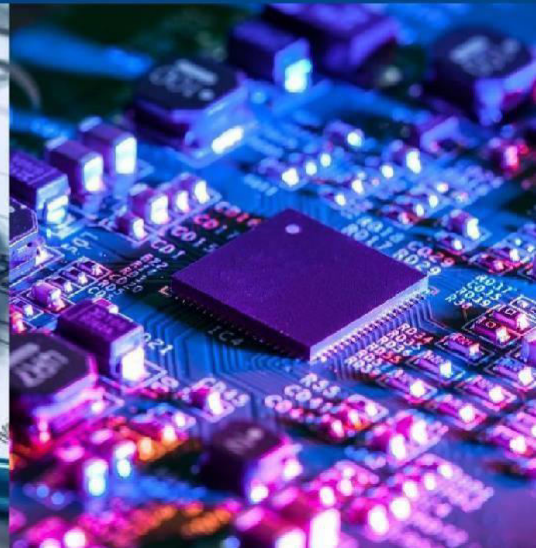
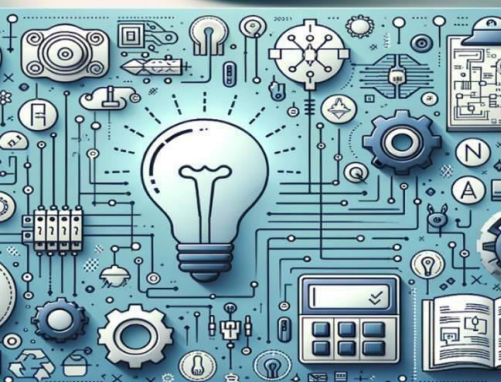




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Emerging Marketing Technologies in Public Sector Enterprises: Global Adoption and Prospects for the Indian Public Sector

Ashwini Ratnoo, Dr. Pramod Gupta

Research Scholar, Department of Management, Sunrise University, Alwar, Rajasthan, India

Professor, Department of Management, Sunrise University, Alwar, Rajasthan, India

ABSTRACT: Marketing in public sector enterprises is no longer confined to official publicity and empanelled advertising. It now depends on a stack of technologies: customer data platforms, marketing automation, conversational agents, programmatic media, mobile service applications, analytics and, in a smaller set of cases, sensor-enabled retail points. This paper examines how those technologies have been adopted by public and state-owned enterprises internationally, and what prospects they hold for the Indian public sector. Global adoption is furthest where corporatised firms treat the digital interface as a product and where data protection regimes allow named-customer files to be used under published rules. Indian public enterprises have built payment applications, grievance portals and loyalty systems, yet many still run campaign, complaint and operations data in separate silos. Prospects for India lie less in purchasing a new tool and more in joining identity, consent, campaign and service records under existing public digital infrastructure. Constraints of procurement, audit, cadre skill and politically visible failure remain. They do not make the stack unusable. They change the order in which it can be introduced.

KEYWORDS: marketing technology; public sector enterprises; CRM; marketing automation; artificial intelligence; digital public infrastructure; India; state-owned enterprises; customer data; conversational systems

I. INTRODUCTION

1.1 Marketing Technology as an Operating Stack

Marketing technology is the set of systems that identify a user, store permission to speak to that user, assemble an offer, deliver a message, receive a response and measure whether the response became a completed service. In a private consumer firm the stack is often bought as a suite. In a public enterprise the same functions are usually scattered across a core banking or billing system, a grievance portal, an advertising agency's report and a ministry dashboard. The scatter is the first fact that any serious account must name. Technology does not enter a public enterprise as a single purchase. It enters as a problem of joining records that were never designed to meet.

Joining is unglamorous work. It looks like schema meetings and legal notes. It does not look like a launch. Boards that fund launches and starve joins obtain launches that shout at the wrong file. The stack then appears to have failed when the join never existed. Diagnosis should start at the record, not at the creative.

