New Hampshire Department of Education



State of New Hampshire

New Hampshire Department of Education—Leading the Way for a Public Domain Education Data Warehouse—Including Student-Teacher Connections That Inform Instructional Change

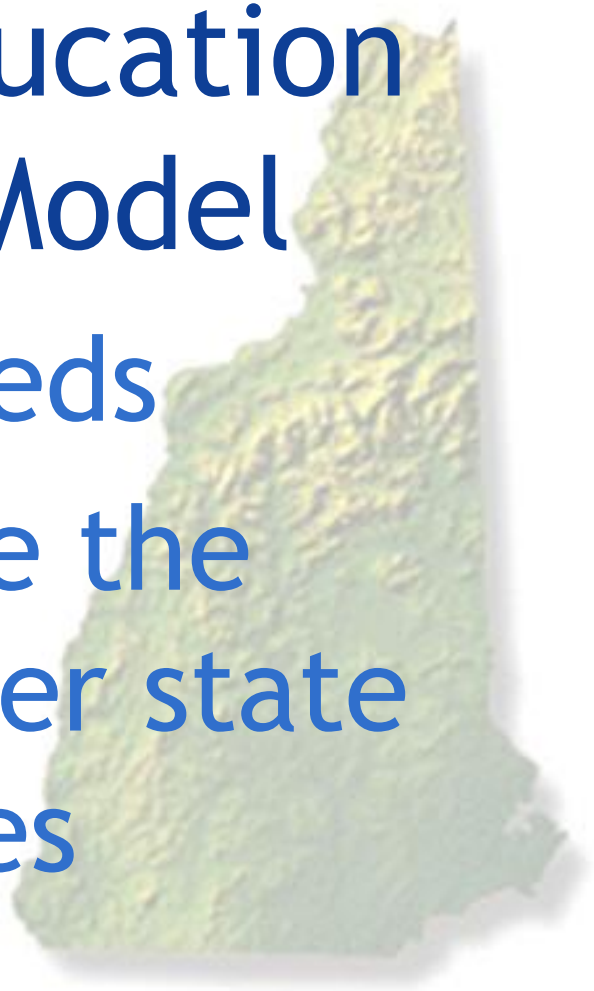
March 3, 2010

Agenda

1. The Scope of NH's Public Data Model
2. The Process and Considerations in Building NH's Public Data Model
3. How NH's Public Data Model will Improve Education
4. Collaborating Across the Country

The Scope of NH's Public Data Model

- Public Domain Education Data Warehouse Model
  - Fully meet NH needs
  - Collaborate: share the resource with other state education agencies



Background: NH DOE Vision

Three categories of uses for longitudinal data:

1. Incent
2. Evaluate
3. Empower

(Source: 2006 presentation by Jon Fullerton and Thomas Kane from Harvard's Project for Policy Innovation in Education, "Leveraging Longitudinal Data to Improve Student Achievement")

Initial Scope of the Data Model

Initial Uses:

- Federal Reporting
- State Reporting
- Analytics to inform Policy
- Feed data to assessment provider
- Feed data to decision support portal for educators

