



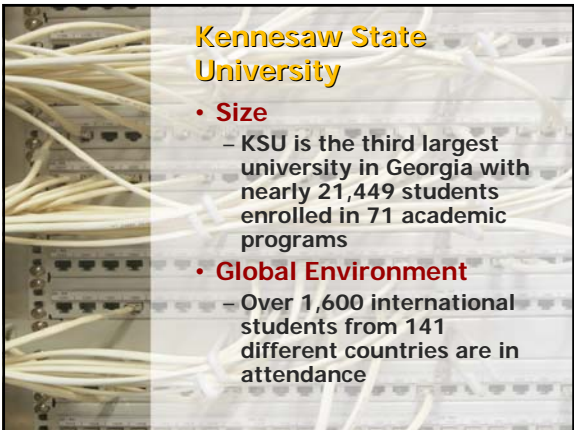
**Mid-America
Association for
Institutional
Research**

**Annual Conference
November 2008
The Role of IR in Decision
Making: Moving Beyond
the Numbers**



**Online Fact Book
Development:
Data, Information,
Intelligence**

**Technical Tips And
Strategies**



**Kennesaw State
University**

- **Size**
 - KSU is the third largest university in Georgia with nearly 21,449 students enrolled in 71 academic programs
- **Global Environment**
 - Over 1,600 international students from 141 different countries are in attendance



Kennesaw State University

- **Faculty**
 - 643 full time faculty members teach at Kennesaw State University
- **Carnegie Classification**
 - Master's College and University L



Today's Agenda

- **Define The "Opportunity"**
 - Where
 - What
 - Why
 - Decision
 - Challenges
 - How
 - Impact



Where We Were In 2001

- **Institutional Research Website 2001**
 - Static pages
 - Static data
- **Ad Hoc Reports**
 - Only in response to a specific request



What We Wanted To Accomplish

- **Information On Demand**
 - Make many of our ad hoc reporting mechanisms available as interactive or drill down tools on our website



Why We Wanted To Accomplish This

- **Program Review**
 - Accurate, up to date information
 - Aggregate and granular data specific to particular academic programs
 - Individual departments need to generate and analyze their own data



The Decision To Develop Our Own Tools

- **Packaged vs. Custom**
 - Crystal Reports, SAS, Cognos, Discoverer
 - ✓ Costs
 - ✓ Learning curve
 - Web Applications
 - ✓ Menu based
 - ✓ Result oriented



Challenges We Faced

- **Technology**
- **Utilization**
- **Communication**
- **Business Practices**



Challenges We Faced

- **Technology**
 - Data Source
 - ✓ Consistent, centralized, local
 - ✓ Extract and present accurate, up to date information



Challenges We Faced

- **Technology**
 - Security
 - ✓ Secure database
 - ✓ Secure connections
 - ✓ Secure presentation
 - No personally identifiable information
 - .NET won't serve source files



Challenges We Faced

- **Technology**
 - Compatibility
 - ✓ Oracle / Microsoft connection issues
 - ✓ We were successful with ODP.NET and ODBC
 - ✓ We were unable to employ OLEDB successfully in our environment



Challenges We Faced

- **Utilization**
 - What reports will be most useful?



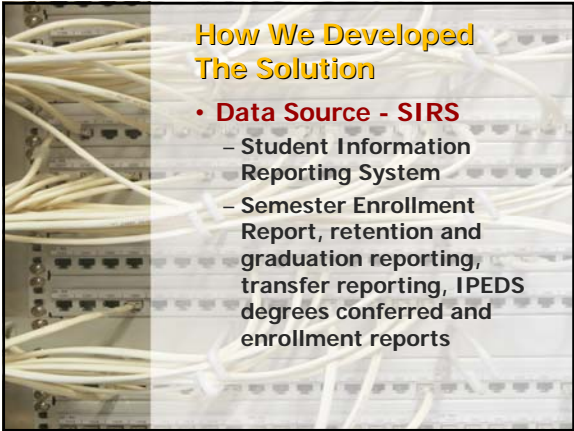
Challenges We Faced

- **Communication**
 - Must have a good working relationship with database administrators and users
 - Systems Development Life Cycle (SDLC)




Challenges We Faced

- **Business Practices**
 - Proactive vs. reactive
 - Transitioning to a systems development orientation
 - User involvement and education




How We Developed The Solution

- **Data Source - SIRS**
 - Student Information Reporting System
 - Semester Enrollment Report, retention and graduation reporting, transfer reporting, IPEDS degrees conferred and enrollment reports




