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MSc Enterprise Software Systems Business Intelligence

Future Trends & Privacy in Analytics

(Sharda et. al. (2018) Business Intelligence, Analytics and Data Science: A Managerial Perspective.
Pearson, New York. ISBN 0134633288)

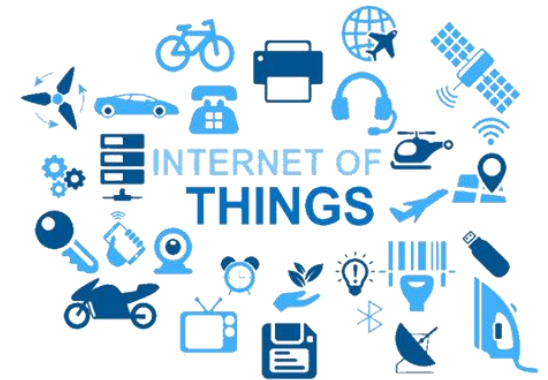
Objectives:

- ▶ Explore some of the emerging technologies that may impact analytics, business intelligence (BI), and decision support
- ▶ Internet of Things (IOT)
- ▶ Cloud computing and BI/Analytics
- ▶ Geospatial and location-based analytics
- ▶ Organizational impacts of analytics applications
- ▶ The major ethical and legal issues of analytics implementation

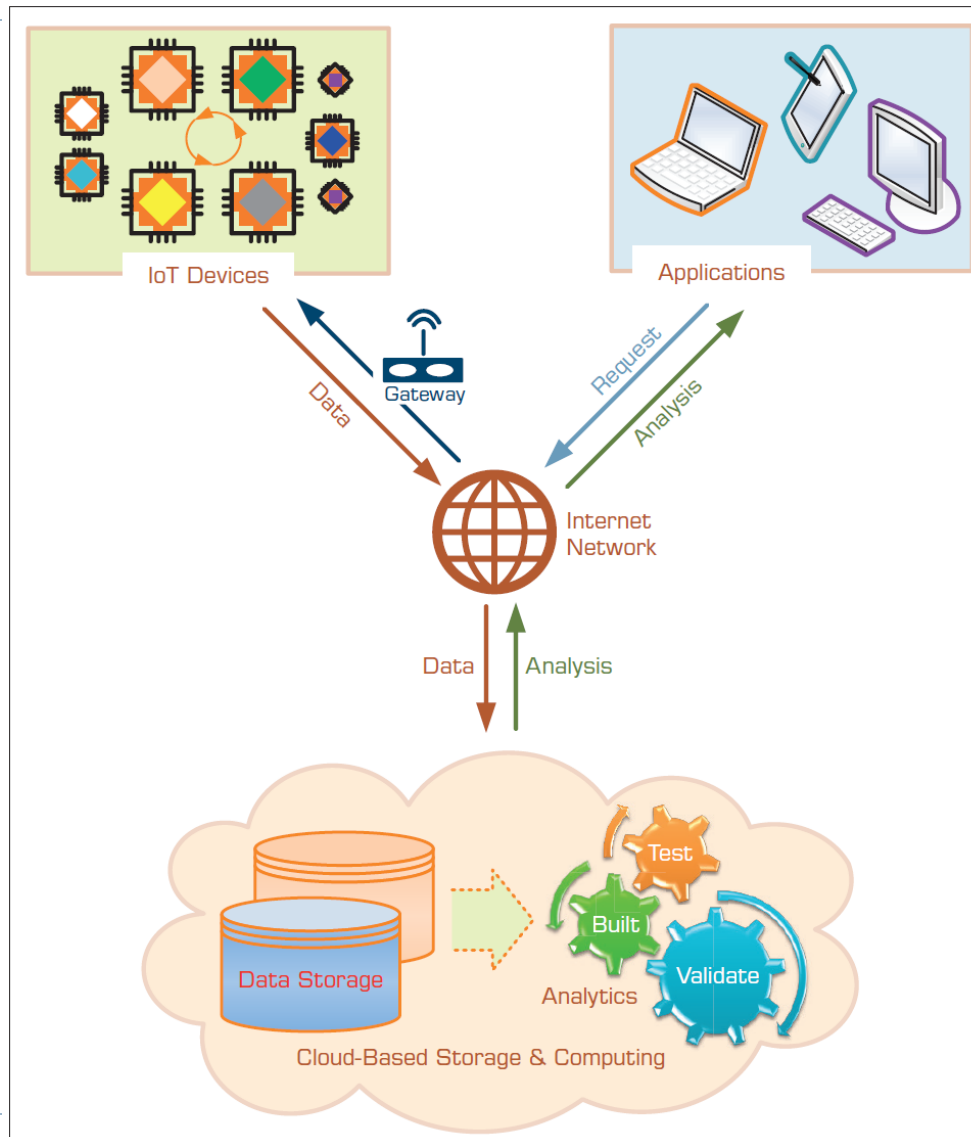


Internet of Things (IoT)

