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India SMART UTILITY Week 2025

Session : AMI – International Experiences

GRIDSPERTISE - AMI GLOBAL AND ITALIAN EXPERIENCE

Presented By

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GRIDSPERTISE PRESENTATION

India SMART UTILITY Week 2025

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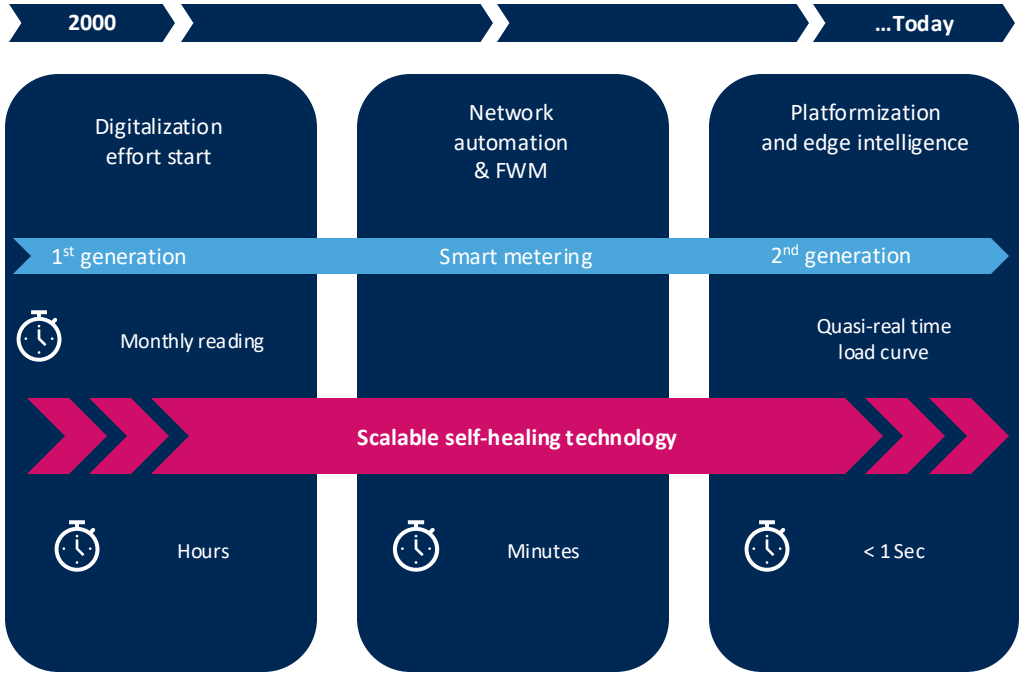
Our Story

Set up in **2021 as a carve out of Enel's** experience in developing and scaling up digital technologies to transform distribution networks into smart grids, Gridspertise consolidates **20+ years of Enel know-how in smart grids** in an independent company, jointly controlled by Enel Group and CVC Capital Partners since Dec '22. In Nov '23 Gridspertise acquired Aidon, a **smart metering leader in the Nordics,** and founded with Cuculus the JV neugemacht for German market**.**



Our Mission

Deliver a new era of sustainable and reliable smart grids

Our Vision

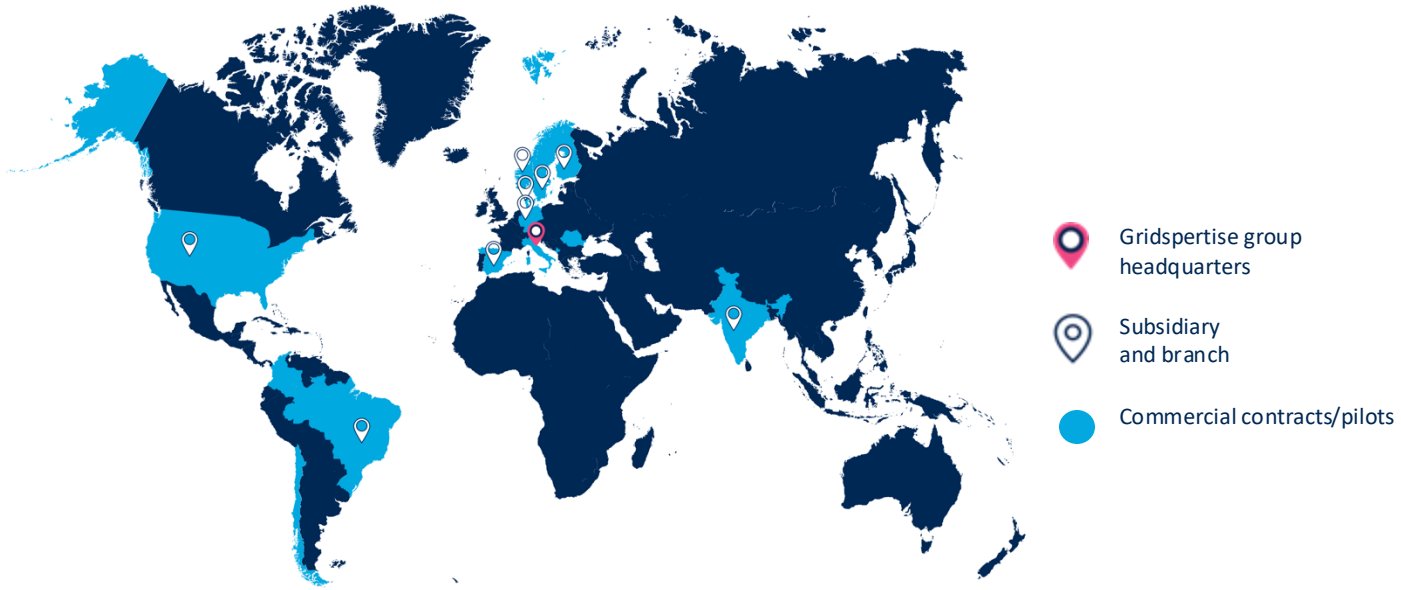
Upgrade grid users' experience through cutting edge sustainable solutions for the digitalization of energy transition actors

