Fundamentals of Asset Management

* 21+ years of technical and managerial experience

* Business and operations, asset management O&M, GIS, emergency management, IT security, strategic planning etc.

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**Asset Management
Business Continuity Planning
Data Migration
IT, Security, GIS
Integration between Systems
Mobile and Cloud**

Why do we need EAM

- Aging infrastructure, workforce, and customer base

- Automation

- Humans don't remember $#%*; paper, sketchy, labor intensive processes dont work

- Loss of institutional knowledge

- Set good rates: public resistance to rate increases

- Manage emergencies well: starts with eliminating emergencies, reactive to proactive
-
  Do more with less, optimizing resrouces, extending asset life

- Funds anf grants, long term funding

- Fed, State, Insurance push

If no EAM

- Unexpected and surprise failures: huge cost of repair, maintenance, treatment options

- Bad uncontrollable rates

- Expertise, Knowledgebase, and Data: Houdini Act

- No funding, no insurance, penalties (non-compliance, regulatory)

- Implication to the administration and political changes: adverse scenarios

- Not sticking to charter: public health and safety

- Litigations, Public Records

- Inefficiency, loss of workforce, negetivity, conflicts: no data driven approach

- Millions of $$$ on/in the ground, no system to manage that investment

- Perception tanks

This is a Necessity!

Every Local Govt.

should GO

CLOUD

MOBILE

GIS/CAD/ SCADA

Life Cycle EAM

Plan

Acquire

Maintain

Rehab

Operate

Dispose

Core Components

Data

People

Triage

Software

Opex, Capex

O&M

Issues

Knowledge

Processes, Practices

Sustainable, best service delivery

aktivov
Total Asset Management

What Management wants?

- Inventory/ registry of Assets with conditions, health checks, decay curves

- CIP, Rate Studies, Comp Plans, Costs, Budgets, Project Management

- Decision Making – Repair vs. Replacements

- Full history of work with cumulative costs accounting and asset depreciation

- Support litigations and lawsuits

- Address Public Records Requests

- Citizen engagement and Support Portals

What Management wants?

- Accountability, Traceability, Audits

- Look for appropriate Funds and Grants, Revenue Strategies

- Manpower planning, succession planning

- State of Good Repair : Continuous and Automatic compliance, Preventative and Predictive maintenance

- Run to Fail vs. Plan to Fail

- Securely access information on fingertips – cloud, mobile, GIS

Solution: All in One Platform

- Maintenance Management – Tactical

- Asset Management – Strategic (Fixed, Rolling, GIS, non-GIS)

- Emergency Management – Crisis Response

- Content Management - Documentation

- Construction Management – cradle to grave

- Fleet Management

- Project Management

- Backflow Management

- Citizen Portal

- Other modules for e-governance : Permitting, Business Licensing, Backflow, Cemetery

Everything Unlimited...

- Mobility and OS

- Users

- Devices and concurrent logins

- Cloud space on Azure - real cloud, no ransom

- GIS and data, assets and layers, no fees

- Documentation and training videos - OLA

- Integration and Reports APIs

- Citizen Portal

- Maintenance of product

- Reports & Dashboards

- Dashboards

- Upgrades, Updates

- Video Training

- Support 24 x 7

- EPA/ FEMA conditions

- Drones, CCTV - Large videos

One point of contact from presale through implementation

AM - Planning

- Planning
  - AM goal – Optimize performance, cost and risk from cradle to grave
  - Financial requirements. GAAP, GASB-34, BARS, etc.
  - AM Policies
    - Financial AM goals – Narrow focus: meet accounting standards
    - Infrastructure AM goals – Broad focus: Above, plus detailed inventory, LOS tracking, true operating cost, life cycle cost target, non-capitalized assets, ancillary assets, performance measurement
    - Donated asset process
  - Setting asset requirements: Service level, life expectancy, efficiency, # of cycles, L-50 life, etc.
  - AM Resources: ISO 55000, AWWA, APWA, MRSC, AM vendors

AM - Acquisition

- Acquisition
  - Purchased vs donated
  - Spec'ing for optimal performance, cost and risk
    - Setting standards and dealing with low-bid
  - ID every asset

AM - O&M

- Operations and Maintenance
  - PM/Repair/Renew schedules
  - ID every asset
  - Asset condition ratings
  - Track ALL costs associated with assets
    - Each asset vs asset class
  - Track life cycle cost against replacement cost
  - Local/ State and Federal reporting requirements

