May 8, 2014

IBM Cognos Interactive Visualization

Stefan Constantinides
sconstan@us.ibm.com

Agenda

- Overview of the Themes for Business Intelligence 10.2.1.x

- Interactive Visualization - What are we solving?

- Values of Analytics Zone and the Marketplace

- IBM Cognos Visualization Customizer

- Demo

- RAVE - Engine Behind the Scenes

- Q&A

IBM Cognos Business Intelligence V10.2.1.1

IBM® Cognos® Business Intelligence V10.2.1.1, central to IBM® Cognos® Enterprise, advances capabilities to provide interactive visualization, mobile, performance and support for big data.

Interactive Visualization	Mobile	Performance	Big Data
Amplify mobile business intelligence with new and innovative visualizations allowing users to quickly pinpoint trends in data.	Leverage native and optimized web applications for Android and iOS to support a broader range of smart phones and tablets.	Get insights quicker than ever before through performance improvements gained from more efficient memory usage, reduced memory footprint and improved use of compression.	Gain a more complete view of the business and act quickly off insights with expanded support for big data sources including Hadoop, analytic data stores and real-time streaming data.

Extensible Visualization provides a growing range of visualization options

The problem:

- Business analytics platforms have traditionally provided a fixed set of built-in charts
- Individual customers or industries demand customized or new visualizations
- Adding new visualizations into the pre-packaged library takes 6 months to 1.5 years
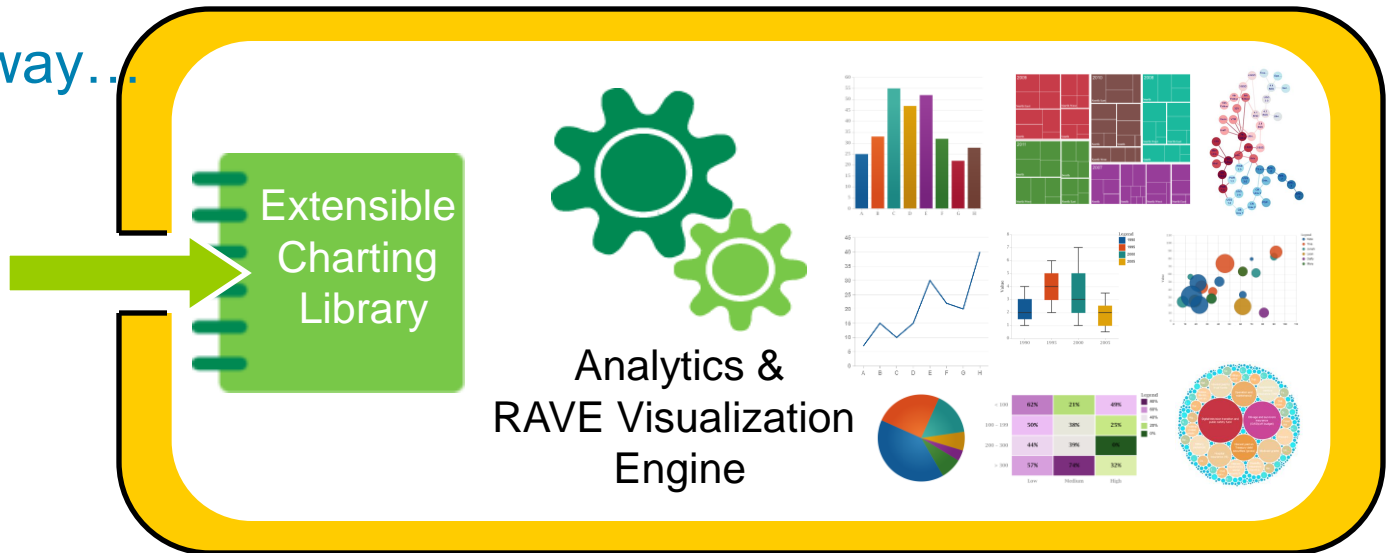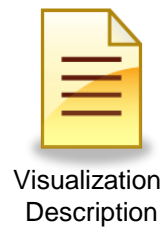
The Solution:

- Enable "pluggable" visualizations that can be added between product releases
- Provide an expanded and growing set of visualizations that can be selected and used by customers
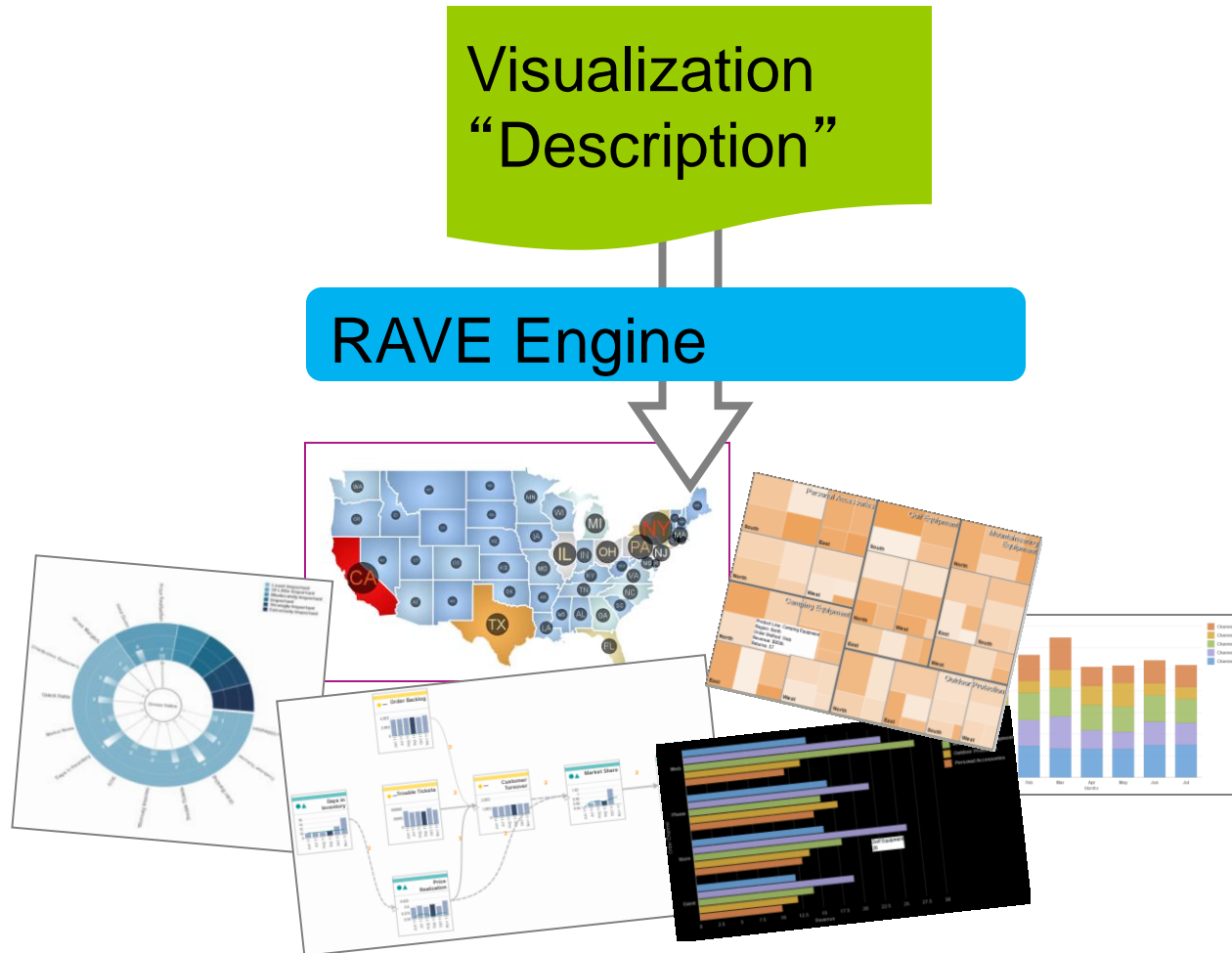
IBM