How We Developed The Solution

- **Data Source - SIRS**
 - Once a semester snapshot
 - SIRS is the basis for many University System reports




How We Developed The Solution

- **Database**
 - We use an Oracle database
 - Other database products, such as MySQL or SQL Server, will also support dynamic web applications
 - MS Access and MS Excel probably won't support dynamic web applications




How We Developed The Solution

- **Data Extraction Queries**
 - Because we use an Oracle database, we write our queries in SQL and PL/SQL
 - There are effective alternatives such as Java, C#, Visual Basic and others




How We Developed The Solution

- **Presentation**
 - We use ASP.NET, Visual Studio and VB.NET
 - We also employ Extensible Markup Language (XML), Extensible Stylesheet Language (XSL) and Cascading Style Sheets (CSS)




How We Developed The Solution

- **What is XML?**
 - The eXtensible Markup Language (XML) is a non-proprietary standard that provides a format for describing structured data.
 - XML was designed to describe, store, carry, and exchange data in a unified manner.



How We Developed The Solution

- **What is XML?**
 - XML provides the ability to liberate data from proprietary data silos.
 - XML separates data from presentation.



How We Developed The Solution

- **What XML is Not**
 - A replacement for HTML
 - A replacement for relational databases
 - A programming language (e.g. Java, C++, VB)
 - Terse
 - A panacea

How We Developed The Solution

• Sample Text File

| ID | Lname | Mname | Fname | Gender |
|-------|-------|-------|-------|--------|
| 83492 | Clark | F | Betty | F |
| 89430 | Bhatt | | Soham | M |
| 94032 | Jones | T | John | M |
| 48392 | Klein | R | Kim | F |

How We Developed The Solution

• Sample XML File

```
<?xml version="1.0" encoding="utf-8"?>
<STUDENTS>
  <STUDENT>
    <ID>83492</ID>
    <LNAME>Clark</LNAME>
    <MNAME>F</MNAME>
    <FNAME>Betty</FNAME>
    <GENDER>F</GENDER>
  </STUDENT>
  <STUDENT>
    <ID>48392</ID>
    <LNAME>Klein</LNAME>
    <MNAME>R</MNAME>
    <FNAME>Kim</FNAME>
    <GENDER>F</GENDER>
  </STUDENT>
</STUDENTS>
```

How We Developed The Solution

• XML

- Standard (Non-proprietary)
- Extensible
- Flexible
- Easy to share




How We Developed The Solution

- XML
 - Web-friendly
 - Separates data from presentation



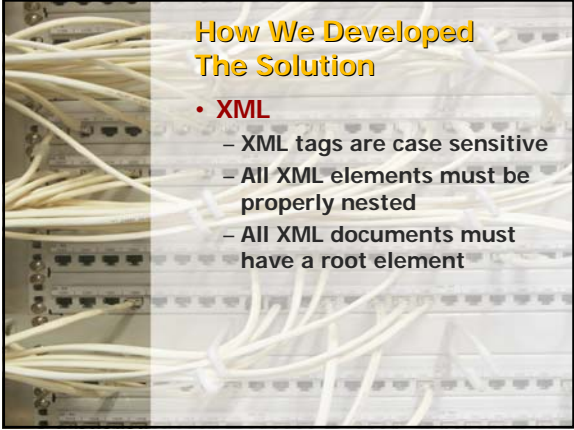
How We Developed The Solution

- XML
 - Far richer than flat text files
 - Makes the structure of the document trivial, leaving the implementation and dialect up to you



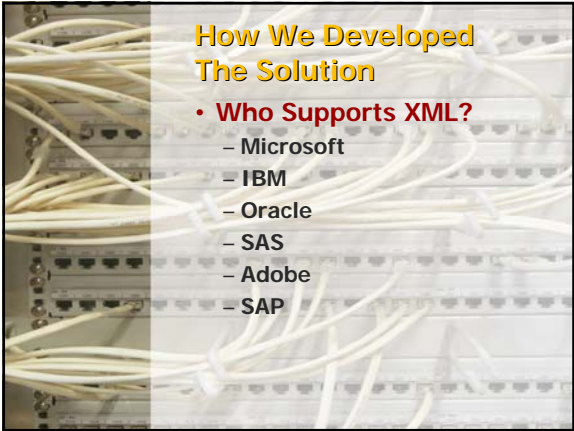
How We Developed The Solution

- XML
 - XML syntax is strict
 - XML documents provide a self-describing syntax
 - All XML elements must have a closing tag



