



11-12 December 2013, Ankara, Turkey

Statistical Database Design and Visualization Tools Development



Statistical Database Experience by SESRIC

- **SESRIC has a good experience in statistical database application and development of visualization tools.**
 - **BASEIND (BASic Social and Economic INDicators)**
 - **OIC Member States in Figures**
 - **Statistical Application Development**
 - **SESRIC Motion Chart (SMC)**
 - ...



Statistical Database Experience by SESRIC (BASEIND)

- SESRIC has built a relational database to store the information collected from the national and international statistical sources.

database » sesrtc » indicators

#	Name	Type	Collation	Attributes	Null	Default
1	<u>IND_CODE</u>	int(10)		UNSIGNED	No	None
2	<u>CAT_CODE</u>	int(10)		UNSIGNED	No	None
3	<u>UNIT_CODE</u>	int(10)		UNSIGNED	No	None
4	<u>IND_NAME_ENG</u>	char(255)	utf8_general_ci		No	None
5	<u>IND_NAME_FR</u>	char(255)	utf8_general_ci		Yes	NULL
6	<u>IND_NAME_ARB</u>	char(255)	utf8_general_ci		Yes	NULL
7	<u>IND_ENG_EXP</u>	longtext	utf8_general_ci		Yes	NULL
8	<u>IND_FR_EXP</u>	longtext	utf8_general_ci		Yes	NULL
9	<u>IND_ARB_EXP</u>	longtext	utf8_general_ci		Yes	NULL

Check All / Uncheck All With selected: Browse Change

database » sesrtc » units

#	Name	Type	Collation	Attributes	Null	Default
1	<u>UNIT_CODE</u>	int(10)		UNSIGNED	No	None
2	<u>UNIT_NAME_ENG</u>	varchar(100)	utf8_general_ci		No	None
3	<u>UNIT_NAME_FR</u>	varchar(100)	utf8_general_ci		Yes	NULL
4	<u>UNIT_NAME_ARB</u>	varchar(100)	utf8_general_ci		Yes	NULL

Check All / Uncheck All With selected: Browse Change

Print view Relation view Propose table structure

Add 1 column(s) At End of Table At Beginning of Table After

database » sesrtc » data

#	Name	Type	Collation	Attributes	Null
1	<u>C_CODE</u>	int(10)		UNSIGNED	No
2	<u>U_CODE</u>	int(10)		UNSIGNED	No
3	<u>D_DATE</u>	date			No
4	<u>IND_CODE</u>	int(10)		UNSIGNED	No
5	<u>D_YEAR</u>	int(10)		UNSIGNED	No
6	<u>FREQ_CODE</u>	int(10)		UNSIGNED	No
7	<u>FREQ_CODE_SUB_VALUE</u>	int(10)		UNSIGNED	No
8	<u>D_VALUE</u>	decimal(35,2)			No

Check All / Uncheck All With selected: Browse Change



Statistical Database Experience by SESRIC (BASEIND)

- **18 categories**
- **266 socio-economic variables**
- **57 OIC member countries**



OIC Member States in Figures

- Presents you with facts and figures from the 57 Member States. After clicking either on the flag or the name of the OIC Member State listed below, the profile of the selected country is displayed.
- Uses live data in BASEIND

