



Part II Basic Analysis and Reporting Features



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16th TourMIS Workshop

September 09, 2021

Basic Analysis and Reporting Features

1. Measuring and benchmarking arrivals and bednights
2. Trends
3. Average length of stay
4. Occupancy rate
5. Analysis of tourism intensity
6. Market volume and growth analysis (,Portfolio A.')
7. Measuring and benchmarking seasonality
8. Comparing the guest mix of destinations

14:45 coffee break

Market volume, market growth analysis
and
Portfolio visualization

A common problem in marketing

To find the right (optimal) mix of target markets

Implications for strategic (long-term) decisions and for the budget allocation process (e.g. where should we invest?)

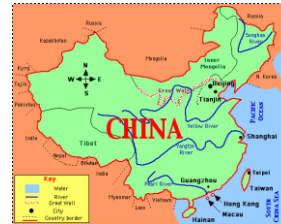
2 basic questions from a DMO's perspective:

- What makes a market attractive?
- What are our chances in attracting visitors from a particular market?

Portfolio Analysis

What makes a market attractive?

1. Size/volume



e.g. Germany, China, ...

2. Growth/Prospects



e.g. Middle East, Brazil,...

• Market volume and market growth indicators

- # of travellers/arrivals/bednights or spendings
- either measured at the country of origin (source market) or in all destinations (e.g. total bednights in all destinations)

Portfolio Analysis

**What are our chances in attracting visitors from a particular market?
„Market chance indicators“**

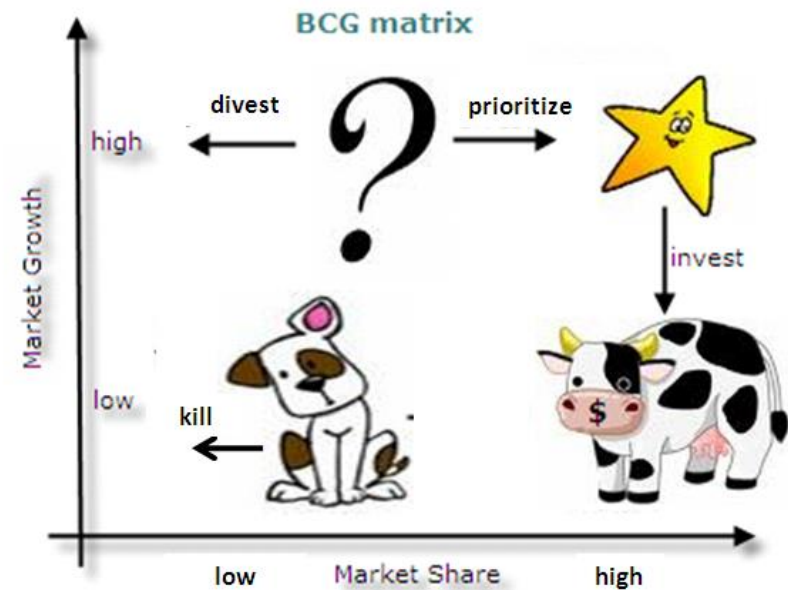
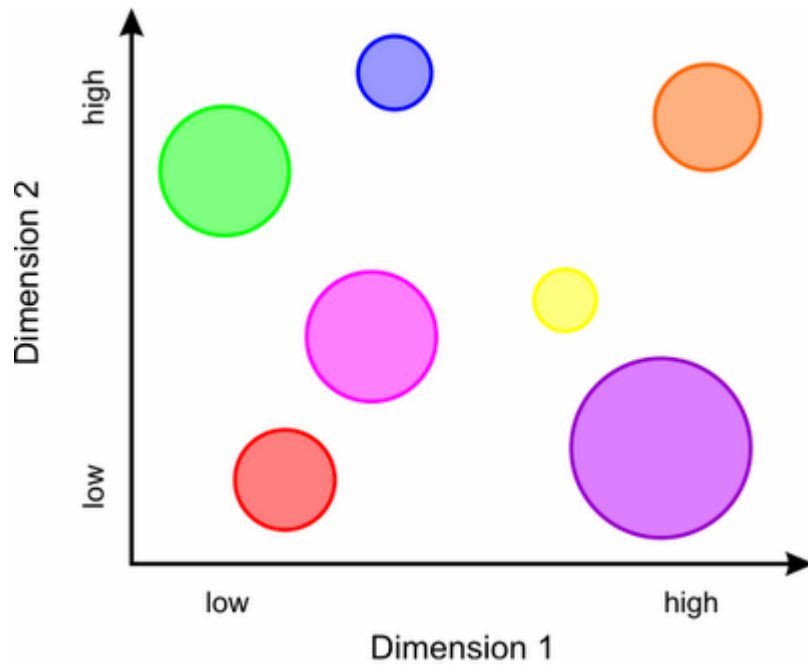
- **Destination awareness**
Knowledge, preference and sympathy towards a destination
- **Relative price level**
Comparison between prices of tourism goods and travel budget of travellers
- **Level of distribution**
Availability of a destination within the generating country's distribution and/or online reservation systems
- **Competitive pressure**
Advertising budget invested by all competitors in a market
- **Travel distance**
Average financial input to cover travel distance

Portfolio Analysis

Strategic Key Performance Indicators

- **Market volume** is an absolute number describing the volume of tourism generated by a particular market
- **Market growth rate** is the percentage change of the market volume
- **Absolute market share** is the ratio when comparing the performance of a particular destination with the overall market volume (in %)
- **Relative market share** is the ratio of the market share of a particular destination compared to the market share of the leading destination (or the second best destination if the destination of evaluation is the market leader)
- **Guest mix share (= importance value)** is the proportion of bednights sold of a particular market compared to the overall number of bednights recorded in a tourism destination (in %)

Visualization by the Market growth-share matrix



Measuring and comparing seasonality in European destinations

Causes of seasonality in tourism

- **Seasonality: The systematic intra-year variation in visitation caused by exogenous factors**
 - Natural (e.g. climate)
 - Institutional
 - caused by the markets of origin (e.g. timing of school holidays)
 - caused by the destination (e.g. regular mega-events)
 - Calendar effects (e.g. Easter)
- **Challenges**
 - The need to **optimize the use of tourism infrastructure** such as roads to accommodate high flows during certain periods
 - Seasonality **increases the risk of high unemployment** during the low seasons
 - In dryer regions the issue of **water scarcity** is of particular concern

Actions to overcome seasonality

- **Product**

Development of new offers, events, packages, ...

