Conceptual Framework of CORS Network for Precise Point Positioning Applications in Pakistan

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Background

- GNSS Technology is being used for standard positioning & tracking applications and precise point positioning applications in Pakistan
- Government and Private sectors are employing Real Time Kinematic (RTK) technique for precise point positioning applications
- Core inclusion areas are Surveying, GIS and Construction
- No homogeneous grid available
- Uncoordinated and Ad-hoc approach, therefore not meeting the long term demand of government and private sector
- Individual setup has limited the RTK technology to fewer companies and institutions
- There is no CORS network to fully exploit the RTK technology and it's applications

Motivation
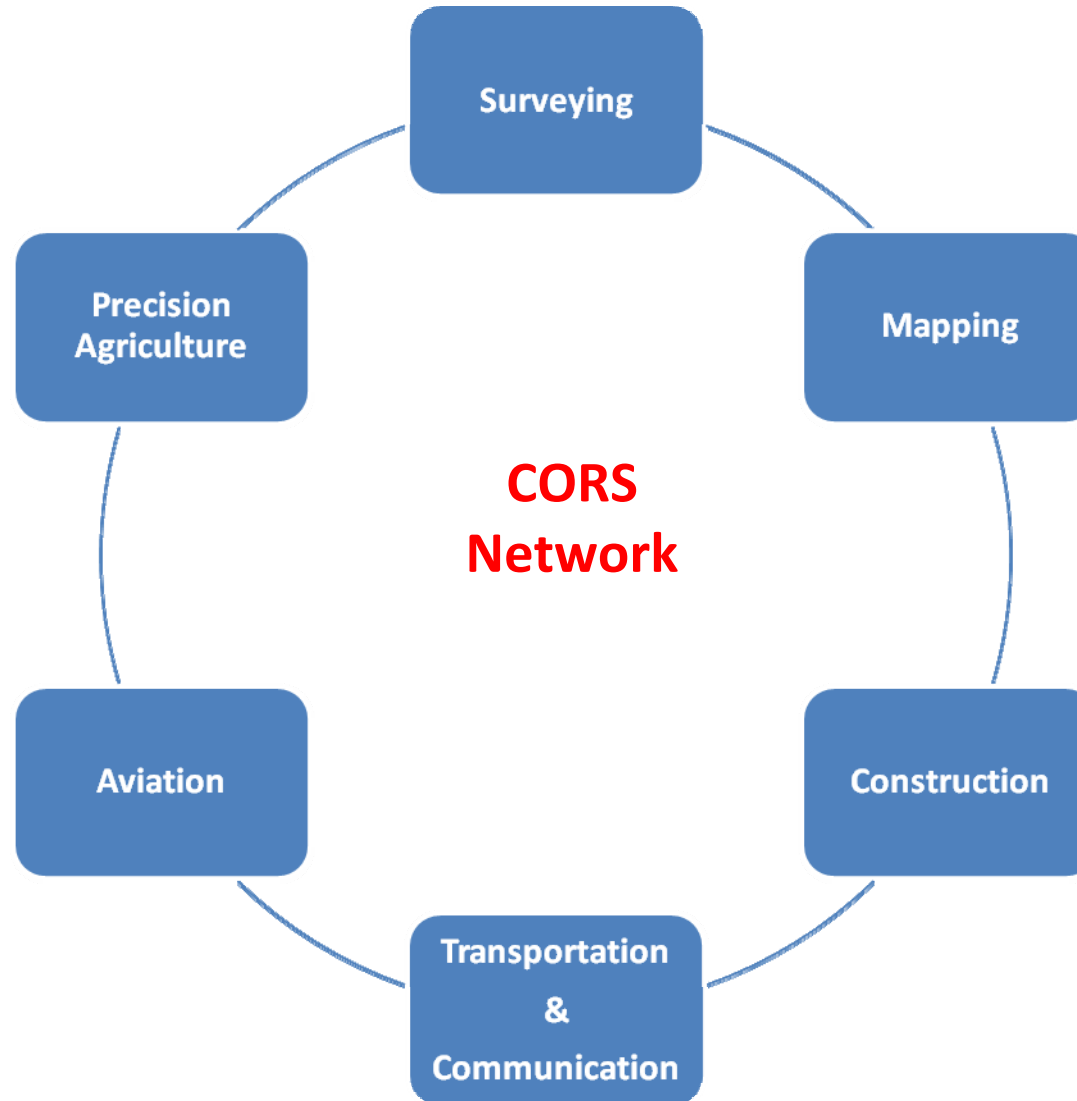
CORS Network for Pakistan

"CORS Network for Pakistan addresses the establishment of CORS all over the Pakistan streaming GNSS correction to authorized users and consequently achieving centimeter to millimeter accuracy nationwide on a common datum."