<input type="checkbox"/> Select / Deselect All			
<input type="checkbox"/>  Afghanistan	<input type="checkbox"/>  Albania	<input type="checkbox"/>  Algeria	<input type="checkbox"/>  Azerbaijan
<input type="checkbox"/>  Bahrain	<input type="checkbox"/>  Bangladesh	<input type="checkbox"/>  Benin	<input type="checkbox"/>  Brunei
<input type="checkbox"/>  Burkina Faso	<input type="checkbox"/>  Cameroon	<input type="checkbox"/>  Chad	<input type="checkbox"/>  Comoros
<input type="checkbox"/>  Cote d'Ivoire	<input type="checkbox"/>  Djibouti	<input type="checkbox"/>  Egypt	<input type="checkbox"/>  Gabon
<input type="checkbox"/>  Gambia	<input type="checkbox"/>  Guinea	<input type="checkbox"/>  Guinea-Bissau	<input type="checkbox"/>  Guyana
<input type="checkbox"/>  Indonesia	<input type="checkbox"/>  Iran	<input type="checkbox"/>  Iraq	<input type="checkbox"/>  Jordan
<input type="checkbox"/>  Kazakhstan	<input type="checkbox"/>  Kuwait	<input type="checkbox"/>  Kyrgyzstan	<input type="checkbox"/>  Lebanon
<input type="checkbox"/>  Libya	<input type="checkbox"/>  Malaysia	<input type="checkbox"/>  Maldives	<input type="checkbox"/>  Mali
<input type="checkbox"/>  Mauritania	<input type="checkbox"/>  Morocco	<input type="checkbox"/>  Mozambique	<input type="checkbox"/>  Niger
<input type="checkbox"/>  Nigeria	<input type="checkbox"/>  Oman	<input type="checkbox"/>  Pakistan	<input type="checkbox"/>  Palestine
<input type="checkbox"/>  Qatar	<input type="checkbox"/>  Saudi Arabia	<input type="checkbox"/>  Senegal	<input type="checkbox"/>  Sierra Leone
<input type="checkbox"/>  Somalia	<input type="checkbox"/>  Sudan	<input type="checkbox"/>  Suriname	<input type="checkbox"/>  Syria
<input type="checkbox"/>  Tajikistan	<input type="checkbox"/>  Togo	<input type="checkbox"/>  Tunisia	<input type="checkbox"/>  Turkey
<input type="checkbox"/>  Turkmenistan	<input type="checkbox"/>  Uganda	<input type="checkbox"/>  United Arab Emirates	<input type="checkbox"/>  Uzbekistan
<input type="checkbox"/>  Yemen			



OIC Member States in Figures

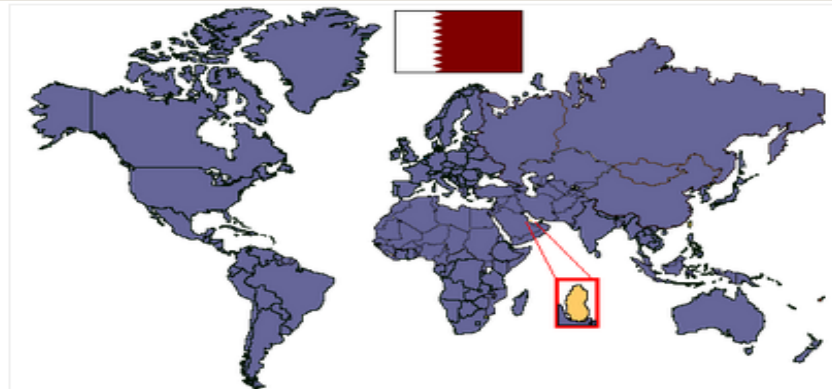
OIC Member States in Figures --> State of Qatar

[General Information](#) | [Location and Geography](#) | [Qatar in Figures](#) | [Special Links](#)



