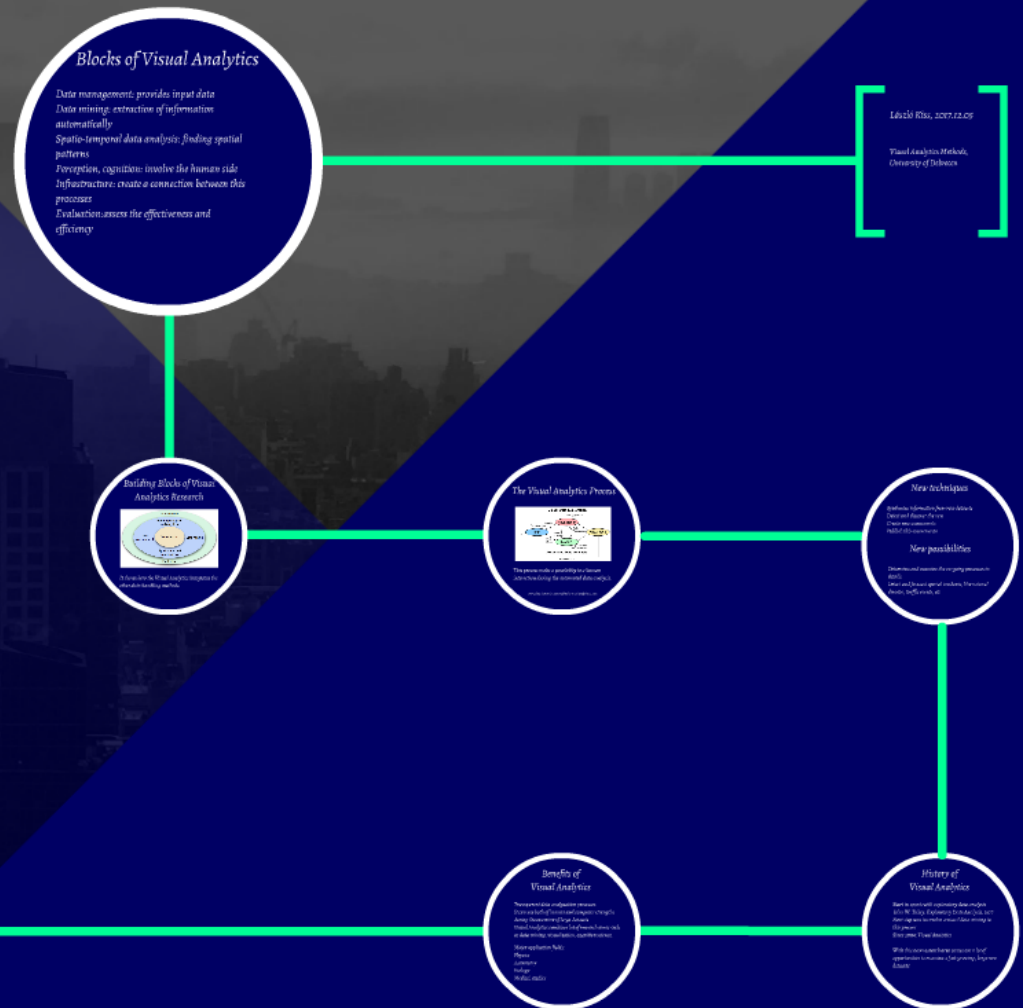


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Visual Analytics Methods

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Blocks of Visual Analytics

Data management: provides input data
Data mining: extraction of information automatically
Spatio-temporal data analysis: finding spatial patterns
Perception, cognition: involve the human side
Infrastructure: create a connection between this processes
Evaluation: assess the effectiveness and efficiency

László Kiss, 2017.12.09

Visual Analytics Methods,
University of Debrecen

Building Blocks of Visual Analytics Research



The Visual Analytics Process



New techniques

Statistical Information Science
Data Mining
Data Management
Data Analysis
Data Visualization

New possibilities

Statistical Information Science
Data Mining
Data Management
Data Analysis
Data Visualization

Benefits of Visual Analytics

Perception of data and its structure
Data management and data mining
Data management and data mining
Data management and data mining
Data management and data mining
Data management and data mining
Data management and data mining
Data management and data mining

History of Visual Analytics

Statistical Information Science
Data Mining
Data Management
Data Analysis
Data Visualization

Dangers about this large amount of raw data

- Lost information (Due the lack of ability to handle this datasets)
- Too long term data analyze processes (when we get the information, it could lose its value)

Age of Information overload

From
• Supply: too many information
• Information: too much information
• Information: too much information
• Information: too much information
• Information: too much information
• Information: too much information
• Information: too much information
• Information: too much information

Age of Information overload

Facts

- *Rapidly increasing amount of data*
- *Appearance of new technologies*
- *"Desire" to access a new information immediately*

Requirements

- *Fast and efficient systems to analyze this large datasets*
- *Discover a new knowledge from the raw data*