AM - Disposal

- Disposal
  - Optimal replacement life
  - Budgets and lead-time
  - Salvage value
- Other Considerations
  - Written and agreed upon definitions
  - Develop solid software functional requirements
  - Beware "Best Practices." Best for who?
  - Accessible software – Bidirectional API's
  - Migration plan – asset's outlive software systems
  - Build AM into rate models
  - Look outside your industry

How to Fund and Start

- Build GIS

- Assemble Data

- Phased Implementation Plan

- Training, Adoption, Support, Usage – Localized Support

- Incrementally build traction

- Integrations

- Ecology, Env. Quality, Energy, Drinking Water

- Fed Grants and Loans, ARPA

- Built-in within the billing/ rate structure

- Pay now vs. Pay Later: lawsuits, compliance, Preventative Maintenance, big CIP

- Accountants and Auditors: love it

- Engage Sponsors and Citizens

Tech Trends

- Water/Wastewater Industry Tech and Automation

  - Iot And AI with Telemetry/ SCADA, Flowmeters...
  - AMR Smart Meters
  - Prediction and Autoassignments of jobs
  - Condition Analysis of Assets
  - Pipeline Failure Predictions: Condition and Robotics
  - Self Diagnostics
  - Intelligent Inverters or Intelligent VSDs
  - Forecast based production/ distribution
  - Aritifial and Biological sensors for pollutant screening
  - Ecosystem support
  - Dryweather reserve
  - Alleviate Flood Risk
  - Tank Cleaners: Oil-free Robots
  - ...