The Basic Concept

The old way…

Fixed Charting Library

Analytics & Visualization Engine

The new way…

Visualization Description

Extensible Charting Library

Analytics & RAVE Visualization Engine

IBM Rapidly Adaptive Visualization Engine
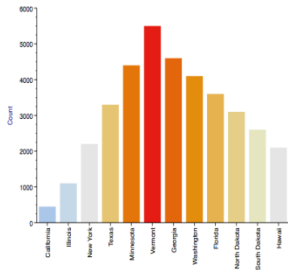
Visualization
"Description"

RAVE Engine

IBM Cognos BI: Analytics Gets Personal
Visualize everything

Engage

Compelling Experience

Focus on end user interactivity and LOB consumption appeal

Everywhere

Platform Independent

Interact with your visualizations anywhere, anytime

Extensible

Integrate Novel Viz

Incorporate new chart types to solve emerging business problems

Easy

Guided Creation

Automatically recommend the best visualization for your data

Why Visualize?

Simple Example

I want to understand…

…achievement level distribution of my student population across subject areas

…how the distribution has changed over time

…how dramatic the change has been

…how my subject areas compare

Student Achievement Trends

% Students		2006	2007	2008	2009
Communication Arts	Below Basic	12%	10%	13%	5%
	Basic	49%	54%	45%	19%
	Proficient	29%	29%	31%	57%
	Advanced	10%	7%	11%	19%
Mathematics	Below Basic	28%	33%	22%	15%
	Basic	38%	36%	31%	38%
	Proficient	27%	24%	39%	36%
	Advanced	7%	7%	8%	10%

How long does it take to acquire the desired understanding from this (very small) tabular data?

Let's try looking at it visually…
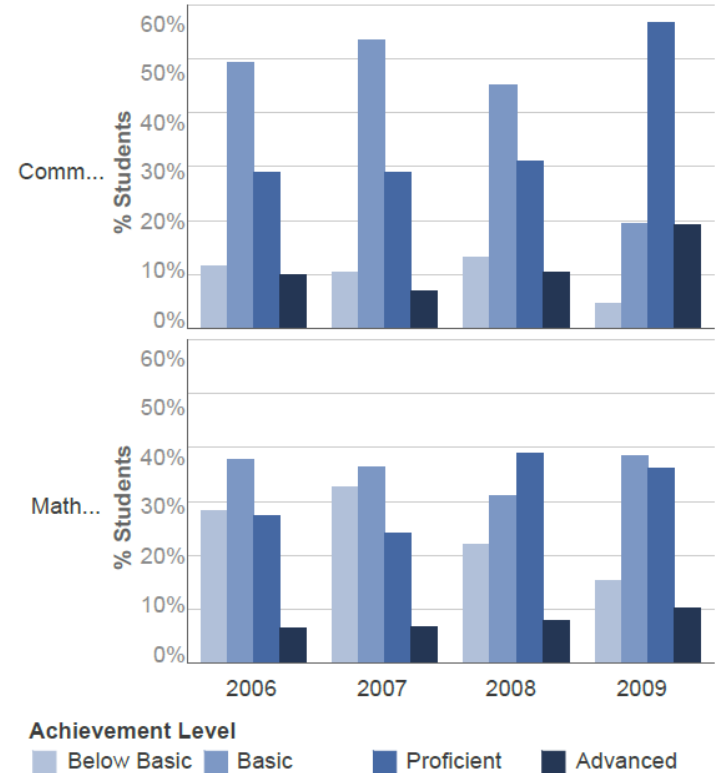
Simple Example *(cont.)*

I want to understand…

…achievement level distribution of my student population across subject areas
…how the distribution has changed over time
…how dramatic the change has been
…how my subject areas compare

Student Achievement Trends

% Students		2006	2007	2008	2009
Communication Arts	Below Basic	12%	10%	13%	5%
	Basic	49%	54%	45%	19%
	Proficient	29%	29%	31%	57%
	Advanced	10%	7%	11%	19%
Mathematics	Below Basic	28%	33%	22%	15%
	Basic	38%	36%	31%	38%
	Proficient	27%	24%	39%	36%
	Advanced	7%	7%	8%	10%

Student Achievement Trends
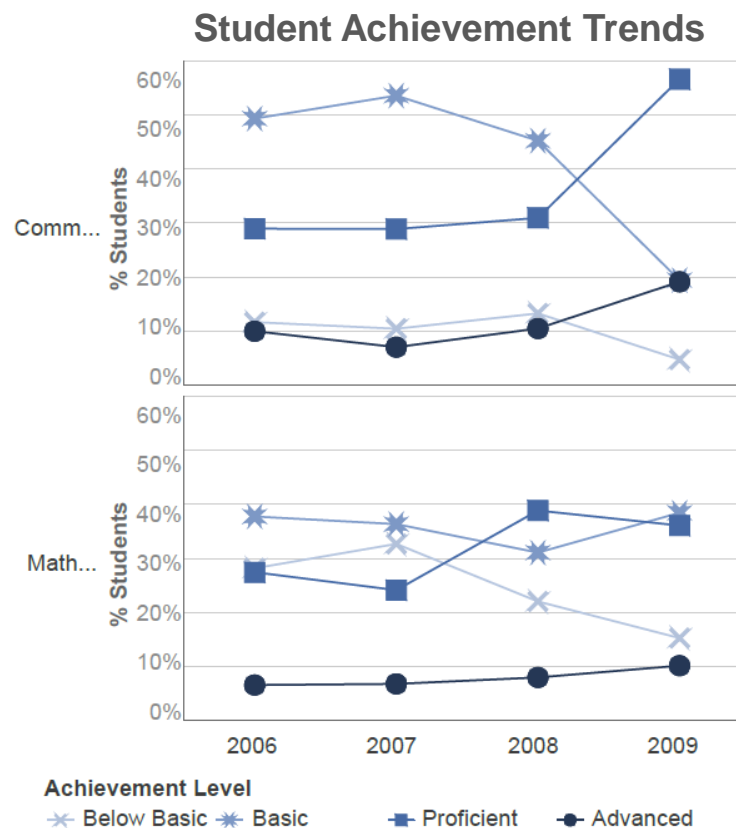
Simple Example *(cont.)*