Our Ambition

Impact change in the broader industry and society to accelerate the transition to a sustainable energy future

Our Global Presence [1]

gridspertise accelerating your electric future · Aidon a gridspertise company · neugemacht



465 employees[1]

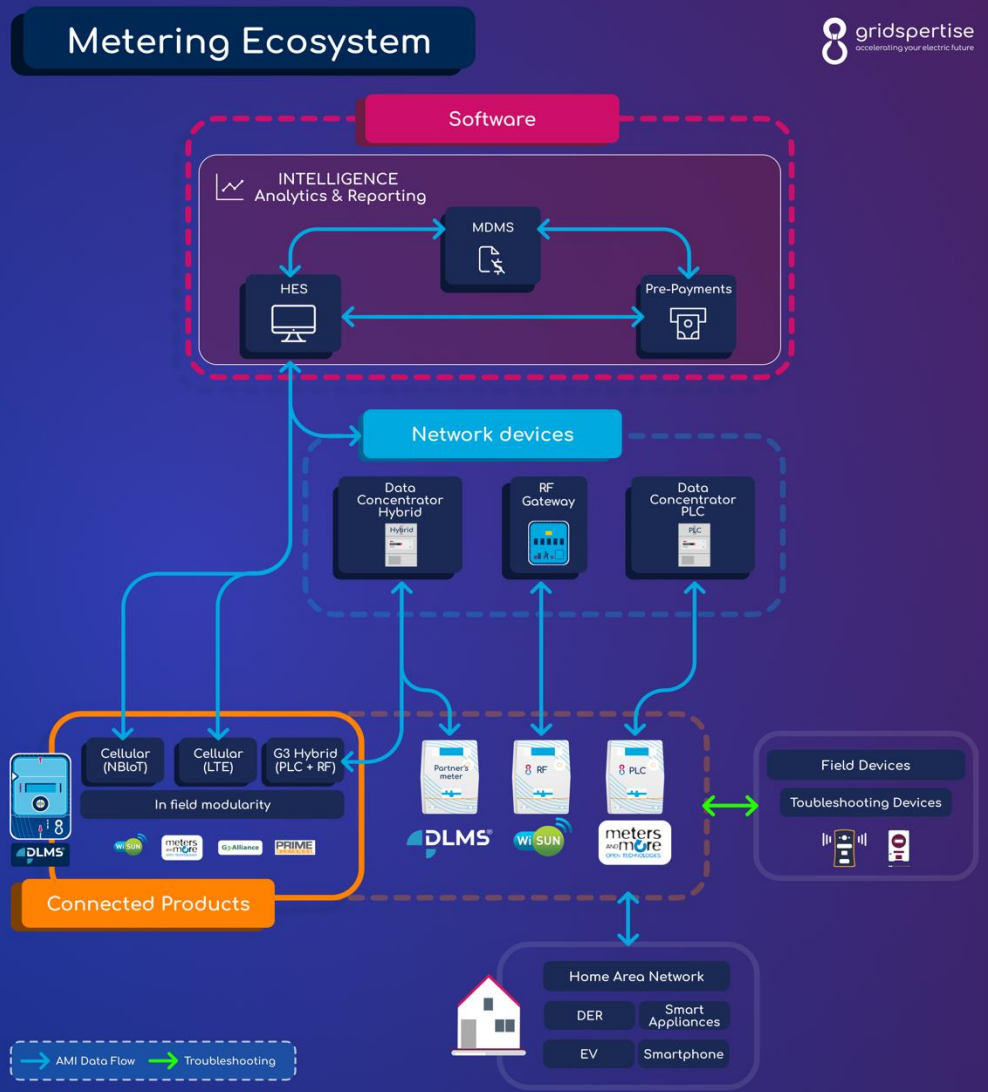
~113M smart meters[2]