The stack has layers. At the base sit identity and consent. Above them sit data stores that can be queried by segment rather than only by account number. Above those sit tools that send a message—email, application notice, short message, voice bot, paid media. At the top sit measurement systems that close the loop from spend to completed transaction. Public enterprises often possess the top and the bottom in primitive form and lack the middle. They can blast a message and they can open an account. They cannot always say which message moved which account.

Measurements that cannot attribute a completion to a message will defend spend with reach. Reach is a weak defence under audit and a weak teacher of the next campaign. Closing the loop from message to completion is therefore not a reporting luxury. It is the only way the stack learns. Public enterprises that accept reach as enough will repeat the same official burst each festival.



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Calling this apparatus 'digital marketing' is too narrow. A sensor at a fuel pump that triggers a cleanliness alert is a marketing technology if cleanliness is how the brand holds a highway customer. A chatbot that books a claim appointment is a marketing technology if waiting time is the product. The paper therefore treats marketing technology as any system that changes the customer's path to an offer or a remedy, not only as a media-buying platform.

1.2 Public Enterprises as Late but Heavy Users

Public enterprises are late users of fashion in marketing software and heavy users of transaction systems. They process millions of accounts, tickets, connections and policies. The data exhaust of those transactions is larger than that of many private rivals. The paradox is that the exhaust is rarely usable for a campaign in the week it is produced. Batch reporting, legacy schema and fear of wrongful use keep the exhaust in warehouses that marketing cannot query.

Lateness has a cost and a compensation. The cost is that citizens now compare a public application with the best private application they used in the same week. The compensation is that India has built public digital infrastructure—identity, payments, consent artefacts and account aggregators—that a public enterprise can lean on instead of inventing a private identity graph. Prospects for Indian adoption run through that infrastructure more than through a imported suite.

Imported suites assume a private identity graph, a flexible cookie store and a marketing team that may test weekly. Indian public enterprises have a public identity rail, a statutory purpose limit and a clearance cycle measured in files. A suite that fights those three facts will be configured as a sending pipe and then blamed for not being intelligent. Intelligence here is configuration under constraint.

II. LAYERS OF THE EMERGING STACK

2.1 Identity, Consent and the Customer Record

No later layer works if the enterprise cannot recognise the same person across a branch, an application and a call. Public enterprises usually recognise an account. They less often recognise a person who holds three accounts. Identity resolution—safe, consented joining of those accounts—is the unglamorous foundation of personalisation. Without it, 'personalisation' is a mail-merge on a name field.

Identity resolution in a public setting must also respect household structure. A connection may stand in one name while the person using the application is another member. Blind merging creates wrongful disclosure. Utilities that already keep authorised-person fields are closer to a safe join than a purchased graph that ignores those fields. Consent tokens should be time-bound and purpose-bound. A permanent marketing yes stored as a brand asset will fail the first purpose-limitation audit.

Consent is not a banner to be clicked once. In a public enterprise it is a legal and political fact. A citizen who gave data for a subsidy cannot be assumed to have given data for a cross-sell. Technology that cannot store purpose limitation will, if used for marketing, produce a scandal rather than a conversion. Global public firms that adopted customer data platforms early did so under data-protection statutes that forced purpose tags. Indian adoption will have to do the same under the domestic data-protection regime and under sectoral secrecy rules in banking and telecom.

2.2 Analytics and Decisioning

Analytics in marketing technology means scoring a next action: whom to remind, whom not to bombard, which channel is likely to complete a payment, which complaint cluster predicts churn. Public enterprises already run risk and fraud models. Few run next-best-action models that marketing is allowed to trigger. The gap is not the absence of statisticians. It is the absence of a rule that a model output may change a customer message without a circular.

Decisioning engines fail in public settings when they optimise only for short-term take-up. A model that pushes a fee-heavy product to a pensioner will pass a conversion test and fail a legislative test. Public-sector analytics therefore needs constrained optimisation: maximise completion of a legitimate service subject to fairness and suitability rules. That is a different object from a private recommendation engine, even when the software looks the same.

