TECHNOLOGY IN SERVICE: AI &

Complaints to Loyalty: Proactive Complaint Management and Customer Win

Jia Lal Koundal[1], Yakanshu Kakkar[2], Chanchal Saxena[3]

[1]Innovision Breakthrough, Gurgaon, Haryana, India
[2]CRM Head, Consumer & Automobile Industry
[3]CTO, Consumer Appliances Industry

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Abstract

Purpose: Complaints are unavoidable, but how an organisation deals with them shapes retention, cost, and reputation. This paper examines how organisations are moving from reacting to complaints to preventing them, and what leaders and organisations must do for that shift to hold. Design/methodology/approach: An integrative review brings together peer-reviewed research on complaint handling and service recovery with regulator, industry-body and consulting data published mainly between 2022 and 2026, with emphasis on India. Evidence from six industries is coded to four stages (prevent, detect, resolve and learn) and read through theories of voice, justice, customer effort and organisational learning. Findings: Three levers recur across industries: removing causes through transparency, detecting trouble early through data and AI, and resolving quickly and fairly. Documented programmes report 20–30% lower contact volume, yet technology alone falls short, since only 14% of service issues are fully resolved in self-service. In India, consumer durables grievances on the National Consumer Helpline rose 59% in one year. Practical implications: Through the proposed Proactive Complaint Management (PCM) framework, organisations can systematically prevent complaints, detect emerging issues early, resolve them efficiently, and institutionalise learning across functions. Organisations that continue to treat complaints as operational issues will struggle to retain customers. Those that treat complaint prevention as a strategic capability will create loyalty, unlock growth, and build more resilient brands. The paper proposes a four-stage Proactive Complaint Management (PCM) framework. Originality/value: Six industries and Indian regulatory data are placed in one comparative frame, the strength of evidence behind each claim is graded, and eight propositions are offered for testing.

Keywords: Complaint management; service recovery; customer loyalty; proactive customer service; after-sales service; artificial intelligence; India

1 Introduction

Customer problems are growing faster than most organisations can handle. In the 2025 National Customer Rage Survey, 77% of American consumers reported a product or service problem in the previous twelve months, more than twice the level measured in 1976, and 43% of the complaints they posted on social media drew no reply (Customer Care Measurement & Consulting [CCMC] & W. P. Carey School of Business, 2025). India shows the same pressure. Complaints under the Reserve Bank Integrated Ombudsman Scheme rose 13.55% to 13,34,244 in FY 2024-25 (Reserve Bank of India [RBI], 2025), and grievances about consumer durables on the National Consumer Helpline (NCH) rose 59% in a single year (Rajya Sabha, 2025).

The commercial case for handling complaints well is long established. Reichheld and Sasser (1990) found that a 5% fall in customer defections raised profit by 25% to 85% in the service businesses

they studied. A complaint is therefore more than a cost. It gives the firm a second chance to keep the customer, and it tells the firm, free of charge, what is broken.

Most organisations nevertheless treat complaint handling as a back-office routine: they wait for the customer to speak and then repair the damage. A smaller group now acts one step earlier, either by removing the cause of the complaint or by finding the fault before the customer does. Practitioner writing commonly claims that such proactive work cuts complaints by up to 30%. The claim is widely repeated and rarely examined.

Two gaps follow. The academic literature is rich on recovery after a complaint but thin on prevention, and what is known about proactive practice is scattered across industries and largely confined to consulting reports. The Indian setting, where complaint volumes and the installed product base are both rising quickly, is seldom studied using regulatory data. This paper addresses these gaps through four research questions:

RQ1. What mainly drives complaints in each industry?

RQ2. Which proactive strategies respond to these drivers, and what results are documented?

RQ3. Which leadership and organisational practices do successful programmes share?

RQ4. How should proactive complaint management be organised, measured and monitored in after-sales service for consumer durables in India?

The paper makes three contributions. First, it places established theories of voice, justice, customer effort, and organisational learning along the life of a complaint and derives a four-stage Proactive Complaint Management (PCM) framework. Second, it compares six industries using sourced evidence and grades the strength of that evidence, separating verified results from popular claims. Third, it applies the framework to after-sales service in India's consumer durables industry and converts it into an operating model, a set of indicators and eight testable propositions. The paper first reviews the theory, then describes the method, reports the findings, presents the framework and discusses its implications.

2 Theoretical background

2.1 Complaints as voice

Hirschman (1970) argued that a dissatisfied customer can respond by exit (leaving quietly) or by voice (complaining). Voice is valuable because it gives the firm a chance to correct itself. Fornell and Wernerfelt (1987) built on this idea and showed that encouraging complaints and settling them is a sound defensive marketing strategy, since keeping a customer generally costs less than winning a new one. Evidence from customer records supports the point: Knox and van Oest (2014) showed that a complaint raises the likelihood that a customer stops buying and that recovery offsets part of this effect.

2.2 Justice, recovery and customer effort

How a complaint is settled matters as much as whether it is settled. Tax et al. (1998) found that complainants judge the experience on three kinds of fairness, namely the outcome, the procedure and the personal treatment, and that most were dissatisfied with the handling they received. Smith et al. (1999) reached a similar view from the service-encounter perspective. Two meta-analyses later

confirmed that perceived justice drives satisfaction after a complaint, which in turn drives loyalty and word of mouth, and that respectful treatment weighs about as much as compensation (Gelbrich & Roschk, 2011; Orsingher et al., 2010). Behind these findings is Oliver's (1980) expectation–disconfirmation model: satisfaction depends on the distance between what was expected and what was delivered, and a complaint is a disconfirmed expectation that the customer has chosen to voice.

Recovery has limits. McCollough and Bharadwaj (1992) proposed that an excellent recovery can leave a customer more satisfied than if no failure had occurred, and Hart et al. (1990) made the commercial case for recovery. Yet the meta-analysis of de Matos et al. (2007) found mixed results for this recovery paradox, and Maxham and Netemeyer (2002) showed that satisfaction held after one well-recovered failure but fell after a second. Recovery protects the relationship once; it does not excuse repetition. Customer effort points in the same direction. In a study of more than 75,000 customers, Dixon et al. (2010) found that 96% of those who had a high-effort service experience became more disloyal, compared with 9% of those whose effort was low. The least effort a customer can make is not having to complain at all, which is the theoretical basis of proactive service.

2.3 Proactive service and prevention

A smaller stream of research asks what the firm can do before the customer speaks. Challagalla et al. (2009) defined proactive post-sales service as action initiated by the supplier after the sale and distinguished three forms: proactive prevention, proactive education and proactive feedback seeking. These forms correspond closely to the prevent and detect stages used in this paper. The stream remains small and largely conceptual. Later syntheses call for recovery to be linked to the firm's wider processes (Van Vaerenbergh & Orsingher, 2016), and Morgeson et al. (2020) found that the link between complaint handling and loyalty varies widely across industries. Complaint management cannot, therefore, be designed in the same way for every sector, which is why this paper compares six industries before examining one in depth.

2.4 Organisation and learning

Complaint handling is also an organisational matter. Davidow (2003) grouped organisational responses to complaints into six dimensions and found the evidence for them uneven. Homburg and Fürst (2005) showed that complaint handling works through a mechanistic route of clear guidelines and an organic route of supportive culture, and that both raise satisfaction. The gap model of Parasuraman et al. (1985) locates the origin of many failures inside the firm, in the distance between what customers expect, what managers believe, what is specified and what is delivered. ISO 10002:2018 turns these ideas into guidance on management commitment, accessibility, responsiveness and continual improvement (International Organisation for Standardisation [ISO], 2018). What happens after closure is a question of learning. Argyris (1977) separated single-loop learning, in which an error is corrected, from double-loop learning, in which the norm that produced the error is questioned. Repairing an appliance is single-loop; changing the design, process or policy that caused the failure is double-loop.

2.5 Theoretical framing

These streams are usually applied one at a time, and only after a complaint has been made. This paper arranges them along the life of a complaint, so that each theory informs one stage of management action (Table 1). Expectation and gap theories explain where complaints come from and so guide prevention. Voice theory explains why complaints must be easy to make and fully captured.

Justice and effort theories govern resolution, and learning theory governs what follows closure. The framework proposed later in the paper rests on this arrangement.

Table 1. Theoretical foundations and their place in the proposed framework.

Theory and source	Core idea	Stage of the framework it informs
Expectation–disconfirmation (Oliver, 1980); service quality gaps (Parasuraman et al., 1985)	Dissatisfaction arises from gaps between expectation and delivery, many of them created inside the firm	Prevent: honest promises, clear information, cross-functional removal of causes
Exit, voice and loyalty (Hirschman, 1970); defensive marketing (Fornell & Wernerfelt, 1987)	Voice gives the firm a chance to correct itself and to retain the customer	Detect: make complaining easy, capture every complaint, sense failure early
Justice theory (Tax et al., 1998; Gelbrich & Roschk, 2011); customer effort (Dixon et al., 2010)	Outcome, procedure and treatment must be fair, and effort must be low	Resolve: fast, fair, empowered settlement at first contact
Service recovery (Maxham & Netemeyer, 2002); double-loop learning (Argyris, 1977)	Recovery works once; the norm behind the error must be changed	Learn: root cause analysis and permanent correction
Proactive post-sales service (Challagalla et al., 2009)	The supplier acts before the customer complains	Prevent and detect taken together
Mechanistic and organic approaches (Homburg & Fürst, 2005)	Guidelines and culture both raise satisfaction	Leadership practices across all stages

3 Method

The study is an integrative review, a design suited to topics where evidence is spread across disciplines and source types and must be brought together before it can be assessed (Snyder, 2019; Torraco, 2005). No primary data were collected. Four kinds of sources were used: peer-reviewed research on complaint handling, service recovery and spare parts logistics; regulator and government data, including the RBI ombudsman report and NCH data placed before Parliament; surveys by industry bodies and research organisations; and consulting and practice studies. Most non-academic sources were published between 2022 and 2026, and each data point was checked for a more recent release in November 2026; where a newer edition existed, the newer figure is used. Table 2 lists the kinds of sources used.

Table 2. Sources of evidence used in the review.

Source type	Examples used	Period
Peer-reviewed research	Journal of Marketing, Journal of Service Research, Marketing Science, Management Science, Harvard Business Review	1979–2017 (seminal work)
Regulator and government data	RBI Ombudsman Scheme report, National Consumer Helpline data placed before Parliament, Ayushman Bharat Digital Mission	2024–2026
Industry-body surveys	National Customer Rage Survey, NRF Retail Returns Landscape, Gartner customer survey, LocalCircles consumer surveys	2022–2025
Consulting and practice studies	McKinsey customer care and maintenance studies, BCG–CII and CEEW reports on Indian durables and cooling	2014–2026

A source was included only if it named its sample or database, came from a regulator, a recognised industry body, a peer-reviewed journal or a named research firm, and reported a figure that could be traced. Vendor marketing claims without a traceable study were excluded. Each item of evidence was coded twice: by industry, and by the stage of the complaint life cycle to which it relates (prevent, detect, resolve or learn). A pattern found in at least three industries was treated as a cross-industry lever, and leadership practices were derived by the same rule.

Six industries were covered: retail and e-commerce, banking and finance, healthcare, hospitality and travel, manufacturing and business-to-business (B2B), and technology and software as a service (SaaS). Consumer durables in India were then examined as an in-depth case because service is delivered in the customer's home and depends on technicians, spare parts, and logistics, making proactive complaint management difficult to deliver. Because the sources differ in quality, the strength of evidence behind each main claim is graded in the discussion. Operational detail that supports the findings, including the full indicator definitions, is presented with the findings.

4 Findings

4.1 Complaint drivers and proactive strategies in six industries

In all six industries, a small number of predictable causes account for most complaints, and the proactive strategies in use address those causes directly (Table 3). This answers the first research question.

Table 3. Complaint drivers, proactive strategies and evidence by industry.

Industry	Main complaint drivers	Proactive strategies	Key evidence
Retail and e-commerce	Product not as described; returns and refunds; delivery	Full product information; easy returns; AI chatbots for status	19.3% of US online sales returned in 2025 (National Retail Federation & Happy Returns, 2025); 5.1 lakh e-commerce complaints on NCH in 2025, up 16% in a year (Media Nama, 2026)
Banking and finance	Loans, credit cards, digital fraud, charges	AI fraud detection; transparent pricing; proactive dispute resolution	51.91% of maintainable ombudsman complaints settled by conciliation (RBI, 2025)
Healthcare	Communication gaps; access to records; billing	Digital health portals; clear communication; compliance	Communication failure in 30% of malpractice cases (CRICO Strategies, 2015)
Hospitality and travel	Failure during the stay or trip; refunds; hidden charges	Real-time recovery; personalisation; transparent pricing	Replying to reviews raises ratings by 0.12 stars (Proserpio & Zervas, 2017)
Manufacturing and B2B	Breakdown and downtime; delivery and SLA breaches	Predictive maintenance; firm SLAs; proactive client contact	Mature predictive maintenance cuts downtime by 30–50% (Reliamag, n.d.)
Technology and SaaS	Bugs; high effort to get help; onboarding gaps	Self-service; quick bug fixes; customer success teams	Only 14% of issues are fully resolved in self-service (Gartner, 2024)

Note: NCH = National Consumer Helpline; SLA = service level agreement.