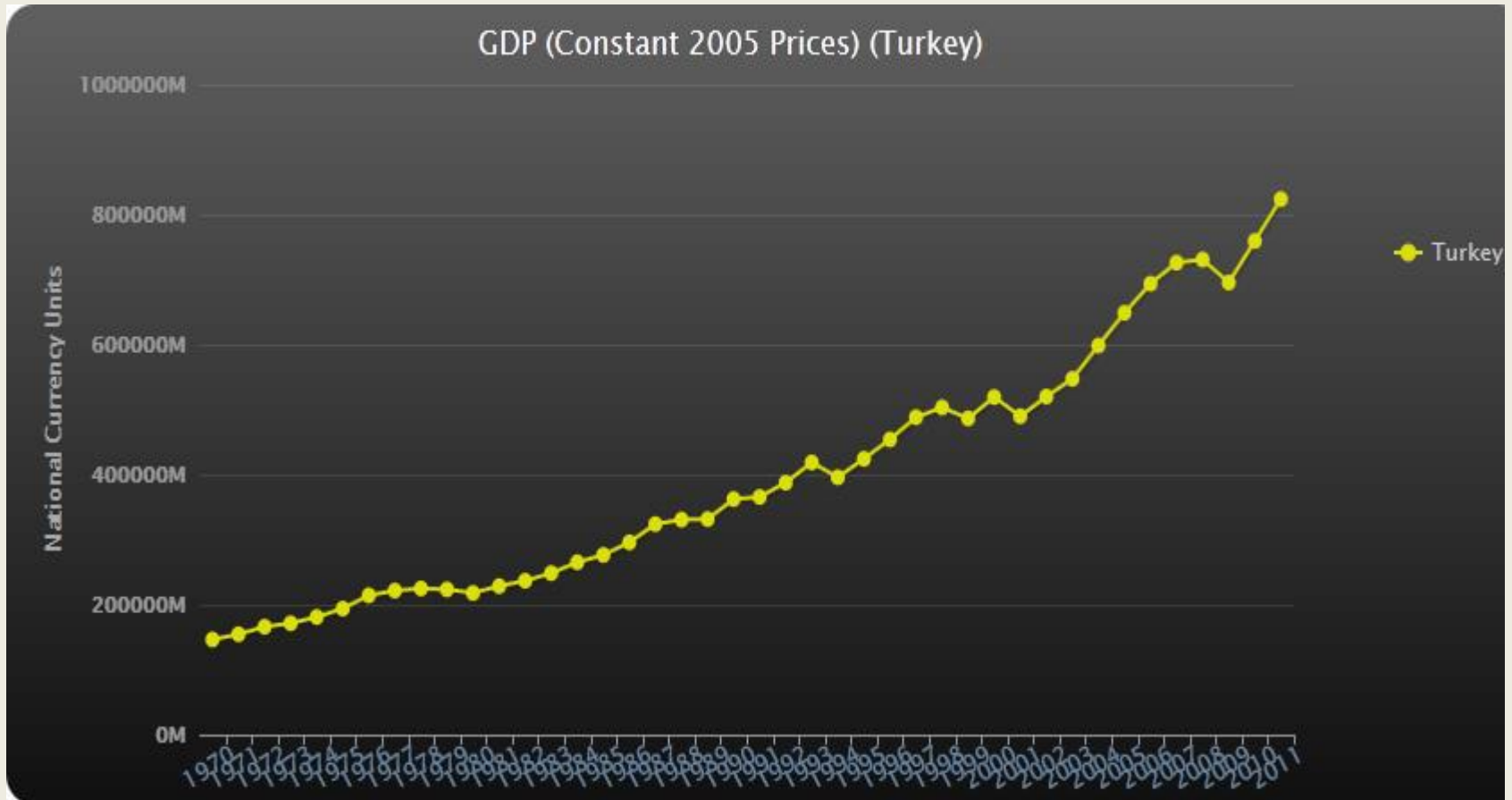
General Information

Total Land Area:	11,520 km ²
Land boundaries:	60 km
Coastline:	563 km
Capital:	Doha
Other Large Cities:	Ar-Rayyan, Al- Wakrah
Official Language:	Arabic
National Currency Unit:	Qatari Riyal (QAR)
National Day:	September 3





OIC Member States in Figures





Statistical Applications



This special software has been developed to extract the full list of BASEIND indicators in which an OIC Member Country is positioned at the very Top or Bottom.



This special software has been developed to rank the OIC Member Countries by a selected BASEIND indicator.



OIC Top Bottom Finder



Step 1/2: Select a Country

Turkey

Step 2/2: Select Ranking Range

Top
 Bottom
 1
 [Display the Ranking Results](#)

Display 1: The list of indicators for which the selected country was ranked in the "Top 1"

Category	Indicator Name
Agriculture	Number of Tractors
Agriculture	Production of Vegetables
Agriculture	Production of Vegetables per Person
Education	Gross Enrollment Rate in Tertiary Schools, Male
Education	Net Enrollment Rate in Primary Schools, Male
Imports	Imports of Goods and Services in USD
Imports	Merchandise Imports
Industry and Manufacturing	Production of Cement
International Finance	Balance of Payments: Net Trade in Services
International Finance	Debt Service Payments
International Finance	External Debt, Long Term
International Finance	External Debt, Short Term
International Finance	External Debt, Total
International Finance	Private Nonguaranteed Debt
Labour Force	GDP per person employed (constant 1990 PPP \$)
Money and Prices	Consumer Price Index (2000=100)
National Accounts	GDP (Constant 2005 Prices)
National Accounts	Gross Capital Formation (Constant 2005 Prices)
National Accounts	Household Consumption (Constant 2005 Prices)
National Accounts	Household Consumption (Current Prices)
National Accounts	Total Consumption (Constant 2005 Prices)
National Accounts	Total Consumption (Current Prices)
Tourism	Balance of Foreign Travel
Tourism	Number of Tourist Arrivals
Tourism	Tourism Receipts
Transportation and Communication	Air Transport, Passengers Carried
Transportation and Communication	Internet Bandwidth, International
Water	Dam Capacity, Total