- **Pricing**

Providing discounts for periods with less demand

- **Promotion**

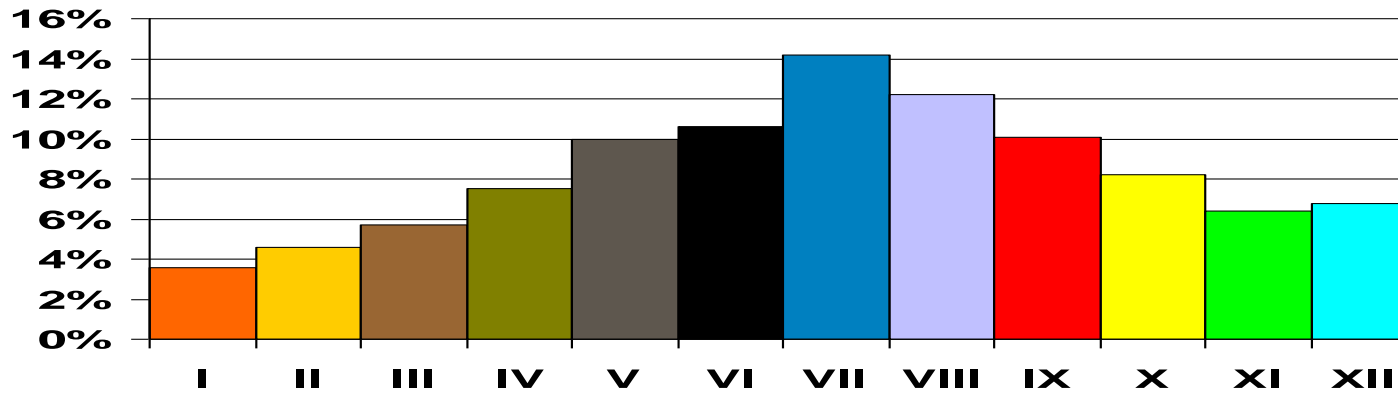
When and how intensively we will promote the tourism products

- **Placement**

Which geographic region/market should be promoted

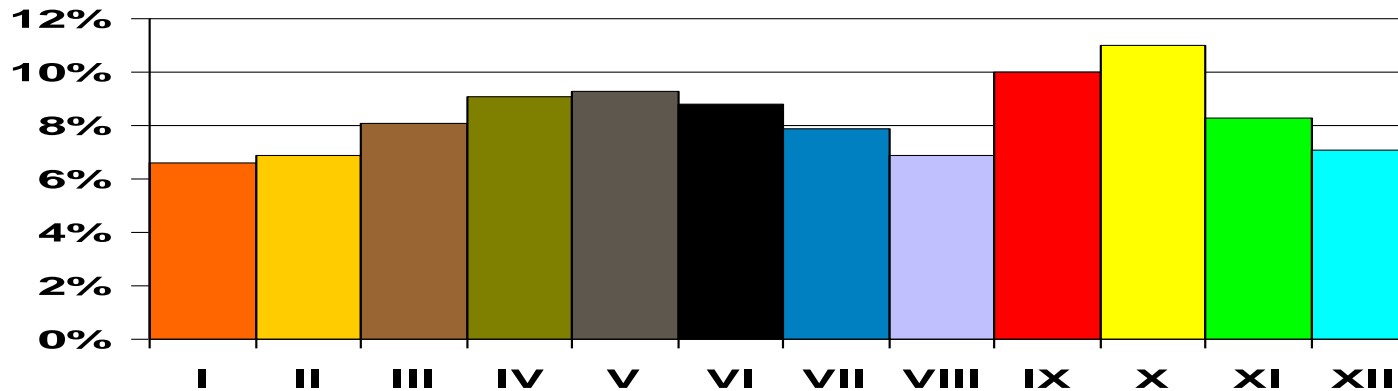
Which segments (e.g. young adults, families, business people)

