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2-6 May 2016

Recovery
from disaster

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Big Data for Disaster Management and Real estate Management in Smart Cities

TS05H - Land Policy and Management as a Tool for Disaster Recovery
Manohar Velpuri (Denmark) and Anusha Pidugu (India)

4 May 2016

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Structure of Presentation

Scope and Approach
Smart cities and Disaster
      Smart cities, Smart cities Map
      Disasters mapped
Case study : Disaster smart cities in India
         Case study - Cyclone Visakhapatnam, Chennai
BigData approach for smart cities : Disaster management and Real estate
         BigData and Real estate, Disaster Management
         Smart city and IBM
         Social media and Cyclone Chennai
Conclusions

Scope & Approach

- Framework to use Big Data in particularly disaster prone areas of the globe.
- Investigate the nature of social media generated during disaster
- Define a list of content categories taking into consideration the information in disaster phases
- Proactively preventing real estate market turbulences.
- Smart cities governance can leverage on this Big Data to plan effective disaster management

Smart Cities and Disasters

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Smart Cities

Approximately 116 existing definitions of smart sustainable cities were studied and analysed

Key categories and indicators were established and a list of 30 key terms to Smart and sustainable cities :

ICT	Standard of living	Water
Adaptable	Employment	Utilities and energy
Reliable	Citizens	Telecommunications
Scalable	Well-being	Manufacturing
Accessible	Medical Welfare	Natural and man-made disasters
Security	Physical safety	Regulatory and compliance
Safe	Education	Governance
Resilient	Environmental	Policies and processes
Economic	Physical and service infrastructure	Standardization
Growth	Transportation and mobility	

Source : https://www.itu.int/en/ITU-T/focusgroups/ssc/.../**TR-Definitions.docx**

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Source: ICF Website, 12/10/2011: Chung Hua University Smart City Laboratory, Jie Hong Nian, Lin Zi Xian, 2012

Disasters - Mapped
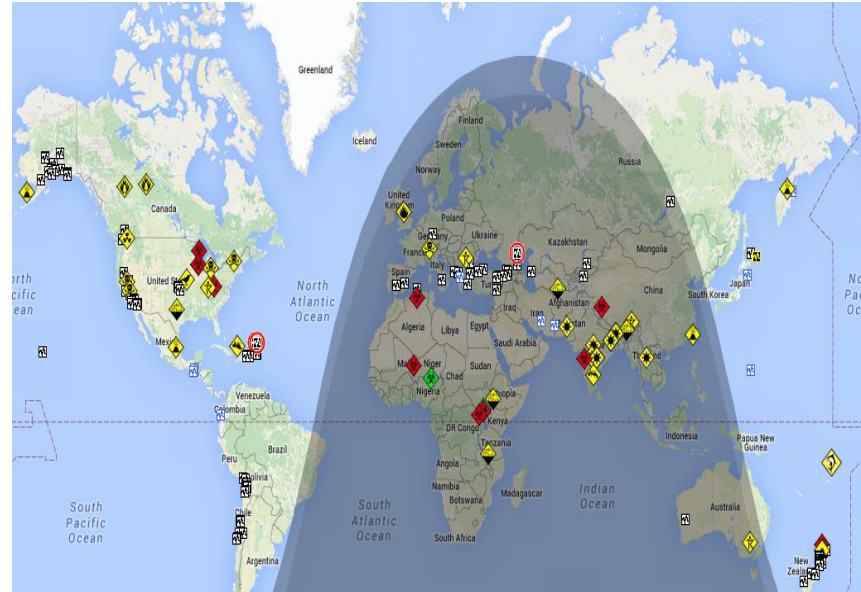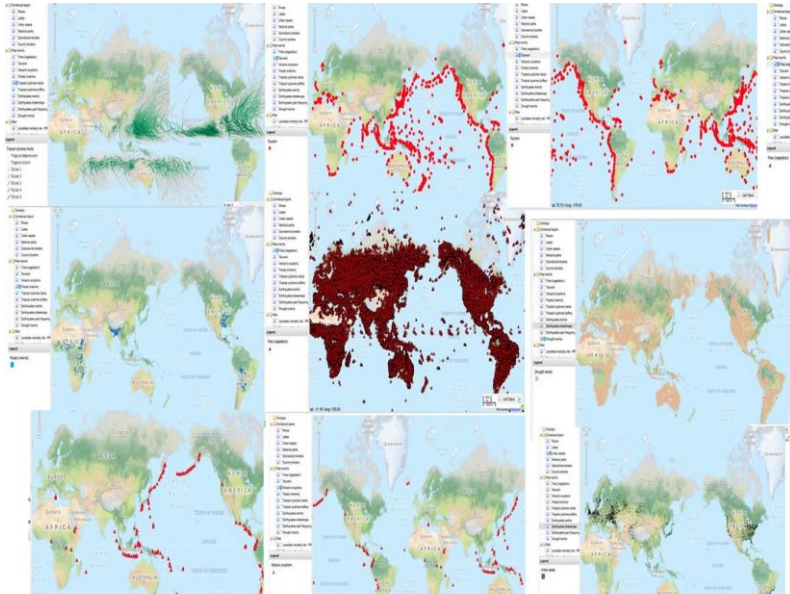
| Emergencies 2 | Short event 19 | Long time event 21 | Earthquakes 148 | Tsunami 0 | Volcano Activity 10 | Tropical Storms 0 | Supervolcano Monitoring System 18 | Earth Approaching Objects 10 |