Three levers recur. The first is removal of the cause through transparency. In retail, returns are the largest trigger of complaints: American retailers expected 15.8% of sales, and 19.3% of online sales, to be returned in 2025 (National Retail Federation & Happy Returns, 2025). Complete product descriptions, size guides and simple refund rules attack this cause before a complaint exists. The same logic appears as fee disclosure in banking, as explanation of diagnosis and cost in healthcare, and as all-inclusive pricing in travel. Indian regulation reinforces it, since the Consumer Protection (E-Commerce) Rules, 2020 require acknowledgement of a complaint within 48 hours and redressal within one month (Ministry of Consumer Affairs, Food and Public Distribution, 2020).

The second lever is early detection through data. Banks use transaction monitoring and instant alerts; in FY 2024-25, complaints about mobile and electronic banking fell 12.74% even as total ombudsman complaints rose (RBI, 2025). Manufacturers use predictive maintenance, and SaaS organisations monitor usage data and contact accounts, showing falling logins or repeated errors. In each case, the firm finds the problem before the customer reports it.

The third lever is fast and fair resolution at first contact. In hospitality, the guest is still on the premises when the failure occurs, so an empowered duty manager can settle the matter before it becomes a public review; where it does become public, replying matters, since hotels that began responding to reviews gained 0.12 stars on average (Proserpio & Zervas, 2017). In banking, more than half of the maintainable complaints that reached the ombudsman were closed by conciliation (RBI, 2025), which means the bank could have settled them itself, earlier and at lower cost.

Further industry evidence supports the three levers.

- **Scale of the problem.** Among American consumers who had a problem, 64% described their feeling as rage (CCMC & W. P. Carey School of Business, 2025), and the future revenue exposed to weak complaint handling has been put at more than USD 596 billion (AZ Big Media, 2025).
- **Retail and e-commerce.** Free returns are an important consideration for 82% of shoppers (National Retail Federation & Happy Returns, 2025). In India, the NCH helped consumers obtain refunds of over INR 105 crore across 35 sectors between April 2025 and July 2026; e-commerce accounted for 1,00,466 of these complaints and over INR 74 crore (Free Press Journal, 2026).
- **Banking.** Loans and advances formed 29.25% of ombudsman complaints, credit card complaints grew 20.04%, and the share of private sector banks rose from 34.39% to 37.53% (RBI, 2025). Reported card and internet fraud cases fell from 29,082 in FY24 to 13,516 in FY25 (Deccan Chronicle, 2025).
- **Healthcare.** The 23,658 malpractice cases analysed by CRICO Strategies (2015) involved USD 1.7 billion in costs and 1,744 deaths. India has the base for digital access: over 104 crore health records were linked to more than 93 crore Ayushman Bharat Health Accounts by July 2026 (News On AIR, 2026).
- **Travel.** American passengers filed a record 66,675 complaints against US airlines in 2024, about 9% more than a year earlier, although passenger volume grew only 4% (U.S. PIRG Education Fund, 2025).
- **Technology.** Although 73% of customers use self-service at some point, only 36% of even the issues they call about are fully resolved there (Gartner, 2024).

4.2 What the documented results support

The second research question asked what results are documented. Migration to digital care is reported to reduce call volumes and operating expenses by 25% to 30% (Bianchi et al., 2014), and re-designing customer care journeys reduced call volume by about 20% in six months (McKinsey & Company, n.d.-b). Mature predictive maintenance is reported to cut downtime by 30% to 50%, although less mature systems deliver a small fraction of this (McKinsey & Company, n.d.-a; Reliamag, n.d.). Technology alone does not deliver: in a survey of 5,728 customers, only 14% of service issues were fully resolved in self-service, chiefly because customers could not find content relevant to their problem (Gartner, 2024). Table 4 brings together the results documented for proactive programmes.

Table 4. Documented results of proactive programmes.

Programme	Documented result	Source
Migration to digital care (e-care)	Call volumes and operating expenses lower by 25–30%	Bianchi et al. (2014)
Redesign of customer care journeys	Total call volume lower by about 20% in six months and by about 75% in selected categories; satisfaction higher by 4%	McKinsey & Company (n.d.-b)
Predictive maintenance (mature)	Downtime lower by 30–50%	Reliamag (n.d.)
Replying to online reviews	Rating higher by 0.12 stars; 12% more reviews	Proserpio and Zervas (2017)
Self-service without redesign	Only 14% of issues fully resolved	Gartner (2024)

The evidence therefore supports a 20% to 30% reduction in customer contact volume where programmes are well run. It does not support a general claim that every industry achieves 30% fewer complaints. The popular figure is best read as the upper range seen in individual cases.

4.3 Leadership practices

Three leadership practices appeared in every successful programme reviewed, which answers the third research question. The first is the use of complaint data at senior level. Leaders classify each complaint by root cause, review the leading causes every month, and track early signals such as repeat contacts and failed transactions. The RBI (2025) applies the same logic by using root-cause analysis of ombudsman complaints to direct corrective action by banks. The second practice is training and empowerment of front-line staff. Since personal treatment weighs as much as compensation (Gelbrich & Roschk, 2011), staff need the skills to listen, explain, and apologise, and the authority to settle routine cases on the spot within a set limit; training without authority produces only polite refusals. The third practice is cross-functional ownership of root causes. A wrong product description belongs to merchandising, a billing error to finance and a software bug to engineering. Complaints fall only when the function that creates the cause also answers for the complaint figure, a responsibility that ISO 10002 places with top management (ISO, 2018) and that matches the combination of guidelines and culture recommended by Homburg and Fürst (2005). Table 5 links each practice to a suggested measure.

Table 5. Leadership practices and suggested measures.

Practice	What leaders do	Suggested measure
Data-driven insight	Monthly review of root causes; dashboard of leading indicators	Complaints per 1,000 transactions; share of complaints tagged with a root cause
Training and empowerment	Skill training; authority to settle at first contact	First contact resolution (%); Customer Effort Score
Cross-functional collaboration	Shared targets; an owner for each leading cause	Repeat complaint rate (%); time taken to close a root cause (days)

4.4 The case of consumer durables in India

The cross-industry levers are hardest to apply where service is physical. India's consumer durables industry is such a setting, and it is examined here in answer to the fourth research question.

India's demographics create both the biggest service challenge and the biggest service opportunity. A young, connected, multilingual population spread across expanding small-town markets will complain more quickly, expect faster resolutions, and publicly share their experiences. Companies that invest early in technician capability, digital service channels, regional-language support, and proactive service models will transform service from a cost centre into a long-term growth engine. Service is more critical in India than in most markets because of who the customers are and where they live. Six demographic facts shape the service task (Figure 1).

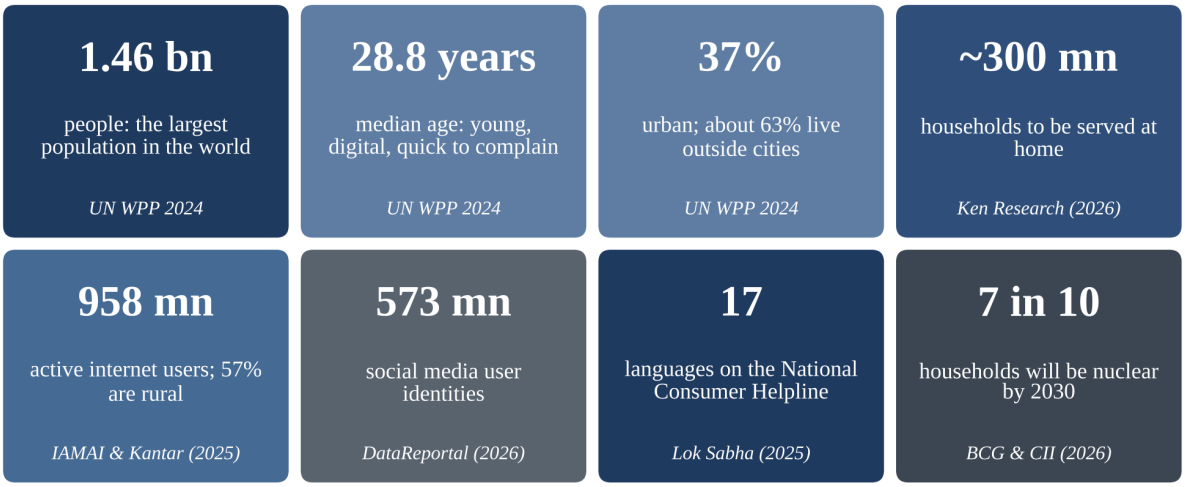


Figure 1. Demographic facts that shape service operations in India.

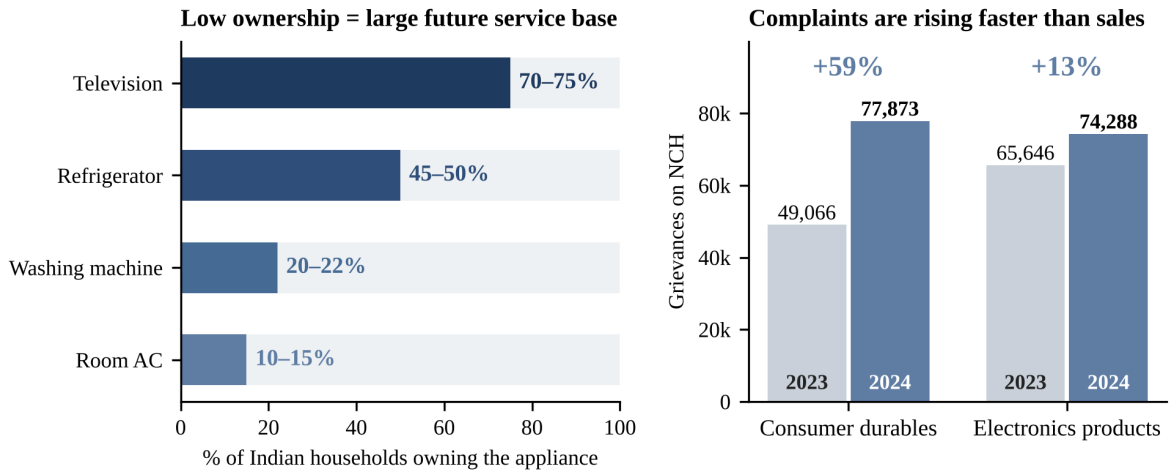
- **Scale and first-time buyers.** India has about 1.46 billion people and roughly 300 million households (Ken Research, 2026; Worldometer, n.d.). With appliance ownership still low, a large share of buyers are first-time owners who need installation, demonstration and guidance, not only repair.
- **Young and connected.** The median age is 28.8 years (Worldometer, n.d.). India has 958 million active internet users and about 573 million social media user identities (Business Today, 2026a; DataReportal, 2026). A poor service experience is shared quickly and publicly.
- **Small-town and rural demand.** Only about 37% of the population is urban (Worldometer, n.d.), rural users form 57% of all internet users (Business Today, 2026a), and tier 3 cities grew faster

than metros in technology and durables sales, 10% against 7% (IANS, 2025). Demand now arises where service density is lowest and each visit costs the most.

- **Many languages.** Almost all internet users, 98%, access content in Indian languages, and 57% of urban users prefer regional-language content (Business Standard, 2025). The National Consumer Helpline works in 17 languages (Lok Sabha, 2025). Service scripts, apps and technician communication in English alone will fail most customers.
- **Nuclear and working households.** About seven in ten households are expected to be nuclear by 2030, and the share of affluent households is rising from about 21% to 26% (Business Today, 2026b). Smaller, busier households depend more on appliances and expect fixed appointment slots, not day-long waiting.
- **Climate and seasonality.** North India alone accounts for about one-third of home appliance revenue, driven by cooling demand (Ken Research, 2026). Heat concentrates AC breakdowns into a few weeks, which no fixed workforce can absorb without planning.

The same demographics are also the solution. A young population is the source of the technicians the industry lacks, and high mobile and messaging use makes low-cost digital service possible in every language.