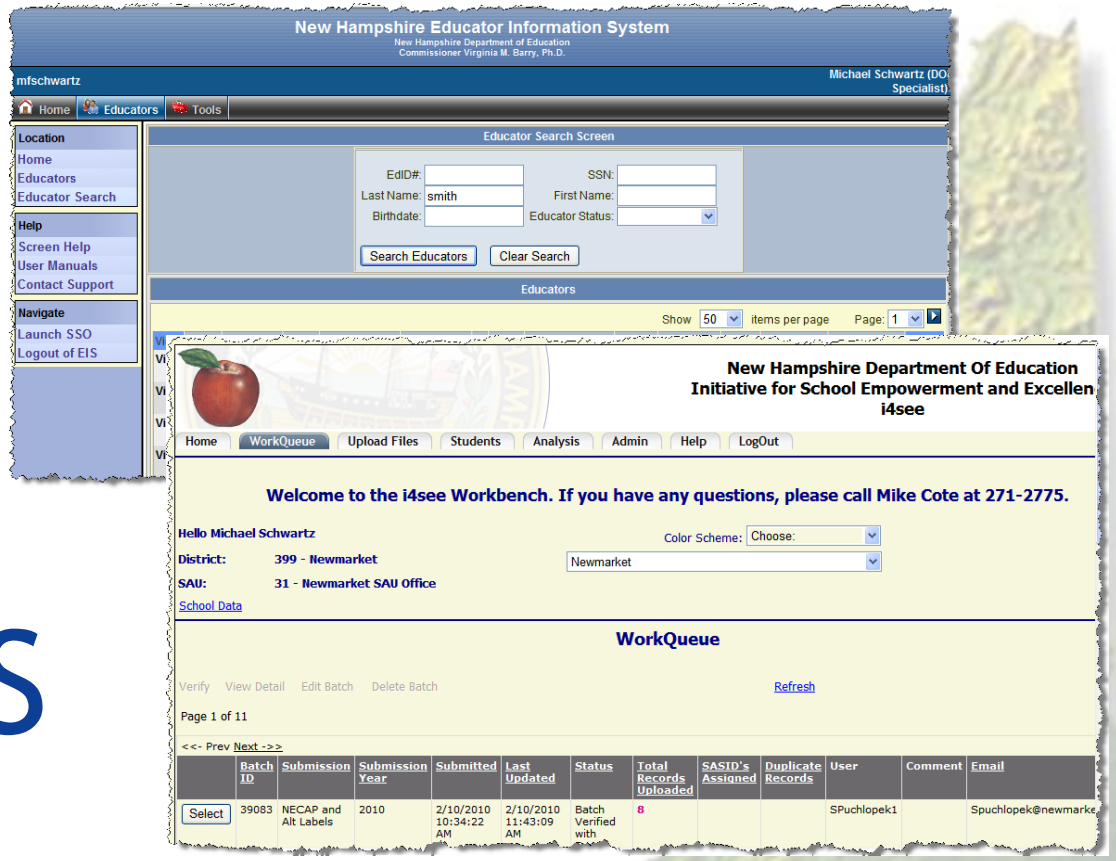
Initial Scope of the Data Model

Initial Collections:

- Student
- School
- District
- Program
- Educator
- Policy data
- Census, geographic and tax data

Initial Scope of the Data Model

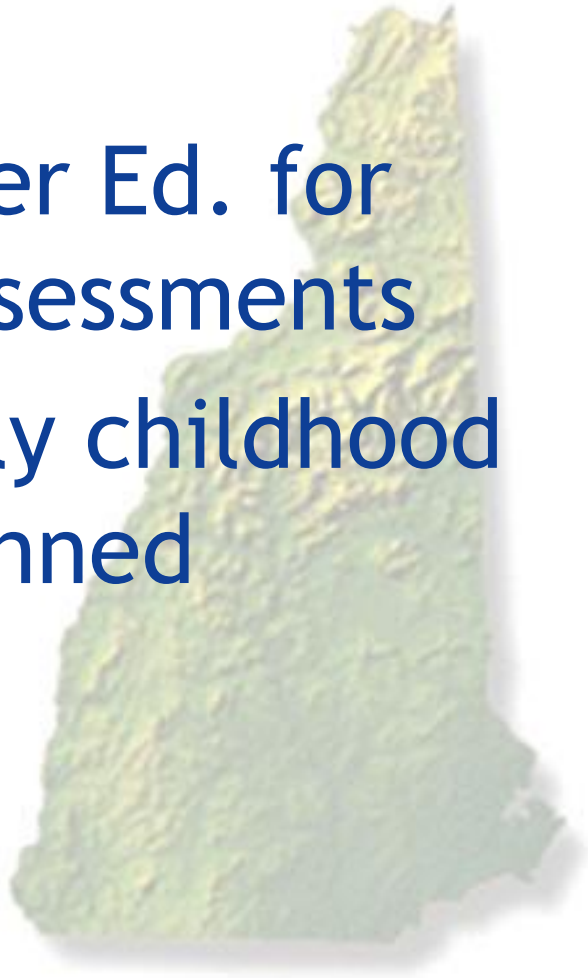
- I4see
- EIS
- CaTE
- NHSEIS
- Others…



Initial Scope of the Data Model

P-20

- Supports K-12 and Higher Ed. for data such as student assessments
- Further support for early childhood and workforce data planned



