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Organizational Models for Managing Change During Digital Transformation in Utilities

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Abstract: This article offers a comprehensive review of organizational models for change management in the course of digital transformation within utility services. Its relevance stems from the high rate of unsuccessful "smart" technology implementations in traditionally conservative infrastructure organizations. The study's innovation lies in juxtaposing classical and hybrid change frameworks that have been tailored to the specific needs of the utilities sector. The paper outlines the application principles of Kotter's 8-Step model, the ADKAR framework, Lewin's three-stage scheme and their various adaptations in Western context. Approaches to forming internal change-champion teams, designing training programmes, and engaging with regulatory bodies are examined. Special emphasis is placed on leadership support, effective communication, and demonstrating quick wins. The research aims to identify practical techniques for reducing employee resistance and minimising bureaucratic delays. To this end, a comparative analysis, systematic review of literature, and industry reports, and synthesis of case studies were employed. The conclusion presents recommendations for the phased implementation of change and ensuring staff engagement. These guidelines facilitate the development of roadmaps, risk assessment, enhancement of operational resilience in utility services, and the optimisation of a robust long-term transformation strategy.

Keywords: organizational models; digital transformation; utilities; change management; Kotter's 8-Step; ADKAR; Lewin's model; communication; staff training; quick wins.

Introduction

The digital transformation of utility services—such as electricity providers, water utilities, heating services, and other infrastructure enterprises—has become a prominent global trend. Under the influence of technologies like smart meters, IoT sensors, and big-data analytics systems, the utilities sector is adopting new operational practices. However, technology deployment alone does not ensure success: organizational change management is a critically important factor. Utilities are traditionally characterized by conservative structures and strict regulations, and digital innovations demand a restructuring of these foundations. The topic of organizational change-management models in this context is therefore highly relevant, given the high proportion of unsuccessful digital-transformation initiatives.

The aim of this article is to review and analyse the models that enable effective management of change during the digital transformation of utility enterprises. The objectives of the study are:

1. to identify the characteristics of change in the utilities sector under digitalisation;
2. to examine existing change-management approaches and models as applied to utility organisations;
3. to reveal the key success factors and barriers to implementing digital transformation from an organisational perspective.

Methods and Materials

The study's materials comprise publications on change management in the utilities sector. Bullock M.M. [1] examined a hybrid approach to overcoming barriers during digitalisation. Cadei A., Glickman J., Guille C. and Sinha A. [2] articulated a staged, "tortoise-paced" transformation strategy. Crooks M. [3] analysed organisational shifts achieved through the creation of internal centres of expertise. Faro B., Abedin B. and Cetindamar D. [4] described the effects of hybrid organisational structures on change outcomes. Gornostaeva G. [5] investigated how an innovation-driven culture influences implementation processes. Karakuş M. and Yalçın C. [6] presented theoretical models alongside concrete examples. Pulido F.L.P. and Taherdoost H. [7] evaluated the efficacy of the ADKAR and Kotter's 8-Step models across various sectors. Schultz R. [8] provided strategic guidance for engaging with regulatory bodies.

To prepare this article, the comparative method, a systematic literature review, practical case-study analysis, and data synthesis were employed, facilitating the development of phased recommendations for implementing organizational change.

Results

Digital transformation in the utilities sector simultaneously affects technological, processual, and cultural dimensions of the organisation. For example, the deployment of smart meters and automated metering systems reshapes data-collection and customer-service workflows, requiring personnel to acquire new skills and assume new roles. Research shows that successful digitalisation of utility services is accompanied by a reassessment of entrenched practices and organisational structures [3]. In particular, digital initiatives have proven to be catalysts for positive organisational change: entrenched departmental silos are dismantled, cross-functional collaboration improves and processes become more streamlined. A case in point is the experience of Western energy firms, where the introduction of a unified digital network-management platform enabled engineering, IT and operational units to work in closer coordination, exchange real-time data and jointly resolve emerging issues—effectively driving organisational change alongside technological advancement.

