

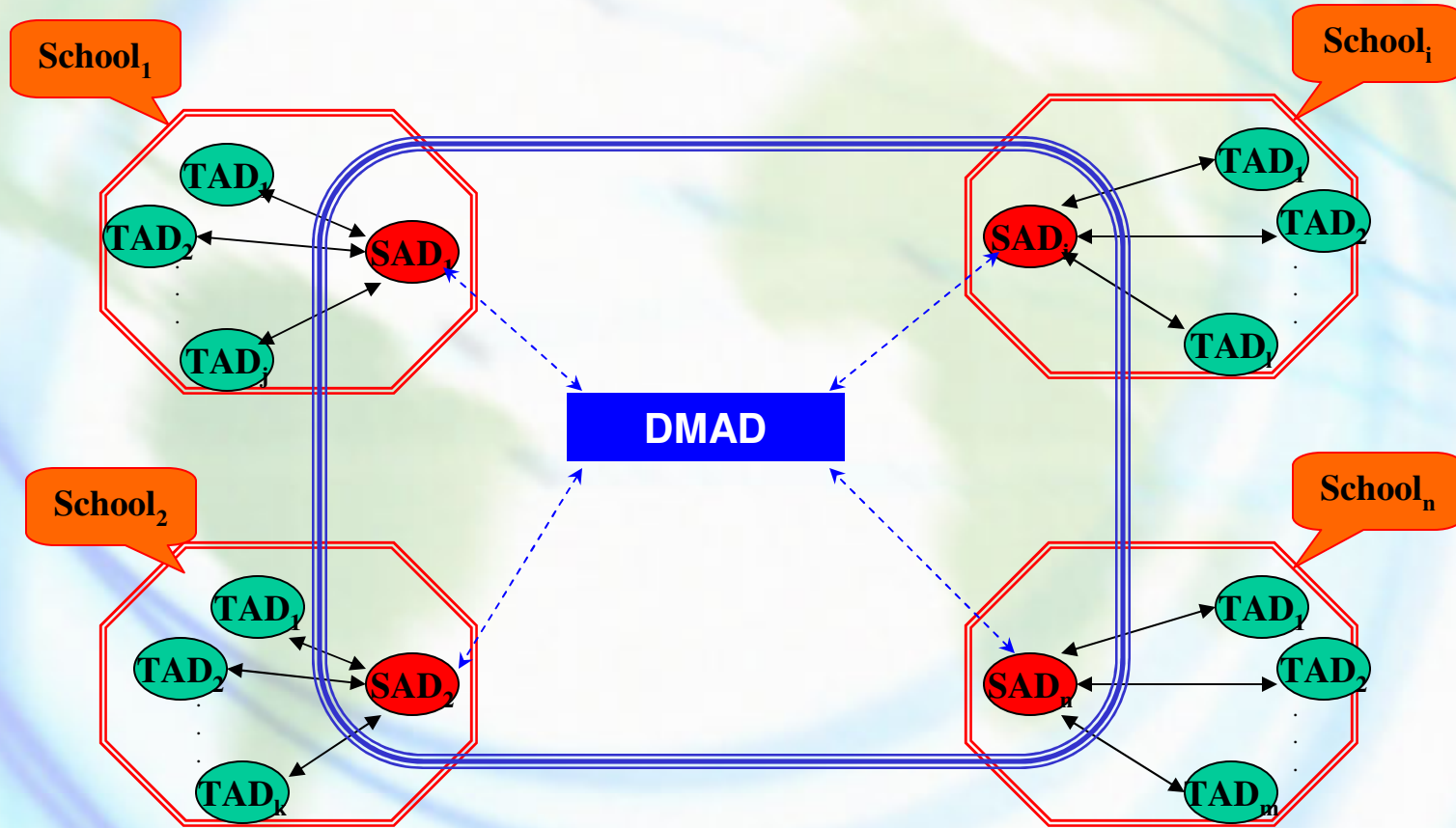
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DMAD Progress and Demo + Integrating DMAD with WME