The Process and Considerations in Building NH's Public Data Model

- WHY this model?
  - U
  - F
  - O

The Process and Considerations in Building NH's Public Data Model

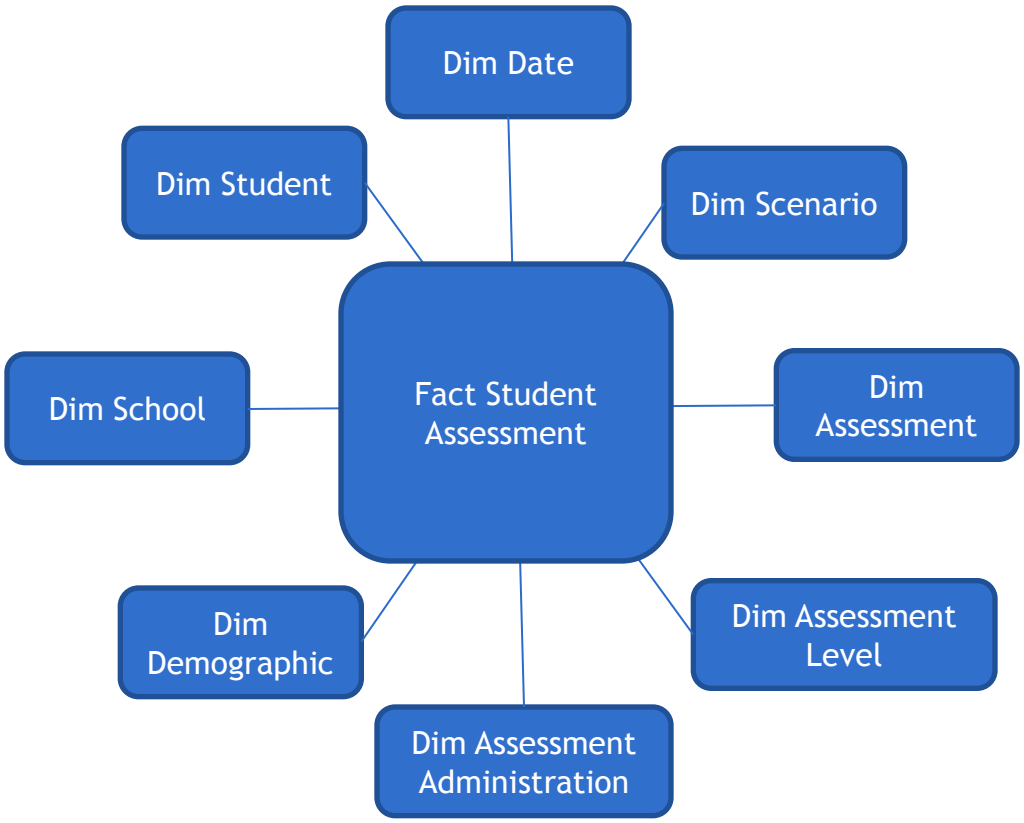
- WHY this model?
  - Usability
  - Flexibility
  - Open Standards