Gini coefficient



LÜBECK

Gini=0.207



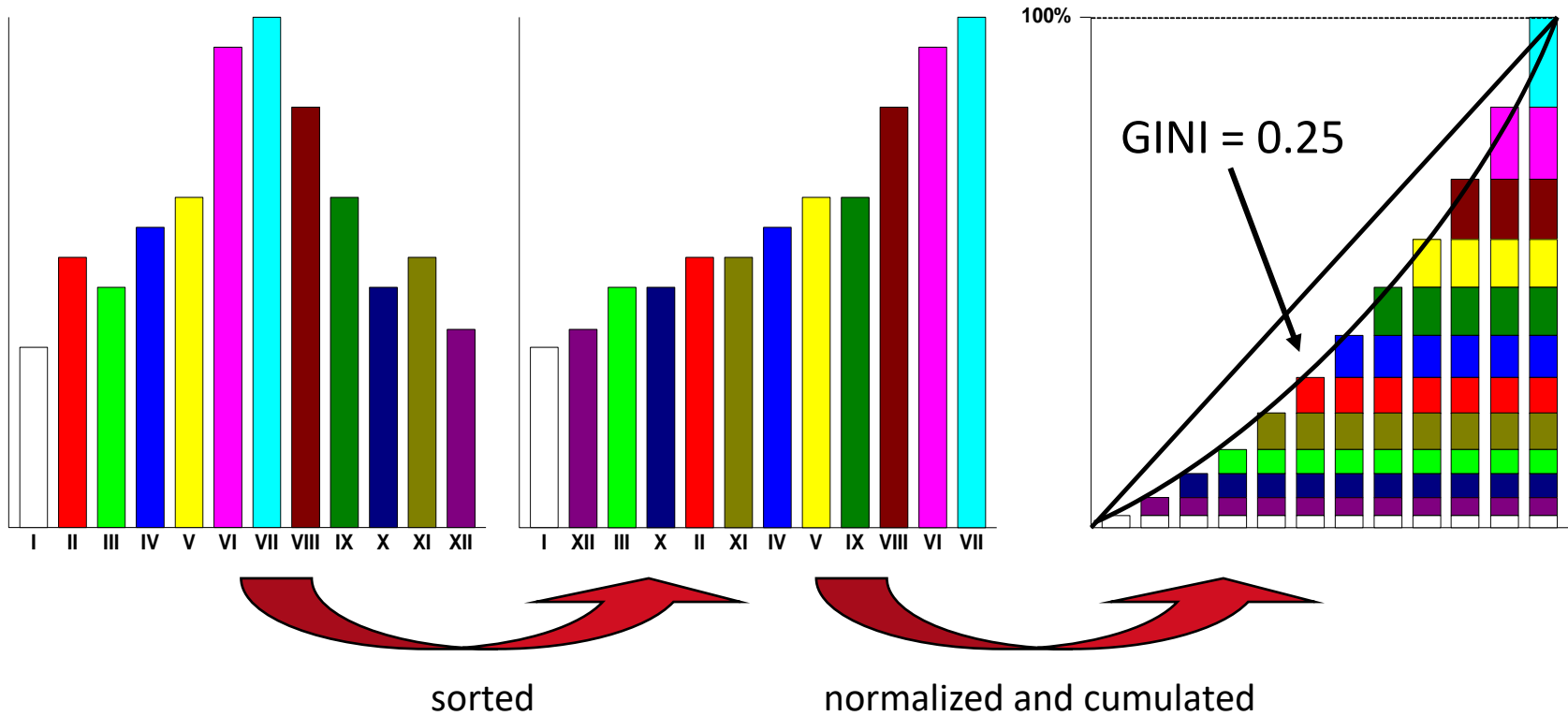
MADRID

Gini=0.088

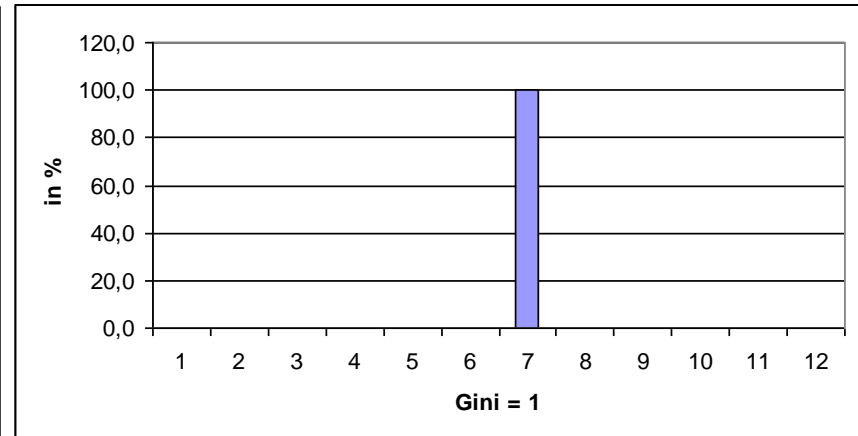
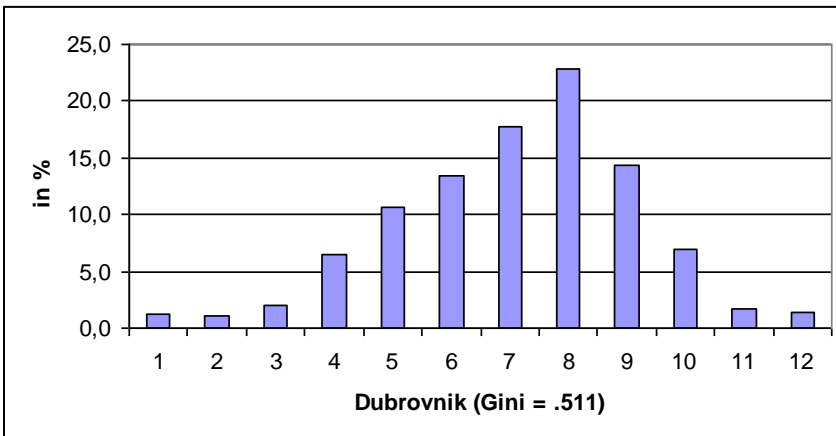
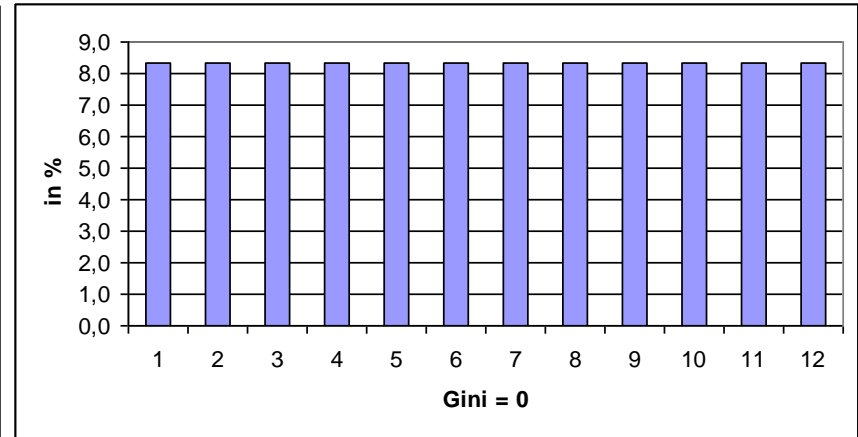
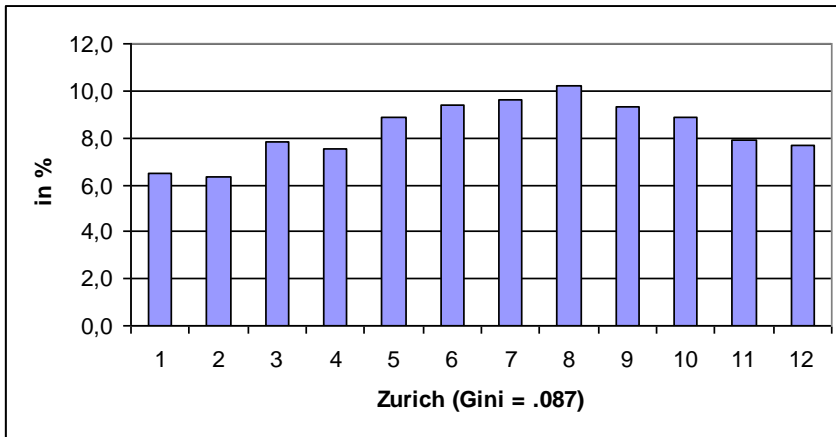
Gini coefficient

Measure of statistical dispersion. The Gini can be approximated

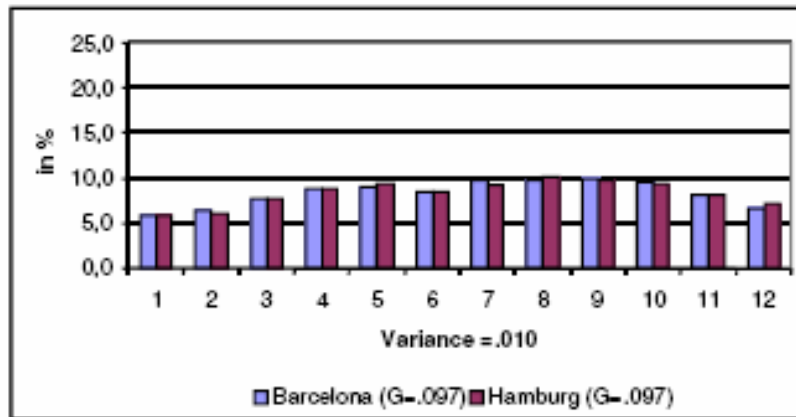
with trapezoids:
$$G^* = 1 - \sum_{i=1}^{12} (X_i - X_{i-1}) \times (Y_i + Y_{i-1})$$



Measuring seasonality

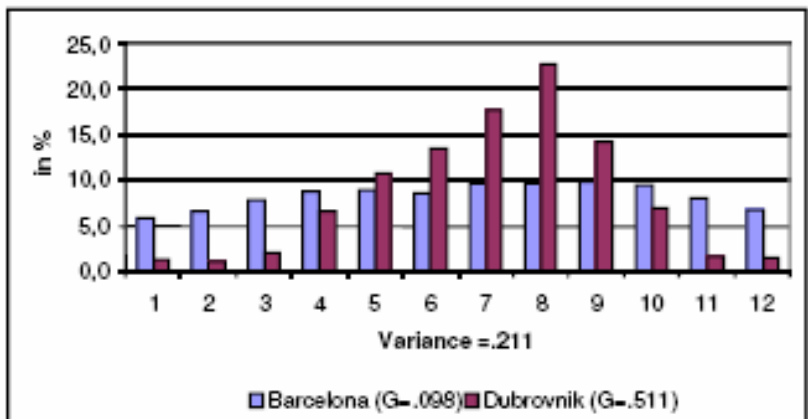
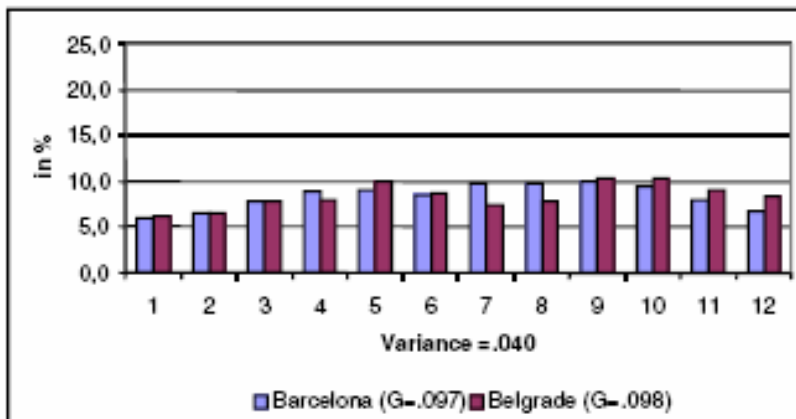


Similarity of seasonal patterns



$$d = \sqrt{\sum_{i=1}^{12} (x_i - y_i)^2}$$

Similarity of seasonal patterns of two destinations. Multiple destinations?

