



**ITU Kaleidoscope 2014**

**Living in a converged world - impossible without standards?**

# **Comparison of WiBro and TD-LTE through the Social Network Analysis**

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# Introduction:

## Rise in TD-LTE and Decline in WiBro

- As of July 2013, 59 TD-LTE networks are in deployment or planned to be deployed in the global market, including 18 commercially launched network
- Many of the Mobile WiMax service providers, such as Clearwire (US), UQ (Japan), Yota (Russia), P1 (Malaysia), have decided to provide TD-LTE
- WiMax Forum has agreed to integrate elements of TD-LTE into WiBro

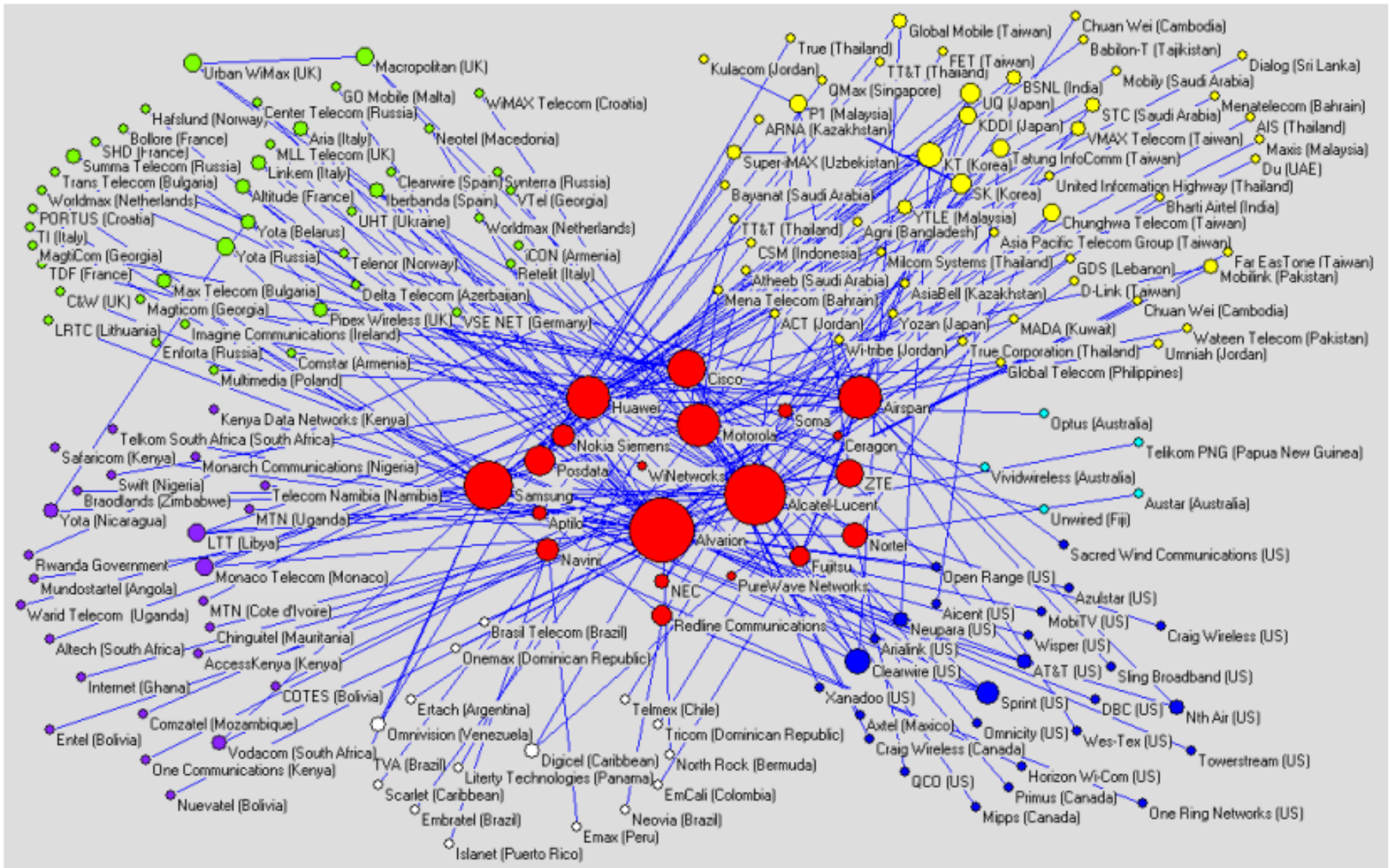
# Research Question

- What are the differences between WiBro and TD-LTE in the deployment process of the standards in the global market, which can be attributed to the failure of WiBro and success of TD-LTE?
- To this end, this paper studies the effect of network composition of two standards