Source : http://hisz.rsoe.hu/alertmap/index2.php (4 May 2016)

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Case Study (Disaster in smart cities in India)

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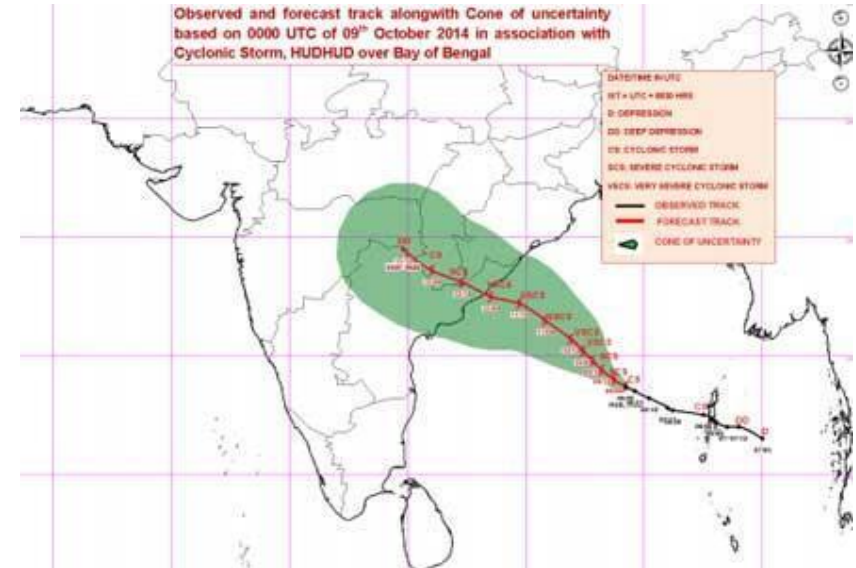CHRISTCHURCH, NEW ZEALAND
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Case Study : Cyclone Hud Hud (Visakhapatnam)

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Case Study : Cyclone Hud Hud

- loss of nearly INR 8,000 crore to both public and private properties
- extensively damaged the roof of the airport building and terminal
- number of registered sales of property steadily remain cautious for 6 months.

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Case Study : Cyclone Chennai
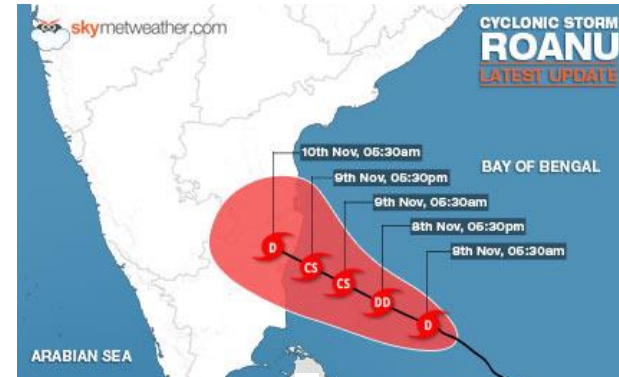
- Chennai real estate market sustained an estimated loss of nearly ₹30000 crore (US$4.5 billion),while over 20,000 small and medium industrial units across Tamil Nadu reported total losses of over ₹14000 crore(US$2.1 billion)

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Big Data Approach for Smart cities
- Disaster management
- Real estate

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Big Data and Real Estate (I)

