

Meter Data Management Systems: an Overview and Examples

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National Information Solutions Cooperative®



**In the Technology Business
for 47 Years...**

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Company Overview

- Proven co-op business model
- 600+ utility & telecom members
- \$130 million revenue
- 950+ employees
- 4 offices
 - Lake St Louis, MO
 - Shawano, Wis.,
 - Mandan, ND
 - Cedar Rapids IA
- Market leader of turn-key enterprise IT solutions



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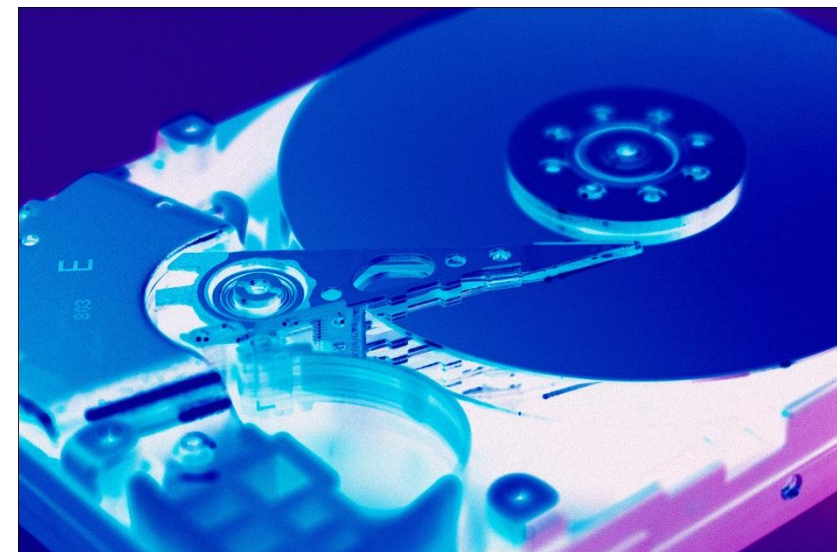
What in the world is MDMS anyway?

- Ask 5 people and you may get 5 different answers
 - “It’s all about data storage” 
 - “It’s all about analytics” 
 - “It’s all about billing” 
 - “It’s all about engineering” 
 - “It’s all about the customer” 
- It should be about all of these things and more



It's about data storage

- 60, 30, 15 and 5 minute reads = a lot of storage space
- Don't forget about quality and event codes for the reads
- Multiple units of measure:
 - KW
 - KVAR
 - KVARh
 - KVA
 - KVAh
 - Voltage (min, max, etc...)



The Evolution of Meter Reading

In the past...
1 reading
meter/month



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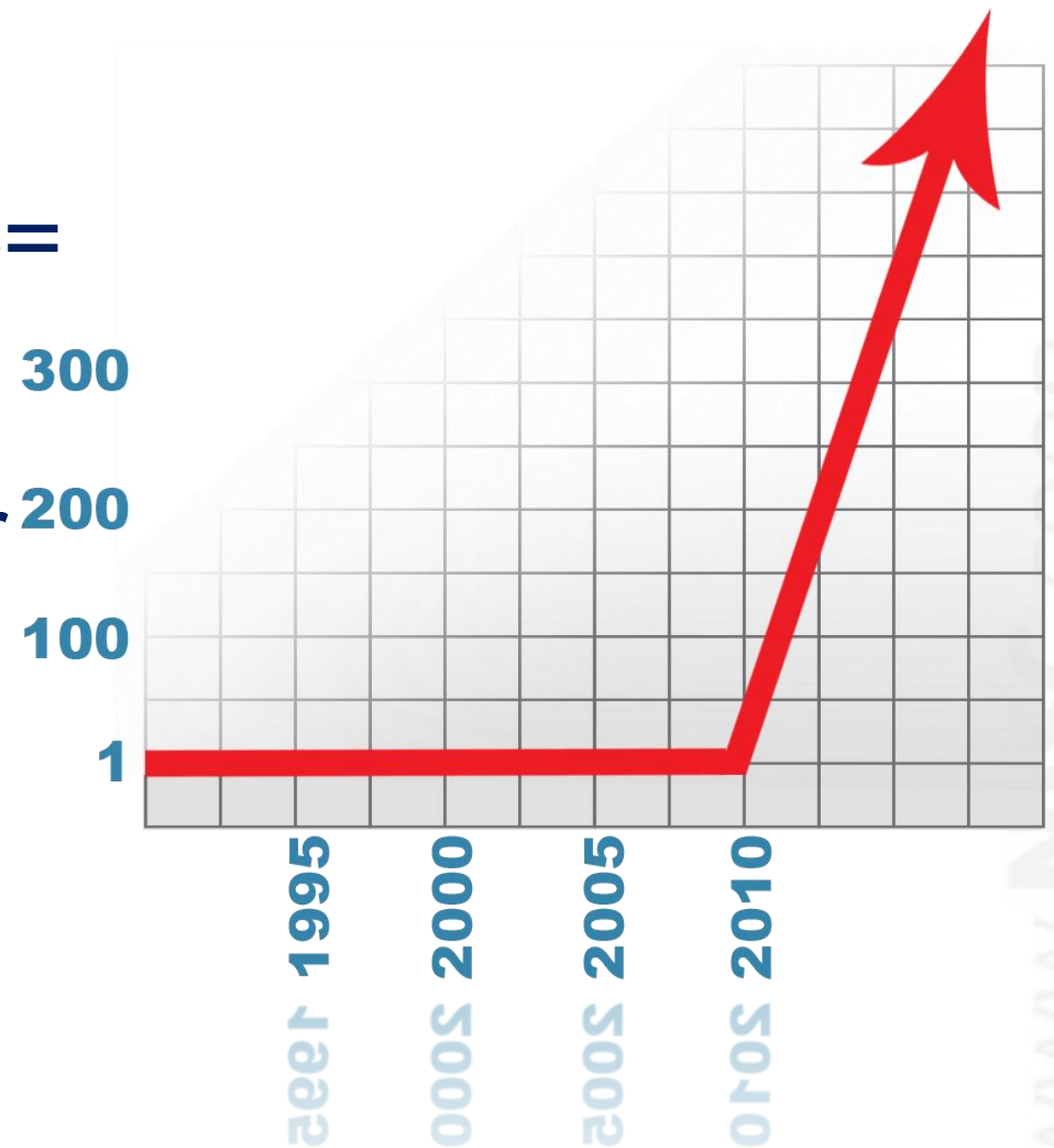
The Evolution of Meter Reading