For utility enterprises—characterised by significant inertia and stringent regulatory oversight—it is critical to adopt formalised change-management approaches. International experience underscores that digital transformation is not a one-off IT project but a comprehensive organisational strategy that demands a clear plan for engaging personnel and redesigning processes [3]. Publications on this topic emphasise that to maximise the benefits of network modernisation (for example, transitioning to smart grids and advanced distribution-management systems), the effort must be treated not merely as a technology rollout but as an integrated change programme encompassing organisational structure, culture and workforce capabilities [3]. Accordingly, alongside the technical implementation (installation of new software, devices, etc.), a change-management programme is initiated—comprising staff training, revision of job descriptions, creation of new departments or roles (such as data analysts) and the revision of interdepartmental interaction protocols.

In global practice, a number of classical organisational change-management models are employed (ADKAR, Kotter's 8-Step model, Lewin's model, etc.) (Table 1).

Table 1: Classification of change-management models in utility services (compiled by the author based on [1, 5, 7])

Model	Core Principles	Applicability
Kotter's 8-Step	Creating a sense of urgency; building a leadership coalition; vision and strategy; removing obstacles	Highly bureaucratic projects
ADKAR	Awareness; Desire; Knowledge; Ability; Reinforcement	Pilot initiatives and staff training
Lewin's Model	Unfreezing current processes, change, refreezing	Comprehensive operational-model transformations

Each of these methodologies entails phased staff involvement and the formation of an internal leadership team, reducing resistance and accelerating the adoption of technological innovations. Analysis of consulting-firm reports and industry studies revealed a set of factors that significantly facilitate the implementation of digital-transformation programmes in utilities (Table 2).

Table 2: Factors facilitating the implementation of digital transformation (compiled by the author based on [1, 2, 5])

Factor	Description
Leadership support	Access to funding and an expedited decision-making process
Innovation culture	Employee readiness to adopt digital tools
Open communication	Continuous sharing of information on goals and outcomes
Demonstration of quick results	Pilot projects with measurable effects to cement change
External partners	Engagement of consultants and technology providers

Leadership support ensures resource availability and streamlines decision alignment. Open communication lowers employee mistrust and increases willingness to embrace new tools. Establishing rapid-response task forces enables early demonstration of results and consolidation of successes across the organisation. In practical projects, the main obstacles to digital-transformation initiatives in the utilities sector were identified (Table 3).

Table 3: Obstacles on the path to digital transformation in the utilities sector (compiled by the author based on [2, 3, 6])

Obstacle	Description
Employee resistance	Fear of new technologies and the departure of experienced staff
Regulatory constraints	Requirement for approvals from the controlling authorities
Process inertia	Traditional regulations and working procedures
Skills gap	Insufficient competence with analytical and digital tools
Generational change	Conflicting expectations between veteran and junior staff

Eliminating these barriers requires training employees in new skills, adapting regulations to digital-process requirements, and actively engaging with regulatory bodies.

In the context of utilities, industry reviews show that the most effective models combine a strategic vision with phased implementation of change [2]. For example, Kotter's model begins by creating a sense of urgency, forming a coalition of change leaders, then developing the vision and strategy, communicating this vision to all staff, removing obstacles, achieving quick wins and anchoring changes in the culture. The relevance of this approach for utility enterprises is underlined by the fact that 95 % of energy-sector executives cite digital transformation as a priority, yet face slow progress due to resistance and bureaucracy [8]. Building an internal coalition—a team of senior managers and department heads who champion change—has proven to be a powerful lever: such teams act as the "locomotive" of transformation, driving the new strategy forward and persuading frontline employees to embrace innovation.