# Methodology and Data Collection

- Methodology: Social Network Analysis
  - Network composition has been considered a resource that which may confer firms a sustainable competitive advantage (Gulati 1999)
  - The network composition of a focal firm and its partners may affect the success/failure of a standard in the market
- This study focuses on the data of transactions among telecom service providers and vendors, such as procurement contracts and MOU for collaboration
- For collection of data, the authors first examined industry reports and identified focal firms. Then we searched focal firms' transaction records through relevant industry news and reports, firms' homepages, blogs tailed to WiBro and TD-LTE news

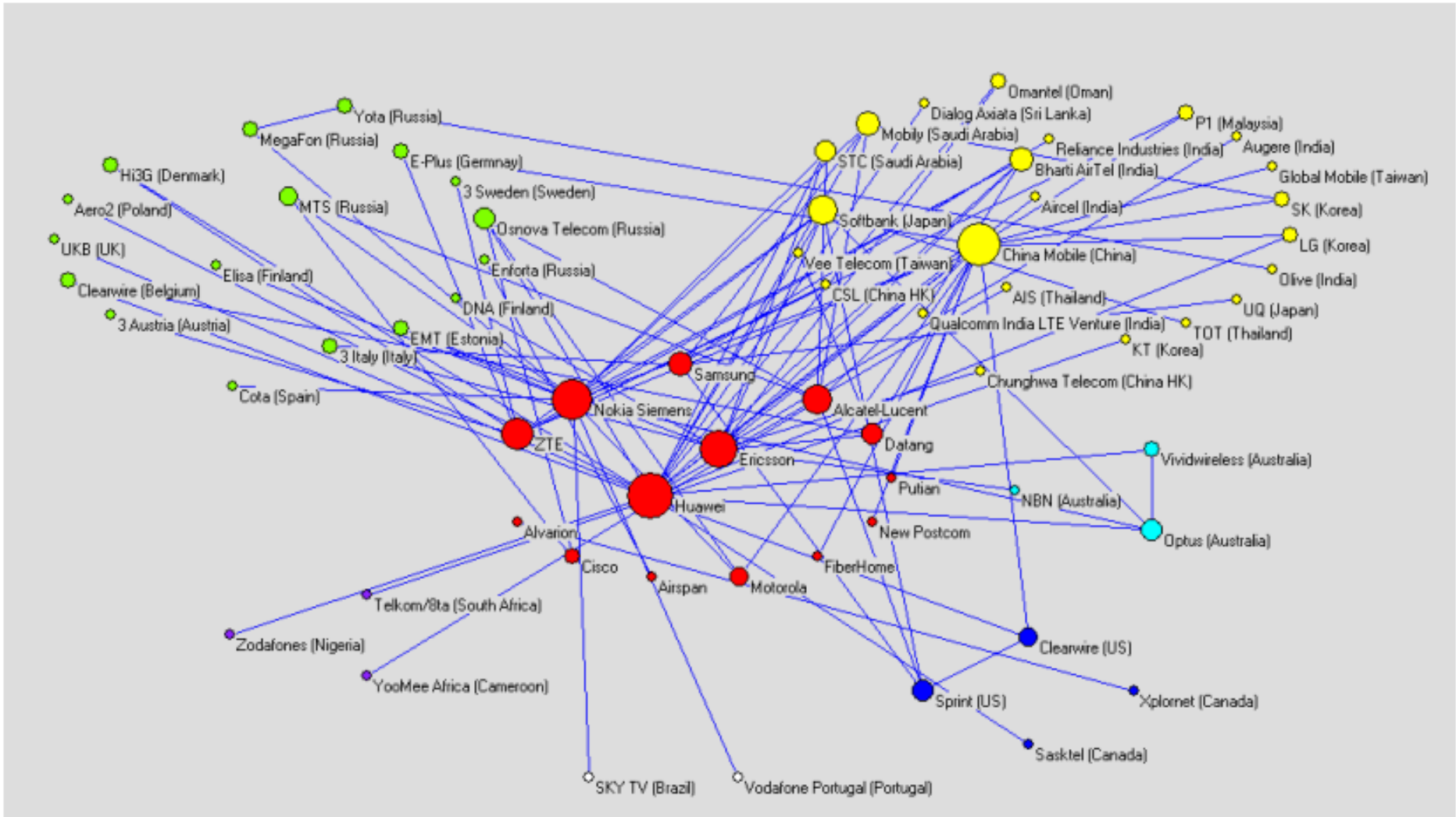
# Network of WiBro Delopymnt



**Figure 1.** Network of WiBro (Mobile WiMax) Deployment in the Global Market (N=185)

Note: 20 Vendors (Cluster at the Center), 40 Service Providers in Europe (Upper Left), 51 Asia (Upper Right), 5 Oceania (Right), 26 North America (Lower Right), 16 South America (Lower Left), 25 Africa (Left).

# Network of TD-LTE Deployment



**Figure 2.** Network of TD-LTE (LTE-TDD) Deployment in the Global Market (N=66)  
 Note: 14 Vendors (Cluster at the Center), 17 Service Providers in Europe (Upper Left), 23 Asia (Upper Right), 3 Oceania (Right), 4 North America (Lower Right), 2 South America (Lower Left), 3 Africa (Left).

# Degree and Eigenvector Centralities

**Table 1.** Degree and Eigenvector Centralities of WiBro Network

Vendors/ Service Providers	Degree	Normalized Degree	Eigenvector	Normalized Eigenvector
Alvarion	38	20.652	0.468	66.174
Alcatel- Lucent	35	19.022	0.455	64.415
Samsung	22	11.957	0.229	32.451
Motorola	19	10.326	0.05	7.121
Huawei	19	10.326	0.089	12.563
Clearwire (US)	6	3.261	0.075	10.629
KT (Korea)	6	3.261	0.059	8.32
Sprint (US)	5	2.717	0.08	11.287
UQ (Japan)	4	2.174	0.048	6.812
SK (Korea)	4	2.174	0.121	17.103
Network Centralization (Degree) = 19.571%				

**Table 2.** Degree and Eigenvector Centralities of TD-LTE Network

Vendors/ Service Providers	Degree	Normalized Degree	Eigen- vector	Normalized Eigenvector
Huawei	18	27.692	0.395	55.793
China Mobile (China)	16	24.615	0.394	55.735
Nokia Siemens	14	21.538	0.326	46.135
Ericsson	12	18.462	0.260	36.829
ZTE	9	13.846	0.204	28.905
Alcatel- Lucent	7	10.769	0.181	25.562
Softbank (Japan)	7	10.769	0.247	34.877
Mobily (Saudi Arabia)	5	7.692	0.173	24.512
Bharti AirTel (India)	5	7.692	0.201	28.429
STC (Saudi Arabia)	4	6.154	0.192	27.104
Network Centralization (Degree) = 24.038%				

# Findings

- Widespread Deployment of WiBro
  - The widespread deployment of a standard does not guarantee success in the global market
- Leading Role of China in TD-LTE Deployment
  - TD-LTE network is more centralized, which indicates a smaller number of actors holds a critical role
  - Those influential players in the network are Chinese firms, especially China Mobile and Huawei
  - China Mobile is the world's largest mobile telecom operator whose massive purchasing power attracts the attention of equipment vendors
- Vigorous Participation of the World's Top Telecom Equipment Vendors in TD-LTE Deployment
  - Huawei, Nokia Siemens, Ericsson, ZTE and Alcatel-Lucent play a significant role in the TD-LTE network
  - In contrast, Ericsson, Nokia Siemens and ZTE did not take any part in the WiBro deployment



# Discussion

- The price competitiveness and fast data speed of WiBro was likely to contribute to its widespread deployment. Yet the extensive deployment of WiBro does not assure its long term success
- The role of China Mobile is critical in the deployment of TD-LTE. Its massive purchasing power draws the world's top telecom gear vendors into the deployment of TD-LTE
- In contrast to the leading role of China Mobile, the Korean largest telecom operator SK was passive in promoting WiBro because potential cannibalization effects on its existing investment
- This study provides policy implications that a government should examine the willingness and capabilities of leading players in a deployment of a new standard and potential cannibalization effects on their sales, if it want to successfully launch a new standard in the market