I also want to understand…

…trend of each achievement level
…how the trends compare across subject areas

Student Achievement Trends

% Students		2006	2007	2008	2009
Communication Arts	Below Basic	12%	10%	13%	5%
	Basic	49%	54%	45%	19%
	Proficient	29%	29%	31%	57%
	Advanced	10%	7%	11%	19%
Mathematics	Below Basic	28%	33%	22%	15%
	Basic	38%	36%	31%	38%
	Proficient	27%	24%	39%	36%
	Advanced	7%	7%	8%	10%

Student Achievement Trends

Achievement Level
Below Basic ✳ Basic ■ Proficient ● Advanced

Simple Example *(cont.)*

In addition, I might want to understand…

…how achievement level distribution compares across gender, ethnicity, grade
…how achievement level distribution compares across schools

Student Achievement Trends – Jefferson H.S.

% Students		2006	2007	2008	2009
Communication Arts	Below Basic	7%	6%	11%	4%
	Basic	47%	42%	52%	20%
	Proficient	32%	40%	26%	53%
	Advanced	14%	12%	11%	23%
Mathematics	Below Basic	22%	19%	14%	
	Basic	30%	40%	29%	
	Proficient	36%	32%	38%	
	Advanced	12%	8%	19%	

Student Achievement Trends – Monroe H.S.

% Students		2006	2007	2008	2009
Communication Arts	Below Basic	8%	8%	8%	8%
	Basic	48%	48%	44%	40%
	Proficient	33%	30%	36%	41%
	Advanced	11%	13%	12%	12%
Mathematics	Below Basic	14%	14%	13%	9%
		37%	34%	35%	34%
	...ficient	35%	35%	40%	39%
	...vanced	14%	17%	12%	18%

Student Achievement Trends – Madison H.S.

% Students		2006	2007	2008	2009
Communication Arts	Below Basic	12%	10%	13%	5%
	Basic	49%	54%	45%	19%
	Proficient	29%	29%	31%	57%
	Advanced	10%	7%	11%	19%
Mathematics	Below Basic	28%	33%	22%	15%
	Basic	38%	36%	31%	38%
	Proficient	27%	24%	39%	36%
	Advanced	7%	7%	8%	10%

Evaluating multiple schools becomes progressively more challenging with tabular data

The value of data visualizations

- Incorporate new and innovative visualizations in general reporting and Cognos Active Reports
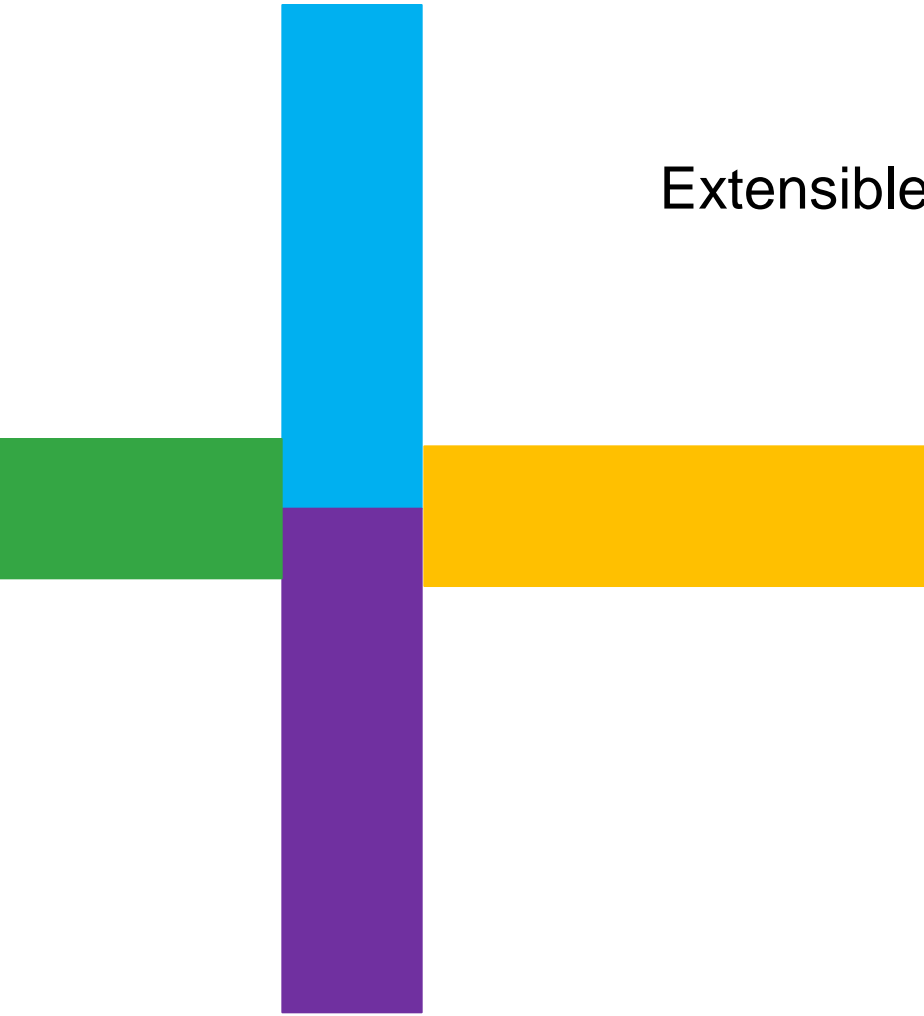
  - Authoring within Report Studio and Cognos Workspace Advanced.
  - Consumption and assembly in Cognos Workspace
  - Improved usability with the Visualization library

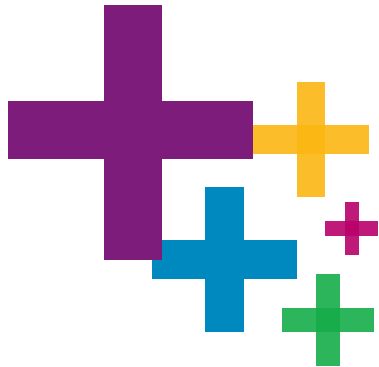- Enhance the user experience through the delivery of interactive and animated charts