An evolutionary, step-by-step change model has also gained traction in the utilities sector, as opposed to a radical overhaul. A Bain consulting study notes that some utilities attempted to digitise too rapidly, investing heavily in technologies that staff and processes were not prepared to adopt—resulting in frustration and missed opportunities [2]. More successful organisations focused on enhancing key processes through targeted digital tools. In one instance, a North American power company, instead of undertaking a total rebuild, selected a few critical pain points (frequent equipment failures, prolonged outages) and applied advanced analytics to address these issues—for example, deploying a predictive-maintenance system that cut emergency outages by 20 % [2]. This pinpointed approach—gradually building digital capabilities around existing processes—delivered measurable improvements, bolstered trust in the transformation and provided a foundation for expanding the change programme to other areas.

Analysis of utilities' experiences across countries reveals several common enablers of successful digital transformation. First, executive sponsorship and a culture of change are vital. 2023 research indicates that utility leaders prioritise shifting corporate culture—from conservative mindsets to innovation-and-data orientation [1]. A change-supportive culture is characterized by employee engagement, a willingness to learn new skills, and experimental approaches to work. Reports highlight that utility leaders invest in training (e.g., digital-skills programmes) and form cross-functional project teams (to break down silos between IT, network operations, and customer service) [1,5].

Second, communication and transparency. Change-management models recommend actively and continuously informing all employees about transformation goals and progress. Practice shows that clearly explaining why a given technology is introduced and how it benefits both the organisation and individual roles reduces resistance and fear. For example, when moving to automated dispatch systems, company leadership made it clear that this was not about workforce reductions but about eliminating manual routine tasks and enabling staff to focus on more complex duties—such candid, understandable communication increased acceptance of change among personnel [4].

Third, quick wins and success measurement. Classic approaches call for achieving and showcasing rapid results to convince the organisation of the chosen direction. In utilities, quick wins might take the form of a successful pilot on a network segment (for instance, implementing analytics to prevent water leaks that saved several thousand cubic metres and produced cost savings over six months)—this local victory is then rolled out company-wide, generating positive momentum for further change. Experts emphasise that measurability is key: demonstrating in numbers a reduction in failures, increased customer satisfaction, or budget savings from a digital initiative significantly strengthens the drive to continue the transformation [2,6].

Among the chief barriers to change management in the utilities sector, the literature cites staff resistance and the "generation shift." Many utility organisations employ a significant proportion of pre-retirement and retirement-age workers who adhere to established standards. These employees may perceive digital innovations as a threat, whether through fear of unfamiliar technology or anxiety over job security. Simultaneously, this cohort is retiring, to be replaced by younger professionals whose expectations differ: they are unwilling to work with outdated paper-based processes and demand modern digital tools [8].

Senior management recognises this as a dual challenge: on one hand, retraining and motivating the existing workforce; on the other, attracting and retaining younger talent by offering a fully digital work environment. A combined strategy has proven effective: mentoring programmes in which experienced employees impart industry know-how to newcomers, while younger specialists provide reverse mentoring on new technologies. Additionally, many organisations have established "change-agent" roles—staff members in each department trained to assist colleagues in adapting to innovations, gather feedback and relay emerging issues to leadership. These change agents act as a bridge between the transformation project team and front-line personnel, helping to reduce tension and resolve challenges swiftly [7].

Another significant obstacle is regulation and bureaucracy. Utilities operate under strict regulatory regimes—safety standards, tariff controls, and so forth—meaning any change must align with existing norms. This requirement can slow digital transformation; for example, rolling out remote customer-service capabilities often demands approvals from regulatory bodies. Here, a flexible change-management model is crucial: best practices call for phased implementation that accommodates regulatory requirements and proactive engagement with authorities to explain the nature of proposed innovations. In some jurisdictions, regulators have even begun to incentivise digitalisation—such as mandating the deployment of smart meters—which eases the path for utilities.

Discussion

A comparison of the findings reveals several overarching insights. First, digital transformation in the utilities sector is, above all, an organisational transformation; technical change follows only thereafter. Without reconfiguring processes and mindsets, even the most advanced technologies yield little benefit. This conclusion is borne out by statistics indicating that digital projects demand a deep evolution of an enterprise's operating model.

Second, change management must be both proactive and holistic. Successful deployments demonstrate that organisations which invest early in people—through training, clear communication and encouragement of new ways of thinking—achieve markedly greater results than those focusing solely on IT roll-out. For example, a number of Western electric and gas companies have established in-house digital-transformation centres of expertise or created roles such as "Chief Digital Transformation Officer," thereby institutionalising change management and embedding it into the corporate fabric.

Notably, digital transformation often serves as the catalyst for re-examining a utility's strategic mission. In several instances, companies expanded their aims beyond mere power delivery to encompass energy-services provision and consumer comfort via digital solutions. Such a strategic pivot necessitates organisational restructuring, such as launching dedicated customer-experience or analytics units. Here, an organisational-change model proves essential, guiding a smooth yet decisive shift onto new rails. Theoretically, this underscores the relevance of frameworks grounded in dynamic-capabilities theory: utilities must acquire the agility to adapt continuously as technologies and external conditions evolve. Historically slow-moving, these organisations now face pressure to develop that agility, and change-management models function as the "muscle-building" tool for sustained improvement.

Culturally, utilities tend to be hierarchical, with an emphasis on reliability, strict adherence to procedures, and risk avoidance. The digital era, by contrast, prizes innovation, experimentation, and data-driven decision-making. Reconciling these cultural poles is therefore paramount: preserving the reliability and safety that underpin utilities, while simultaneously nurturing an innovation mindset. Gradual-change models offer a path forward—retaining the best of the legacy culture (discipline, safety compliance) while introducing new elements (flexibility, interdisciplinarity, customer centricity). Training programmes and "culture cultivator" initiatives support this effort: when senior leaders visibly champion new behaviours—such as openly soliciting employee ideas or hosting internal innovation challenges—they model the desired culture. Experts also observe a generational turnover in utility leadership: digitally fluent managers increasingly arrive as agents of cultural change, articulating and driving the vision of a digital future.

Finally, any discussion of organisational-change models must acknowledge the role of external partners and the broader ecosystem. Utilities rarely operate in isolation: they interface with municipal authorities, technology vendors, and consulting firms. Experience shows that engaging external change-management experts can accelerate transformation and introduce best practices. However, these external frameworks must be carefully adapted to local contexts.

Conclusion

Organizational change management is the cornerstone of successful digital transformation in utility services. This study demonstrates that, without careful attention to people, processes, and culture, even the most advanced technological innovations risk falling short of their potential. The key findings are as follows:

1. Digital transformation is a strategic, organisation-wide change initiative. Utilities whose leadership articulates a clear vision for their digital future and meticulously plans each step—especially those involving workforce engagement—achieve substantially better outcomes.
2. Phased, process-focused change models. Rather than attempting an all-at-once overhaul, it is more effective to enhance priority areas, showcase early successes, and then scale solutions. This evolutionary approach suits utilities particularly well, where service stability is critical.
3. Culture and employee engagement drive success. Establishing an environment in which staff understand the goals of change, possess the necessary skills and feel motivated to participate is essential. Experience shows that organisations investing in training and open communication reduce resistance and secure stronger bottom-up support.

Theoretical and practical significance arises from underscoring the human factor in technological transitions. For change-management scholarship, these findings reaffirm the universal principle that innovation succeeds only when an organisation is internally prepared. For utility practitioners, the results provide a roadmap: invest not only in smart meters and software but also in comprehensive change-management programmes—training, leadership development and culture change. In sum, digital transformation in utilities represents an organisational paradigm shift requiring expert stewardship. By leveraging the models and success factors discussed here, utilities can build robust change-management systems and thereby maximize the likelihood that their digital projects will meet objectives and deliver more efficient, reliable, and modern services to their communities.

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