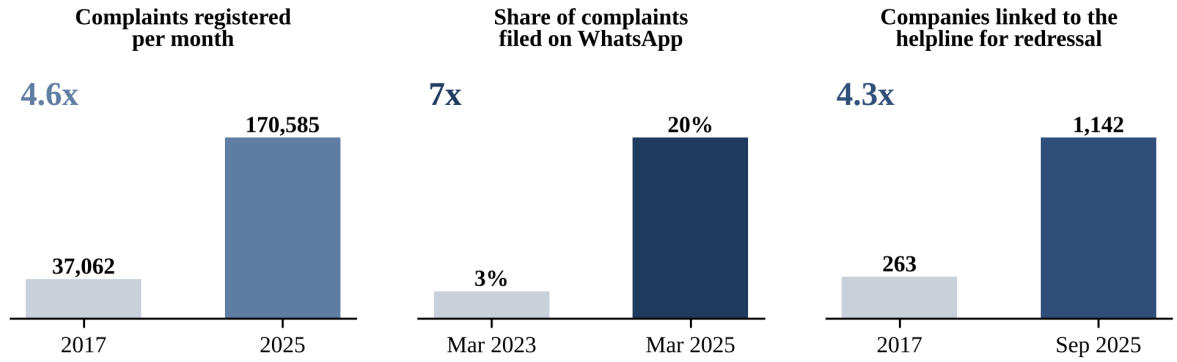
A growing base and rising complaints. The market is valued at about INR 2.01 lakh crore in 2025 and is projected to reach INR 3.0 to 3.25 lakh crore by 2030 (Boston Consulting Group [BCG] & Confederation of Indian Industry [CII], as cited in Business Today, 2026b). Ownership is still low: only 10% to 15% of households own a room air conditioner (AC) and about two in ten have a washing machine (Figure 2). Every appliance sold remains a service customer for eight to ten years, so the installed base is growing faster than the capacity built to serve it. Complaint data already show the strain. NCH grievances on consumer durables rose from 49,066 in 2023 to 77,873 in 2024 (Rajya Sabha, 2025). Complaining has also become easier: average registrations on the helpline rose from 37,062 a month in 2017 to 1,70,585 a month in 2025, nearly 65% of grievances now arrive through digital channels, and the share filed through WhatsApp rose from 3% in March 2023 to 20% in March 2025 (Press Information Bureau, 2025). Customers are young, connected, and multilingual, and demand is shifting to small towns where service coverage is thinnest (IANS, 2025).



Sources: BCG & CII, as cited in Business Today (2026b); Rajya Sabha (2025). NCH = National Consumer Helpline.

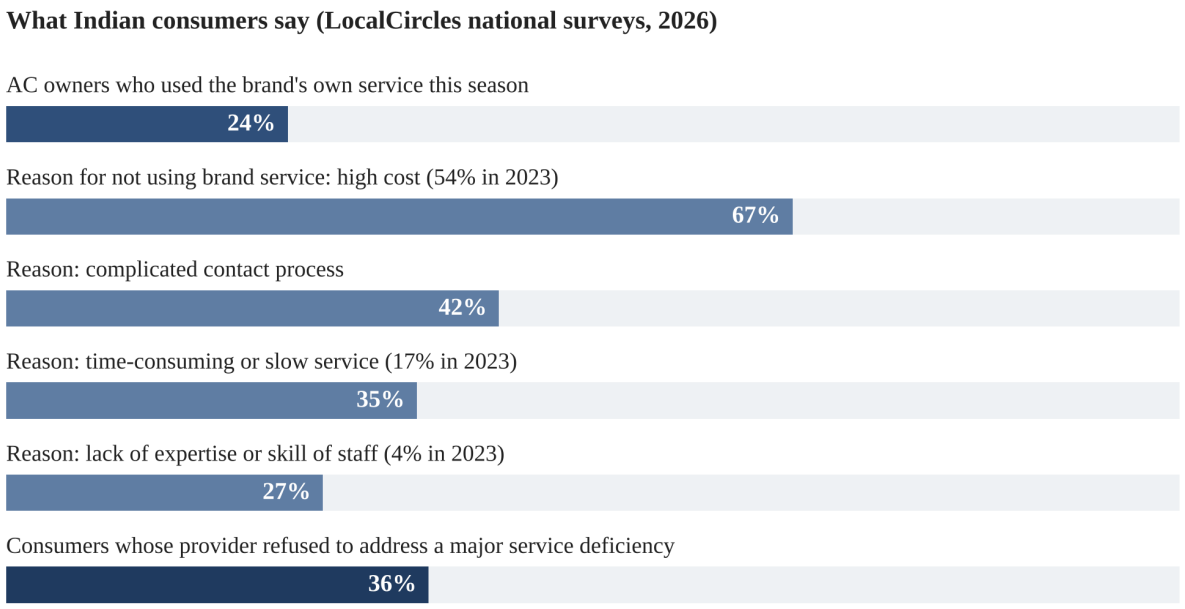
Figure 2. Appliance ownership in Indian households and consumer grievances on the National Consumer Helpline, 2023 and 2024.

Ownership has a long way to grow. Room AC ownership of 10% to 15% in India compares with about 38% in Thailand, 80% in Malaysia and close to 100% in China (BCG & CII, as cited in Business Today, 2026b). Complaining has become easier and more digital (Figure 3), and the latest national surveys show how consumers experience after-sales service (Figure 4). A 2024 survey also found that 32% of television owners had a problem within five years (NewsMeter, 2024).



Source: Press Information Bureau (2025). Nearly 65% of grievances are now registered through digital channels.

Figure 3. Growth of the National Consumer Helpline as a complaint channel.



Sources: LocalCircles (2026), over 27,000 responses from 289 districts; LocalCircles, as cited in NewsMeter (2026), over 15,000 responses.

Figure 4. Consumer experience of after-sales service in India, 2026.

Regulation is moving in the same direction. The Right to Repair Portal India names consumer durables as one of four focus sectors (Department of Consumer Affairs, n.d.). A Repairability Index framework proposes to score products on spare part availability, cost of repair, software updates and access to repair information (Vision IAS, 2025). The Department has also advised white goods makers to start the warranty from the date of installation instead of the date of purchase (Business Standard, 2023a). Service quality is becoming a disclosed attribute of the product.

Five problems. National surveys show the problem from the customer's side. In a 2026 survey of more than 27,000 households in 289 districts, only 24% of AC owners used the brand's own service

that season. Among the reasons for staying away, 67% cited high cost, up from 54% in 2023; 42% complicated contact process; 35% slow service, up from 17%; and 27% lack of skill among service staff, up from 4% (LocalCircles, 2026). The trend is therefore failing on cost, speed and skill at the same time. Read with industry and skills data, the evidence points to five problems that are large, measurable and within the firm's control (Table 6). The skill gap is the most severe: India had about 0.37 million skilled AC technicians in 2022-23 and will need about 2 million by 2036-37 (Ravindran et al., 2025).

Table 6. Five core problems in Indian after-sales service, with levers and indicators.

Problem	Evidence	Lever	Indicator
Price and trust gap in paid service	Only 24% of AC owners use the brand's service; 67% of the others cite high cost, up from 54% in 2023 (LocalCircles, 2026)	Published rate card and spare prices; warranty counted from installation	Charge-related complaints
Slow and difficult access	42% cite a complicated contact process and 35% slow service (LocalCircles, 2026); calls bunch in the summer months (ICRA, 2025)	WhatsApp booking in regional languages; pre-season service camps; capacity planning	Turnaround time; pending complaints by age
Skill gap	0.37 million skilled AC technicians against a need of 2 million by 2036-37 (Ravindran et al., 2025); 27% of owners cite lack of staff skill, up from 4% in 2023 (LocalCircles, 2026)	Certification aligned to national standards; remote expert desk	First-time fix rate; share of certified technicians
Part not available at first visit	Critical components depend on imports (BCG & CII, as cited in Business Today, 2026b)	Hub-and-spoke stocking; part reserved before dispatch; common parts across models	Fill rate at first demand; revisit rate
Reach in small towns	Tier 3 cities grew 10% against 7% in metros (IANS, 2025)	Pin-code serviceability check before sale; partner network with scorecards	Sales in pin codes without service cover

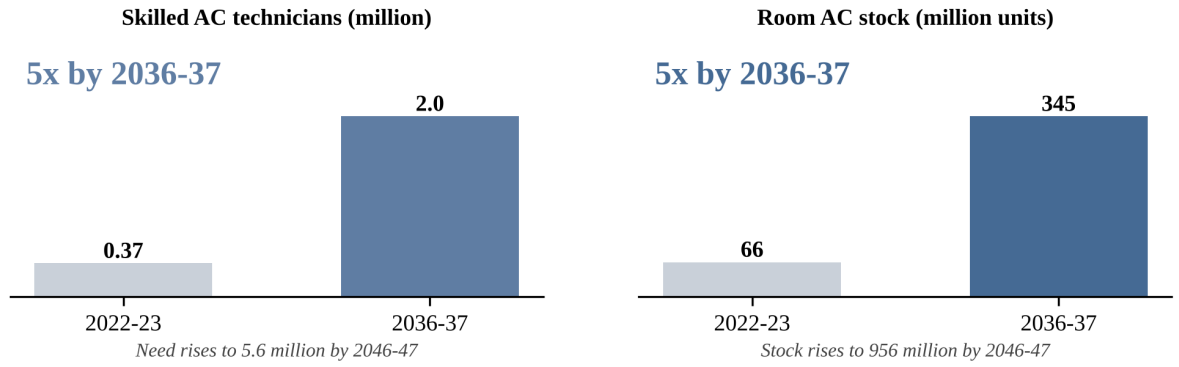
Table 7 lists nine challenges with the basis for each; where no published Indian data were found, the item is marked as the authors' analysis.

Table 7. Challenges in Indian after-sales service.

Challenge	What it looks like on the ground	Basis
Seasonal demand peaks	AC calls cluster in April to June and waiting time shoots up. Volumes also move with the weather: a record 12.5 to 13.0 million room ACs were sold in FY2025, and a fall of 10% to 15% was projected for FY2026.	ICRA (2025)
Technician shortage and skill gap	About 0.37 million skilled AC technicians in 2022-23 against a need of about 2 million by 2036-37. Only about one-quarter of informal-sector technicians had formal AC training.	Ravindran et al. (2025); Sridhar and Chaturvedi (2017)
Spare part availability	Compressors, display panels and motors still rely on global supply chains; lead times are long and stock-outs hold up repair.	BCG and CII, as cited in Business Today (2026b)

Challenge	What it looks like on the ground	Basis
Reach beyond large cities	Demand is shifting to small towns (tier 3 growth of 10% against 7% in tier 1; 57% of internet users rural), while service centres stay concentrated in big cities, delaying installation and repair.	IANS (2025); Business Today (2026a); the gap in service cover is the authors' analysis
Control over service partners	Franchise partners carry out most field service. Nationally, only 24% of AC owners used the brand's own service in 2026, and 67% of the others cited high cost.	LocalCircles (2026)
Repeat visits	A wrong diagnosis or a part not carried means a second visit, a higher cost and an angry customer.	Dixon et al. (2010)
Fragmented data	The call centre, dealer system, partner app and spares system are not connected, so there is no single view of customer and product.	Authors' analysis
Service treated as a cost centre	Budgets are trimmed when sales are weak; training and spares stock are hit first.	Authors' analysis
Cross-functional gaps	Design, quality, sales, supply chain and service pursue different targets.	Homburg and Fürst (2005)

The skill gap is quantified in Figure 5. Skilled AC technicians needed rise from about 0.37 million to about 2 million by 2036-37 and 5.6 million by 2046-47, as the room AC stock grows from about 66 million units to 345 million and then 956 million; training up to 2037 is estimated to cost about INR 2,200 crore (Ravindran et al., 2025). National occupational standards exist for AC and home appliance technicians, and the government has an agreement to train and certify one lakh AC service technicians (Ahmed, n.d.). Servicing also accounts for about 40% of refrigerant use in India (Sridhar & Chaturvedi, 2017).

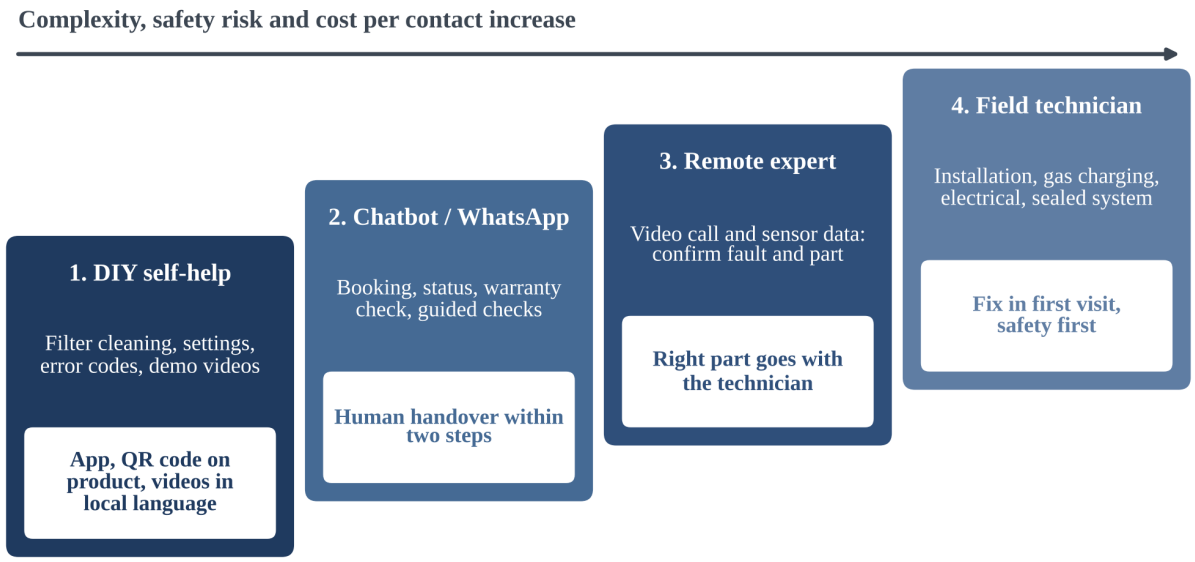


Source: CEEW (Ravindran et al., 2025). 2022-23 is the estimated base; later years are projected need and projected stock.