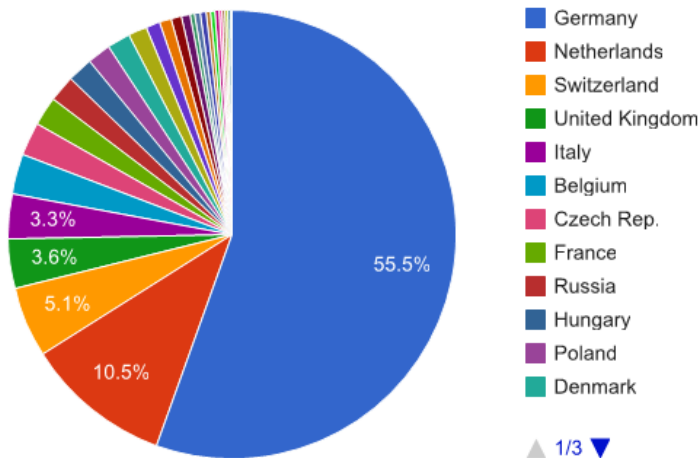


Comparing the guest mix of destinations

Diversity of guest mix

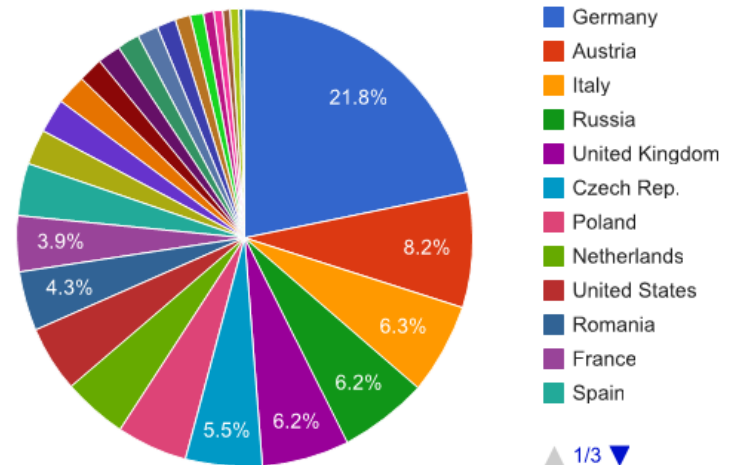
Assumption: A high diversity of guest mix spreads the risk of negative economic developments in single markets

Average length of stay of a market in all ETC destinations - Bednights (preferred definition) 2012



Austria (Gini = 0.792)

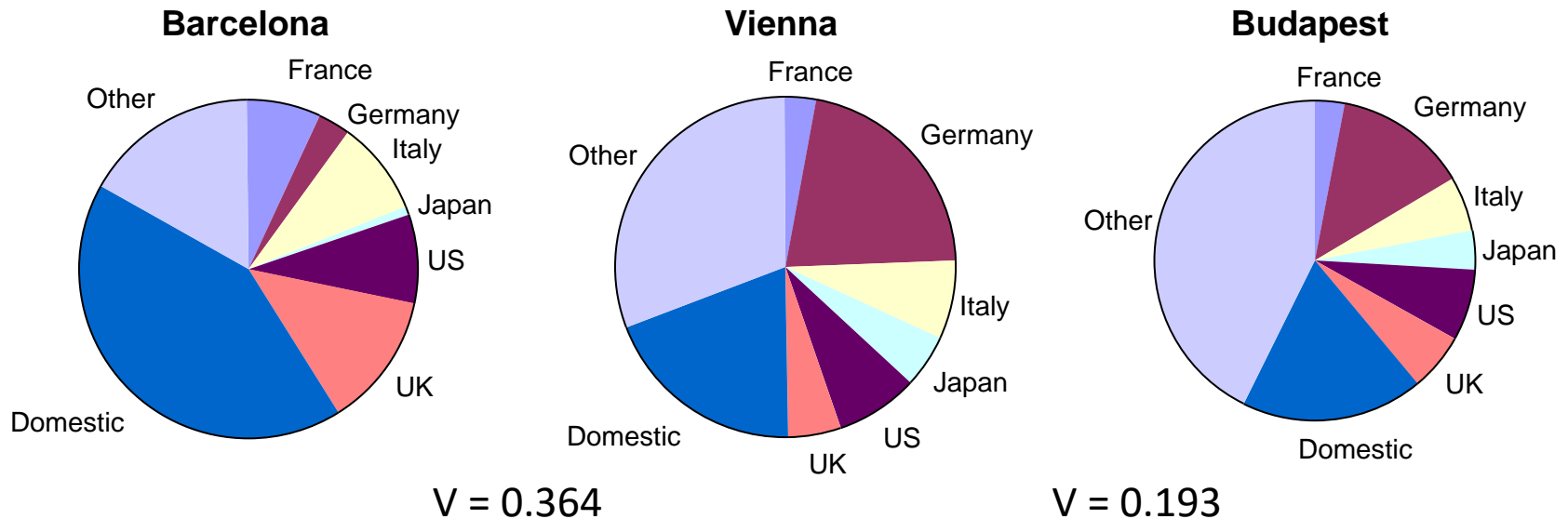
Average length of stay of a market in all ETC destinations - Bednights (preferred definition) 2012



Hungary (Gini = 0.525)

Analyzing the similarity of guest mix

Assumption: The comparison (variance) of guest mix shares defines a destination's exposure to interregional competition



Estimating CO₂ emissions of European city tourism

Research Article

Estimating transportation-related CO₂ emissions of European city tourism

Ulrich Gunter  & Karl Wöber

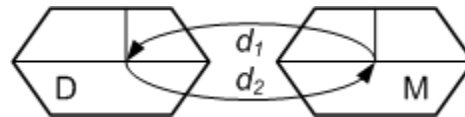
Received 11 Dec 2020, Accepted 02 Jun 2021, Published online: 21 Jun 2021

Ulrich Gunter & Karl Wöber (2021) Estimating transportation-related CO₂ emissions of European city tourism, Journal of Sustainable Tourism, DOI: [10.1080/09669582.2021.1939708](https://doi.org/10.1080/09669582.2021.1939708)

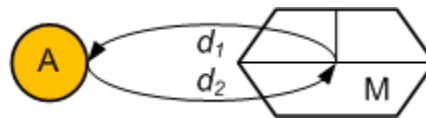
Objectives and motivation

Stefan Gössling, Daniel Scott, Michael Hall 2015: *Inter-market variability in CO2 emission-intensities in tourism: Implications for destination marketing and carbon management*, *Tourism Management*, 46, pp. 203-212

CO2 emissions in tourism calculated based on the distances flown of all tourists from a specific **source market** to a specific **destination** times CO2 emission factors per flight distance



The primary objective of the TourMIS project is to create **more precise estimates** of CO2 emissions of European **city tourism**