Tech Trends

- Public Works and Asset Management

  - Maintenance and Operations
  - GIS vs CAD vs SCADA Based asset management - on the fly
  - Construction Management
  - Project Management
  - Emergency Management
  - Document Maanagement - support rich multi-media
  - Planning and Budgeting, CIP, Comp Plans, Rate Studies
  - AI and Sensors, Predictive Maintenance, IoT
  - Natural Language Processing - BIG Data
  - Drones - Remote Recon, Surveillance, Data Capture, Inspections
  - CCTV Integration
  - Asset Recognition – QR code, bar code, picture
  - Virtual Reality, AVR
  - Free and unlimited cloud, update, upgrade, training, APIs
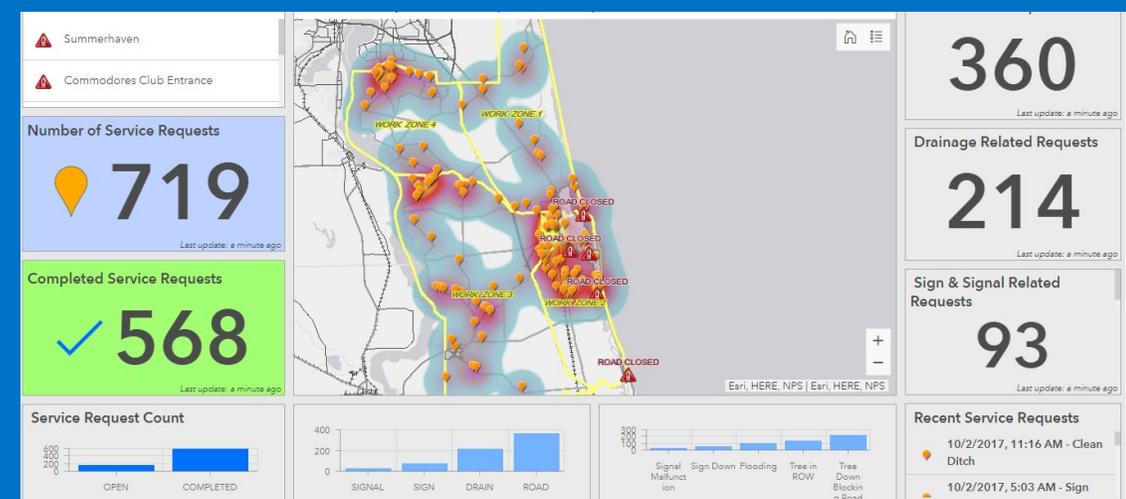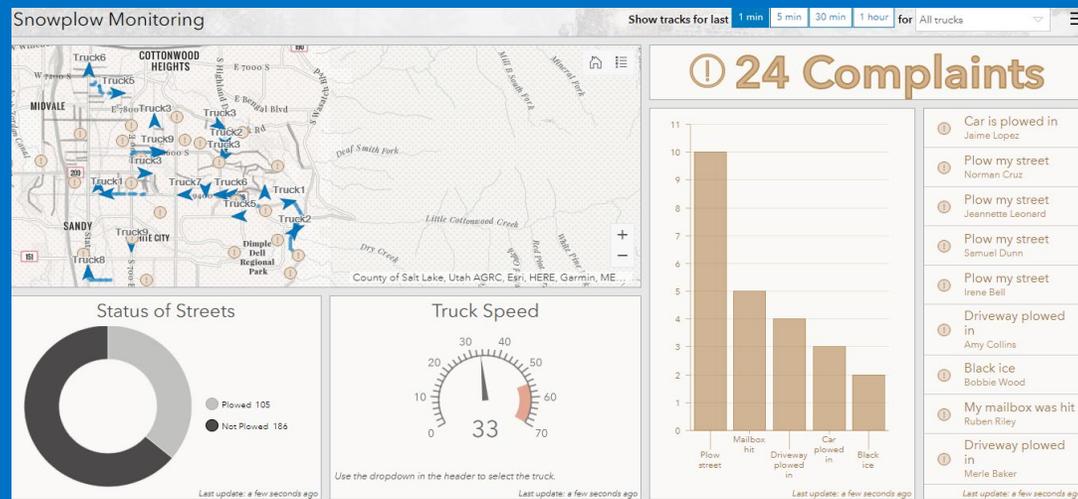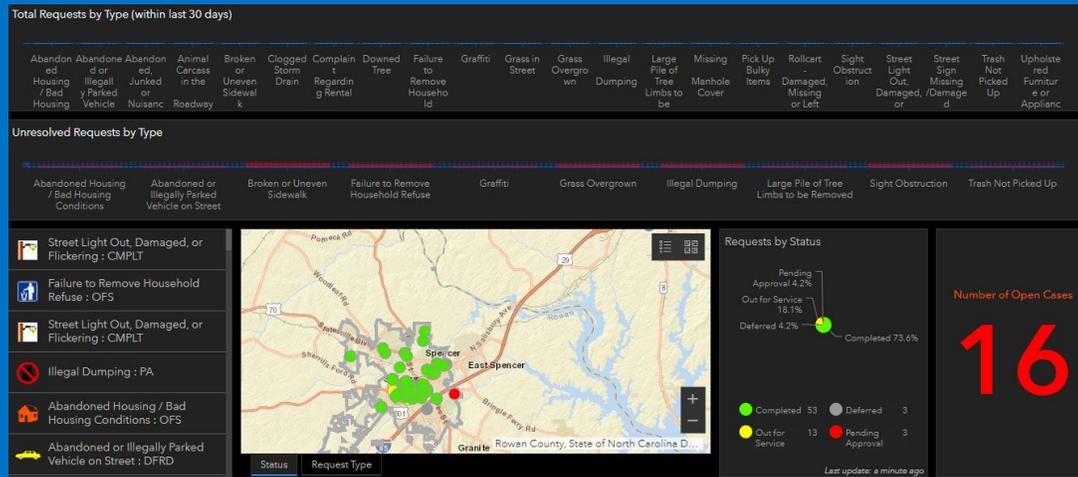
Key Questions