Fairness can be encoded as exclusions that an engine must read: no fee-product push to a pension-flagged account; no more than a stated number of messages in a week; no campaign during specified live grievances. An engine that cannot



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read an exclusion table is unfit, whatever lift it shows on a private test set. Public analytics is constrained optimisation, not unrestricted targeting.

2.3 Automation of Journeys

Marketing automation is the timed sequence that follows an event: an application abandoned, a policy due, a meter unread, a claim unacknowledged. Public enterprises still handle many of these events by queue and by circular. Automation is valuable precisely where the event is frequent and the correct next step is known. It is dangerous where the next step requires judgement that a script cannot hold. Adoption should therefore start with high-frequency, low-judgement journeys—reminders, acknowledgements, status—and only later touch journeys that allocate a scarce benefit.

Automation also fails when posting in the core system lags. A reminder that a bill is due after the bill has been paid in a branch is worse than silence. Journey tools cannot repair a two-day posting delay with a better sentence. Playbooks should name the event, the wait, the first message, the second message, the stop rule and the escape before any code is written. Coding without a playbook produces invented steps that cannot be defended.

2.4 Conversational and Voice Systems

Chatbots and voice bots absorb volume that call centres cannot. They also destroy trust when they block the path to a human after two wrong answers. Public enterprises are judged more harshly for that blockage than private firms, because the user reads the bot as the state. Global postal and transport operators that succeeded with bots published a short list of tasks the bot can finish and a visible escape to an agent. Indian public portals that hide the escape produce rage that no later campaign can repair.

Language is a technical requirement, not a courtesy. A bot that cannot complete a journey in the language of the household is not a national public system. Multilingual models are now usable. Procurement that still specifies only English and Hindi for a country-wide utility is specifying failure in advance.

Speech systems face noise, age and distress. Long menus fail those conditions. Short intent detection, one-sentence confirmation and transfer on second failure belong in the acceptance test. Agents who receive a transfer must see the transcript. A transfer that forces the citizen to begin again is a second failure, not an escape. Transcript integration is part of the bot project.

2.5 Paid Media and Programmatic Delivery

Programmatic buying places an advertisement through automated auctions rather than through a single official rate card. Public enterprises approach it with suspicion because auction paths look irregular under older advertising codes. Some foreign public firms now run programmatic under logged bid rules and published agency mandates. The technology is not the obstacle. The obstacle is a rule that treats any non-rate-card placement as a potential audit objection. Until empanelment rules name logged programmatic as a permitted path, Indian public enterprises will continue to buy reach as they bought it twenty years ago.

Where logged programmatic is permitted, brand-safety lists and adjoining-content exclusions must sit in the same log as the bid. A public mark cannot discover after the fact that it sat beside prohibited material. Unlogged cheap reach is not a solution to that risk. A pilot list of platforms, a spend cap and a mandatory file of winning prices can precede any general doctrine.

2.6 Applications, Sensors and the Physical Edge

The customer's primary branch is increasingly an application. Secondary edges include sensors at pumps, stations and meters that can trigger a service or a message. These are marketing technologies when they change perceived reliability. A pump that tells a highway application it has working facilities is competing. A meter that tells a household its slab in time to change use is competing. Indian public enterprises already own many of the physical points. They rarely close the loop from sensor to message to the same person's application.

Sensors should first put a fact on the application—a working facility, a live slab, an estimated restoration—and only later, if at all, support a lifestyle film. Dealer-owned edges must see the same fact in the same hour, or the application will promise what the forecourt cannot keep. Indian oil retail already lives that edge. Technology that ignores the dealer device publishes a liability.



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III. GLOBAL ADOPTION

3.1 Europe: Charters, Platforms and Unbundled Data

Corporatised European utilities and public banks adopted service platforms earlier because regulators asked for measurable waiting times and because listing brought investor questions about digital cost-to-serve. Customer data was unbundled from billing more cleanly than in many Indian utilities, which still treat the billing file as the only file. Marketing automation grew around moving-house, tariff-switch and outage journeys. Conversational systems were introduced with published task lists. The European lesson is institutional as much as technical: a charter that names a minute-count creates a demand for a system that can report that count.