Vision & Mission

- Vision
  - Be a pioneer in providing and maintaining high accuracy positioning services nationwide through high level of ethical and professional values

- Mission
  - To develop, operate and maintain the RTK network as a National Positioning Service for public and corporate sectors delivering economic, environmental and social benefits

Scope

- Network RTK approach
- Reliable, Accurate, Robust and Economical (RARE) Positioning Service
- 80 to 100 base station across the country
- Backbone for providing common datum

Target

- Positional accuracy
  - 2 to 5 centimeter in real time
  - 2 to 5 millimeter in post-processing
- Interoperable Service

Objectives

- A national standard for location based information.
- To provide fast, economical and accurate position, velocity and time services for authorized users on a variety of platforms.
- To maximize the benefit of satellite based precise positioning and timing information for Pakistan.
- To improve technology of surveying, mapping, GIS and town planning
- Enhance national scientific and technical capabilities.
- Continuously model the size of the effects of different error sources in the GNSS.
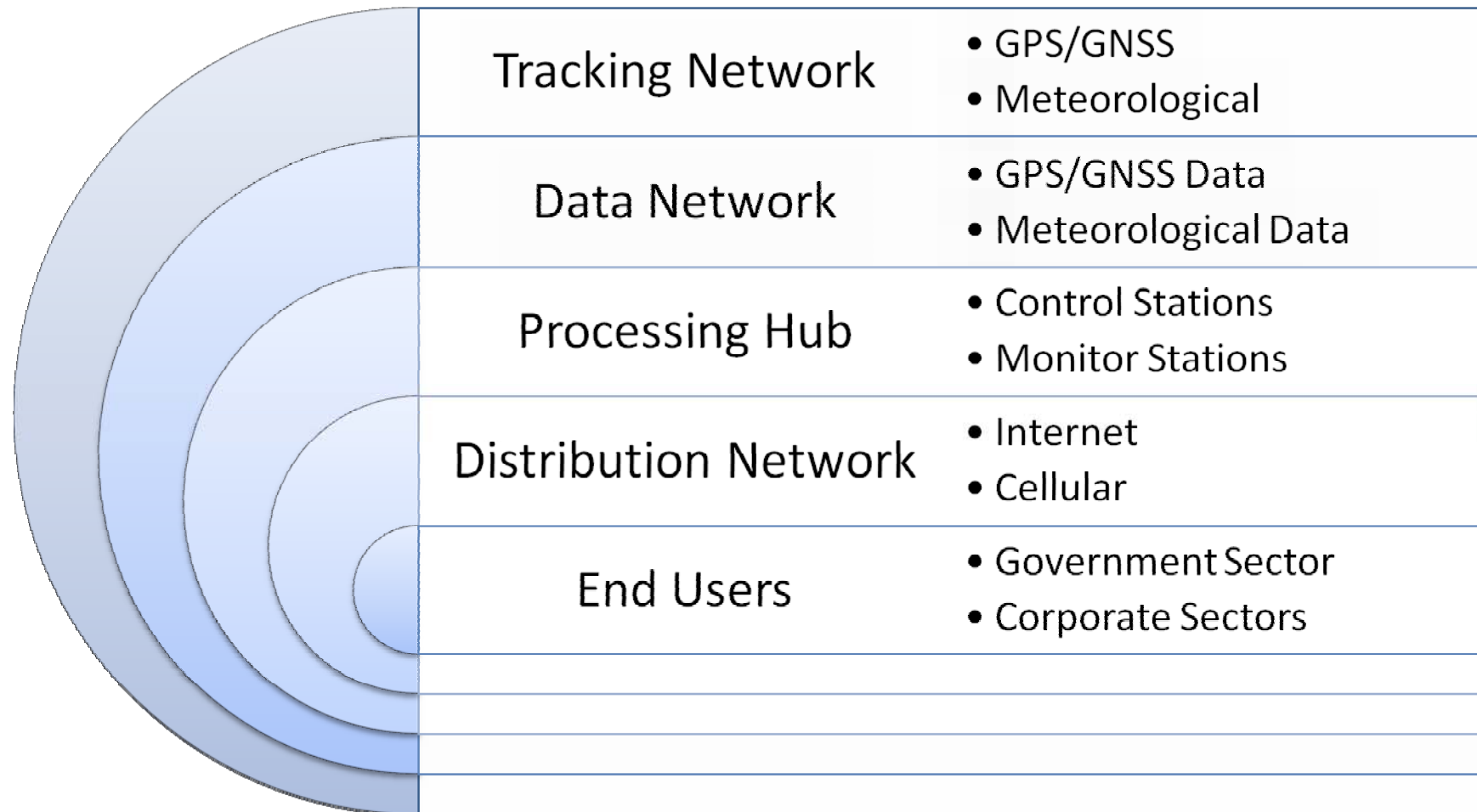- Plat tectonic movement study