210+ clients worldwide[3]

>1M smart meters in MaaS[4]

1 - Gridspertise, Aidon and neugemacht, Dec. 2024
2 - Cumulated Smart Meters produced with Gridspertise (2001 - Dec. 2024) and Aidon (2004 - Dec.2024) technology
3 - Cumulated Gridspertise and Aidon customers, Dec. 2024
4 – Energy metering points in Aidon's Metering Service, Dec. 2024

AMI: A COMPREHENSIVE ECOSYSTEM

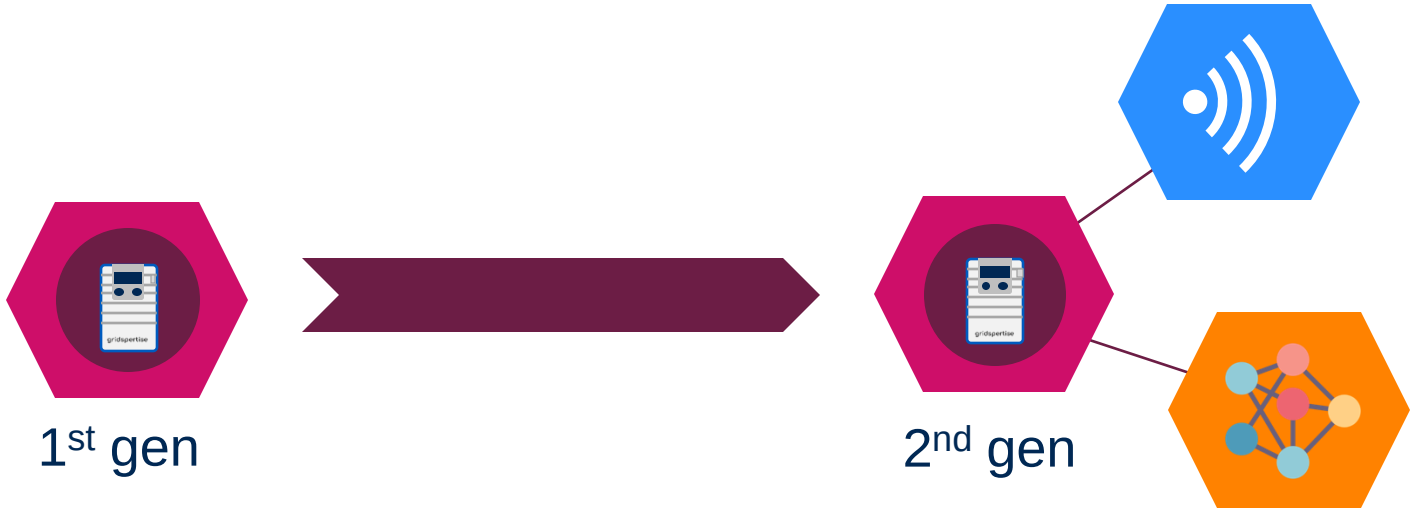


The Metering Ecosystem is an interoperational platform that makes a wide assortment of devices and systems, integrating components and solutions that talk to each others with several communication systems and standard protocols.

CONTEXT: CHALLENGES AND TRENDS

What are the current trends?

The first smart meters aimed to digitalize readings of electricity consumption, providing benefits on billing and operations along the expected designed lifetime (15 years in italy and Spain). Today, **smart meters need to turn into intelligent sensors to tackle the increasing complexity of the grid** as well as facilitating a more active role of the customer in the energy market and encourage the penetration of distributed renewable resources.



Technology standards are changing rapidly, and the market is highly fragmented. Not all technologies perform evenly under different circumstances. **Keeping pace with the evolving technology** is a challenge to achieve a sustainable competitive advantage.

The number of IoT is increasing in urban environments, what reduces the quality of the signal in some locations. At the same time, they need to **ensure interoperability, interchangeability and interconnectivity** as well as security of communication.

FROM THE FIRST GENERATION….