Source : Global map of Big Data and real estate. (JJLC research)
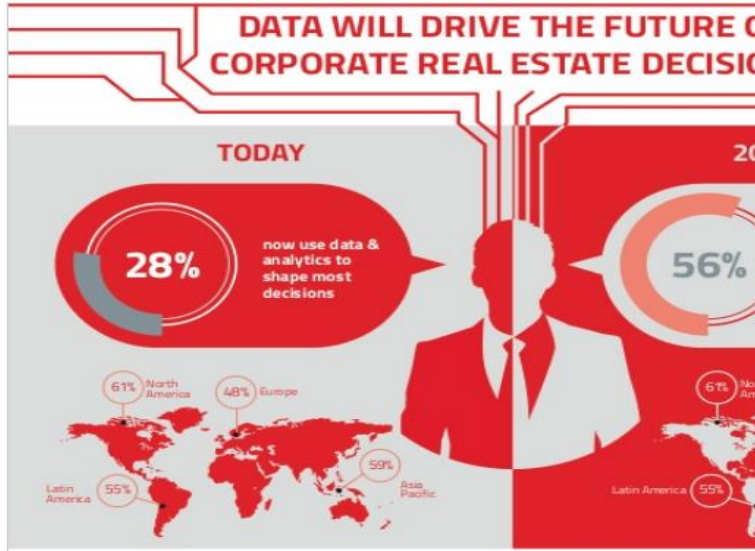
- Two major sources of big data, dedicated sensor networks and multi-purpose sensor networks have demonstrated usage in disasters such as the Tohoku Earthquake

- Two of the major big data challenges are: Variety and Veracity

- Building data can give executives invaluable insight into how the office is actually utilized by employees

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Big Data and Real Estate (II)

Realtors helping clients price and sell a home had to utilize hard, transactional data on recent comparable sales but also had to draw on bigger data sets about appeal of neighbourhood, types required for potential buyers, and general economic trends at the national and local level.

Government and infrastructure agencies are able to instantly predict the next hot development zones through use Cases of Big Data in Real Estate

Big Data enables the accurate reporting of every aspect of the project ranging from labor performance & construction quality to asset maintenance & budget spirals high budgets complex construction cycles exhaustive inventory management and mass labor inputs.

Big Data and Real Estate (III)

- Most important application of BIG Data would be that it can predict future shortcomings & delays as well as provides solutions as to how they can be evaded. Delays & operational hassles often occur on large-scale construction projects these can result in budget spirals.

- Developers can track the performance & competency of labor equipment materials and deadlines to ensure that the project wraps up without any delays or hassles.

- Smart Search via Lifestyle Scores & Trends can be linked to property websites to assign lifestyle scores and generate price-demand heat-maps for specific areas.

- Using predictive analytics the value of properties in that area for forecast. Big Data makes this possible by permitting the tracking of property value trends, real-time rental & purchase demand as well as the growth of lifestyle establishments in the locality.

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Big Data and Disaster Management

- 4 phases of disaster management: (Neal , 1997)
  Prevention, Preparedness, Response, Recovery
- Vieweg defined a complete list of categories for coding social media message
  Caution & Advice
  Fatality
  Injury
  Offers of Help, Missing, and General Population Information.
- Extracted tweets for natural disasters classification (Imran et al, Purohit et al 2013)
  caution and advice
  casualty and damage
  donation and offer, and information source,
  Request and Offer

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Smart city - Disaster management

- IBM Corp, had come forward to prepare a disaster management plan for Visakhapatnam as part of their social responsibility — IBM Smarter Cities Challenge.

- Visakhapatnam is one among those three cities in India and 16 across the world IBM has identified to take up the social responsibility

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Big Data and Disaster Recovery (Vizag)

- Large portion of chats are related to impact categories on the day of the disaster.
- The impact topic reaches its maximum on 9 October, two days after HudHud moved away from Visakhapatnam.
- Cyclone dissipated, it can be observed that an increasing number of media responses are about recovery (after 15 November) on disaster recovery had several peaks.
- The first one was on 9 October, two days after HudHud hit the area.

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Social media : Cyclone Chennai

- In Chennai, people across the city used social media channels like Twitter, Whatsapp, and Facebook. (offered aid, shelter and food)
- Social media sites were used for information about flooded areas, rescue agencies and food and relief centers.
- (ChennaiRains.org) to crowd source information about people needing help and about those who were ready to help.
- Celebrities participation (RJ Balaji, actor Siddharth and Chinmayi) in the relief process by using social media to coordinate aid and gather information
- Several Twitter hashtags including #ChennaiFloods, #ChennaiRains and #PrayForChennai were among the top trending hashtags across Twitter in India
- Indian real estate portal Commonfloor.com created links on its company website for people who need shelter or want to offer shelter. commonfloor.com also created a list of flood safe localities where victims of the flood can look for shelter

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Conclusions

- Property sales are made easy through online exchange of information or data

- Big data and mobile computing can be leveraged by brokers, agents and real estate portals to more effectively market homes to consumers.

- IoT and predictive analytics are helping the real estate industry better understand transaction and market data to the benefit of the industry, agents and consumers

- The amount of data collected will likely continue to increase and will be used more to predict buyer and seller behavior as well as trends in home preferences and neighborhoods

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