Figure 5. Skilled AC technicians needed and room AC stock in India.

Routing each problem to the right channel. The channel question is usually posed as chatbot against technician. The evidence suggests a different rule: route each problem to the lowest-cost step that can fully solve it, and decide by complexity and safety, not cost alone (Figure 6). Self-help suits filter cleaning, settings and error codes. Chatbots and WhatsApp suit booking, status and guided checks. A remote expert confirms the fault and the part before a visit, and the field technician handles installation, gas and electrical work. Because self-service fully resolves only a minority of issues (Gartner, 2024) and high effort drives disloyalty (Dixon et al., 2010), every digital step needs a human

handover within two steps. Customer behaviour is also moving faster than company tools: in a 2026 survey of 3,566 customers, people were about three times as likely to use third-party generative AI tools as company-provided chatbots when resolving a service issue (Gartner, 2026). Accurate and openly available product and repair information therefore matters more than a proprietary chatbot. The biggest gain from digital channels in this industry is not fewer technicians, but a technician who arrives once with the right part.



Route each problem to the lowest step that can solve it fully. Only 14% of issues are fully resolved in self-service (Gartner, 2024), so every step needs an easy exit to the next one.

Figure 6. The service ladder: Matching the problem to the channel.

Table 8 compares the four service channels of the service ladder, and Table 9 sets out the capability to be built at each level.

Table 8. Service channels compared.

Channel	Use it for	Do not use it for	Main risk
DIY self-help	Filter cleaning, settings, meaning of error codes, first use	Electrical faults, gas, sealed system	Injury or damage if the scope is not clearly limited
Chatbot or WhatsApp	Booking, status, warranty check, simple guided checks	Angry or repeat complainants; complex faults	Customer is caught in a loop and effort rises
Remote expert (video, sensor data)	Diagnosis before the visit; identifying the part; guiding a junior technician	Faults that require instruments on site	Needs skilled staff and good connectivity
Field technician	Installation, repair, gas charging, safety checks	Queries that information alone can settle	Highest cost; quality varies from person to person

Table 9. Capability building in service.

Level	What to build	How to measure
Technician skills	Certified training aligned to national qualifications for home appliance and AC technicians; multi-product skilling; soft-skill and safety training; a refresher before every season	Share of certified technicians (%); first-time fix rate (%)
Technical support	Central expert desk for remote diagnosis; digital job cards with fault trees; knowledge base updated from field failures	Repeat visits within 30 days (%); average diagnosis time
Capacity planning	Pin-code level forecast of calls by season; pre-season service camps to flatten the AC peak; a trained seasonal workforce	Turnaround time (hours); calls pending beyond SLA (%)
Service partners	Tiered partner model with scorecards on quality, parts discipline and customer rating; transparent rate card	Partner scorecard; customer rating per job
Systems	One service platform connecting the call centre, technician app, spares stock and customer history	Share of jobs closed with the part reserved before the visit (%)

Connected appliances allow pre-emptive service: reminding the customer before performance drops, predicting a part failure and booking a visit before breakdown, and sending the correct part with the technician. Three practical steps are suggested. Brands should start with high-value categories such as inverter ACs and premium refrigerators. For the large base that is not connected, simple rules based on installation date, season and local water or power conditions by pin code can trigger reminders without any sensor. And appliance data should be collected only with clear consent and used only for service.

Parts and capability. Whether a repair is finished in one visit depends on the spare part. A hub-and-spoke network places fast-moving parts with technicians and branches, medium movers at regional hubs and slow or costly parts at a central warehouse (Huiskonen, 2001). Pooling slow movers reduces the safety stock needed roughly by the square root of the number of locations (Eppen, 1979), and using common parts across models reduces it further (Collier, 1982), making commonality a target for the design stage. The part should be reserved when the call is diagnosed, before the technician is sent, and a single point of contact (SPOC) should own the complaint from call to closure. Most of these fixes lie outside the service department. Service inherits the product design, its quality, where it has been sold, and the spares budget, so the gaps identified by Parasuraman et al. (1985) appear here as gaps between functions.

Figure 7 shows the hub-and-spoke spare parts network. Seven rules govern it: stock each part by value, movement and criticality; pool slow movers at hubs; use common parts across models; reserve the part before dispatch; close the reverse loop so that defective parts return and are reconciled with warranty claims; appoint a single point of contact for each region or key account; and publish spare prices and availability.

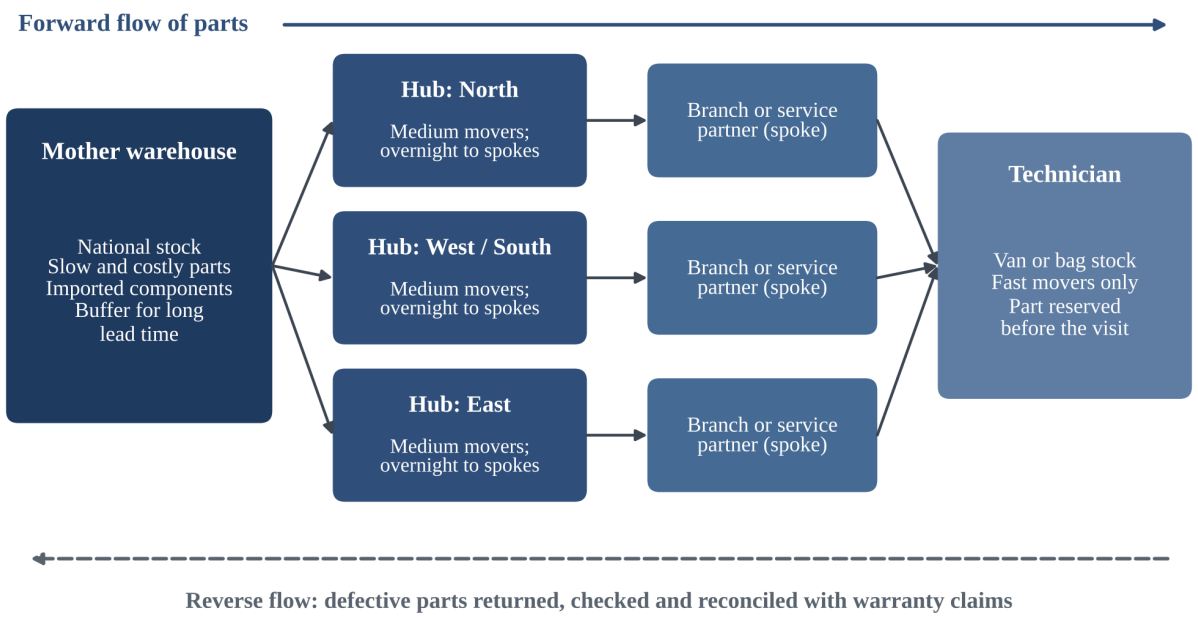


Figure 7. Hub-and-spoke spare parts network with reverse flow of defective parts.

Most service failures are created outside the service department. Table 10 lists the typical gap in each function and its fix. Three governance steps make the fixes hold: the service head sits in the leadership team; one shared measure, complaints per 1,000 installed units, appears in the scorecard of every function; and a monthly cross-functional review assigns each leading failure cause to the function that created it.

Table 10. Cross-functional gaps and fixes.

Function	Typical gap	Fix
Design and R&D	Product not designed for easy repair; too many unique parts	Serviceability review before launch; commonisation target for each platform
Manufacturing and quality	Field failure data reaches the plant late	Monthly field-failure review; early warning on failures in the first 90 days
Sales and channel	Product sold where no service cover exists; over-promise on installation	Pin-code serviceability check before listing or sale
Supply chain	Spares planned from whatever production leaves over	Separate spares forecast, budget and fill-rate target
Finance	Service viewed only as warranty cost	Service profit and loss account that includes AMC and extended warranty income
IT	Customer, product and service systems not connected	One customer and product identity across systems
HR	High technician attrition; no career path	Grades and incentives linked to certification

Note: AMC = annual maintenance contract.

Indian consumer brands use five service operating models, usually in combination (Table 11).

Table 11. Service operating models in the consumer industry.

Model	How it works	Strength	Weakness
Company-owned service	The brand employs technicians and runs its own centres	Full control over quality and data	High fixed cost; difficult to scale outside metros
Authorised service partners	Franchise partners serve a territory on a rate card	Quick reach at low fixed cost	Uneven quality; weak control over parts and charges
Hybrid	Own teams in big cities, partners elsewhere, a central expert desk	Balance of control and reach	Requires strong systems and partner management
Service platforms and retailers	Multi-brand platforms and retailer-owned service arms book and deliver jobs	Convenience for the customer; technology; multi-brand scale	The brand loses the customer relationship
Warranty and AMC providers	Third parties sell protection plans and arrange the repair	Recurring income; the customer pays in advance	Delivery of service still depends on others

Three complaint lanes. Most organisations run one complaint process for all customers. The evidence indicates three kinds of complaints that differ in who complains, what is at stake and how damage spreads (Table 12). Domestic complaints dominate by volume and service cost. B2B complaints carry the highest value per case, since one dissatisfied institutional buyer can remove a large account. Social media complaints spread fastest: negative reviews reduce sales more than positive reviews raise them (Chevalier & Mayzlin, 2006), and negative word of mouth has been shown to hurt future cash flows (Luo, 2009). The three are linked because most social media complaints begin as domestic complaints that were not solved at first contact. In a 2026 survey, 36% of consumers who raised a major service deficiency said the provider refused to address it, and another 18% took the matter to social media after that refusal (Local Circles, as cited in News Meter, 2026). Responding on social media improves the relationship but also teaches customers to complain there (Ma et al., 2015), so the lasting remedy is to make the first lane work. The three lanes should run on one ticket system with different owners and measures.

Table 12. Three complaint lanes compared.

Aspect	Domestic	B2B	Social media
Who complains	Household that owns the product	Builder, hotel, hospital, office, government buyer	Any customer, in public; usually a domestic complaint that failed at first contact
Owner	Regional service manager	Key account SPOC with a service engineer	Social care desk within the service function
What the customer values	Speed, one visit, clear charges	Uptime, SLA compliance, documentation	Quick acknowledgement and visible closure
Revenue at risk per complaint	One household's next purchase and referrals	The contract, the maintenance agreement and future projects	The purchase decisions of many readers
Key measures	Turnaround time, first-time fix, repeat visits	Uptime, SLA compliance, renewal rate	First response time, share resolved, review rating

Note: SPOC = single point of contact; SLA = service level agreement.

Figure 8 and Table 13 describe the three complaint lanes in full, and Figure 9 and Table 14 compare their effect on the business. Non-residential buyers account for more than half of India's air conditioning market by value in one estimate, with the residential segment near 44% (IMARC Group, n.d.), and 64% of Indian online shoppers check ratings and reviews before buying (Business Standard, 2022). No published Indian study compares the three lanes in rupee terms. A firm can estimate it from its own records with a simple score for each lane: the number of complaints, multiplied by the revenue at risk per complaint, multiplied by a visibility factor.

