Asset Management In Power Network Towards Optimization Performance Using Integrated, Intelligent And Automated (IIA) Scheme

Mohamed Yousuf S, Dr. Ramzi A. Abdulhalem

Abstract: Asset management is a wide variety of interpretations throughout the industry and even electricity supply organizations. It has been as the core of the distribution business and responsible for the strategy of the power network. Also, data is an essential ingredient to effective asset management. Asset management process adds value by converting this data into decisions, which reduce the overall lifecycle cost of the network. In service, lifecycle costs can be broken down into three distinct areas as: Installation, operations & Maintenance and Decommissioning. Installation and decommissioning costs have been evaluated at the conceptual stage of the project. So, this paper shows the current status and the unused patterns for benchmarking and moving forward the asset management in power networks towards optimization execution.


1. INTRODUCTION:
The management of dissimilar, complex and conveyed resources is one of the most challenges confronting the power organize industry. The current inconstancy in asset management approaches, there's a significant opportunity for standardization exercises to move forward some approach and comes about of power network asset management. Universal guidelines put input by organizations such as the ISO or IEC can guarantee that different substances, from businesses to company officials and engineers utilize the same dialect and measurements when examining asset management hone. Benchmarks can too be utilized to detail the state of the craftsmanship in specific resource administration approaches, helping those modern to the region and facilitating the relative comparison of hones between organizations. According to ISO 55000:2014, benefits from asset management include [7]:
- Improved financial performance
- Educated asset venture decisions
- Overseen risk
- Illustrated social responsibility and Compliance
- Upgraded reputation
- Progressed organizational sustainability
- Progressed efficiency and effectiveness

When overviewed by the IEC [13], power organizes businesses recorded the benefits of asset management to their commerce as counting:

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Asset management technique & planning and asset management choice making are the centers' hone of asset management, utilizing input from the organizational key arrange and resource information frameworks [6, 1]. Benchmarks or industry guides can play an imperative role in the entire asset management hone steps appeared in Figure1. But the key shows of that the asset management comprises of Labor, fund, Innovation, Customer & Company.

Figure 1. Conceptual model of Asset Management
2. CURRENT STATUS:
In many developed countries, the development of power networks progressed quickly in the course of the twentieth century, coordinating an unceasing development in request and spread of electrification. Nowadays, in various of these created countries, request development has qualified considerably or halted, and traditional power organize businesses, or trade hones, confront vital challenges together with an assortment of weights extending from modern varieties of the disseminated era, like sun oriented electrical phenomenon, to increasingly high masses and body weight on decreasing use. These dynamical strengths are having a big result on the cosmetics of the power to organize assets [12, 13]. Many utility assets operational of late, within and out large-scale period, transmission, and transport were commissioned in the course of the wander booms of the ‘60s, ‘70s, and ‘80s. however since at that time, wander levels haven't persistently unbroken pace with the need to produce and come after plus bases, and also the setup and once relentless regard chain is directly experiencing the disruptive impacts of advanced advancements, that utilities continuously need to utilize. The management & utility portion is encountering an amount of radical alter, affected by advancement improvement, moving people stream and burgeoning budgetary advancement [5, 16].

- Disruption on the ordinary worth chain, from the decentralized era and demand- side operations to vitality capacity and so the rise of electric vehicles are dynamical the strategy utilities operate.
- The global populace is a figure to develop to 9.2 billion by 2040, for generally in non- OECD nations where an expanding, optimistic center lesson is driving more noteworthy vitality demand.
- GDP is a figure to develop from US$74.5t in 2015 to US$136.7t in 2040, an increment of 83%.5 past patterns appear a solid connect between GDP and power demand.

3. INTEGRATED, INTELLIGENT AND AUTOMATED (IIA) SCHEME:
As the section changes, optimizing the exchange and crucial worth of utility assets may be a solid equalization act. Asset proprietors and directors ought to be pass on more noticeable accomplice regard in particular to clients while reducing risk and minimizing costs. The nature of asset organization depends on experiences and understanding from the information. Present day advancements are changing how asset information is collected, collated and analyzed, giving an establishment for utilities to run operations in a completely another way from an “intelligent hub” (Figure 2). Physical partitioned between assets is less of an obstacle to operational efficiency, with contraptions by and by able to remotely checking and transmitting asset data in honest to goodness time. Complex analytics donate present day, much more point by point knowledge on asset danger and execution, opening up unused openings to communicate perfect execution and boost regard. Presently is the time to center difficult on creating cleverly resource administration as an essential driver of value, for today and future [6, 9].

