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Effectiveness of live chat support in resolving customer queries on online tax filing platforms: A review of secondary evidence

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ABSTRACT :

Online tax filing has moved routine compliance onto government and commercial portals, but the questions taxpayers raise while filing are often account-specific, time-bound and consequential. Live chat is now a common way of answering them, yet little is known about how well it actually resolves queries. This paper reviews secondary evidence on the effectiveness of live chat support on online tax filing platforms. It draws on peer-reviewed studies of live chat and e-filing, an audit report by the U.S. Treasury Inspector General for Tax Administration (TIGTA), OECD comparative data, Indian Income Tax Department releases and a small set of industry benchmarks. The evidence is organised around five dimensions: resolution, timeliness, accuracy, taxpayer satisfaction and equity of access. General service research links live chat quality to satisfaction, and e-filing research points to system and information quality, but we located no peer-reviewed study that measures live chat resolution on a tax filing platform. The one audit-grade source, an IRS collections programme, recorded fewer than half of chats as resolved and found its own chat data unreliable. Indian official sources describe chat as one helpdesk channel but publish no resolution or satisfaction measures. We propose a set of indicators and a research agenda for primary studies.

Keywords: Live chat; online tax filing; e-filing; customer support; service quality; taxpayer satisfaction; India

1. Introduction

Filing a tax return online is, for most people, something done once a year, against a deadline, with real consequences for getting it wrong. India's e-filing facility began in September 2004 on a voluntary basis and was later made mandatory for several categories of filers, including individuals above an income threshold from 2015 (Puthur, Mahadevan, & George, 2016). The volumes are now very large: the Income Tax Department reported that more than 7 crore returns had been filed by 7 pm on the 31 July 2024 deadline (ETV Bharat, 2024). At that scale, even a small share of filers needing help translates into a very large number of questions arriving in a short window.

Support has expanded alongside the portals. When the Department launched its current e-filing portal in June 2021, early press coverage listed a chatbot and live agent among its features (ClearTax News, 2021). Its October 2024 release on audit-report filing names live chats alongside inbound and outbound calls, WebEx and co-browsing sessions as helpdesk channels (Central Board of Direct Taxes [CBDT], 2024), and in April 2026 it introduced an AI-based assistant called Kar Saathi (IANS, 2026). The pattern is not specific to India. The OECD's comparative survey of 58 jurisdictions reported more than 30 million contacts through chatbots in 2020, alongside a 30% rise in digital contacts overall (OECD, 2022).

What is much less clear is whether these channels work. Usage figures tell us that taxpayers open chat windows; they do not tell us whether the question was answered, how long it took, whether the answer was right, or whether the taxpayer had to try another channel afterwards. Research on tax filing has mostly asked why people adopt e-filing in the first place (Wang, 2003; Carter & Schaupp, 2008), while research on live chat has mostly been conducted in retail and telecommunications (McLean & Osei-Frimpong, 2017). The two literatures rarely meet.

This paper therefore sets out to:

- describe where live chat sits within the support arrangements of online tax filing platforms;
- synthesise what published secondary evidence says about its resolution, timeliness, accuracy, satisfaction and equity outcomes; and
- identify the gaps in that evidence and propose indicators that future studies and platform operators could use.

The paper is a review, not an empirical test. We collected no primary data, and where the evidence is thin we say so rather than fill the space with industry statistics of uncertain origin. Section 2 sets out the conceptual background, Section 3 describes how sources were identified and weighed, Section 4 reviews the evidence, Section 5 discusses it, and Sections 6 and 7 give limitations and conclusions.

2. Conceptual background

2.1. Live chat as a service channel

Live chat lets a customer put a question to a human service representative through a web-based, synchronous text exchange (McLean & Osei-Frimpong, 2017). In a survey of 302 UK customers describing real chat encounters with mobile network providers, McLean and Osei-Frimpong found that service quality, information quality and system quality all shaped satisfaction with the encounter, with the strength of each depending on why the customer had

come to chat. Design details mattered as well: emoticons, a photograph of the representative, canned responses and estimates of response time altered how strongly those quality factors translated into satisfaction.

Automated agents are a separate case. Chung, Ko, Joung, and Kim (2020) studied chatbot e-service in luxury brands, with customer satisfaction as the outcome. On tax platforms the two are often chained rather than alternatives: in the IRS programme discussed below, a taxpayer reaches a human assistor by first passing through an automated chatbot (Treasury Inspector General for Tax Administration [TIGTA], 2026). A weak chatbot can therefore degrade the human channel behind it, which is one reason we treat the two together in Section 4.