OIC Ranker



Step 1: Select an Indicator

- Agriculture - Agricultural Area (Thousand hectares)**
- Agriculture - Agricultural Population (Thousands)
- Agriculture - Arable Land Area, % of Total Land Area (Percentages)
- Agriculture - Arable Land, Total (Thousand hectares)
- Agriculture - Fertilizer Use (Tonnes)
- Agriculture - Fish Catches (Tonnes)
- Agriculture - Number of Tractors (Units)
- Agriculture - Permanent Crops (Thousand hectares)
- Agriculture - Permanent Meadows and Pastures (Thousand hectares)
- Agriculture - Production of Cereal (Tonnes)

Display the Ranking Results

Display 1: The Ranking of OIC Member Countries (GDP, Per Capita (Current Prices))

Rank	Country	Value (US Dollars)	Year
1	Qatar	92682.23	2011
2	Kuwait	57101.89	2011
3	United Arab Emirates	42921.45	2011
4	Brunei	40300.83	2011
5	Oman	25536.20	2011
6	Saudi Arabia	21261.82	2011
7	Bahrain	19512.34	2011
8	Gabon	15737.65	2011
9	Kazakhstan	11258.72	2011
10	Turkey	10524.00	2011
11	Malaysia	9977.23	2011
12	Lebanon	9165.28	2011
13	Suriname	8708.46	2011
14	Iran	6976.53	2011
15	Azerbaijan	6915.76	2011



Visualization Tools

SESRIC Motion Chart (SMC) Module



SESRIC Motion Chart Module

- **SESRIC Motion Charts (SMC) Module is an interactive and dynamic motion chart generator, producing data visualizations from the indicator sets available in the BASEIND Database.**
- **The SMC Module allows the users to dynamically explore the trends of several indicators over time**
- **The produced charts are time series based bubble charts including two indicators (x and y axes) which can be customized by the user to have either linear or logarithmic scale(s) with alternative bubble sizes (radius) based on a chosen indicator.**



Selection of Indicators

Step 1 of 3 - Indicators Selection

After the Motion Chart has been produced, the axis of the selected indicators can be changed.

A - Select the indicator to be displayed on the Y-axis

- Money and Prices - Money Supply: M1 (Million national currency units)
- Money and Prices - Money Supply: M1 plus Quasi-money (Million national currency units)
- Money and Prices - Wholesale Price Index (2005=100) (Number)
- National Accounts - Agriculture, Share in GDP (Percentages)
- National Accounts - Construction, Share in GDP (Percentages)
- National Accounts - GDP (Constant 2005 Prices) (US Dollars)
- National Accounts - GDP (Constant 2005 Prices) (National Currency Units)
- National Accounts - GDP (Current Prices) (National Currency Units)
- National Accounts - GDP (Current Prices) (US Dollars)
- National Accounts - GDP, Per Capita (Current Prices) (US Dollars)**

B - Select the indicator to be displayed on the X-axis

- Demography - Crude Birth Rate (Per thousand persons)
- Demography - Crude Death Rate (Per thousand persons)
- Demography - Fertility Rate, Total (Births per Woman)
- Demography - Growth Rate of Population, Annual (Percentages)
- Demography - Growth Rate of Population, Natural (Percentages)
- Demography - Life Expectancy at Birth, Female (Years)
- Demography - Life Expectancy at Birth, Male (Years)
- Demography - Life Expectancy at Birth, Total (Years)**
- Demography - Population Density (Persons per square kilometre)
- Demography - Population, Ages 0-14, % of Total (Percentages)

[Return to SMC Home Page](#)

[Next](#)



Selection of OIC Member Countries

Step 2 of 3 - Country Selection

[Step 1 \(Indicators Selection\)](#) -> Step 2 (Country Selection)

[Return to SMC Home Page](#)

<input checked="" type="checkbox"/> Select/Deselect All			
<input checked="" type="checkbox"/>  Afghanistan	<input checked="" type="checkbox"/>  Albania	<input checked="" type="checkbox"/>  Algeria	<input checked="" type="checkbox"/>  Azerbaijan
<input checked="" type="checkbox"/>  Bahrain	<input checked="" type="checkbox"/>  Bangladesh	<input checked="" type="checkbox"/>  Benin	<input checked="" type="checkbox"/>  Brunei
<input checked="" type="checkbox"/>  Burkina Faso	<input checked="" type="checkbox"/>  Cameroon	<input checked="" type="checkbox"/>  Chad	<input checked="" type="checkbox"/>  Comoros
<input checked="" type="checkbox"/>  Cote d'Ivoire	<input checked="" type="checkbox"/>  Djibouti	<input checked="" type="checkbox"/>  Egypt	<input checked="" type="checkbox"/>  Gabon
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<input checked="" type="checkbox"/>  Yemen			