Charters without systems become slogans. Systems without charters become dashboards that no one is obliged to improve. European practice bound the two. Indian citizen charters often exist as pages. Binding a named minute-count to a named system report is the piece that still has room to travel.

3.2 East Asia: Scale Platforms and National Rails

Public and public-linked firms in parts of East Asia built marketing technology on top of national payment and identity rails and on top of super-applications that already held the customer. Adoption was fast where the enterprise could sit inside an existing daily habit rather than asking the citizen to download a twelfth application. The lesson for India is direct because India now has comparable rails. The risk in the East Asian path is concentration: a public service that lives only inside one private super-application inherits that application's rules. Indian public enterprises should use rails without disappearing into a single private shell.

Sitting on rails is not the same as sitting inside one commercial application. Rails are public goods. A commercial shell is a private rule-set. Public enterprises that offer a service only inside one shell outsource the customer relationship. Payment success in that shell can hide the loss of the complaint path.

3.3 North America: Digital Default and Ombudsman Data

Public authorities and crown corporations that made digital the default path generated complaint data that marketing could read. Ombudsman case types became a feed for journey redesign, not only a legal residue. Analytics here was less about next-best product and more about next-worst failure. That use of complaint data as a design input is still rare in Indian public enterprises, where grievance portals often stop at a number and a closure code.

3.4 Emerging-Market Utilities: Prepaid, Field Apps and Inclusion

Utilities in several Latin American and African systems adopted prepaid and field-force applications before they adopted campaign suites. The marketing effect was inclusion: a household could see a balance and a slab without visiting an office. Technology that reduces a journey to a balance check is more valuable in thin-connectivity districts than a recommendation engine. Indian state utilities that chase a sophisticated campaign cloud before they give the household a reliable balance view have reversed the useful order.

Balance visibility and prepaid status are humble screens. They prevent shock. Shock is the moment at which a public brand loses a household for a season. Campaign clouds do not prevent that shock. Order of adoption that starts with shock-prevention screens is therefore not a lack of ambition. It is a correct reading of what the household needs first.

Postal operators that opened tracking to the public created a marketing asset without buying a campaign suite. The asset was a true status. Transport operators that published disruption maps did the same. The pattern is cheap to name and demanding to keep true. Indian railways and utilities already possess the events. Publishing them in the same hour is the adoption that costs least in licence and most in operational honesty.

Public banks abroad that opened consented account-aggregation feeds allowed the customer to bring data to a comparison without surrendering the bank's entire file to a vendor warehouse. That pattern fits Indian account-aggregator work. Marketing technology that waits for a warehouse copy when an authorised feed exists has chosen the heavier path.

3.5 What Global Adoption Did Not Do

Global public enterprises did not, as a class, abolish counters. They did not give models unsupervised rights to refuse a statutory service. They did not treat every citizen file as a marketing file. Adoption that ignored those limits produced



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backlash and, in some cases, statutory correction. The Indian prospect should copy the limits as carefully as it copies the tools.

Copying limits means writing them before the go-live note: no silent merge; no model refusal of a statutory service; no bot without escape; no unrestricted graph. A go-live note that lists only features lists only half of what global practice actually did.

IV. INDIAN PUBLIC SECTOR: PRESENT CAPABILITY

4.1 Transaction Systems and Portals

Indian public banks, insurers, oil retailers, railways and utilities already run large transaction systems and citizen portals. Payments, bookings and bill presentment are no longer experimental. The missing piece is not another portal. It is a shared view of the same person across portals that still behave as separate kingdoms. A household that pays a fuel loyalty account, a bank account and a power bill to three public enterprises should not have to teach its identity three times if law and consent allow a join. Present capability is wide at the edge and thin at the join.

Joining is a sequence of consented pairs, each with a legal basis: application identity to account; loyalty identifier to invoice; connection number to authorised mobile. Pairs that already have a basis should be joined first. Waiting for a universal graph waits forever. Frequency caps belong beside those joins. A public brand that messages daily trains the citizen to ignore the one notice that matters in a shortage.