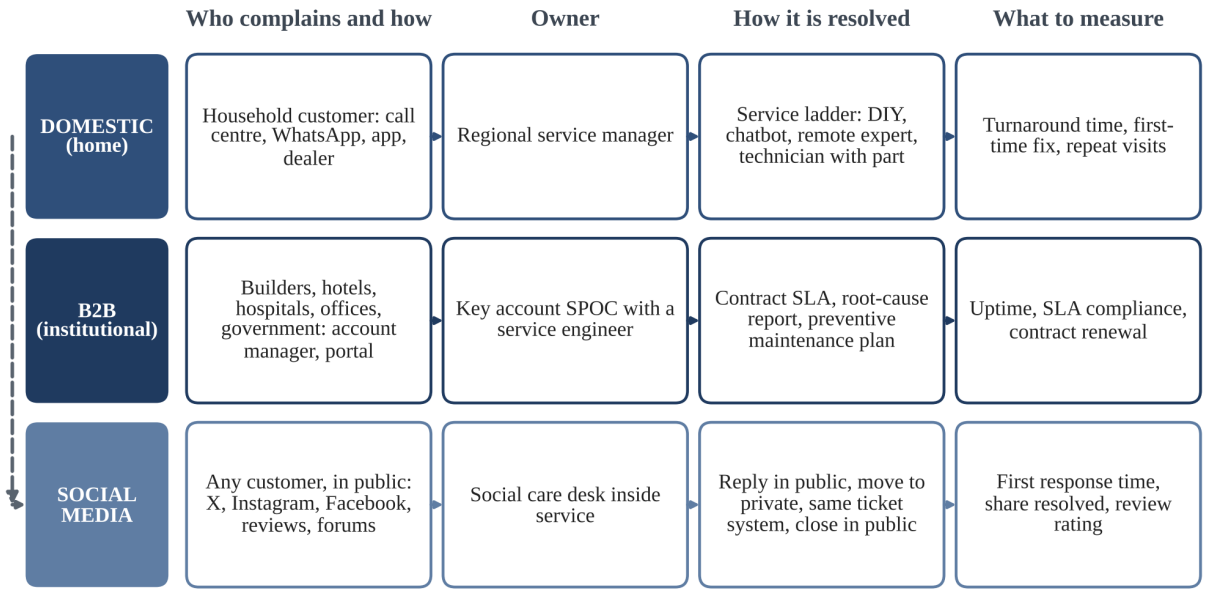
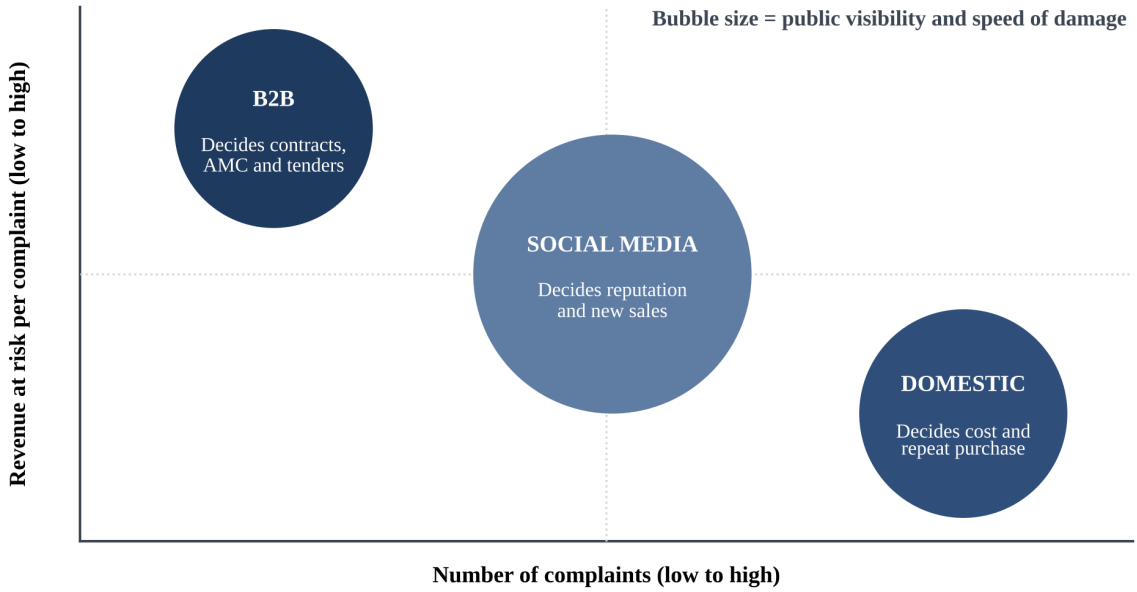


Figure 8. Three complaint lanes on one ticket system.

Table 13. Domestic, B2B and social media complaint processes compared.

Aspect	Domestic (home customer)	B2B (institutional customer)	Social media
Who complains	Household that owns the product	Builder, hotel, hospital, office, government buyer, dealer	Any customer, in public view; usually a domestic complaint that failed at first contact
Typical issue	Breakdown, installation delay, warranty dispute, charges	Downtime, delay in project commissioning, AMC or SLA breach, billing	No response, repeated visits, refund or replacement refused
Entry channel	Call centre, WhatsApp, app, dealer	Account manager, portal, email	X, Instagram, Facebook, Google and e-commerce reviews, consumer forums
Owner	Regional service manager	Key account SPOC with a service engineer	Social care desk within the service function, not marketing alone
What the customer values	Speed, one visit, clear charges	Uptime, SLA compliance, documentation	Quick acknowledgement and a visible closure
Resolution path	Service ladder (Figure 6)	Contract SLA, root-cause report, preventive maintenance plan	Reply in public, move to private, raise a priority ticket, close in public

Aspect	Domestic (home customer)	B2B (institutional customer)	Social media
Where it escalates	NCH, consumer commission, social media	Penalty, loss of contract, exclusion from future tenders	Viral spread, news media, regulator attention
Key measures	Turnaround time, first-time fix, repeat visits, satisfaction	Uptime, SLA compliance, renewal rate	First response time, share resolved, review rating



Conceptual positions based on the reviewed evidence; not to scale. Each company should plot its own data.

Figure 9. Business impact of the three complaint types (conceptual).

Table 14. How each complaint type affects the business.

Dimension	Domestic	B2B	Social media
Number of complaints	Highest	Lowest	Medium and rising
Revenue at risk per complaint	The next purchase of one household and its referrals	The entire contract, the AMC and future projects	The purchase decisions of many readers
Speed of damage	Slow	At renewal or the next tender	Immediate
Visibility	Private	Known within the buyer's industry	Public and permanent
Main cost to the company	Visits, parts, refunds	Engineering time, penalties, lost contracts	Lost new sales and brand value
What it decides	Service cost and repeat purchase	Contracts and institutional reputation	Brand reputation and new sales

Measurement. A firm cannot manage complaints it does not measure. Four sets of indicators are linked as a tree (Figure 10). Call centre, field call management and spare parts indicators are the drivers; total service indicators, led by complaints per 1,000 installed units, are the results that the customer and the board see. A weak result at the top can be traced to one of the driver sets. Three

rules make measurement useful: all indicators are calculated from the time stamps of one ticket system; indicators that can be gamed are read in pairs, such as turnaround time with repeat complaint rate; and closure is verified by the customer. Targets should be set from each firm's own baseline and not copied from other industries. The definitions, formulas and review frequency of each indicator are given in the tables that follow.

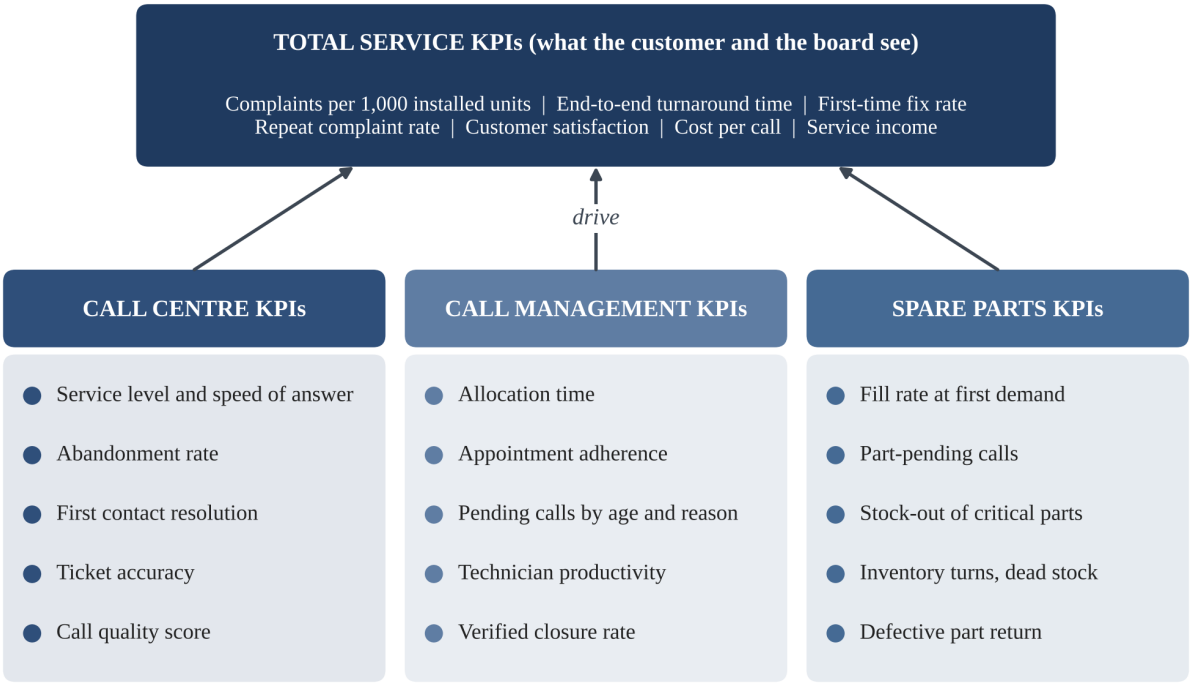
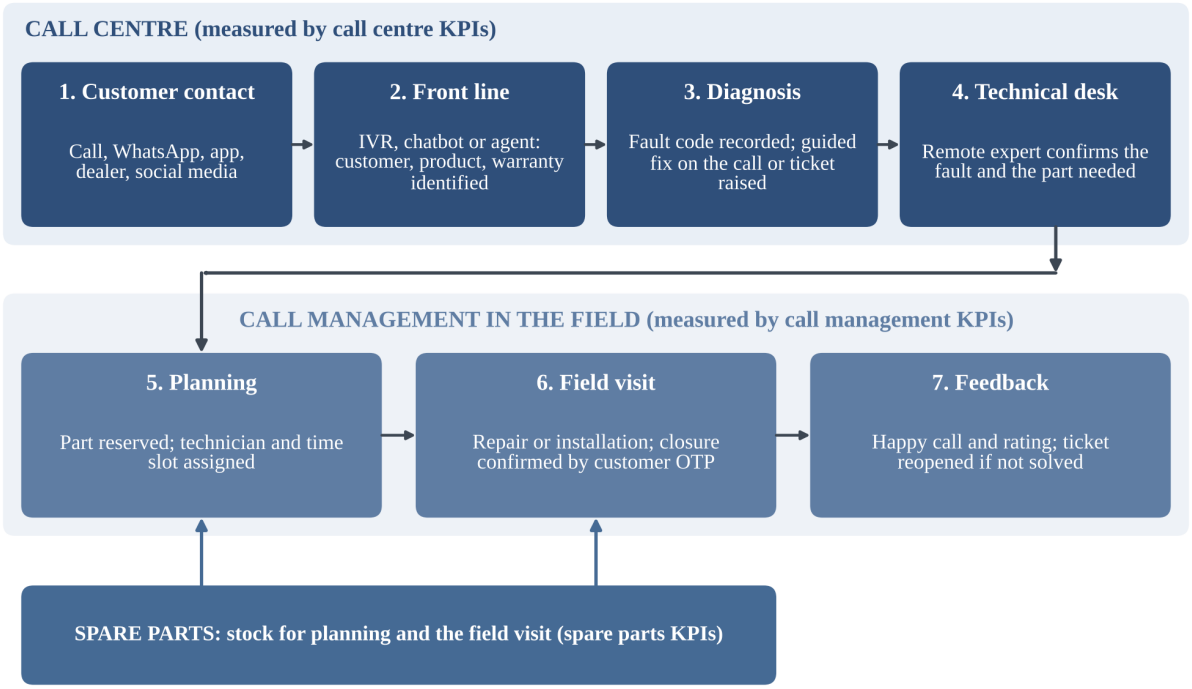


Figure 10. The service KPI tree: Three driver sets and the total service result.

Figure 11 shows how the call centre works with field operations and spare parts. One ticket number follows the complaint through seven steps, and ISO 18295-1:2017 expects contact centres to define performance measures (ISO, 2017). Tables 15 to 18 define the four sets of indicators.



One ticket number follows the complaint through all seven steps. Every step records a time stamp, and the KPIs are calculated from these stamps. IVR = interactive voice response; OTP = one-time password.

Figure 11. How the call centre works with field operations and spare parts.

Table 15. Total service KPIs.