Outlines

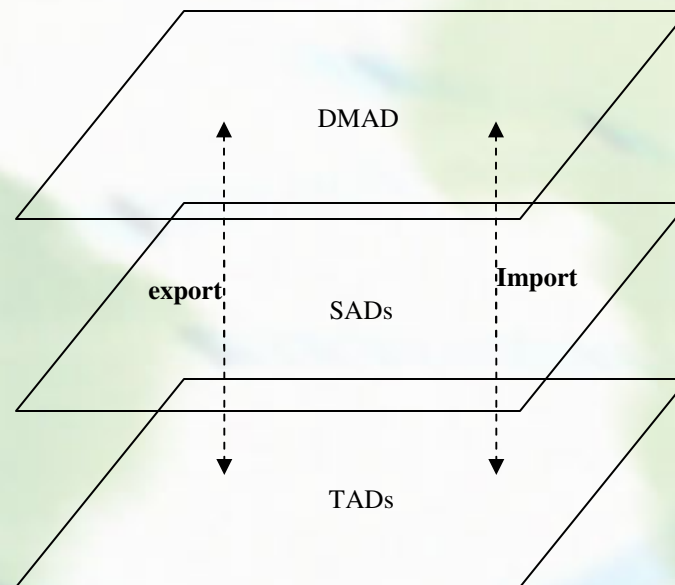
- **DMAD Organization (Changed!).**
- **DMAD Implementation Updates.**
- **DMAD Web Service.**
- **Integrating DMAD with WME.**
- **MAML Markup Language.**
- **Issues and Future work.**
- **Demo and Q & A.**

DMAD Organization (Changed!)



DMAD

DMAD Visualization



DMAD

DMAD Implementation (Updates)

➤ Old way:

- ✓ To author (or import) questions and make assessment tests: Teacher had to create assessment Sets (Question Sets or Assessment Pools) first to be as backgrounds or containers (collections) for their assessment tests and questions. Then the Teacher can make tests or questions (X confusing!).
- ✓ Creating NEW assessment tests/questions and Assessment test Management are done in the same place.
- ✓ No Interoperability/Integration with WME (yet).

DMAD Implementation (Updates)

➤ Old way (cont.):

- ✓ At End of the test, Students can submit their answers for assessment test questions all at once.
- ✓ No accumulative submission of student answers.
- ✓ Automatic grading is done when student submits her answers immediately at the end of the test.
- ✓ Not test codes used in the assessment tests.
- ✓ No Test Re-take!

DMAD Implementation (Updates)

➤ **New way:**

- ✓ Teacher Question Sets (or Assessment Pools) idea is eliminated.
- ✓ Different functionalities are now separated. So after logging in, a teacher has different types of links (directions): Make a new Assessment test/homework, Manage Assessment test/homework, Browse DMAD question bank (For education experts/contributors), and so on.
- ✓ Supporting Interoperability/Integration with WME: Interaction between WME system (as a client service) and DMAD system as (a Web Service) .

DMAD Implementation (Updates)

➤ **New way (cont.):**

- ✓ DMAD uses accumulative submission of student answers (question-by-question).
- ✓ Automatic grading is done at the time of reviewing student answers/grades.
- ✓ It uses 'test codes' uniquely/randomly generated for students in the login system.
- ✓ 'Test Re-take!' is supported and controlled only by the teacher.
- ✓ Supports test/codes print out (hard copies).

DMAD Implementation (Updates)