4.2 Loyalty, Offers and Retail Identity

Oil marketing companies and some banks operate loyalty and offer engines. These are marketing technologies in daily use. Their limit is isolation. Points rarely meet a complaint record. An offer rarely knows that a claim is pending. Isolation produces the familiar public-sector absurdity of a festive push message arriving while a grievance is open. Joining offer engines to grievance status is a small technical task and a large service improvement.

4.3 Grievance and Ombudsman Rails

Centralised grievance systems and sectoral ombudsmen generate structured case data. That data is under-used as a marketing-technology input. Closure codes could train a bot's escape rules. Repeat categories could kill a journey that automation keeps restarting. Present practice treats the grievance file as a compliance object. Prospect practice would treat it as the richest available description of where the offer breaks.

Anonymised grievance text is also a language resource. Citizens' phrases train bots better than manual prose. Few enterprises have used their own complaint corpus this way. Offer engines that cannot see an open grievance will push a festive message onto a live complaint and convert a service failure into a brand event.

4.4 Public Digital Infrastructure as an Asset

Identity credentials, payment addressing, consent artefacts and account aggregation are public goods that Indian public enterprises can call rather than rebuild. A private foreign suite that insists on its own identity graph fights this asset. Procurement that prefers such a suite taxes the enterprise twice: once in licence cost and once in integration cost. Prospects improve when the stack is specified as functions on public rails, not as a branded platform that replaces them.

A suite that becomes the identity store cannot be unplugged. A suite that calls public rails can be replaced. Procurement should refuse the first design even when the demonstration is smooth. Shared notification across sister enterprises would also reduce contradictory messages in the same week. Citizens do not read organograms as cleanly as files do.

4.5 Cadre and Vendor Reality

Technology is operated by people and by vendors. Public-enterprise information cadres are stronger in core systems than in journey design. Marketing cadres are stronger in official campaigns than in event-triggered sequences. Vendors sell suites. The resulting default is a purchased dashboard that no internal owner can change in a week. Capability therefore includes a named product owner for each journey, with authority to alter a message without a new tender. Without that owner, adoption is a licence, not a practice.



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Each high-volume journey needs a weekly review of three numbers: started, completed, escaped to a human. Technology does not attend that review. Owners do. A board that approves a suite and does not name owners has approved an ornament. Training courses without owners produce slides.

Boards appoint owners. Academies train tools. A paper that funds tools and is silent on owners will be repeated at the next conference with a new product name and the same unfinished journeys.

4.6 Data Quality at Source

Marketing technology amplifies whatever the source file contains. Wrong mobile numbers, stale authorised persons and unposted payments become wrong messages at scale. Quality work at the branch and at the meter is therefore part of the technology programme. Enterprises that fund a campaign cloud and leave the source file dirty will scale error. They will then blame the cloud.

Quality can be improved with simple loops. A failed message returns a code. The code should open a correction task, not disappear into a bounce report. Field staff who correct a number should see that the next message arrived. Without that sight, correction has no reward and will not be repeated. Technology that hides the loop from the field wastes the only workforce that can clean the file.

Master-data ownership is usually unclear. Billing owns a connection. The application owns a login. Loyalty owns a card. Marketing owns none of these and is asked to speak to all of them. A short ownership note—who may change which field, who is informed—prevents the stack from writing over a legal name in order to complete a merge. Clarity here is cheaper than a later restoration of the file.

5.7 Edge Cases in Inclusion

Feature phones, shared phones and low literacy are not edge cases in much of the Indian public-sector base. They are the base. Applications that assume a private smartphone and fluent text will market only to the already served. Voice in the household language, missed-call triggers and assisted counters remain part of the stack. Dropping them in the name of digital default repeats an old exclusion under a new name.

Assisted digital is a technology pattern: an agent completes the journey on a shared device with the person present and a recorded consent. Public banks and common-service centres already know the pattern. Marketing technology should treat the assisted completion as a first-class channel with its own template and its own log, not as a leak from the pure-digital report.