2.2. Service quality frameworks

Three frameworks recur in the e-filing literature. SERVQUAL-style models define quality as the gap between expected and perceived service. E-S-QUAL, developed for websites, uses 22 items across four dimensions (efficiency, fulfilment, system availability and privacy), and is accompanied by a second scale, E-RecS-QUAL, of 11 items in three dimensions (responsiveness, compensation and contact) that applies to customers who have had a non-routine encounter with the site (Parasuraman, Zeithaml, & Malhotra, 2005). That second scale is the more relevant one here, because a taxpayer who opens a chat window has, almost by definition, run into something the self-service pages did not resolve.

The updated DeLone and McLean (2003) information systems success model adds service quality to system quality and information quality as antecedents of user satisfaction and use. It has been applied to e-filing in several settings, and as we show below, the results for the service-quality component are not consistent.

2.3. Defining effectiveness

No source we reviewed offers a standard definition of live chat effectiveness for tax platforms, so we use a working one assembled from the sources themselves. Effectiveness is treated as having five dimensions: *resolution* (the query is settled without a further contact), *timeliness* (waiting and handling time), *accuracy* (the answer is correct and sufficient), *satisfaction* (the taxpayer's own judgement) and *equity* (the benefit is shared across taxpayers of different circumstances). A sixth consideration, *security*, acts as a constraint rather than an outcome, since tax account information may not be disclosed until identity is verified (TIGTA, 2026).

3. Method

3.1. Design and search

This is a narrative review of secondary evidence, supported by documentary analysis of official and audit sources. Searches were run in October 2026 across publisher and repository pages, open abstracts, government and international-organisation websites, and trade press. Query terms combined live chat, chatbot, customer support and service quality with e-filing, online tax filing, tax administration and India. Sources were retained if they bore directly on live chat or chatbot support, on service quality or satisfaction in e-filing, or on support channels used by tax administrations, and if their bibliographic details could be traced to a publisher, repository or issuing body. We did not follow a formal systematic-review protocol, and the search should not be read as exhaustive.

3.2. Weighing the sources

Sources differ greatly in how far they can be trusted, so we sorted them into three tiers (Table 1) and let the tier govern how a claim is worded. In the course of searching we found that several commercial pages repeat the same headline figures, such as a 73% satisfaction rate for live chat, while attributing them to different originators. Statistics we could not trace to a primary report were excluded. Figures taken from the retained sources are reported as the source states them, with their context; no figures were recomputed.

Table 1 - Source tiers used in this review.

Tier	Source type	How it is used
A	Peer-reviewed journals and conference proceedings; NBER working paper	Basis for statements about relationships and mechanisms; working paper flagged as not yet peer reviewed
B	Audit reports, official press releases, OECD publications	Basis for descriptions of programmes, volumes and measured performance
C	Trade press and industry benchmarks	Context only; always attributed and caveated

4. Evidence review

4.1. Live chat and satisfaction in general service research

The peer-reviewed evidence on live chat comes mainly from consumer settings. McLean and Osei-Frimpong (2017) is the most directly relevant, for the reasons given in Section 2.1. Industry benchmarks tell a broadly positive but less rigorous story. A Zendesk benchmark covering 2,261 of its customers using a live chat product reported an average satisfaction rating of 92% and an average first response time of 1 minute 36 seconds, based on firms with at least 25 satisfaction ratings in the quarter (Loyalty360, n.d.). The same benchmark, as summarised by CMSWire (n.d.), found that satisfaction fell when customers waited more than 30 seconds for an agent.

A 2017 SuperOffice test paints a different picture. Researchers sent one question through the chat window of 1,000 business-to-business and business-to-consumer websites in the United States; 21% of requests went unanswered and the average wait was 2 minutes 40 seconds (Carufel, 2017). The two benchmarks are not in conflict, because they measure different things. The first reports satisfaction ratings left by customers who completed a chat on a particular platform; the second records what happened when a tester tried to start one. Neither involved tax filing, and both come from vendors with an interest in the channel.

4.2. E-filing research: system quality, information quality and satisfaction

Early e-filing research was concerned with adoption. Wang (2003) extended the technology acceptance model with perceived credibility to explain intention to use electronic tax filing, and Carter and Schaupp (2008) surveyed 260 participants on adoption factors, trust and self-efficacy. Neither examined support channels.