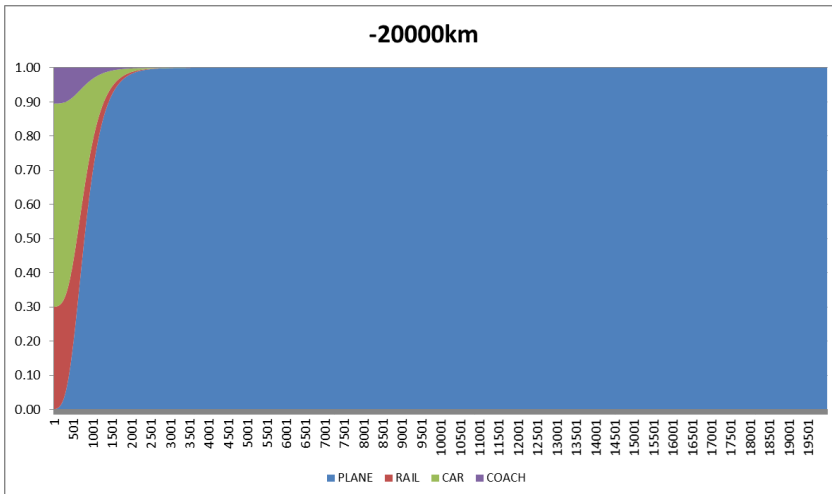
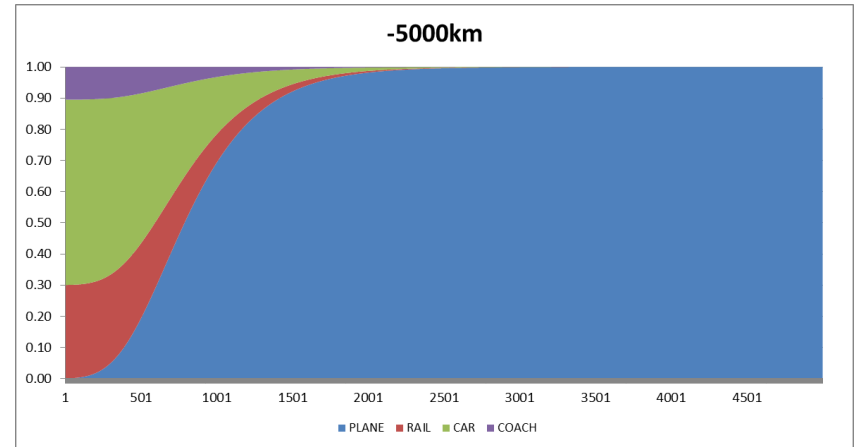
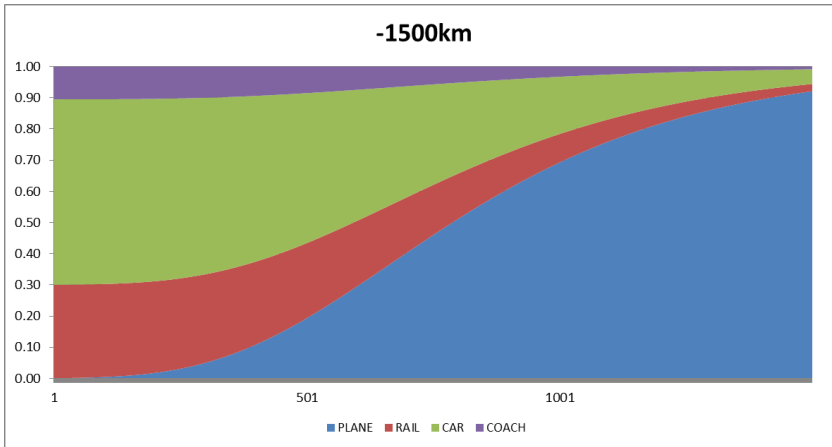


In order to achieve this objective, **not only the travel distance** (as typically done) but also the **chosen transportation mode(s)** and the particularities of the different cities' **source markets** are taken into account

Four steps

1. Calculation of travel distances in km between European cities and their source markets based on their geographical coordinates (population centers) as reported by the Socioeconomic Data and Applications Center (SEDAC) by NASA
2. Calculation of share of travel mode (air, rail, car, coach)
 - a) Entered by TourMIS inputter (information from guest surveys)
or
 - b) Estimated (by TourMIS)*New feature!*
3. Calculation of CO2 emissions by multiplying distance by travel mode with average CO2 emissions by travel mode
4. Incorporating multiple trips and average length of stay

Estimating travel mode by travel distance



The probability of choosing a certain transportation mode is approximated by a Gompertz function in travel distance (PLANE) and a growth function in travel distance (RAIL), with the remaining probability (i.e., $100\% - \text{Pr}(\text{PLANE}) - \text{Pr}(\text{RAIL})$) being distributed on CAR (85%) and COACH (15%), respectively

Estimating CO2 emissions

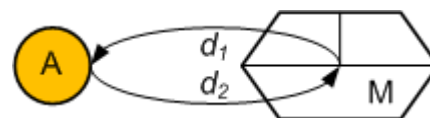
- Travel distances per transportation mode are calculated by multiplying the travel distance in km per destination and source market by Pr(PLANE), Pr(RAIL), Pr(CAR), and Pr(COACH), respectively
- CO2 emissions per tourist arrival are calculated by multiplying the travel distances per transportation mode by the average CO2 emissions per transportation mode according to Peeters et al. (2007):

Table 11.2 Emission factors for tourism transport modes in the EU context

Mode	CO ₂ factor (kg/pkm)	Occupancy rate/load factor (%)
Air < 500 km	0.206	-
500-1,000 km	0.154	-
1,000-1,500 km	0.130	-
1,500-2,000 km	0.121	-
> 2,000 km	0.111	-
Air world average ^(a)	0.129	75
Rail	0.027	60
Car	0.133	50
Coach	0.022	90

(a) This value is calculated in Section 11.1.2.1.

Source: Peeters, P. et al. (2007b)



$$CO_2 = \sum f^T(d_1) * kg/pkm^T + \sum f^T(d_2) * kg/pkm^T$$

Limitations and future research

- Differences in transportation mode preferences across European countries have not been considered
 - Eurostat data on the terrestrial modal split of passenger transport as well on passenger flights could be incorporated in the future
- Only (direct) CO₂ emissions from transportation from the source markets to the destinations are considered
 - More information is needed on the other (indirect and induced) CO₂ emissions of tourists to and within European cities