KPI	How to calculate	What it tells	Review
Complaints per 1,000 installed units	Complaints registered in the month, divided by products under service, multiplied by 1,000	Joint effect of product quality and service, free of the effect of sales growth	Monthly
End-to-end turnaround time (TAT)	Average time from registration of the complaint to verified closure; also the share closed within the promised time (%)	Speed as experienced by the customer	Weekly
First-time fix rate	Jobs closed in one visit, divided by total jobs closed (%)	Diagnosis quality, skill and part availability taken together	Weekly
Repeat complaint rate	Complaints on the same product within 30 days of closure, divided by jobs closed (%)	Quality of repair; brings false closures to light	Weekly
Customer satisfaction	Average rating or satisfied customers (%) from the post-closure call or message; Customer Effort Score	The outcome in the customer's own words	Monthly
Pending complaints by age	Open complaints in age bands (for example 0–2, 3–7 and over 7 days), as a share of all open complaints (%)	Backlog and the customers likely to escalate	Daily
Escalation rate	Complaints reaching the NCH, a consumer commission, social media or senior management, per 1,000 complaints	Failure of the normal process	Monthly
Cost per call	Total service cost (people, travel, parts, partner payout), divided by jobs closed	Efficiency; to be read along with first-time fix	Monthly

KPI	How to calculate	What it tells	Review
Service income	Income from AMC, extended warranty and paid repair, per installed unit and as a share of revenue (%)	Whether service is growing as a business	Quarterly

Table 16. Call centre KPIs.

KPI	How to calculate	What it tells	Caution
Service level	Calls answered within the set number of seconds, divided by calls offered (%)	Whether customers can reach the company	Conceals the wait of calls that miss the limit
Average speed of answer	Total waiting time of answered calls, divided by calls answered	The typical wait	Read with abandonment
Abandonment rate	Calls dropped by the customer before answer, divided by calls offered (%)	Lost contacts and probable repeat callers	Leave out very short abandons
First contact resolution	Contacts resolved without a second contact or a visit, divided by total contacts (%)	How much the call centre settles by itself	Measure by customer confirmation, not by the agent's tick
Ticket accuracy	Tickets with the correct product, fault code, address and part identified, divided by tickets raised (%)	Quality of the handover to the field	Audit by sample
Average handle time	Talk time plus after-call work, divided by calls handled	Capacity planning	Never a target by itself; it pushes agents to hurry
Call quality score	Score from audit of recorded calls against a checklist (%)	Courtesy, clarity, correct information	Calibrate the auditors
Chaser calls per ticket	Repeat contacts seeking status, divided by open tickets	Failure to keep the customer informed	An early sign of escalation
Self-service completion	Contacts completed in WhatsApp, IVR or chatbot without an agent, divided by contacts started there (%)	Value of digital channels	Count completed tasks only
Language match	Contacts handled in the language chosen by the customer, divided by total contacts (%)	Access for customers who do not use English	Important in India

Note: IVR = interactive voice response.

Table 17. Call management KPIs for field operations.

KPI	How to calculate	What it tells	Owner
Allocation time	Average time from creation of the ticket to assignment to a technician or partner	Speed of planning	Regional service manager
Response time	Average time from creation of the ticket to the first visit; share within the promised time (%)	Speed of reaching the customer	Regional service manager
Appointment adherence	Visits made in the promised slot, divided by visits promised (%)	Reliability of the promise	Service partner
Stage-wise turnaround time	Time spent in each stage: allocation, first visit, part wait, revisit, closure	Where the delay lies	Service analytics

KPI	How to calculate	What it tells	Owner
Pending calls by reason	Open calls by cause (part, technician, customer not available, approval), with age bands	What to act on today	Regional service manager
Technician productivity	Jobs closed per technician per working day	Capacity and route planning	Service partner
Revisit rate	Jobs requiring more than one visit, divided by jobs closed (%)	Diagnosis and part planning	Technical support
Verified closure rate	Jobs closed with customer OTP or confirmed by a happy call, divided by jobs closed (%)	Honesty of closure data	Call centre
Installation turnaround time	Average time from delivery to installation	First experience of a new buyer	Regional service manager
Partner scorecard	Combined score of turnaround, first-time fix, repeat rate, rating and parts discipline for each partner	Which partners to grow, train or exit	Service head

Note: OTP = one-time password.

Table 18. Spare parts KPIs.

KPI	How to calculate	What it tells	Type
Fill rate at first demand	Part lines supplied from stock at the first request, divided by part lines demanded (%)	Availability at the point where the technician needs it	Availability
Part-pending calls	Open calls waiting for a part, divided by all open calls (%), with age bands	Effect of stock-outs on customers	Availability
Stock-out of critical parts	Critical and fast-moving part codes at zero stock, divided by such codes (%)	Risk before it reaches the customer	Availability
Replenishment lead time	Average days from order to receipt, hub to spoke and supplier to hub	How much safety stock is required	Availability
Inventory turns	Annual parts consumption at cost, divided by average stock value; or days of stock	Money locked in stock	Efficiency
Non-moving and obsolete stock	Value of parts with no movement in a set period, divided by total stock value (%)	Past planning errors; risk of write-off	Efficiency
Forecast accuracy	One minus absolute forecast error divided by actual consumption, for key parts (%)	Quality of planning	Efficiency
Defective part return	Defective parts returned within the set days, divided by parts replaced under warranty (%)	Control of leakage and warranty claims	Control
Unused part return	Parts issued but returned unused, divided by parts issued (%)	Wrong diagnosis or wrong part sent	Control
Stock accuracy	Part codes where the physical count matches system stock, divided by codes counted (%)	Whether the system can be trusted	Control

Three reference points exist for the call centre. The common convention for service level is 80% of calls answered within 20 seconds, although no standards body has set it (HiveDesk, n.d.). In India the telecom regulator requires operators to answer at least 95% of customer care calls within 90 seconds

(Business Standard, 2023b). A North American benchmark study reports first contact resolution of about 71% on average (Desmarais, 2022). These are reference points and not benchmarks for Indian consumer durables.

Seven rules make monitoring work: one source of data from the time stamps of one ticket system; a written dictionary for every indicator; a fixed rhythm of review (Figure 12 and Table 19); leading and lagging measures read together; paired measures, so that one indicator is not improved by damaging another; exception reporting against limits set from the firm's own baseline; and verification of closure by the customer.

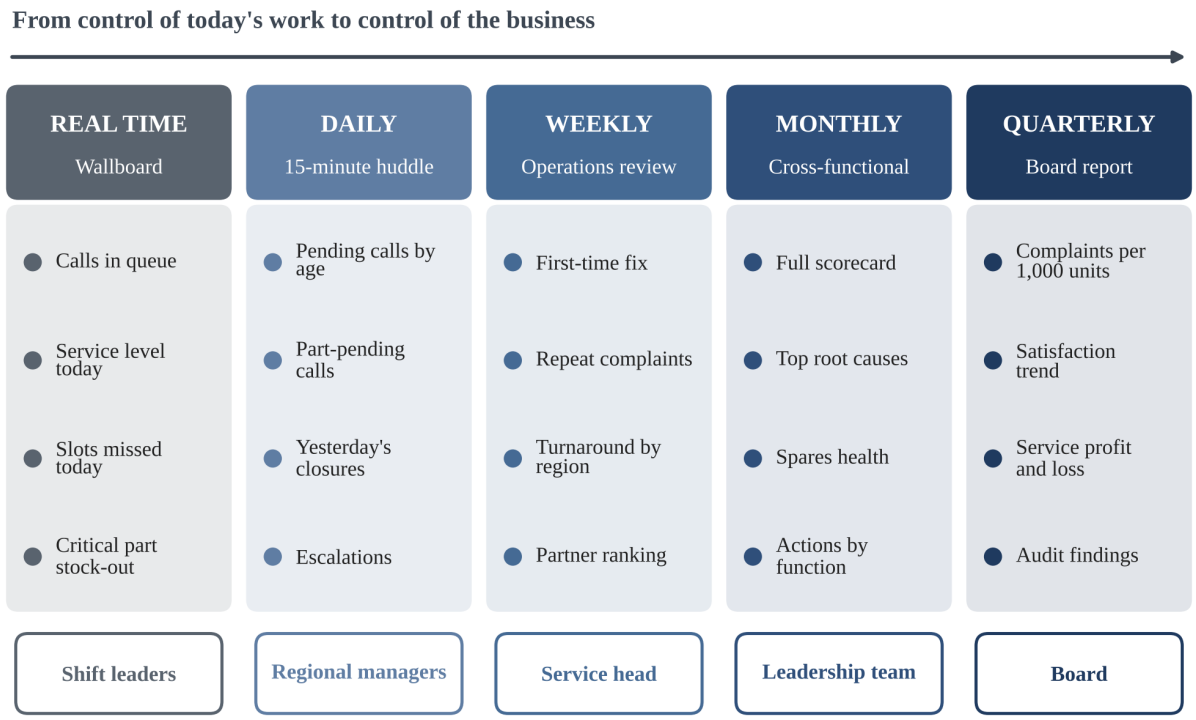
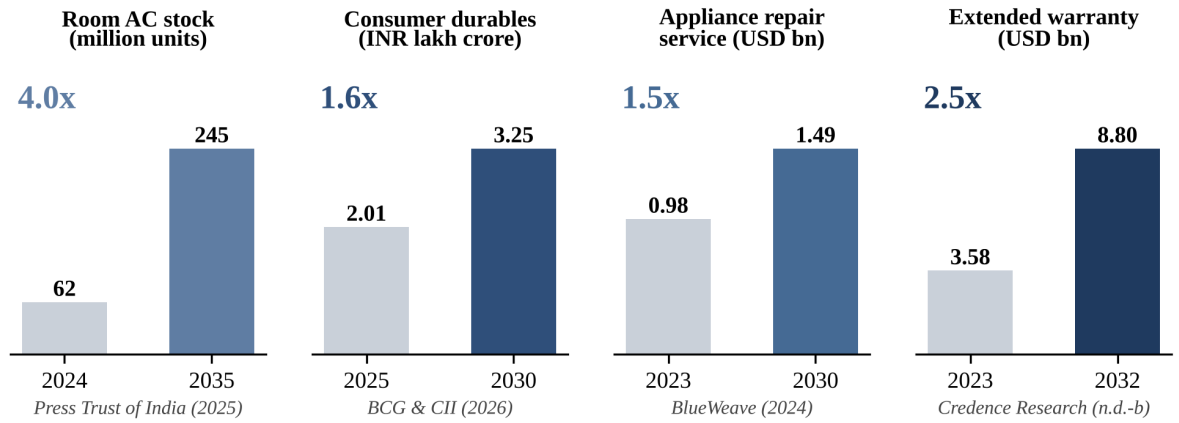


Figure 12. Monitoring rhythm for service KPIs.

Table 19. Monitoring plan.

Frequency	What is reviewed	Who reviews	Action expected
Real time	Calls in queue, service level, abandonment; the day's visits and missed slots; stock-outs of critical parts	Call centre shift leaders, regional coordinators	Shift staff between queues; re-plan visits; rush parts
Daily	Pending calls by age and reason; part-pending calls; closures of the previous day; escalations	Regional service managers	Clear the oldest calls first; call back escalated customers
Weekly	First-time fix, repeat complaints, stage-wise turnaround, partner ranking, fill rate	Service head with regions and spares	Correct partners and stock levels; train where required
Monthly	Full scorecard; leading root causes by product; spares health; cost per call	Leadership team with design, quality, sales, supply chain and finance	Assign each root cause to the function that owns it
Quarterly	Complaints per 1,000 installed units, satisfaction trend, service income, audit findings	Board	Decide investment in capability, systems and network

Service is a business opportunity as well as a cost (Figure 13). The room AC stock is projected to grow from 62 million units in 2024 to 245 million in 2035 (Press Trust of India, 2025), and a separate study expects 130 to 150 million new room ACs between 2025 and 2035 (Abhyankar et al., 2025). The home appliance repair service market is estimated at USD 0.98 billion in 2023 and USD 1.49 billion by 2030 (BlueWeave Consulting, 2024), AC servicing at USD 0.65 billion in 2025 and USD 1.70 billion by 2035 (Credence Research, n.d.-a), and the extended warranty market for consumer electronics at USD 3.58 billion in 2023 and USD 8.80 billion by 2032 (Credence Research, n.d.-b). The smart appliance market is estimated at USD 2.9 billion in 2025 and USD 6.1 billion by 2030 (MarketsandMarkets, n.d.). These are research-firm estimates and differ between organisations, but the direction is consistent. Organised platforms show that scale is possible: Urban Company Limited (2026) reported revenue from operations of INR 1,555.5 crore in FY2026 with 8.4 million annual transacting users in 51 cities.



2030 durables value is the upper end of the INR 3.0–3.25 lakh crore range. Market sizes are research-firm estimates.

Figure 13. Growth of the installed base and service-linked markets in India.

Seven opportunity areas follow: protection plans sold as a subscription at purchase; organised multi-brand service for the out-of-warranty base; technician skilling and certification; online sale of genuine spares at transparent prices; remote diagnosis and predictive service for connected appliances; certified leak-free servicing; and refurbishment and resale. A brand typically builds service income through five stages, namely installation, repair under warranty, maintenance contract or extended warranty, paid repair after warranty, and exchange or upgrade. Each stage is a chance to lose the customer or to sell the next product.

