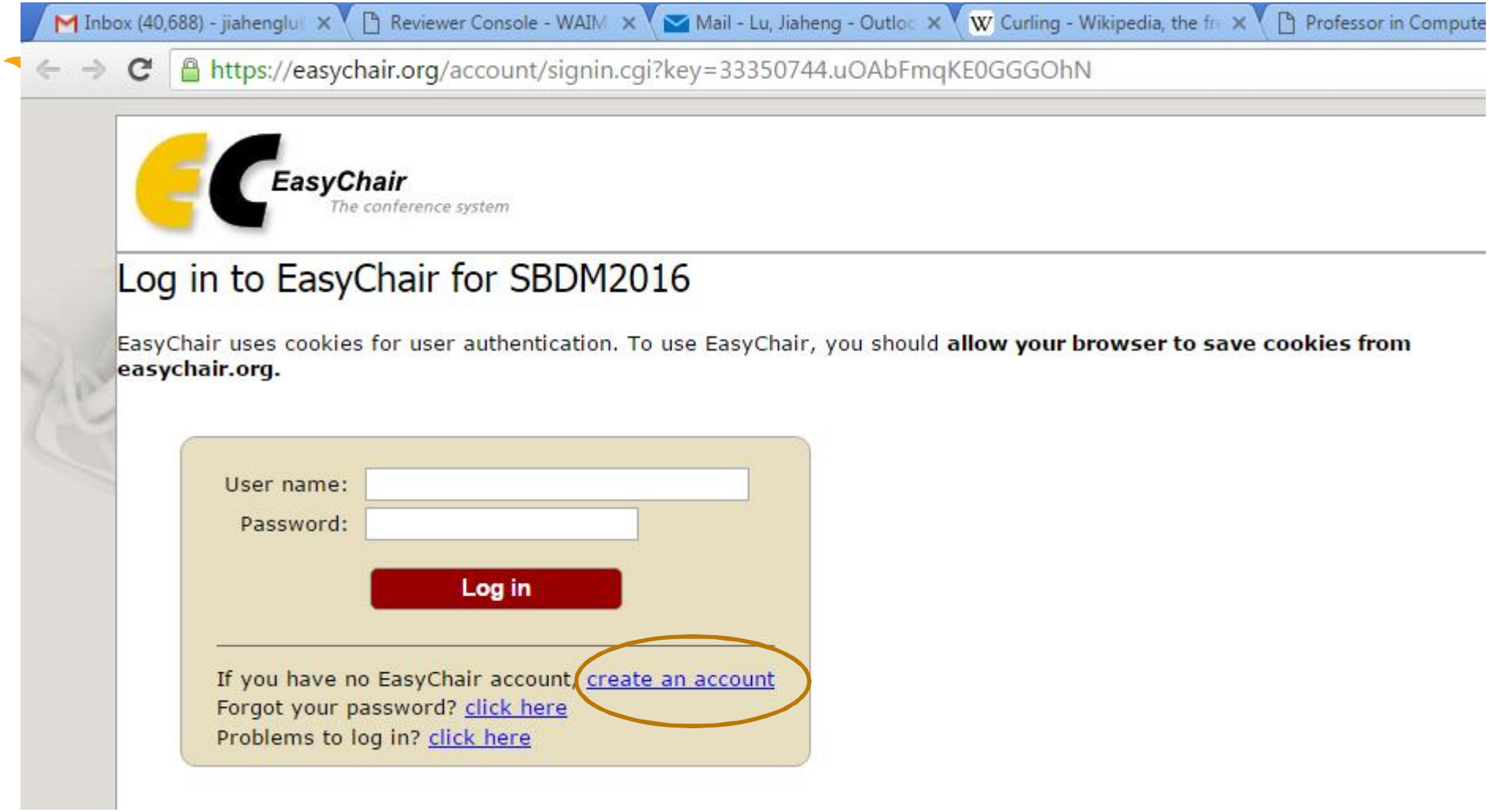
This seminar will use the EasyChair system to manage the reports and reviews.

The submission website is https://easychair.org/conferences/?conf=sbdm2016

The deadline of the first version of the report is 7 Mar, 2016.