Deliverable

- Precise homogeneous geodetic position to subscribed user
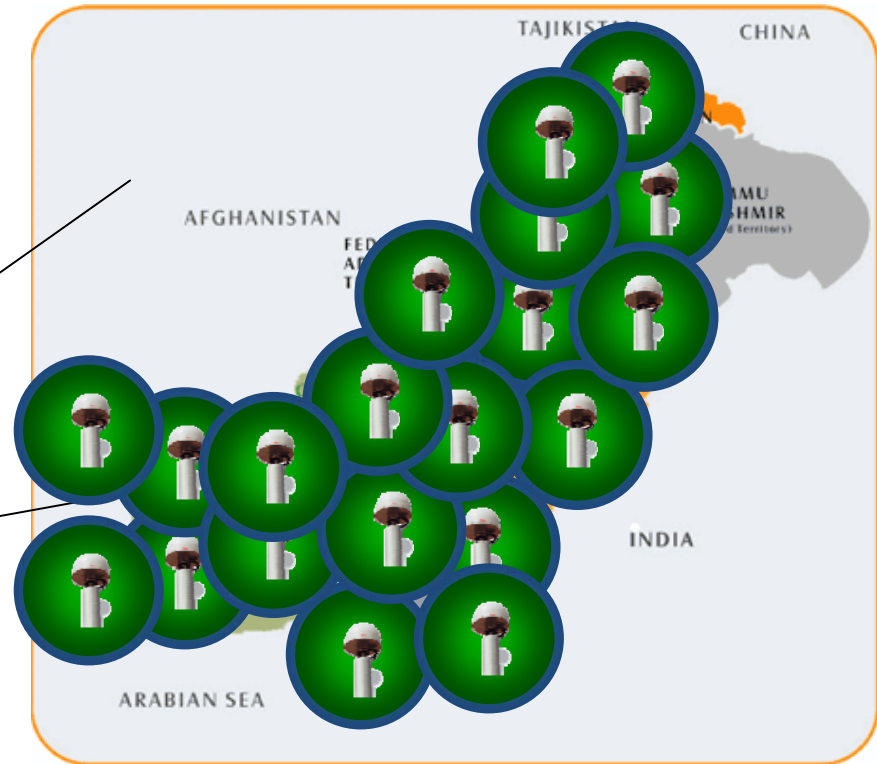- Scientific studies, especially related to atmospheric and plate tectonic

Services

- Post-processing data through a WWW/FTP (Internet) service (Accuracy 2 to 5 millimeter)
- PRNPS Automatic Computation Service on the server (Accuracy 2 to 5 millimeter)
- Real-time CORS network service (Accuracy 2 to 4 centimeter)
- Training courses for end users, state officials and international students in GNSS applications

Strata

Tracking Network	• GPS/GNSS • Meteorological	
Data Network	• GPS/GNSS Data • Meteorological Data	
Processing Hub	• Control Stations • Monitor Stations	
Distribution Network	• Internet • Cellular	
End Users	• Government Sector • Corporate Sectors	

Infrastructure

GNSS raw observation (and ephemeris) data from the reference stations

Reference data (RTCM)

Control centre

GNSS position (NMEA)

User

SWOT Analysis

Strengths

► National standard for location based information

► Independent and vendor neutral

► Enhance national scientific and technical capabilities

Weakness

► Low end user knowledge base

► Reluctance to adapt newer technology

Opportunities

► Pioneer in RTK Networks

► Project cooperation with CAA, mapping agencies and other govt. agencies etc

► Common datum

Threats

► Communications uncertainty

► Inadequate IT, Electricity and business systems

► Technology developing rapidly

Conclusion

- Utilizing the modern technology for geo-positioning applications

- Enhance the technological and scientific boundaries of the country

- Unfolding the potential applications in Pakistan e.g., Common datum, Up-to-date mapping infrastructure, Modern technology in mining and agriculture and disaster management

Thanks for your attention

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