➤ Constants:

```
<?php
// Global Database Variables:
define("DMAD_DB_SERVER", "localhost");
define("DMAD_DB_USER", "user");
define("DMAD_DB_PASS", "pass");
define("DMAD_DB_TAD", "wme_dmad_tad");
define("DMAD_DB_SAD", "wme_dmad_sad");

// ** * Database Table Constants - these constants hold the names of all the database tables used in the script.
define("DMAD_TBL_STUDENT", "tbl_student");
define("DMAD_TBL_STUDENT_ANSWERS", "tbl_student_answers");
define("DMAD_TBL_STUDENT_TESTCODE", "tbl_student_testcode");
define("DMAD_TBL_TEST", "tbl_test");
define("DMAD_TBL_TEST_QSCORE", "tbl_test_qscore");

define("DMAD_TBL_TQ_ESSAY", "tbl_tq_essay");
define("DMAD_TBL_TQ_FORMULA", "tbl_tq_formula");
define("DMAD_TBL_TQ_IMAGE", "tbl_tq_image");
define("DMAD_TBL_TQ_IMG_MULTIPLECHOICE", "tbl_tq_img_multiplechoice");
define("DMAD_TBL_TQ_MULTIPLECHOICE", "tbl_tq_multiplechoice");
define("DMAD_TBL_TQ_QUESTION", "tbl_tq_question");
define("DMAD_TBL_TQ_SHORTANSWER", "tbl_tq_shortanswer");
define("DMAD_TBL_TQ_TRUEFALSE", "tbl_tq_truefalse");

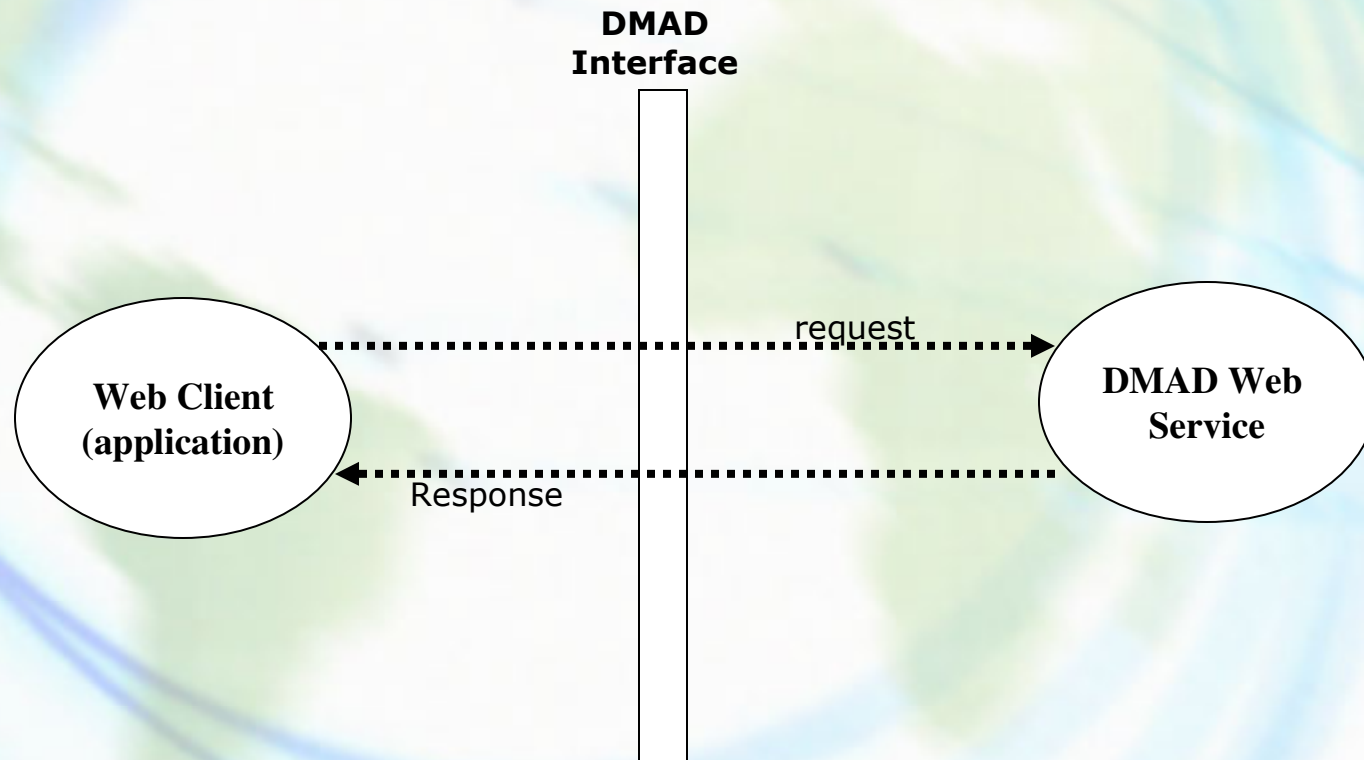
?>
```