How We Developed The Solution

- **XML**
 - XML tags are case sensitive
 - All XML elements must be properly nested
 - All XML documents must have a root element



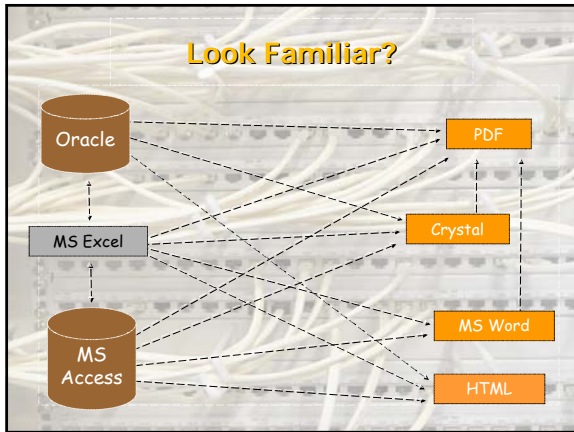
How We Developed The Solution

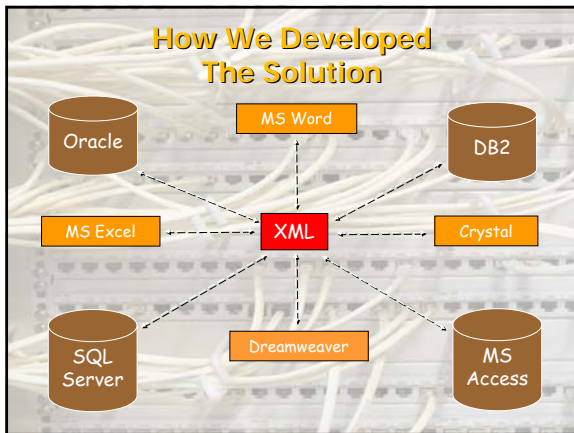
- **Who Supports XML?**
 - Microsoft
 - IBM
 - Oracle
 - SAS
 - Adobe
 - SAP



How We Developed The Solution

- **Who Supports XML?**
 - Sun Microsystems
 - BEA
 - Business Objects
 - W3C
 - Computer Associates
 - PeopleSoft





Text vs XML

| Student Record | XML |
|--|--|
| Ni ck Roberts 0001462395 143 Mai n St Cl emson, SC 29634 26 3. 4 3. 8 | <pre> <Student> <LName>Roberts</LName> <FName>Ni ck</FName> <ID>0001462395</ID> <Street>143 Mai n St</Street> <Ci ty>Cl emson</Ci ty> <State>SC</State> <Zi pCode>29634</Zi pCode> <Age>26</Age> <GPACumul ati ve>3. 4</GPACumul ati ve> <GPATerm200508>3. 8</GPATerm200508> </Student> </pre> |

HTML vs XML


| | |
|---|--|
| <pre>Student Record Ni ck Roberts 0001462395 143 Mai n St Cl emson, SC 29634 26</pre> | <pre><Student> <LName>Roberts</LName> <FName>Ni ck</FName> <ID>0001462395</ID> <Street>143 Mai n St</Street> <Ci ty>Cl emson</Ci ty> <State>SC</State> <Zi pCode>29634</Zi pCode> <Age>26</Age> </Student></pre> |
|---|--|

How We Developed The Solution

- **An XML Schema Defines**
 - Elements that can appear in a document
 - Attributes that can appear in a document
 - Which elements are child elements
 - The order of child elements


How We Developed The Solution

- **An XML Schema Defines**
 - The number of child elements
 - Whether an element can be null or must include data
 - Data types for elements and attributes
 - Default and fixed values for elements and attributes



How We Developed The Solution

- **So, What is An XML Schema?**
 - A schema describes the structure of an XML document using XML
 - An XML schema manages the expectations of those sharing an XML document



How We Developed The Solution

- **So, What is An XML Schema?**
 - A schema enforces business constraints and ensures data validation
 - For example, we can create a standard definition for social security number (data type is string, format=###-##-####, required field, etc.).