Inclusion also limits frequency. Households that pay per message, or that share a handset, experience a burst of official texts as a cost and a nuisance. Caps that look conservative on a dashboard look reasonable in that household. Public enterprises that copy private frequency norms copy a cost structure their users do not share.

6.6 Vendor Lock and Exit

Lock appears when templates, consent stores and identity maps live only in one cloud. Exit then requires a translation project that boards will postpone. Specifying portable objects—message templates in open formats, consent records with public identifiers, logs as ordinary tables—keeps exit thinkable. Thinkable exit improves behaviour during the contract. Unthinkable exit trains the vendor.

Lock also appears in people. A single systems integrator who alone understands the journey map is a person-shaped lock. Documentation that a second team can read is part of acceptance. Demonstrations that only the integrator can run are not acceptance.

V. PROSPECTS FOR THE INDIAN PUBLIC SECTOR

5.1 Order of Adoption

The useful order is identity-and-consent, then journey automation for high-frequency events, then conversational escape-aware bots, then analytics that may trigger a message, then programmatic media under logged rules. Reversing the order—buying media technology before joining records—produces spend without learning. Several Indian enterprises have already bought the later layers. Prospect work is to go back and finish the earlier ones.



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Order protects consent as well as spend. Analytics that trigger messages before purpose tags exist will use the wrong file. Programmatic that runs before identity is clean will pay for the wrong household. Sequence is a control. It can be shown on a board page as this quarter's status journeys and next quarter's reminders, so that a vendor cannot sell the later quarter first.

5.2 Journeys Worth Automating First

Abandoned digital applications, due dates, unread meters, unacknowledged claims and outage restoration notices are journeys with known correct steps and high volume. Automating them releases call-centre time and reduces the rage that later campaigns must overcome. Cross-sell sequences are a later journey. In a public bank or insurer they require suitability checks that a first-wave engine will not hold. Prospect does not mean 'automate everything'. It means automate the known step.

5.3 Bots with a Visible Human Path

A public bot should advertise its limits. Three completed tasks and a labelled transfer are worth more than an open-ended conversation that fails. Voice in regional languages should be specified in the same tender as the engine. Enterprises that tender for a bot as a cost-cutting device will obtain a device that cuts the wrong cost: the path to remedy.

Bots specified as cost-cutting devices cut the path to remedy. Bots specified as task lists with escapes cut waiting time on known tasks and leave judgement to agents. The tender language decides which of those two objects arrives. Cost-cutting language is cheaper in the file and more expensive in public anger.

5.4 Analytics under Suitability Rules

Models may rank who needs a reminder to complete a statutory enrolment. They should not rank who can be sold a margin product without a suitability screen. Encoding that distinction is the specifically public-sector prospect of analytics. Software that cannot accept a hard exclusion list is the wrong software, however accurate its lift chart.

Suitability already exists as paperwork in insurance and in parts of credit. Paper behind an automated push is decoration. Screens must be machine-readable so that automation cannot skip them. Models may rank reminders for statutory enrolment. They may not rank margin products without that screen.

5.5 Programmatic Media inside Empanelment

Prospect here is regulatory as much as technical. If advertising codes name logged, audited programmatic buying as a permitted path, public enterprises can stop paying official rates for inventory that the rest of the market buys by auction. If codes do not name it, the technology will remain a demonstration. The paper's claim is that the code can be written without abandoning propriety. Logged bids are more auditable than some current package deals.

5.6 Shared Platforms across Enterprises

Not every public enterprise needs its own campaign cloud. Payments and grievance already show that shared rails work. A shared notification and consent layer, called by many enterprises, would reduce the twelfth-application problem and raise the quality of purpose limitation. Competition among public enterprises for customers can continue at the offer layer. It need not be reproduced at the identity layer.