- Current State of Assets - Susutainability

- Required Level of Service - Performance

- Best O&M and CIP Investment Strategies

- Long Term Funding Strategy
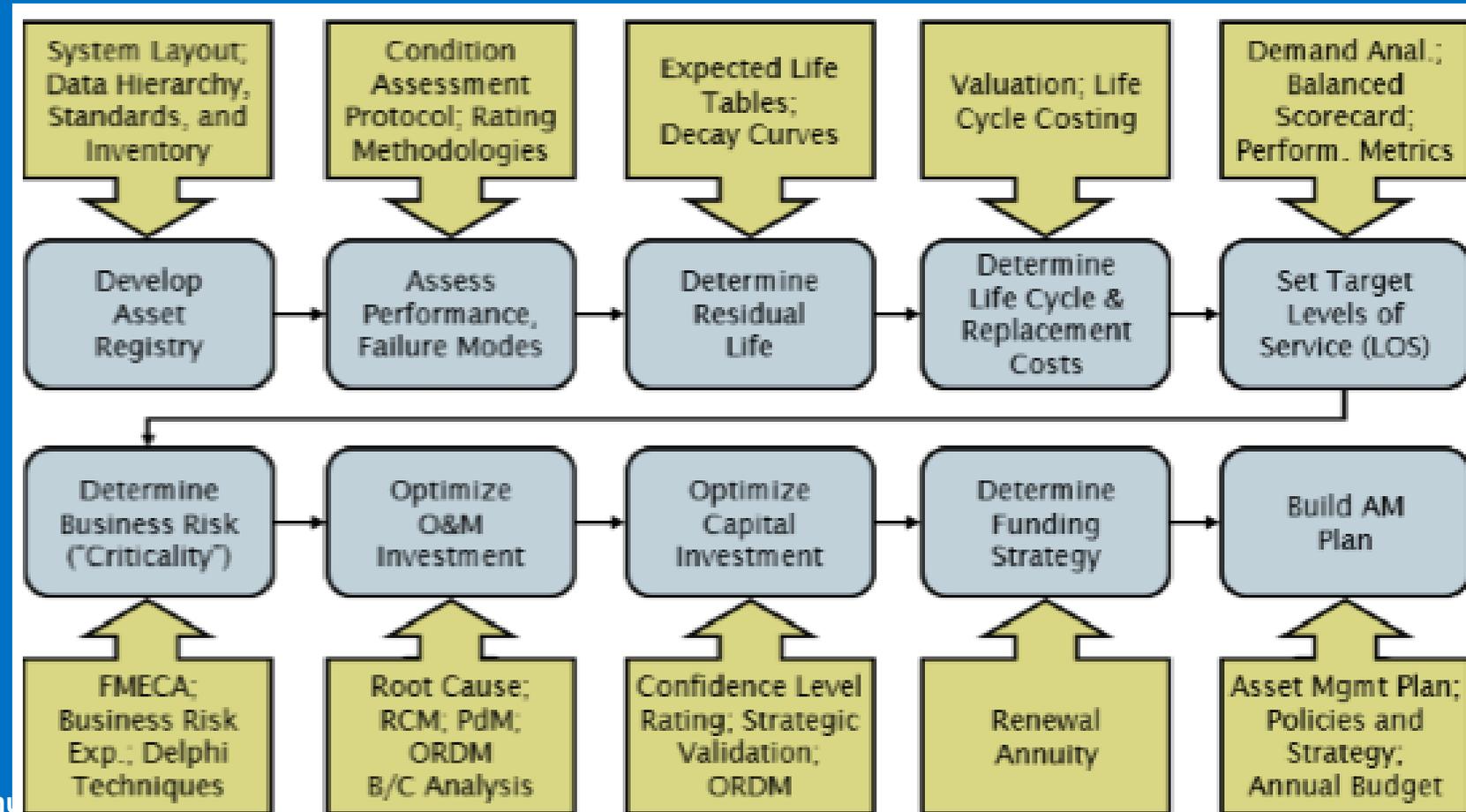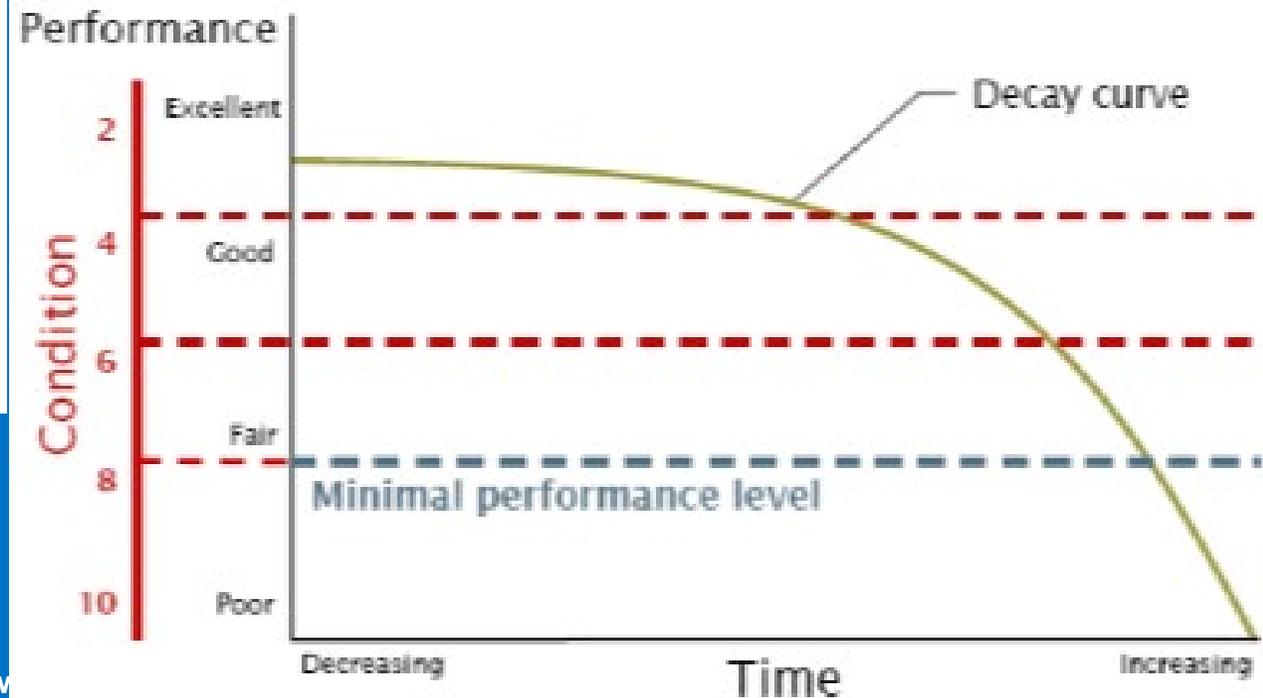