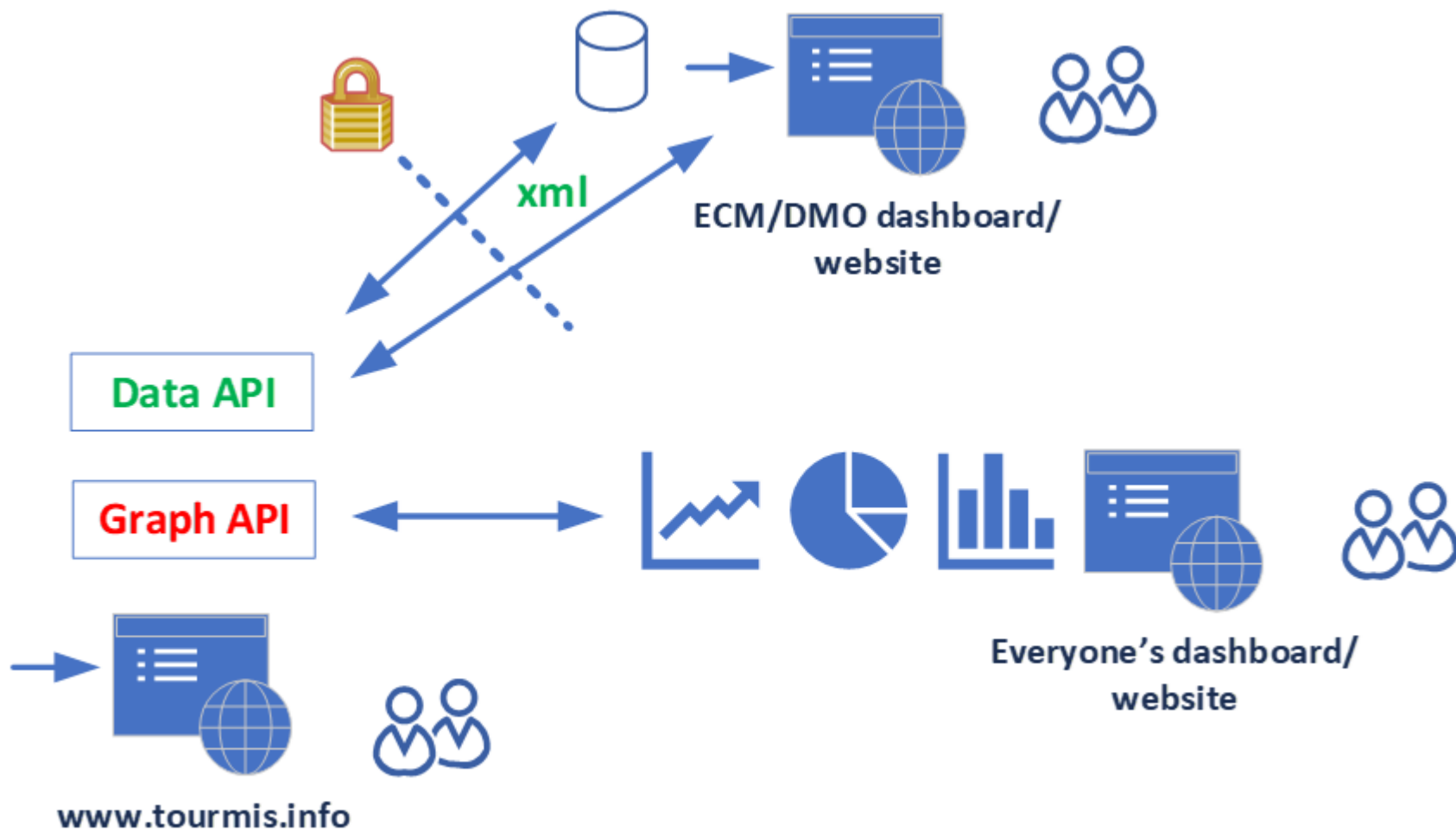
The future development of TourMIS

Agenda

- Application Programming Interface (API)
- Interactive graphs
- Forecasting
- Sharing data on tourism expenditures
- ...

Application Programming Interface (API) and Interactive graphs

Two types of APIs



TourMIS data API

<https://www.tourmis.info/cgi-bin/tmxml.pl?id=xu20180831&s=ECM&l=txe>

lists all parameters for the ECM database on TourMIS (l=txd = German)

<https://www.tourmis.info/cgi-bin/tmxml.pl?id=xu20180831&d=CPH>

prints default data (latest year) for Copenhagen

<https://www.tourmis.info/cgi-bin/tmxml.pl?id=xu20180831&c=NG&m=UK&d=CPH&y=2017>

<https://www.tourmis.info/cgi-bin/tmxml.pl?id=xu20180831&c=NA&m=IT&d=CPH&y=2012>

c = content

d = destination

m = market

l = language

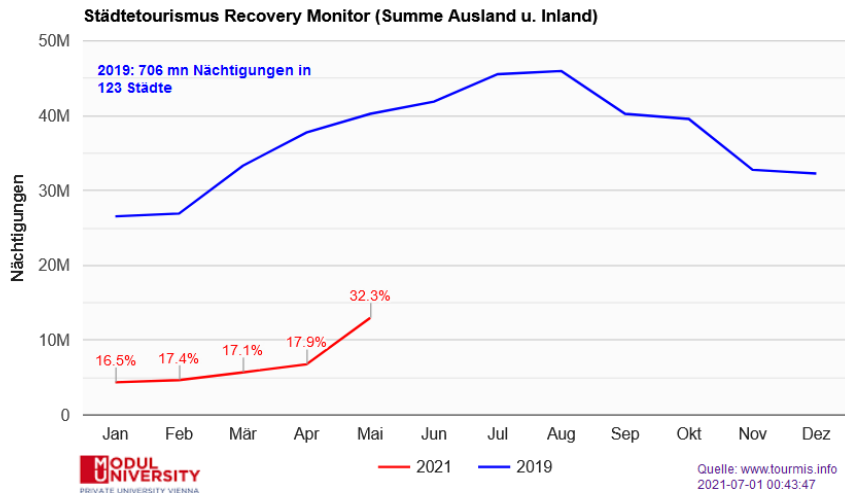
y = year

Graph API: Example for embedded graphs (iframe)

- ▶ Was ist TourMIS?
- ▶ Anmelden
- ▶ Unterstützer
- ▶ Benutzerforum
- ▶ Weitere Web Seiten
- ▶ **Login**
- ▶ Impressum
- ▶ TourMIS Idee & Vision
- ▶ TourMIS Manual
- ▶ Eurocity Handbuch
- ▶ Definitionen Städtetourismus
- ▶ Excel-Formular für ETC
- ▶ Excel-Formular für ECM
- ▶ Nächster TourMIS Workshop
- ▶ ECM Benchmarking Report
- ▶ **TourMIS Charts API**

Europäische Länder					
Entwicklung der wichtigsten Märkte					
Januar - April 2021					
Herkunftsmarkt	Ankünfte (1)		Nächtigungen (1) (2)		
Österreich	-67.5		-69.6	14/16	
Kanada	-73.3		-76.5	13/15	
Schweiz	-53.7		-62.7	14/14	
China	-89.4		-87.0	14/15	
Deutschland	-69.5		-76.4	15/16	
Dänemark	-84.2		-78.1	13/14	
Spanien	-73.4		-70.0	14/14	
Frankreich	-60.2		-65.5	16/16	
Indien	-72.3		-61.5	12/13	
Italien	-70.3		-61.0	16/16	
Japan	-93.1		-87.3	13/16	
Niederlande	-74.4		-82.6	14/15	
Norwegen	-73.2		-62.5	13/14	
Polen	-51.9		-38.4	13/14	
Schweden	-78.0		-78.6	13/14	
Russland	-67.9		-80.6	16/17	
Vereinigtes Königreich	-86.6		-83.7	16/17	
Vereinigte Staaten	-67.7		-72.1	15/15	