Usability

- WHY this model?
  - Usability
  - F
  - O

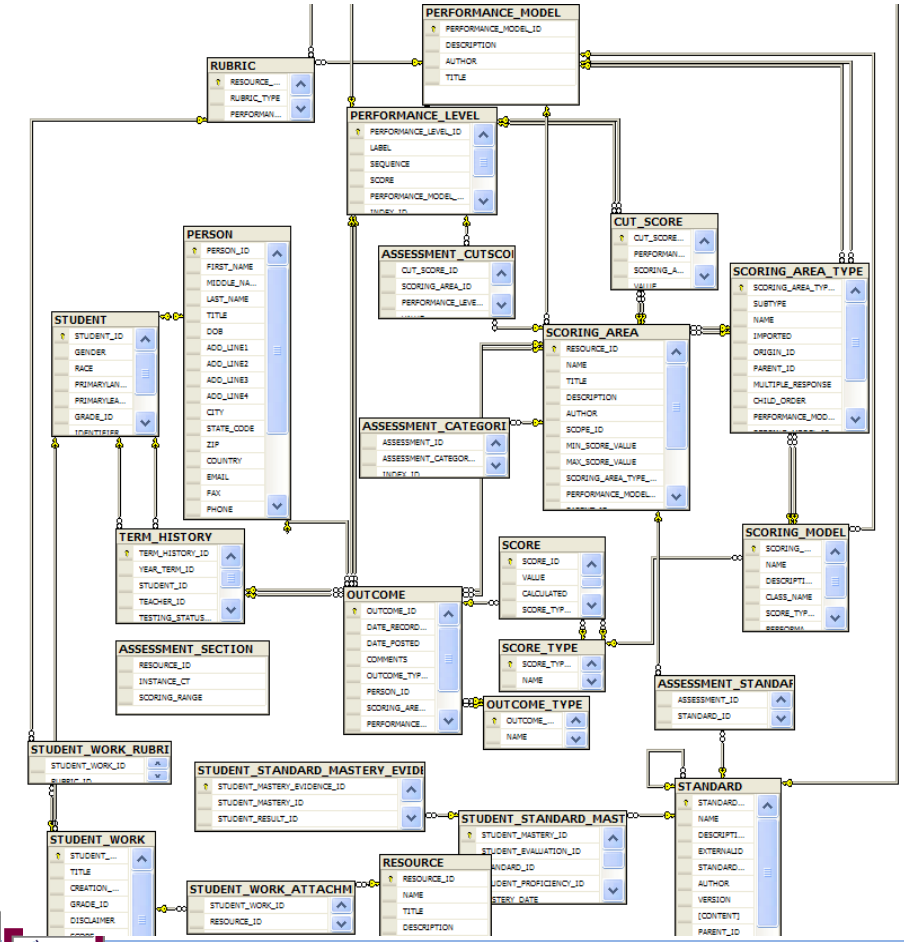
Usability

Dimensional Model



Usability

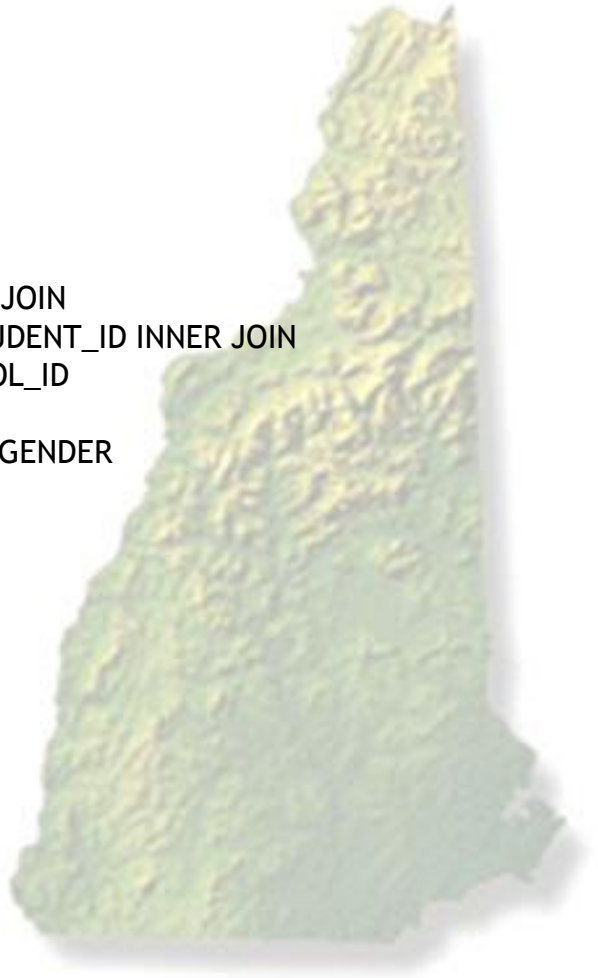
Normalized Assessment Data



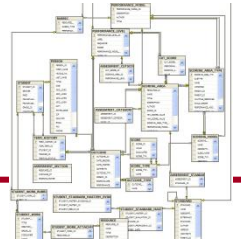
Usability

Dimensional Model

```
SELECT     ASSESSMENT.PERFOMANCE_LEVEL, dimSTUDENT.RACE,
                dimSCHOOL.SHORTNAME, dimDATE.ACCADEMIC_YEAR
FROM       ASSESSMENT INNER JOIN
               dimDATE ON ASSESSMENT.DATE_ID = dimDATE.DATE_ID INNER JOIN
               dimSTUDENT ON ASSESSMENT.STUDENT_ID = dimSTUDENT.STUDENT_ID INNER JOIN
               dimSCHOOL ON ASSESSMENT.SCHOOL_ID = dimSCHOOL.SCHOOL_ID
WHERE      dimSTUDENT.GENDER = [MALE]
GROUP BY  dimSCHOOL.SHORTNAME, dimDATE.ACCADEMIC_YEAR, STUDENT.GENDER
```