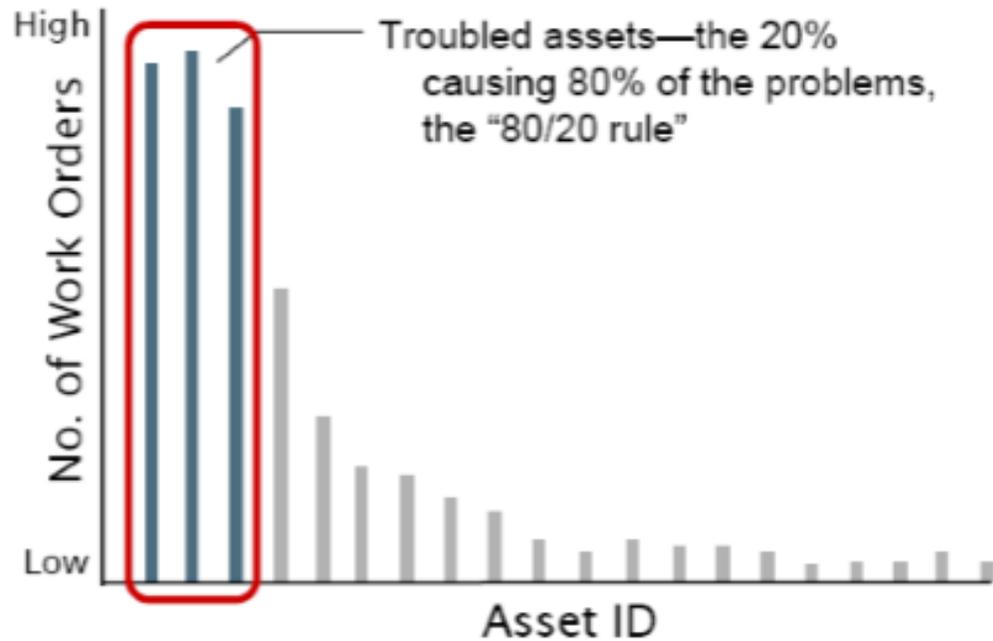
Integration Architecture
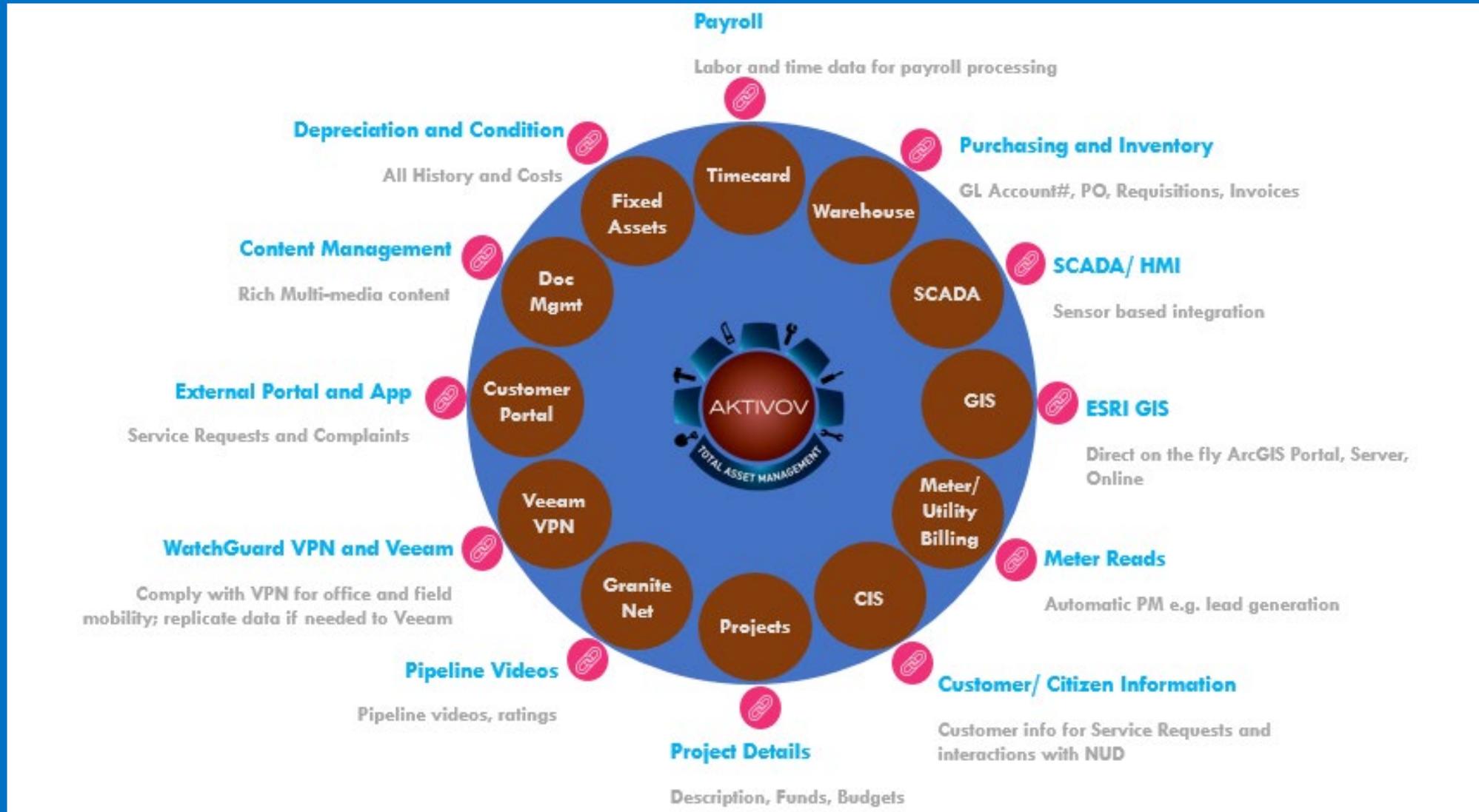
Dashboards Examples