5 The Proactive Complaint Management framework

5.1 Four stages

The findings fit one loop of four stages (Figure 14). Prevent asks how the cause can be removed, through clear information, honest promises and products designed for service. Detect asks how the problem can be found before the customer finds it, through analytics, sensors, and easy complaint channels. Resolve asks how the matter can be settled fast and fairly at first contact, through empowered staff and self-service with a human route. Learn asks how recurrence can be stopped, through root cause analysis and ownership of the cause by the function that created it. The industries

differ only in the tools they use at each stage. Three leadership practices support all four stages, and what is learnt in one cycle becomes prevention in the next.

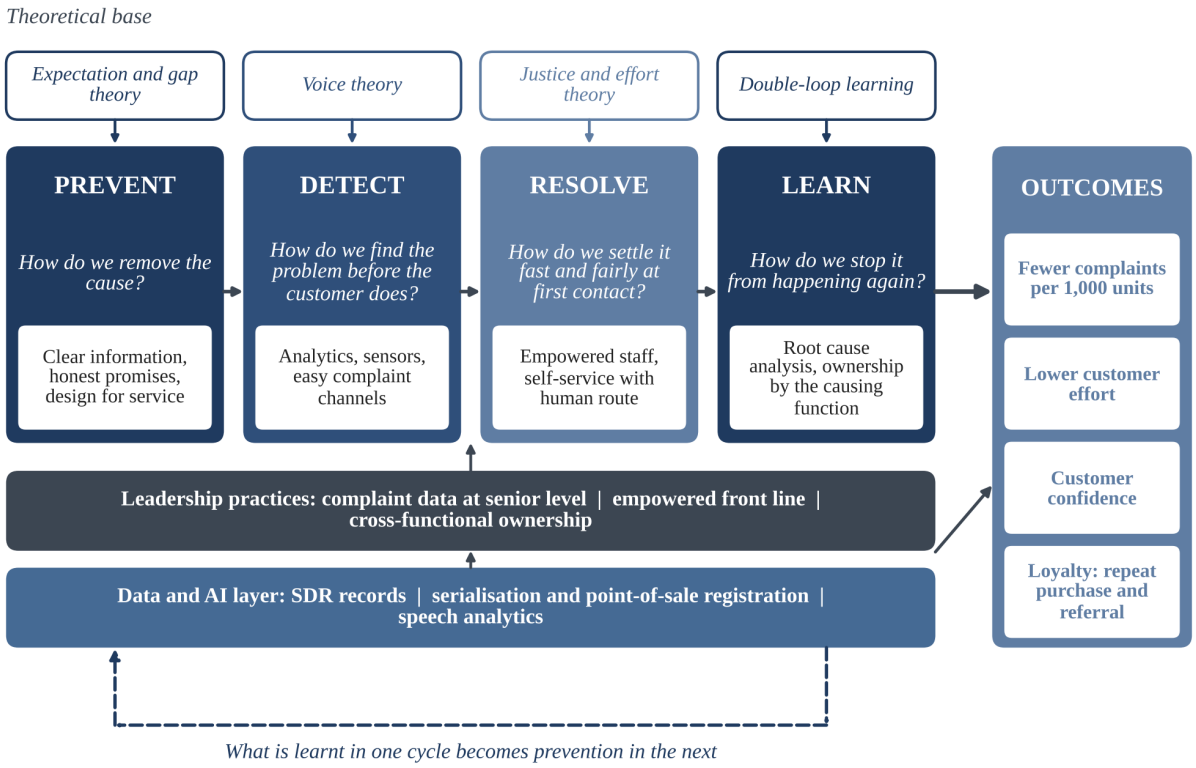


Figure 14. The Proactive Complaint Management (PCM) framework.

5.2 A data and AI layer

In service industries, one asset links the four stages: the record of past service calls. Each record holds the symptom reported by the customer, the defect found by the technician, the resolution carried out, and the part replaced. This paper calls it the Symptom–Defect–Resolution (SDR) record. A large brand builds millions of such records and commonly uses them only for warranty accounting. Three applications are proposed, drawing on the authors' practitioner experience (Table 20); they are offered as propositions, since published evidence is not yet available.

At the Prevent stage, classification of SDR records by origin (manufacturing, design, logistics, installation or usage) gives a ranked list of causes for cross-functional review. Serial numbers recorded from plant to installation allow the firm to trace a defect to a batch and correct the affected units before they fail. The Indian automobile industry shows the practice: in 2025, Maruti Suzuki recalled 39,506 vehicles of one model built between 9 December 2024 and 29 April 2025 for a fuel gauge fault (Pal, 2025), and in 2023, it recalled 17,362 vehicles built within a five-week window (Autocar Professional, 2023). Such precision is possible only when each unit can be traced to its parts. Appliance brands usually lose sight of the unit once it leaves the dealer. Registration at the point of sale, where the customer scans a code and uploads the invoice in return for added warranty, closes this gap, opens a channel for usage guidance and recall alerts, and provides the occasion to obtain the specific and informed consent that the Digital Personal Data Protection Act (2023) requires. The Digital Personal Data Protection Rules, 2025, notified in November 2025 and brought into force in phases, set out how such consent is to be obtained and managed (The Tribune, 2025).

At the Detect and Resolve stages, a model compares a new symptom with past SDR records for the same product, age and region, and recommends the likely defect, resolution and part. The agent can then guide a fix on the call, the technician carries the predicted part, and the recommendations added together forecast part demand by location. At the Learn stage, speech analytics applied to recorded calls identifies complaint themes, handling skills and gaps in product knowledge, which feed coaching and product feedback. The quality of all three applications depends on standard symptom and defect codes and on closure verified by the customer.

Table 20. Data and AI enablers across the PCM stages.

Stage	Data source	Application	Suggested measure
Prevent	SDR records; serial and batch data	Classification of defects by origin; batch traceability and targeted field correction	Complaints per 1,000 installed units by cause; time to contain a defective batch
Prevent	Point-of-sale registration	Usage guidance and reminders through a consented channel	Registered units with consent (%); usage-related complaints (%)
Detect and Resolve	SDR records; product and customer history	Recommendation of defect, resolution and part	First contact resolution (%); first-time fix rate (%)
Learn	Recorded calls; satisfaction and effort scores	Speech and sentiment analytics	Call quality score; repeat complaint rate (%)

Note: SDR = Symptom–Defect–Resolution.

Product traceability is illustrated by four recalls by Maruti Suzuki India Limited: 1,279 Swift and Dzire cars built between 7 May and 5 July 2018 for an airbag controller (Autocar Professional, 2018); 17,362 vehicles of six models built between 8 December 2022 and 12 January 2023, also for an airbag controller (Autocar Professional, 2023); 39,506 Grand Vitara vehicles built between 9 December 2024 and 29 April 2025 for a fuel gauge fault (Pal, 2025); and proactive replacement of a parking-sensor controller on the Ignis in June 2026 (Noronha, 2026). Where numbers were disclosed, each recall covered a precise build window and not the whole model.

A consent request at the point of sale should meet four conditions: state the purpose plainly, such as warranty registration, service reminders and safety recalls; keep marketing consent separate and optional; not make the warranty benefit depend on marketing consent; and make withdrawal of consent easy. Two cautions apply to speech analytics. Customers must be told that calls are recorded, and because emotion detection is imperfect its output is better used for coaching than for penalties. These applications also change roles: agents become guides for self-help, technicians become sources of structured data, and service analysts become a link between the customer and the factory, so structure, roles and data ownership have to be redesigned around the technology.

5.3 From complaint to loyalty: the operating model

The framework states what must be achieved; managers also need the order of work and the points of decision. Figure 15 sets out the framework as one operating sequence. Its aim is not merely to close complaints but to convert a dissatisfied customer into a loyal one.

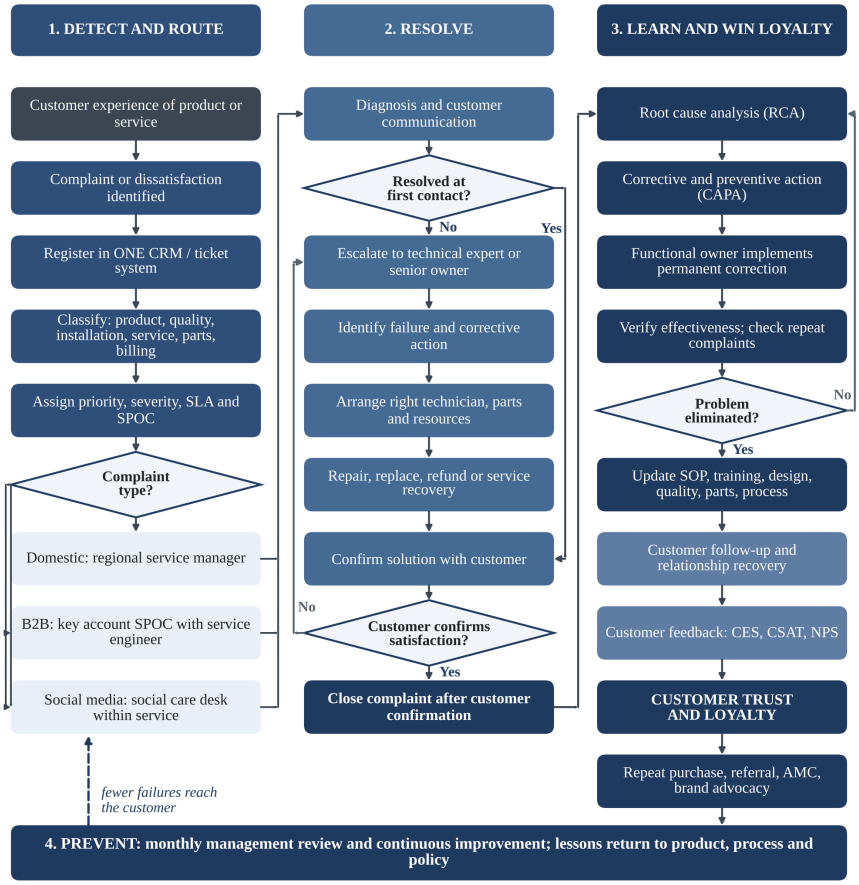


Figure 15. The complaint-to-loyalty operating model.

Three decision gates give the model its character, and each is anchored in theory. The first asks whether the complaint was resolved at first contact, which operationalises the effort principle of Dixon et al. (2010). The second asks whether the customer's satisfaction is closure: closure is declared by the customer and not by the technician, which gives effect to the procedural and interactional fairness described by Tax et al. (1998). The third asks whether the problem has been eliminated. A complaint that is closed while its cause remains is treated as unfinished and returns to root cause analysis and corrective and preventive action. This is double-loop learning (Argyris, 1977) and the continual improvement expected by ISO 10002 (ISO, 2018). Only after the third gate does the sequence move to follow-up, feedback and the loyalty outcomes of repeat purchase, referral and maintenance contracts.

The process fails at predictable points. Table 21 lists ten of them, along with the required control and the indicator that shows whether the control is working. One principle governs ownership: the service department should not own every failure, and the function that creates a root cause must own its correction. Review therefore works at three levels: open and overdue cases are examined daily, leading causes and parts shortages weekly, and root causes and corrective actions monthly in a cross-functional review led by the chief executive. The path can be summarised as complaint, correction, confidence and loyalty. Correction alone does not produce loyalty; the confidence created when the firm keeps its word, communicates the outcome, and visibly removes the cause is what brings the customer back.

Table 21. Critical control points in the complaint-to-loyalty process.

Control point	Typical failure	Control required	Indicator
Registration	Complaints are not captured	One ticket system and a unique ticket number	Share of contacts with a ticket (%)
Classification	Wrong category recorded	Standard complaint codes	Ticket accuracy (%)
Ownership	No single accountability	One SPOC from registration to closure	Chaser calls per ticket
Diagnosis	Wrong diagnosis	Technical expert support	Revisit rate (%)
Parts availability	Part not available at the visit	Part reserved before dispatch	Fill rate at first demand (%)
Resolution	Several visits and delay	First-time fix by empowered technicians	First-time fix rate (%); turnaround time
Communication	No updates; promises not kept	Proactive updates by message	Appointment adherence (%)
Closure	Ticket closed without the customer's consent	Closure confirmed by the customer	Verified closure rate (%)
Root cause	The same complaint returns	Root cause analysis and permanent correction	Repeat complaint rate (%)
Management review	No cross-functional accountability	Monthly complaint council	Complaints per 1,000 installed units

Figure 16 and Table 22 give a twelve-month action plan with owners and measures. The plan answers the five core problems directly: published rate cards and honest warranty terms address the price and trust gap; WhatsApp access, pre-season camps and capacity planning address slow access; certification addresses the skill gap; part reservation and hub-and-spoke stocking address parts; and the pin-code map addresses reach. Numerical targets are not prescribed, and each firm should record its baseline in the first 30 days.



Figure 16. Twelve-month action plan for service transformation.