Usability



Normalized Assessment Data

```
SELECT     PERFORMANCE_LEVEL.LABEL, STUDENT.RACE, LS_GROUP.GROUP_NAME, YEAR(OUTCOME.DATE_RECORDED) AS YEAR
FROM        ASSESSMENT_CUTSCORE INNER JOIN
                  PERFORMANCE_LEVEL INNER JOIN
                  OUTCOME ON PERFORMANCE_LEVEL.PERFORMANCE_LEVEL_ID = OUTCOME.PERFORMANCE_LEVEL_ID INNER JOIN
                  SCORE ON SCORE.OUTCOME_ID = OUTCOME.OUTCOME_ID INNER JOIN
                  PERSON ON OUTCOME.PERSON_ID = PERSON.PERSON_ID INNER JOIN
                  STUDENT ON PERSON.PERSON_ID = STUDENT.STUDENT_ID INNER JOIN
                  SCHOOL ON SCHOOL.GROUP_ID = OUTCOME.SCHOOL_ID INNER JOIN
                  LS_GROUP ON LS_GROUP.GROUP_ID = SCHOOL.GROUP_ID ON
                  ASSESSMENT_CUTSCORE.PERFORMANCE_LEVEL_ID = PERFORMANCE_LEVEL.PERFORMANCE_LEVEL_ID INNER JOIN
                  ASSESSMENT_ENTRY ON OUTCOME.ENTRY_ID = ASSESSMENT_ENTRY.ENTRY_ID INNER JOIN
                  ASSESSMENT_SCORES ON PERFORMANCE_LEVEL.PERFORMANCE_LEVEL_ID =
ASSESSMENT_SCORES.PERFORMANCE_LEVEL_ID INNER JOIN
                  ASSESSMENT_CATEGORIES INNER JOIN
                  ASSESSMENT ON ASSESSMENT_CATEGORIES.ASSESSMENT_ID = ASSESSMENT.ASSESSMENT_ID ON
                  ASSESSMENT_SCORES.ASSESSMENT_ID = ASSESSMENT.ASSESSMENT_ID INNER JOIN
                  ASSESSMENT_STANDARDS ON ASSESSMENT_ENTRY.ASSESSMENT_ID = ASSESSMENT_STANDARDS.ASSESSMENT_ID
CROSS JOIN
                  ASSESSMENT_SECTION
WHERE     STUDENT.GENDER = [MALE]
GROUP BY LS_GROUP.GROUP_NAME, STUDENT.GENDER, STUDENT.RACE, YEAR(OUTCOME.DATE_RECORDED),
PERFORMANCE_LEVEL.LABEL,
                  SCHOOL.SCHOOLCODE, SCORE.VALUE
```

Why a Dimensional Model?

- WHY this model?
  - Usability
  - Flexibility
  - O

Flexibility

- Fine Grain
- Conformed Dimensions
- Many Dimensional Attributes

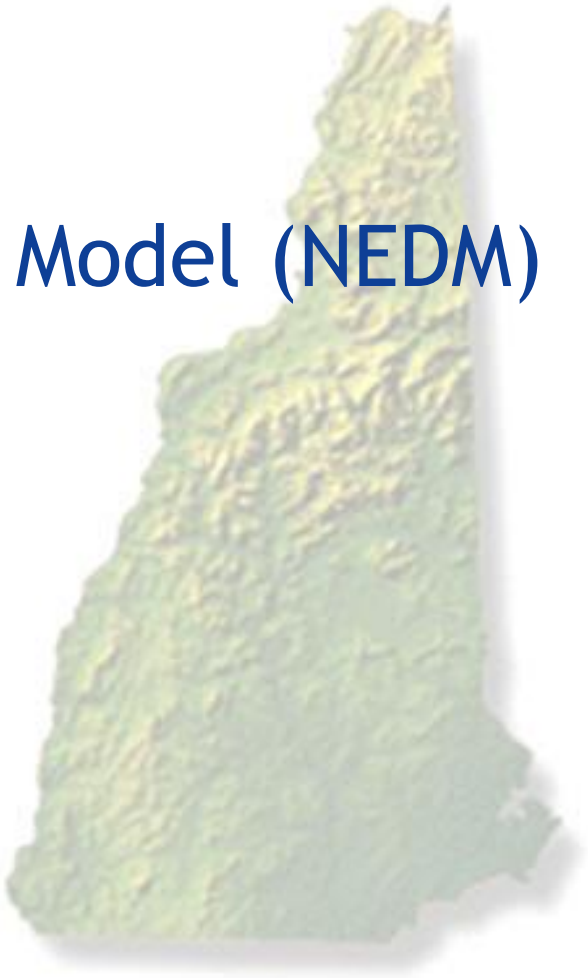
= Slice & Dice, Roll-up, Drill Down

Why a Dimensional Model?