DMAD Web Service

➤ **Explanation:**

- ✓ I am Designing the DMAD Web Service to be independent of any other system and it does not have any knowledge of any client system. So that we need:
- ✓ Interface (DMAD Interface) and the purpose of this interface is to isolate the two systems (Web Service and Client Service) that are being connected by that interface.
- ✓ Thus, The DMAD Interface will capture all the info of interaction between the Web Service and Client Service.

DMAD Web Service



Integrating DMAD with WME

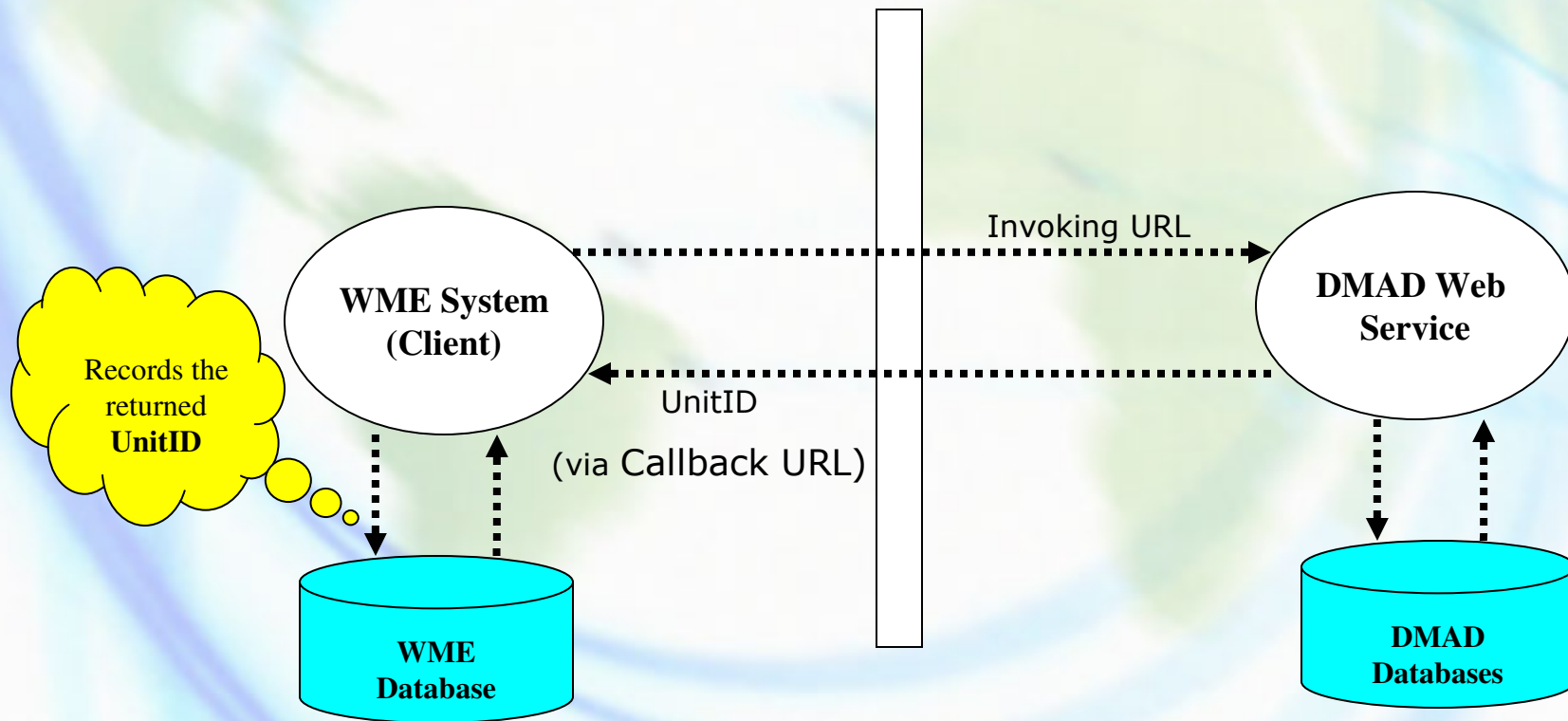
➤ Procedures:

- ✓ DMAD is invoked via a URL to author a new "Assessment Unit". This URL will receive POST or GET data including a "callback URL".
- ✓ The user can author (or import/export) questions in "Assessment Unit" and a new "UnitID" will be generated for the stored Assessment Unit.
- ✓ When authoring ends, the user will be redirected to the callback URL using something like (...?UnitID=...) appended at the end of it.
- ✓ This call back URL is a program that knows how to take the UnitID and records it in the database for the WME page involved.

Integrating DMAD with WME

DMAD Interface

(using parameters: Callback URL and UnitID)



MAML (Mathematics Assessment Markup Language) for DMAD

- ✓ DMAD system aims to support interoperability and inter-communications with other applications on the Web. Thus, many DMAD functionalities are accessible as Web Services.
- ✓ So, a well-defined API (Application Programming Interface) is needed to communicate and serve other applications on the Internet to achieve this goal.
- ✓ This XML markup language MAML (Mathematics Assessment Markup Language) will be used to represent assessment questions and exams and to transmit assessment questions to and from DMAD.
- ✓ MAML defines markup *elements and attributes* such as question head, type, classification, body, rubric, and so on.
- ✓ DMAD Web services will receive and return MAML encoded data.
- ✓ The XSLT style sheet for MAML (maml.xsl) will be responsible to translate MAML markup into XHTML + SVG + MathML.

MAML (cont.:

• Multiple choice example:

```
DMAD <?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="maml.xsl"?>
<dmad>
<question type="multiple_choice">
<q_head>
    <author>Johe Bob</author>
    <keywords>Measurement, Area, Rectangle </keywords>
    <classification>Plan Geometry</classification>
    <answer>choice 2</answer>
</q_head>
<q_body>
    <q_text>What is the Area a rectangle with height=h and base=b?</q_text>
    <q_diagram>
        <svg xmlns="http://www.w3.org/2000/svg">
            <rect x="100" y="20" width="40" height="60" />
        </svg>
    </q_diagram>
    <q_choices>
    <choice id="1">
        <math xmlns='http://www.w3.org/1998/Math/MathML'>
            <mi>h</mi><mo>+</mo><mi>b</mi></math>
        </choice>
    <choice id="2">
        <math xmlns='http://www.w3.org/1998/Math/MathML'>
            <mi>h</mi><mo>*</mo><mi>b</mi></math>
        </choice>
    <choice id="3">
        <math xmlns='http://www.w3.org/1998/Math/MathML'>
            <mi>h</mi><mo>-</mo><mi>b</mi></math>
        </choice>
    <choice id="4">
        <math xmlns='http://www.w3.org/1998/Math/MathML'>
            <mi>h</mi><mo>/</mo><mi>b</mi></math>
        </choice>
    </q_choices>
</q_body>
</question>
</dmad>
```

DMAD

DMAD Issues and Future Work

✓ **Integration with WME:**

- ❖ Using a well-defined interface **DMAD Interface** using (Callback URL & UnitID, etc.).
- ❖ With other WME parts: geoSVG, MathEdit, and so on.

✓ Define & Implement **MAML** as XML-based representation of assessment questions and tests and providing some kind of a **Web service** (ex: export a question as an XML file to other applications).

✓ Supporting SVG using geoSVG tool, to be included.

✓ Supporting formulas using MathEdit tool (and Infex → MathML program).

✓ **Converting** between one question type to another.

✓ **Adding** new question types.

✓ **DMAD Search?** How do we search? If Add some participating school sites?

Implementation

- **Take a look..**

http://wme.cs.kent.edu/kimpton/assessment_2.0/

<http://wme.cs.kent.edu/develop/kimpton/>



Q & A