The closest Indian evidence is Puthur et al. (2016), who surveyed 330 taxpayers who had e-filed for the 2014-15 financial year, using convenience sampling and partial least squares modelling. Perceived usefulness and perceived ease of use both had significant positive effects on satisfaction. Information quality significantly raised perceived usefulness, perceived ease of use and satisfaction, whereas website quality raised the two perceptions but had no significant direct effect on satisfaction. Satisfaction in turn strongly predicted the intention to keep using the system (path coefficient 0.650). The authors also noted that many filers turned to paid intermediaries, citing press reports that one commercial filing service handled about one million e-filings in 2015-16, and read this as a sign that the government portal was not easy enough to use unaided. Support was not a construct in their model, but their reading points to an unmet need that chat is meant to address.

Kresnandita, Prawati, and Lusiana (2023) applied the DeLone and McLean framework to Indonesian personal taxpayers using the e-filing system. System quality and information quality had significant effects on satisfaction; service quality, as measured in that study, did not. This cuts against the intuition that better support must raise satisfaction. A plausible reading is that taxpayers who complete a return without trouble never encounter support, so support quality shows up in the satisfaction of only a minority. We offer that as an interpretation, not a finding of the study.

4.3. Live chat in a tax administration: the IRS audit

The most substantial evidence on chat performance in a tax setting is an audit by TIGTA (2026) of chat applications in the IRS Automated Collection System (ACS), the function that handles balances due and delinquent returns. It is therefore evidence about collections, not about filing a return, and it covers the United States. With that caveat, it is the only audit-grade assessment we found.

The IRS piloted unauthenticated live chat in November 2017, added authenticated chat in June 2019, introduced an automated chatbot in December 2021 and made the ACS live chat permanent in June 2025. TIGTA reported that the IRS spent roughly US$7.2 million of Inflation Reduction Act funds on chatbot and live chat applications in fiscal years 2024 and 2025. Its main findings were these.

- **No performance measures.** The IRS had not analysed the effectiveness of its chat applications and had no performance measures for them, and the data it did collect were unreliable. Reports showed one assistor handling as many as 603 chats at once, although the system limits concurrency to three.
- **Over half unresolved.** Of 635,684 chats recorded, 290,181 (46%) were classed as resolved and 345,503 (54%) as unresolved, a category that included abandoned chats (40% of the unresolved), disconnected chats (37%) and referrals to the telephone line (24%). TIGTA cautioned that the data weaknesses prevented a precise count and that the reasons for non-resolution were not recorded.
- **Multitasking.** In a judgmental sample of 40 assistors, 24 (60%) worked several chats concurrently, which TIGTA warned could lower service quality and raise the risk of disclosing information to the wrong taxpayer. The sample cannot be projected to the whole workforce.
- **Feedback not used.** No survey had been offered after live chats since September 2022, and the two-question survey at the end of automated chatbot sessions was not collected or reviewed.
- **Chatbot gaps.** In testing, 29 of 206 chatbot process flows (14%) could be improved, and 44 of 53 keywords (83%) were either not recognised or answered insufficiently. The Spanish version offered no keyword search.

The IRS agreed with all nine of TIGTA's recommendations. For our purposes the audit matters less for any single percentage than for what it shows about the state of measurement: an agency that had run chat since 2017 could not say, from its own records, how often chat settled the taxpayer's problem.

4.4. India: portal, helpdesk and Kar Saathi

Indian official sources describe chat as part of a multi-channel helpdesk but publish little about its performance. The CBDT release of 9 October 2024 reported that the e-filing helpdesk handled around 1.23 lakh queries in September and October 2024 through inbound calls, outbound calls, live chats, WebEx and co-browsing sessions (CBDT, 2024). The release gives no resolution rate, satisfaction score or channel-wise breakdown. An earlier departmental update, as reproduced by TaxTMI (2022), said that on 15 March 2022 alone the helpdesk responded to over 8,500 calls and 260 chats. That is one day, one filing deadline and one category of filers, so it cannot be generalised, but it does suggest that at that time chat carried a small fraction of the contact volume that calls did.

The telephone helpline publishes fixed hours, 8 am to 8 pm on weekdays and 9 am to 6 pm on Saturdays (Income Tax Department, n.d.), whereas Kar Saathi is described as a round-the-clock assistant (IANS, 2026). The department has also said the helpdesk runs on a 24x7 basis around filing deadlines (ETV Bharat, 2024). Kar Saathi is too recent for any published evaluation to exist, and we found none.