2001 | 2008 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023

1st generations of Smart Meters

Telegestore

Italy
32 M SM

Cervantes

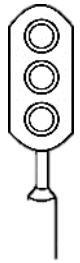
Spain 12M SM

Romania 1,5M SM

End customers
- Invoices on real consumption
- Remote contract mgmt.
- Multiple/Tailored tariffs
- Greater awareness

Regulator
- Sector development
- Improved quality of Service (technical & commercial)
- Enabling free market
- RAB* model

Others



Decrease expenses for field operations
- Remote readings
- Remote work orders
- Lower switching costs
- Lower meter maintenance and consumption

Revenue Protection & Cash collection
- Loss detection
- Energy balance
- Stimulates bills and payment culture

Customer Service
- Better accuracy
- Increased billing reliability
- Lower claims management
- Lower customer service costs
- New flexible tariffs

Logistic optimization
- Delivery/Warehousing
- Transportation optimization
- Purchasing & logistic
- Skills&training

DSOs

*RAB: Regulated Asset Base

>> Yearly savings around 450M, ~ 6M SM yearly installed, 400 internal + 4000 third parties' resources involved
(Telegestore project 2001-2006)

…TO THE NEW GENERATIONS

- Presentation on the Topic/Pro

2001 | 2008 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024

1st generations of Smart Meters

NEW generations of Smart Meters

Open Meter

2nd generation

37 M SM

JOBI

5M SM

NEXY

1M SM

Romania 1M SM

NEW PRODUCTS

In compliance with the **new challenges on energy efficiency and grid management**, smart metering systems must:

- provide **increasingly granular** energy data
- provide **more detailed** information about the status of the network at edge level
- enable **post metering services**
- stimulate end customers **greater awareness** and energy efficiency
- To support **Decentralization, Digitazion and Decarbonization** (DDD) of the energy and power chain

- **Increasingly granular load profiles, new data analysis and reporting tools/technologies**
- **LV Network monitoring, control and management**
- **Multi-channel communication, Cybersecurity**
- **Enable new services to active customers, prosumers and energy communities (Flexibility, DR..)**
- **Enhanced power quality functionalities**
- **Advanced anti-tampering and fraud detection**

AMI – METERS AS ACTIVE GRID COMPONENTS

Data

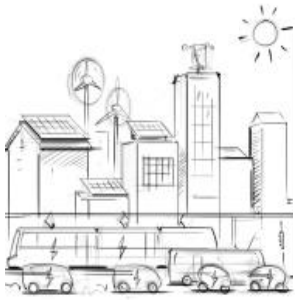
- Energy measurements
- Electrical parameters
- Work orders
- Diagnostic data
- Tampering
- Last gasp messages
- Multi-services data
- Sensors' data

Asset Owner

- **Advanced grid planning and management** through the information provided by the new Smart Meter
- **Increasingly granular data (15' samples)** to support Distribution Management Systems, LV network calculations and **identification of critical issues**

Asset / System Operator

- **Increase efficacy and efficiency** of technical processes and enable flexibility management, predictive more than corrective O&M
- **Enhanced work orders success** rate thanks to optimized algorithms and multiple communication channels (e.g., PLC + RF)



Smart stakeholders

- **Enabling new services** for municipalities, energy communities and other smart subjects
- Support to **multi-metering** (Sensors, Gas Meter, Water Meter))
- Third-parties leverage on the metering infrastructure to **enable and managed new platforms and services (e.g. DR, flexibility..)**