Planning & Analysis
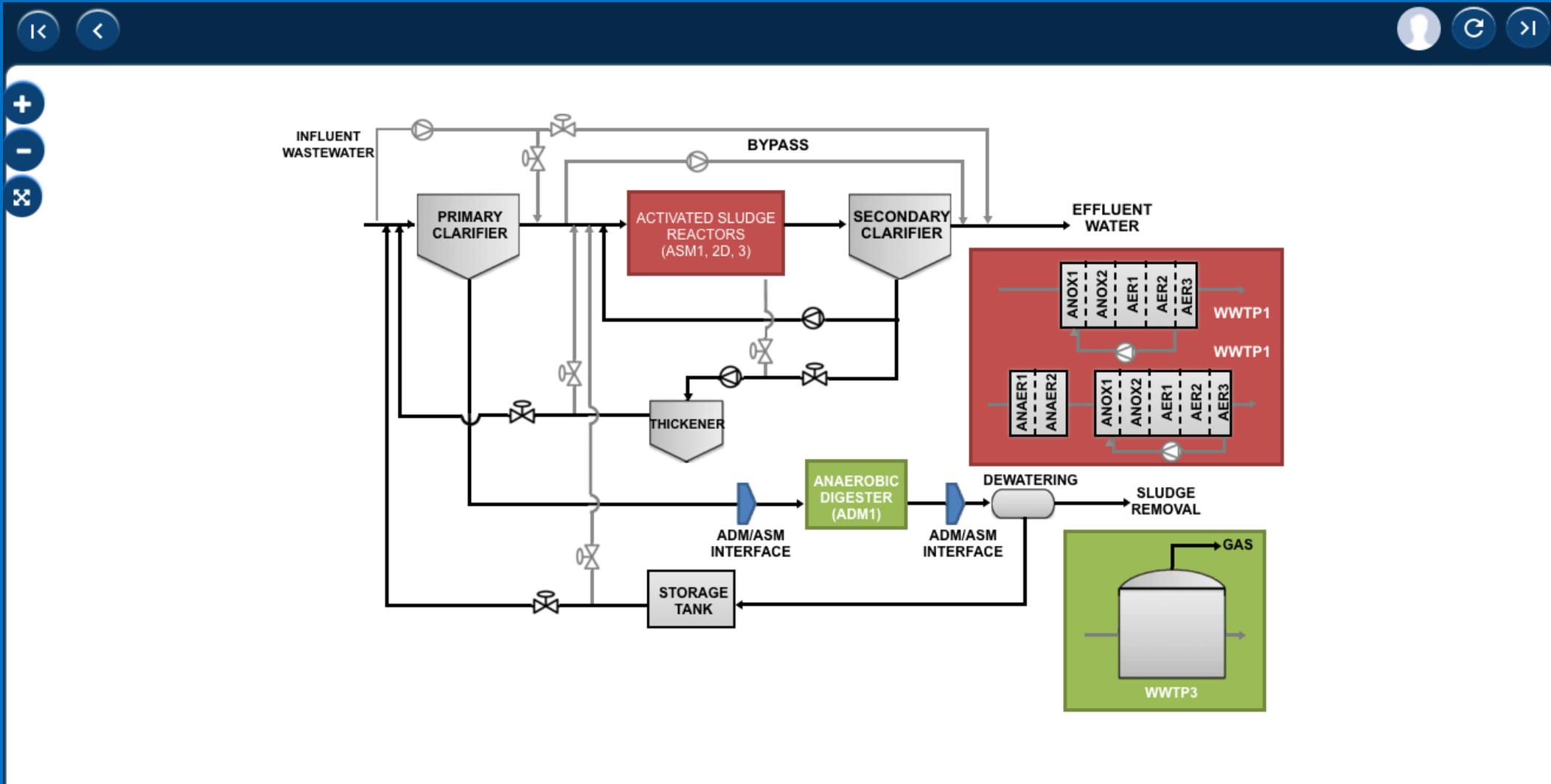

Do we know which are our problem assets?

Troubled assets—the 20% causing 80% of the problems, the "80/20 rule"

Performance — Decay curve

Minimal performance level

Interface - GIS

Interface - CAD Buildings

Interface - SCADA

Home Grown Systems

Benefits:

- Custom Built

- Changes: Your preference and whims

- Reuse programs or codes

Issues:

- Total cost of ownership is very high

- Biz Continuity

- Limited knowledgebase

- FTE dependency and costs

- Enhance with technology advancements, market pace

- IT Security, Backups, DR, access anywhere

- Integration with other systems

- Support, scalability, high availability, SaaS

Reports, KPIs, Dashboard

- Water Loss

- Activity based Plans

- Asset Conditions vs. Cost Analysis

- Benefit / Cost Analysis

- Asset Investment Profile

- Capital Plan and Budget

- Inventory Reports

- Project Management and Tracking

- Special Project and Construction

- Leak and Main Breaks

- Custom Reporting Engine

- Developer Extensions

- Cost per CCF - Production

- Water Quality

- Monitoring Dashboards

- Call Resolution

- Customer Service Performance

- Productivity Reports

PW Scenarios

- Instant Tracking/ Monitoring

- Main Breaks

- Street Sweeping and Snow events

- NPDES Compliance

- Flooding/ Landslide

  - Remote Recon
  - Proximity Assignments
  - One Shot: Tools and Resources
  - Access on Mobile/ Cloud
  - No panic runs/ no OSHA
  - Productivity
  - Cost Control
  - Happy Employees and Citizens