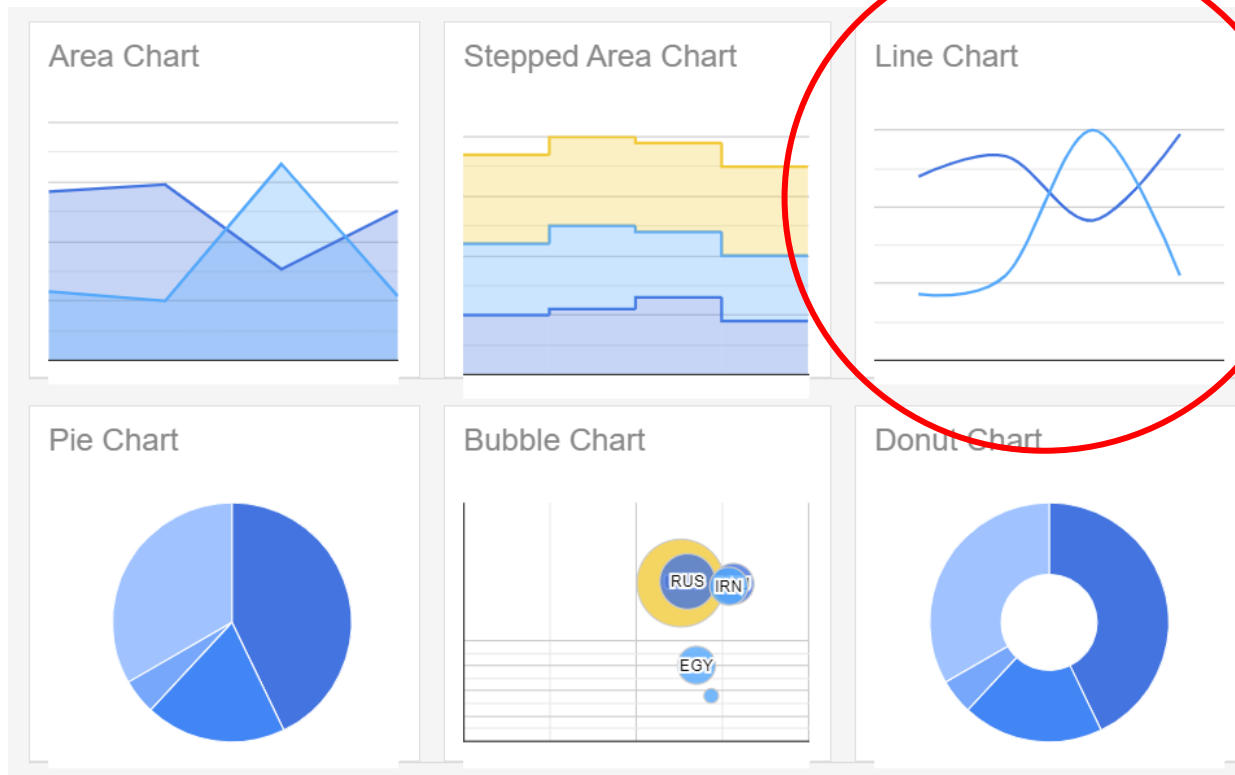
Entwicklung in Gesamt Europa					
Januar - April 2021					
Herkunftsmarkt: Summe Ausland					
Destination	Def	Ankünfte		Nächtigungen	
		absolut	% d.Vj. (3)	absolut	% d.Vj. (3)
Bulgarien	AV		-30.1	NA	
Dänemark				374501	-82.9 **
Deutschland	ΔΔ	806768	-85.3	3284993	-75.2



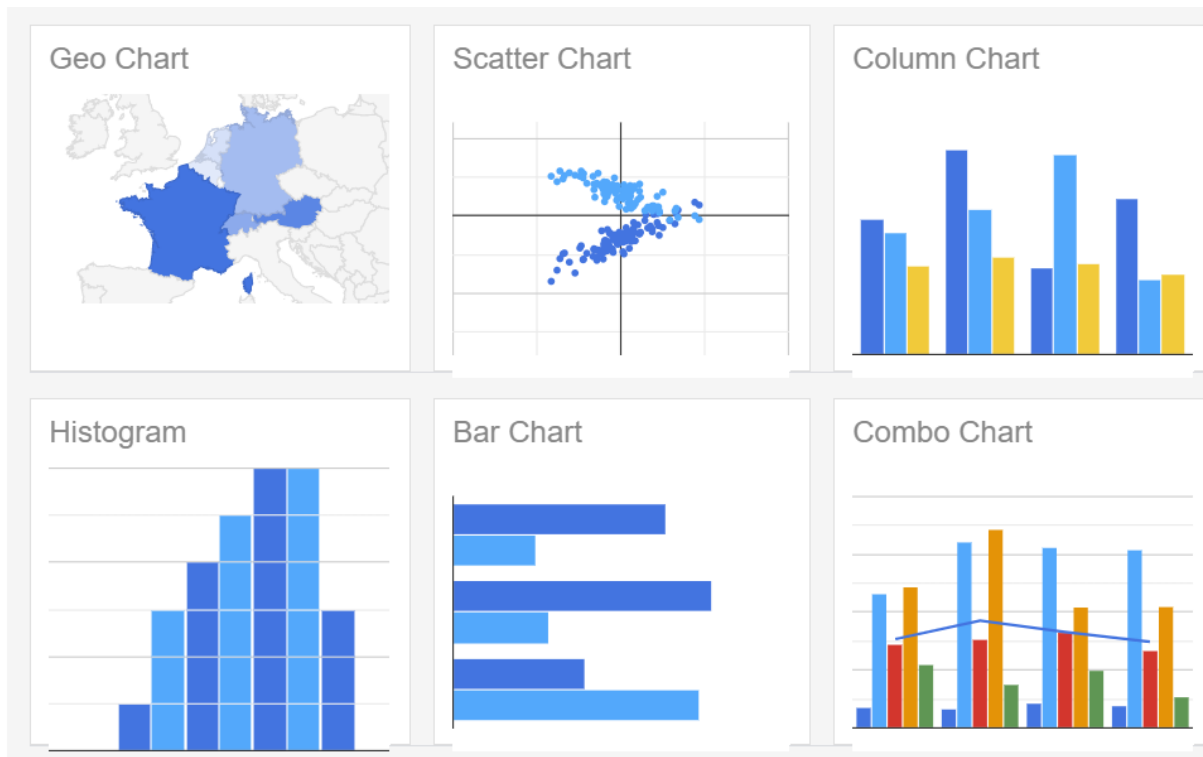
Next steps

- Making API exclusive for ECM and ETC members
 - Revising API program
 - Providing a manual
- Develop charts for benchmarking purposes
 - 'Benchmarking report style' (for ECM homepage)
 - Individual city vs other cities (for ECM members' homepages)
 - ...
- Other ECM sources: capacities, CO2, MICE, attractions, ...
- Challenges: Time, resources & communication