Table 22. Action plan with owners and measures.

Phase	Action	Owner	Measure
0–30 days	Tag each complaint by lane (domestic, B2B, social), product and root cause	Service head, IT	Share of complaints tagged (%)
0–30 days	Publish one dashboard showing complaints per 1,000 installed units, turnaround time and repeat visits	Service analytics	Dashboard reviewed weekly by leadership
0–30 days	Name a social care owner; connect every public complaint to a service ticket	Service head, corporate communication	First response time; share linked to tickets (%)
31–90 days	Prepare a pin-code serviceability map; give an honest installation promise at the point of sale	Sales, service	Sales in pin codes without service cover (%)
31–90 days	Reserve the part before the technician is sent, beginning with the fastest-moving parts	Spares head	First-time fix rate (%)
31–90 days	Offer booking and status on WhatsApp in the main regional languages, with human handover	Customer experience, IT	Share of contacts completed without a call (%)
31–90 days	Appoint a SPOC for each key B2B account; maintain an SLA register; hold quarterly reviews	B2B sales, service	SLA compliance (%); renewal rate (%)
3–6 months	Certify technicians before the season through courses aligned to national standards	HR, training	Share of certified technicians (%)
3–6 months	Hold pre-season AC service camps to spread the summer peak	Regional service managers	Pending calls in the peak month
3–6 months	Re-plan spares stock on hub-and-spoke lines by value, movement and criticality	Supply chain	Parts fill rate (%); stock value
3–6 months	Establish a remote expert desk for diagnosis before the visit	Technical support	Repeat visits within 30 days (%)
6–12 months	Start the warranty from the installation date; publish the service rate card and spare prices	Legal, service, finance	Charge-related complaints
6–12 months	Fix commonisation and serviceability targets for new product platforms	R&D, quality	Number of unique part codes per platform
6–12 months	Open a service profit and loss account with AMC and extended warranty income	Finance, service head	Service income as share of revenue (%)

Table 23 allocates the ownership of correction by function. Table 24 gives indicative aspiration levels for the core indicators; these are the authors' proposals based on practice, not validated benchmarks, with the exception of first contact resolution, which is anchored to the benchmark reported by Desmarais (2022).

Table 23. Ownership of correction by function.

Function	Responsibility
Customer service	Registration of complaints, communication and tracking
Service operations	Resolution, technician productivity and turnaround time

Function	Responsibility
Technical team	Diagnosis and technical support
Spare parts and supply chain	Availability of parts and inventory
Quality	Failure analysis and corrective action
R&D and design	Permanent product improvement
Sales and dealers	Correct product promises and customer expectations
HR and training	Technician competency and certification
IT and CRM	Integrated customer and product history
Leadership	Review, accountability and allocation of resources

Table 24. Core PCM indicators with indicative aspiration levels.

Indicator	Indicative aspiration level (authors' proposal)
Complaints per 1,000 transactions or installed units	Downward trend every year
First contact resolution	Above 70%
First-time fix rate	Above 85%
Customer Effort Score	Continuous improvement
Repeat complaint rate within 30 days	Below 5%
End-to-end turnaround time	Within the SLA commitment
Escalation rate to regulators, consumer forums or social media	Continuous reduction
Root-cause closure time	Fewer days each year to eliminate a recurring issue
Share of complaints tagged with a root cause	Above 95%
Service income as a percentage of revenue (after-sales organisations)	Rising share

Figure 17 contrasts the traditional approach with the approach proposed in the paper.

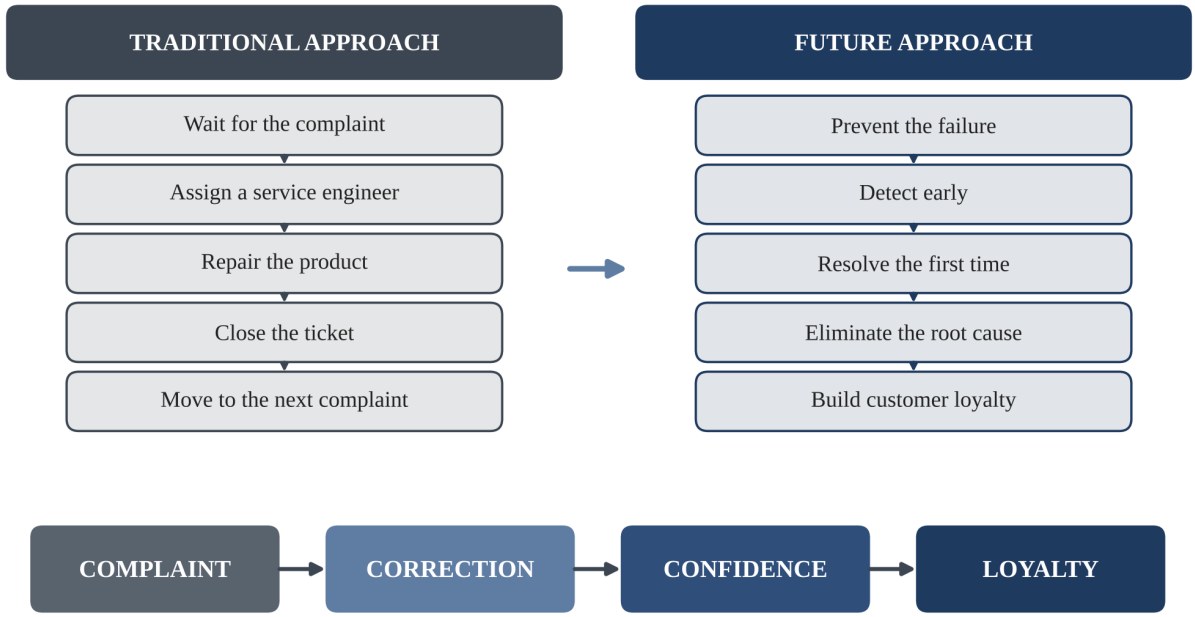


Figure 17. From the traditional approach to the proposed approach.

6 Propositions

The framework yields eight propositions for empirical testing.

P1. Organisations that invest in the Prevent and Detect stages will show fewer complaints per 1,000 transactions than organisations that invest in the Resolve stage alone.

P2. AI tools reduce complaint volume only where a smooth human handover exists; otherwise, customer effort rises.

P3. Perceived fairness of treatment mediates the link between complaint resolution and repurchase intention.

P4. Cross-functional ownership of root causes moderates the link between complaint analytics and complaint reduction.

P5. Organisations that link serial numbers to customer identity at the point of sale will complete field corrections faster and more completely than organisations that do not.

P6. Recommendations based on SDR records will raise first contact resolution and first-time fix rates, and the effect will depend on the quality of symptom and defect coding.

P7. Customer education at the point of sale will reduce usage-related complaints per 1,000 installed units.

P8. Complaints closed on the customer's confirmation and followed by a verified corrective action will show higher repurchase intention than complaints closed administratively.

7 Discussion

7.1 Answers to the research questions

On RQ1, complaints in every industry studied come from a small number of predictable causes: returns and product information in retail, loans, cards and fraud in banking, communication in healthcare, failures during the stay in hospitality, downtime in B2B and customer effort in SaaS. On RQ2, three strategies recur, namely transparency, early detection and fast and fair resolution, and well-run programmes report 20% to 30% lower contact volume. On RQ3, successful programmes share the use of complaint data at senior level, empowered front-line staff and cross-functional ownership of causes. On RQ4, proactive complaint management in Indian consumer durables requires a service ladder that routes each problem to the right channel, three complaint lanes on one ticket system, linked indicators verified by the customer, and control of spare parts and technician capability. The PCM framework and the operating model bring these answers together.

7.2 Critical appraisal of the evidence

Three observations stand out. Prevention yields more than recovery: the recovery paradox is uncertain (de Matos et al., 2007), while the cost of effort and of repeated failure is well established (Dixon et al., 2010; Maxham & Netemeyer, 2002). Technology is necessary but not sufficient, since a tool without process and people does not reduce complaints. And regulation in India is pressing in the same direction, through time limits for redressal and the publication of complaint data.

The evidence behind these observations is not of equal quality (Table 25). Two rival explanations also deserve mention. The rise in Indian complaint numbers may partly reflect a growing installed base and easier complaint channels, and not only poorer service; this is why the paper recommends a ratio, complaints per 1,000 installed units, in place of absolute counts. And the reductions reported for proactive programmes come largely from organisations and consultants describing their own successes. Programmes that failed are unlikely to have been published, so the 20% to 30% range describes what good programmes achieve and not an average.

Table 25. Strength of evidence for the main claims.

Claim	Evidence base	Strength	Caution
Fair treatment drives satisfaction and loyalty after a complaint	Meta-analyses (Gelbrich & Roschk, 2011; Orsingher et al., 2010)	Strong	Mostly Western samples
High customer effort leads to disloyalty	Large practitioner survey (Dixon et al., 2010)	Moderate	Practitioner journal
An excellent recovery leaves the customer more satisfied than no failure	Meta-analysis with mixed results (de Matos et al., 2007)	Contested	Does not survive repeated failure
Proactive programmes cut contact volume by 20–30%	Consulting case reports (Bianchi et al., 2014; McKinsey & Company, n.d.-b)	Moderate to weak	Self-reported successes
Self-service fully resolves only 14% of issues	One research-firm survey (Gartner, 2024)	Moderate	Single source
Complaints in India are rising	Regulator and parliamentary data (RBI, 2025; Rajya Sabha, 2025)	Strong for volume	Base growth and easier channels also contribute

Claim	Evidence base	Strength	Caution
Indian consumers avoid brand service because of cost and access	Online community surveys (LocalCircles, 2026)	Moderate to weak	Self-selected respondents; press reports
SDR records, serialisation and AI improve prevention and first-time fix	Practitioner experience; automobile recalls as illustration	Untested	Stated as P5 to P7

7.3 Theoretical contribution

The paper adds to the literature in four ways. It shifts the unit of analysis from the complaint received to the complaint life cycle, bringing prevention and detection into a field that has concentrated on recovery and extending the proactive stream opened by Challagalla et al. (2009). It places theories of expectation, voice, justice, effort and learning along that life cycle and shows them to be complementary. It introduces the SDR record as a unit of service knowledge that links the four stages and makes double-loop learning observable. It separates domestic, B2B, and social media complaints as lanes with different economics, in line with the finding of Morgeson et al. (2020) that the effect of complaint handling depends on context.

7.4 Managerial implications

Six implications follow for managers. They should measure complaints per 1,000 transactions or installed units, so that growth does not hide the trend. They should identify the leading root causes and assign each to the function that creates it. They should begin with transparency, which was the lowest-cost form of prevention in every industry studied. They should use AI first for detection and alerts and then for self-service, keeping a human route open. They should give front-line staff a settlement limit and training in fair treatment. And they should report complaint indicators to the board every quarter, alongside revenue. For Indian consumer brands the timing matters, because the installed base of the 2030s is being sold now; manufacturers that add service to their products earn steadier income and stay closer to the customer (Cohen et al., 2006; Vandermerwe & Rada, 1988). A twelve-month action plan and indicative levels for the main indicators are set out with the operating model.

7.5 Limitations and future research

The study uses secondary data only. Several sources are consulting or industry reports whose methods are not fully disclosed, and some Indian figures are taken from press reports of the original studies. Part of the evidence comes from the United States and may not transfer directly to India, and contact volume is used as a proxy where direct complaint data were not available. The grading in Table 25 is the authors' judgement and not a formal quality assessment. The framework, the operating model and the data and AI applications have not been tested with primary data. A survey of Indian organisations across the six industries could test the eight propositions; longitudinal studies could measure complaint ratios before and after the adoption of AI; and a rupee-level comparison of domestic, B2B and social media complaints would add depth.

8 Conclusion

Complaints cannot be removed from business, but most of them can be predicted. Five conclusions follow from this review. First, most complaints arise from a small number of predictable causes, so

prevention is feasible and worth more than recovery. Second, published evidence supports 20% to 30% lower contact volume in well-run programmes, not a universal 30% reduction in complaints. Third, technology helps only when a human route remains open and when process and people change with it. Fourth, leadership decides the result, through the use of complaint data at senior level, empowered front-line staff and ownership of root causes by the function that creates them. Fifth, a complaint should be closed by the customer and completed by the organisation: closure needs the customer's confirmation, and completion needs a verified permanent correction.

For India's consumer durables industry the lesson is sharper. Complaints are rising while the installed base multiplies, and a young, connected population complains faster and more publicly than before. Service that is planned with the product and supported by certified technicians, disciplined spare parts and traceable products is the answer to rising complaints and a business in its own right. The path from complaint to loyalty runs through correction and confidence. Organisations that stop at correction will go on repairing the same failures; organisations that restore the customer's confidence and remove the cause will keep the customer.

Declarations

Conflict of interest. The authors declare no conflict of interest.

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Data availability. All data used in the study come from the published sources listed in the references.

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