Inbox (40,688) - jiahenglu
Reviewer Console - WAIM
Mail - Lu, Jiaheng - Outlo
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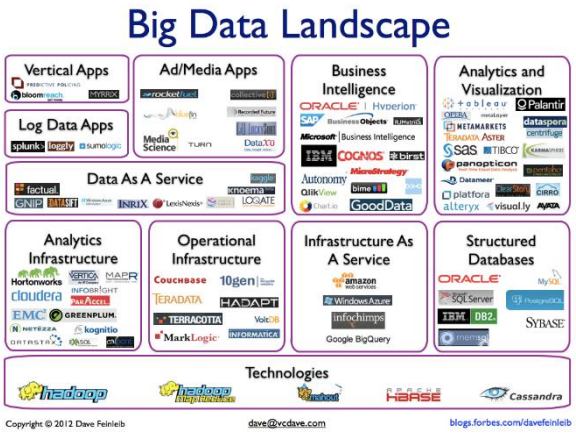


Information when you prepare your presentation

Seminar on big data management

Lecturer: Jiaheng Lu

Spring 2016

Your attitudes are important

- Are you INTERESTED in your topic?
  - If no, get a different one!
  - If yes, ACT LIKE IT
- If YOU are not excited …
  - Can not expect OTHER people to be!

Avoid dead man talking

- Are you hiding behind the podium?
- Are your hands/face motionless?
- Are you staring …
  - at your laptop
  - At the screen
  - At the ceiling
- IF SO … you are probably BORING

Is your back to the audience?


9. Do not read directly from your notes.
Keep eye contact with your audience.

Right here. See ?

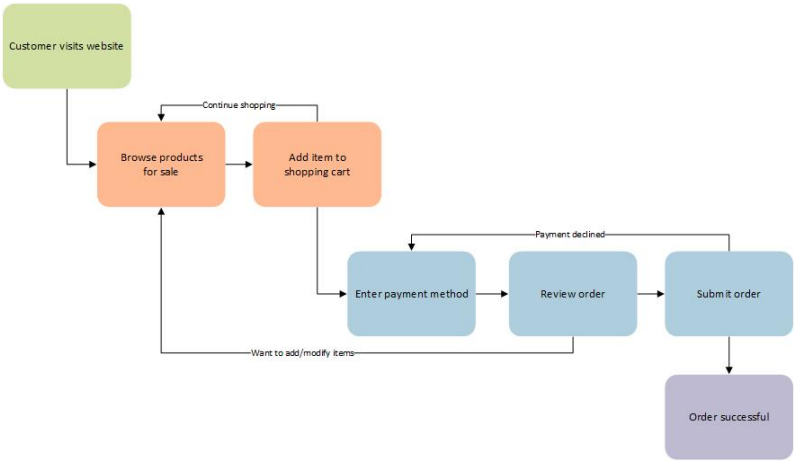
- Do not point at your laptop screen
- They cannot see it

Practice is important

- Practice makes perfect (at least three times before your talk)
- Do not read your slides like a script
- Most people lose 20 IQ points in front of an audience

Picture the idea

- In general, do not have only text on most of your slides
- Try to draw diagrams wherever applicable
- (Well-drawn) pictures easier to understand

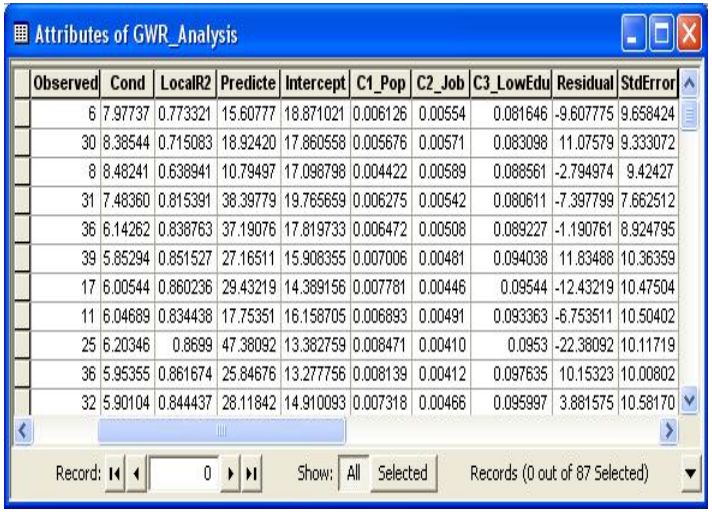


Anticipatory lecturing

- Do not be a tease
- Let the audience think at their own pace
- It only provides benefit if there is a ”surprise” result.