- Integrate custom visualizations

New in 10.2.1.1
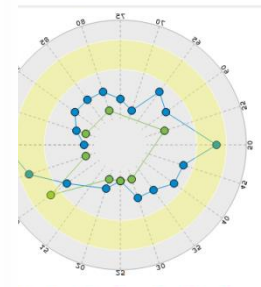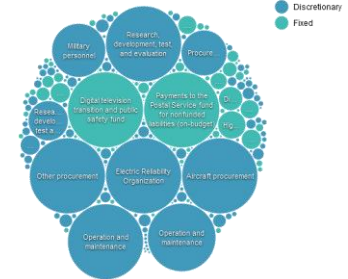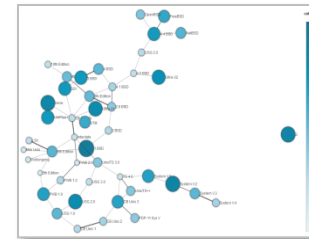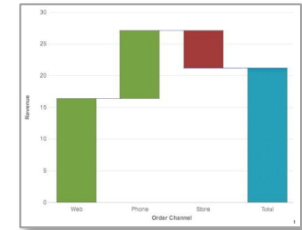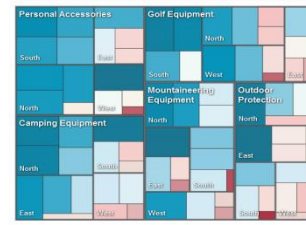
Extensible Visualization

Visual Analytics: Visualizing Data.
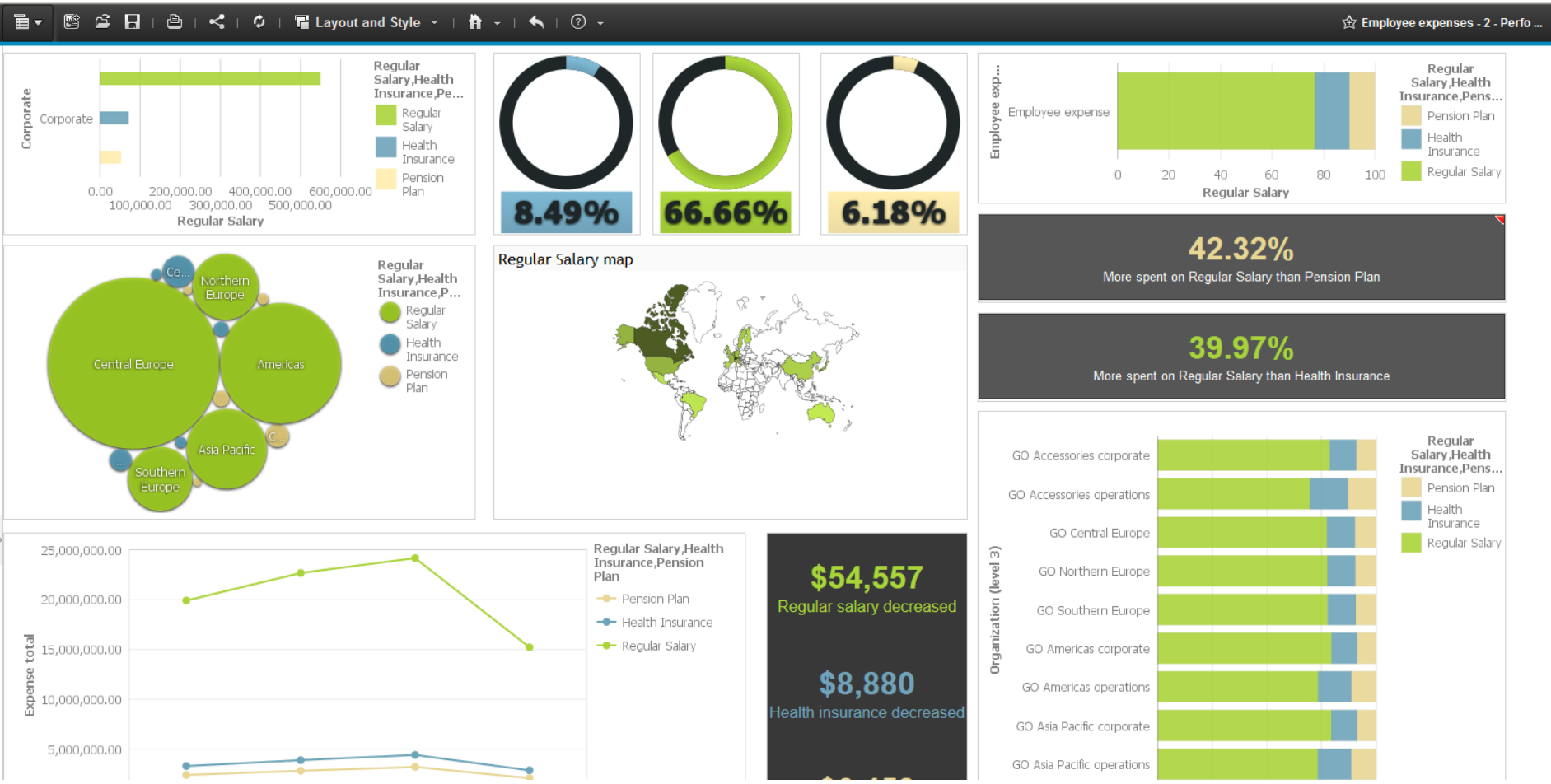Discovering answers.