- ▶ IoT is an area with explosive growth
- ▶ Connecting physical world to the Internet
- ▶ By 2020, besides computing and communication devices (tablets, phones, and PCs), another 38 billion things will be connected to the Internet
- ▶ Enablers: sensors and sensing devices
- ▶ Example
 - ▶ Self driving cars
 - ▶ Fitness trackers
 - ▶ Smartbin – trash detectors detecting fill levels
 - ▶ Smart refrigerators, and other appliances



Building Blocks of IoT Technology Infrastructure



RFID Sensors



- ▶ RFID: radio-frequency identification
- ▶ One of the earliest/disruptive sensor technologies
- ▶ Part of a family of automatic identification technologies
 - ▶ Including ubiquitous barcodes and magnetic strips
- ▶ The goal is to use radio-frequency waves to accurately and quickly identify objects
- ▶ Used in supply-chain management – visibility
- ▶ Led/promoted by large retailers:
 - ▶ Wal-Mart, Target, Dillard's
- ▶ How it works –
 - ▶ **Tag** – a circuit attached to the product to be identified
 - ▶ **Interrogator** (i.e., reader) – with antennas and a computer to detect objects, store the data, and take due actions

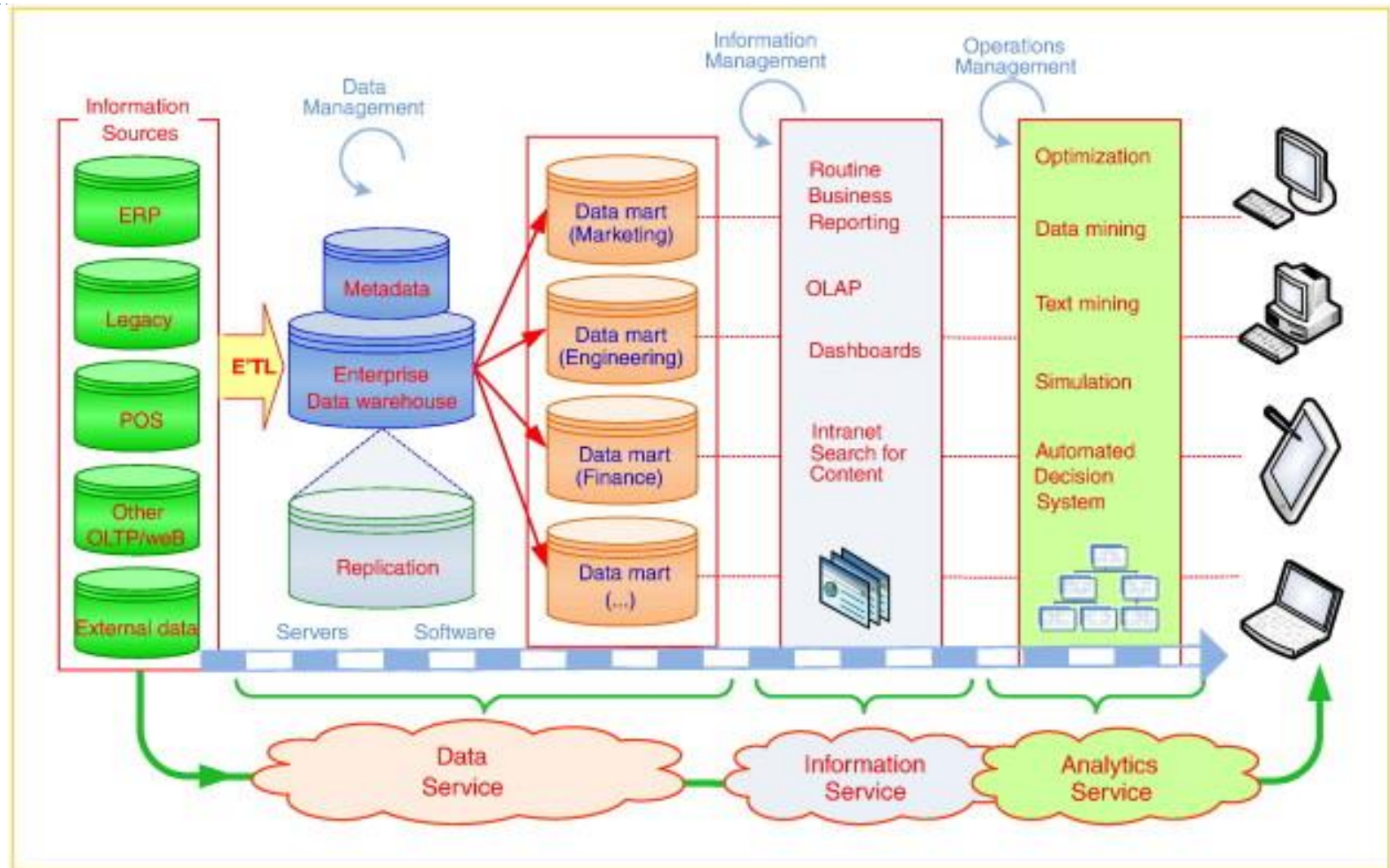


Cloud Computing and Business Intelligence