4.5. AI assistance in tax: OECD data and a field experiment

Beyond India and the United States, the OECD's Tax Administration 2022 documents the scale of chatbot use but not its outcomes (OECD, 2022). The only randomised evidence we found is a field experiment by Holz, Perez-Truglia, Simon, and Zentner (2026) with 645 households in Dallas County, Texas, on appealing property tax assessments. All received a website with personalised guidance; half also received an AI chatbot. Of those, 78% started a conversation, and access to the chatbot raised the probability of filing an appeal without a human agent from 41.4% to 50.5%, a gain of 9.1 percentage points. The gain was smaller among less-advantaged households, which the authors read as suggestive evidence that the chatbot widened existing disparities. The setting is property tax appeals, the tool is an AI chatbot rather than a human chat agent, and the paper is an NBER working paper dated August 2026 that has not been peer reviewed. It is nonetheless the clearest causal evidence we found that conversational help can change taxpayer behaviour, and that who benefits depends on who uses it.

Table 2 - Summary of the principal sources and their relevance.

Source	Context and design	Main finding reported	Relevance
McLean & Osei-Frimpong (2017)	UK mobile providers; survey (n = 302); structural equation modelling	Service, information and system quality shape satisfaction with chat encounters; design features moderate the effects	Direct on live chat; not tax
Chung et al. (2020)	Chatbot e-service, luxury brands	Examines chatbot service and customer satisfaction	Chatbots; not tax
Wang (2003); Carter & Schaupp (2008)	E-filing adoption; Taiwan; U.S. survey (n = 260)	Adoption determinants including credibility, trust and self-efficacy	Adoption, not support
Puthur et al. (2016)	India; survey (n = 330); PLS	Usefulness, ease of use and information quality drive satisfaction; website quality has no direct effect	Indian filers; support not modelled
Kresnandita et al. (2023)	Indonesia; DeLone and McLean model	System and information quality significant; service quality not	Support effects may be context dependent
TIGTA (2026)	IRS collections chat; audit	46% of recorded chats classed resolved; data unreliable; 60% of sampled assistors multitasked	Only audit-grade chat evidence; not return filing
CBDT (2024)	India; official release	About 1.23 lakh helpdesk queries; live chat among channels	No chat-specific metrics
OECD (2022)	58 jurisdictions	More than 30 million chatbot contacts in 2020	Scale of use only
Holz et al. (2026)	Field experiment (n = 645); property tax appeals	AI chatbot raised unaided appeal filing by 9.1 percentage points; smaller gain for less-advantaged households	Causal, but AI not human chat; working paper
Loyalty360 (n.d.); Carufel (2017)	Vendor benchmarks, non-tax	92% satisfaction rating; 21% of chat requests unanswered	Context only

5. Discussion

5.1. What the evidence supports

Read together, the sources support three cautious statements and leave several questions open. First, the quality of a chat encounter matters to satisfaction, and details such as visible response-time estimates can change how much (McLean & Osei-Frimpong, 2017). Second, in e-filing the strongest and most consistent predictors of satisfaction are system and information quality (Kresnandita et al., 2023; Puthur et al., 2016), which means chat is better understood as a safety net under those two than as a substitute for them. Third, conversational tools can shift taxpayer behaviour, though not equally for everyone (Holz et al., 2026). What the sources do not establish is how often live chat actually resolves a tax query. Table 3 sets out what each dimension of effectiveness looks like in the evidence.

Table 3 - Dimensions of effectiveness: what the evidence shows and suggested indicators.

Dimension	What the reviewed evidence shows	Suggested indicator (our proposal)
Resolution	Only TIGTA (2026) measures it: 46% classed as resolved in an IRS collections programme, with unreliable data	Share of chats followed by no repeat contact on the same issue within a fixed window
Timeliness	Vendor benchmarks only: 1 min 36 s average first response (Loyalty360, n.d.); 2 min 40 s average wait and 21% unanswered in a 2017 test (Carufel, 2017)	Median wait to first human reply, reported for filing peaks and off-peak separately
Accuracy	Chatbot responses in the IRS audit: 14% of flows improvable; 83% of keywords unrecognised or insufficient	Expert audit of a random sample of transcripts against current tax rules
Satisfaction	General studies link quality to satisfaction; no tax-chat survey located; IRS had stopped post-chat surveys	Post-chat rating plus a short survey, with non-response tracked
Equity	Holz et al. (2026): smaller gains for less-advantaged households; IRS Spanish chatbot lacked keyword search	Outcomes broken down by language, age, device and region
Security	TIGTA (2026): multitasking raised disclosure risk; authentication limits what an agent can answer	Rate of chats ended for lack of authentication; concurrency audit