Extensible Visualization
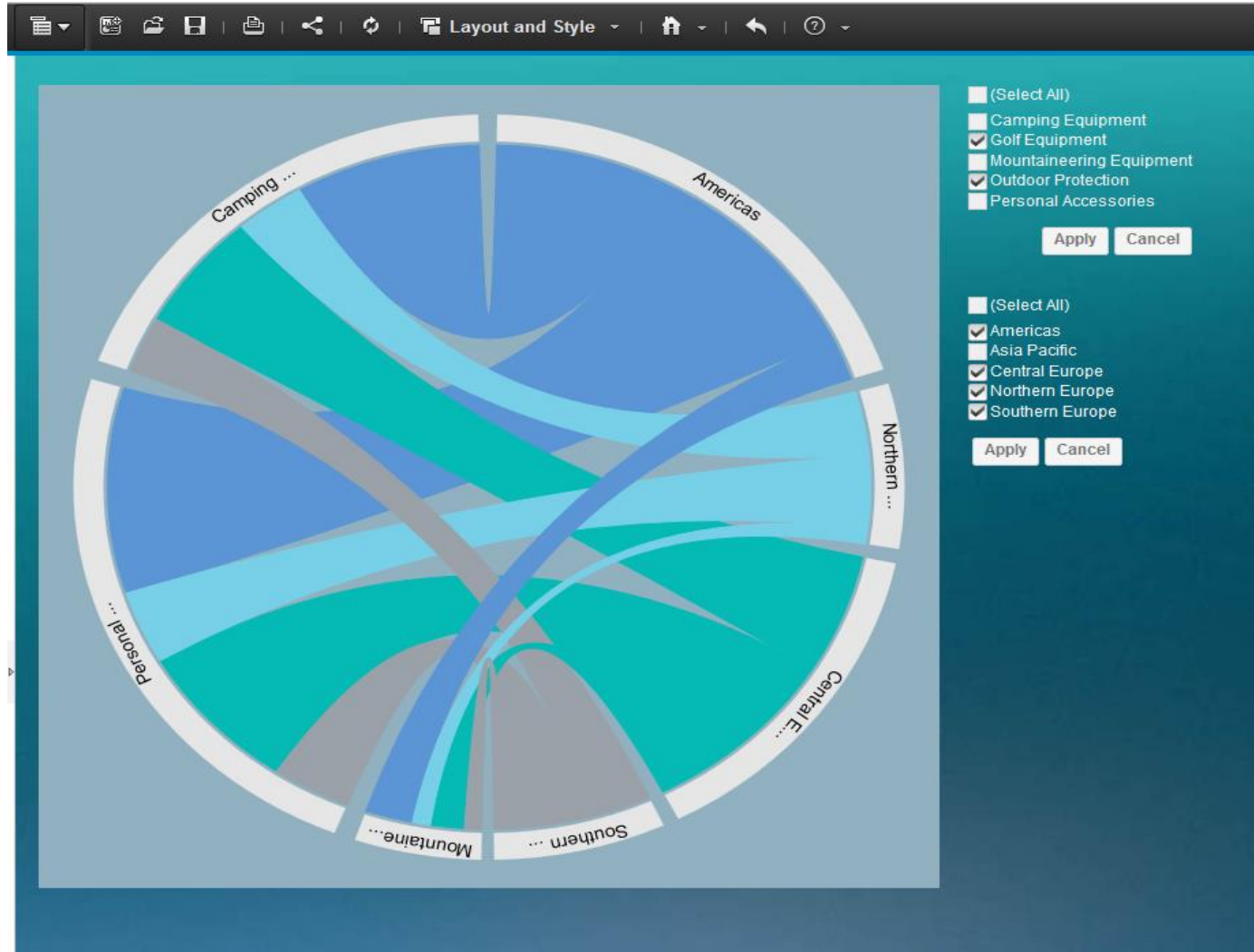lets you download
just the right visualization
when you need it

Interactive, Engaging Visualizations
that enable rapid
understanding

IBM RAVE powering visualizations today

Cognos Workspace Examples With New Interactive Visualization

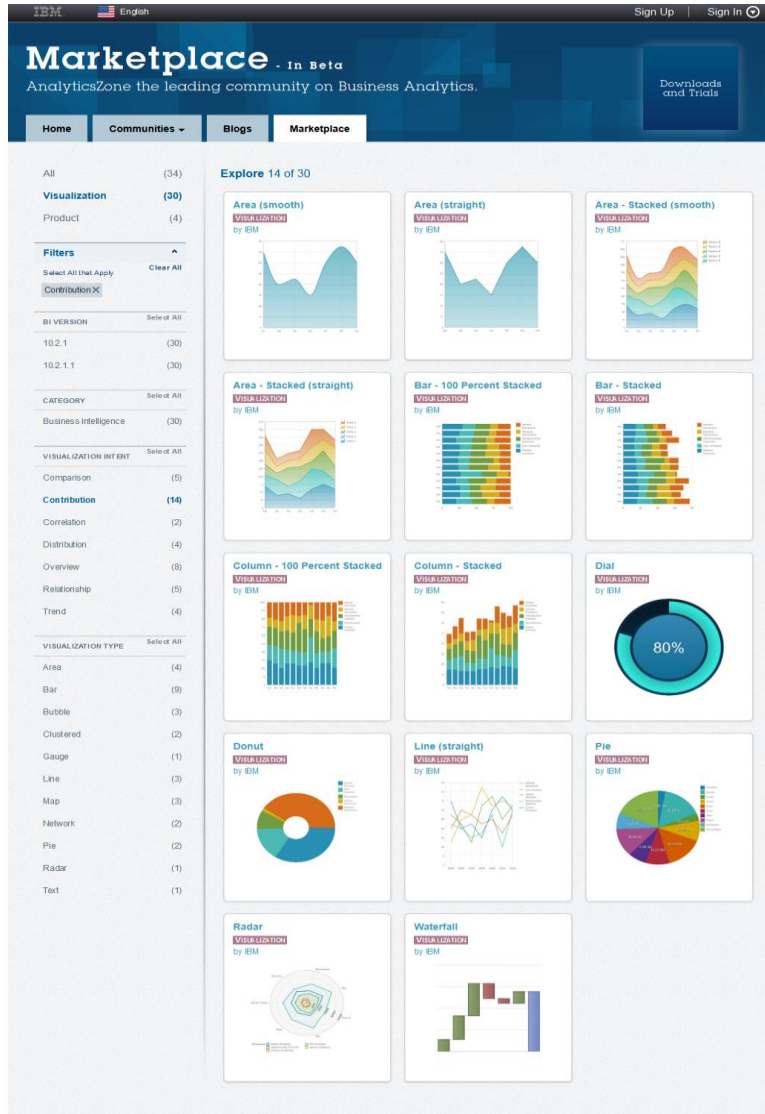# Cognos Workspace Examples With New Interactive Visualization

Cognos Workspace Examples With New Interactive Visualization on **Mobile**

Values of Analytics Zone and the Marketplace

New visualizations are a simple download away

NEW! Visualization Marketplace

Browse and download from over 30 visualizations from the extensible visualization community.