How We Developed The Solution

```

<?xml version="1.0"?>
<xs:schema id="STUDENTS" targetNamespace="http://ie.kennesaw.edu/STUDENT1.xsd"
  xmlns="http://ie.kennesaw.edu/STUDENT1.xsd"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  attributeFormDefault="qualified">
  <xs:element name="STUDENTS">
    <xs:complexType>
      <xs:choice base="xsd:string" minOccurs="unbounded">
        <xs:element name="STUDENT">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="ID" type="xs:string" minOccurs="1" />
              <xs:element name="LNAM" type="xs:string" minOccurs="1" />
              <xs:element name="MNAME" type="xs:string" minOccurs="0" />
              <xs:element name="FNAM" type="xs:string" minOccurs="1" />
              <xs:element name="GENDER" type="xs:string" minOccurs="0" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:choice>
    </xs:complexType>
  </xs:element>
</xs:schema>

```



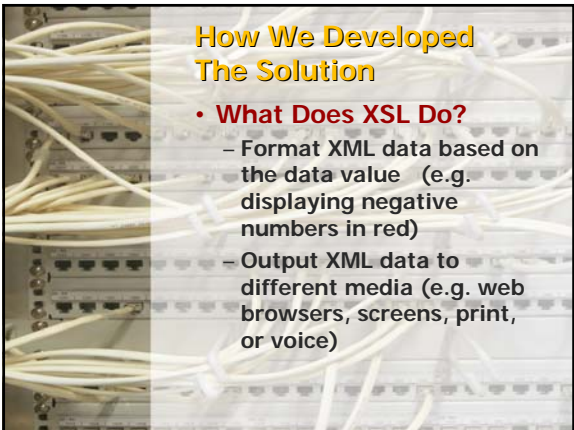
How We Developed The Solution

- **What Is XSL?**
 - XSL stands for eXtensible Stylesheet Language



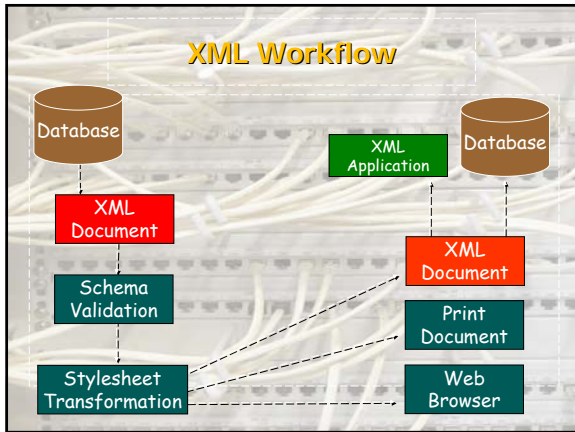
How We Developed The Solution

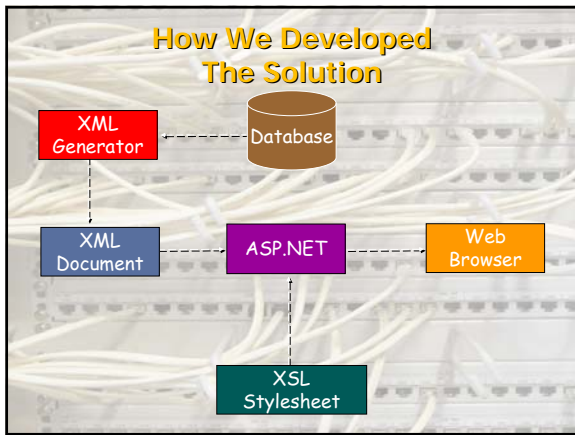
- **What Does XSL Do?**
 - Transform XML into XHTML
 - Filter and sort XML data

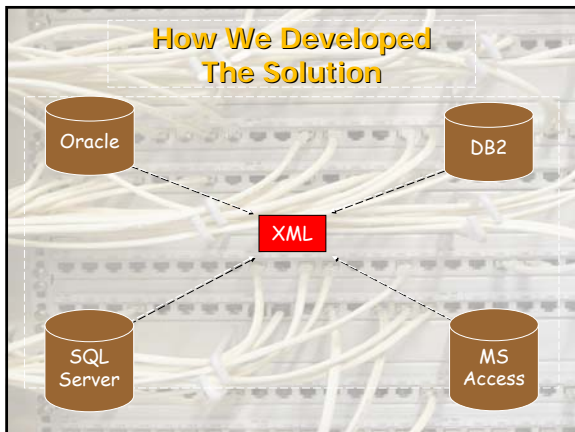


How We Developed The Solution

- **What Does XSL Do?**
 - Format XML data based on the data value (e.g. displaying negative numbers in red)
 - Output XML data to different media (e.g. web browsers, screens, print, or voice)