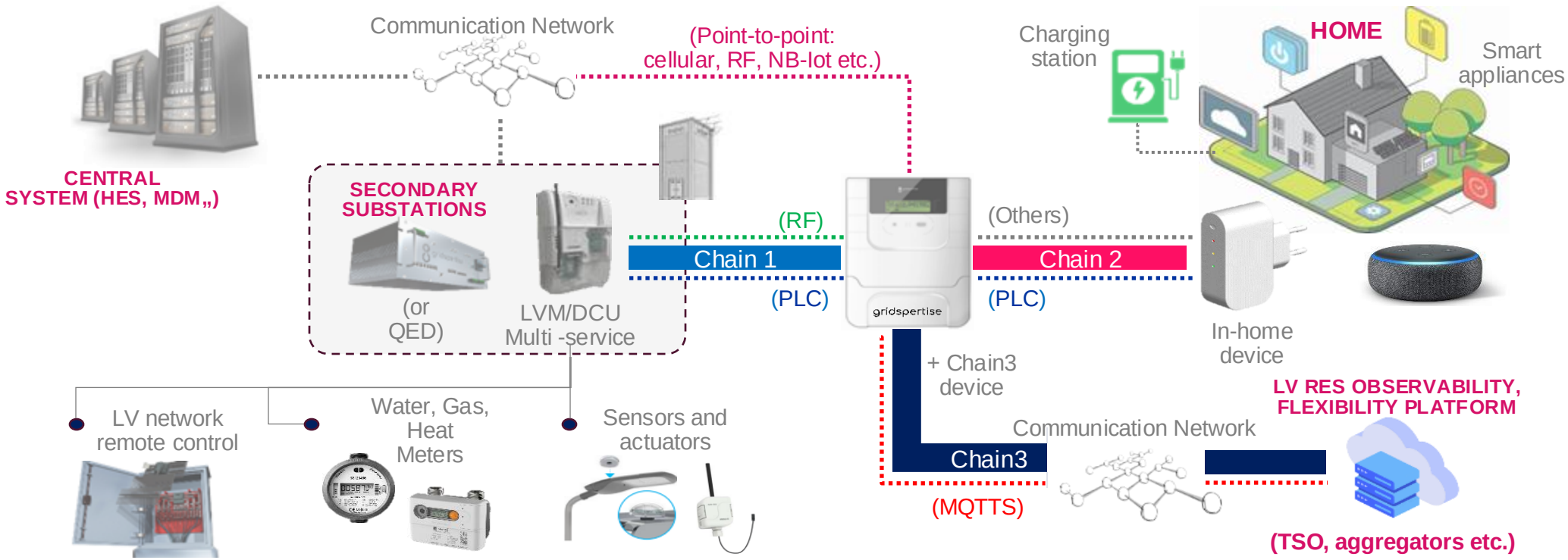
Customer Engagement

- **Enabling new services** for active customers
- **Increased awareness** on energy use
- **Tailored tariff structures**

AMI ARCHITECTURE 2ND GENERATION - ITALY

Main characteristics:

- Double communication channels for DSOs, PLC + RF
- Three chains of data connection: chain 1 for DSOs, chain 2 for end customers, chain 3 for TSOs, aggregators
- Chain 2 enabling 17 use cases
- LVM multi-service, able to integrate gas, water and heat meters
- Security by design



LVM: Low Voltage Manager (Data Concentrator Unit); QED: Quantum Edge Device

Note: Chain 1 (Narrow-Band Power Line Communication - Band A), Chain 2 (Narrow-Band Power Line Communication - Band C), RF (W-MBUS 169 MHz Radio Communication)

AMI PROJECTS - KEY TAKEAWAYS / RECOMMENDATIONS

Topics	Lesson learnt and recommendations
Project Implementation and Training	➢ **Installing smart meters seems simple and easy,** but few E2E solutions provider have the experience to understand the complexity in installing multi-million-meter with systems and maintaining them for about 15 years, managing and solving all the possible issues along the project timeline. ➢ Very important to take care in a correct way of the **training of the business, technical and operational units involved** .
Customer engagement	➢ For successful AMI rollout and customer's participation in leveraging the full benefits of the AMI systems, **it is essential to have customer engagement by DSOs** in the program right from the beginning with a proper awareness campaign and periodical surveys
DSOs role	➢ Particular attention to the **change management and internal new organization required** ➢ To design a coherent AMI ecosystem, taking care of the **integration of all the components of the solution** both internals and outsourced. ➢ Attention to **skills and training,** with adequate workforce avoiding resources constraints. ➢ **Clear definition of the scopes of the projects** with focus also on expected future benefits and specifics risks (e.g. cybersecurity)
Business model, financing and projects affordability	➢ **A clear business model with a bankable project** is essential to ensure the financing of the projects and their affordability. ➢ It's useful **an open consultation phase between DSOs. Govt. Authorities and their Regulators** to establish how to manage the higher initial investments defining the correct business model (capex, opex, totex, Xaas..) and the depreciation of the assets maintaining the affordability of the program. ➢ **The failure of promised tariff reductions** after a few years will not motivate the end customers
Solutions and services providers, Manufacturers	➢ To successfully implement all the AMI projects, it's necessary **to ensure OT/IT and security experts whit experience in E2E solutions including field activities, devices and HES/MDM/System integration**. Risk mitigation plans ➢ Particular attention to the **communication network issues,** essential to achieve KPIs/SLAs ➢ **Correct design of the architecture and selection of the products** to implement a successful E2E solutions, specially for long terms contracts (e.g.15 years) ➢ **Manufacturers:** Correct design of the products and calibration/testing phases to ensure the achievement of main KPIs (lifetime, failure rate, O&M activities, warranties…) and the best TCO for MaaS proposals

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THANK YOU

For discussions/suggestions/queries email: isuw@isuw.in

www.isuw.in

Links/References (If any)