Results explanation

- You have lots of cool results
  - No one can read this
  - No one can undstand this
- Graphs are your friend



Attributes of GWR_Analysis

Observed	Cond	LocalR2	Predicte	Intercept	C1_Pop	C2_Job	C3_LowEdu	Residual	StdError
6	7.97737	0.773321	15.60777	18.871021	0.006126	0.00554	0.081646	-9.607775	9.658424
30	8.38544	0.715083	18.92420	17.860558	0.005676	0.00571	0.083098	11.07579	9.333072
8	8.48241	0.638941	10.79497	17.098798	0.004422	0.00589	0.088561	-2.794974	9.42427
31	7.48360	0.815391	38.39779	19.765659	0.006275	0.00542	0.080611	-7.397799	7.662512
36	6.14262	0.838763	37.19076	17.819733	0.006472	0.00508	0.089227	-1.190761	8.924795
39	5.85294	0.851527	27.16511	15.908355	0.007006	0.00481	0.094038	11.83488	10.36359
17	6.00544	0.860236	29.43219	14.389156	0.007781	0.00446	0.09544	-12.43219	10.47504
11	6.04689	0.834438	17.75351	16.158705	0.006893	0.00491	0.093363	-6.753511	10.50402
25	6.20346	0.8699	47.38092	13.382759	0.008471	0.00410	0.0953	-22.38092	10.11719
36	5.95355	0.861674	25.84676	13.277756	0.008139	0.00412	0.097635	10.15323	10.00802
32	5.90104	0.844437	28.11842	14.910093	0.007318	0.00466	0.095997	3.881575	10.58170

Record: 0 Show: All Selected Records (0 out of 87 Selected)

Keep it simple

- Do you really need all those equations?
  - This is very instance-dependent
  - Depends on what you are discussing
  - Depends on your audience
- Sometimes you may need them
  - Explain the variables

    and what they mean
  - Given a ”plain-text” description of it

$$\nabla \cdot \mathbf{A} = \frac{\partial A_x}{\partial x} + \frac{\partial A_y}{\partial y} + \frac{\partial A_z}{\partial z}$$

$$= (\text{rate of change of } \mathbf{A} \text{ in x-direction}) + (\text{rate of change of } \mathbf{A} \text{ in y-direction}) + (\text{rate of change of } \mathbf{A} \text{ in z-direction})$$

Summay and conclusion

- Remember to summarize work and results
- Giving ”selling” points here
  - 30X performance increase with only 10% area penalty

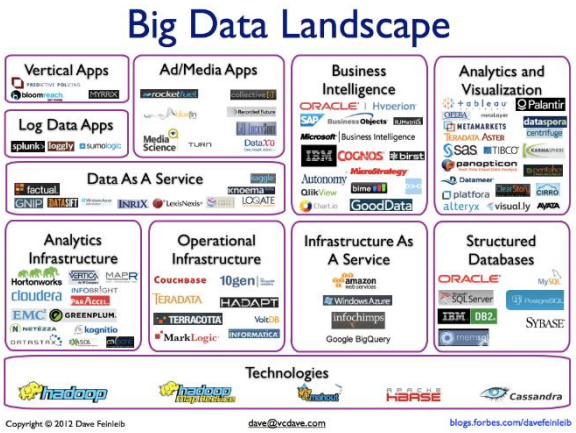
Before your presentation

- Please discuss with me about your presentation paper at least one week in advance of your presentation

- Please send the slides to the opponent and me before your presentation

Bad presentations

Wish your presentation to be a good presentation



New trends of big data management in 2016

Seminar on big data management

Lecturer: Jiaheng Lu

Spring 2016

Trend 1: Spark grows fast

Spark “on the radar”