VI. CONSTRAINTS THAT SHAPE ADOPTION

6.1 Procurement Cycles

A tender that takes a year cannot buy a tool whose useful life of a version is nine months. Constraint is reduced by buying functions on existing rails, by using rate contracts for short-cycle work, and by separating data hosting from journey design so that the design can change without retendering the host. Enterprises that insist on a single grand suite retender themselves into permanence of the last version.

Modular contracts for hosting, design, messaging and analytics allow one module to move. A monolithic suite holds all four hostage. Part of the procurement constraint is the shape of the last tender, not only the length of the cycle. Rate contracts for short-cycle design work can sit beside a longer host contract.



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6.2 Audit and Explainability

A model that cannot explain why a person was messaged will not survive a paragraph. Prospect systems must log the rule, the score threshold and the exclusion applied. Explainability is not an ethical extra in this setting. It is the condition of use. Vendors who treat the model as a sealed lift machine are unusable, whatever their private-sector list.

Logs should record suppression as well as dispatch. Why this person was not messaged is as reviewable as why another was. Silence can hide exclusion. Vendors who will not emit suppression reasons fail the public-sector interface even if their lift charts are tidy.

6.3 Purpose Limitation and Secrecy

Banking secrecy, telecom secrecy and subsidy purpose tags limit joining. The limit is correct. Technology that requires a single unrestricted graph fights the law and will lose. Prospects run through consented, purpose-tagged joins and through account aggregation where the person authorises them. They do not run through a silent warehouse merge.

Purpose tags will irritate campaign teams. They are the price of using public files. Teams that cannot work with tags should not receive the file. That staffing rule is technology governance, not a human-resources afterthought.

6.4 Political Visibility of Failure

A private bot that fails is a brand event. A public bot that fails is a state event. Risk aversion is rational. It becomes paralysis only when the alternative is an overloaded human queue that also fails, more slowly. A staged rollout with a published task list and an escape path is the risk-reducing design. A silent nationwide switch-on is the risk-maximising design.

Staged rollout should be functional and linguistic at once: one journey, one language cluster, one trained escape team. Nationwide switch-on of an untested journey maximises the state event. Small staged success is quieter and cleaner. Risk aversion that refuses staging and also refuses the overloaded queue chooses the slower public failure.

6.5 Skill and Ownership

Journeys need owners who live with weekly numbers. Cadres organised by branch and by file do not automatically supply those owners. Creating a small journey team—operations, technology, marketing, grievance—around each high-volume path is the organisational prospect that makes the technical prospect real. Training courses without owners produce slides.

VII. AN ADOPTION FRAME

7.1 Function First, Suite Second

Specify the function: recognise a consented person, trigger a known next step, escape to a human, log the rule. Then choose software that can sit on public rails. The reverse order produces a suite that demands its own rails.

Function-first specification eases exit. If the function is a consented status notice, another party can send it. If the function is life inside one vendor's identity cloud, exit is a migration programme. Public enterprises have already lived such migrations in core systems. They need not repeat them for marketing technology.

7.2 High-Frequency Journeys before Persuasion

Status, reminder and acknowledgement create trust that later persuasion can use. Persuasion before status creates noise on top of an unfinished service. The frame is sequential for that reason.

Status and acknowledgement create the trust that later persuasion uses. Persuasion laid on unfinished service is noise. Sequence is therefore not caution for its own sake. It is the only order in which persuasion has something true to stand on.

7.3 Logged Rules as the Public-Sector Interface

Every automated message should leave a record that an auditor can read without a vendor's engineer. Threshold, exclusion, template, time. That record is the public-sector substitute for private-sector speed of informal change. It is slower than a start-up's slack channel. It is faster than a circular.



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Logged bands allow delegation. Inside the band a journey owner may change a template. Outside the band a higher clearance applies. Delegation without logs is indiscipline. Logs without delegation are delay. The pair is the workable public-sector speed.

7.4 Measurement that Closes on Service, Not on Clicks

A public enterprise that measures only open rates will automate the wrong thing. The closing metric is completed service: bill paid, claim acknowledged, outage restored, application finished. Clicks are intermediate. Technology that cannot see the completed service should not be allowed to optimise the path.