- Scatter
- Gantt
- Area
- Radar
- Boxplot
- Dial
- Treemap/Heatmap
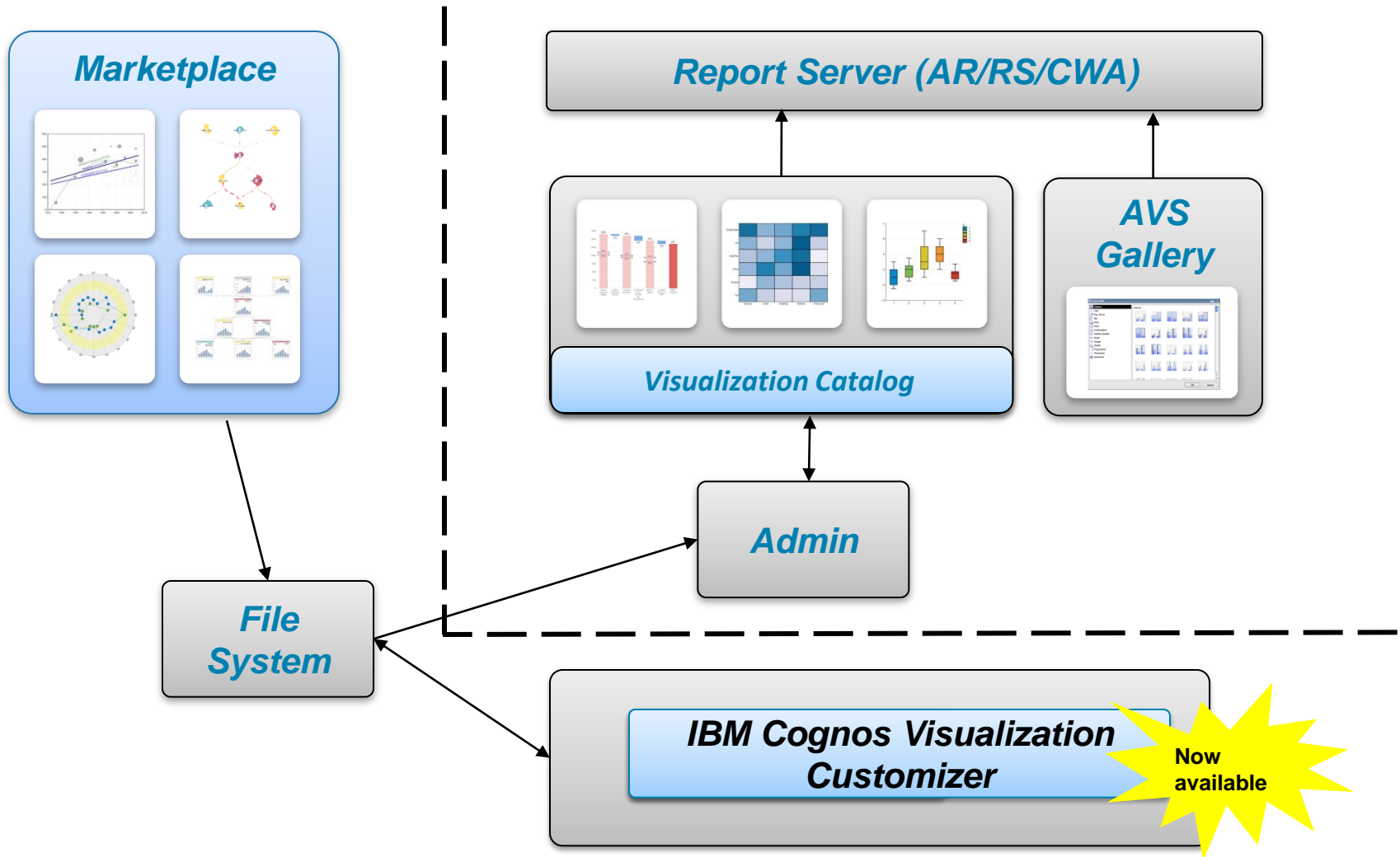- Plus a continually growing set of visualizations

analyticszone.com/visualization

IBM

DEMO

Cognos General Reporting with Interactive Visualization

https://www.youtube.com/watch?v=ULD6B7GM93o&list=PL0hKkrT8yJOnhDxq3ADNZNMqumpKvoREa&index=32

IBM Cognos Visualization Customizer

IBM Cognos Visualization Customizer

- **Provide the flexibility to change popular properties for visualizations such as colors, fonts, labels etc.**

- **How to Videos available directly in the product and on AnalyticZone.com**

- **To get access:** ibm.biz/viscustomizer

DEMO

Customizer

Rapid Adaptive Visualization Engine (RAVE)

The New IBM visualization Engine

Not a prescribed "Library of Charts"

- A highly adaptive framework that allows each integrator to quickly create and customize their **own library** of charts and interactive visualizations

- Based on the **patented** SPSS "Grammar of Graphics" approach

    - Use a simple language to **describe a visualization**

    - Language has the **flexibility** to describe **known** chart types

    - Language has the **extensibility** to describe **new** advanced visualizations

VizJSON Visualization "Description"

Common Visualization Framework
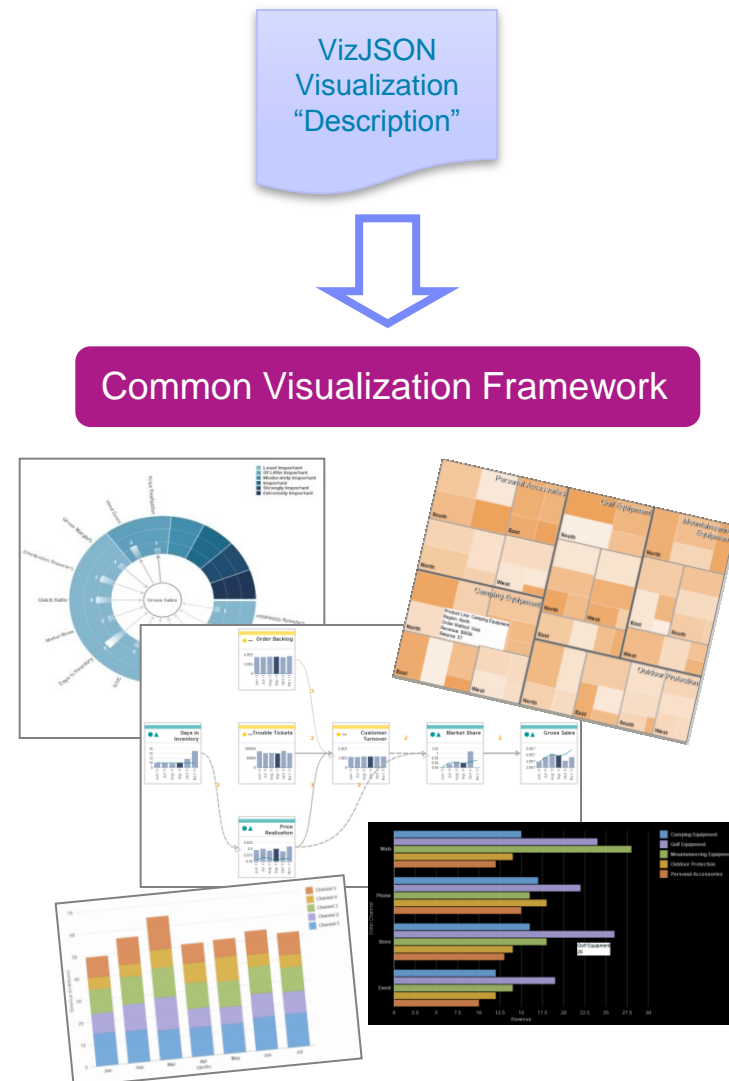
Use the flexibility of RAVE to create almost any chart

Old Way – Charts are "Types"

- Fixed Set of "supported charts"
  - If it isn't in the list, you can't have it

- Expensive and slow to innovate
  - Each new chart is a new development effort

- "Ad hoc" features tightly coupled to type
  - E.g. "Animation only implemented for Hans Rosling-style bubble charts, not for all charts"
 - Adding a new feature to 20 charts is a large effort

Kills creativity

Our Way – Grammar of Graphics

- A language-based specification of a chart

- In terms of features, not "types", e.g.