5.2. Why tax queries are a distinct case

Tax queries differ from the retail and telecom questions that dominate the chat literature in at least three ways. Many are specific to the taxpayer's own account, which means an agent cannot answer until identity is verified. In the IRS programme, unauthenticated chats were limited to general inquiries, and a pilot of mid-chat authentication raised its own problem: an assistor might wait 15 to 20 minutes while the taxpayer created an online account (TIGTA, 2026). Whether a chat resolves a query may therefore depend as much on how authentication is designed as on how good the agent is.

Demand is also sharply seasonal. India recorded over 7 crore returns by 7 pm on a single deadline day (ETV Bharat, 2024), so staffing and queue design must cope with spikes that retail support rarely sees. Finally, the consequences of a wrong answer are unusually concrete. TIGTA noted that inaccurate or insufficient chat responses could lead taxpayers to file an incorrect return or to contact the IRS again (TIGTA, 2026). A poor answer about a refund or a deduction is not just an annoyance.

5.3. A measurement problem

The sharpest obstacle to judging effectiveness is not a lack of numbers but a lack of comparable ones. The Zendesk benchmark reports satisfaction ratings, the IRS audit reports resolution codes, and the CBDT release reports query counts. These cannot be set side by side. A 92% satisfaction rating and a 46% resolution rate are not contradictory, since the first comes from customers who chose to rate a completed chat and the second from agent-assigned codes across all chats, including those abandoned or disconnected. Even within one source the categories can mislead: the IRS counted a referral to another IRS function as resolved, yet counted a referral back to the telephone line as unresolved, and it left abandoned chats out of its own analysis (TIGTA, 2026). A chat can be a success under one scheme and a failure under another.

5.4. Implications for platform operators

The sources do not allow us to say how effective live chat is, but they do suggest what an operator would need to find out. These points are consistent with TIGTA's recommendations and are our synthesis rather than findings of any single study.

- Define resolution explicitly, publish the definition, and count abandoned and referred chats in the denominator.
- Record why chats are referred, disconnected or abandoned, since without reasons no improvement can be targeted.
- Survey taxpayers after live chats and actually review the responses.
- Limit concurrency for authenticated chats and audit transcripts, given the disclosure risk.
- Test the chatbot that fronts the human channel using the words taxpayers really type, including in regional languages.

6. Limitations

This review has limits that readers should keep in mind. It rests on secondary sources and offers no new measurement. The search was not systematic, and sources in languages other than English, or behind paywalls we could not read in full, may have been missed. For several sources we relied on abstracts and official summaries, and only the TIGTA report and Puthur et al. (2016) were read in full. The strongest evidence on chat performance comes from a U.S. collections programme, and the Indian evidence on e-filing satisfaction dates from filing behaviour before the 2021 portal. Industry benchmarks are vendor produced and were used only as context. Kar Saathi and the Holz et al. field experiment are very recent and have not been independently evaluated or peer reviewed. Finally, the five-dimension definition of effectiveness is ours, and other scholars may weigh the dimensions differently.

7. Conclusion and future research

Live chat has become a fixture of online tax filing support, but the published evidence does not yet show how well it works. General service research suggests that quality and responsiveness matter; e-filing research suggests that system and information quality matter more; and the one audit of chat in a tax administration found that the agency could not reliably tell whether chats resolved taxpayers' problems. Indian official sources confirm that chat is offered but give no outcome data.

Three lines of primary research follow. First, a survey of Indian filers who have used the portal's chat, adapting the E-RecS-QUAL responsiveness and contact items (Parasuraman et al., 2005) and linking them to a resolution measure. Second, an analysis of platform log data, with the Income Tax Department or a commercial filing platform, to estimate repeat-contact rates after chat compared with telephone and email. Third, an equity analysis of who uses chat and who benefits, building on Holz et al. (2026). Until such work exists, claims that live chat resolves taxpayer queries effectively remain plausible but unproven.

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