- PMs

  - Service Manuals, SOP, LOS
  - Business Continuity
  - Track and Comply
  - Litigation Support
  - Public Record Requests
  - CCTV
  - Heat Maps
  - Visual Dashboards

- Predictive AI

  - Pipe Failure
  - Meter Leaks
  - Pump Vibrations
  - Telemetry Alarms

Review Major Features and Functions

Example Configurations

Public Water System Name: _____ PWS ID: _____ Date: _____

Public Water System Description

Source Type:
☐ Ground water ☐ Surface water
☐ Ground water purchased ☐ Surface water purchased

Number of Service Connections: _____

Number of People Served: _____

Interconnections:
(List, if applicable) _____

Water System Usage

Average Daily Demand (gpd; estimate or if available): _____

The water usage in the next 5 years is expected to:
☐ Increase
☐ Decrease
☐ Stay the Same

Hours per day the system runs: _____

System capacity:

Limiting Factor for System Capacity: _____

Contact Information

Contact Type	Name	Phone	Email	Current Address
Business Owner				
Property Owner				
Manager				
Financial Contact				
Operator				
Sampler				
Maintenance				

Example Configurations

Asset	Life Expectancy (years)
Backflow Prevention	35-40
Blow-off Valves	35-40
Buildings	30-60
Chlorination Equipment	10-15
Computers	5
Distribution Pipes	35-40
Electrical Systems	7-10
Hydrants	40-60
Lab/Monitoring Equipment	5-7
Meters	10-15
Other Treatment Equipment	10-15
Pressure Tank	7-10
Pumps	10-15
Service Lines	30-50
Storage Tanks	30-60
Transportation Equipment	10
Valves	35-40
Wells	25-35

Operation and Maintenance Programs:
Attach the operation and maintenance programs of water system assets.

ROI Categories for Ops Efficiency

Locates:

-Do the regular locates work

-Not carrying a ton of paper to sites

-Find the right locations quickly

Inventory Management:

-Field count vs. system reconciliation

-Requisitions and purchase orders

-Receiving and assignments to jobs

-Reporting

-Audits

Multimedia Documentation:

-Job and asset level documentation

-Public records requests

-Litigation support

Cooridnation with Externals (engineers etc.):

-GIS

-Project planning and documentation

-Asset conditions and documentation

Collaboration:

-Instant access from anywhere on any device to track and monitor

-Field and Office are in sync, no chasing or phone calls/ emails

-Role based authentication for access

Comprehensive Planning, Rate Studies:

-Comp plan including conditions not just capacity

-Good state of upkeep leading to better rate determination

ROI Categories for Ops Efficiency

Workload Balancing:

-Work distribution and monitoring

-Status and priority monitoring of assets and jobs by color codes

-Backlog monitoring

-Hiring justification based on acitvity-hours-costs

Customer Service:

-Intake of requests and complaints with multimedia documentation

-Monitoring job status to answer customers

-Publish maps and info for customers on websites/ portals/ reports

GIS Integration:

-On the fly, real time updates from GIS

-Nothing to migrate or set up

-GIS is always current in real time

One Platform Approach:

-Maitnenance/ Operations Management (Tactical)

-Emergency Response

-Asset Management (Strategic)

-Construction Management

-In-built Content Management

-Citizen Portal

-Project Management

Project Management:

-Setup and track projects with budget

-Track jobs on projects with all job costs

ROI Categories for Ops Efficiency

Dashboards:

-Interactive graphs

-At a glance dashboards

Reports:

-Many canned reports

-Reporting engines to cutomize own reports at will

IT Engagement:

-Zero IT FTE engagement

-Works on any OS and any device anytime anywhere

-Secure encryted system

Audits of all transactions systemwide:

-Fully traceable system for documentation and record keeping

-Each transaction detail is logged with date/ time/ user info

Vandalism Tracking:

-Search information for court

-PD incident tracking

Hard Costs Savings:

Unmetered Cloud, Backup, Disaster Recovery

Unlimited Upgrades, Updates,Training and Support

Unlimited Users, Devices

No Travel Costs

IT Infrastructure (No IT hardware, software)

GIS (No additional fees)

APIs (No seperate API lic. for integration)

The Future

- More IoT, Connected Systems, Sensors

- Wearable Technology: watch, glass

- Big Data and Analytics

- Drones

- AVR Scenarios

- 3D Models

- Industrial AI

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