Today...

30 days x **24** hours =
720

readings/month/meter

(based on hourly intervals)



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Hourly meter readings and calculations per **month**

for a utility with 100,000 meters

72,000,000

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15 minute

meter readings and calculations per
month for a utility with 100,000
meters

288,000,000

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15 minute

meter readings and calculations per
year for a utility with 100,000 meters

3,456,000,000

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Rates & data storage

- Are you moving toward Time Based Rates?
 - Time of Use
 - Critical Peak Pricing
 - Residential Demand
- Do you need to improve your existing TOU times?
 - Low participation because of long On Peak hours?

Storing more granular data = more defined rate studies

More defined rate studies = more accurate TOU hours



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It's about data analytics

- How many meters are reporting
- Which substation(s) are missing the most data
- Total Usage by substation
- Highest consuming meters by day
- Peak hours of the day
- The list goes on and on.....it is about analytics



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Rates & analytics

- Groups of meters with usage during certain hours
- Are your customers on the right rates?
- Don't forget about finding theft, stopped meters, etc...



It's about billing

- One area to source my billing reads
- Data needs to be validated and cleansed before billing
- Time based rates
 - TOU
 - CPP
 - Day Ahead Pricing
 - Peak Time Rebates
 - Residential demand
- CSR's need the data to help with high bill question



Rates/Billing & MDMS

- Interval usage exports for rate consultants
- Source for a daily/monthly read for existing rates
- VEE (Validate/Estimate/Edit) makes usage bill ready.
- Frames interval usage into “bins” for
 - TOU
 - CPP
- Calculate demand for
 - Residential demand rates (using interval kWh)
 - Find coincidental KW
- Import prices from ISO for Day Ahead Pricing



It's about engineering

- Meter failures
- AMI problems at the substation
- Demand Response
- Transformer loading
- Feeder line loss analysis



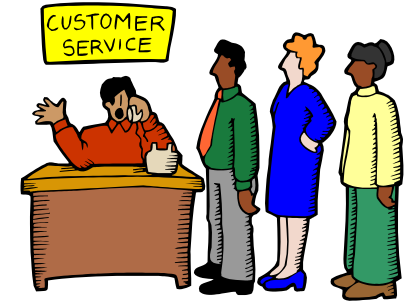
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It's about the customer

- Energy efficiency requirements
 - Educate the customer
 - Use demand management
 - Increase participation in time based rates
- CSR's needing more detail for high bill concerns
- Customer's wanting more information more quickly
- Mobile phone apps for everything...why not electric?



Rates & the customer



- Web presentment to educate on usage patterns
 - Great for helping understand time based rates
- Combining weather, billing info and usage to help the customer change the patterns
- Tools to allow the customer see how a rate affects them.
- Giving it all to them via the web or better yet... is there an App for that