- ▶ A style of computing in which dynamically scalable and often virtualized resources are provided over the Internet (Wikipedia)
- ▶ Users need not have knowledge of, experience in, or control over the technology infrastructures in the cloud that supports them.
- ▶ Cloud computing = utility computing, application service provider grid computing, on-demand computing, software-as-a-service (SaaS),
- ▶ Examples:
 - ▶ Web-based e-mail , social networking sites, Google Docs, Google Drive,
 - ▶ e-commerce, BI, CRM, SCM.- Amazon's web services



Service-Oriented BI



Variations of Service-Oriented Architecture and the Cloud

- ▶ Data as a Service (DaaS)
- ▶ Software as a Service (SaaS)
- ▶ Platform as a Service (PaaS)
- ▶ Infrastructure as a Service (IaaS)
- ▶ ...



Major cloud platform providers in analytics:

- ▶ Amazon Elastic Beanstalk
- ▶ IBM Bluemix
- ▶ Microsoft Azure
- ▶ Google App Engine
- ▶ OpenShift



Representative Analytics as a Service Offering

- ▶ Teradata - Aster Analytics as a Service
 - ▶ IBM Watson Analytics
 - ▶ MineMyText.com
 - ▶ SAS Visual Analytic and Visual Statistics
 - ▶ Tableau
 - ▶ Snowflake
 - ▶ Predix by General Electric
- Most of these have free/restricted/trial offerings