Seeing a completion flag in the core system may require an interface project. That project is part of adoption. Blind optimisation of clicks is not a temporary phase. It trains the stack to love the wrong number.

7.5 What the Frame Refuses

The frame refuses silent nationwide bots, unrestricted graphs, sealed models, click-only scores and suites that replace public rails. Refusal is part of design. A list of adoptions without a list of refusals will be completed by the first scandal. Boards can adopt the refusals as standing instructions before they adopt any vendor.

The frame also refuses the claim that constraint makes technology pointless. Constraint changes sequence and logging. It does not change the need for a status message that is true tonight. Enterprises that use constraint as a reason to remain on festival bursts have chosen the weaker reading of their own setting.

Finally the frame refuses to treat citizens as a media audience first. They are account holders with a right to a correct status and a path to a human. Media may follow. Media that precedes status is official noise. The stack exists to stop that noise from being the only voice the enterprise has.

VIII. CONCLUSION

Emerging marketing technologies are already inside public enterprises as portals, loyalty engines and bots. They are not yet a stack. Global adoption shows that the stack forms when identity is joined under consent, when high-frequency journeys are automated, when bots advertise their limits, and when complaint data redesigns the path. Indian public enterprises hold unusual assets in transaction volume and in public digital rails. They hold unusual constraints in procurement, secrecy and political visibility. Prospects are therefore ordered, not total.

Ordered work is easier to fund. Money can be released for a consented join and one status journey without a transformation banner. Total banners invite total tenders. Total tenders invite delay. Modest funded steps produce a stack. Banners produce files.

A public enterprise that treats marketing technology as a campaign purchase will obtain campaigns. A public enterprise that treats it as the wiring of identity, consent, journey and remedy will obtain a customer path that can stand beside private paths without pretending to be private. That is the available prospect.

The available prospect is also a staffing prospect. Journey owners, grievance analysts who feed design, and procurement officers who can write function-first tenders are scarce. Technology spend that ignores that scarcity buys idle licences. Spend that funds those roles for two years will still be visible after the licence period ends.

Nothing in this account requires public enterprises to become advertising businesses. It requires them to become accurate about status, careful about consent, quick on known steps and open on escape. Those four qualities are old public virtues. The stack is a new way of practising them at the volume the opened market now demands.

A last distinction is worth keeping. Digital public infrastructure gives Indian public enterprises a starting position that many foreign public firms had to buy. Identity, payment and, increasingly, consent are not vendor gifts. The remaining work is to let marketing technology call those rails for status and remedy rather than for noise. If that call is made, the Indian public sector need not trail global adoption on every layer. It can lead on the layers that sit on public rails and refuse the layers that demand a private graph. That combination is not a compromise. It is a strategy.



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REFERENCES

1. Bozeman, B. (2007). Public values and public interest. Georgetown University Press.
2. Chen, H., Chiang, R. H. L., & Storey, V. C. (2012). Business intelligence and analytics. *MIS Quarterly*, 36(4), 1165–1188.
3. Dunleavy, P., Margetts, H., Bastow, S., & Tinkler, J. (2006). Digital era governance. Oxford University Press.
4. European Commission. (2016). General Data Protection Regulation. Official Journal of the European Union.
5. Hood, C., & Dixon, R. (2015). A government that worked better and cost less? Oxford University Press.
6. Kotler, P., & Lee, N. (2007). Marketing in the public sector. Pearson.
7. Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation of government. *Government Information Quarterly*, 36(4).
8. OECD. (2015). OECD guidelines on corporate governance of state-owned enterprises. OECD Publishing.
9. OECD. (2019). The path to becoming a data-driven public sector. OECD Publishing.
10. Osborne, S. P. (2010). The new public governance. Routledge.
11. Ministry of Electronics and Information Technology. (n.d.). Digital public infrastructure notes. Government of India.
12. World Bank. (2016). World development report: Digital dividends. World Bank.
13. Zuboff, S. (2019). The age of surveillance capitalism. PublicAffairs.



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