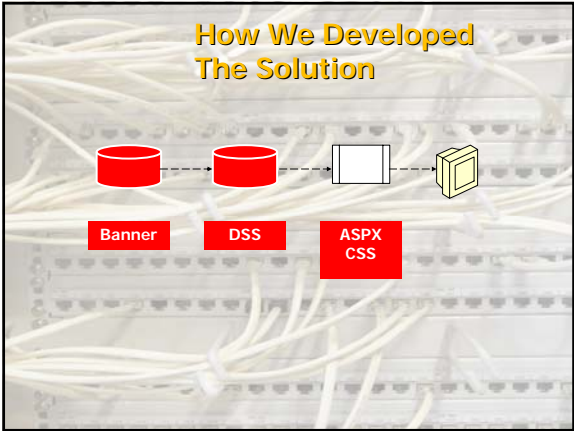
How We Developed The Solution

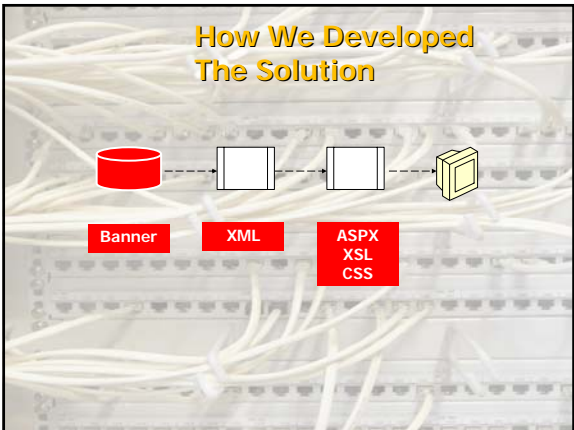
- **Data Extraction Snippet**

```

FUNCTION GET_TERM_DESC
(term_code IN TABLE.TABLE_TERM_CODE%TYPE)
RETURN TABLE.TABLE_TERM_DESC%TYPE
IS
CURSOR term_desc_cur (term_code IN
TABLE.TABLE_TERM_CODE%TYPE)
IS
SELECT TERM_DESC
FROM TABLE.TABLE
WHERE TERM_CODE = term_code;
return_value TABLE.TABLE_TERM_DESC%TYPE;
BEGIN
OPEN term_desc_cur (term_code);
FETCH term_desc_cur into return_value;
CLOSE term_desc_cur;
RETURN return_value;
END;

```







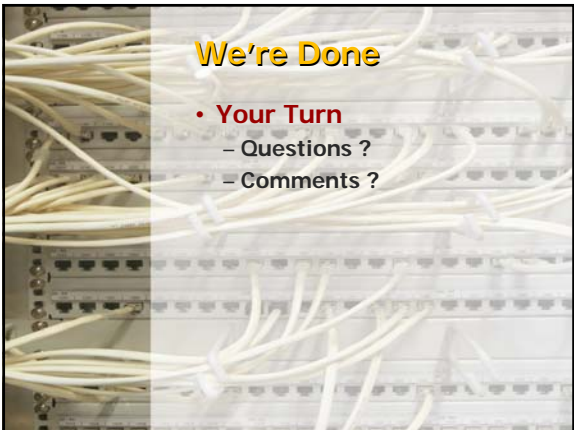
Impact

- **New Demands**
 - Technical proficiencies
 - Additional consumers and requests
 - Data integrity



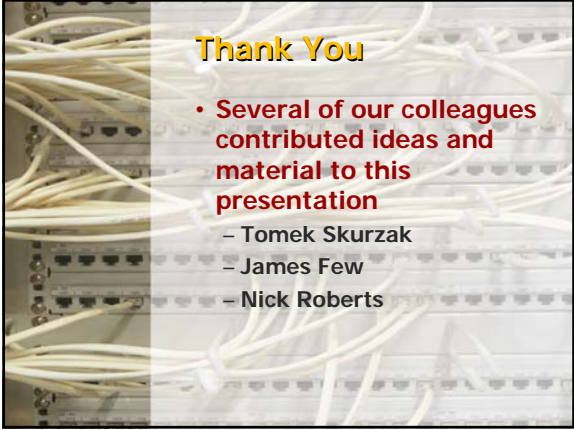
Impact

- **Business Practices**
 - Proactive vs. reactive
 - Transitioning to a systems development orientation
 - User education



We're Done

- **Your Turn**
 - Questions ?
 - Comments ?



Thank You

- **Several of our colleagues contributed ideas and material to this presentation**
 - Tomek Skurzak
 - James Few
 - Nick Roberts



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Contact Us

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