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Selection of Time Range and Indicator to be Used as Bubble Size

Step 3 of 3 - Range and Other Parameters Selection

[Step 1 \(Indicators Selection\)](#) -> [Step 2 \(Country Selection\)](#) -> Step 3 (Range and Other Parameters Selection)

[Return to SMC Home Page](#)

Select Range and Parameters :

Select Year Range : 1970 - 2010

Select Indicator to be used as Bubble Size :

- Demography - Population, Total (Units)
- Education - Education Expenditure, Current, Public, % of total public expenditure on education (Percentages)
- Education - Education Expenditure, Per Pupil, Public, All levels, % of GDP per capita (Percentages)
- Education - Education Expenditure, Public, % of GDP (Percentages)
- Education - Enrollment, Primary Schools (Units)
- Education - Enrollment, Secondary Schools (Units)
- Education - Enrollment, Tertiary Schools (Units)
- Education - Gross Enrollment Rate in Primary Schools, Female (Ratio)
- Education - Gross Enrollment Rate in Primary Schools, Male (Ratio)
- Education - Gross Enrollment Rate in Primary Schools, Total (Ratio)

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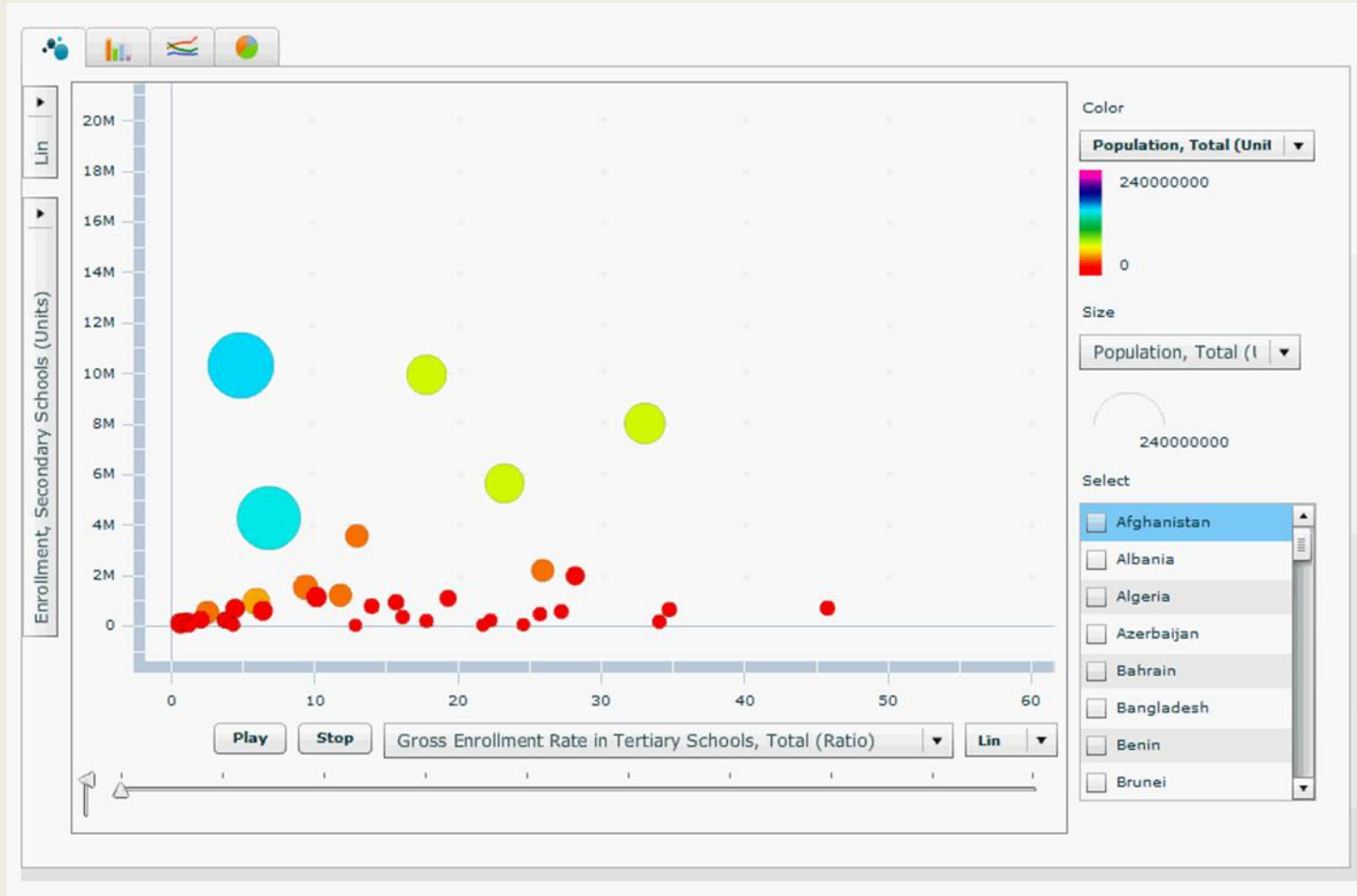
[Prepare Chart](#)