- "**bar chart**" = basic 2D coordinates, categorical x numeric displayed with intervals dropped from locations

- "**line chart**" = basic 2D coordinates, any x numeric displayed with lines connecting locations

- "**histogram**" = basic 2D coordinates, numeric x statistic *binned counts*, displayed with intervals dropped from locations

- Orthogonal set of features describes **all** common charts, **virtually all** uncommon charts, and **most** cutting-edge research charts
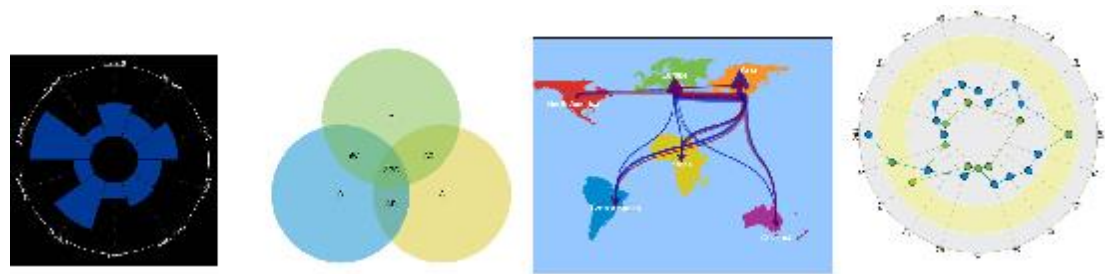
Interactive Charting

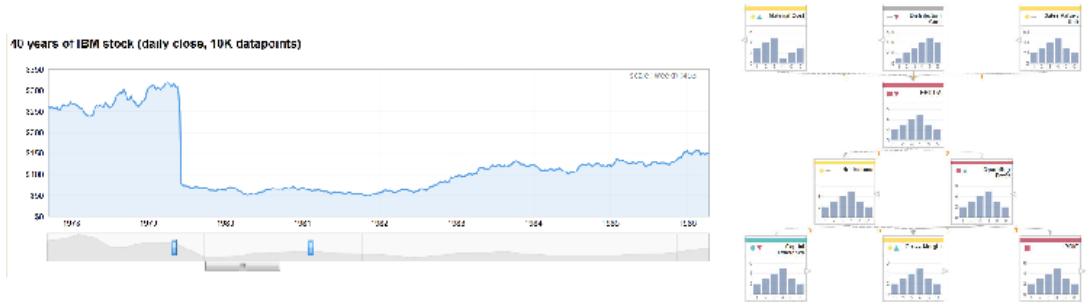Dynamic, interactive and flexible visualizations across mobile, desktop and we

Common, traditional
business charts
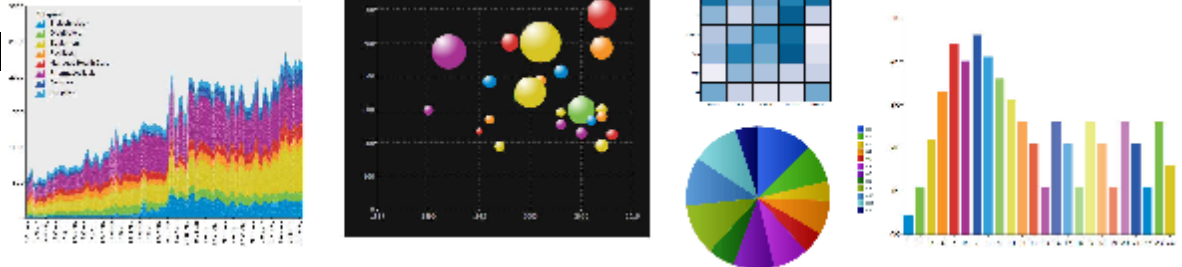
More advanced/
non-traditional
business charts

Visualizations that
would typically
require a dedicated
graphics
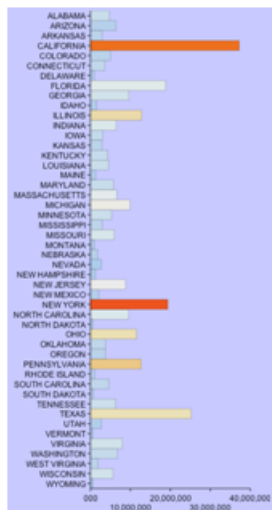programmer

Flexibility: Simple description update to change the visualization

Before:

```
{
    "type": "interval",
    "position": [
        {"field": {"$ref": "pop2010"}},
        {"field": {"$ref": "name"}}
    ],
    "color": [ {"field": {"$ref": "pop1960"}} ],
    "style": {"stroke": {"width": 0.25}}
}
```
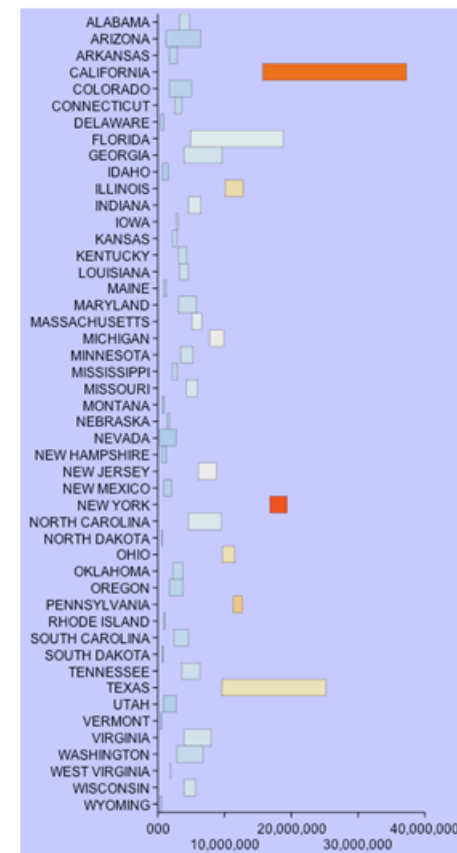
Before