- 2008 - Yahoo! Hadoop team collaboration with Berkeley Amp/Rad lab begins
- 2009 - Spark example built
- 2011 - “Spark is 2 years ahead of anything at Google”
  - Conviva seeing good results w Spark
- 2012 - Yahoo! working with Spark / Shark
- Today - Many success stories
  - Early commercial support

Spark updates Hadoop

- Hardware had advanced since Hadoop started:
  - Very large RAMs, Faster networks (10Gb+)
  - Bandwidth to disk not keeping up
- MapReduce awkward for key big data workloads:
  - Low latency dispatch (E.G. quick queries)
  - Iterative algorithms (E.G. ML, Graph…)
  - Streaming data ingest

Spark, “lingua franca?”

- Support for many development techniques
  - SQL, Streaming, Graph & in memory, MapReduce
  - Write “UDFs” once and use in all contexts
- Small, simple & elegant API
  - Easy to learn and use; expressive & extensible
  - Retains advantages of MapReduce (fault tolerance…)

Spark often better

- Today you will hear many success stories from teams who have converted Hadoop based workloads to Spark and seen:
  - Huge speedups and Big cost savings
- But there do exist cases were Hadoop is superior…
  - Proven to work at the largest scales
  - Mature & widely commercially supported
  - Much larger ecosystem of solutions and tools

Spark complements Hadoop

- Spark leverages Hadoop ecosystem
  - HDFS, HCatalog, Data Input/OutputFormats
  - Huge investment in data collection & tooling

Spark the “lingua franca”

- Data scientists & Developers need an open standard for sharing their Algorithms & functions, an “R” for big data.

- Spark best current candidate:
  - Open Source - Apache Foundation
  - Expressive (MR, iteration, Graphs, SQL, streaming)
  - Easily extended & embedded (DSLs, Java, Python…)

Trend 2: most operational DBMSs will offer multiple data models, relational and NoSQL, in a single DBMS platform.

Operational databases

- Operational database management systems are used to manage dynamic data in real-time.

- Operational databases use NoSQL DBMS engines

and distributed database architecture that provides high availability and fault tolerance

Gartner Magic quadrant for operational database management systems

- By 2017, all leading operational DBMSs will offer multiple data models, relational and NoSQL, in a single DBMS platform.

Using SQL to query NoSQL and relational databases

- SQL: SELECT * FROM NoSQL WHERE category='NoSQL‘ (Support by CouchBase)

- JSON results:


```
{
  "name": "Couchbase Server",
  "version": "4.0",
  "category": "NoSQL",
  "features": [ "name": "N1QL", "capabilities": ["JOIN", "NEST", "UNNEST“ ] ]
}
```

Using SQL to query NoSQL and relational databases

- SQL: SELECT * FROM RDB WHERE category='RDB'

- Relational results:

Name	Version	category	Features_name	Features_capabilities
MySQL	4.0	RDB	SQL	JOIN, NEST, GROUP-BY

Using SQL to join NoSQL and relational databases

- SQL: SELECT * FROM RDB, NoSQL WHERE RDB.name= NoSQL.name

- Relational results:

Name	Version	category	name	capabilities
ORACLE	1.0	NoSQL	SQL	JOIN

JSON results:


```
{
  "name": “ORACLE",
  "version": “12c",
  "category": “RDB",
  "features": [ "name": “SQL",
"capabilities": ["JOIN" ] ]
}
```