Sample Data Visualization

X-Axis: Gross Enrolment Rate in Tertiary Schools

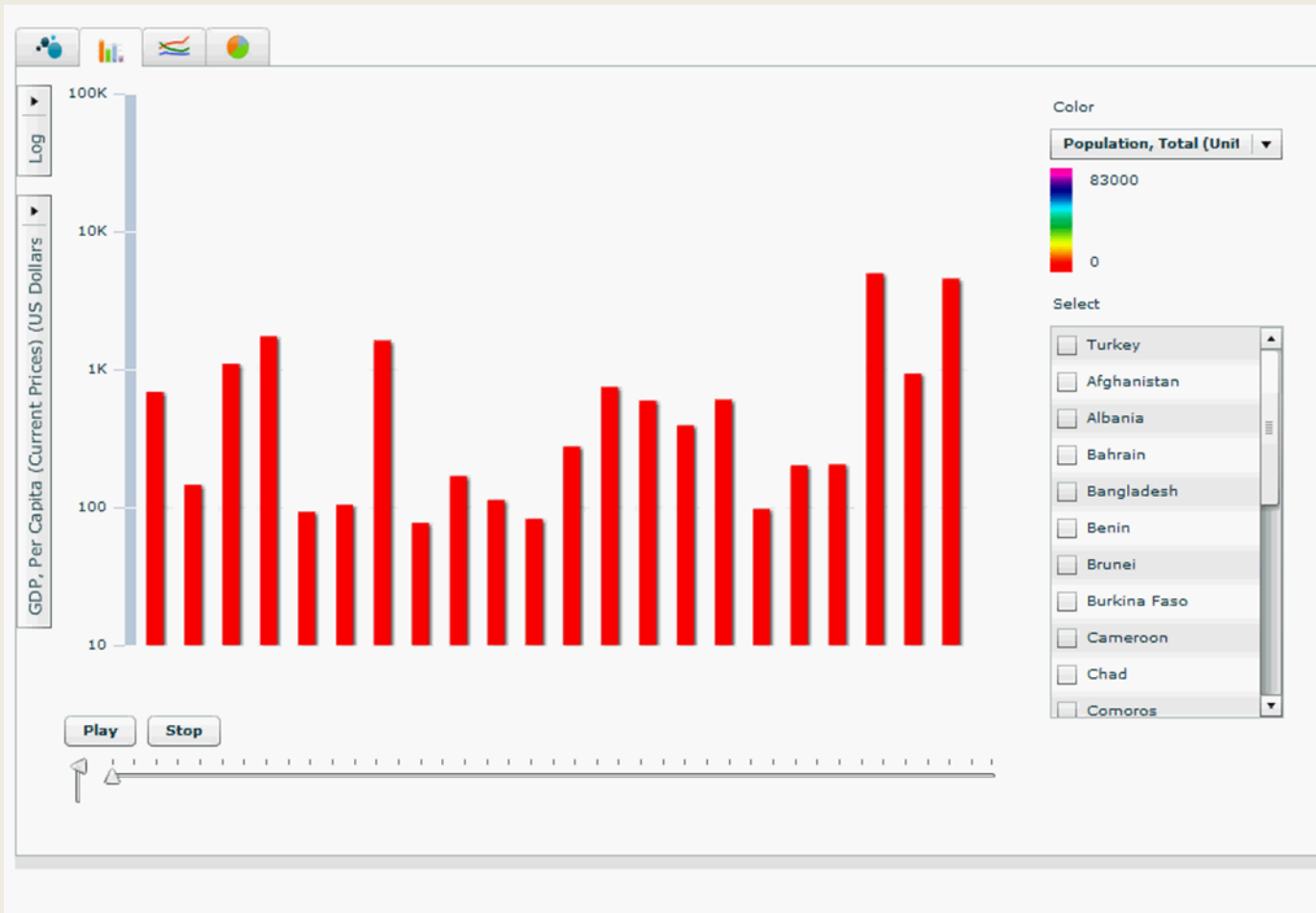
Y-Axis: Enrollment Secondary Schools





Sample Data Visualization

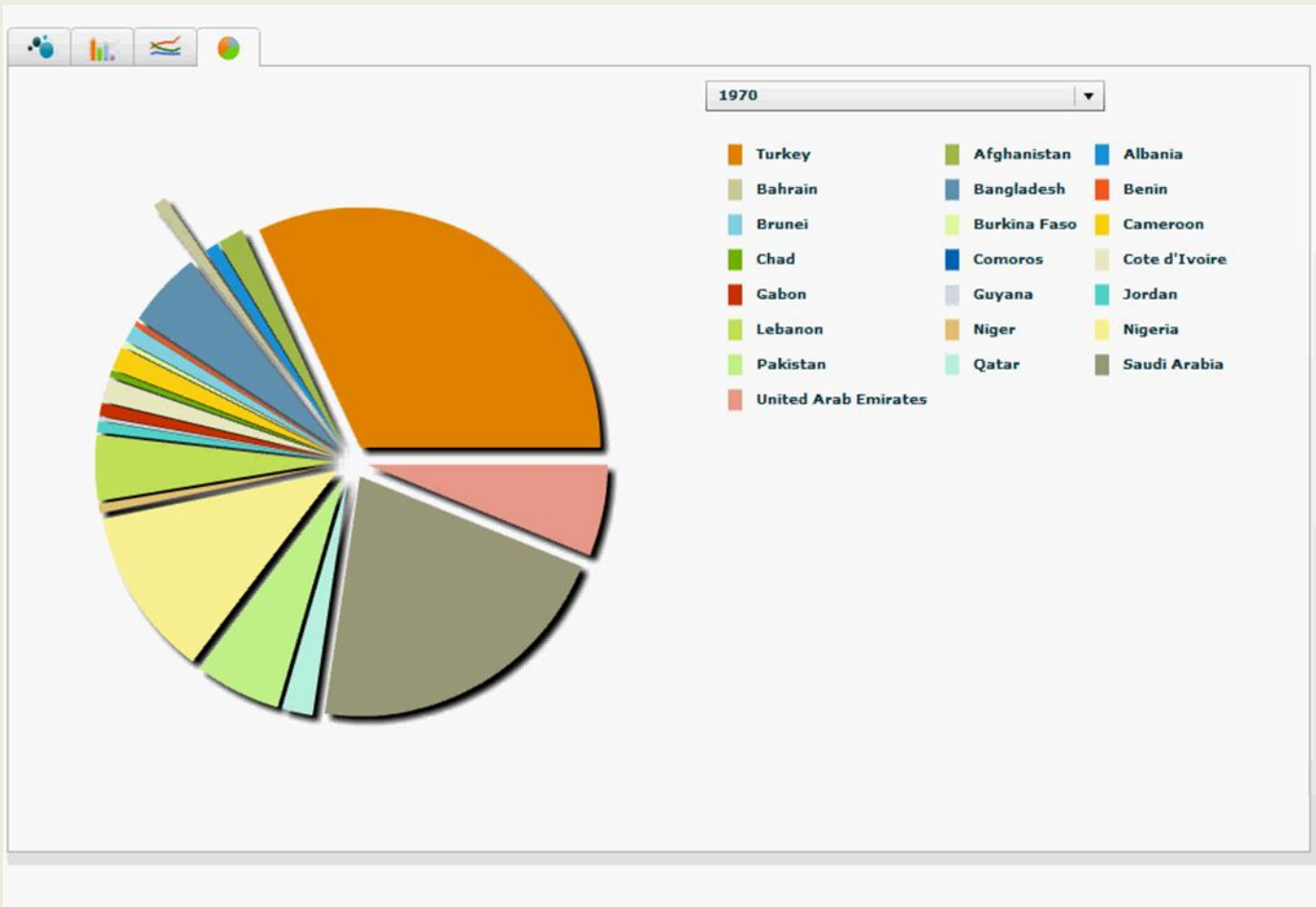
X-Axis: GDP, Per Capita





Sample Data Visualization

Pie Chart





SMC (SESRIC Motion Chart) Module

- **Main Design Principles SMC**
- **Technologies Used in the SMC**
- **Features of SMC**