The NISC solution

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Enterprise Applications



Customer Information System



Outage Management System



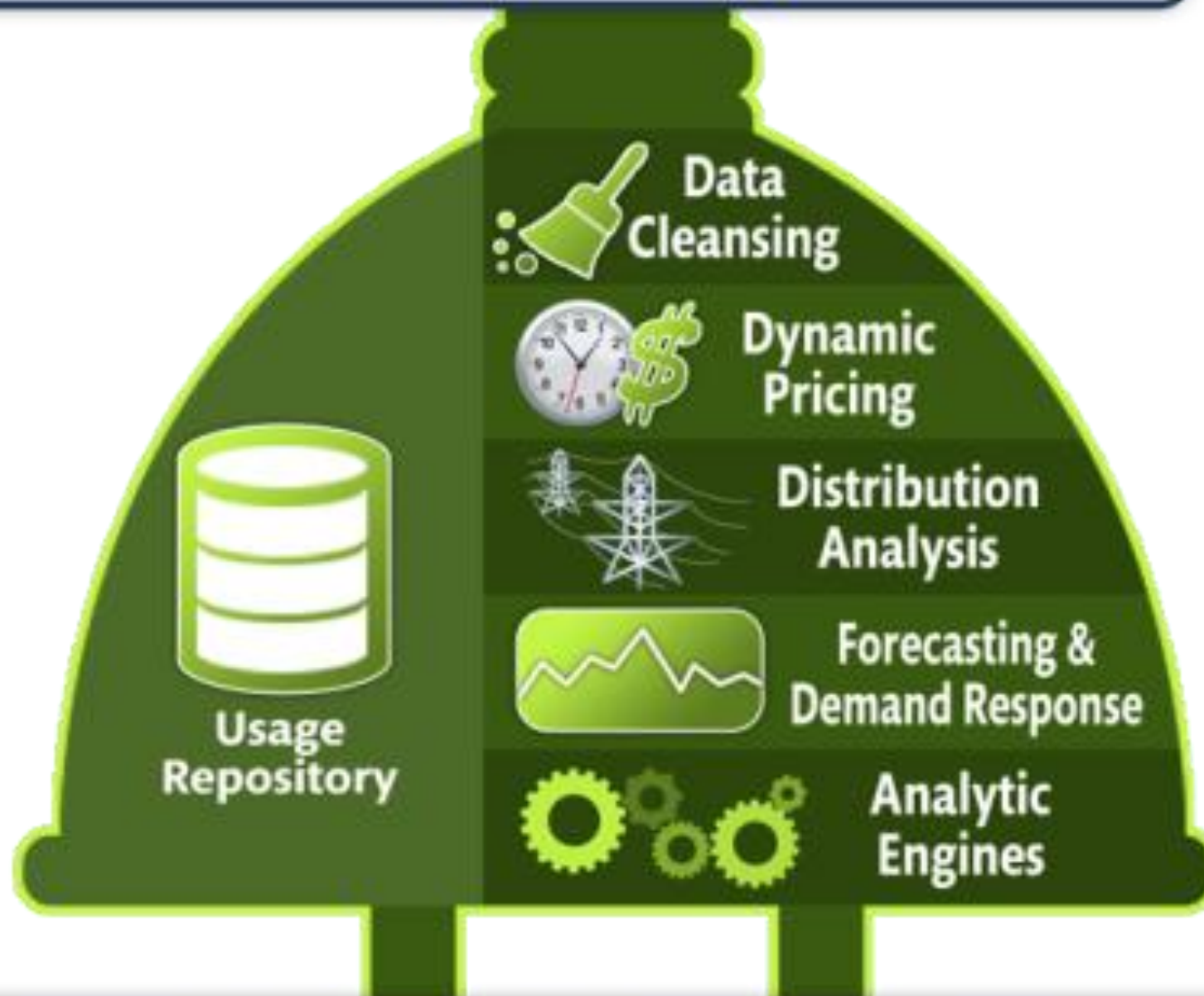
Other Enterprise Systems



E-Solutions



Cloud Computing
Virtualization



Data Collection Systems

Tantalus

ACLARA

Landis
Gyr

COOPER
Power Systems

Others



Scada

NISC MDMS Solution Demo

Dashboard
Explorer
Rate Profiles
Consumer Usage Analysis

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MDM Dashboard

- Monitors AMI imports and VEE results
- Drag & Drop charts onto employee worksheet
- Used for Operational reporting
- Ability to create service orders
- Links to details for individual meters
- Results can be filtered by Sub, Feeder, Rate, etc



MDM Explorer – Employees

- Link directly from iVUE CIS or search directly
- Displays monthly, daily & hourly usage graphs
- High, low, average & actual temperature
- Billing comparisons
- Service order review and creation
- Creation of “Energy Markers”



Consumer Usage Analysis

- Links directly to utilities E-Bill site
- Customizable theme to match utilities website
- Access to Monthly, Daily & Hourly Use
- Hourly weather data
- Billing comparisons
- Utility creates the Branding



Time-based Rates

- TOU rates billed without TOU meters
- Rate Profiles link to CIS rate schedules
- Prices pulled from CIS
- Calendar controls which hours are on and off
- Supports Critical Peak Pricing



Implementation Status

- Approx. 30 live sites
 - Smallest site less than 4,000 meters
 - Largest site approx. 160,000 meters

Some of the functionality being used in production includes:

- Daily Read export to CIS (used for regular billing and prepaid billings)
- TOU Pricing
- Critical Peak Pricing
- Customer presentment of monthly, daily and interval usage
- Operational reporting is already finding meters that need to be replaced



Discussion



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