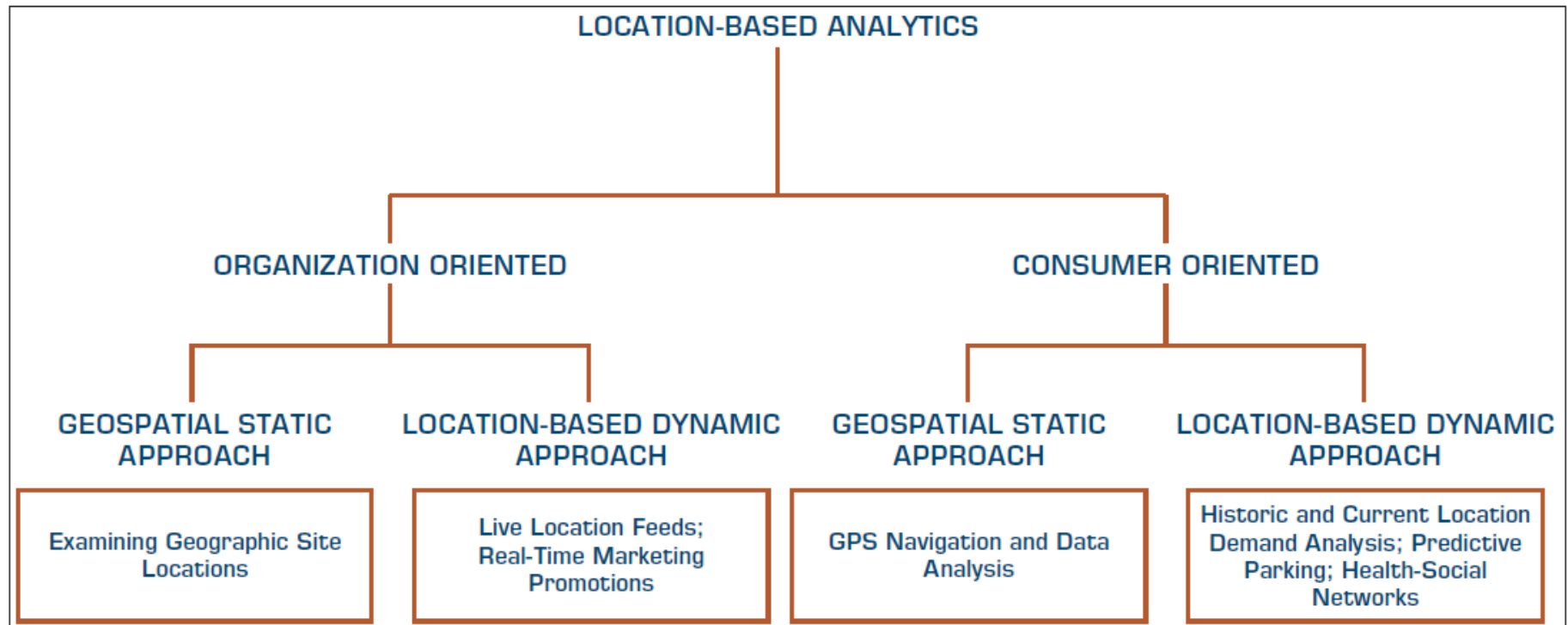


Location-Based Analytics

- ▶ Geospatial Analytics
- ▶ Geocoding
 - ▶ Visual maps
 - ▶ Postal codes
 - ▶ Latitude & Longitude
- ▶ Enables aggregate view of a large geographic area
- ▶ Integrate “where” into customer view



Location-Based Analytics



Location-Based Analytics

- ▶ Location-based databases
- ▶ Geographic Information System (GIS)
 - ▶ Used to capture, store, analyze, and manage the data linked to a location
 - ▶ Combined with integrated sensor technologies and global positioning systems (GPS)
- ▶ Location Intelligence (LI)?
 - ▶ Interactive maps that further drill down to data/information details about any location



Use of Location-Based Analytics

- ▶ Retailers – location + demographic details combined with other transactional data can help ...
 - ▶ determine how sales vary by population level
 - ▶ assess locational proximity to other competitors and their offerings
 - ▶ assess the demand variations and efficiency of supply chain operations
 - ▶ analyze customer needs and complaints
 - ▶ better target different customer segments
- ▶ In addition to business/retail applications, GIS based analytics are being used in
 - ▶ Agricultural applications
 - ▶ Crime analysis
 - ▶ Disease spread prediction



Use of Location-Based Analytics

▶ Global Intelligence

▶ U.S. Transportation Command (USTRANSCOM)

- ▶ track the information about the type of aircraft
 - ▶ maintenance history
 - ▶ complete list of crew
 - ▶ equipment and supplies on the aircraft
 - ▶ location of the aircraft
- ▶ → well-informed decisions for global operations



Real-Time Location Intelligence

- ▶ Many devices are constantly sending out their location information
 - ▶ Cars, airplanes, ships, mobile phones, cameras, navigation systems, ...
 - ▶ GPS, Wi-Fi, RFID, cell tower triangulation
- ▶ Reality mining?
 - ▶ Real-time location information = real-time insight
 - ▶ Path Intelligence (pathintelligence.com)
 - ▶ Footpath – movement patterns within a city or store
 - ▶ How to use such movement information



Real-Time Location Intelligence

▶ Example **Radii app**

- ▶ Collects information about the user's favorite locations, habits, interests, spending patterns, ...
- ▶ Radii uses the Gimbal Context Awareness SDK
- ▶ Combines time + place + duration + action + ...
- ▶ Assigns Location Personality → Recommendation

▶ **Cachetown** - reality-based game

- ▶ Encourage users to claim offers from select geographic locations
- ▶ User can start anywhere in a city and follow markers on the Cachetown app to reach a coupon, discount, or offer from a business
- ▶ User can point a phone's camera toward the virtual item through the Cachetown app to claim it
- ▶ Claims → free good/discount/offer from a nearby business

▶ Interesting Examples:

- ▶ CabSense – finding a taxi in New York City
- Rating of street corners; interactive maps, ...
- ▶ ParkPGH – finding a parking spot





Email

Password

SIGN IN

CREATE ACCOUNT

[Forgot Password ?](#)