Main Design Principles SMC

- The charts generated by the SMC Module are rendered within the users' browser using the Adobe Flash technology. It supports all most every browsers.
- The current engine of the motion charts generator is originally developed by the Google Inc. (base framework acquired from Gapminder Foundation).
- However, the API provided by Google has some restrictions on the data set available within the BASEIND Database.
 - Localization is weak, No Arabic Support
 - Missing data leads to wrong Data Interpolation
 - Weak Support and maintenance, weak customization
 - Many bugs



Technologies Used in the SMC

- Being developed by SESRIC, the SMC employs the Flex technology as the platform of the module.
- Flex is a powerful, open source application framework that allows anyone to easily build traditional applications for Web and Desktop Application.



Technologies Used in the SMC

- Flex also allows to develop mobile applications for Apple iOS, Google Android, and RIM BlackBerry Tablet OS devices using the same programming model, tool, and codebase.
- Flex integrates with all major back ends including Java, Spring, Hibernate, PHP, Ruby, .NET, Adobe ColdFusion, and SAP using industry standards such as REST, SOAP, JSON, JMS, and AMF.

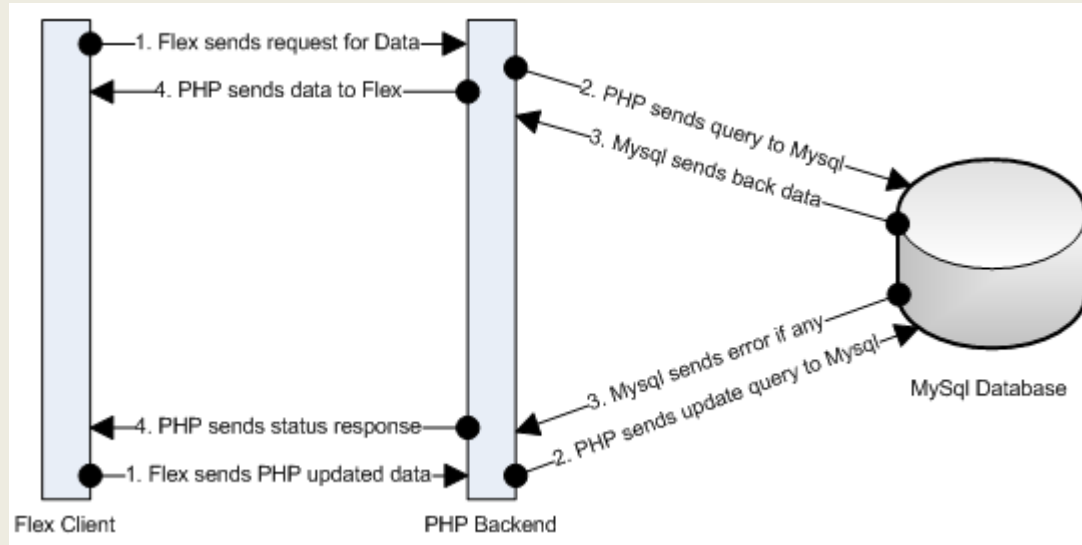


Technologies Used in the SMC

- The SMC Module uses XML (Extensible Markup Language) as the Data Source over HTTP services embedded in Flash with ActionScript.
- XML is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.
- Any back-end that has the capability of producing XML code can work with the SMC Module to generate data visualisation.
- This attribute makes the module to work independently with any kind of database technology.



SMC Structure





Features of SMC

- SMC Module has the inflexibility of Google's API on the issue of handling missing data.
- The current SMC uses linear interpolation to handle missing data within indicators.
- Thanks to its flexibility, the SMC allows developers to quickly embed any interpolation methods to be deployed.



Networking, Cooperation and Collaboration

- A Network can be formed to keep close bond among the OIC NSO`s
- Initiate cooperation and activities such as joint projects, experience sharing etc.



SESRIC Motion Chart Module

Thank You