Dangers about this large amount of raw data

- *Lost information (Due the lack of ability to handle this datasets)*
- *Too long term data analyze processes (when we get the information, it could lose it's value)*

Benefits of Visual Analytics

Transparent data analyzation processes

*It can use both of human and computer strengths
during the examine of large datasets*

*Visual Analytics combines lot of research areas such
as data mining, visualization, cognition science.*

Major application fields:

Physics

Astronomy

Biology

Medical studies

History of Visual Analytics

Start in 1970's with exploratory data analysis

John W. Tukey, Exploratory Data Analysis, 1977

*Next step was to involve a visual data mining to
this process*

Since 2004: Visual Analytics

*With this new research area comes out a lot of
opportunities to examine a fast-growing, large raw
datasets*

New techniques

Synthesise information from raw datasets

Detect and discover the new

Create new assessments

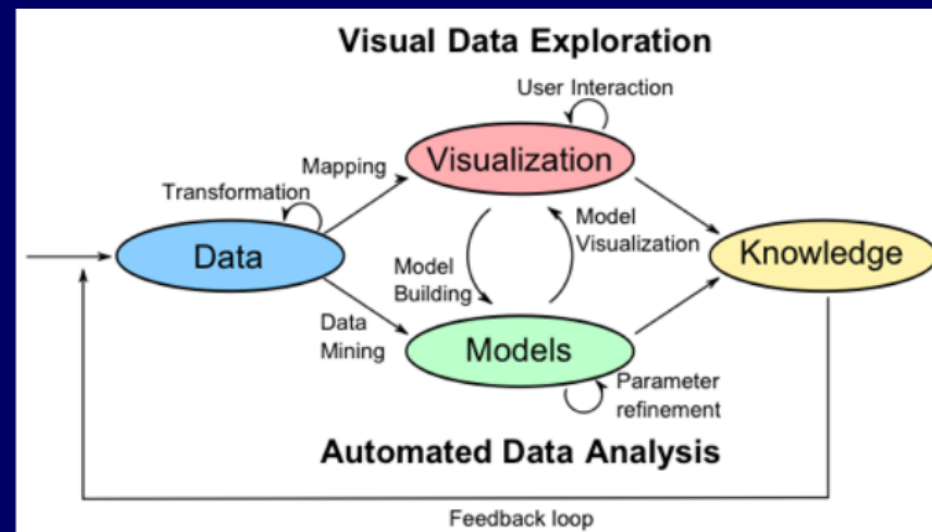
Publish this assessments

New possibilities

Determine and examine the on-going processes in details

Detect and forecast special incidents, like natural disaster, traffic events, etc

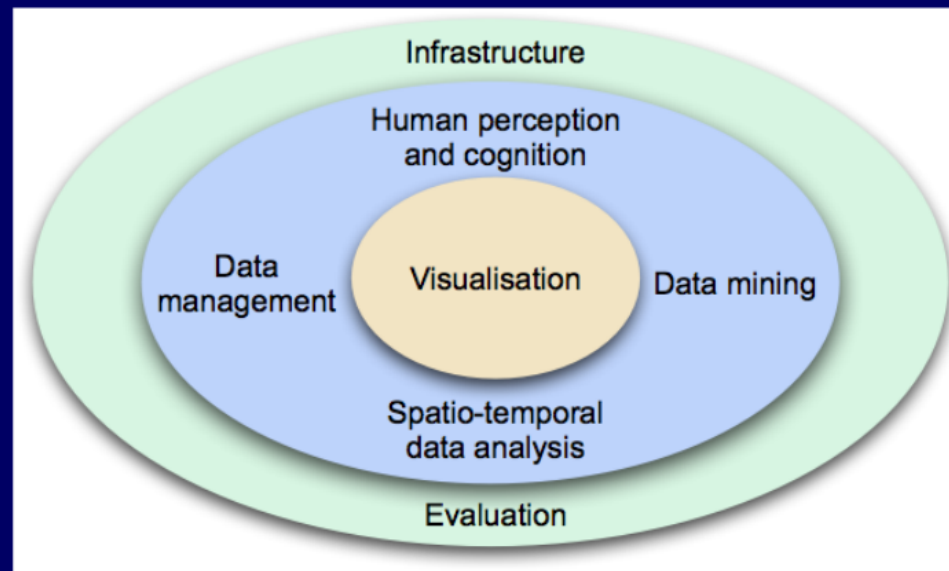
The Visual Analytics Process



This process make a possibility to a human interaction during the automated data analysis.

source: <http://www.vismaster.eu/faq/the-visual-analytics-process/>

Building Blocks of Visual Analytics Research



It shows how the Visual Analytics integrates the other data handling methods.

Blocks of Visual Analytics

Data management: provides input data

*Data mining: extraction of information
automatically*

*Spatio-temporal data analysis: finding spatial
patterns*

Perception, cognition: involve the human side

*Infrastructure: create a connection between this
processes*

*Evaluation: assess the effectiveness and
efficiency*

László Kiss, 2017.12.05

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