4. QUALITY EXCELLENCE MODEL:
The progression of the asset management instruct and it’s around the world benchmarks (ISO: 55000) permit a framework for driving to observe and a reference for utilities to spot improvement openings. Based on a data-rich, risk-informed choice get ready, an illustrate follows the key components required to supply a joined-up and effective approach to asset management over the asset life cycle [2, 9, 14]. Figure 3 shows the asset excellence model.

Utility pioneers must ensure all parties are balanced, capable and careful of these obligations. To maximize the regard of resource administration, utilities have to be compelled to comprehensively, planning and executing a comprehensive approach that handles not reasonable the system but the people, shapes and disobedient that support it. Collaboration with providers is based on a shared understanding of objectives and backed by development that empowers providers and resource proprietors to share information on the assets they have built. Information lights up each management choice all through the quality life cycle and provides chain. It has to stream effectively and result in critical understanding. The more an organization values data and information as a key asset and a differentiator in its have right, the more critical the ampleness of its resource administration and
the chance of maximizing return on investment (ROI). Working out tight organizing and controls to manage data quality makes organizations removed superior arranged for helpful, cost-effective Interventions. But collecting and managing the correct data all through the asset life cycle requires solid organizational instruct, particularly where broad resource armadas are concerned, as these demands increase with the exponential advancement in data volumes.

5. QUALITY STRATEGIES:
To turn resource management into quality greatness, driving organizations solidify the ensuing four information concerns into their quality strategy [8, 10, 11].
* Treat information as an asset class.
* Identify particular outcomes.
* Seek out assist openings to abuse information within the organization.
* Pursue knowledge through empowering innovations and explanatory capabilities.

6. NEW TECHNOLOGIES TO ENABLE IN ASSET MANAGEMENT:
Currently, some advanced techniques (Table 1) are used at developed countries for improving the performance in Asset management side [3, 15].

<table>
<thead>
<tr>
<th>Technology</th>
<th>Field Application</th>
<th>Field Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Mobile Devices</td>
<td>From smart meters to remote sensors, inaccessible gadgets share particular, real-time information from the commerce and its providers.</td>
<td>Field agents can take on more of a decision-making part.</td>
</tr>
<tr>
<td>Unmanned Aerial Vehicles</td>
<td>Aerial Overviews of assets give point by point assessments and recording of data on asset condition and natural components.</td>
<td>Substantial taken a toll and security points of interest.</td>
</tr>
<tr>
<td>Artificial Intelligence</td>
<td>Computers utilize machine-learning calculations to anticipate and recognize at-risk sites and assets.</td>
<td>Prevents blackouts over the organize, making a difference the field constraints move from costly reactive to effective, risk-based predictive maintenance.</td>
</tr>
<tr>
<td>IoT and Sensors</td>
<td>Allows remote tracking of field operative's area and imperative signs.</td>
<td>Monitoring of well-being and safety risks in real time</td>
</tr>
<tr>
<td>Blockchain</td>
<td>Digitally associated supply chain management frameworks and forms</td>
<td>Improved efficiency and reduced costs by establishing a “single version of the truth” about asset status.</td>
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7. CONCLUSION:
An increasingly competitive industry there will be regulatory and energy business concerns that the distribution business has information that could be of significant benefit to other supply or generation businesses. The challenges for asset management are to evaluate continually the benefits of individual techniques and equipment against the cost of installation and operation. Based on the data and information, the quality of the asset management can be improved towards the optimum value. The present-day progress can offer help overcome these and other limitations and revolutionize numerous of the physical perspectives of resource administration though changing the effectiveness, security and work fulfillment of the field workforce. Advanced advancements are changing real-time interaction with clients, apparatuses, and frameworks, and permitting operators to require more of a decision-making portion. As a result, the portion of the control center will be gotten to be less “command and control” and more “empower and assure” a basic operational and social development. Applying the correct advancement inside the proper way will boost the chances of diminishing costs, maximizing ROI, keeping up operations and making strides client fulfillment.

REFERENCES:


