



A Human-Centric Event-Driven Digital Nation Framework: Blockchain-Enabled Trust Architecture, Consent-Based Data Governance and Life-Cycle Oriented Public Service Automation

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Abstract —

This paper redefines digital governance from a human perspective in which citizens emerge as not just consumers of services, but also owners of their data, participants in decision-making, and co-creators of governance. The current e-governance models are still largely **dependent on form-submission, document-verification,** departmental clearance and manual process-handling, due to which the citizen-experience becomes fragmented, slow and trust-oriented. In this context, this study develops an alternative perspective, where administrative processes **are inherently coordinated with life events,** and decision-making is based on **event-driven automation, blockchain-based verification, and consensus-controlled data-use.**

In the proposed model, citizen-life is **structured as** a state-transition journey from birth to retirement, where each event — such as birth-registration, education-transition, employment-change, transfer, social-security status, or pension-initiation — takes the **form of an administrative trigger-event** itself. The blockchain-enabled trust-layer transforms these events **into immutable, cryptographically-linked, and auditable record-chains.** Consent-ledger, on the other hand, gives citizens the right to decide when, for what purpose, by which entity and for how long their data can be used — and every use of it **is protected as a digital evidence-trail.**

The study argues that if governance moves beyond services to a **"life-cycle-based social system"**, administrative processes become not only faster and more coherent, but also significantly strengthen citizen trust, accountability structure, and policy legitimacy. This paper delves into the **conceptual underpinnings, practical use-cases, policy implications, and social impact dimension of this model.**

Keywords:

Event-Driven Digital Governance, Lifecycle-Based Public Service Delivery, Consent-Centric Data Governance, Blockchain-Enabled Trust Architecture, Digital Nation Framework, Human-Centric Governance, Administrative Automation, Citizen Data Sovereignty, Trust-Ledger Evidence, Public Sector Digital Transformation



Background of Studies and Human Perspective

Digital governance is generally understood in terms of technical efficiency and service delivery (UN DESA, 2022; OECD, 2021), quick service delivery and process simplification ; But at the level of civic experience, the change has not been so smooth. In most systems, the citizen still has to go through multiple departments, verification points and processes of record-duplication. Every new service asks for a new application , every verification wants a new document , and every institutional interaction forces the citizen to re-authenticate their identity and status. This experience gives a digital embodiment to the governance system, but does not change its **structural nature**.

This is where this research raises an important question—should digital governance be limited to providing online services, or should it become an **administrative mechanism that is inherently intertwined with civic life**?

The humanistic approach of this study is based on the idea that the life of a citizen is a continuous flow of events , and that governance is helpful only when it is **intuitively coordinated with these events** . In this context, the event-driven model becomes the basis for not just technological innovation , but **socio-behavioural change — where government processes take the form of event-activated entitlement rather than application-dependent**.

Problem Statement & Motivation

Modern frameworks of digital governance have certainly made the delivery of services easier , but the citizen-experience is still tied to the same traditional administrative structure , rooted in a model based on form-submission , office verification, and departmental hierarchy. Whether a citizen makes a change of address , updates employment status , submits a pension claim, or receives a social-security-related service — each time he or she has to resubmit his own data and documents. This situation not only causes process-delays , but also affects citizen-trust , as the system **makes the citizen an applicant who repeatedly certifies** himself instead of accepting him as a **trustworthy data-owner**.

The root cause of the problem is that most e-governance systems, despite being based on digital infrastructure, still operate in **a service-centric and department-oriented** framework. Services are not governed by life-events , but by institutional rules and administrative environments. As a result, the actual events of civilian life — such as births , changes of employment , transfers, health status, social security entitlements or retirements — are not automatically reflected in the administrative system. Instead every event has to undergo human-intervention , application-



submission, and multi-level validation , creating challenges such as process-friction , data-duplication, and verification-incompatibility.

Another serious problem relates to the use of citizen-data. In existing structures, the control of data is often centralized at the institutional level , while the citizen does not have the transparent ability to decide **when, for what purpose, and for how long his or her data** will be used. This creates a subtle gap between data-use and citizen-rights , which has a direct impact on both the moral-legitimacy and social-credibility of the system. In this context, the question of data-sovereignty and consent-based governance becomes not only a matter of privacy , but also of **civic-dignity and administrative responsibility**.

It is from these realities that the inspiration for this study arises. This research explores the possibility that if governance **is restructured with an** event-driven approach, and life-events are accepted as administrative process-triggers , could decision-making become more automated , equitable, and context-sensitive? Can a blockchain-based trust-layer reinforce record-credibility , and can Consent-Ledger transform citizen-data **from a controlled resource to a rights-based asset**?

The driving element of this study is not just technological innovation, but the belief that the real success of digital governance is possible only when the system becomes **transparent, responsive and human-centric, communicating naturally with citizen-life**.

Research Objectives and Core Proposition

The basic objective of this study is to restructure digital governance to a level where administrative processes can naturally connect with the realities of civic-life. The central theme of the research is that if governance **is transformed into an event-driven**, blockchain-enabled, and consent-based data-governance framework, it can not only enhance procedural efficiency but also provide a strong foundation for **credibility, transparency, and citizen-rights architecture**. This study advances the view of seeing governance not as a technological platform, but **as a human-centric social system**, where every incident of civic-life itself takes the form of a **policy and administrative trigger-event**.

Based on these theoretical dimensions, the main objectives of this research have been set out as follows: First, to develop a conceptual model in which civic-life events — such as birth, education, employment, relocation , social-security entitlement, and retirement — **are structured as** Lifecycle Event Streams . And the administrative processes related to them **should be conducted through Event-Triggered Rule-Automation**. Second , to analyze the practical utility of the blockchain-based trust-layer to understand how **immutable-records, cryptographic verification, and distributed evidence-chains** reinforce dispute-reduction , verifiability, and record-reliability. Third , to study the effectiveness of consent-based data-



governance, to assess whether Consent-Ledger makes the use of citizen-data **objective-specific, time-limited, and audit-worthy**.

With these objectives, the study presents a broad **core proposition**—that the event-driven, blockchain-enabled Digital Nation model **can transform governance from** application-dependent governance **to** rights-activated governance, where related benefits, services, and services are delivered as life events occur. Eligibility review and compliance processes are automatically activated. This premise indicates that such a model can become not just a tool for administrative efficiency, but also a strong foundation for **social justice, responsive data-ethics and citizen-empowerment**.

Ideological Basis and Human-Centered Governance Approach

In the traditional understanding of digital governance, the citizen has been seen as a "service-seeking user," while administrative processes have evolved around departmental structures, policy forms, and institutional approvals. The conceptual underpinnings of this study depart from this thinking in which the citizen is treated as not just a service-user, but **an active social-citizen** going through a life-long journey — each event, every transition and every change of role is deeply intertwined with the governance system. In this view, governance is not seen as a top-down controlled administrative apparatus, but as **a social structure communicating with life-experience**.

On this basis, the study asserts that a citizen's life is not a form of static identity, but **a series of ever-changing state** transitions — where states such as birth, education, skill-development, employment, family structure, transfer, social security, senior-citizen status, and retirement are not mere records, rather, give rise to **new social-meanings, rights and administrative obligations**. The problem arises when life events change naturally, but the administrative system is slow to recognize them — and the citizen has to repeatedly "authenticate" his or her own change through documents. The study identifies this discrepancy as the **structural distance that exists between the human-life and the administrative system**.

Bridging this gap in the approach to human-centric governance requires that the system does not view events as mere application-starting points, but captures them **as context-aware administrativesignals**. When a citizen moves, it's not just the address that changes—the jurisdiction of social services, the local profit status, and the administrative obligations also change. When employment conditions change, it affects the tax situation, insurance coverage and social security contexts. When a citizen enters senior-citizen status, his or her needs, jurisdiction and statutory support schemes must automatically change. This study establishes the recognition that governance becomes truly human-centred only when it **functions as a system that understands and addresses life-changes**.



It is in this context that the event-driven model **is presented as a theoretical-social** paradigm — where life events become not just data-records, but **policy decision-triggers**. This approach moves governance away from document dependency to **behaviour-sensitive and situation-friendly governance**. The blockchain-enabled trust-layer provides a technical basis to this perspective, as it converts citizen-life records into **an immutable, evidence-worthy, and dispute-proof verifiability-base**. Consent-ledger, on the other hand, gives citizens control, **ownership, and authority over their data** — making governance not only efficient, but **also just and morally responsible**.

Thus, the conceptual basis of this study makes it clear that the digital nation does not just mean developing technological infrastructure, but about building **life-event-centered, consent-driven, and faith-based social governance structures** — where **technology is the means**, and human dignity and civil rights are its real purpose.

Proposed Model and Life-Cycle-Based Governance Structure

The proposed Digital Nation model reorganises the **governance system from a departmental service structure** to a life-cycle based governance stream, where every event of civic life becomes the basis of the administrative process itself. This model is based on the assumption that life-changes are not just information-updates, but indicative of a rebalancing **of rights-status, policy entitlements and social obligations**. The system should therefore not treat these events as "record-entry", but as **event-signals** — with the rules, compliance conditions and service flows automatically activated.

In this framework, civic life is **organized in the form of Lifecycle Event Streams** — such as **birth registration**, education transition, change of employment status, residency, social-security status, senior-citizen status, and finally retirement and pension-starting. In the proposed model, each event **is recorded as an Event Recognition Node**, where its authenticity and context are verified. The event is then **linked to the Rule-Binding Layer**, where the eligibility conditions, policy rules, and inter-agency procedures related to it are automatically mapped. This activates the service flow **based on the Condition-Satisfied Event Trigger** rather than the "application-initiated".

To conceptualize the proposed life-cycle-based and event-driven governance model, Figure-1 presents an integrated framework in which citizen life-events are treated as administrative trigger points rather than application-initiated processes.

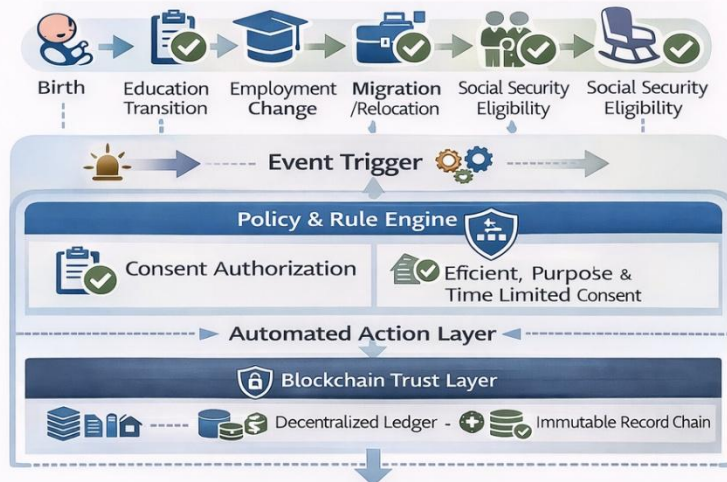


Figure-1: Lifecycle-Based Event-Driven Digital Nation Framework

As illustrated in Figure-1, major life events such as birth, education transition, employment change, migration, social security eligibility and retirement function as event triggers that activate rule-based administrative actions. These actions are executed through consent-authorized data access and recorded within a blockchain-enabled trust layer, ensuring automated

service delivery, evidence-based decision-making and long-term record integrity.

The most significant change in this governance structure is that administrative processes **move from form-based processing to Event → Rules → Automated Action** order. For example, a change in employment status does not require a citizen to apply separately for tax updates, insurance adjustments, Social Security eligibility reviews, or benefits continuity — but rather the system kicks these processes through **event-activated automation**. Similarly, relocation is not just a change of address, but the processes associated with it such as jurisdiction **restructuring, local benefit eligibility review and relocation of service** are automatically initiated. This leads to a citizen-experience free from application-dependency and **co-ordinated administrative collaboration with living situations**.

Consent-Based Data Governance & Blockchain Trust Architecture

The architectural integration of consent-centric data governance with a blockchain-enabled trust mechanism is depicted in Figure-2.

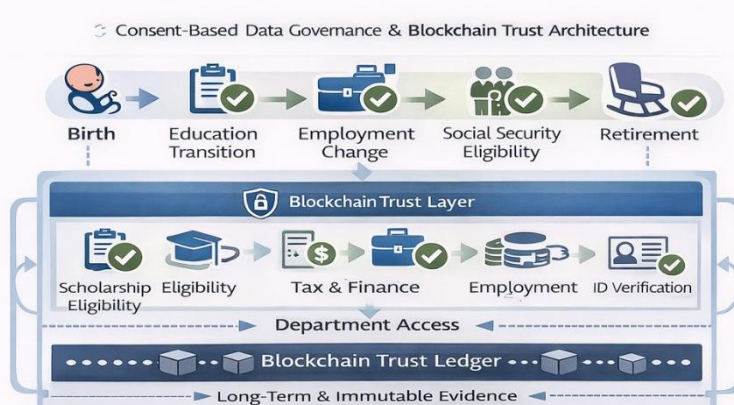


Figure-2: Consent-Based Data Governance & Blockchain Trust Architecture

Figure-2 demonstrates how citizen data access is governed through purpose-specific, time-limited and revocable consent, while verification evidence and administrative decisions are preserved in a blockchain trust ledger. The architecture ensures inter-departmental verification



without data duplication and strengthens institutional accountability and citizen trust.

Consent-based data governance **serves as a central pillar in this model**. The system operates every use of citizen-data under **purpose-specific, time-limited, and revocable permission**. Every access-event on Consent-Ledger **is protected as a** digital evidence-entry, making data-use not just a technical process, but **an ethical and responsive social-rights regime**. Citizens have the right to decide which entities can use their data when, why, and for how long — and this control structure makes governance **trust-based, transparent and accountable**.

Table 1: Consent-Based Data Governance Framework

Consent Dimension	Description	Governance Significance
Purpose-Specific Consent	Data accessed only for a clearly defined objective	Prevents misuse and function creep
Time-Limited Consent	Consent valid only for required duration	Avoids indefinite data retention
Attribute-Level Access	Only essential data attributes shared	Ensures proportional data use
Citizen-Controlled Authorization	Citizen approves and revokes access	Strengthens data sovereignty
Auditable Consent Trail	Every access logged as evidence	Enables accountability and review

The blockchain-enabled trust-layer provides long-term reliability to this framework. Important state transitions associated with life events — such as eligibility-recognition, statutory entry, benefit-activation or pension-initiation — **are preserved as a series of immutably and cryptographically linked records**. This makes the decision-making in dispute situations evidence-based, and inter-agency verification is possible without data duplication. This trust-layer becomes not an instrument of technological decentralization, but a **strong foundation of institutional accountability and record-validity**.

Table 2: Blockchain-Enabled Trust Ledger: Evidence Mapping

Administrative Event	Evidence Stored in Trust Ledger	Institutional Benefit
Eligibility Verification	Cryptographic verification hash	Reduces disputes



Consent Grant / Withdrawal	Consent transaction reference	Transparent data usage
Life-Event Trigger	Event timestamp & authority proof	Reliable automation
Inter-Department Validation	Shared ledger reference	Eliminates duplicate verification
Appeal / Review	Historical audit trail	Procedural fairness

Overall, this life-cycle governance structure transforms the administrative system **from a request-driven service flow to a rights-driven, context-cognizable, and humane-responsive administrative structure**—where technology does not expedite the process, but **makes it life-affirming and equitable**.

Table 3: Lifecycle Event–Driven Governance: Administrative Trigger Mapping

Citizen Event	Life Event	Event Recognition Signal	Triggered Administrative Processes	Governance Outcome
Birth Registration		Identity & civil status creation	Identity seeding, health record linkage, early welfare enablement	Automatic initiation of basic rights and services
Education Transition		Change in educational status	Scholarship eligibility review, academic aid mapping	Continuity of education support
Employment Entry / Change		Employment status transition	Tax realignment, insurance update, social-security adjustment	Reduced manual compliance
Migration / Relocation		Jurisdiction shift signal	Local service reallocation, benefit portability	Service continuity without reapplication
Social Security Eligibility		Entitlement status update	Welfare activation, compliance verification	Timely benefit delivery
Senior Citizen Status		Age-based eligibility trigger	Age-related benefits activation	Rights-based service extension
Retirement		Retirement confirmation	Pension initiation, medical &	Automatic pension and



	event	social support mapping	dignity assurance
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Use-case orientation and actual governance scenario

To understand the true utility of the proposed Digital Nation model, the study prioritizes scenarios where civic-life events are directly linked to administrative processes, but in the current system they are **application-dependent, delayed and multi-level verification-based** operates in form. These use-cases were selected to clearly demonstrate how governance can become **more human-centric, automated and evidence-supported** when an event-driven approach is adopted.

Birth Event and Natural Beginning of Life Cycle

In the present system, birth registration is seen as a separate administrative function, when in fact it is the basic premise **of many legal and social rights of civic** life. In the traditional model, health records after birth, identity-registration, child-health services, and future education-related processes operate through separate departments. In the proposed model, the birth event itself **is recorded as a Primary Lifecycle Event**, with processes such as **Identity Seeding, Health-Record Mapping, and Early-Benefit Enablement** automatically activated.

This change makes birth registration no longer just an administrative entry but **a starting point for life-cycle automation**—where Consent-Ledger ensures that health or social-welfare organizations use data only within **purpose-specific and time-limited permissions**.

Automatic flow of employment-status changes and policy adjustments

Transition of employment is one of the events that has a direct impact on the tax system, insurance coverage, social security entitlements and future pensions. But in the present model, for all these processes, the citizen has to apply separately. The study structures this scenario **as an Employment State Transition Event**, where the system maps the relevant rules to the Policy-Rule Binding Engine **as soon as the change** is recorded.

As a result—

- ✓ Tax status realignment
- ✓ Insurance coverage adjustment
- ✓ Benefit continuity verification
- ✓ Social security eligibility review
- They start automatically.



In this model, the government does not ask for proof from the citizen , but the incident-based authentic record itself **is preserved in the** Blockchain Trust Layer—making the decision-making **flow non-disputed, traceable, and transparent.**

Relocation and Jurisdiction-Based Service-Rebalancing

A transfer is not just a change of address , but also a change of **social-service authority** . In the present system, the citizen has to submit address verification to several entities repeatedly.

In an event-driven model, the transfer is registered as a **Jurisdiction Shift Event**.

This event automatically activates the following processes —

- ✓ Local eligibility reassessment
 - ✓ Service area reallocation
 - ✓ Document verification and coordination
 - ✓ Administrative responsibility rebalancing
- Consent-Ledger ensures that address-related data is only **available for the required period**.

The transfer thus shifts from a "recurring verification process" to a **context-conscious administrative restructuring**.

Event-activated entitlement model of retirement and pension-initiation

The retirement stage marks the stage of civic life where the nature of services translates into rights.

In the current model, a citizen has to submit a number of documents , certificates and verifications for commencement of pension.

In the proposed model, retirement is recorded as a **Retirement Trigger Event**.

With this:

- ✓ Pension Auto-Initiation
- ✓ Service Continuity Validation
- ✓ Medical-Support Mapping
- ✓ Compliance-Evidence Ledger Entry

They are auto-active.

That means pensions are no longer a rights-claims-based process, but rather an event-activated right-of-way execution — which provides a strong foundation for civic dignity.

Integrated perspective emerging from use-cases

A consolidated analysis of all these scenarios indicates that—



1. Governance **can move beyond** form-based **services to** an event-centric automation system
2. Data **can be established from institutional control** to citizen-rights
3. Decision-making **can be** evidence-based and trust-driven **rather than** discretionary

This is where the digital nation emerges as a **human-centric social-governance model** rather than a technological project.

Evaluation Perspective, Ethical Implications and Governance Implications

The proposed event-driven and blockchain-enabled Digital Nation model cannot be evaluated solely on the basis of technical efficiency , as its impact is equally reflected at all four levels — administrative structure, civil rights, data-ethics, and policy decision-making. Therefore, in this study, evaluation has been **seen as a** multi-dimensional framework, where equal importance has been given to process-speed , record-reliability and verifiability-accuracy, as well as **trust-realization, accountability-structure and rights-empowerment** . From this point of view, it is clear that the real contribution of the proposed model is not limited to "process-simplification " , but produces profound changes in both **the governance mindset and the decision-culture**.

From an ethical perspective, the most important dimension of this model is Consent-Based Data Sovereignty, which positions citizen-data as a rights-based social asset **rather than an administrative resource** . Data-use in existing systems often relies on institutional discretion , while Consent-Ledger makes data-access **objective-specific, time-limited, and audit-able** . This makes the governance system accountable to the citizen and the use of data is not just a legal formality, but a **moral commitment** . Transparency in this framework means not just information display, but also ensuring that the data-evidence behind every decision is **traceable and verifiable**.

Table 4: Traditional Governance vs Event-Driven Digital Nation Model

Aspect	Traditional Governance Model	Event-Driven Digital Nation Model
Trigger Mechanism	Citizen application	Life-event based trigger
Verification	Manual, repetitive	Automated, evidence-based
Data Control	Institution-centric	Citizen-centric
Trust Structure	Discretion-based	Blockchain-backed
Service Delivery	Delayed & fragmented	Proactive & continuous



Citizen Role	Applicant	Rights-holder
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In terms of governance impact, this model transforms administrative processes **from a request-based service flow to a rights-based decision-flow**. When life events themselves become policy triggers, processes such as benefit entitlement, pension start, social security activation, and continuity of service act as **event-activated entitlement**. This changes the role of the citizen from a "beneficiary who submits the application" to that of **an authoritative participant**. At the same time, the blockchain-based trust-layer makes decision-flow more reliable and institutionally stable through dispute-mitigation, **evidence-validation, and inter-agency verification-compatibility**.

The ethical and institutional implications of consent-centric governance are systematically aligned with accountability outcomes in Figure-3.

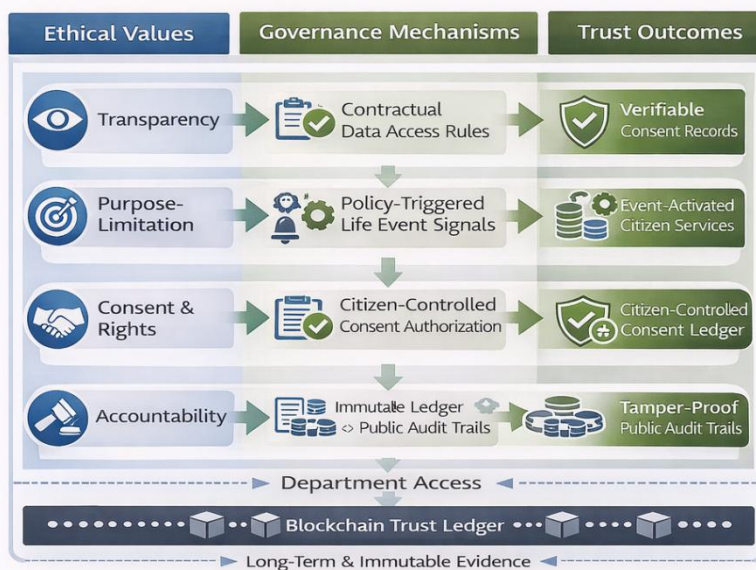


Figure-3: Ethical Governance and Institutional Accountability Alignment Model Integrating Consent-Centric Data Governance and Trust-Ledger

As shown in Figure-3, ethical principles such as transparency, proportionality, citizen autonomy and accountability are operationalized through consent-based authorization, role-based access and trust-ledger evidence. This alignment ensures procedural legitimacy, grievance reduction and trust-based citizen-state relations.

From a policy perspective, the study indicates that such a model makes governance

not just digitally efficient, but **also socially legitimate, ethically accountable, and long-term credible**. This transformation is not due to any single technology, but due **to the convergent impact of event-driven automation, consent-based data-governance, and trust-infrastructure**. For this reason, this model elevates the digital nation from the level of a technological project to **a human-centric governance-restructuring**.

Conclusions, Knowledge Contributions and Future Research Directions

The study has looked at digital governance not merely as a process of technological innovation or simplification of service-flows, but as **a socio-governance paradigm integrated with**



citizen-life. The proposed event-driven and blockchain-enabled Digital Nation model establishes that administrative processes become more meaningful, equitable, and human-centric when they transcend departmental boundaries and align with **the natural sequence of life-events**. In this model, events such as births, changes of employment, transfers, social-security status, retirement, and pension initiation **take the form of policy and rights-activated decision-triggers** — whereby the administration does not ask for evidence from the citizen, but provides **evidence-based and context-conscious decisions** on its own.

This study presents three important grounds for the level of knowledge contribution. First, it establishes digital governance as a lifecycle-driven governance perspective, where the citizen is treated as an empowered-social member passing through life, not a service-consumer. Second, the study conceptualizes consent-based data sovereignty not as a formal element of privacy, but as **a moral authority-structure and institutional accountability** — where every data-use decision creates an **auditable evidence-trail**. Third, this research presents blockchain not as a tool for technological decentralization, but **as a strong foundation of** trust-infrastructure, providing long-term stability to inter-agency verification, dispute-mitigation, and record-reliability.

To highlight the structural shift proposed by the event-driven and consent-centric model, Figure-4 presents a conceptual comparison between traditional application-centric governance and trust-ledger-enabled governance.

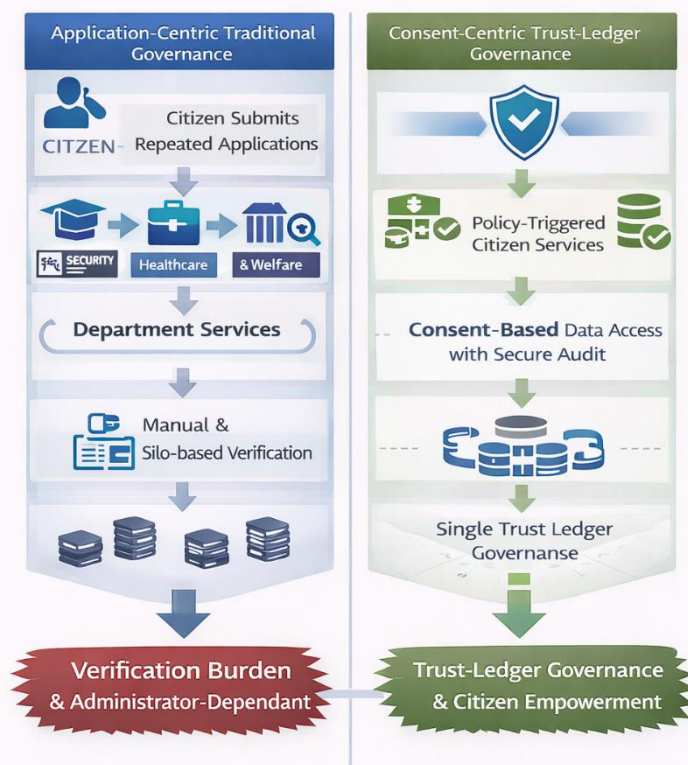


Figure-4: Traditional vs Event-Driven Consent-Centric Governance Model

Figure-4 clearly illustrates the transition from repetitive application-based verification to proactive, life-event-driven service activation. While traditional governance places the burden of verification on citizens, the proposed model enables automated eligibility assessment, consent-based data access and single-source trust verification, thereby enhancing efficiency, dignity and institutional trust.

This study opens up various possibilities in terms of future research directions. One direction is **the empirical evaluation study**, in



which the actual pilot-results of the proposed model can be measured through process-time, data-consistency, dispute-reduction and citizen-confidence indicators. The other direction is **domain-specific governance applications** — such as healthcare , land-records management , judicial administration, and social-welfare delivery — where event-driven automation can generate different behavioral impacts in different contexts. The third direction is ethics-and-policy impact research, in which the social-justice dimensions of data-rights , consent-control, and trust-infrastructure can be comparatively analyzed.

Overall, the study indicates that the future of the digital nation lies not just in technological advancement, but in the established balance between **citizen-life, data-rights, and transparent governance**. The model conceptually reinforces this balance and provides a solid intellectual basis for further **policy experiments, pilot projects, and comparative governance studies**.

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