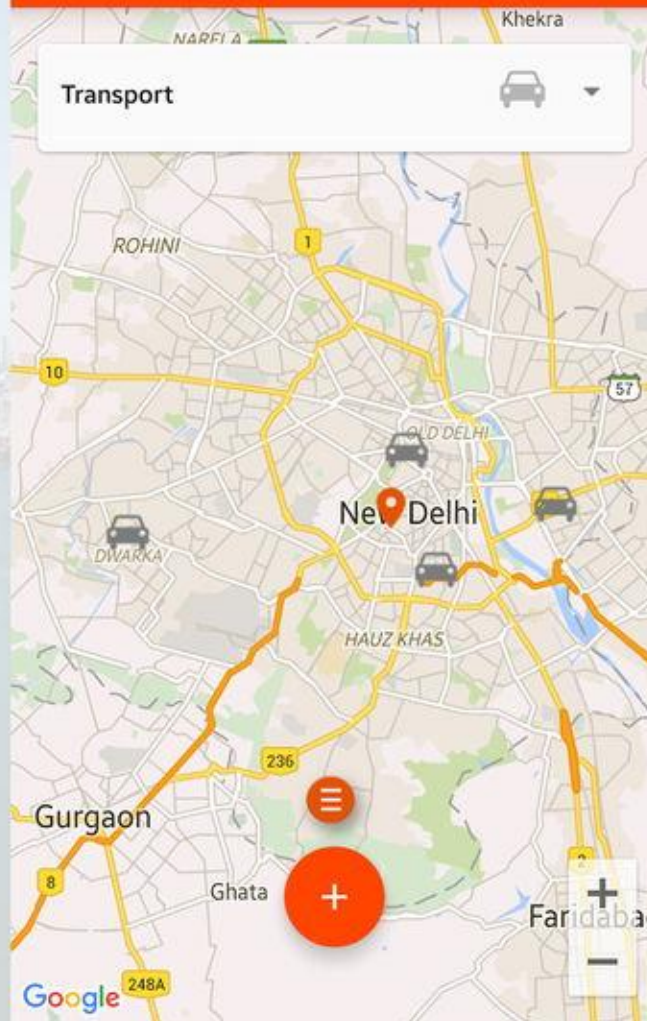


SIGN IN with FACEBOOK

Broadcasts Around You



RADII



Broadcasts Around You
Let's Carpool!

Car Pooling

Looking for car pooling partner to comply with good odd/even initiative by delhi government to reduce pollution. Post your requirements here and someone in your neighbourhood will connect with you...



4.21 Kms away
Saini Gali, New Delhi

Recommended Broadcasts

anybody for carpool... even numbered cars owners with offices in Shalimar Bagh please connect for car pool. I have an odd numbered vehicle which we can car pool as well



14.93 Kms away
Dwarka, New Delhi

Emerging Trends...

1. Advanced social analytics
2. More predictive analytics
3. Interest grows in data visualisation
4. Self service
5. Hadoop matures
6. Data scientists

Resources:

[Tableau: 2018 Top 10 Business Intelligence Trends](#)

[Geospatial analytics](#)

[BI – IOT and Cloud](#)



Issues of Legality, Privacy, and Ethics

▶ Legal issues to consider

- ▶ What is the value of an expert opinion in court when the expertise is encoded in a computer?
- ▶ Who is liable for wrong advice (or information) provided by an intelligent application?
- ▶ What happens if a manager enters an incorrect judgment value into an analytic application?
- ▶ Who owns the knowledge in a knowledge base?
- ▶ Can management force experts to contribute their expertise?



Issues of Legality, Privacy, and Ethics

- ▶ **Privacy** - The right to be left alone and the right to be free from unreasonable personal intrusions
 - ▶ Collecting information about individuals
 - ▶ How much is too much?
 - ▶ Mobile User Privacy
 - ▶ Location-based analysis/profiling
 - ▶ Homeland Security and Individual Privacy
 - ▶ Recent Issues in Privacy and Analytics
 - ▶ “What They Know” about you (wsj.com/wtk)
 - ▶ Rapleaf (rapleaf.com), X + I (xplusone.com), Bluecava (bluecava.com), reputation.com, sociometric.com...
 - ▶ Who owns our private data?

Issues of Legality, Privacy, and Ethics

- ▶ **Ethics in Decision Making and Support**
 - ▶ Electronic surveillance
 - ▶ Software piracy
 - ▶ Invasion of individuals' privacy
 - ▶ Use of proprietary databases
 - ▶ Use of knowledge and expertise
 - ▶ Accessibility for workers with disabilities
 - ▶ Accuracy of data, information, and knowledge
 - ▶ Protection of the rights of users
 - ▶ Accessibility to information
 - ▶ Personal use of corporate computing resources
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