Trend 3: Self-service data preparation tools are exploding

Self-service data preparation

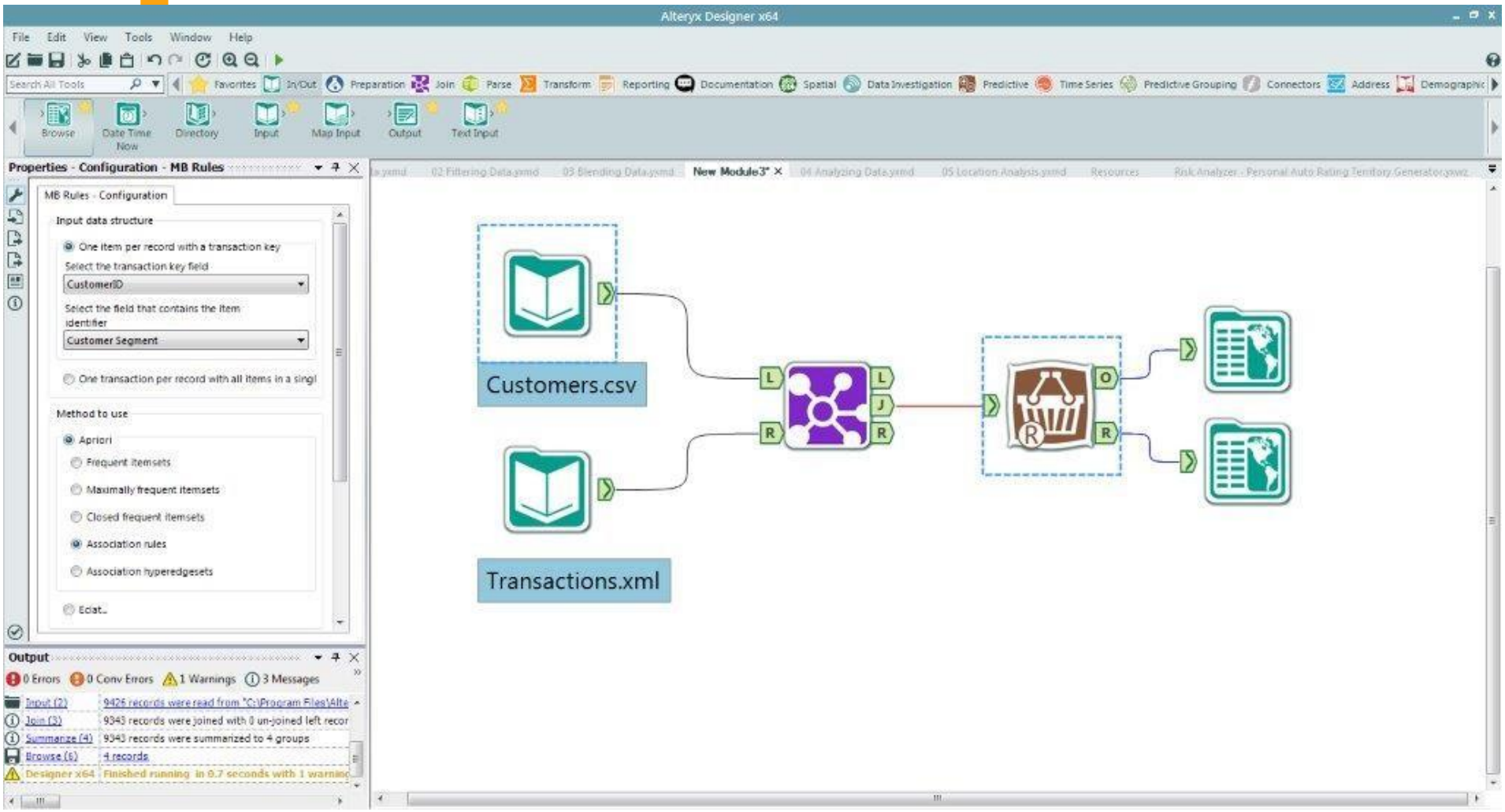
- Business users want to reduce the time and complexity of preparing for analysis big data

- Products: Alteryx, Trifacta, Paxata

Alteryx

- Alteryx is an American computer software company based out of Irvine, California.
- The company's products are used for data blending and advanced data analytics.
- Alteryx has a stated goal of enabling advanced analytics to be performed by non-specialists

Alteryx workflow



Trifacta

- Trifacta is a data transformation platform provider that enables business analysts, data scientists and IT programmers to transform data into a usable form for analysis.

TRIFACTA
PEOPLE DATA COMPUTATION

Paxata

- Paxata develops self-service data preparation software
- Paxata's software is used to combine data from different sources, then check it for data quality issues, such as duplicates and outliers.
- Algorithms and machine learning automate certain aspects of data

Summary

- Three trends for big data management in 2016:

1. Spark grows fast and more popular
2. One DBMS will host NoSQL and SQL
3. Popularity of self-service data preparation tools will explode.