows SharePoint Services context properties will be accessed that help determine the destination.

Create an InfoPath Form to send through the system:

1. Open a web browser and navigate to http://kamil-biztalk/sites/ TowerOrderingProcess
2. On the left hand side, under Documents, click *InfoPathSolutions*.
3. Click the *PurchaseOrder* file, and then click **Open**. InfoPath will load the form.
4. In the **Purchase Order ID** field, type *1002*.
5. In the **Bill To** field, type *Kamil Güçlü*.
6. In the **Amount** field, type *1500*.
7. In the **Purchase Order Date** field, type *2/2/2006*.
8. Click **Save**.
9. In the **Save As** dialog box, type http://kamil-biztalk/sites/ TowerOrderingProcesss*/Source* in the **file name** field, and then hit Enter.


Form1 - Microsoft Office InfoPath 2003
File
Edit
View
Insert
Format
Tools
Table
Help
Type a question for help
Form template's location: http://kamil-biztalk

Purchase Order ID: 1002
Bill To: Kamil Güçlü
Amount: 1.500
Purchase Order Date: 02.02.2006

Figure 3.44 Create an InfoPath Form to Send through the System.

10. Type *PurchaseOrder2.xml* in the **file name** field, and then click **Save**.
11. Close Microsoft Office InfoPath 2003.
12. In the web browser, on the top navigation bar, click **Documents and Lists**.

13. Under **Document Libraries**, click **Destination**.
14. In the Destination Document Library, you will now see your message listed in this library. You will also find a copy archived in the Archive Document Library.
15. Click **Home**.
16. Under **Lists**, click **Tasks**.
17. In the Tasks list you will see the newly created approval task.

Note:
In the Destination Document Library, the file name column should contain the value of the PurchaseOrderID field and the Partner Name column should contain the value of the BillTo field. Since the amount of the purchase order was over $1,000.00, the task was created.

4 CONCLUSION AND RECOMMENDATIONS FOR FUTURE WORK

Business Process Management (BPM) is becoming a very important topic for organizations that are spending great amounts of time, resources and money to automate business procedures to become more efficient in today's global market. As BPM is growing more and more popular in today's world, more and more businesses that desire to streamline processes and save money are adopting BPM in their future strategies.

The Infrastructure defined when followed with the proper Methodology defined in this thesis makes the arcane science of enterprise application integration a thing of the past. But this road that lies ahead will not be easy for the implementers.

This thesis associate with BizTalk Server 2006 Installation Guide and by expanding it, explains how BPM implementers should behave and decide when creating BPM environments. The Methodology provided in this thesis brings guidance which creates a standard view and a common platform into the world of implementing BPM to get the benefits of the single platform for business process management. End-to-end process management is very important to managers but without the proper vision and ideology BPM projects can fail miserably.

This is why it is important that we bring standards to this growing technology that is becoming a necessity with the current needs of businesses by creating standards in infrastructure and methodology for business process management.

Recommendations for future work would be to integrate Artificial Intelligence with BPM which would create the thinking Information Worker.

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[11] **John Matranga, Stephen Tranchida, Bart Preecs,** Understanding BizTalk.

APPENDIX A ABBREVIATIONS

ACID: Atomicity, Consistency, Isolation, and Durability.

BAM: Business Activity Monitoring

BizTalk Orchestration Designer: A design tool used to create drawings that describe long-running, loosely coupled, executable business processes. The XLANG schedule drawing is compiled into an XLANG schedule that is used to execute the automated business process.

BPEL: Business Process Execution Language

BPM: Business Process Management

BPMS: Business Process Management System

DC: Domain Controller

Document Type Definition (DTD): A standard definition that specifies which elements and attributes might be present in other elements and attributes and that specifies any constraints on their ordering, frequency, and content.
EAI: Enterprise Application Integration

Extensible Stylesheet Language (XSL): A style sheet format for Extensible Markup Language (XML) documents. XSL is used to define the display of XML in the same way that cascading style sheets (CSS) are used to define the display of Hypertext Markup Language (HTML). BizTalk Server uses XSL as the translation language between two specifications.

MOM: Microsoft Operations Manager

MSMQ: Windows Message Queuing

MSMQT: BizTalk Message Queuing Adapter

OASIS: Organization for the Advancement of Structured Information Standards.

PORT: A port that requires that all necessary information be provided for an XLANG schedule at design time. The designer who creates the XLANG schedule must know the location to which messages are sent or from which messages are received, as well as the technology chosen to implement the communication action.

TPI: Trading Partner Integration