- WHY this model?
  - Usability
  - Flexibility
  - Open Standards

Open Standards

- NCES Handbooks
- EDEN/EDFacts
- National Education Data Model (NEDM)
- Others



National Data Standards

- Informed by the work of key national organizations such as the Data Quality Campaign and the Schools Interoperability Framework Association.

Dimensional Data Model

- The public domain model supports vertical alignment between state and local education agencies.
- The model contains structures to capture student learning longitudinally from early childhood through adult.
- The data warehouse in New Hampshire will feed data to PerformancePlus decision support portal for educators.

How NH's Public Data Model will Improve Education

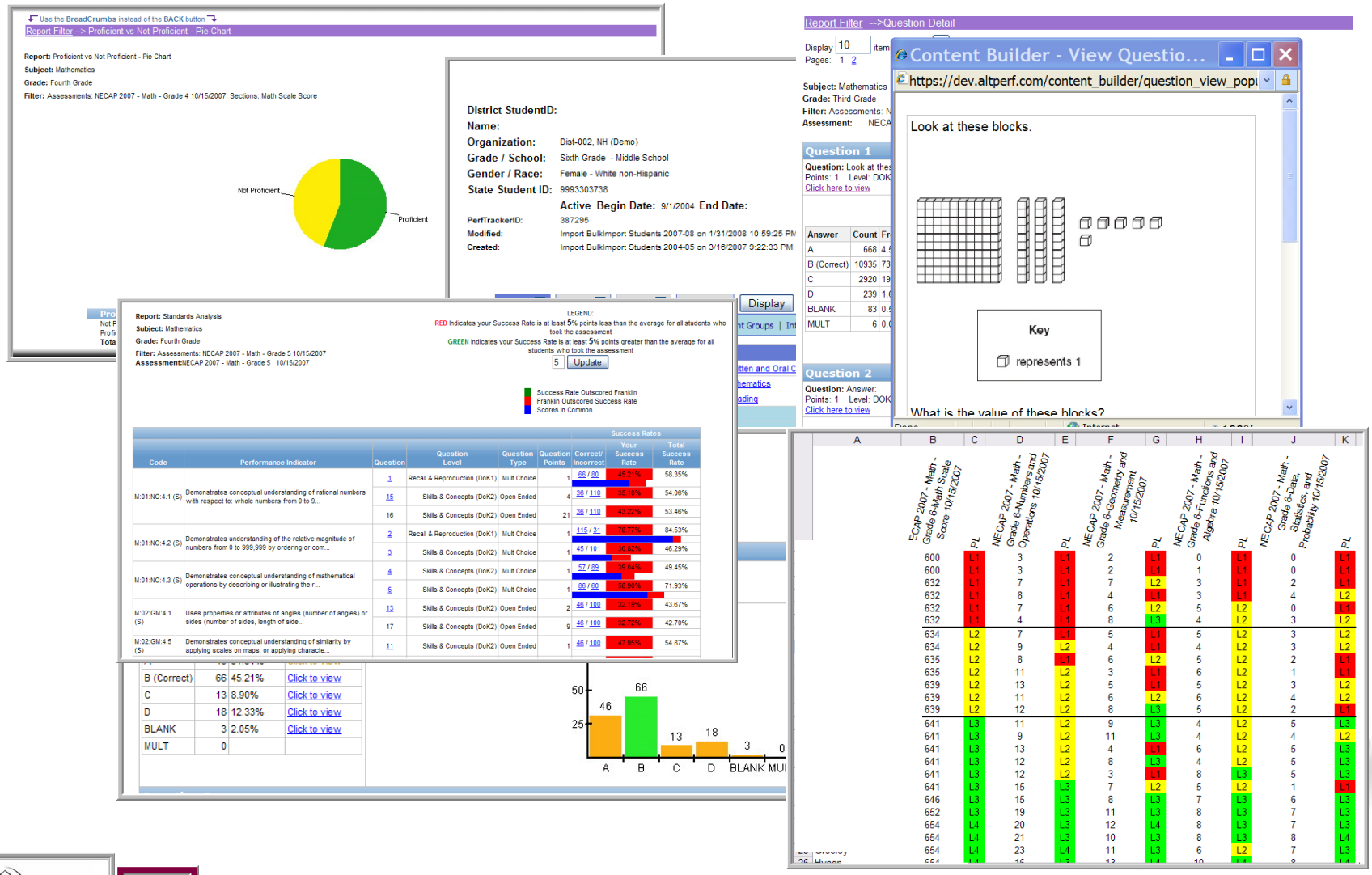
Current Uses:

- PerformancePlus (data to schools & classrooms)
- EDEN/EdFacts
- School/District Report Cards
- Legislative Reports (inform policy)
- Data Quality (feedback)
- Research

Future Uses:

- P-20
- Early Childhood
- Workforce
- Social Services (e.g. foster care)

Multiple Channels of Access



A Variety of Educational Improvements

- **Teachers** across the state are using multiple assessments to triangulate their understanding of student performance with quantitative data, to identify students' success and challenges with given state standards.
- **Districts** are looking across their schools to increase collaboration – for example, bringing together math leads after realizing two feeding elementary schools were out performing a third in a specific topic. They are considering the needs of each individual student.
- **Schools** are using data to inform their reading initiative as they focus on literacy. They are developing their own local assessments to monitor student progress.
- **Curriculum directors** are able to analyze the connection between their students' performance on standards, with the curriculum being taught in their schools. Strengths, weaknesses and gaps in the curriculum are quickly identified when analyzing the data.
- **Special education coordinators** and case managers are monitoring and tracking individual student growth and needs.

And many more uses (a few more examples)…

1. Incent

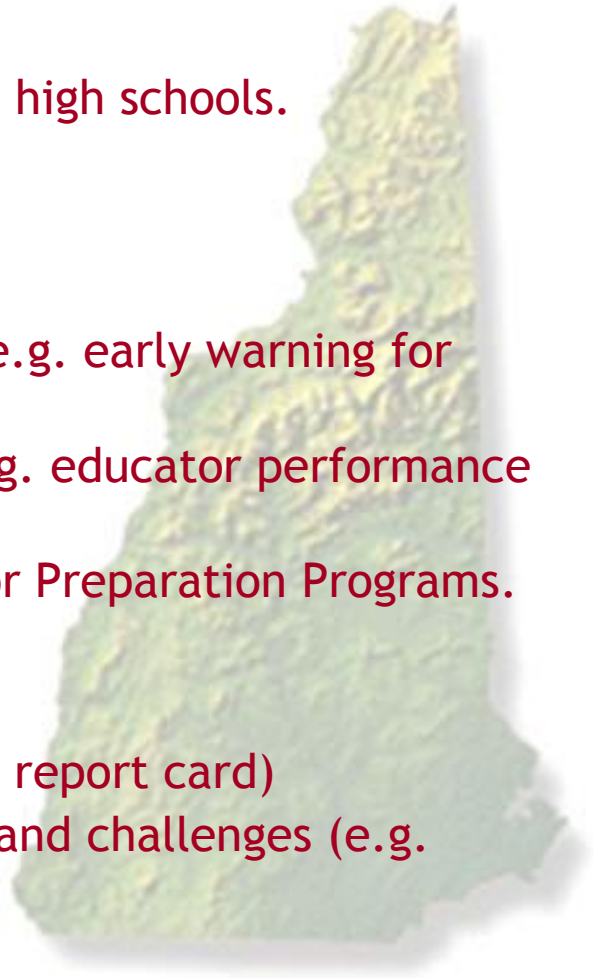
- Collaboration between postsecondary and high schools.
- Data analysis to inform education policy

2. Evaluate

- Researchers to understand policy needs (e.g. early warning for dropouts)
- LEAs to consider teacher performance (e.g. educator performance systems)
- Institutes of Higher Ed to analyze Educator Preparation Programs.

3. Empower

- Parents to consider school outcomes (e.g. report card)
- Students to consider individual successes and challenges (e.g. NYTimes)



Collaborating Across the Country

http://sites.google.com/site/EducationDataWarehouse