Add a position field to make it a range chart with start at 1960, end at 2010

After:

```
{
    "type": "interval",
    "position": [
        {"field": {"$ref": "pop1960"}},
        {"field": {"$ref": "pop2010"}},
        {"field": {"$ref": "name"}}
    ],
    "color": [ {"field": {"$ref": "pop1960"}} ],
    "style": {"stroke": {"width": 0.25}}
}
```
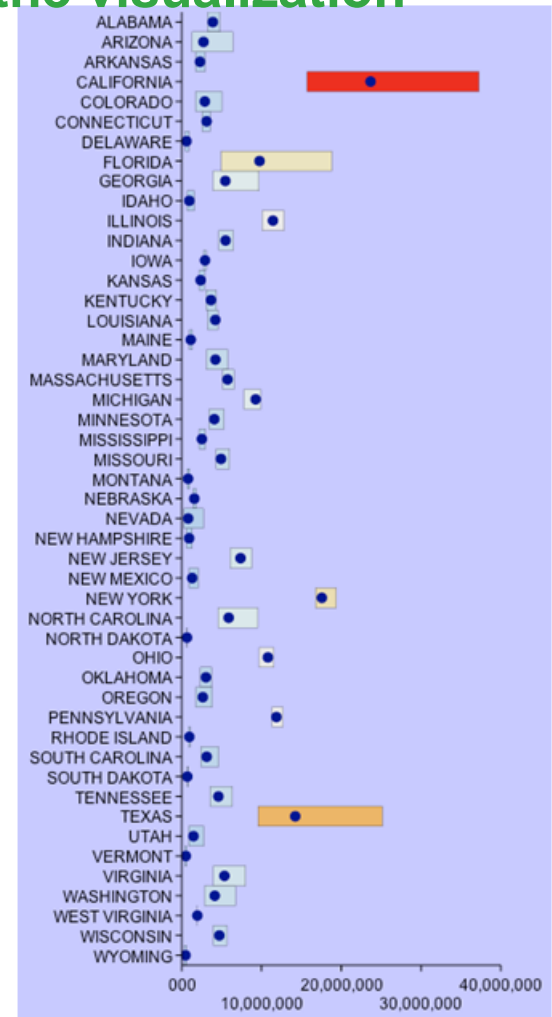
After

Flexibility: Simple description update to change the visualization
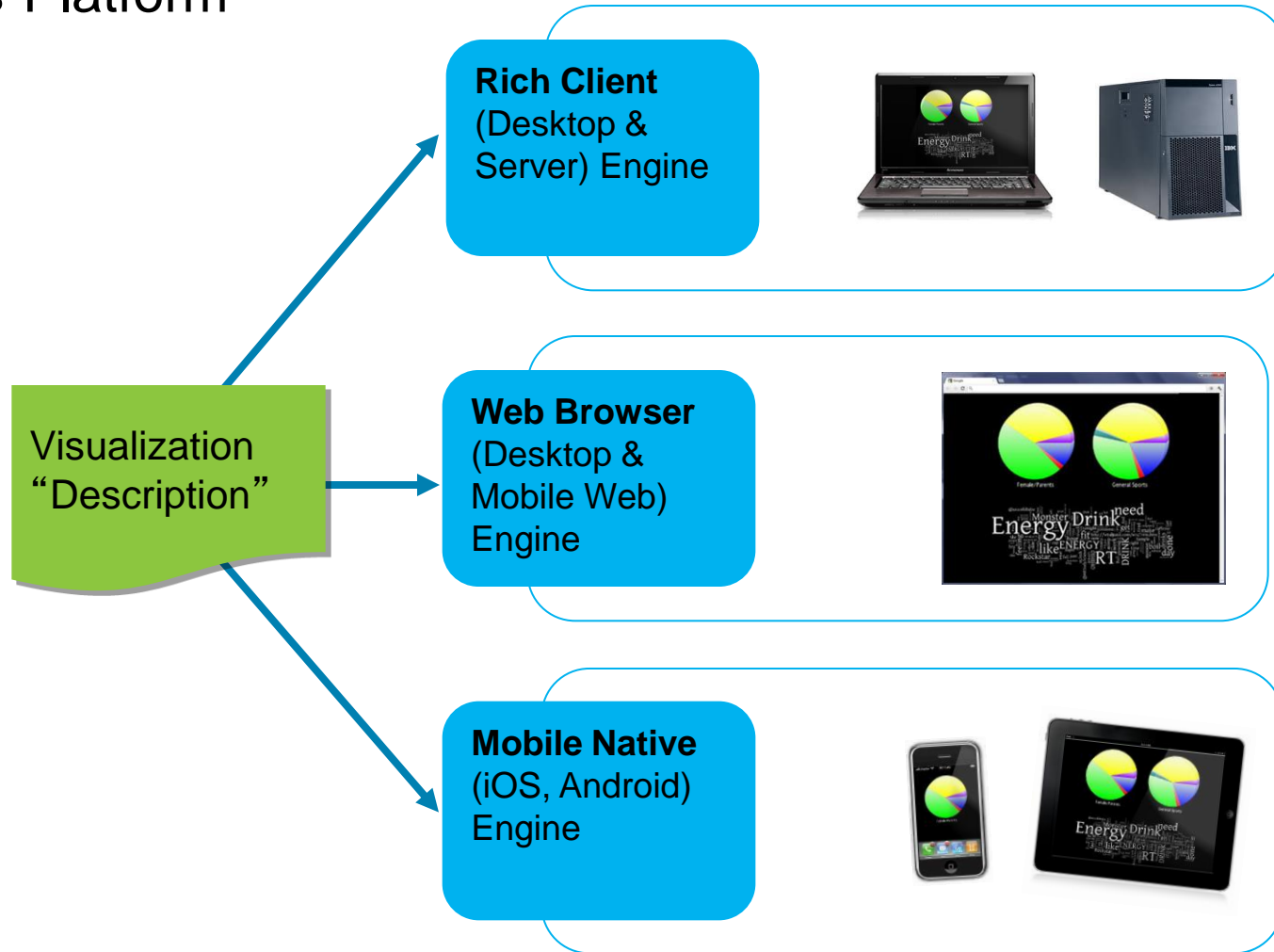
Add a point element for 1980 populations

After:
```
{
  "type": "interval",
  "position": [
    {"field": {"$ref": "pop1960"}},
    {"field": {"$ref": "pop2010"}},
    {"field": {"$ref": "name"}}
  ],
  "color": [ {"field": {"$ref": "pop1960"}} ],
  "style": {"stroke": {"width": 0.25}}
},
```

```
{
  "type": "point",
  "position": [
    {"field": {"$ref": "pop1980"}},
    {"field": {"$ref": "name"}}
  ],
  "style": {"fill": "navy", "size": 8}
}
```

Cross-Platform

Rich Client
(Desktop &
Server) Engine

Visualization
"Description"

Web Browser
(Desktop &
Mobile Web)
Engine

Mobile Native
(iOS, Android)
Engine

A single spec provides the same visualization in
Desktop, Web, and Mobile

© 2013 IBM Corporation