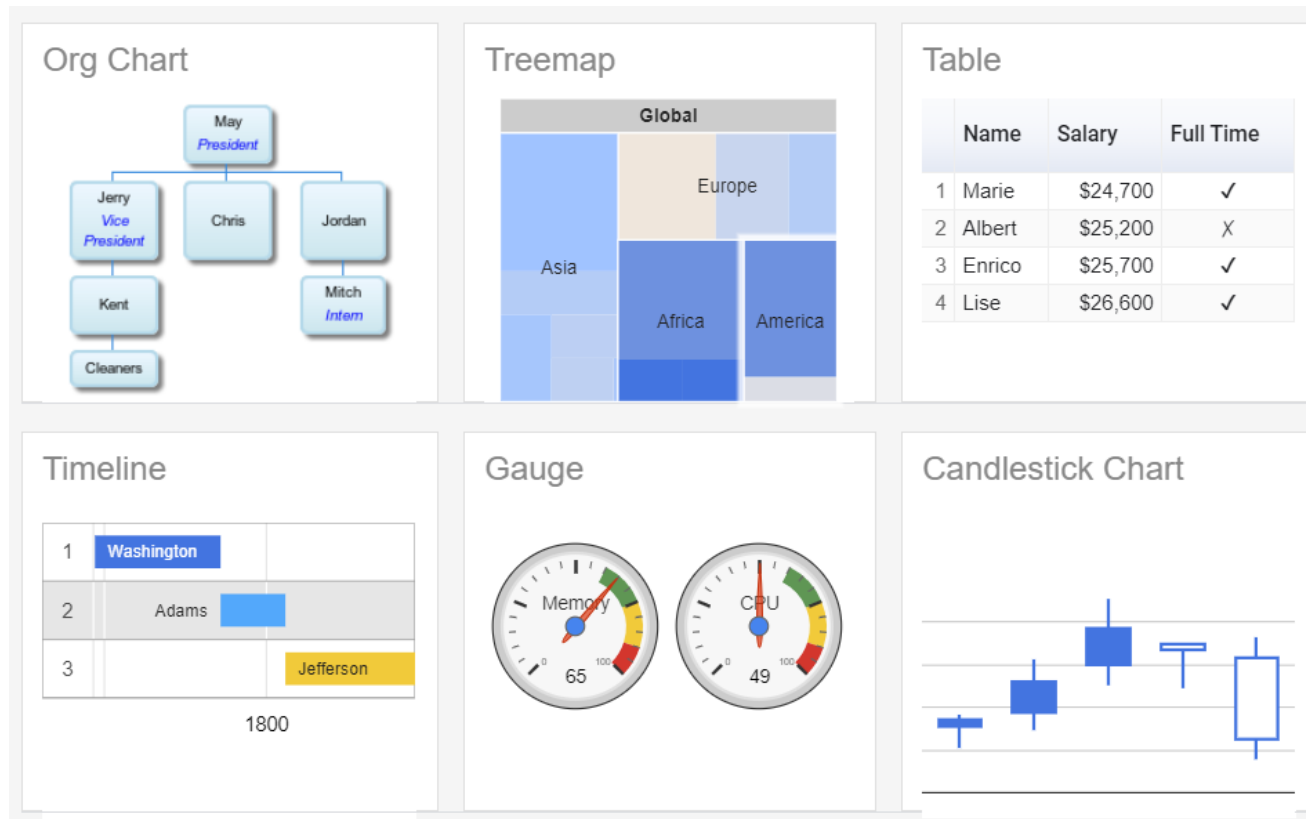
Google charts gallery (1/3)



Google charts gallery (2/3)



Google charts gallery (3/3)

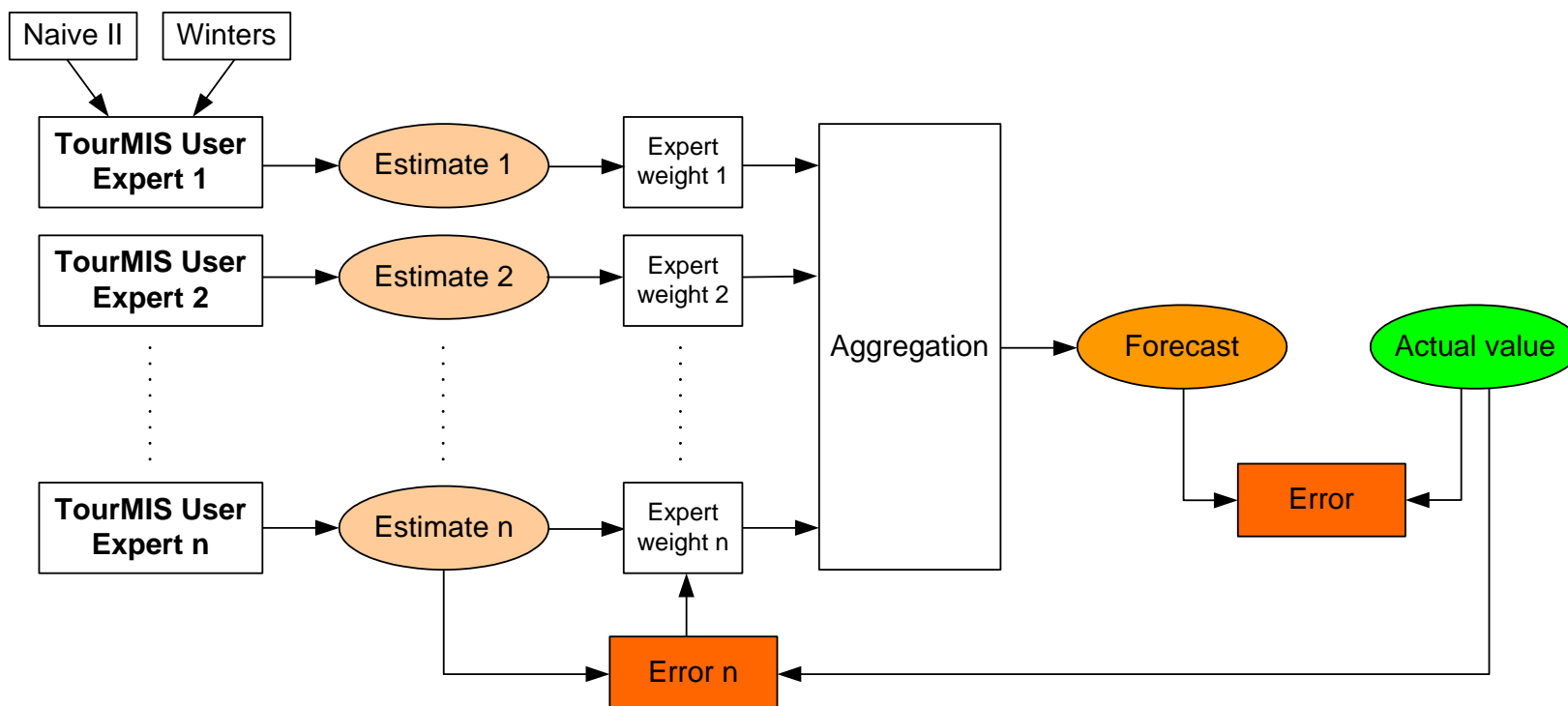


Forecasting

Tourism Forecasting Methodologies

- Quantitative (statistical) forecasting
 - Econometric approaches
 - Time-series techniques (e.g. **linear regression, decomposition and extrapolation**) used in the ECM Benchmarking report
- Qualitative (judgmental) forecasting
- Both (hybrid) forecasting
 - builds on the complementary strengths and weaknesses of quantitative and qualitative forecasting methods
 - **“My best estimate”** on TourMIS

Adaptive Qualitative Forecasting



Sharing data on tourism expenditures

Objectives:

1. Monitoring and comparing the daily expenditures of all and individual markets (domestic plus 59 foreign markets) for destinations who perform visitor surveys
Focus: Average daily expenditures of tourists (excluding transportation to the destination) broken down by
 - accommodation
 - food and beverages
 - entertainment
 - shopping
 - local transportation
 - other
2. Developing an econometric model which allows to estimate the direct economic contribution of tourism even if there is no or only incomplete data available for a particular destination

Thank you very much!

18:00	Transfer to Motel One Wien-Westbahnhof (for delegates not registered for our dinner event) or to restaurant Zum Martin Sepp (http://zummartinsepp.at/). We recommend that you take a scenic walk through the vineyards to the restaurant and join us there for the traditional Austrian food and wine.
18:30	Dinner at Zum Martin Sepp; Transfer back to hotel at 22:00.